PROPOSED TERMS OF REFERENCE FOR EIA STUDIES

Sindesar Khurd Mine of M/s HZL is proposing capacity expansion from 4.5 Mtpa to 6.0 Mtpa for Lead – Zinc ore production & 5.0 Mtpa to 6.5 Mtpa for Lead – Zinc Ore beneficiation at Sindesar Khurd village, Tehsil Relmegra District Rajsamand, Rajasthan to cater to the requirement of the market demand. The mine expansion will be at existing and sanctioned mining lease area (ML-7/95, 199.8425ha, valid till 19.03.2049).

Standard Terms of Reference (ToR) for conducting Environmental Impact Assessment study for Mines Industry under EIA Notification-2006, issued by MoEF & CC, GoI will be followed.

1] **Assessment of Baseline Environmental Conditions**

Detailed activities involved in the assessment of baseline environmental conditions.

These component parameters briefly include literature survey, Environmental Impact Assessment, preparation of Environmental Management Plan (EMP) covering the fields of air quality, meteorology, noise levels, water quality, soil characteristics, hydrology, land use, water use, demography, socio-economics, aquatic ecology and terrestrial ecology.

The study area, wherein field data will be covered, is within a radius of 10 km around the mine boundary. The work will be carried out in phases as mentioned below:

- Determination of baseline conditions;
- Assessing the impacts on the environment due to proposed expansion;
- Preparation of EIA and EMP documents with recommendations on preventive measures for limiting the impact on environment to the desired level. suitable improvement of post study-monitoring program will also 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 accidents.

2] **Project Implementation**

A detailed description of all elements of the project during the pre-construction, construction and operational phases of the opencast mining will be prepared. The elements analyzed will include the infrastructures of the project including drainage features, roads, waste collection, disposal and management and utility requirements.
Analysis and assessment of designs to ensure environmental soundness, sustainability and regulatory compliance of the designs will be studied and incorporated in the Draft and Final EIA Reports.

3] Field Assessment

Field assessments of the physical, ecological, and socioeconomic aspects of the site and associated environment features will be conducted. These assessments will be used to determine the potential impacts, if any, of the proposed project. A photographic survey of the proposed site and the nearby environment features will be conducted. The survey will include a photo-inventory of the physical and biological features of the site and environs, and the areas will be viewed with respect to the suitability of the proposed expansion. The assessment will include:

- **Physical:**
  
  Climate, air quality, geology, topography, groundwater/surface water hydrology and quality and hazard vulnerability.

- **Ecological:**
  
  Terrestrial and aquatic communities; presence of rare, threatened, and endangered species.

- **Socio-Economic:**
  
  Demography, regional setting, location assessment, and land uses.

**Baseline Study Details:**

The technical scope of work for carrying out the baseline monitoring will be as given below. The baseline monitoring will be carried out in 10 km radius study area around the mine boundary for three months representing non-monsoon season.

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<th>Sr. No.</th>
<th>Attributes</th>
<th>Scope of Work</th>
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| 1       | Ambient Air Quality            | **Eight Locations - 2 days/week for 13 weeks (3 months)** PM (PM$_{10}$ and PM$_{2.5}$), SO$_x$, NO$_x$ and CO will be monitored as per CPCB guidelines.  
AAQ monitoring locations will be selected as per guidelines specified in GSR 176 (E) notification (selection of AAQ sites).  
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 the maximum GLC zones prior to baseline study. |
<p>| 2       | Meteorological data            | <strong>1 Location - 90 days</strong> Wind speed, direction, temperature, humidity, cloud cover and rainfall will be monitored.                          |</p>
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<td>This will be further supported by the meteorological data for the area of interest from the nearest meteorological observatory and Trend analysis of micrometeorological data generated at the site.</td>
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<td>3</td>
<td>Water Quality</td>
<td>Ten Locations – Once during the EIA study. Parameters as per IS-10500 and EPA Act as applicable etc will be carried out for surface/ground waters in the study area. The survey also includes estimation of water balance and assessment of impacts on regional water demand and availability of fresh water due to drawl of water for mine, recommendations on water conservation and rain water harvesting measures based on past experience on similar projects; identification of suitable location and methodology for disposal of waste water from all sources.</td>
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<td>4</td>
<td>Soil Quality</td>
<td>Eight Locations once during EIA study. Parameters related to afforestation, nutrients, pollutants etc will be carried out.</td>
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<td>5</td>
<td>Noise Levels</td>
<td>Eight Locations once during EIA study. Readings will be taken for 24 hr duration at each location</td>
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<td>Land use</td>
<td>Land use as per the district census handbooks as well as with the help of satellite imagery will be presented in 10 km radius study area.</td>
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<td>7</td>
<td>Geology and Hydro-geological aspects</td>
<td>These aspects will be covered for 10 km radius study area for the proposed project. The data will be compiled from the secondary sources only.</td>
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<td>8</td>
<td>Socio-Economic and Health aspects</td>
<td>Socio-economic and health aspects will be covered for 10 km radius study area based on the Census documents and NIC database.</td>
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<td>9</td>
<td>Ecological studies (Terrestrial and Aquatic)</td>
<td>Flora and fauna will be studied in 10 km radius study area. These studies will be based on primary as well as secondary sources. The survey also includes assessment of the species diversity, density, abundance etc. in the study area and formulation of ecological indexes, 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 and suggestions for development of new conservation areas locally.</td>
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<tr>
<td>10</td>
<td>Traffic Study</td>
<td>Important points on the approach roads will be surveyed for the existing total daily traffic, peak hour traffic and traffic composition at</td>
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<td>Assessment of the change in traffic</td>
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<td>composition and volumes and suggestions for improvement of traffic flow</td>
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<td>11</td>
<td>Aesthetic/Cultural Aspects</td>
<td>Identification of all historical/ archeological sites/monuments in the study</td>
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Detailed qualitative assessments of the physical, ecological, and socio-economic conditions will be done with the site in focus.

4] **Legislation and Regulatory Considerations**

Government policies, legislation and regulations relevant to the proposal will be identified. Local plans and policies will also be evaluated. Project characteristics will be analyzed to ensure compliance with these policies, legislation and regulations. Appropriate recommendations will be provided to ensure regulatory compliance.

The legislation relevant to the project will be summarized and presented in the EIA Reports.

5] **Environmental Impact Assessment**

There are various qualitative as well as quantitative methods of conducting EIA studies, each having its own merits and demerits. We intend to use the best logical tool to assess the impact of the project.

The baseline data generated from above studies will be analyzed and compared with applicable standards for each environmental attribute so that the critical environmental areas and also attributes of concern will be identified. The short term and long-term impacts particularly on sensitive targets such as endangered species, plants and historically important monuments will be identified.

The Environmental Impact Assessment of proposed expansion will be done on above basis to determine the environmental acceptability of this proposed expansion in absence of control measures and after implementation of the mitigation measures, including worst impact scenarios.

A qualitative and quantitative assessment of pollution aspects of proposed expansion (air and dust, wastewater, noise pollution, and wastewater discharges etc.) will also be done to identify the adequacy of the existing and proposed control measures as well as the likely impact on existing critical areas. Mitigation measures to reduce adverse impacts will be suggested.

**Air Impacts**

Emission Inventory will be carried in an area of 10 km around the project site. A computer based internationally recognized mathematical air quality model FDM and other models suitable for the region will be identified and run to predict the concentration of SPM & RSPM due to the operation of the proposed mining activities. The model would also take into account other sources of pollution and...
topographical features of the area. The emission of relevant pollutant (SPM) from nearby sources shall be used in the model for more accurate estimate of air quality. The results will be presented for seasonal and short-term (24 hourly) concentrations over a radius of 10 km around the mine area. 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 will be compared with existing regulations and mitigative measures, if any, will be identified. The long term and short term impact at all the monitoring locations shall also be estimated.

Noise Impacts

Sources of noise and its impact on the environment would be clearly brought out. The noise level at varying distances for multi-sources will be predicted using suitable model. A comparison of measured noise (Leq) at monitoring locations to that of predicted noise levels (Leq) would be made and mitigatory measures required, if any, will be recommended to conform to regulatory ambient air noise standards.

The incremental noise level will be estimated over the baseline conditions in different zones like industrial, residential and sensitive areas like hospitals, wildlife habitation etc. The potential noise level exposure will be determined and evaluated for acceptable limits of exposure.

6] Environment Management Plan

For each potential negative impact identified, recommendations will be presented for avoidance, minimization or mitigation of impacts along with costs associated with potential mitigation.

An EIA/EMP, based on three months baseline study, will be prepared for the project. The EMP will address the following:

- Identify and summarize all anticipated significant adverse environmental impacts;
- Identify and summarize all mitigation measures, including the type of impact to which it relates and the conditions under which it is required;
- Define a set of policies and objectives for environmental performance and continual enhancement of performance;
- Green belt development plan;
- Recommend monitoring and reporting procedures including the parameters to be monitored;
- Recommend capacity development and training requirements for implementation of EMP;
- Recommend an organizational structure for effective implementation of the EMP; and
- Draw up an implementation and cost schedule for EMP.

An environmental monitoring and management plan will be developed for the sensitive elements of the environment that may require monitoring during construction and implementation of the proposed project. Recommendations will be made on the institutional arrangements that will be necessary to ensure effective monitoring and management.
A detailed management and monitoring program will be developed to reduce the effects of potential negative environmental impacts.

7] Risk Assessment and Disaster Management Plan

Risk Assessment studies comprising sub-activities such as hazard identification, assessment and quantification of risk for suggesting risk mitigation measures for the proposed project. Preparation of the Risk Assessment Report will be followed by Disaster Management Plan (DMP) and on-site Emergency Preparedness Plan (EPP) based on the quantitative Risk Assessment of the proposed activity and associated infrastructure for the project.

8] Occupational Health and Safety

The safety management and occupational health surveillance system in the existing and proposed mining activity will be reviewed and further appropriate measures will be recommended.