# APPLICATION FOR ENVIRONMENTAL CLEARANCE

# PRE-FEASIBILITY REPORT

## For

# 'CHANGE IN PRODUCT MIX OF SURFACTANTS AND PIGMENTS

By

## M/s Ultramarine and Pigments Limited

## At

## Survey No: 52 & 846

## Village: Karai

## Taluka: Walajah

## District: Vellore

## State: Tamil Nadu

**Consultant**

**HUBERT ENVIRO CARE SYSTEMS (P) LTD, CHENNAI**
**(NABET Accredited vide Certificate No. NABET/EIA/1619/RA0083) &**
**(MoEF Recognized Lab vide F. No. Q-15018/13/2016-CPW)**

**MARCH 2019**

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# 1 EXECUTIVE SUMMARY

M/s. Ultramarine and Pigments limited (UPL) is a public sector company involved in the manufacturing of inorganic pigments (Ultramarine Blue – Pigment Blue 29), surfactants & synthetic detergents, incorporated in the 1975. The unit is located at survey number 52 and 846, Karai village, Walajah Taluka, Vellore district, Tamil Nadu. Land allotment letter is attached as **Annexure 1.**

## 1.1 Project Summary

The project summary is given in **Table 1-1.**

**Table 1-1 Project Summary**

| S. No | Particulars | Details |
|---|---|---|
| **1.** | Name of the company | M/s. Ultramarine and Pigments Limited |
| **2.** | Name of the project | Change in Product Mix of Surfactants and Pigments |
| **3.** | Project location | M/s. Ultramarine and Pigments Limited,<br>Survey No 52 and 846,<br>Karai Village,<br>Walajah Taluk,<br>Vellore District, Tamil Nadu. |
| **4.** | Site co-ordinates (centre co-ordinates) | $12^0$57'6.66"N<br>$79^0$18'57.93"E |
| **5.** | Project activity Schedule, category as per EIA notification 2006 & Amendment | The proposed project falls under Schedule 5(f) Synthetic organic Chemicals.<br>Category 'B', However due to applicability of General Conditions the project to be appraised as A category. |

**6.** Product details

| S. No | Products | Capacity (MT/Month) | | |
|---|---|---|---|---|
| | | Existing | Proposed | Total |
| 1. | Ultramarine Blue | 200 | 100 | 300 |
| 2. | Linear Alkyl Benzene Sulphonic acid – LABSA | 1350 | -350 | 1000 |
| 3. | Alpha olefin Sulphonate – AOS | 1000 | Nil | 1000 |
| 4. | Synthetic detergents | 4000 | -2000 | 2000 |
| 5. | Mixed Metal Oxide Pigments | -- | 50 | 50 |
| 6. | Bismuth Vanadate pigments | -- | 50 | 50 |
| 7. | Sodium Lauryl Ether Sulphate (SLES) or Sodium Lauryl Sulphate (SLS) | -- | 1500 | 1500 |
| 8. | Specialty surfactants | -- | 500 | 500 |
| | **Total** | **6550** | **-150** | **6400** |

Consent to operate (Air & water) for the existing product is attached as **Annexure 2.**

**7.** Land details

The total plot area is 8.6602 Ha.

| S. No | Description | Area | | | Percentage (%) |
|---|---|---|---|---|---|
| | | Hectares | Acres | Sq. m | |
| 1 | Built up area | 2.10 | 5.18 | 21000 | 24 |
| 2 | Solid waste storage/disposal are | 0.20 | 0.49 | 2000 | 2 |
| 3 | Green belt area | 3.10 | 7.66 | 31000 | 36 |
| 4 | Vacant area | 3.26 | 8.05 | 32600 | 38 |
| | Total | 8.66 | 21.39 | 86600 | 100 |

Land allotment letter is attached is **Annexure 1.**

**8. Water requirement**

The existing fresh water requirement for the project is 106.9 KLD and total water requirement is 168.4.

After expansion, the fresh water requirement is 329.5 KLD and the total water requirement is 412.8 KLD.

Source: SIPCOT

Water bill for SIPCOT is attached as **Annexure 3.**

Water balance for the existing and proposed project is attached as **Annexure 12.**

**9. Domestic wastewater management**

| Description | Domestic waste water generation | Treatment units | Disposal |
|---|---|---|---|
| Existing (KLD) | 4.5 | STP | Water reused for Green belt development & Sludge used as Manure. |
| Proposed (KLD) | - | - | |
| After expansion | 4.5 | STP | |

**10. Industrial wastewater management**

| Description | Industrial waste water generation | Disposal |
|---|---|---|
| Existing (KLD) | 9.1 | Trade effluent is being treated in RO, MEE & VTFD. Condensate water is reused in process & salt obtained ($Na_2SO_4$) is used in Detergent process. |
| Proposed (KLD) | - | |
| After expansion | 9.1 | |

**11. Power requirement**

| Details | Existing (KVA) | Proposed (KVA) | After Expansion (KVA) |
|---|---|---|---|
| Power requirement | 1425 | - | 1425 |
| Back up D.G. set | 725 x 2 | - | 725 x 2 |
| | | | |

**12. Fuel requirement**

| S. No | Details | Point of use | Unit | Existing | Proposed | After expansion |
|---|---|---|---|---|---|---|
| 1 | Coal | Pigment process | MT/Day | 1.2 | -- | 1.2 |
| 2 | Coke | Pigment process | | 3 | -- | 3 |
| 3 | SKO | Pigment process | Lit/Day | 1200 | -600 | 600 |
| 4 | LPG | Pigment & spray Tower Process | Kg/Day | 400 | 850 | 1250 |
| 5 | HSD | DG sets | Lit/Day | 1000 | -- | 1000 |
| 6 | Furnace oil | Boiler & spray Tower process | MT/Day | 3.0 | -0.5 | 2.5 |

**13.** Air Emission Source and Control measure — Detailed Air emission source and control measures are given in **Annexure 7.**

**14. Municipal Solid waste Management**

| S. No | Waste | Quantity (kg/day) | | | Treatment/Disposal method |
|---|---|---|---|---|---|
| | | Existing | Proposed | After expansion | |
| 1 | Packing materials | 5 | - | 5 | Sent to TNPCB authorized recyclers |
| 2 | organic | 45 | - | 45 | Vermi compositing |
| 3 | STP sludge | 0.05 | - | 0.05 | STP sludge is used as Manure for Green belt. |

**15. Hazardous waste management**

| S. No | Category | Type of the Hazardous waste | Quantity (MT/Year) | | | Mode of Disposal |
|---|---|---|---|---|---|---|
| | | | Existing | Proposed | After Expansion | |
| 1 | 5.1 | Used/ Spent oil | 4.5 | -- | 4.5 | Recover and Reuse- CPCB Authorized recyclers |
| 2 | 5.2 | Wastes/ residues containing oil | 1.2 | -- | 1.2 | TSDF |
| 3 | 17.1 | Residues, dusts or filter cakes | 6 | -- | 6 | TSDF |
| 4 | 17.2 | Spent catalyst (V2O5) | 0.2 | -- | 0.2 | Buy back with the suppliers |
| 5 | 33.3 | Discarded containers / barrels / liners contaminated with hazardous wastes /chemicals | 1.2 | -- | 1.2 | TSDF |

**16.** Man power — At present, 250 persons are employed in the unit including contract workers.

**17.** Project Cost — 100 lakhs for raw materials

# 2 INTRODUCTION OF THE PROJECT

## 2.1 Identification of the Project

M/s. Ultramarine and Pigments limited (UPL) is a public limited company involved in the manufacturing of inorganic pigment (Ultramarine Blue - Pigment Blue 29), Surfactants & Synthetic Detergents, incorporated in the year 1975. The unit is located at survey number 52 and 846, Karai village, Walajah Taluka, Vellore district, Tamil Nadu.

UPL focuses on the manufacturing of environmental friendly pigments that can be used safely across a variety of end users, including paints, plastic, inks, laundry, cosmetic etc. since 1975, UPL has been manufacturing a menu of Anionic surfactants, used in laundry, construction fire safety and personal care products. The unit began with Linear Alkyl Benzene Sulphonic acid as a common surfactant used for detergents, now the unit produces Alpha Olefine Sulphonate in various concentrations and forms, including liquid, paste, powder & Noodle.

UPL is a **"Responsible Care"** logo company & certified towards ISO 9001:2015, ISO 14001:2015 and OHSAS 18001:2007 certifications. The industry manufactures a range of inorganic pigments, detergents and cosmetic grade surfactants and in the process is the preferred supplier for most of the clients.

UPL manufactures certified non-toxic (food safe) environmental friendly inorganic pigments for paints, auto and consumer plastics, and surfactants that are widely used in home and personal care sectors, agrochemical and construction industries.

M/s. Ultramarine and Pigments limited proposed to enhance the capacity as well as introduce new products within the existing facility at survey number 52 and 846, Karai village, Walajah Taluka, Vellore district, Tamil Nadu. The total plot area is 8.66 Hectares.

## 2.2 Project Proponent

The Board of Ultramarine & Pigments limited has three Executive Directors, Six highly qualified independent Directors and Non- Executive Directors. The Chairman, Mr. R. Sampath graduated in Chemistry from the University of Bombay and obtained his chemical Engineering degree from Washington State University, USA. After a few years working in USA and India, he joined Ultramarine & Pigments Limited in 1970 as Project Engineer, Since then, he has worked in various capacities in the company, as Project Manager, Development Manager and General Manager before being appointed as the Managing Director in 1990 and CMD (Chairman and Managing Director) in 1998. Mr. Sampath held office of CMD up to March 2016. He is now continuing as Non – Executive Chairman, guiding and advising the Executive Board and Management regarding business and affairs of the company.

## 2.3 Brief Description of Nature of the Project

M/s. Ultramarine and Pigments limited is engaged in the manufacturing of Ultramarine Blue, Linear Alkyl Benzene Sulphonic Acid – LABSA, Alpha Olefin Sulphonate (AOS) and Synthetic detergents. Ultramarine and pigments limited is an India public limited company listed on the Bombay Stock Exchange. For over fifty years, the industry has offered quality products with excellent technological expertise. UPL has manufacturing facilities in Chennai and Ranipet, Tamil Nadu. Ultramarine is a blue pigment consisting primarily of a double silicate of aluminum and sodium with some sulfides or sulfates. It a very safe, non-hazardous blue pigment with a variety of application worldwide.

## 2.4 Need for the Project and its importance

The proposed project will cater to the need of clients of South India. The project will contribute towards need of industries which use these as raw materials. As the industry is situated in Ranipet, it is catering to the needs of Chennai and due to increase in the demand from industries situated in this region and other part of the country for timely delivery and to meet the growing demand. Therefore in order to meet the growing demands of the market, the proponent proposed expansion within the existing facility.

## 2.5 Demand-Supply Gap

The company generates revenue mainly from four business activities, namely as Pigment, Surfactant, wind Mill Power Generation business and IT division. Of these four, the pigment division is the largest contributor of the total turnover of the company followed by the Surfactant business, IT division and Wind Mill Power generation division. Net Sales for FY 2017-18 stood at Rs. 2825 million of which laundry & allied products segments which included the Pigments & Surfactants business constituted about 86% of the revenues with the balance 14% coming in from the IT & Wind Mill Division. Growth in exports for the pigments and surfactants division and introduction off our new products seem to have boosted the top line

## 2.6 Import Possibility

Raw material like Lauryl Alcohol & Lauryl ethoxylates will be imported from other countries as there is no supply from India.

## 2.7 Domestic/Export Markets

High supply gap is observed for specialty surfactants and pigments in India. Both products are imported at higher level from other countries. Particularly, mixed metal oxide and

bismuth vanadate requirements in India are fulfilled by 100% import. To capture this UPL is proposing this change in product mix and quantity.

### 2.8 Employment Generation

The total employment in the existing facility is 250 persons including contractual workers.

# 3 PROJECT DESCRIPTION

To cater the needs of the growing market, UPL proposes to increase the production capacity of the proposed products at its existing unit. The proposed project falls under category 'B', however due to applicability of General Conditions the project to be appraised as 'A' category, Schedule 5(f), Synthetic Organic Chemicals Industry as per EIA notification dated September 14, 2006 and its amendments. There is no interlinked project.

M/s. Ultramarine and Pigment limited (UPL) is an existing unit engaged in the manufacturing of Ultramarine Blue, Linear Alkyl Benzene Sulphonic acid, Alpha Olefin Sulphonate and Synthetic detergents. The unit is currently manufacturing Four (4) products with the production capacity of 6550 MT/Month. The existing capacity of 2 products is decreased from 5350 MT/Month to 3000 MT/Month. UPL proposes Five (5) new products with a capacity of 2400 MT/Month. After expansion UPL will produce Eight (8) products with capacity of 6400 MT/Month (existing 4 products with a capacity of 6550 MT/Month and 5 new products with a capacity of 2400 MT/Month). The details of Existing and proposed products are given in **Table 3-1.**

**Table 3-1 Existing and Proposed products with capacities**

| S. No | Existing products | Capacity (MT/Month) | | |
|---|---|---|---|---|
| | | **Existing** | **Proposed** | **Total** |
| 1. | Ultramarine Blue | 200 | 100 | 300 |
| 2. | Linear Alkyl Benzene Sulphonic acid – LABSA | 1350 | -350 | 1000 |
| 3. | Alpha olefin Sulphonate – AOS | 1000 | Nil | 1000 |
| 4. | Synthetic detergents | 4000 | -2000 | 2000 |
| 5. | Mixed Metal Oxide Pigments | -- | 50 | 50 |
| 6. | Bismuth Vanadate pigments | -- | 50 | 50 |
| 7. | Sodium Lauryl Ether Sulphate (SLES) or Sodium Lauryl Sulphate (SLS) | -- | 1500 | 1500 |
| 8. | Specialty surfactants | -- | 500 | 500 |
| | **Total** | **6550** | **-150** | **6400** |

## 3.1 Project location

The proposed site is located in the SIPCOT Industrial area. The site is situated at Survey No 52 and 846, Karai Village, Walajah Taluk, Vellore district. The site is located adjacent to State Highway (SH) 124A and National Highway (NH) 4. The center co-ordinates of the plant area are $12^0$57'7.37" N, $79^0$18'58.58" E. The project location index map is shown in **Figure 3-1.**Satellite image of the project site is given in **Figure 3-2**. Satellite imagery around 10 km

and 5km radius from the project site is given in **Figure 3-3**and **Figure 3-4.**Map showing environmental sensitive area within 15 km radius of the project site is given in **Figure 3-5.**

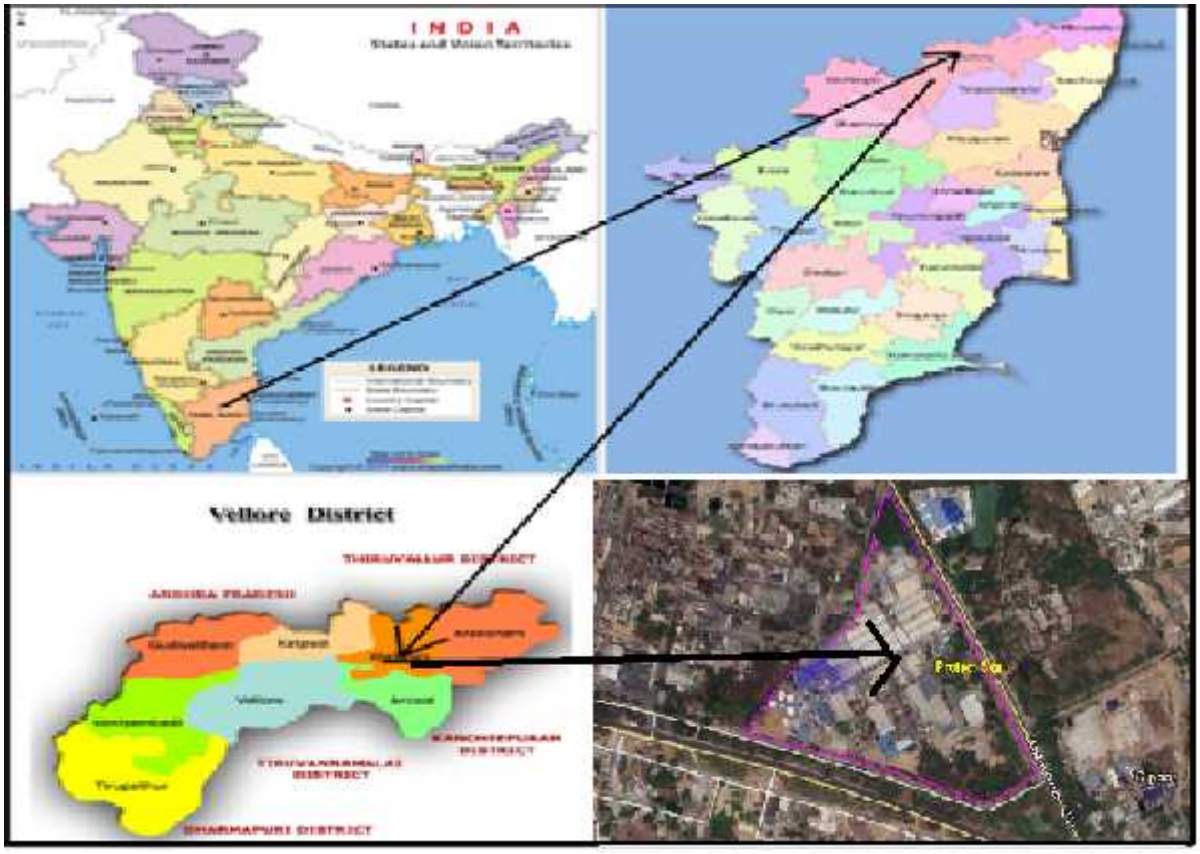


**Figure 3-1 Project location index map**


**Figure 3-2 Satellite image of the project site**

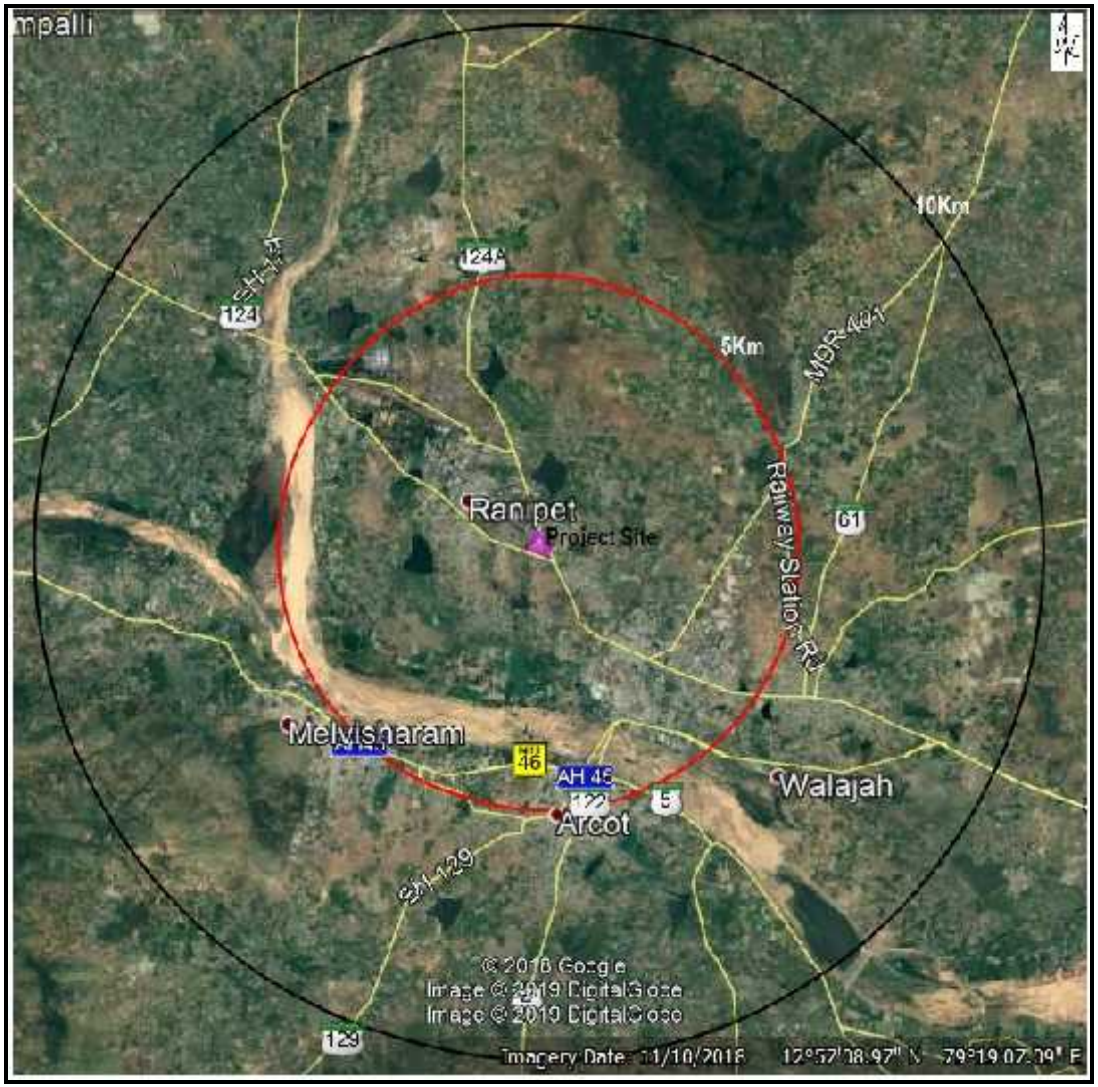


**Figure 3-3 Satellite Imagery of 10 km radius of the project site**

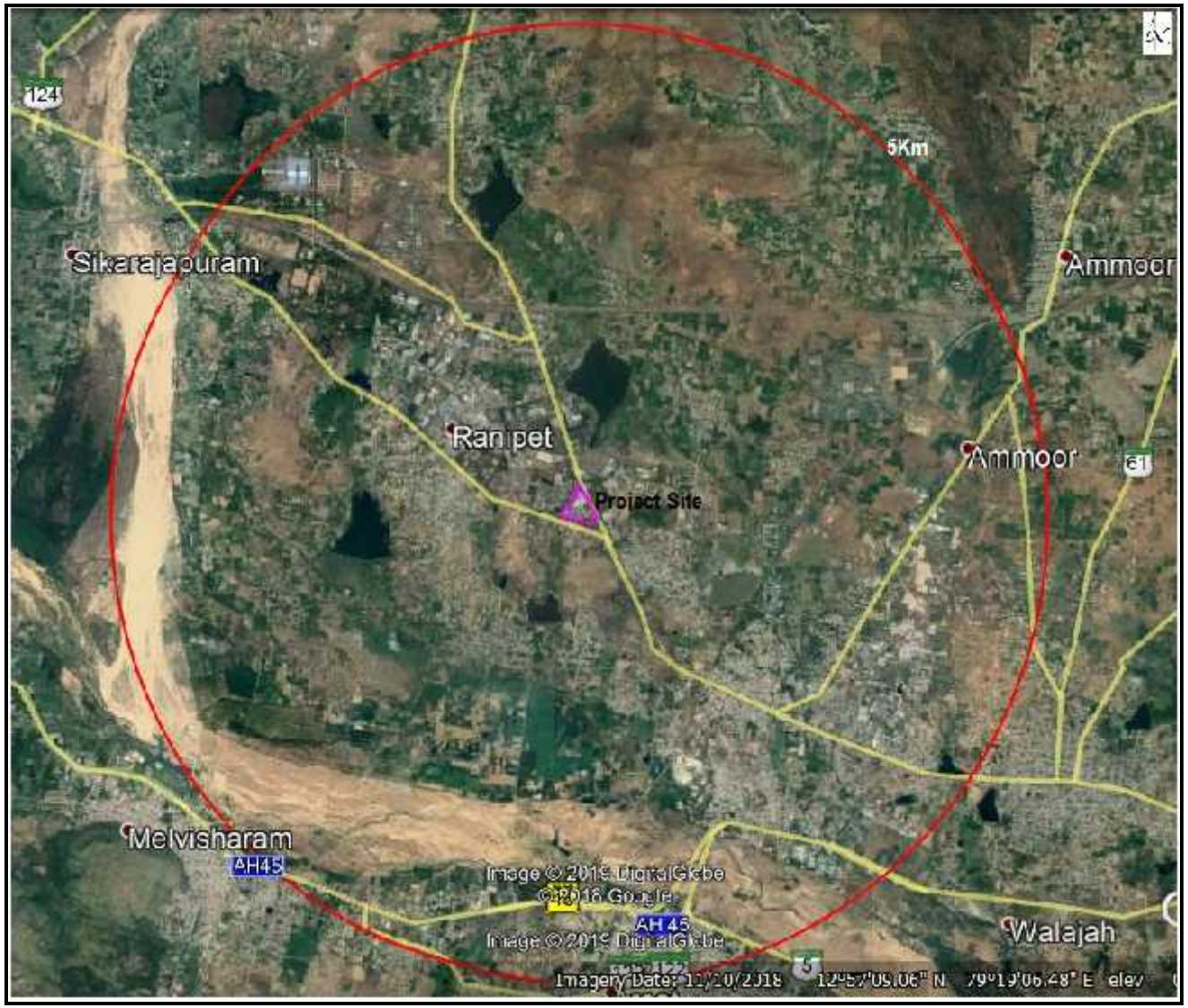


**Figure 3-4 Satellite imagery of 5km radius of the project site**

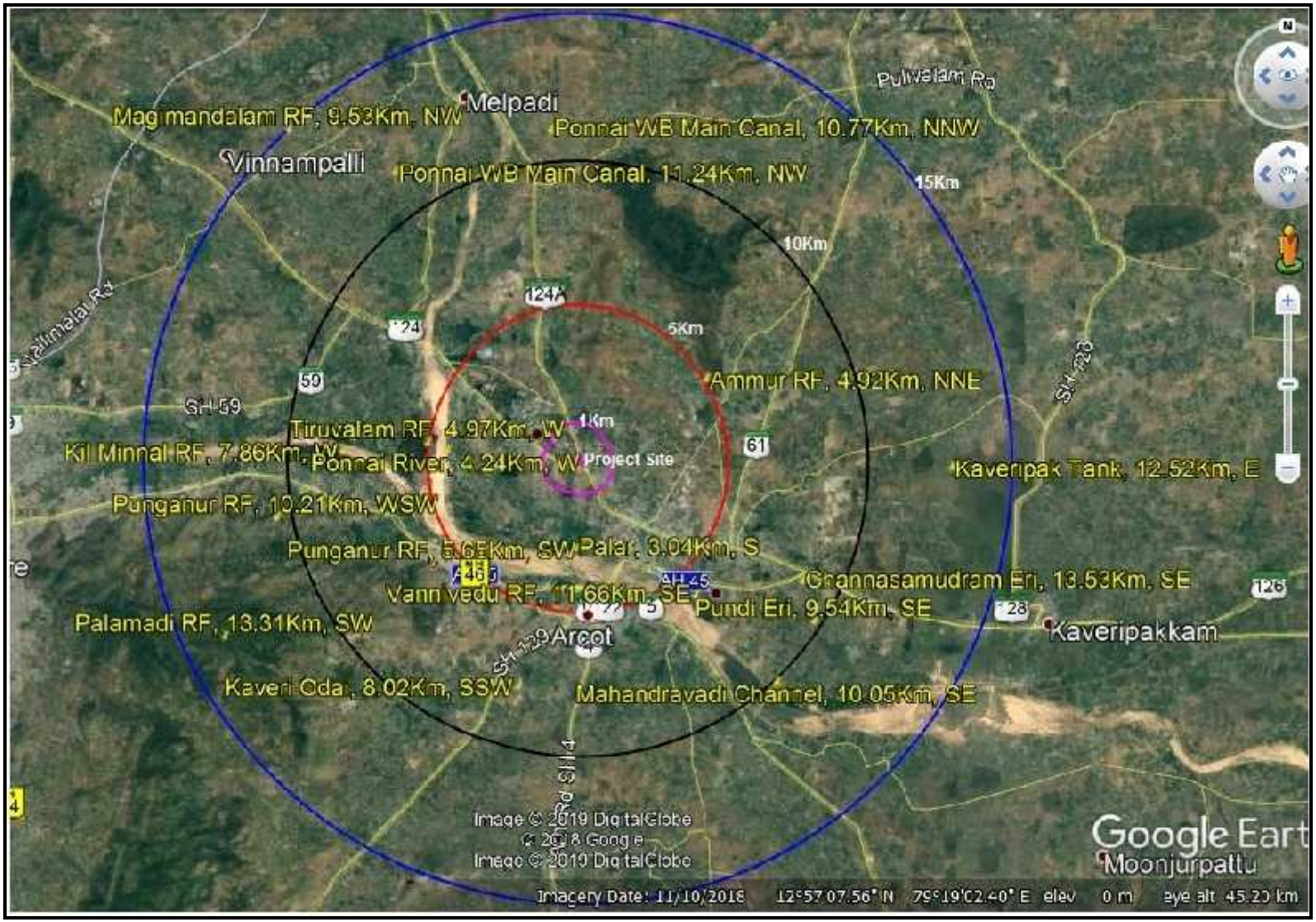


**Figure 3-5 Environmental Sensitive Areas within 15km of the project site**

### 3.2 Details of Alternate sites considered

Since the proposed project will take place within the existing facility, alternate site is not considered. The environmental setting of the existing site is given in **Table 3-2.** Project site layout plan is given in **Figure 3-6.**

**Table 3-2 Environmental Feature of the existing site within 15 km radius**

| S. No. | Particulars | Details | | | |
|---|---|---|---|---|---|
| 1. | Site Co-ordinates of the project site (center co-ordinates) | $12^0$57'6.66"N<br>$79^0$18'57.93"E | | | |
| 2. | Elevation | 188m | | | |
| 3. | Present land use | Industrial Use | | | |
| 4. | Nearest Highway | National Highway NH4 is adjacent to the site towards East direction | | | |
| 5. | State Highway | State Highway SH 124A is adjacent to the site towards South West direction. | | | |
| 6. | Nearestrailway Station | Mukundarayapuram Railway station, at a distance of ~3.94 km towards NW direction. | | | |
| 7. | Nearest Airport | Vellore Airport is a distance of ~27.48km towards WSW direction. | | | |
| 8. | Nearest village | Karai village at a distance of ~1.69 km towards SW direction. | | | |
| 9. | Nearest major city | Vellore | | | |
| 10. | Type of soil | Red Soil | | | |
| 11. | Defense Installations | Nil | | | |
| 12. | Nearest Town | Ranipet | | | |
| 13. | Nearest River/ Lakes/Dams | **S. No** | **Name of the Location** | **Distance (~km)** | **Direction** |
| | | **Water bodies** | | | |
| | | 1 | Ponnai river | 4.24 | W |
| | | 2 | Ponnai WB main canal | 11.24 | NW |
| | | 3 | Palar | 3.04 | S |
| | | 4 | Channasamudram Eri | 13.53 | SE |
| | | 5 | Kaveri odai | 8.02 | SSW |
| | | 6 | Mahandravadi channel | 10.05 | SE |
| | | 7 | Kaveripak main channel | 10.22 | SE |
| | | 8 | Kaveripak tank | 12.52 | E |
| | | 9 | Ponnai WB main canal | 10.77 | NNW |
| | | 10 | Pundi Eri | 9.54 | SE |
| | | **Reserve forest** | | | |
| | | 1. | Magimandalam RF | 9.53 | NW |
| | | 2. | Ammur RF | 4.92 | NNE |
| | | 3. | Tiruvalam RF | 4.97 | W |
| | | 4. | Kil Minnal RF | 7.86 | W |
| | | 5. | Punganur RF | 10.21 | WSW |
| | | 6. | Punganur RF | 5.65 | SW |
| | | 7. | Vannivedu RF | 11.66 | SE |
| | | 8. | RF | 7.52 | W |
| | | 9. | Palamadi RF | 13.31 | SW |
| 14. | Hills & valleys | Nil within 15 Km radius of the project | | | |

| S. No. | Particulars | Details |
|---|---|---|
| 15. | Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas & Archeologically Important Places/ Tourist/Religious importance | Nil |
| 16. | Areas occupied by sensitive man-made land uses<br>a). Hospitals | |

| S. No | Hospitals | Distance (~km) | Direction |
|---|---|---|---|
| 1. | Thirumalai mission hospital | 0.86 | ESE |
| 2. | Scudder Memorial Hospital | 2.13 | SSE |
| 3. | Anjukam Hospital | 2.47 | SSE |
| 4. | Rupa nursing home | 2.71 | SE |
| 5. | Ramya dental clinic | 3.61 | SSE |
| 6. | Rajeshwari hospital | 3.60 | SSE |
| 7. | Apollo KH hospital | 5.29 | SW |
| 8. | Government Hospital | 5.44 | SW |
| 9. | Melvisharam primary health center | 5.43 | SW |
| 10. | G.K. hospital | 1.90 | NW |
| 11. | Dr. L. Shanthi Vimala clinic | 2.49 | SE |

b). Schools and colleges

| S. No | Schools and collages | Distance (~KM) | Direction |
|---|---|---|---|
| 1. | Government ITI college | 1 | SE |
| 2. | B.ed college, Vadagal | 4.23 | NW |
| 3. | Dav Bhel School | 3.66 | NW |
| 4. | Sri Ramachandra ITI college | 0.40 | SE |
| 5. | Navelpur bharathiyar nursing college | 2.46 | SE |
| 6. | Govt. teacher training institute for Women | 2.67 | SE |
| 7. | Bharathi institute of Catering & Hotel Management | 2.36 | SSE |
| 8. | Sunrise College, Ranipet | 3.39 | SSE |
| 9. | SSS college of Arts, Science & Management | 4.32 | S |
| 10. | M.M.E.S. women's Arts & Science College | 5.14 | SW |
| 11. | The Geekay world school | 3.62 | ENE |
| 12. | Municipal central school, walajapet | 5.83 | SE |
| 13. | Walajapet womens college | 7.18 | SE |
| 14. | V.K.V.matriculate school | 6.38 | SE |
| 15. | Bright Minds vidyodaya | 5.69 | E |
| 16. | RTI- polytechnic college | 9.33 | SE |
| 17. | Ranippettai Engineering college | 9.35 | SE |
| 18. | Ranipet institute of Technology | 9.35 | SE |
| 19. | Little Flower convent | 2.50 | SSE |

c). Industries

| S.No | Schools and collages | Distance (~KM) | Direction |
|---|---|---|---|

<table>
<tr><th>S. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>1.</td><td>Sathvik springs</td><td>2.84</td><td>NE</td></tr>
<tr><td>2.</td><td>Citizen industries</td><td>3.29</td><td>E</td></tr>
<tr><td>3.</td><td>Indira industries</td><td>0.42</td><td>NE</td></tr>
<tr><td>4.</td><td>United foundries private limited</td><td>0.81</td><td>N</td></tr>
<tr><td>5.</td><td>Mitsubishi heavy industries</td><td>0.85</td><td>N</td></tr>
<tr><td>6.</td><td>SNAP Industries</td><td>1</td><td>N</td></tr>
<tr><td>7.</td><td>Balaji oil industries limited</td><td>1.91</td><td>NNW</td></tr>
<tr><td>8.</td><td>Sviss labs private limited</td><td>2.54</td><td>NW</td></tr>
<tr><td>9.</td><td>Saroj leathers</td><td>2.58</td><td>NW</td></tr>
<tr><td>10.</td><td>Same Deutz- Fahr private limited</td><td>2.50</td><td>NNW</td></tr>
<tr><td>11.</td><td>Indira Damper industries</td><td>3.47</td><td>NNW</td></tr>
</table>
</td></tr>
<tr><td>17.</td><td>Ecologically sensitive areas (National Parks/Wild Life sanctuaries/Bio Sphere reserves)</td><td>Nil</td></tr>
<tr><td>18.</td><td>Reserved/Protected Forests within 15Km radius</td><td>
<table>
<tr><th>S. No</th><th>Reserve forest</th><th>Distance (~km)</th><th>Direction</th></tr>
<tr><td>1.</td><td>Magimandalam RF</td><td>9.53</td><td>NW</td></tr>
<tr><td>2.</td><td>Ammur RF</td><td>4.92</td><td>NNE</td></tr>
<tr><td>3.</td><td>Tiruvalam RF</td><td>4.97</td><td>W</td></tr>
<tr><td>4.</td><td>Kil Minnal RF</td><td>7.86</td><td>W</td></tr>
<tr><td>5.</td><td>Punganur RF</td><td>10.21</td><td>WSW</td></tr>
<tr><td>6.</td><td>Punganur RF</td><td>5.65</td><td>SW</td></tr>
<tr><td>7.</td><td>Vannivedu RF</td><td>11.66</td><td>SE</td></tr>
<tr><td>8.</td><td>RF</td><td>7.52</td><td>W</td></tr>
<tr><td>9.</td><td>Palamadi RF</td><td>13.31</td><td>SW</td></tr>
</table>
</td></tr>
<tr><td>19.</td><td>Areas susceptible to natural hazard which could cause the project to present environmental problems (earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions)</td><td>The project location is falls under Zone III (Moderate risk category). As per the IS:1893 (Part-1) 2002 of Bureau of Indian Standards (BIS) There is no susceptible to natural hazards like subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions.<br>Note :<br>Seismic Zone-II : Low risk<br>Seismic Zone-III : Moderate Risk<br>Seismic Zone-IV : High Risk<br>Seismic Zone-V Very high Risk</td></tr>
</table>

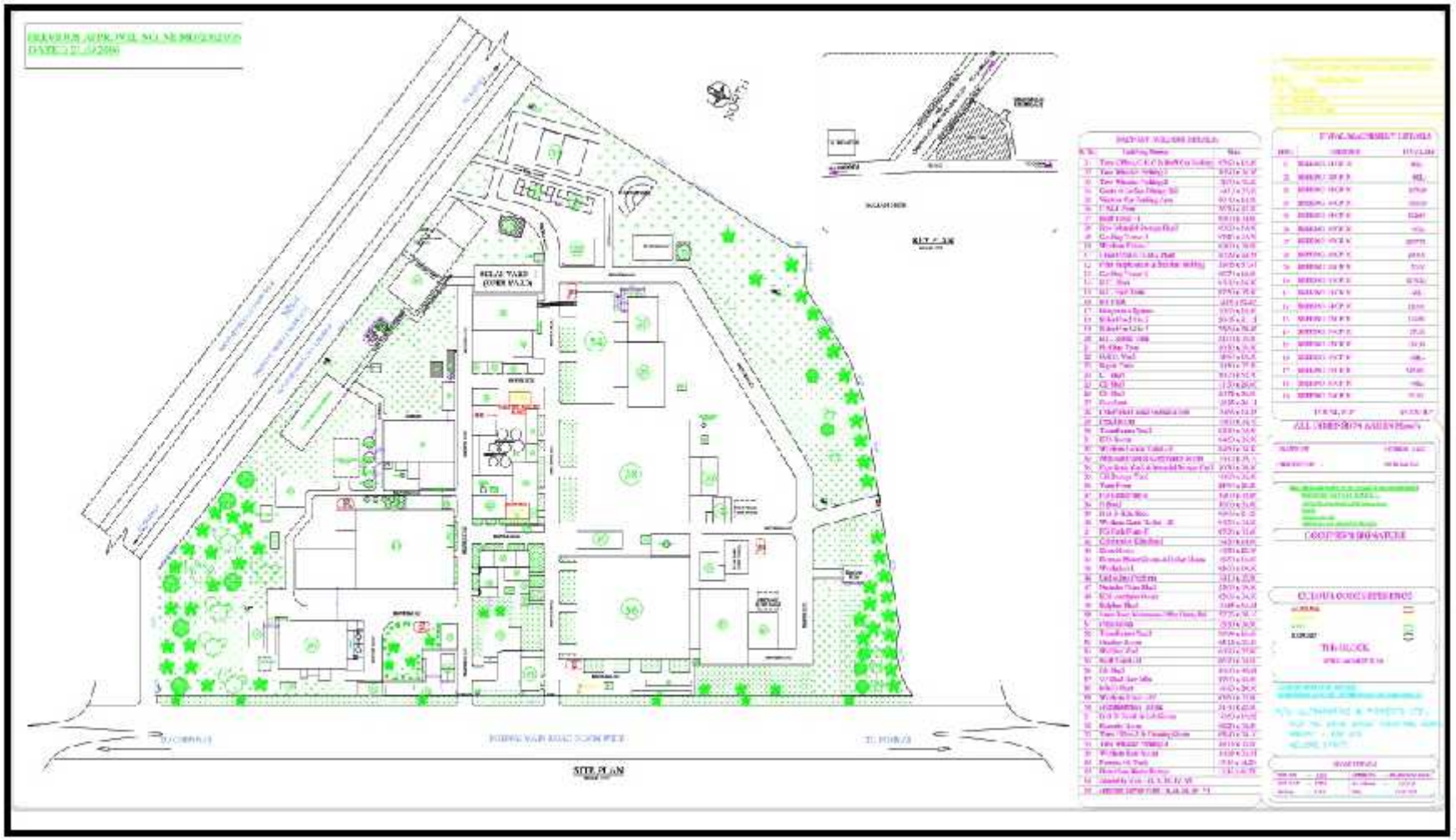


**Figure 3-6 Project site layout plan**

### 3.3 Magnitude of Operation

M/s. Ultramarine and Pigments limited is engaged in the manufacturing of inorganic pigments and organic surfactants. UPL's manufacturing units are in Chennai, Ranipet in Tamil Nadu. Under the surfactants division, the key products encompass Linear Alkyl Benzene Sulphonic Acid, Alpha Olefin Sulphonate, as well as Detergents. In view of fulfilling the market demand, the unit proposes for change in product mix and quantities within the existing facilities. The existing and proposed production detail along with capacities is given in **Table 3-1.** Raw material MSDS and Product MSDS are enclosed as **Annexure 5** and **Annexure 6.**

### 3.4 Process Description

The detailed process description is given below:

**A. Sulphonation:**

Sulphonation is having the following steps.

1. Air Compression & Drying
2. Sulphur Melting
3. $SO_2$ Production
4. $SO_3$ Production
5. Sulphonating required Organic.
6. Ageing and Hydrolyzing.
7. Neutralizing if required.
8. Effluent Treatment.
9. Drying of Finished Products.

**1. <u>Air Compression & Drying:</u>**

Atmospheric air is compressed using screw or twin lube compressor to feed the air in to the system to the required pressure and volume. During compression heat is generated which is cooled using pre chilled glycol solution using chilling compressors. After chilling the moisture is removed using cyclone separator and adsorbent beds. These adsorbent beds are regenerated by heating with hot air produced during sulphonation process and by cooling using cooling water and chilled glycol solution. The dry air is passed to the oven where $SO_2$ is produced.

**2. <u>Sulphur Melting:</u>**

Sulphur pellets received from refineries are melted in Sulphur melting chambers which heated using steam. Required quantity of molten Sulphur is pumped to oven using metering pumps for producing $SO_2$.

**3. $SO_2$ Production:**

The oven is preheated using dried air, to the required temperature before pumping molten Sulphur. After preheating the molten Sulphur pumped to the oven get ignited due availability of air & heat which produces the $SO_2$ gas. During $SO_2$ production the heat generated due exothermic reaction was recovered using waste heat recovery units.

**4. $SO_3$ Production:**

$SO_2$ produced from the oven is passed through catalyst bed to covert this $SO_2$ in to $SO_3$. The catalyst used was V2O5 which is converting $SO_2$ gas in to $SO_3$ gas which is an exothermic reaction. The heat generated during this was recovered using waste heat recovery units and series of heat exchanger. After cooling $SO_3$ was diluted to the required concentration level using dried air. Then this diluted $SO_3$ is passed to the reactor.

**5. Sulphonation:**

During Sulphonation the pre cooled organic (LAB / AO / LA / LEO) is pumped to the "**Multi tube or Single Tube Falling Film Reactor**" depending on the products. During Sulponation, organic will fall from top to bottom as thin film having thickness of 100 microns along with $SO_3$ gas. Because of the residence time $SO_3$ get reacted with organic and forming corresponding sulphonic acid which is taken to next step.

**6. Ageing &Hydrolysis:**

This step is applicable only for LABSA production. As LABSA is stable by its nature we have to do ageing to increase the active matter by allowing the free $SO_3$ to react with available organic. After this reaction we have to stop the further reaction by adding small quantity of water to convert the free $SO_3$ in to sulphuric acid otherwise the color of the final product will be changed due to over sulphonation.

**7. Neutralizing:**

Other than LABSA all other products (AOA, LEOA, LAA) has to be neutralized after sulphonation as the corresponding sulphonic acid are weak acid and tend decompose to produce $SO_3$ and organic. During neutralization diluted caustic soda is reacting with corresponding sulphonic acid to form sodium salt of corresponding acid. (Alpha olefin sulphonate for AO, Sodium Lauryl Ethoxy sulphate for LEO, Sodium lauryl sulphate for LA).

**8. Effluent Treatment:**

During this process acid mist along with $SO_2$& $SO_3$ gas will generate as effluents. Acid mist is separated using "**Electro Static Precipitator**" and the gases are treated with Caustic Soda lye solution in "**Wet Alkali Scrubber**". The water generated from Scrubber operation will be treated in RO plant to recover usable water and the reject is being sent to evaporator for evaporation.

**9. Drying of Final Products:**

Final products of Alpha Olefin sulphonate and Sodium Lauryl Sulphate can be dried using Vacuum dryers / Spray dryers to get desired moisture level and physical form the FG like Noodle , Needle , Paste or Powder.

**B. Specialty Surfactants:**

Specialty Surfactants are mild surfactant which is normally produced by reaction of base raw materials with required functional group amine / chloride / calcium etc. These compounds are produced by heating the base raw materials in the reactors (SS / Glass lined) and by addition functional group base materials followed by cooling / Solidification / filtration etc.

**C. Ultramarine Blue Pigment:**

Raw materials like china Clay, Sulphur, Soda Ash, Silica Powder and Tar pitch are mixed and grinded to the required particle size in dry ball mill using grinding media like pebble or ceramic balls. After grinding, this raw mix is filled in refractory pots and loaded in the batch kilns.

These kilns are heated using fuels like coal &Coke to the required temperature and the temperature is maintained to particular time. After this the kiln is allowed for natural cooling which will take min 25 to 30 days depending upon the atmospheric conditions. Then the kilns are opened to unload raw blue (Pigment + By Product) and washed in the washing tanks / equipment's to remove the water soluble salts.

After washing or before washing the pigment is grinded using wet mills to get desired particle size followed by natural settling to separate the pigment based on the particle size. After settling separation wet pigment is taken to the different type of dryers where hot air or oil is circulated to remove the moisture.

Final dried pigment is de-agglomerated using high speed turbo's and blended to get the desired tone and strength. Then the final product is packed based on the customer requirement.

**D. Ultramarine Violet Pigment:**

Ultramarine violet is produced by heating the Ultramarine Blue pigment along with Ammonium Chloride to the specific temperature in a Heating equipment like Tray dryer or Blender. During heating sodium is removed from Ultramarine Blue pigment and producing Ultramarine Violet which is washed, dried, grinded and blended to get desired shades.

**E. Bismuth Vanadate Pigment:**

Bismuth vanadate pigment is produced by high temp calcination of Bismuth Tri Oxide with Vanadium Pentoxide. After calcination the raw yellow pigment is wet grinded in the wet mill / bead mills to get desired particle size and shade. After grinding the pigment is filtered using vacuum filters followed by drying in tray dryers. Dried pigment is pulverized to disintegrate the particles and then blended to get desired shade.

**F. Mixed Metal Oxide (MMO) Pigments:**

Mixed metal oxide pigments are produced by calcinating the parent metal oxide powder along with coloring metal oxide (Chromophores / Dopants) at very high temperature of 1100 deg C plus. During calcinations the dopants are doped inside the lattice of parent metal oxides and thus color is obtained. The color of the final product will vary based on the parent metal oxide, dopants and their quantity.

After calcinations the raw pigment is wet grinded using ball mills / bead mills to get desired color shade and particle size followed by filtration and drying. Drying is done using tray driers / drying cum blending equipment's which is preheated using Thermic Fluid Heaters. After drying pigment in disintegrated using high speed Turbo Mills and then blended to get desired color shade.

### 3.5 Raw Materials Requirement and storage facility

Raw materials like LAB, Sulphonic acid – LABSA, benzyl chloride, Sodium Chloride are required for the production process. A detailed list of raw materials required is summarized in **Table 3-3.**

**Table 3-3 List of Raw materials for Existing and Proposed Expansion (Unit MT/Month)**

| S. No | Raw material | Monthly consumption | | | Principle Use | Storage |
|---|---|---|---|---|---|---|
| | | Existing | Proposed | After expansion | | |
| 1. | China clay | 113.76 | 90.18 | 203.94 | Raw material | Bags |
| 2. | Sulphur | 254.4 | 190.09 | 444.49 | Raw material | Bulk quantity in civil building |
| 3. | Sodium carbonate | -- | 118.69 | 118.69 | Raw material | Bags |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4. | Silica | 12.24 | 35.24 | 47.48 | Raw material | Bags |
| 5. | Tarpitch | 12.24 | 6.49 | 18.73 | Raw material | Bags |
| 6. | LAB | 1080 | -340.96 | 739.04 | For LABSA manufacturing | Tanks |
| 7. | AO | 960 | -293.26 | 666.74 | For AOS manufacturing | Tanks |
| 8. | Caustic Soda | 15.27 | 514.29 | 529.56 | Neutralizing | Tanks |
| 9. | Lauryl alcohol (LA) | | | 1000.11 | For SLS/SLES manufacturing | Tanks |
| | Lauryl Ethoxylate (LEO) | | | | | |
| 10. | Cobalt carbonate CaCO3 | -- | 33.60 | 33.60 | Raw material | Bags/drums |
| 11. | Aluminum Hydroxide Al(OH)3 | -- | 44.05 | 44.05 | Raw material | Bags |
| 12. | Potassium Chloride – KCL | -- | 3.309 | 3.309 | Raw material | Bags |
| 13. | Nickel oxide - NiO | -- | 13.80 | 13.80 | Raw material | Bags/ drums |
| 14. | Titanium di oxide – $TiO_2$ | -- | 709.80 | 709.80 | Raw material | Bags |
| 15. | Zinc Oxide - ZnO | -- | 12.66 | 12.66 | Raw material | Bags |
| 16. | Nickel Carbonate - NiCO3 | -- | 5.70 | 5.70 | Raw material | Bags/ Drums |
| 17. | Sodium Chloride - NaCl | -- | 3.30 | 3.30 | Raw material | Bags |
| 18. | Antimony Tri Oixde - Sb2O3 | -- | 121 | 121.00 | Raw material | Bags |
| 19. | Chromium Tri Oxide - Cr2O3 | -- | 4.17 | 4.17 | Raw material | Bags/Drums |
| 20. | Tungsten Tri Oxide - WO3 | -- | 5.16 | 5.16 | Raw material | Bags |
| 21. | Potassium Carbonate - K2CO3 | -- | 5.16 | 5.16 | Raw material | Bags |
| 22. | Bismuth Tri Oxide – Bi2O3 | -- | 35.93 | 35.93 | Raw material | Bags / Drums |
| 23. | Vanadium Pentoxide – V2O5 | -- | 14.16 | 14.16 | Raw material | Drums |
| 24. | Sulphonic Acid - LABSA | 303.03 | -63.03 | 240 | Active detergent | Tanks |
| 25. | Sulphuric Acid - H2SO4 | -- | 9.43 | 9.43 | Raw material | Tanks |
| 26. | Calcium Chloride / | -- | 87.67 | 87.67 | Raw material | Bags |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Cal. Carbonate | | | | | |
| 27. | Diluents as Required | -- | 943.45 | 943.45 | Raw material | Bags / Drums |
| 28. | Distilled Cocoa Fatty Acid | -- | 443.85 | 443.85 | Raw material | Drums/ Tanks |
| 29. | Mono Ethanolamine | -- | 93.84 | 93.84 | Raw material | Drums/ Tanks |
| 30. | Dimethyl Lauryl Amine | -- | 314.16 | 314.16 | Raw material | Drums/ Tanks |
| 31. | Benzyl Chloride | -- | 185.84 | 185.84 | Raw material | Drums/Tanks |
| 32. | Hydrogenated Coco Fatty Acid (C12-18) | -- | 382.75 | 382.75 | Raw material | Drums/ Tanks |
| 33. | Dimethyl Amino Propyl Amine | -- | 149.12 | 149.12 | Raw material | Drums/ Tanks |
| 34. | Sodium MonoChloro Acetic Acid | -- | 169.58 | 169.58 | Raw material | Drums |
| 35. | Di Ethanolamine | -- | 141.51 | 141.51 | Raw material | Drums |
| 36. | Stearic Acid | -- | 435.58 | 435.58 | Raw material | Bags |
| 37. | Mono Ethylene Glycol | -- | 95.09 | 95.09 | Raw material | Drums |

### 3.6 Mode of Transportation

All raw materials, axillary materials & finished goods will be transported using road tankers & trucks based on the quantity being handled.

### 3.7 Resource optimization

Sodium sulphate produced as by product in ultramarine blue pigment process will be washed off using water and the same water will treated in RO & MEE to get solid “Sodium Sulphate “ which will be reused in detergent production as Sodium sulphate was the major filler for any detergent.

### 3.8 Recycling /Reuse of Solvents

No solvent being used in the process

### 3.9 Power Requirements

The existing power requirement of 1425 kVA is sufficient for the proposed expansion project. So no additional power is required. The power supply is from. D.G. sets will be used as alternative source of power and will be used during power failure. The power requirement for existing and proposed expansion is summarized in **Table 3-4.**

**Table 3-4 Power requirement details**

| Details | Existing (kVA) | Proposed (kVA) | After Expansion (kVA) |
|---|---|---|---|
| Power requirement | 1425 | - | 1425 |
| Back up D.G. set | 725 x 2 | -- | 725 x 2 |

### 3.10 Fuel Requirements

The major fuel used in the production process included Coal, Coke, SKO (Super Kerosene Oil), LPG, HSD and Furnace oil. The details of Fuel used are given in **Table 3-5.**

**Table 3-5 Fuel requirement details (Existing & proposed Expansion)**

| S. No | Details | Point of use | Unit | Existing | Proposed | After expansion |
|---|---|---|---|---|---|---|
| 1 | Coal | Pigment process | MT/Day | 1.2 | -- | 1.2 |
| 2 | Coke | Pigment process | | 3 | -- | 3 |
| 3 | SKO | Pigment process | Lit/Day | 1200 | -600 | 600 |
| 4 | LPG | Pigment & spray Tower Process | Kg/Day | 400 | 850 | 1250 |
| 5 | HSD | DG sets | Lit/Day | 1000 | -- | 1000 |
| 6 | Furnace oil | Boiler & spray Tower process | MT/Day | 3 | -0.5 | 2.5 |

### 3.11 Manpower

The total employment in the existing facility is 250 persons including contractual workers

### 3.12 Water Requirement

The total water requirement for the existing facility is 168.4 KLD. Water requirement for the proposed expansion process is 412.8 KLD. Water requirement for the project will be met from SIPCOT. Water bills towards SIPCOT are attached as **Annexure 3.** Water balance for the existing and proposed expansion project is attached as **Annexure 12.**The existing water requirement and breakup details are given in **Table 3-6.**

Water requirement and breakup detail for the proposed expansion is given in **Table 3-7.**

**Table 3-6 Existing water requirement**

| S. No | Particulars | Total water Req. | Effluent/ sewage | Treated water used | Loss | Remarks |
|---|---|---|---|---|---|---|
| 1 | Domestic | 4.5 | 4.5 | 0 | 0 | Sent to STP |
| 2 | DM plant regeneration | 4 | 4 | 0 | 0 | Sent to RO |
| 3 | Boiler | 24 | 1.2 | 22 | 0.8 | Blow down sent to RO |
| 4 | Cooling Tower | 24 | 3 | 0 | 21 | Blow down sent to RO |
| 5 | Process | 111.2 | 31.2 | 35.5 | 80 | sent to RO |
| 6 | Floor washing | 0.7 | 0.7 | 0 | 0 | sent to RO |
| 7 | Green belt | 0 | 0 | 4 | 0 | |
| | **Total** | **168.4** | **44.6** | **61.5** | **101.8** | |

**Table 3-7 Water requirement for proposed expansion**

| S. No | Particulars | Total water Req. | Fresh water req. | Effluent/sewage | Treated water used | Loss | Remarks |
|---|---|---|---|---|---|---|---|
| 1 | Domestic | 4.5 | 4.5 | 4 | 0 | 0.5 | Sent to STP |
| 2 | Boiler | 45 | 4.5 | 2.5 | 40.5 | 2 | Sent to RO II for treatment |
| 3 | Cooling Tower | 40 | 40 | 4 | 0 | 36 | Sent to RO II for treatment |
| 4 | Process | 307.6 | 269.5 | 27 | 84.1 | 280.6 | RO I Rejects+ Treated Water +Boiler Condensate is considered in treated water |
| 5 | Floor washing | 0.7 | 0 | 0.7 | 0 | 0 | Sent to RO II treatment |
| 6 | Green belt | 10 | 6 | 0 | 4 | 6 | Treated water from STP used |
| 7 | MEE cleaning | 5 | 5 | 5 | 0 | 0 | -- |
| | **Total** | **412.8** | **329.5** | **43.2** | **129.3** | **325.1** | -- |

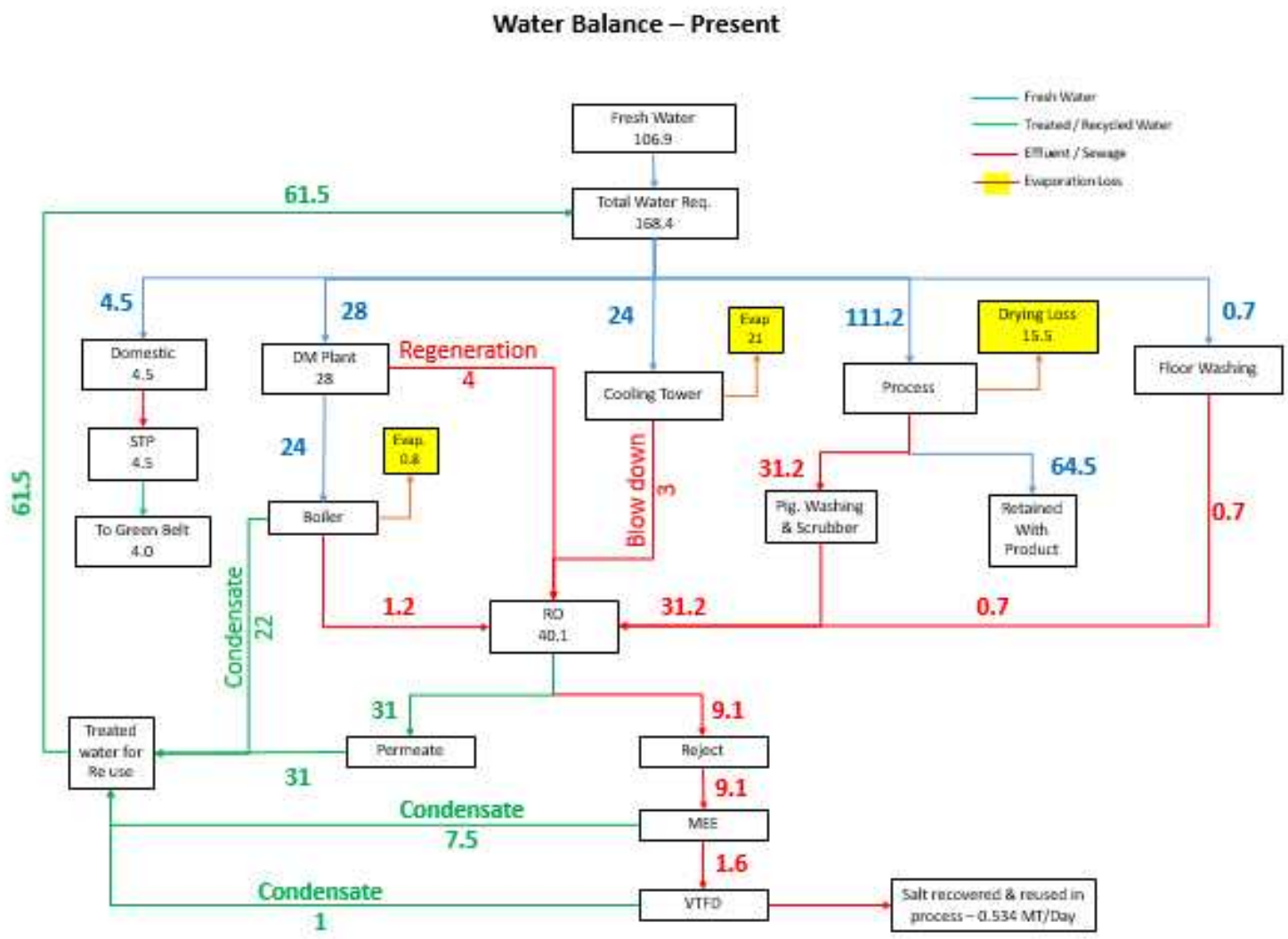


**Figure 3-7 Existing Water Balance Chart**

## Water Balance – Proposed

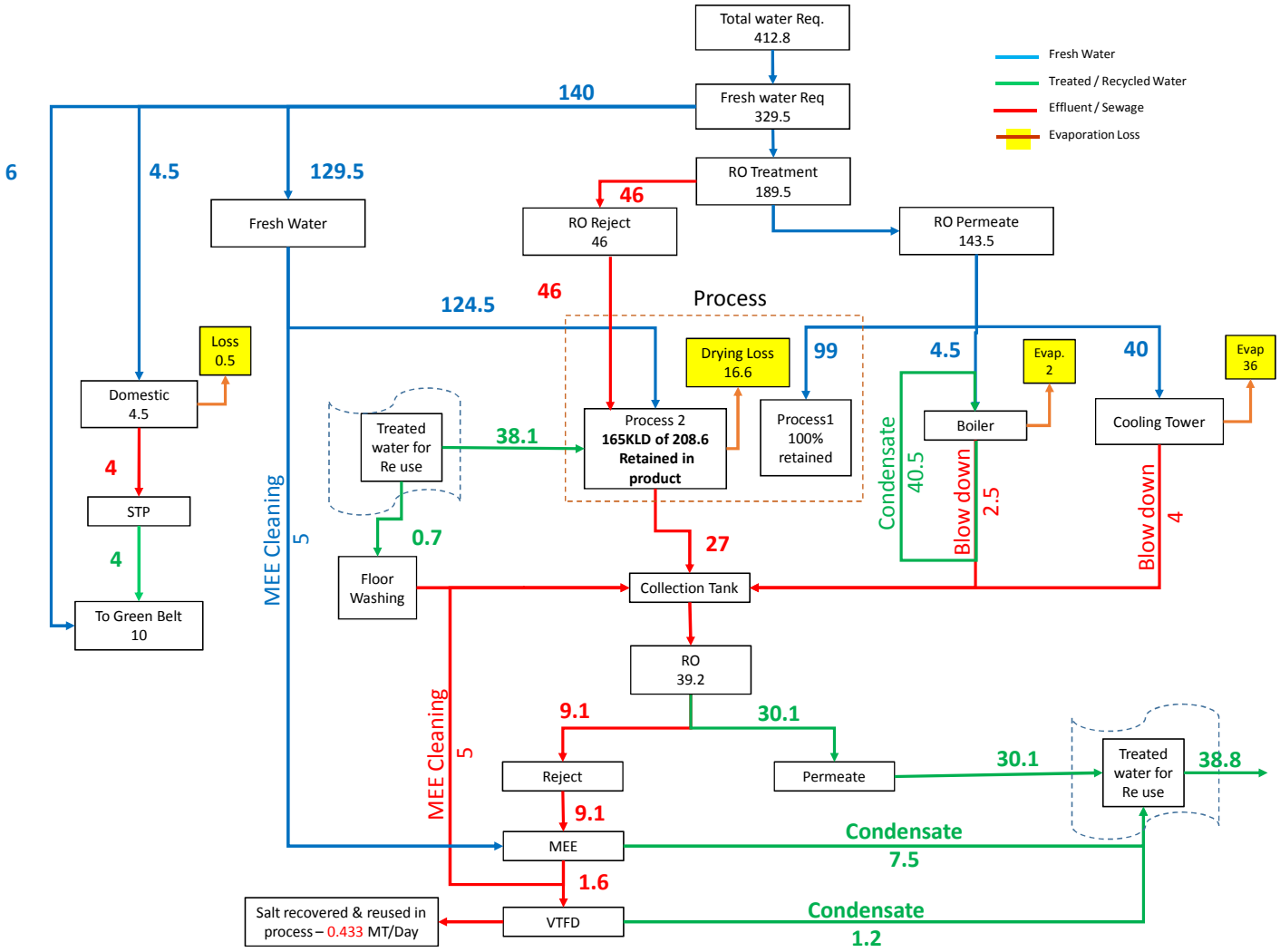


**Figure 3-8 Proposed Water Balance Chart**

### 3.13 Liquid waste management

#### 3.13.1 Industrial Effluent Treatment

Industrial Effluent generation details are given in **Table 3-8.**

**Table 3-8 Effluent generation details for Existing and proposed project**

| Description | Industrial waste water generation | Disposal |
|---|---|---|
| Existing (KLD) | 9.1 | Treated using RO & MEE followed by VTFD. Salt Generated ($Na_2SO_4$) will be reused in Detergent Process. |
| Proposed (KLD) | - | |
| After expansion | 9.1 | |

#### 3.13.2 Sewage Treatment

The existing domestic wastewater is being sent to STP. The existing and proposed Domestic wastewater disposal details are given in **Table 3-9.**

**Table 3-9 Domestic wastewater generation and Management**

| Description | Domestic waste water generation | Treatment units | Disposal |
|---|---|---|---|
| Existing (KLD) | 4.5 | STP | Domestic waste water is being treated in "Sewage Treatment Plant" of 60 KLD and treated water is being reused for green belt development. |
| Proposed (KLD) | - | - | |
| After expansion | 4.5 | STP | |

### 3.14 Air Pollution Control Measures

- The discharge of emission from air pollution sources will be passed through stack and adequate stack height is provided for better dispersion of pollutants.
- Ambient Air quality of the premises will be maintained within the National Ambient Air Quality standards.
- Emissions are analyzed on regular basis.
- Detailed description on Air pollution control measures is given in **Annexure7.**

### 3.15 Waste Management and Disposal Method

#### 3.15.1 Municipal Solid Waste Management

##### 3.15.1.1 Construction Phase

Since the proposed project involves change in product mix and will take place within the existing facility, no additional construction works are proposed.

### 3.15.1.2 Operation Phase

Municipal Solid waste generation for existing facility is 45 kg/day (STP Sludge is 0.05 kg/day and will be used as manure for green belt) will be generated and will be disposed off into local municipal bins. Salt recovered from the effluent treatment will be reused in detergent production process.

**Table 3-10 Solid waste generation and management**

| S. No | Waste | Quantity (kg/day) | | | Collection method | Treatment/Disposal method |
|---|---|---|---|---|---|---|
| | | Existing | Proposed | After expansion | | |
| 1 | Packing materials | 5 | - | 5 | Bins | Sent to TNPCB authorized recyclers |
| 2 | Organic | 45 | - | 45 | -- | Vermi compositing |
| 3 | STP sludge | 0.05 | - | 0.05 | Sludge drying bed | Will be used as manure in green belt development |

Note: existing Manpower is 250, no additional man power is required for the proposed expansion.

### 3.15.2 Hazardous Waste Management

The Hazardous waste will be stored in isolated area above concrete platform under roofed shed. These waste will be segregated & stored and will be disposed off by giving it to the TNPCB authorized dealers/recyclers/TSDF within a stipulated period of time (90 days).

Hazardous waste materials will be properly disposed as per the Hazardous and other waste/Management Handling and Transboundary Movement) Rules 2016.The type of hazardous waste and the quantity generated are detailed in **Table 3-11.** Hazardous waste authorization letter is attached as **Annexure 8.**

**Table 3-11 Hazardous waste generation and management**

| S. No | Category | Type of the Hazardous waste | Quantity (MT/Year) | | | Mode of Disposal |
|---|---|---|---|---|---|---|
| | | | Existing | Proposed | After Expansion | |
| 1 | 5.1 | Used/ Spent oil | 4.5 | - | 4.5 | Recover and Reuse- CPCB Authorized recyclers |
| 2 | 5.2 | Wastes/ residues containing oil | 1.2 | - | 1.2 | TSDF |
| 3 | 17.1 | Residues, dusts or filter cakes | 6 | - | 6 | TSDF |
| 4 | 17.2 | Spent catalyst ($V_2O_5$) | 0.2 | - | 0.2 | Buy back with the suppliers |
| 5 | 33.3 | Discarded containers / barrels / liners contaminated with hazardous wastes /chemicals | 1.2 | - | 1.2 | TSDF |

### 3.15.3 Non Hazardous Waste Management

Sodium Sulphate will be produced as Solid waste from the VTFD which will be reused in Detergent Production process.

# 4 SITE ANALYSIS

## 4.1 Connectivity

The project site is located in SIPCOT industrial area at survey no 52 and 846, Karai village, Walajah Taluka, Vellore district Tamil Nadu and project connectivity is shown in **Table 4-1**. Project site boundary co-ordinates are given in **Table 4-2**.

**Table 4-1Connectivity of Project site**

| S. No | Description | Name of Connectivity | Distance (~km) | Direction |
|---|---|---|---|---|
| 1 | Nearest Highway | NH-1 | Adjacent to the project site | SW |
| 2 | Nearest state Highway | SH 124A | Adjacent to the project site | E |
| 3 | Nearest Railway station | Mukundarayapuram | ~3.94 | NW |
| 4 | Nearest Airport | Vellore Airport | ~27.48 | WSW |
| 5 | Nearest major city | Ranipet | ~1.54 | NW |

**Table 4-2 Geographical locations of the existing project site**

| S. No | Site Point | Geographical co-ordinates | |
|---|---|---|---|
| | | Latitude | Longitude |
| 1. | Center co-ordinates | $12^0$57’6.66”N | $79^0$18’57.93”E |
| 2. | A | 12°57’2.81"N | 79°19’3.93"E |
| 3. | B | 12°57’2.02"N | 79°19’2.93"E |
| 4. | C | 12°57’1.52"N | 79°19’2.09"E |
| 5. | D | 12°57’1.51"N | 79°19’1.42"E |
| 6. | E | 12°57’4.72"N | 79°18’50.56"E |
| 7. | F | 12°57’7.22"N | 79°18’52.35"E |
| 8. | G | 12°57’8.07"N | 79°18’52.88"E |
| 9. | H | 12°57’8.39"N | 79°18’53.54"E |
| 10. | I | 12°57’9.08"N | 79°18’54.71"E |
| 11. | J | 12°57’9.61"N | 79°18’55.35"E |
| 12. | K | 12°57’10.40"N | 79°18’55.80"E |
| 13. | L | 12°57’11.15"N | 79°18’56.01"E |
| 14. | M | 12°57’12.30"N | 79°18’56.24"E |
| 15. | N | 12°57’13.83"N | 79°18’56.30"E |
| 16. | O | 12°57’15.33"N | 79°18’56.80"E |
| 17. | P | 12°57’15.63"N | 79°18’57.11"E |
| 18. | Q | 12°57’15.73"N | 79°18’57.28"E |

## 4.2 Land Form, Land use & Land ownership

The proposed expansion project is situated at Survey no 52 and 846, Karai village, Walajah Taluka, Vellore district, Tamil Nadu. The total land area is 8.66 Ha. Land allotment letter is attached as **Annexure 1.** The project site is located in SIPCOT industrial area. The area breakup details of the project site are given in **Table 4-3.**

**Table 4-3 Land area breakup details**

| S. No | Description | Area | | | Percentage (%) |
|---|---|---|---|---|---|
| | | Hectares | Acres | Sq. m | |
| 1 | Built up area | 2.10 | 5.18 | 21000 | 24 |
| 2 | Solid waste storage/disposal area | 0.20 | 0.49 | 2000 | 2 |
| 3 | Green belt area | 3.10 | 7.66 | 31000 | 36 |
| 4 | Vacant area | 3.26 | 8.05 | 32600 | 38 |
| | Total | 8.66 | 21.39 | 86600 | 100 |

### 4.3 Topography of the District

The district covers a geographical area of 6077 sq. km and lies between $12^0$15' to $13^0$15' North latitude and $78^0$20' to $79^0$50' East longitudes in Tamil Nadu. Vellore the district Head Quarter is well connected by rail and road to the entire neighboring district, other major town and to the nearby states. Topo map of the project site is given in **Figure 4-1.**

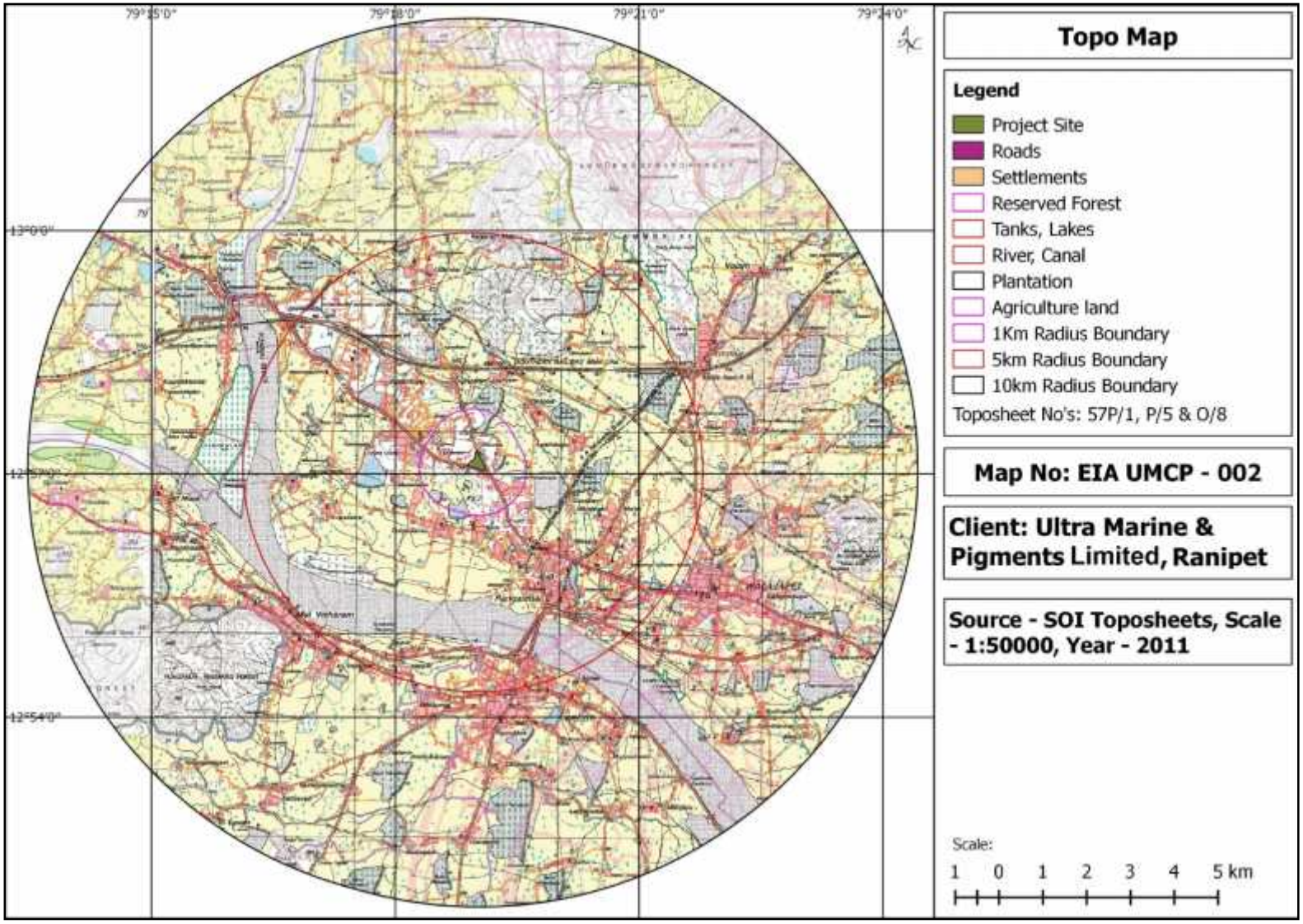


**Figure 4-1 Topo map of the Project site**

### 4.3.1 Drainage

The district has the following important rivers: Palar, South Pennar, Cheyyar and Ponnai. 'Palar' is the most important river of the district. Rising near Nandidurg in Karnataka state, Palar enters the district in the western part through Vaniyambadi taluk. It flows then in an east-north-easterly direction in the taluk and is joined by some jungle streams like Malattar flowing in Gudiyattam taluk.

### 4.3.2 Climate and rainfall

The district has a moderate climate. Some taluks like Arakkonam, parts of Walajapet and Gudiyattam that are interspersed by hills and mountains are exposed to different climatic conditions and having very hot weather during the summer seasons.

The district receives rainfall due to southwest and northeast monsoons. The actual level of rainfall in the district ranges from 570.6 milli meter (mm) in 2002-03, the lowest level in the last 13 years, to the highest level of 1297.7 mm in 2005-06.

### 4.3.3 Land use pattern

The nature of irrigation practiced in a region is capable of affecting the cropping pattern, agricultural income and the standard of living in a rural society. **Table 4-4** presents the data on the land utilization pattern in Vellore district. The table shows that the total geographical area of the district is 6077 sq. km out of which 42.68 % was under agricultural crop land. Land use pattern of the project influence area is given in **Figure 4-2**. Land use land cover map of the study area is given **Figure 4-3.**

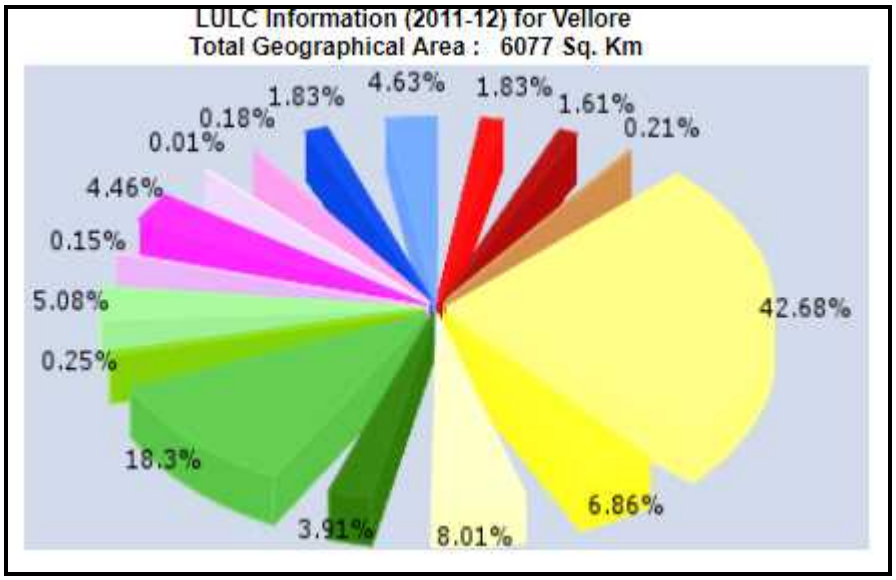


**Figure 4-2 Land use pattern of the project influence area**

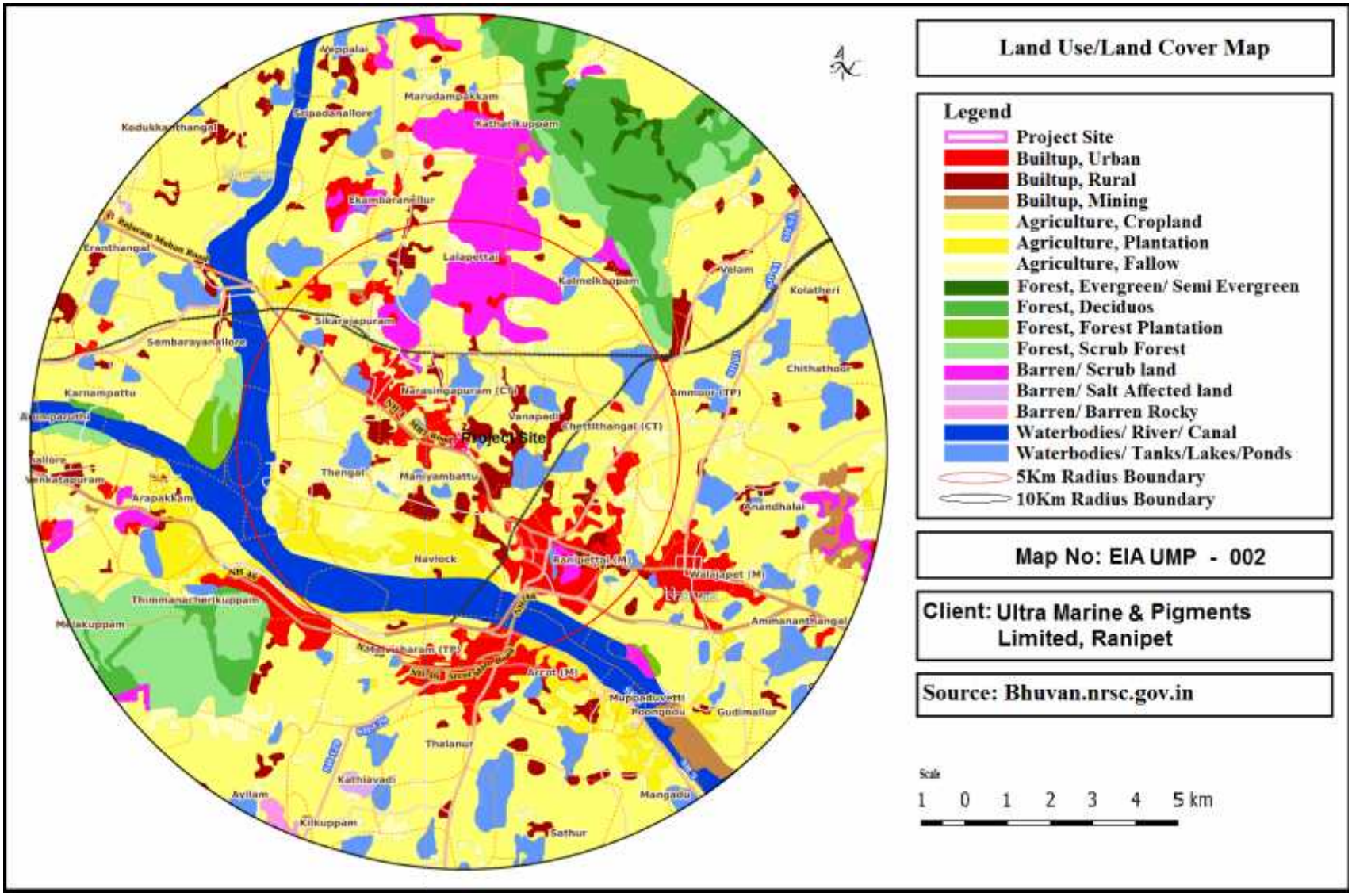


**Figure 4-3 Land use Land Cover map of the study area**

**Table 4-4 Land use pattern of the district**

| LULC Class | Area (Sq. Km) | LULC class | Area (Sq. Km) |
|---|---|---|---|
| Built-up, Urban | 110.98 | Built-up, Rural | 97.8 |
| Built-up, Mining | 13.03 | Agricultural Crop land | 2593.47 |
| Agricultural plantation | 416.87 | Agriculture, Fallow | 486.59 |
| Forest Evergreen/Semi evergreen | 237.63 | Forest deciduous | 1111.98 |
| Forest, forest plantation | 15.3 | Forest scrub forest | 309 |
| Barren/unculturable/wasteland, salt affected land | 9.38 | Barren/unculturable/wastelands, scrub land | 271.01 |
| Barren/unculturable/wastelands, sandy area | 0.81 | Barren/unculturable/waste land, Barren rocky | 10.77 |
| Wasteland/water bodies, River/Stream/canals | 11.16 | Wetlands/ water bodies, reservoir/lakes/ponds | 281.2 |
| **Total** | | | **6077.00** |

### 4.3.4 Soil

Soil of the district is not uniform and one can observe different varieties of soil. The soil is mostly of the red femginous variety both sandy and loamy, with black area accounting for about 16 per cent. The black soil is found mostly in the neighborhood of the rivers of Palar, Ponnai and in the anaicuts of a few big tanks.

### 4.3.5 Flora and Fauna

Some varieties of flora and fauna, most of which are unique to the region are found in Javadi region. On flora, no distinguishing variety is observed in the district. The hilly areas belong to the 'dry deciduous' type. In the lower areas, plants like tamarind trees, teak wood, sandal wood, ven-teak, casurina, bamboo etc., can be found. With regard to fauna, no special and distinguishing variety is available in the district.

## 4.4 Existing Land use Pattern

The present land is used for the industrial purpose. The land allotment letter is attached as **Annexure 1.**The project study area is 8.66 Hectare i.e. 21.39 acres. The land use/Land cover statistics of 10km radius of the study area is given in **Table 4-5**. Land use land pattern of the project study area is shown in **Figure 4-4.**

**Table 4-5Land use/Land cover statistics of 10km radius of the study area**

| Description | Total project study area : 322.29 sq. km | | | |
|---|---|---|---|---|
| | Sq. km | Acres | Ha. | Percentage |
| Cropland | 131.35 | 32457.24 | 13135 | 40.76 |
| Fallow land | 55.77 | 13781.05 | 5577 | 17.30 |
| River /Stream/Canals | 20.81 | 5142.255 | 2081 | 6.46 |
| Reservoirs /Lakes/Ponds | 21.26 | 5253.452 | 2126 | 6.60 |
| Scrub forest | 15.14 | 3741.17 | 1514 | 4.70 |
| Deciduous | 14.84 | 3667.038 | 1484 | 4.60 |
| Scrub land | 14.37 | 3550.899 | 1437 | 4.46 |
| Rural | 13.88 | 3429.817 | 1388 | 4.31 |
| Urban | 17.3 | 4274.917 | 1730 | 5.37 |

| | | | | |
|---|---|---|---|---|
| Plantation | 11.2 | 2767.576 | 1120 | 3.48 |
| Evergreen/ semi evergreen | 1.57 | 387.9549 | 157 | 0.42 |
| Forest plantation | 1.35 | 333.5918 | 135 | 0.42 |
| Salt affected land | 0.36 | 88.9578 | 36 | 0.11 |
| Barren rocky area | 0.3.6 | 88.9578 | 258 | 0.80 |
| Mining | 2.58 | 637.5309 | 258 | 0.80 |
| Sandy area | 0.15 | 37.06575 | 15 | 0.05 |
| Total | 322.29 | 79639.47 | 32229 | 100 |

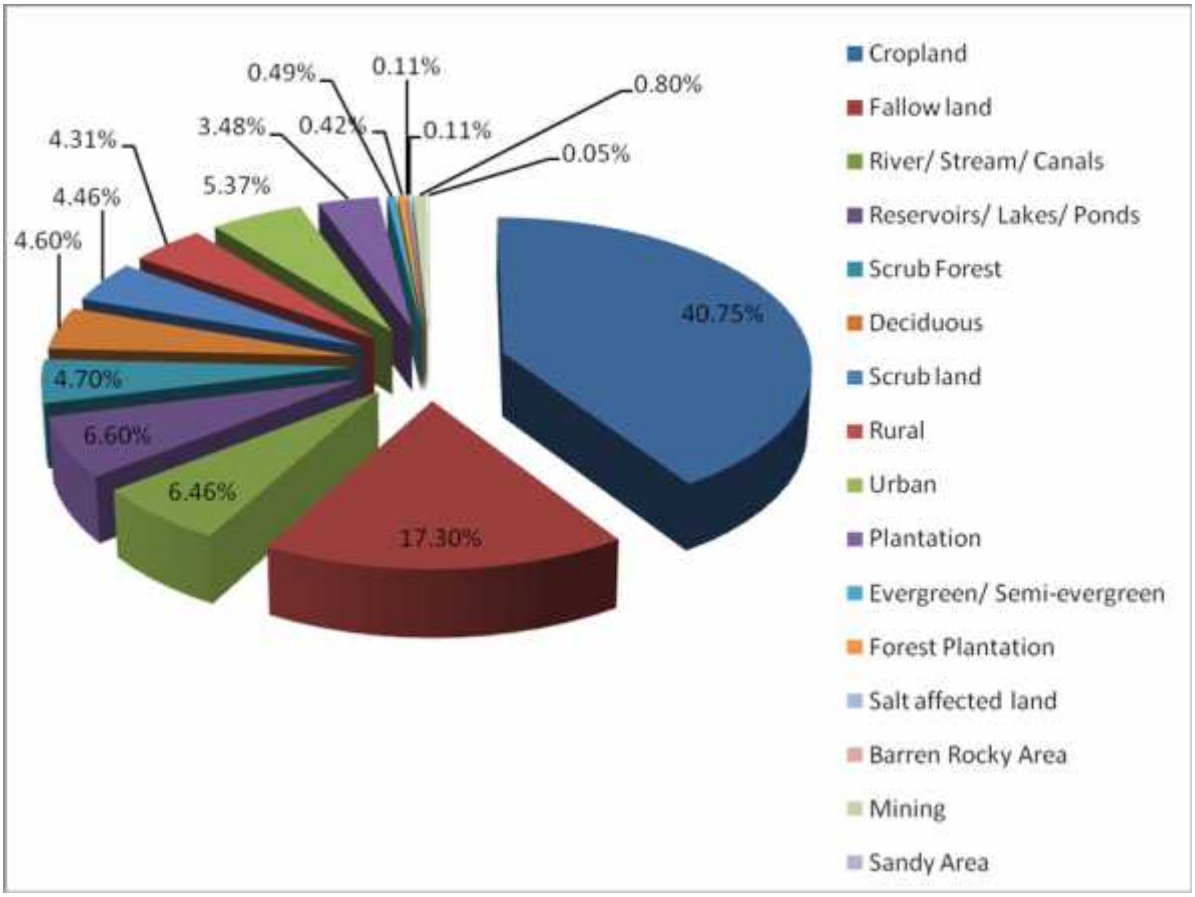


**Figure 4-4 Land use pattern of the project study area**

## 4.5 Environmental Sensitivity of the Project site within 15 km radius

Environmental Sensitivity areas of the project site within the 15 Km radius of the project site are summarized in **Table 3-2.**

## 4.6 Existing infrastructure

### 4.6.1 Land

The total area of the project site is 8.66 Ha. The proposed expansion will takes place in the existing facility, no construction is proposed.

The area break up detail is given in **Table 4-3.** The site layout is shown in **Figure 3-6.**

### 4.6.2 Buildings

Total factory footprint is divided into various sections like Production Blocks, Engineering, Warehouses, Administration, Toilets etc.

### 4.6.3 Plant Machinery & Utilities

The Plant Facilities have been designed and set up with the objective to carry out almost all chemical reactions and processes. As the proposed expansion project will be carried out in the existing premises, the existing infrastructure facilities will also be utilized with the addition of some new machinery and utilities for the proposed project. The list of Plant and Machineries for existing and proposed project are given **Table 4-6.**

**Table 4-6 List of Machinery &Equipment**

| S. No | Plant | Machinery & Equipment | |
|---|---|---|---|
| | | **Existing** | **Proposed** |
| 1. | Film Sulphonation Plant | 1. Storage Tanks.<br>2. Reactors<br>3. Blowers<br>4. Compressors<br>5. Pumps.<br>6. Filters<br>7. Oven<br>8. Catalyst Tower<br>9. Heat Exchanger<br>10. Agitating Tanks<br>11. Instruments<br>12. Electrical Panels.<br>13. Electrostatic Precipitator.<br>14. Scrubber<br>15. Chimney<br>16. Spray Drier<br>17. Vacuum Drier<br>18. Vacuum Pumps / Ejectors | Same as present |
| 2 | Pigment Plant | 1. Storage Tanks<br>2. Ball Mills<br>3. Kilns<br>4. Cyclone Separator<br>5. Scrubber<br>6. Chimney<br>7. Agitating Tanks<br>8. Settling Tanks<br>9. Filters<br>10. Blenders<br>11. Dryers<br>12. Mixers<br>13. Vibrators<br>14. Attritor<br>15. Thermic Fluid Heaters<br>16. Burners<br>17. Multi Mills<br>18. Turbo Grinders | Same as present |

| | | | |
|---|---|---|---|
| 3 | Detergent Plant | 1. Mixer<br>2. Bucket Elevator<br>3. Cage Mills<br>4. Vibratos<br>5. Storage Tanks<br>6. Packing Machines<br>7. Plodders | Same as present |

### 4.6.4 Fire & Safety System

Fire hydrant is installed across the plant & required firefighting equipments like extinguishers, fire buckets etc are provided where ever required. Trained people are available to mitigate the fire during emergency and regular mock drills are conducted to enrich the knowledge of the people. Fire Hydrant layout is attached as **Annexure-9.**

### 4.6.5 Rain water harvesting facility layout

UPL is having rain water collection system in Sulponation plant and rain water collection & recharging pits across the plant.

Total no of rain water collection & recharge pits – 8 Nos

Total rain collection area in Sulponation plant – 1068 Sq.M

### 4.7 Social Infrastructure available

Social infrastructure like religious places, school and colleges and common places within 15 km radius of the project site is given in **Table 3-2.**

# 5 PLANNING BRIEF

## 5.1 Planning concept

M/s. Ultramarine and Pigment limited (UPL) is an existing unit engaged in the manufacturing of Ultramarine Blue, Linear Alkyl Benzene Sulphonic acid, Alpha Olefin Sulphonate and Synthetic detergents. The proposed project involves change in product mix and will take place with the existing premises situated at Survey No 52 & 846, Karai village, Walajah Taluk, Vellore district, Tamil Nadu. The existing production capacity with 4 products is 6550 MT/Month. The proposed production capacity with 8 products is 6400 MT/Month. The production details are given in **Table 5-1.**

**Table 5-1 Existing and Proposed products with capacities**

| S. No | Products | Capacity (MT/Month) | | |
|---|---|---|---|---|
| | | Existing | Proposed | Total |
| 1. | Ultramarine Blue | 200 | 100 | 300 |
| 2. | Linear Alkyl Benzene Sulphonic acid – LABSA | 1350 | -350 | 1000 |
| 3. | Alpha olefin Sulphonate – AOS | 1000 | Nil | 1000 |
| 4. | Synthetic detergents | 4000 | -2000 | 2000 |
| 5. | Mixed Metal Oxide Pigments | -- | 50 | 50 |
| 6. | Bismuth Vanadate pigments | -- | 50 | 50 |
| 7. | Sodium Lauryl Ether Sulphate (SLES) or Sodium Lauryl Sulphate (SLS) | -- | 1500 | 1500 |
| 8. | Specialty surfactants | -- | 500 | 500 |
| | **Total** | **6550** | **-150** | **6400** |

## 5.2 Transportation

- The workforce is sourced locally who come to the factory in their own transport arrangement by road.
- Raw materials, finished products are transported through Trucks by road.

## 5.3 Population Projection

The total employment for the existing facility is 250 persons including workers on contractual basis.

## 5.4 Land use Planning & Break up

The proposed project is situated at Survey No 52 and 846, Karai village, Walajah Taluk, Vellore district. The total plot area is 8.66 Hectares utilized for Building, solid waste

storage/disposal area, and Green belt/irrigation area. Land breakup details are given in **Table 5-2.**

**Table 5-2 Land area breakup details**

| S. No | Description | Area | | | Percentage (%) |
|---|---|---|---|---|---|
| | | Hectares | Acres | Sq. m | |
| 1 | Built up area | 2.10 | 5.18 | 21000 | 24 |
| 2 | Solid waste storage/disposal are | 0.20 | 0.49 | 2000 | 2 |
| 3 | Green belt area | 3.10 | 7.66 | 31000 | 36 |
| 4 | Vacant area | 3.26 | 8.05 | 32600 | 38 |
| | Total | 8.66 | 21.39 | 86600 | 100 |

### 5.5 Assessment of Infrastructure Demand

As the proposed project involves change in product mix and quantities, no additional infrastructure facilities are proposed. The existing road facilities are will be used and maintained. Medical facilities are available near the project site.

### 5.6 Amenities/Facilities

The existing site is having all sanitary facilities, Drinking water facility for employees.

# 6 PROPOSED INFRASTRUCTURE

## 6.1 Industrial Area

The project site is located in SIPCOT Industrial Complex.

## 6.2 Residential Area

The proposed project involves expansion and change in product mix within the existing facility. The project is situated at Survey No 52 & 846, SIPCOT industrial complex, Karai village, Walajah Taluka, Vellore, Tamil Nadu.

The total project area is 8.66 Hectares. The land devoted for greenbelt is 3.10 Hectares i.e. 35.79% of the total project area.

## 6.3 Social Infrastructure

The project will provide employment to local youth and good supply of products to Domestic & Commercial purposes, thus increasing their standard of living and thus helping strengthen the social infrastructure of the region.

## 6.4 Connectivity

The project site is well connected by road to the nearby locations. The site is adjacent to State Highway (SH 124A) and to the National Highway (NH 1). The connectivity of the project site is given in **Table 6-1.**

**Table 6-1 Connectivity of the project site**

| S. No | Description | Name of Connectivity | Distance (~km) | Direction |
|---|---|---|---|---|
| 1 | Nearest Highway | NH-1 | Adjacent to the project site | SW |
| 2 | Nearest state Highway | SH 124A | Adjacent to the project site | E |
| 3 | Nearest Railway station | Mukundarayapuram | ~3.94 | NW |
| 4 | Nearest Airport | Vellore Airport | ~27.48 | WSW |
| 5 | Nearest major city | Ranipet | ~1.54 | NW |

## 6.5 Drinking Water Management

Drinking water facility is available for the employees with the project site.

## 6.6 Sewerage system

4.5 KLD of Domestic waste is generated in the existing facility and it is treated in STP.

## 6.7 Industrial Waste& Emissions management:

Industrial waste effluent generation is given in **Table 6-2.**

**Table 6-2 Effluent waste generation for Existing and proposed project**

| Description | Industrial waste water generation | Disposal |
|---|---|---|
| Existing (KLD) | 9.1 | Treated using RO & MEE followed by VTFD. Salt Generated ($Na_2SO_4$) will be reused in Detergent Process. |
| Proposed (KLD) | - | |
| After expansion | 9.1 | |

## 6.8 Municipal Solid Waste Management

The solid waste generation and management are given in **Table 6-3.**

**Table 6-3 Solid waste generation and management**

| S. No | Waste | Quantity (kg/day) | | | Collection method | Treatment/Disposal method |
|---|---|---|---|---|---|---|
| | | Existing | Proposed | After expansion | | |
| 1 | Paper materials | 5 | - | 5 | Bins | Sent to TNPCB authorized recyclers |
| 2 | organic | 45 | - | 45 | Bins | Vermi composting |
| 3 | STP sludge | 0.05 | - | 0.05 | Sludge drying bed | Will be used as manure in green belt development |

## 6.9 Power and Fuel Requirements and Supply/ Source

The existing power requirement of 1425 kVA is sufficient for the proposed expansion project. So no additional power is required. D.G. sets will be used in case of emergency during the power failure. Power and Fuel requirement are given in **Table 6-4** and **Table 6-5.**

**Table 6-4 Power requirement details**

| Details | Existing (kVA) | Proposed (kVA) | After Expansion (kVA) |
|---|---|---|---|
| Power requirement | 1425 | - | 1425 |
| Back up D.G. set | 725x2 | -- | 725x2 |

**Table 6-5 Fuel requirement details**

| Details | Point of use | Unit | Existing | Proposed | After expansion |
|---|---|---|---|---|---|
| Coal | Pigment process | MT/Day | 1.200 | - | 1.200 |
| Coke | Pigment process | | 3 | - | 3 |
| SKO | Pigment process | Lit/Day | 1200 | -600 | 600 |
| LPG | Pigment & spray Tower Process | Kg/Day | 400 | 850 | 1250 |
| HSD | DG sets | Lit/Day | 1000 | -- | 1000 |
| Furnace oil | Boiler & spray Tower process | MT/Day | 3.0 | -0.5 | 2.5 |

# 7 REHABILITATION AND RESETTLEMENT (R &R) PLAN

## 7.1 Policy to be adopted (Central/ State)

Not applicable as proposed project involves change in product mix and quantities within the existing facility.

# 8 PROJECT SCHEDULE AND COST ESTIMATE

## 8.1 Likely date of start of construction and likely date of completion

As the proposed expansion will take place within the industry so no construction activity is envisaged.

## 8.2 Project Schedule and Cost Estimate

The overall project cost is 1 Crores for raw materials only.

# 9 ANALYSIS OF PROPOSAL

## 9.1 Financial and social benefits

Existing Annual Turnover: 350 Crores.

Proposed projected Annual Turnover: 400 Crores

## 9.2 Social Benefit

The project will provide employment to local youth and good supply of products to the Domestic and commercial purposes, thus helping strengthen the social infrastructure of the region.

## 9.3 CSR benefit to local community

Promotion of education and possible infrastructure development in nearby villages will be undertaken possibly.

## 9.4 Green belt benefits to the environment

The main objective of the green belt is to provide a barrier between the source of pollution and the surrounding areas. The green belt helps to capture the fugitive emission and to attenuate the noise generated apart from improving the aesthetics. M/s. Ultramarine & Pigments limited will maintain green belt inside the factory premises and also plant trees at the periphery of the boundary for environmental protection.

## 10 CONCLUSION

- Since the proposed project is expansion within the existing site, there will not be any change in land use pattern.
- There are no new/additional construction activities.
- Socio – economic benefit to the local people as it would provide both direct employment and indirect employment.
- Increase in supply of products for commercial purpose will improve the standard of living and thus helps in strengthen the social infrastructure of the region.
- Marginal impacts if any due to proposed project will be fully mitigated by the Environmental Management Plan (EMP).