PRE-FEASIBILITY REPORT

(In terms of provision of EIA Notification 2006)

FOR

CAPACITY EXPANSION OF EXISTING PLANT FROM

11,000 TPA TO 22,000 TPA

SPECIALTY CHEMICALS MANUFACTURING PROJECT

AT

KONNAGAR, DISTRICT – HOOGHLY.

WEST BENGAL, INDIA

By

NALCO WATER INDIA LIMITED
1, LENIN SARANI, P.O. – KONNAGAR
DIST.-HOOGHLY, WEST BENGAL – 712235
INDIA

Submitted to
Ministry of Environment & Forest (MoEF)
New Delhi

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1. Executive Summary

Nalco Water India Limited is an American MNC and a global leader in providing essential expertise for water, energy and air. The company has recently entered into a merger agreement with Ecolab Inc.-an MNC too and a major global player in the field of cleaning, sanitizing, food safety & infection-prevention products &Services. Nalco Water India limited is the Indian wing of Nalco and is responsible for all the business activities of the company in the Indian sub-continent. The annual turnover of Nalco Water India is around Rs 250 crore.

Globally Nalco is an 11 billion dollar company having its presence in 133 countries of America, Europe, Asia, Australia and Africa. It is a knowledge-based and research-oriented company contributing in various fields of green technology. Nalco Mobotec-a wing of Nalco is a world leader in combustion improvement and multi-pollutant reduction.

Nalco became a presence in India in the field of specialty chemicals during the late 1970s, but in 1987 that presence was boosted with the incorporation of Nalco Chemicals India Limited. From the main headquarters in Pune, Nalco also manages district offices in Mumbai, Baroda, Kolkata, Delhi, and Chennai. Programs in India are developed to focus on the local needs and conditions of each geographical area. Our state of the art manufacturing plant in Konnagar, West Bengal produces a full range of specialty chemicals and is further enhanced by the fact that it is the first specialty chemical company in India to be ISO 9001, ISO14000 & OHSHA certified. This unit initially came into operation in a joint venture with ICI India Limited -Konnagar but after sometime became independent. Here we manufacture water treatment chemicals, oil field chemicals and Industrial Additives.

Our peak production capacity being 11000 TPA as approved by the West Bengal Pollution Control Board and the Ministry of Industries, Govt. of West Bengal.

Nalco is a global leader in its area. Nalco Water India Limited also today is a symbol of reliability to its customers. Our Corporate policy is to sell solutions and add values by working safely. We have an answer for almost every water-related problem. Given a problem we first observe, then study to identify the root cause, conduct research if required and finally suggest a remedy. This is, in nutshell our activity in the market. Off course we also sell chemicals but only those of our proprietary chemicals which properly fit in our suggested remedy. We depute our engineers at various sites to ensure proper use of our chemicals. In water treatment chemicals our market share in India is 20%.

Besides chemicals we have also diversified in the fields of instruments, plant set up and technology. At TATA STEEL we have installed a Reverse Osmosis Plant to purify the boiler feed water for their Power House 5. It has ensured a much longer life of their Turbine.

In Mumbai we made use of our technology to optimize the cooling system of Hotel Mariott. We reduced the fresh water needs of the hotel by allowing the reuse of treated wastewater in the cooling system saving 60000 cubic meters of water each year. These

savings equal 256 million glasses of water which means 18 glasses of water for every resident of Mumbai.

We improved the cooling system performance in Mariott by preventing scaling ,corrosion and microbiological fouling. It helped conserve 600,000 kwh of electricity. It has also avoided 400 metric tons of greenhouse gas emissions. Mariott has achieved a significant environmental return on investment (eROI).

In 2010, Nalco opened a new corporate office and research and development facility in Pune, India. The $8.5 million, 60,000-square foot facility serves as the headquarters for sales, marketing and supply chain for Nalco Water India Ltd. as well as housing a new, state-of-the-art technology and innovation center. The Pune laboratory will eventually employ more than 100 engineers and chemists, three quarters of who will have advanced degrees.

South-East Asia and India in particular have had a fair share of the unprecedented growth of chemical industries that the world witnessed in the recent past. The Economy of India is the eleventh largest in the world by nominal GDP and the third largest by purchasing power parity (PPP).[1] The country is one of the G-20 major economies and a member of the BRICS. The Indian market for petrochemicals, agro-industries and specialty chemicals is expanding fast. The market size of specialty chemicals is now more 900 million US$ and it is growing at a phenomenal rate of 10 to 12%. In consideration of this Nalco Water India Limited has adopted the policy of rising to the occasion and stepping up its market share. Konnagar Works is the leading manufacturing facility of Nalco in India and hence it has to be renovated to enable it to cater to an exponentially growing market demand which would be there sooner or later. We would, therefore, intend to step up our peak production capacity from 11000 M.T. /year to 22000M.T./year and it is technically possible to achieve it without any major expansion, purchase of machineries or land and simply by increasing plant capacity utilization.

2. Introduction of Project

2.1 Identification of Project and Project Proponent:

2.1.1 Identification of Project:

Nalco Water India is in operation of manufacturing specialty chemicals at Konnagar, Hooghly, West Bengal since 1989 with the product ranges viz. Water treatment chemicals, Oil field chemicals and Industrial additives. The license capacity of the plant since inception is 11,000 ton per annum. With gradual growth since inception, now Nalco Water India is producing around 6000 to 7000 ton per annum in last few years with 16 hours / day and 6 days / week operation.

Recently, there is a trend of huge industrial growth in India and also tremendous pressure on water and energy conservation throughout all industries which gives an opportunity to Nalco Water India to penetrate the specialty chemicals market to give their essential expertise to save energy and water through their value additive products globally.

In view of the above industrial growth, Nalco water India wants to expand its capacity from 11000 TPA to 22000 TPA within its existing facilities at Konnagar by utilizing their idle capacity, assets, and hardware along with idle hours with minimum addition of equipment / accessories.

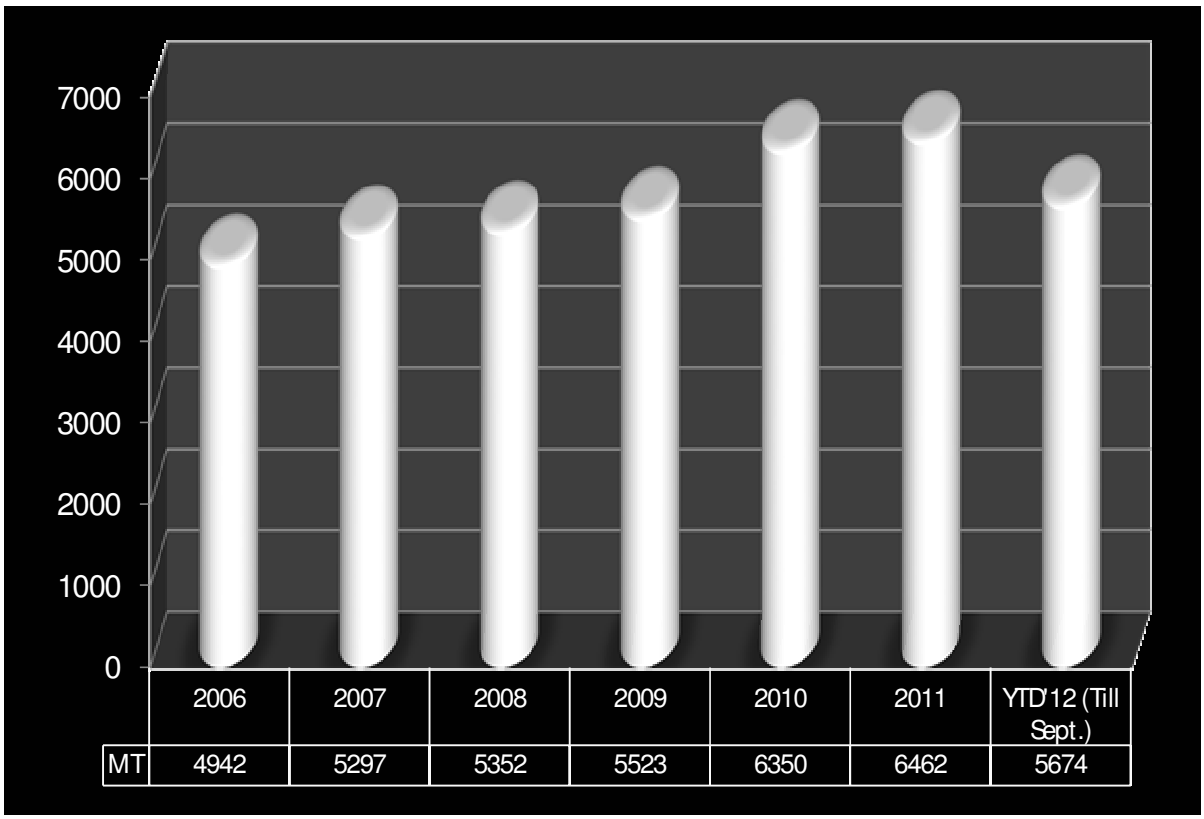
2.1.2 Project Proponent

It is proposed to expand its capacity from 11000 TPA to 22000 TPA specialty chemicals at its existing facilities at Konnagar, Hooghly, and West Bengal by:

- Utilizing already inbuilt plant capacity
- Utilizing idle hours – i.e. 16 hours/day & 6 days/week operation to 24 hours/ day & 7days/week operation.
- Adding only one 10 M3 SS Reactor with its accessories within the existing Product line to reduce batch cycle time vis-à-vis building capacity.

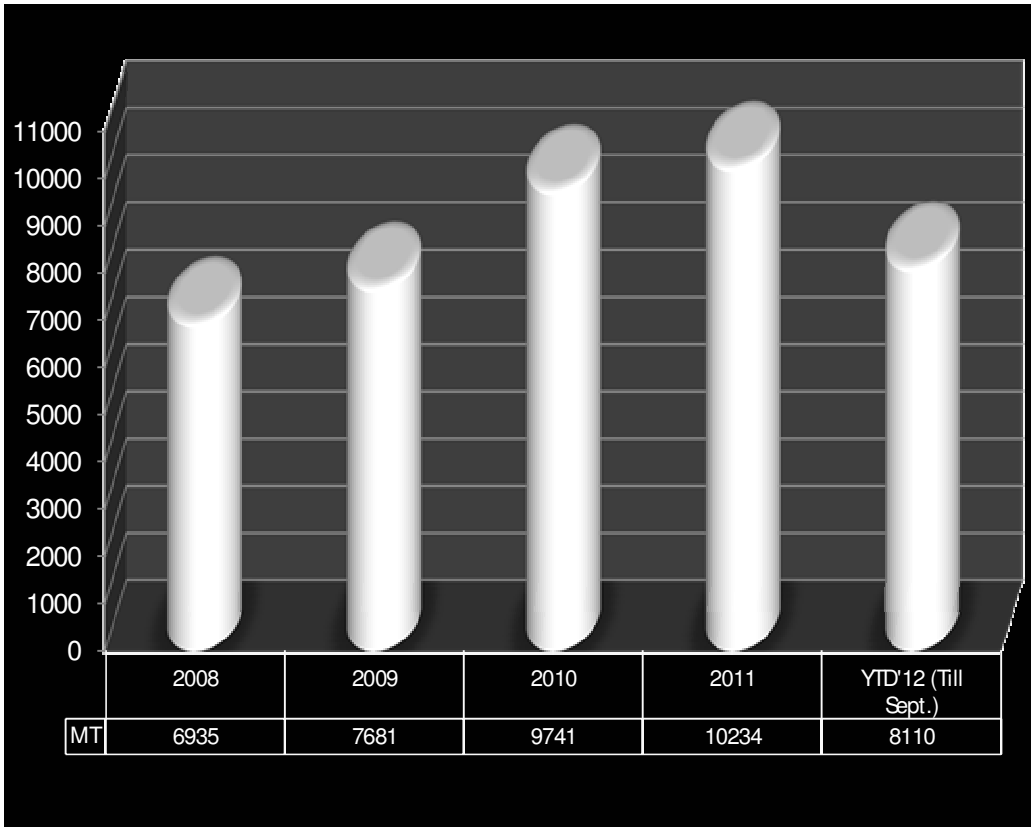
It will help us to reduce the product cost to compete in domestic as well as global market for survival as well as it will create some employment opportunity directly and indirectly.

2.1.2.1 Manufacturing Volume of last 5 years.



	2006	2007	2008	2009	2010	2011	YTD'12 (Till Sept.)
MT	4942	5297	5352	5523	6350	6462	5674

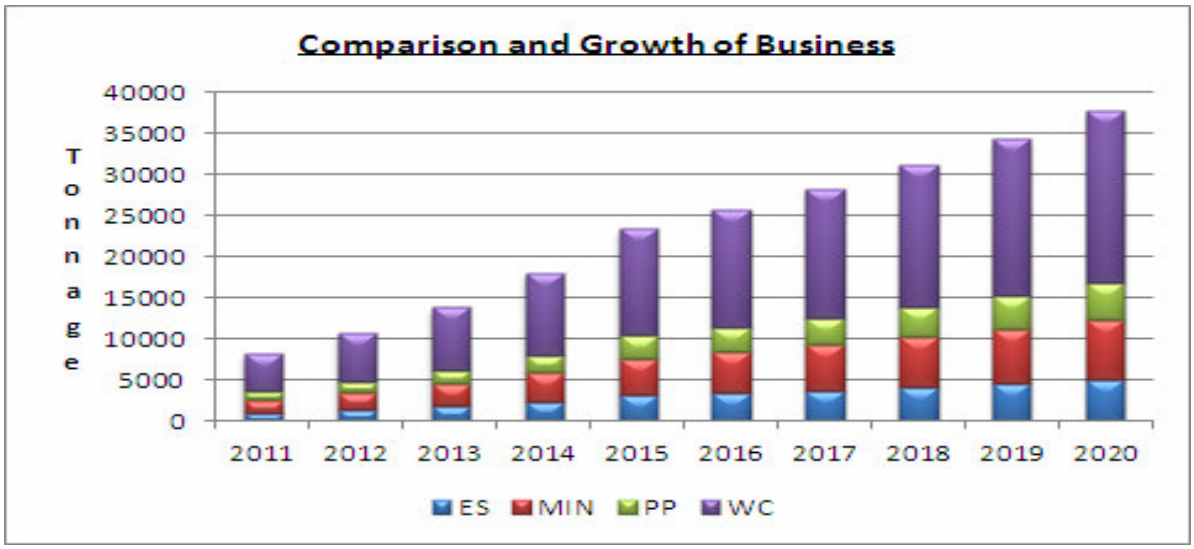
2.1.2.2. Dispatch volume of last 5 years:



2.1.2.3: GAP Analysis to assess the potential for localization:

Year	Manufacturing Volume, MT	Dispatch Volume, MT	Gap for localization (Dispatch – Manfg.) , MT
2008	5352	6935	1583
2009	5523	7681	2158
2010	6350	9741	3391
2011	6462	10234	3772
2012 (Till Sept.)	5674	8110	2436

2.1.2.4: Business growth forecast-

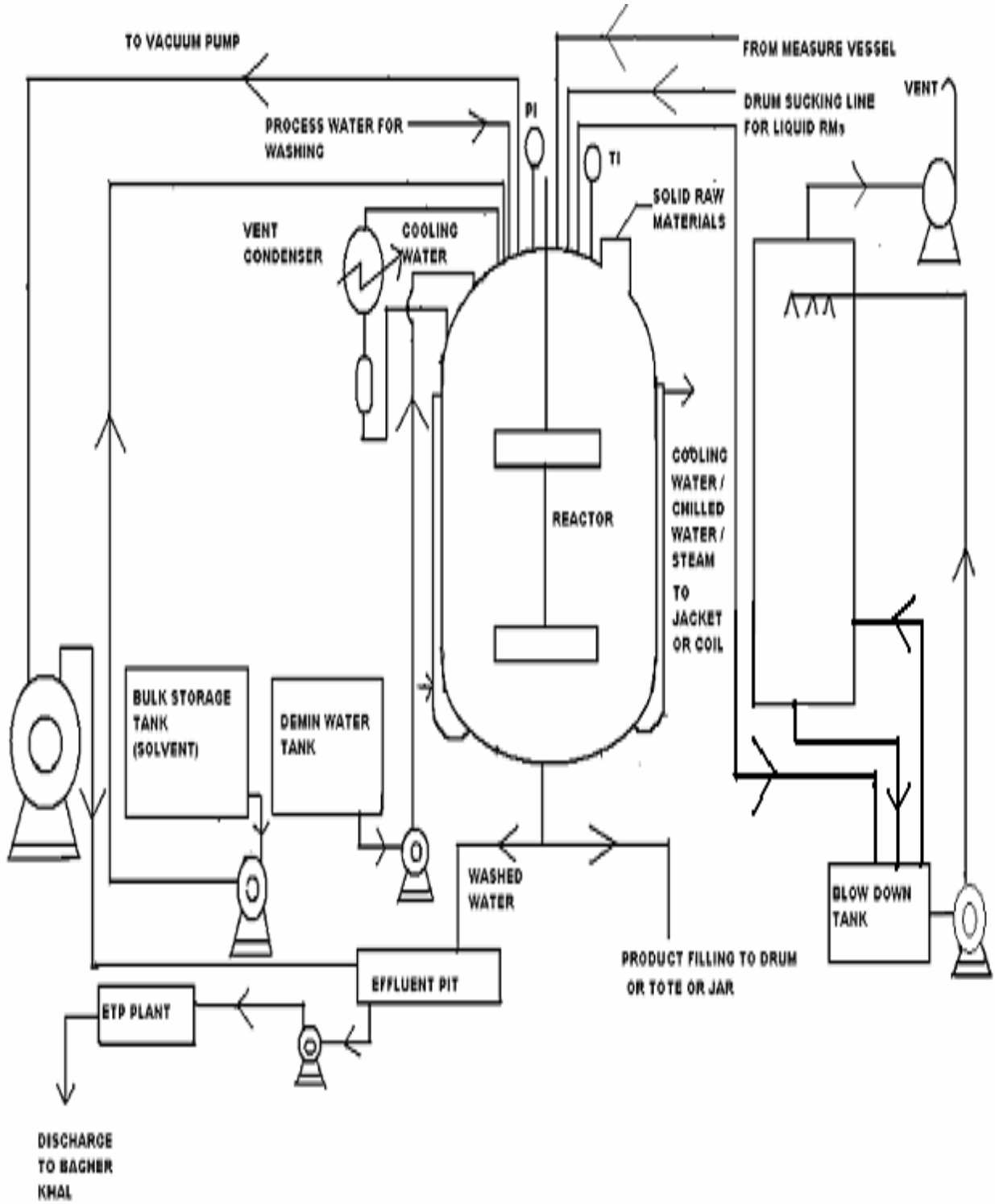


2.2 Brief Description of the Process

Production is done by batch process. Most of the products are blended product of different raw materials based on standard business formulation and some are reaction based polymer product. Liquid raw materials are either pumped or sucked under vacuum into the reactor or into a measure vessel for subsequent charging into the reactor. Solid raw materials are charged through charge hole of the reactor. Reaction temperature is maintained by heating with steam or cooling with cooling water or chilled water by passing them through jacket or coil of the reactor whenever required. Reactor is vented through scrubber. In some products, reactor is hooked up to a vent condenser. After processing is over, batch is sampled to control laboratory for analysis and adjustments are done if required to meet the product specification. When approved, product is filled in MS drums or Plastic Barrels or HDPE Totes or Jars for shipments to customers.

During product change over, it is necessary to decontaminate the reactor with thorough caustic / water boil-out followed by water washing. The boiled out and washed water is drained into nearby effluent pit followed by transfer into Effluent treatment plant for necessary microbial treatment prior to separate the separable solid in Lamella Clarifier by dosing of lime, coagulant & flocculants and finally discharge into nearby Khal / River maintaining WBPCB' discharge specifications. The separable solids & ETP sludge are disposed through authorized waste management group M/s WBWML, Haldia, WB.

2.2.1 Process Flow Diagram



2.3 Need for the project and its importance to the country,

Our Products & services are key driver in industries for reduction of –

- Fresh water use,
- Energy requirement,
- CO_2 emission
- Other Air pollutants,
- Heavy metal discharges
- Water pollution

With our wide ranges of products, we are providing economical solution to the customers to improve in resource utilization, asset longevity, indoor air quality, waste recycling and employee's safety with lowering in product cost.

Our innovative solutions are carefully designed to deliver significant environmental, social and economic sustainability.

We deliver measurable results to the customers through:

- World class teams
- An integrated approach
- Technological leadership
- A global presence

With the increase of industrial growth in India, the major challenges to Indian industries are on sustainability with respect to natural resources and environmental pollution vis-à-vis lower product cost with high quality to make the industries competitive globally. This expansion project will contribute to Indian industries to make them competitive by reducing - water consumption, energy consumption, waste generation and environmental pollution.

Almost all industrial sectors will be benefitted from our value added products and services as below:

- **Water Treatment Chemicals:**
  - cooling water treatment (scale control, microbial fouling, corrosion control
  - boiler water treatment (pre-treatment, condensate control, internal treatment)
  - raw and waste water treatment
  - membrane solutions
  - hygiene services
  - air quality
  - mining and mineral process aids
  - Other water-based process applications.

Major Customers:

TATA Iron & Steel Company (TISCO), West Bengal Power Development Corporation, MCC PTA, Paradeep Phosphate etc.

- **Oil Field Chemicals:**
  - flow assurance
  - oil/water separation
  - heavy crude desalting
  - monomer inhibitors
  - anti-oxidants
  - fuel and lubricant additives
  - boiler, cooling water, raw water and waste water applications
  - combustion efficiency and air emission control

Major Customers:

Essar Oil, HPCL, BPCL, IOCL etc.

- **Industrial Additives**:
  - Latex flocculants
  - Other flocculants
  - Process Antifoam
  - Crystal Modifiers
  - Floatation Collectors
  - digester additives
  - de-foamers and wash aids
  - de-linking chemicals
  - felt cleaners
  - coating additives
  - boiler, cooling water, raw water and waste water applications
  - combustion efficiency and air emission control

Major Customers:

TISCO, National Aluminium Company, Hindalco Industries Limited & Vedanta Aluminium Limited

With these types of innovative product ranges and continuous global R&D support from corporate to develop new products in line with the industrial demand – we are sure this project will contribute significantly to Indian industries with respect to environmental, social & economic sustainability.

2.4 Demand & Supply Gap

1. Today we import about 3.5 million kg of finished goods which we would like to manufacture in India, thereby reducing cost.
2. Today Nalco has only 20% of the Specialty chemical market, the growth expected is around 10% year to year, to capture this growing market we will need to expand our manufacturing capacity.

2.5 Imports Vs. Indigenous Production

This expansion can reduce dependency on imports and Fx drain by about 30 – 40% if locally produced.

2.6 Export Feasibility for :

Exports to neighboring / SAARC countries may increase**.**

2.7 Domestic Market

Year to year growth of 10% in Specialty Chemical market.

2.7.1 Export Market

Export market is another business opportunity.

2.8 Employment Generation

This expansion can create direct employment of 10 to 20 persons.

3. Project Description

3.1 Type of Project including interlinked and interdependent projects, if any

Not relevant to our expansion project

3.1.1 Raw Material Sources:

Domestic as well as Import. We actively work to have local sources developed and optimize cost.

3.2 Location (map showing general location, specific location, project boundary & project site layout) with coordinates

Existing site of Konnagar works. Location map enclosed as Annexure-1.

3.3 Alternate Sites Considered

Not applicable

3.4 Size of Operation

Increase of capacity from 11,000 TPA to 22,000 TPA of Specialty Chemicals manufacturing.

3.5 Project description (a schematic diagram/ flow chart showing the project layout. Components of the project etc. should be given):

Project layout along with schematic diagram showing the process description attached as Annexure-II & III.

3.6 Raw material requirement

Regular Raw materials – Only volumes to be increased with respect to capacity expansion. The details of raw materials are given below:

Raw material	Quantity
Polymers	20.0 TPM
Other organic compounds	150.0 TPM
Organic alcohols	50.0 TPM
Organic acids	80.0 TPM
Inorganic acids	110.0 TPM

4. Site Analysis

4.1 Connectivity:

Our site is connected to the Grand Trunk Road and Delhi Road by all weather & motor able roads. The Kolkata Airport is the nearest airport and it does not take more than 45 minutes to reach there by car.

4.2 Land Form, Land use and land ownership

The total land area of the existing factory is 5 acres which is taken on a 99 years' lease from ICI India Limited in 1989.

4.3 Topography

4.4 Existing Land Use Pattern

Existing factory land is to be proposed for expansion project. The land is already under industrial use.

4.5 Soil Classification

The soil type of Konnagar is mainly alluvial similar to the soil of Indo-Gangetic plains. Quaternary sediments consisting of clay, silt, various grades of sand and gravel underlie the town. These sediments are sandwiched between two clay beds, the lower one at depths between 250 and 650 m and the upper one ranging between 10 and 40 m in thickness. Konnagar falls under the seismic zone-III with moderate damage risk in case of an earthquake.

4.6 Climatic data and secondary sources

The typical climatic data of Konnagar area in the month of May-2012.

Scattered clouds. Extremely hot.

Temperature	37°C	**Comfort Level**	46°C
Wind Speed	17km/h	**Barometric Pressure**	1002.0mb
Wind Direction	S	**Barometric Tendency**	N/A
Humidity	50%	**Visibility**	4.0km
Dew Point	25°C		

4.7 Social Infrastructure available

The existing social infrastructure includes the following:

- State Govt. hospital with ambulance
- Bank
- Post Office
- Railway Station
- Bus Station
- Fire Station
- Senior Secondary School
- Police Station
- Market
- Sports Infrastructure (Stadium & Camps etc.)
- College
- Community Halls
- Cinema Hall
- Primary Health Care Centers

5. Planning

5.1 Planning Concept

This unit is situated in an area under Konnagar Municipality which is informally called The Rishra-Konnagar industrial belt. There are several other industries in the neighborhood, namely Berger Paints, PMC Rubber Chemicals Pvt Limited (Previously M/S ICI INDIA LIMITED), Hindustan National Glass, Jayashree Textile etc. all of which come under either the Konnagar Municipality or the Rishra Municipality.

5.2 Population Projection

As of 2001 India census, Konnagar had a population of 72,211.The present population i.e. in 2011 is slightly above 80-000. Males constitute 52% of the population and females 48%. Konnagar has an average literacy rate of 80%, higher than the national average of 59.5%: male literacy is 84%, and female literacy is 77%. In Konnagar, 8% of the population is under 6 years of age.

Male –Female Ratio	52: 48
Male literacy rate	84%
Female literacy rate	77%
Overall literacy rate	80%
Per cent of children below 6 years	8 %
Population density	3871/square km
Infant mortality rate	55/ 1000 births

5.3 Land Use planning

As such existing plant layout.

5.4 Infrastructure (Physical and social) –

For the proposed expansion project there shall be demand for the following physical and Social infrastructure.

i) Road Network – shall be upgraded through Govt of Govt. West Bengal, Local Municipality.
ii) Water Supply-Shall be upgraded by addition of one bore well .
iii) Power transmission – Need approval from CESC for extra power requirement, if any.

5.5 Amenities and Facilities

i) Education: There exists Primary, Secondary and Senior Secondary Schools, College in the existing township under the State Government & Private ownership.
ii) Social Infrastructure like Post Office, Bank, Police Station, Bus Station, Facility Exists and will continue to meet the demand.
iii) Telecommunication, LPG services, marketing stalls, Sports infrastructure – exists and shall continue to meet the demand..
iv) Recreation- Existing Recreation facilities such as cinema hall, Sports ground etc.
v) Hospital – Govt. Hospital and Private Hospitals exist in the locality..
vi) Commuting/conveyance- Conveyance system from project site to the nearby towns and city is easily accessible by roads or railways.

6. Proposed Infrastructure

6.1 Land

No additional land required for proposed expansion. It is proposed within the existing plant premises having an area of 27.40 acres.

6.2 Water

Water requirement for the proposed expansion will be 65 m^3/day which will be met from ground water resources with prior approval of the CGWA.

6.3 Power

Power required after expansion is 20,00,000 KWh which will be sourced from the state grid.

6.4 Manpower

Temporary influx of about 50 people during the construction stage. During operational phase about 20 personnel will be get direct employment.

6.5 Road Network

Well connected with NH-1 at a distance of 6.5 km, W and SH-6 at a distance of 1.1 km, E, SH-2 (3.1 km, E) and NH-2 (4.0 km, W).

6.6 Environmental Aspects

Environmental management plan (EMP) which is under implementation for the existing plant will be strengthed for the proposed expansion.

6.8 Industrial Waste Water management

In-house Effluent Treatment Plant: Capacity @60 m3/day

Design capacity, M3/day	Existing Load, M3/day	Propose Load, M3/day	Increase Load, M3/day
60	25 - 30	45 - 50	20 - 25

NB:
Our effluent load is mainly due to decontamination of reactors for product change over. So, the decontamination frequency will not be in same proportion of volume increase as we will be in the same product range.

6.9 Solid Waste Management

The nature of Solid wastes is ETP Sludge, Physical Sludge from Lamella Clarifier and some Polymeric sludge during vessel rinsing prior to decontamination. All solid wastes are disposed off through external authorized agency. M/S West Bengal Waste Management Limited, Haldia, Purba Medinipore, West Bengal.

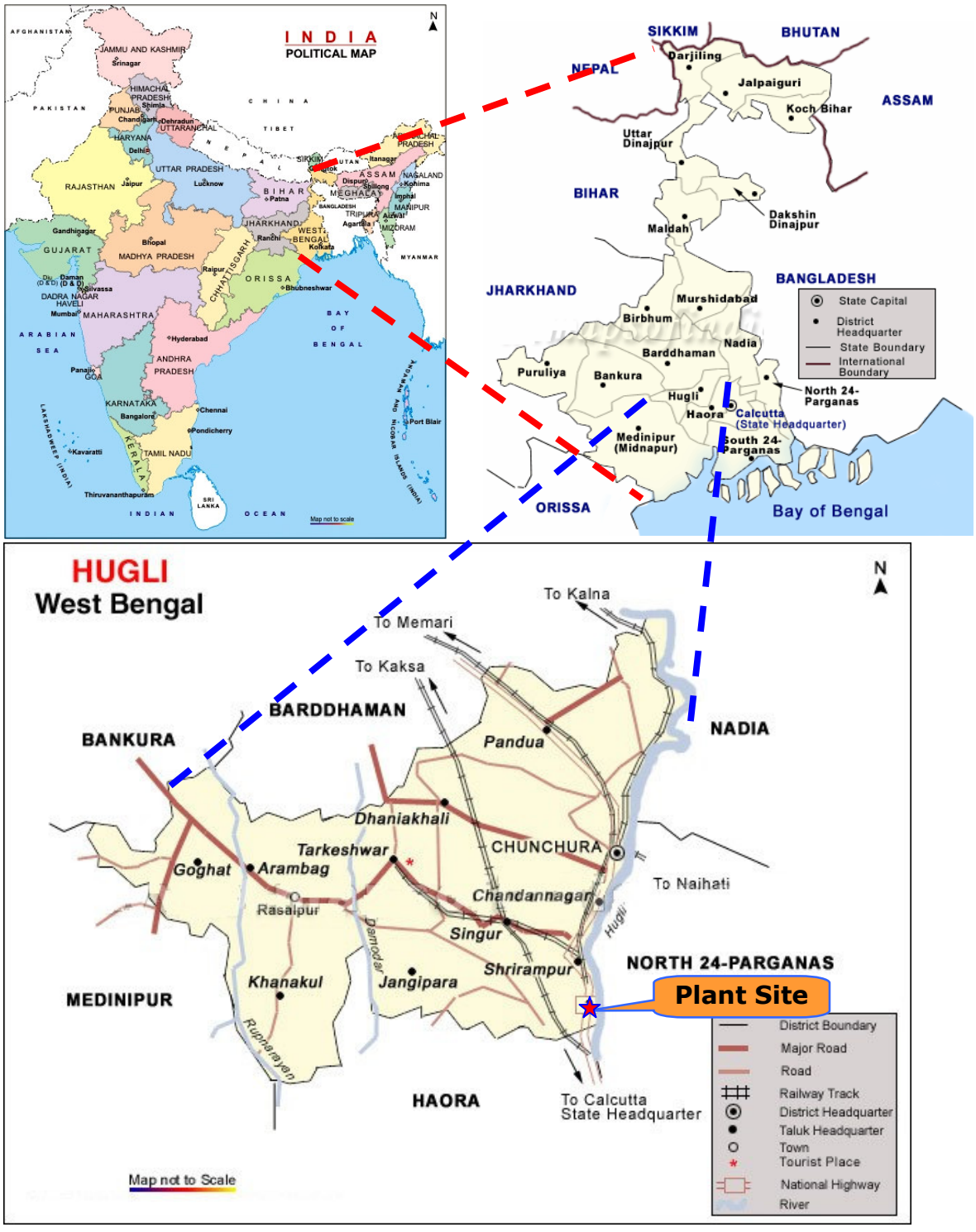
7. Investment

The investment on the proposed expansion project will be around Rs. 10 Crores (approx.)

8. Socio-Economic Benefits

The industrial activity of the proposed project coupled with the ancillary industries, would contribute to the overall socio-economic development of the region.

ANNEXURE-I
LOCATION MAP



ANNEXURE-II
PLANT LAYOUT

ANNEXURE-III
PROCESS FLOW DIAGRAM