

## Proposed Terms of Reference for EIA Studies

The components of the EIA study will include:

- Determination of baseline data using primary data generation and secondary data available from various government published reports on air, meteorology, water, soil, flora & fauna, socio-economics, infrastructure, sensitive areas (forests, archaeological, historical etc);
- Detailed description of all elements of the project activities during the construction and operational phases. The elements to be analyzed will include the infrastructures of the project including drainage features, roads, waste collection, disposal and management and utility requirements;
- Identifying the sources of pollution and assessing the impacts on the environment due to proposed project;
- Preparation of EIA and EMP documents with recommendations on preventive and mitigative measures for limiting the impact on environment to the desired level during various stages of project. Development of a suitable post study-monitoring program to comply with various environmental regulations will also to be done; and
- Risk Assessment (RA) and Disaster Management Plan (DMP) describing the probable risks and preventive & precautionary measures to be followed in the event of emergency situations such as accidents, fire etc.

## **BASELINE ENVIRONMENTAL DATA GENERATION**

S. No.	Attributes	Scope of Work
1.	Ambient Air Quality	<p>The baseline air quality will be monitored at <b>8 Locations twice a week</b> for 13 weeks for PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub>, CO, Pb, As, Ni, NH<sub>3</sub>, C<sub>6</sub>H<sub>6</sub>, B(a)P, O<sub>3</sub> &amp; Hg</p> <p>AAQ monitoring locations were selected as per guidelines specified in GSR 176 (E) notification (selection of AAQ sites).</p> <p>Design of ambient air quality sampling network with regard to topography, population, sensitive locations, emission sources, background concentrations and possible impact zones, through application of screening air quality models for assessing air quality prior to start of baseline study.</p>
2.	Meteorological data	<p>1 Location - <b>90 days</b></p> <p>Micrometeorological survey will be carried out at project site for 3 months. Data will be generated for temperature, Wind speed, Wind direction and R.H (min &amp; max), rain fall.</p> <p>This will be further supported by the meteorological data for the area of interest collected from nearest IMD Station and Trend analysis of micrometeorological data generated at the site.</p>
3.	Water Quality	<p><b>8 groundwater samples</b> will be collected and analysed covering 10-km radius area during the study period.</p> <p>The samples will be analyzed as per IS-10500 and EPA Act as applicable.</p>
4.	Soil Quality	<p><b>6 soil samples</b> will be collected from three different levels up to a depth of 90-cm and will be analyzed for the parameters such as grain size, pH, salinity, electrical conductivity, organic carbon, NPK, TDS, Na, Mg, Ca, Cl<sup>-</sup>, F<sup>-</sup> etc.</p>

<b>S. No.</b>	<b>Attributes</b>	<b>Scope of Work</b>
5.	Noise Levels	Noise monitoring will be carried at <b>10 locations</b> by using Integrated noise meter on hourly observations for 24 hours at each location. The observed data will be compiled and statistical analysis will be done for $L_{10}$ , $L_{50}$ , $L_{90}$ , $L_{eq}$ , $L_{day}$ , $L_{night}$ and $L_{dn}$ .
6.	Land use	Land use as per the district census handbooks will be analysed to identify the present land use within the 10-km radius area. Various land use classifications will be computed.
7.	Geology and Hydro-geological aspects	These aspects will be covered for the study area based on the secondary data on groundwater resources and availability.
8.	Ecological Studies (Terrestrial and Aquatic)	Primary as well as secondary data will be collected for Flora and fauna of the study area. The survey will also include assessment of the species diversity, density, abundance etc in the study area and formulation of ecological indices, assessment of likely changes on flora and fauna due to the project related activities, suggestions for conservation and protection of flora and fauna in the study area.
9.	Socio-Economic aspects	Socio-economic and health aspects will be covered for the project area based on the Census documents and NIC database. Local and District administration will also be contacted for collecting the required data. No primary studies will be carried out under this aspect.

## **IDENTIFICATION OF SOURCES OF POLLUTION**

### **Data Generation**

This includes the following:

- Identifying the sources of pollution of air, water, land and noise;
- Quantifying the emissions from the pollution generating sources; and
- Quantification of solid wastes and likely disposal methods will be suggested.

### **Sources of Pollution**

- The likely sources of air and water pollution will be identified and quantified;
- The proposed pollution control measures envisaged in project area for fugitive dust, noise pollution and other environmental effects of each project activities will be assessed for their adequacy;
- The present and proposed changes in land use pattern will be identified; and
- Suitable green belt development plan will be prepared.

Based on various project activities, the likely impact on the environment attributes in project area will be identified by:

- Estimating the air pollution levels for PM, SO<sub>2</sub> and NO<sub>x</sub> in the study area during construction and operational activities;
- Estimating the source emissions for each project specific pollutants;
- Predicting the noise dispersions for all the noise generating sources;
- Predicting the impact of wastewater discharges;
- Determining the impact of construction activities (movement of construction material); and
- Studying the short-term and long-term effects on sensitive targets like endangered species, crops and historically/archaeologically important sites (if any).

## **ENVIRONMENTAL IMPACT ASSESSMENT**

The proposed project may have some impacts on the environment. The parameters likely to be affected are air quality, water quality, soil quality and noise levels etc on account of gaseous emissions, liquid effluent discharges, resultant particulates, generation of solid wastes etc will be discussed.

The baseline data generated from the above studies will be analyzed and will be compared with applicable standards prescribed by the CPCB. By this means, the impact whether positive or negative will be assessed and the environmental attributes requiring special attention for mitigating the negative impact, if any, will be identified. Also the areas, which fulfil the prescribed environmental norms and not requiring further improvements, will be specified. Both short-term and long term impacts particularly on sensitive targets such as habitat of endangered species of wildlife or mines, crops, historically / culturally important sites / monuments, centres with concentrated population in the study area will be established. Impact of the stack emissions on terrestrial flora will be scientifically documented based upon species composition of the area and their air pollution tolerance levels.

The impacts of project on various components of environment and the possible mitigation measures for mitigating the negative impacts were described in the following sections.

### Impact on Land Use

- *Impact Assessment*

The land use impacts due to proposed project will be identified in terms of local land use planning efforts. The change in land use pattern of project site will also be identified. This includes visual impact, impact on forest, impact due to industrial growth and growth due to socio-economic factors.

- *Mitigation Measures*

The mitigation measures will be addressed towards restoration of land disturbed by the proposed project activities to the extent possible.

### Impact on Water Use

- *Impact Assessment*

The impacts of the proposed project due to water usage and wastewater discharges will be addressed covering the following:

- Groundwater quality degradation due to likely solid waste disposal and wastewater disposal;
- Agricultural productivity;
- Habitat conditions; and
- Recreation resources and aesthetics.

- *Mitigation Measures*

The mitigation measures will be addressed ensuring the present and anticipated future water requirements for various purposes. The measures also address the need to maintain or improve the existing Class of Water (as per IS: 2296) to ensure that the current / proposed uses are not impaired due to deterioration of the water quality.

### Impact on Water Quality

- *Impact Assessment*

The assessment of potential impacts of the project will be carried out with respect to:

- i. Ground water quality degradation;
- ii. Surface and river water quality degradation;
- iii. Agricultural productivity;
- iv. Habitat conditions; and
- v. Recreation resources and aesthetics.

- *Mitigation Measures*

Considering the dependence of the people in the area on surface or ground water as sources for drinking purposes, the prevailing quality and extent of contamination due to the proposed project activities, the mitigation measures will include and the treatment required for meeting the effluent discharge standards specified under the Environment Protection Rules and SPCB will be addressed. The disposal arrangements will be conceptually indicated.

### Impact on Demography and Socio-Economics

- *Impact Assessment*

On the basis of the compiled information and the proposed employment and other benefits to the people of the study area as well as others, the likely socio-economic impacts of proposed project in post project scenarios for demography, facilities and services, agricultural sector, civic infrastructure and basic amenities, industrial sector, economic status and health status of people, etc will be assessed.

- *Mitigation Measures*

Strategies to mitigate the negative impacts of the project will be developed for areas where negative impacts are projected to occur. The potential actions considered will include both policy and planning actions. The roles of different bodies in mitigation measures will be identified.

### Impact on Soil

- *Impact Assessment*

Impacts on soil characteristics include destruction of soil profile, changes in soil productivity, increased erosion and subsequent loss of agricultural soils and land use changes. The impact assessment includes an analysis of susceptibility of the area to loss of agricultural production, change in crop pattern etc. Details on solid wastes from the proposed activity will be estimated. Impact assessment of disposal of solid waste will be addressed to the effect on human settlement, vegetation, ground water contamination etc.

- *Mitigation Measures*

Based on analysis of soil data, mitigation measures will be proposed which will avoid, minimize or compensate for significant adverse impact on soil characteristics.

### Impact on Ambient air Quality

- *Impact Assessment*

A computer based internationally recognized mathematical air quality model (ISCST3) suitable for the region will be used to predict the concentration of  $SO_2$ ,  $NO_x$  & PM due to the operation of the proposed activities. The results will be presented for short-term (24-hourly) concentrations in and around the project site. The dispersion model results will be included in the report using isopleths or other graphical methods, over laying a land use map of the surrounding area. The predicted air quality results will be compared with existing regulations.

- *Mitigation Measures*

Potential mitigation measures include the control measures at the source level and providing adequate stack heights. The measures to control the fugitive dust emissions such green belt development and sprinkling will be suggested.

### Impact on Noise

- *Impact Assessment*

Sources of noise and its impact on the environment will be addressed. The noise level at varying distances for multi-sources will be predicted using Noise model. A comparison of measured noise ( $L_{eq}$ ) at monitoring locations to that of predicted noise levels ( $L_{eq}$ ) will be made and mitigatory measures will be recommended to conform to regulatory ambient air noise standards.

Baseline noise levels in different zones like industrial, residential and sensitive areas like hospitals, wildlife habitation, etc., will be monitored. The potential noise level exposure will be determined and evaluate for acceptable limits of exposure.

- *Mitigation Measures*

The potential mitigation measures will be addressed to reduce noise levels by control at source, provision of greenery to absorb noise during its propagation, isolation of high noise generating sources, use of protective measures especially in high noise areas.

### Impact on Ecology

Impacts on aquatic species especially during dry season will be assessed particularly those which are endangered. The parameters, which are of concern, are TSS, TDS, heavy metals, oil and grease, pH and temperature. The assessment will also include impacts of chlorinated organic chemicals. The impact of site preparation activities involving site clearing, excavation, earth moving, dewatering or impounding water bodies and developing burrow and fill areas will be assessed. Recommendations will be made to mitigate such adverse impacts as soil erosion and habitat loss. In addition, impact of fugitive and stack emissions will be assessed on the surrounding species of economic/genetic/biological importance.

### **ENVIRONMENT MANAGEMENT PLAN**

A Rapid EIA Report based on three months field data generation will be prepared for the purpose of getting clearance from MoEF. EIA/EMP will be prepared based on one season data. The Environment Management Plan (EMP) will include all the mitigatory measures proposed under each significant environmental attribute. Further, a suitable green belt development plan for the project site will be included in the EMP report.

### **POST STUDY MONITORING PLAN**

The Post Project Monitoring (PPM) plan will be prepared considering the following:

- i. The proposed pollution control measures for air, wastewater and solid waste (hazardous/non-hazardous) disposal;
- ii. Waste minimization, wastewater management, waste reuse and resource recovery, waste segregation to make the treatment and disposal cost-effective;
- iii. The monitoring requirements for ensuring the statutory as well as process data is collected; and
- iv. The organizational/institutional set-up required for effective environment management plan implementation and post-project monitoring will be suggested along with the budgetary requirements.

## **DISASTER MANAGEMENT PLAN AND OCCUPATIONAL SAFETY**

A Disaster Management Plan (DMP) for dealing emergency situation arising due to fire, explosion, leakages of hazardous substances etc in the project will be prepared. The plans include storage, handling, transportation etc for the hazardous materials to be used in the proposed project.

Occupational risk involved during construction and operation of the project will be assessed and necessary safety and protective measures were spelt out. The DMP include both onsite and offsite emergency preparedness plans.

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