Proposed Terms of Reference (TOR)
For EIA studies

FOR
PROPOSED EXPANSION PROJECT AT

| Name of the Industrial Unit | M/s. Sagar Life Science Pvt. Ltd.  
                            | Plot No.3045, GIDC Estate Panoli- 394116,  
                            | Dist. Bharuch, State - Gujarat, India |
|-----------------------------|----------------------------------------|
| Registered Office           | M/s. Sagar Life Science Pvt. Ltd.  
                            | 101, Baba Market, DCM Market,  
                            | Ajmer Road Jaipur 302 006.       |
**Introduction**

M/s. Sagar Life Sciences Pvt. Limited is a steady growing company incorporated in 2007. It is registered as a Small Scale Industrial unit. Sagar Life Sciences Pvt. Limited is a dynamic organization, continuously investing in innovative products and processes, as well as cleaner technologies. The plant is of international standards. The plant boasts of contemporary infrastructure facilities with advanced machinery and automated processes.

**Location of the unit**

The plant is located at Plot No. 3045, GIDC Estate, Panoli, Dist. Bharuch, Gujarat.

**Present Manufacturing Activities**

M/s. Sagar Life Sciences Pvt. Limited is an existing manufacturing facility since 2007. The Unit is manufacturing dye intermediates and Specialty Chemicals.

**Proposal**

Now, the Company proposes to expand the existing few products & also plans to add new products at the site as per below table:
- Total Production capacity of Existing 4 Nos. products shall be remain same.
- There shall be addition of 17 new products with total production capacity up to 179 MTM.

**Product List (Existing + Proposed after EC Expansion)**

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of Products</th>
<th>CAS no.</th>
<th>CTO available MT/month</th>
<th>EC applied for additional /new production MT/month</th>
<th>Total after EC expansion MT/month</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Calcium Chloride</td>
<td></td>
<td>100</td>
<td>-</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Repackaging &amp; formulation of agrochemicals liquid products</td>
<td></td>
<td>250</td>
<td>-</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Repackaging &amp; formulation of agrochemicals Powder products</td>
<td></td>
<td>250</td>
<td>-</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Soil Conditioner (Powder &amp; Granules)</td>
<td></td>
<td>5000</td>
<td>-</td>
<td>5000</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Iodobenzene Di acetate</td>
<td>3240-34-4</td>
<td></td>
<td>2</td>
<td>2</td>
<td>Existing Products- No change</td>
</tr>
<tr>
<td>6.</td>
<td>Tert Butyl Carbazate</td>
<td>870-46-2</td>
<td></td>
<td>2</td>
<td>2</td>
<td>New Products</td>
</tr>
<tr>
<td>7.</td>
<td>2 Hydroxy Decanoic Acid</td>
<td>5393-81-7</td>
<td></td>
<td>25</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>4, Hydroxy Benzyl Alcohol</td>
<td>623-05-2</td>
<td></td>
<td>25</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Ammonium Acetate</td>
<td>631-61-8</td>
<td></td>
<td>75</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>4 Chloro Butyl Chloride</td>
<td>4635-59-0</td>
<td></td>
<td>75</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Ortho Toludene Di Sulphate</td>
<td>95-53-4</td>
<td></td>
<td>75</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>Sr. No</td>
<td>Name of Products</td>
<td>CAS no.</td>
<td>CTO available MT / month</td>
<td>EC applied for additional / new production MT / month</td>
<td>Total after EC expansion MT / month</td>
<td>Remarks</td>
</tr>
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</tr>
<tr>
<td>12.</td>
<td>Tri Methyl Silyl Triflate</td>
<td>27607-77-8</td>
<td></td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Triflic Anhydride</td>
<td>358-23-6</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>14.</td>
<td>Tri Fluoro Acetic Anhydride</td>
<td>407-25-0</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15.</td>
<td>1-Ethyl 3-(3-dimethyl amino propyl) Carbodimide -HCl</td>
<td>25952-53-8</td>
<td></td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Methyl Triflate</td>
<td>333-27-7</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Penta Methyl Bromo Benzene</td>
<td>5153-40-2</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>7-OCTYNE 1-OL</td>
<td>34126-19-7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>4-OCTYN 1-OL</td>
<td>871-91-0</td>
<td></td>
<td>15</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>1-bromo,6 methyl heptane</td>
<td>52648-04-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td></td>
<td>5600</td>
<td>179</td>
<td>5779</td>
</tr>
</tbody>
</table>

**Applicability of EIA Notification dated 14th September 2006**

It falls under project type 5(f) and Screening Category (B) (Industrial Sector) of the EIA notification dated 14-09-2006 and therefore requires prior Environmental Clearance from the State Environment Impact Assessment Authority (SEIAA).

In compliance to above-mentioned directions, an application in duly filled Form-1 is submitted herewith alongwith relevant documents and annexures.

Unit is located inside Notified Industrial Estate GIDC, Panoi.

**Environmental Impact Assessment (EIA) Studies & Proposed TORs**

In order to identify, frame and prioritize the environmental issues associated with the proposed expansion project and work out the required mitigation measures, Environmental Impact Assessment (EIA) studies may be required to be conducted so that the negative impacts can be minimized or avoided during actual operation of the proposed action. The need for the studies is subject to the scrutiny of the application.

However, we propose to include the following Terms of References (TORs) in the EIA –EMP studies, as relevant to our proposal.

**Project Profile**
- Executive summary of the project
- Justification of project
- Promoters and their background
- Project site location along with site map of 10 km area and site details providing various industries, surface water bodies, forests etc.
- Proposed Project total cost & cost for Environmental pollution control measures
- Regulatory framework
- Project location and Plant layout.
- Details of the total land and break-up of the land use green belt and other uses.
- Infrastructure facilities including power /water source
- Proposed product & By-product lists with capacities
- Water source and utilization including proposed water balance
- Proposed utilities
- Power, Fuel and Manpower requirements
- List of hazardous chemicals with their hazard information
- Manufacturing process of each product with reactions, flow sheet and mass balance
- Pollution potential from the proposed products & its mitigation plan. Details of ETP, Air pollution control measures & Hazardous waste management.
- Storage and action plan for the Transportation of raw materials and products
- Solvent details

**Baseline environmental status**
- Impact Boundary (Study Area)
Taking into consideration proposed project activities and guidelines, an area of 10 km radius from the center of the project shall be selected and designated as the study area for the purpose of rapid EIA studies.

- Monitoring duration – ToR for the M/s. Mega Innovative Crops Pvt. Ltd., Panoli (10 km) has been already received dated 27th Feb 2017 and base line data collection have already started, having baseline monitoring duration of February to April 2017 hence we proposed to use the same data for M/s. Sagar Life Science Pvt. Ltd. Panoli.
Baseline data shall be collected for one season (i.e. for Three months)

- Environmental Attributes
Baseline data for the following environmental attributes shall be collected for the EIA studies:
  - Micro Meteorology
  - Ambient Air Quality
  - Surface and Ground water Quality
  - Local area hydrology
  - Storm water drainage
  - Ambient Noise Quality
  - Soil Quality and Geological Data
  - Land use pattern
  - Ecological & Biodiversity Information
  - Socio-economic status
  - Infrastructure facilities

- Base Line Condition
The samples of ambient air, ground and surface water and soil shall be collected and analyzed as per the standard methods for establishing the baseline data and to determine the impact of proposed activity on the same.
Micro-Meteorology & Meteorology
Micrometeorological data shall be collected from secondary sources i.e. Indian Meteorological Department (IMD), Government of India, for the parameters like temperature, rainfall, relative humidity, wind speed and wind direction for Bharuch District.
Meteorology
Site specific meteorological data shall be collected by setting up a weather monitoring station at the project site during the study period as per the methods specified by IMD. Records of temperature, rainfall, wind speed, wind directions and relative humidity shall be prepared.

Ambient Air Environment
Ambient air monitoring and analysis shall be carried out at min. six locations within the study area in accordance with the methods prescribed under IS: 5182 and Methods for Air sampling and Analysis published by American Public Health Association (APHA). The monitoring shall be carried out twice in a week for 24 hours for PM$_{10}$, PM$_{2.5}$, SO$_2$, NO$_x$, Benzene, Toluene and xylene (BTX), Benzene, Benzo(a)pyrene.

Ground And Surface Water Environment
To assess the physico-chemical quality of the water, a number of water samples from groundwater and surface water sources located in the study area shall be collected as per the guidelines of CPCB. The samples shall be analyzed as per IS:2488 and APHA for pollution parameters viz., pH, TDS, Turbidity, BOD$_3$, COD, fluorides, Chlorides, Sulphates, Nitrates, Ammonical Nitrogen, Hardness, Alkalinity, Oil & Grease and some heavy metals in order to find out the contamination, if any.

Noise Environment
Noise level measurements at industrial and residential locations within the study area shall be carried out during day-time and night time for evaluating existing status. The anticipated noise sources are those from industrial activities, which are likely to be increased due to proposed activity. Noise level monitoring shall also be carried out at various locations within the factory premises.

Hourly equivalent sound levels (Leq) shall also be recorded for calculating Day and Night noise levels in the surrounding villages.

Soil Environment
Soil sampling and analysis shall be carried out once during the study period to assess physico-chemical characteristics of the soils and delineate existing cropping pattern, existing land use and topography, within the study area. The samples shall be analyzed for particle size distribution, permeability, water holding capacity, porosity, electrical conductivity, alkali matter, carbon exchange capacity, sodium absorption ratio etc.

Ecological Information
Keeping in view, the importance of biological component of total environment due to the proposed project, biological characterization of terrestrial and aquatic environments, changes in species, diversity of flora and fauna in terrestrial as well as aquatic systems shall be studied for impact analysis due to proposed project activity, if any. Land use pattern of the region in terms of forests, cultivated land, water bodies, settlements, non-cultivated land etc. shall be assessed from secondary sources i.e. Census records and other government publications. Details regarding the flora and fauna within the study area shall be collected; emphasis shall be given to rare and endangered species present in the study area, if any. The plantation density of the area shall also be assessed.
Socio-economic Environment
Demographic and related socio-economic data shall be collected from census handbook to assess socio-economic status of the study area. Assessment of impact on significant historical, cultural, and archeological sites/places in the area and economic and employment benefit arisen out from the project shall be given special attention. Data regarding population density, literacy rates, community, religion, occupational structure, urban and rural population-distribution, and civic amenities such as schools, hospitals, dispensaries, water supply, power supply, health services, post and telegraph services, transportation services, higher education etc. shall be collected for the residential areas within the study area and studied for the level of development.

**Summary of Methodology for Baseline Data Collection**

<table>
<thead>
<tr>
<th>Environmental Attribute</th>
<th>Sampling location</th>
<th>Sampling Frequency</th>
<th>Method for Monitoring and Analysis</th>
<th>Parameters to be analysed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micrometeorology</td>
<td>From secondary sources i.e. Indian Meteorological Department, Government of India etc. for Bharuch District</td>
<td>For three months</td>
<td>As specified by IMD</td>
<td>Temperature, Wind speed, Wind direction, rainfall, relative humidity</td>
</tr>
<tr>
<td>Meteorology</td>
<td>Project site</td>
<td>Twice in a week for 24 hours</td>
<td>IS: 5182 and APHA</td>
<td>Temperature, rainfall, Wind speed, Wind direction, relative humidity, PM10, PM2.5, SO2, NOx, Benzene, Toluene and xylene (BTX), Benzene, Benzo(a)pyrene</td>
</tr>
<tr>
<td>Ambient Air quality</td>
<td>Min. 6 stations</td>
<td>Once during the study period</td>
<td>IS:2188 and APHA</td>
<td>pH, TDS, TSS, COD, BOD, Total Alkalinity(as CaCO3), Total Hardness (as CaCO3), Calcium Hardness (as CaCO3), CI⁻, SO4²⁻, Fluoride, Sodium, Potassium, Nickel, Arsenic, Chromium Hexavalent, Chromium, Copper, Lead, Iron, Zinc, Phenol</td>
</tr>
<tr>
<td>Surface Water Quality</td>
<td>One sample from each AAQM stations</td>
<td>Once during the study period</td>
<td>IS:2488 and APHA</td>
<td>pH, TDS, Calcium, Magnesium, Potassium, Sodium, Iron, Nickel, Fluoride, Phosphate, Water Holding Capacity, Chloride, Sulphate, Alkalinity, Specific Gravity</td>
</tr>
<tr>
<td>Ground Water Quality</td>
<td>One sample from each AAQM stations</td>
<td>Once during the study period</td>
<td>IS standards</td>
<td>Particle size distribution, Permeability, Water holding capacity, Porosity, Electrical conductivity, Alkali matter, Carbon exchange capacity, Sodium absorption ratio etc.</td>
</tr>
<tr>
<td>Soil Quality</td>
<td>One sample from each of the AAQM stations</td>
<td>Once during the study period</td>
<td>IS standards</td>
<td>Leqs</td>
</tr>
<tr>
<td>Noise Environment</td>
<td>AAQM stations and within factory premises</td>
<td>Once during the study period for 60 minutes during daytime and</td>
<td>IS standards</td>
<td></td>
</tr>
</tbody>
</table>

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Sagar Life Science Pvt. Ltd.
Proposed TOR's
Proposed Expansion Project (Existing Unit)
<table>
<thead>
<tr>
<th>Environmental Attribute</th>
<th>Sampling location</th>
<th>Sampling Frequency</th>
<th>Method for Monitoring and Analysis</th>
<th>Parameters to be analysed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use pattern</td>
<td>From secondary sources i.e. Census Records</td>
<td>night time</td>
<td></td>
<td>Geographical data, Flora, fauna.</td>
</tr>
<tr>
<td>Ecological Information</td>
<td>From secondary sources</td>
<td></td>
<td></td>
<td>Population density, literacy rates, occupational structure, community, religion, education, civic amenities</td>
</tr>
<tr>
<td>Socio-Economic Environment</td>
<td>From secondary sources i.e. Census Records as well as local sources</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Identification of Impacting Activities**

- Various activities of the project during construction, erection and commissioning and operational phase, which are likely to have an impact on the environmental attributes from the proposed project, shall be identified and activity-impact matrices shall be developed.
- Fugitive emissions and Noise generation shall be included in the impacting activities.

**Evaluation of Impacts and Mitigation Measures**

- Prediction of impacts of the various project activities on the environmental attributes shall be carried out.
- The impact of release of air pollutants from the stack emissions during the operational phase of the project, on the Ambient Air quality of the study area shall be assessed by using air dispersion modeling on computer program.
- Control of Fugitive emissions and Green belt development shall be given special attention.
- Impacts due to Water consumption and wastewater discharge shall also be assessed in detail.
- Quantitative assessment shall be carried out in Environment Impact Evaluation matrices and cumulative score of impact shall be worked out. Inference of the nature and quantum of overall impact of the project on the environment shall be made from the calculated value.

**Preparation of Environmental Management Plan**

A comprehensive Environmental Management Plan shall be prepared covering all the aspects of pollution prevention measures like Air and Water Pollution Control measures, Hazardous Waste Management, Environmental Surveillance, Rain water Harvesting and Green Belt Development Plan.

**Risk Assessment**

Following points shall be covered under Risk Assessment of the project

- Objectives, Philosophy and methodology of risk assessment
- Details of manufacturing process of proposed products
- Details of storage facilities
- Process safety, transportation, fire fighting systems, safety features and emergency capabilities to be adopted.
- Identification of hazards
- Compatibility studies and special hazards
- Consequence analysis through occurrence & evaluation of incidents
- Selection of incidents and consequence calculations
- Risk analysis using risk matrices
- Recommendations on the basis of risk assessment done & Disaster Management Plan.
- Safety precautions for the storage of Chemicals and vapour condensation.
- Occupational Health and Safety Program for the Project.