

SECTION 10 Summery and conclusion

10 Introduction

The Indian chemical industry is among the traditional sectors of the country that play an integral role in the country's economic development. This sector forms a part of the basic goods industry and is a critical input for industrial and agricultural development.

The Indian chemical industry is one of the oldest industries in India and has made immense contribution to the industrial and agricultural development of India. It encompasses both large and small-scale units. The fiscal incentives granted to the small scale units in the mid-1980s provided the thrust to the growth of Micro, Small and Medium Enterprises (MSMEs) in the sector. The chemical industry serves the needs of sectors such as textiles, pharma, petrochemicals, dyes, leather, plastics, paper, printing inks and food stuffs, among others.

M/s. Lakeland Chemicals (India) Ltd. is a medium scale unit is located at Madap Village Tq. Khalapur Dist Raigad, Maharashtra is largest surfactant manufacturing companies in India. Now, it plans to expand its plant capacity. As per EIA notification 2006, and amendments their on such projects are considered in category 5(f) A of schedule and requires prior environmental clearance. Environmental Impact Assessment Report is prepared as a procedure for obtaining prior Environmental Clearance for the proposed expansion. The Environmental studies carried out during the post monsoon (October) & winter (November, December) of Year-2015 as per guidelines of EIA notification the results of the study presented in draft EIA report.

10.1 Project description

S.No.	Item	Description																																																
1	Title of the project	Proposed expansion of synthetic organic chemicals(205 TPM to 1125TPM) at plot no 63,6A,6B, Rasayani Road, Village Madap, Taluka Khalapur, District Raigad Maharashtra by M/s Lakeland Chemicals (India) Ltd.																																																
2	Land	The existing plot ids of 17575 Sq Mter and out of this 2510 Sq mter will be utilised for proposed expansion.																																																
3	Cost of the project	24.05 Cr																																																
4	Production capacities.	<table border="1"> <thead> <tr> <th rowspan="2">No</th> <th rowspan="2">Product</th> <th colspan="3">MT/MONTH</th> </tr> <tr> <th>Existing</th> <th>Proposed</th> <th>Total after proposed expansion</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Esters</td> <td>80</td> <td>0</td> <td>80</td> </tr> <tr> <td>2</td> <td>Ethoxylates</td> <td>80</td> <td>0</td> <td>80</td> </tr> <tr> <td>3</td> <td>Speciality Chemicals</td> <td>40</td> <td>0</td> <td>40</td> </tr> <tr> <td>4</td> <td>Amphoterics</td> <td>5</td> <td>0</td> <td>5</td> </tr> <tr> <td>5</td> <td>Propoxylates</td> <td>0</td> <td>120</td> <td>120</td> </tr> <tr> <td>6</td> <td>Ester Emulsions</td> <td>0</td> <td>300</td> <td>300</td> </tr> <tr> <td>7</td> <td>Blending Chemicals</td> <td>0</td> <td>300</td> <td>300</td> </tr> <tr> <td>8</td> <td>Block Co</td> <td>0</td> <td>200</td> <td>200</td> </tr> </tbody> </table>	No	Product	MT/MONTH			Existing	Proposed	Total after proposed expansion	1	Esters	80	0	80	2	Ethoxylates	80	0	80	3	Speciality Chemicals	40	0	40	4	Amphoterics	5	0	5	5	Propoxylates	0	120	120	6	Ester Emulsions	0	300	300	7	Blending Chemicals	0	300	300	8	Block Co	0	200	200
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8	Block Co	0	200	200																																														

		polymer (EO /PO)					
		Total	205	920	1125		
5	Resource required	Components	Existing	Proposed	Resources availability		
		Power, KVA	225	200	Will be sourced from MSEDCL		
		Fresh Water, kl/day	72	8	Will be sourced from Irrigation dept.		
		Briquettes for Thermopack 1 No & Steam Boiler	3 MT/Day	5 MT/Day	local dealer		
		Fuel (HSD) for D.G.Set (Capacity: 750 KVA)	300 Lit/day	0	Will be sourced Local Dealer		
6	Air pollution control measure	<p>Flue gas emission:</p> <p>⇒ At present, the unit is having one number of Thermopac and 1 number of Steam Boiler. Cyclone scrubber provided to arrest particulate matter</p> <p>⇒ At present, the unit is having one number of 750 KVA of D G set (standby). It will be used only during power failure.</p> <p>⇒ Adequate stack height and stack monitoring facilities are provided as per rule.</p> <p>Process gas emission:</p> <p>⇒ There is no process emission from manufacturing process since it is close vessel reaction.</p>					
7	Waste water treatment	ETP on ZLD scheme is proposed. Treated water will be reused back in process to the maximum extent and balance will be used for gardening.					
8	Solid /Hazardous waste	Sr. No.	Type of hazardous waste	Categor y	Quantity, TPA	Place of Storage	Dispos al
					Existing		
		1	Waste from ETP	34.3	0.6	1.2	HW storage
2	Used oil	5.1	0.06	1.5	Drum	Sell to registe red re-refiner	

		3	Waste & Residue	23.1	0.6	1.2	HW storage	CHW TSDF
9	Green belt	Existing green belt area is of 6019.97 Sq mtr and proposed green belt area is 2000 Sq mtr.						
10	Capital and recurring cost per annum for environmental protection measures.	Capital Cost – 5.07 Cr Recurring cost per annum- 0.625 Cr						

10.2 Description of Environment

Environmental Baseline Data Collection is carried out during Winter & Post monsoon Season i.e. from Oct to Dec. 2015. The study area comprises of 10 km radial distance around the proposed Project. The predominant wind direction during the study period is South East to North West.

10.2.1 Meteorology: Micrometeorological data within the project area was monitored at site during Winter & Post monsoon

S.No.	Parameters	Data
1	Maximum temperature (°C)	37.1
2	Minium temperature (°C)	14.7
3	Maximum Relative Humidity (%)	81
4	Minimum Relative Humidity (%)	54
5	Predominant wind direction	South East

10.2.2 Ambient Air Quality: Ambient Air Quality is monitored at 6 locations near project site. The ambient air quality results obtained are well within the prescribed limits of National Ambient Air Quality Standards.

Station Code	Station Name	Distance From Project Site (km)	Direction	Upwind/ Downwind
AAQ1	Project site	--	--	--
AAQ2	Dhamani	4.0	E	Upwind
AAQ3	Kharsundi	1.3	E	Upwind
AAQ4	Nimode	2.5	NE	Crosswind
AAQ5	Ambivali	2.6	NW	Downwind
AAQ6	Madap	1.0	W	Downwind

Summary of Air quality Data are given below:

Unit: $\mu\text{g}/\text{m}^3$

Station Name	PM 10	PM 2.5	SO ₂	NOX	VOC
Plant Site	19.5 – 26.8	8.4 – 15.1	11.3 – 20.6	15.7 – 28.7	BDL
Dhamni	15.6 – 28.9	6.5 – 11.1	10.3 – 18.6	10.9 – 27.7	BDL
Kharsundi	19.2 – 28.4	7.2 – 11.7	12.1 - 21.3	16.7 – 24.6	BDL
Nimode	15.2 – 21.3	7.6 – 12.6	16.2 – 27.6	21.2 – 30.9	BDL
Ambivali	18.6 – 27.9	8.2 – 11.3	8.8 – 21.3	10.2 – 24.6	BDL
Madap	15.6 – 30.2	8.1 – 10.5	7.3 – 26.3	10.5 – 29.3	BDL

10.2.3 Ambient Noise Levels

Ambient Noise Levels were monitored at 6 locations near project area. The ambient noise levels obtained were well within the prescribed limits of National Ambient Air Quality Standards with respect to noise.

Summary of Noise Data are given below:

Units: dB (A)

	N 1	N 2	N 3	N 4	N 5	N 6
LMIN	40	38	38.1	38.3	38.7	38.6
LMax	56.5	55.4	52.8	52.8	53	53
Ld	50.4	49.9	48.5	49.2	48.8	48.6
Ln	42.7	42.8	41.5	42.8	43	42.8

10.2.4 Water Quality

About 4 ground water samples and 2 surface water samples have been collected to assess the water quality in the study area. The physico-chemical characteristics of water samples are in compliance with the prescribed drinking water standards of IS 10500.

Table No. 3.9 Water sampling locations

S No.	Location Code	Location Name	Sample Source
Surface water			
1	SWQ1	Patalganga River	Up-stream
2	SWQ2	Patalganga River	Down-stream
Ground water			
1	GWQ1	Ambivali	Open Well
2	GWQ2	Madap	Open Well
3	GWQ3	Kharsundi	Open Well
4	GWQ4	Savaroli	Open Well
5	GWQ5	Dhamni	Open Well

The ground water quality parameters were assessed as per the Indian Standard IS 10500 2012 (Drinking Water Standard). The observations are given below:

- It is observed that the pH of the ground water and surface water samples are in the range of 6.50 to 7.38
- Total dissolved solids (TDS) of the ground water & surface water samples were in the range 58 to 444 mg/l
- Total hardness of the ground water & surface water samples was found to vary between 36.0 to 268 mg/l

10.2.5 Soil Quality

Six soil samples were collected and analysed.

Station Code	Station name
S1	Project Site
S2	Ambivali
S3	Madap
S4	Dhamani
S5	Savaroli
S6	Kharasundi

Results show the pH ranges from of 5.45 – 6.97 and the Nutrients like N, P and K are in moderate concentration.

10.2.6 Ecological Status

Flora- The prominent plant in the study area is Mango, which is found commonly near the road side. Babul was a common tree near the villages and on the hedge of agricultural field. The commonly found trees are Jamun, Bor, Tamrind, Eucalyptus, Neem, Peepal, Vad, Teak, Sheesham, Mango, Palas, etc.

Fauna- The Mammals found in the study area are Five Striped palm squirrel, Common / Indian Mongoose, Common Indian Hare, Indian Field Mouse, House mouse, House Shrew. Some reptiles like water snakes, monitor lizards and common lizards were also observed near village boundary. The dominant birds in the study area are House crow, Owl, Asian koel, common Myna.

10.3.7 Socio-Economics

The data on the demographic structure of the study area were collected from censuses records of Raigad District. There are 28 villages in the study area. The demographic profile of the study area including no. household, total population, population structure viz scheduled Caste population and number of literates & illiterates, are summarized below.

- Total population of villages under the study area is 27012.
- Sex ratio (930 nos. females per 1000 males) is which indicates that females are less in number than their male counterpart in the study area
- The overall literacy rate in the study area is 58 %, which is quite satisfactory.
- Scheduled caste population is 3% while scheduled tribe population in the study area is 13.49%.

10.4 Environmental Impact Assessments

The Environmental Impact due to the project is tabulated below:

Environmental Impact Assessment

Parameter	Construction Phase	Operational Phase
Air Environment	Short term negative impact	Long term negative impact
Water Environment	Short term negative impact	No negative impact
Noise Environment	Short term negative impact	Long term negative impact
Land Environment	No negative impact	Long term positive impact
Soil Environment	Short term negative impact	No Impact
Construction waste	Short term negative impact	No Impact
Ecological Environment	No negative impact	Long term positive impact
Employment generation	Short term positive impact	Long term positive impact
Improvement in Health care facility	No impact	Long term positive impact
Economic Condition of the study area	Short term positive impact	Long term positive impact
Aesthetics Environment	Short term negative impact	Long term positive impact
Resettlement and rehabilitation issue	No negative impact	No impact
Impact on infrastructure facilities	No negative impact	Long term positive impact
Historical , Archaeological and Architectural sites	No impact	Long term positive impact

10.5 Environmental Management Plan

10.5.1 Construction Phase Environment Management

a) Site Preparation

The development of site for erections of plant structure, office building and other allied activities shall require careful management planning as the construction activities will be located in plain land owned by the project proponent and within existing factory premises. Care will be taken to control the dust nuisance that would be created by excavation, leveling and transportation activities so that impacts on the various components of environment would be minimized.

b) Noise

Though level of construction activities shall not be very high, still some specific sources of noise like welding, transportation, movement of earth movers, tractors, will be carried out in a controlled manner. Neither the plant nor the construction workers should be exposed to excessive noise levels.

c) Construction Equipment and Waste

Transport vehicles as well as transport routes will be properly maintained during whole construction phase to minimize smoke / dust emission from vehicle exhausts and unpaved

roads. Composite solid wastes including metal scrape, earthwork, other wastes, getting generated in construction process will be disposed off in safe manner. Certain hazardous waste materials, though the requirement of such materials shall be small, will be stored safely and be disposed off properly.

10.5.2 Operational Phase Environment Management

a) Water Environment & Management

The Surface water shall be used for the plant operation and generation of waste water management shall be as per following

- ETP to be installed as per ZLD scheme.
- Treated water shall be reused in process to the maximum extent and balance shall be used for gardening.
- Rain water will be collected from roof tops and will be recharged through a rainwater recharge tank.
- Storm rain water drainage will be routed through a silting tank, for arresting of silt. Storm water will be used during the rains for the purpose of the plant water requirement.
- The sewage from plant will be directed to Septic tank followed by soak pit overflow if any shall be utilized in greenbelt development.

b) Air Environment Management

To minimize the impact due to the proposed project operations the following steps would be initiated:

- The emission characteristics should also be monitored regularly.
- Green belt to trap dust being emitted from fuel combustion and /or fugitive sources and also attenuate the other gaseous pollutants.
- The control of fugitive emission such as hydrocarbons from DG sets, process units/storage, the following measures are recommended:
 - Proper maintenance and clearing of the roads inside the plant
 - Monitor the consented parameters at ambient air quality monitoring station.
 - Monitor the work zone at various stations to satisfy the corporate requirements for health and environment.

c) Noise Environment

The following precautionary measures are to be adopted in the proposed project

- Insulate/enclose all the noise sources to avoid occupational exposure to the workers and to minimize the generation of excess noise level.
- Monitor the ambient and work zone noise level to conform the stipulated norms.
- Noise attenuation devices such as ear mufflers must be provided to the workers in the high noise exposure areas.

d) Biological Environment

Already 6019.97 Sq mtr of green belt exists within the extant premises of Lakeland. Tree plantation within premises and outside factory premises is also envisaged.

Features of Green belt

- Suitable tree species will be planted in the green belt.

- This will act as a noise barrier and would also reduce the air pollution
- Plantation will also Improve the aesthetic backdrop of the site

e) Land Environment

The impacts on the land environment in this case is again associated with the land applications of ETP effluent for crop irrigation and green belt development & maintenance, which has been discussed earlier under water environment component.

However, the construction of green belts would largely offset the change to the existing landscape and would provide visual comfort. The improved economy of the area is expected to cause increased outputs to agriculture, trade and commerce.

As Lakeland will implement zero wastewater discharge methodology, there would be no impact due to any wastewater disposal on land.

f) Occupational Safety & Health

All precautionary methods will be adopted by the company to reduce the risk of exposure of employees to occupational safety and health hazards. Pre & post medical check-ups will be done of all the employees. Employees will be regularly examined and the medical records will be maintained for each employee. Pulmonary function test and periodical medical check up shall be done once in every year.

g) Socio-Economic Welfare Activities

The operators and workers are to be trained in various aspects of ESH (Environment, Safety and Health). The managers and officers involved in Environment Management Cell shall undergo refresher workshop and up-gradation of information on various environmental issues.

The management of Lakeland shall help in promoting the activities related to environmental awareness in nearby villages. The proponent shall help in promoting local people for livelihood commensurate with their will, skill and abilities. Many other welfare measures will be taken from time to time.

10.5.3 Environmental Protection Cost

The Lakeland management has proposed to incur the following one time and recurring cost for the EMP measures.

Budgetary allocation for environmental protection measures

S. No.	Name of the Activity	Capital cost in (Rs Cr)	Recurring cost in (Rs Cr)
1	Air Pollution control system	1.5	0.05
2	Water pollution control system (ETP)	2.5	0.15
3	Noise pollution control system	0.07	-
4	Green belt development	0.3	0.025
5	Environmental monitoring	0.2	0.10
6	Solid waste/hazardous waste	0.3	0.10

	management		
7	Occupational health & safety	0.2	0.20
	Total	5.07	0.625

10.6 Environmental Monitoring

Based on the environmental impact matrix and considering the proposed product mix, the following Environmental Management Plan is suggested.

1. ETP should be installed on ZLD concept as per guideline of CPCB.
2. ETP should be operated properly.
3. Treated water shall be recycled back in process to the maximum extent and balance shall be used for gardening.
4. Monitoring of emissions to be done regularly
5. Hazardous wastes temporary storage is to be properly maintained and stock should be minimum.
6. Proper labeling on Hazardous Waste containers to avoid mishap.
7. The company should make continuous efforts in waste minimization.
8. Noise monitoring to be done regularly and efforts should be made to reduce them.
9. For the equipments and pipelines, leakage detection and repair is to be scheduled to minimize fugitive emissions.
10. The company should continue implementation and improvisation of EMS.
11. The tree plantation program should be continued with focus on developing green belt along the periphery of the unit.

ENVIRONMENT MONITORING PLAN:

SAMPLES		PARAMETERS	FREQUENCY
RAW/Treated EFFLUENT	24 Hrs. comp.	pH, COD, SS, Oil & Grease	PER DAY
ETP Sludge		L.O.D.	PER MONTH
Third party monitoring		<ul style="list-style-type: none"> • pH, COD, BOD, SS, TDS, Oil & Grease, Chlorides, Sulphates • Ambient air monitoring as per NAQS • Stack monitoring & Noise level monitoring 	Once in month
MPCB SAMPLE		-	As & when

10.7 Project Benefits

Project benefit focused on those points which become beneficial to the surrounding area or community in terms of infrastructural development, Social development, boosting employment and other tangible benefits due to upcoming or proposed activities in form side benefits. The proposed project expansion has a potential for employment of skilled, semi-skilled and unskilled employees during construction phase as well as operational phase.