HINDUSTAN ZINC
Zinc & Silver of India

Sustainability Framework

TECHNICAL STANDARD

Environmental Management

Hindustan Zinc Limited

SAFE SMART SUSTAINABLE

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16/08/2025	v.1	Initial issue

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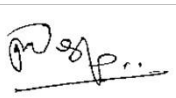
Signature	
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Confidentiality

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1. INTRODUCTION

The purpose of this Technical Standard is to ensure that we manage our impacts to the environment through effective management systems and processes and that work towards improving our environmental performance. This Standard supports HZL's *Environmental Policy*. This standard has been adopted from the parent company Vedanta 's Sustainability framework.

2. SCOPE

3. This Technical Standard is mandatory and applies to all HZL subsidiaries, operations and managed sites, including new acquisitions, corporate offices and research facilities and to all new and existing employees. This Standard is applicable to the entire operational lifecycle (including exploration and planning, evaluation, operation and closure).

DEFINITIONS

Definitions of key terms used in this document are shown in the following table.

Term	Definition
Ambient Conditions	The surrounding and background environmental conditions (e.g. air quality, water quality, temperature etc.) which already exist.
Cleaner Production	A continuous application of an integrated, preventative sustainability strategy to production processes to minimise wastes and resource use.
Competent Person	An individual who has the necessary and sufficient knowledge, skills and experience, as well as the necessary experience to complete their responsibilities safely, effectively and consistently.
Contractor	Any third party organization which is engaged or commissioned by HZL to undertake work or provide services.
Contaminated Land	Land that contains hazardous materials or pollutants above background or naturally occurring levels.
Contractor Employee	An employee of a contracted company engaged or commissioned by HZL to undertake work or provide services, but who are not directly employed by HZL. For example, contractor employees working on HZL operations, persons working for HZL through staff/employment agencies, contract cleaners etc.
Environmental Management System (EMS)	The structured framework that provides the arrangements for managing the environmental aspects through the lifetime of the project/operation.
Ecosystem Services	Ecosystem services are the benefits that people, including businesses, derive from ecosystems. Ecosystem services are organized into four types of services: (i) provisioning services, which are the products people obtain from ecosystems; (ii) regulating services, which are the benefits people obtain from the regulation of ecosystem processes; (iii) cultural services, which are the nonmaterial benefits people obtain from ecosystems; and (iv) supporting services, which are the natural processes that maintain the other services. (*IFC definition*)

Term	Definition
Environmental and Social Impact Assessment (ESIA)	A formalized process designed to identify, assess and document environmental and social impacts associated with a project, along with the mitigation measures and management arrangements for ensuring such measures are implemented.
Fugitive Source	Fugitive source air emissions refer to emissions that are distributed spatially over a wide area and not confined to a specific discharge point. *(IFC definition)*
Hazardous Materials	Materials that represent a risk to health, safety or the environment due to their physical or chemical characteristics.
ICMM (International Council on Mining and Metals)	The International Council on Mining and Metals (ICMM) was established in 2001 and seeks to drive performance improvement through its members which comprise mining and metals companies, as well as national and regional mining associations and global commodity associations.
IFC (International Finance Corporation)	Member of the World Bank that finances and provides advice to private sector ventures and projects in developing countries.
Mobile Source	A source that can be moved or is moving e.g. vehicles or equipment.
Operation(s)	A location or activity that is operated by a HZL Company and its subsidiaries. Locations could include exploration activities, mines, smelters, refineries, wind farms, offices including corporate head offices and research and development facilities.
Point Source	Discrete, stationary, identifiable sources of emissions that release pollutants to the atmosphere. They are typically located in manufacturing or production plants. Within a given point source, there may be several individual 'emission points' that comprise the point source. (*IFC definition*)
Point of Reception (or Receptor)	Any point on the premises occupied by persons where extraneous noise and/or vibration are received (*IFC definition*).
Principles of cleaner production	The continuous application of an integrated preventive environmental strategy applied to processes, products, and services to increase eco-efficiency and reduce risks to humans and the environment (UNEP definition).
Stakeholder	Persons or groups that are directly or indirectly affected by a project as well as those that may have interests in a project and/or the ability to influence its outcome, either positively or negatively. This can refer to shareholders, lenders, employees, communities, industry, governments and international third parties.
Stakeholder Engagement	An umbrella term encompassing a range of activities and interactions between HZL and its stakeholders over the life of a project that are designated to promote transparent, accountable, positive, and mutually-beneficial working relationships.

Term	Definition
	Stakeholder engagement includes stakeholder identification and analysis, information disclosure, problem/conflict anticipation and prevention, ongoing consultation, formation of partnerships, construction of grievance resolution mechanisms, negotiated problem solving, employee involvement in project monitoring, regular reporting forums and procedures, and other related management activities.
Waste	Any substance (solid, liquid, or contained gaseous material) or object that is being discarded – e.g. by disposal, recycling or incineration.

4. PROGRAMME REQUIREMENTS

This Standard aims to outline the requirements in order to avoid (or if not possible, minimise) adverse impacts on the environment and human health from HZL operations. The requirements described below shall be followed by all HZL operations with regards to environmental management.

4.1. General Requirements

a) Environmental management programmes shall meet the requirements of the *IFC Performance Standards and IFC EHS and Mining Sector Guidelines.* These requirements are summarized as follows*:*

- *Performance Standard 1 – Assessment and Management of Social and Environmental Risks and Impacts*. This includes having an effective environmental impact assessment and environmental management system in place which is dynamic and is a continuous process and which is appropriate to the nature and scale of the operation/project. The management system should draw on the business management process of the 'plan, do, check and act' philosophy to provide a methodological approach to managing environmental risks and impacts and to promote improved environmental performance.

  Reference should also be made to the HZL *Conducting ESIA's to International Standards Technical Standard*.

- *Performance Standard 3 – Resource Efficiency and Pollution Prevention*. This includes maintaining an operation/project-level approach to resource efficiency and pollution prevention in line with internationally available technologies and practices and to adopt such practices as far as their use is feasible. The ambient conditions and the application of technically and financially feasible resource efficiency and pollution prevention principles and techniques to avoid (or if not possible, minimise) adverse impacts on the environment, need to be considered.

- *Performance Standard 6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources*. This includes requirements to protect and conserve and mitigate impacts on biodiversity, maintaining the benefits that arise from ecosystem services, and promoting the sustainable management of living natural resources. Reference should also be made to the HZL *Biodiversity Management Technical Standard*.

- *IFC EHS Guidelines*. The EHS Guidelines contain the performance levels and measures that are normally acceptable and applicable to projects or operations. HZL operations are expected to refer to these Guidelines (or other internationally recognized sources, as appropriate) when evaluating and selecting resource efficiency and pollution prevention and control techniques for new projects. Applying the EHS Guidelines for existing operational activities may involve the establishment of operation-specific targets and a timetable for achieving the

Guideline requirements. The applicability of the EHS Guidelines should be tailored to the nature and scale of the hazards and risks and be based on the results of an environmental assessment – the environmental assessment for projects shall meet the requirements of the *Conducting ESIA's to International Standards Technical Standard* and existing operations should also make reference to the *Stakeholder Materiality and Risk Management Standard*.

- *IFC Sector Guidelines*. These Guidelines provide the performance levels and measures that are normally acceptable and applicable to projects or operations in specific industry sectors. Industry sector guidelines that may apply to HZL operations include mining; smelting and refining; thermal power and wind energy.

b) Operations shall conduct and keep record of Environmental and Social Risk Impact Assessment. All new projects shall conduct an Environmental and Social Impact Assessment (ESIA) that meets international requirements and the requirements of the HZL *Conducting ESIA's to International Standards* Technical Standard.

4.2. Management Systems

a) Operations shall ensure the environmental management system (EMS) includes consideration of the protection, as far as possible, of the environment as outlined in this Standard and the suite of HZL Management Standards. The EMS shall include the following methodology:

- 'Plan' – establish objectives and processes required; specifically to identify and manage the impacts of HZL Operations or Projects to the environment;
- 'Do' – implement the processes that are designed to minimise impacts to the environment and biodiversity;
- 'Check' – measure and monitor the processes and report results against the objectives;

  'Act' – take action to improve performance of EMS based on results; and Adopts a continual improvement process.

b) Operations shall seek to obtain, and maintain, external certification of the EMS to the ISO14001 internationally-recognized environmental management system standard through a third party.

4.3. Permit and International Requirements

a) Operations shall ensure that, prior to commencement of construction, operation or decommissioning (as appropriate), all legally required permits are obtained and are maintained as current.

b) Operations shall ensure the management of environmental pollutants and subsequent emissions to air, water and land is in accordance with operational permit requirements and meet local, regional and transboundary regulatory requirements and/or in their absence, other international requirements as applicable (e.g. *IFC Performance Standard, IFC EHS Guideline* and *IFC* sector-specific Guideline requirements). Operations shall ensure the permits are in place and are compliant with the requirements of the *Compliance and Other Requirements Management Standard.*

4.4. Pollution Prevention

a) Operations shall avoid the release of pollutants to the environment (including air, water and land) during routine, non-routine and emergency/accidental activities. Where release cannot be avoided, operations shall minimise and/or control the intensity and mass flow of their release.

b) Operations shall consider the release of pollutants with potential to impact at the local, regional, or transboundary/international level. When addressing potential impacts on ambient conditions, operations shall consider the following:

- the finite capacity of the environment;
- existing and future land uses (and project expansions onto HZL-owned land);
- existing ambient conditions;
- proximity to biodiversity-sensitive areas; and
- potential for cumulative impacts.

c) Operations shall meet pollution prevention requirements as outlined in relevant HZL *Technical Standards.*

4.5. Resource Efficiency

a) Operations shall implement measures (technical, financial and cost effective) for improving efficiency in relation to the consumption of water, materials and other resources, as appropriate, and concentrating on those that are core to operation activities.

b) As stated by IFC Performance Standard 3 (Resource Efficiency and Pollution Prevention), operations will adopt principles of cleaner production in product design and production processes.

c) Operations shall implement technically and financially feasible measures and cost effective options to reduce greenhouse gases (GHGs) associated with the design and activities of the operation/project. For projects or operations that produce more than 25,000 tonnes of CO2- equivalent on an annual basis, operations shall quantify direct emissions (from the facility and within the physical boundary) and indirect emissions associated with the off-site production of energy) on an annual basis.

d) Operations that are significant consumers of water shall adopt measures that avoid or reduce water usage to ensure the operation water consumption does not have significant adverse impacts on surrounding communities (or other users of water).

e) Operations shall meet resource efficiency requirements as outlined in the *Resource Use and Waste Management Technical Standard.*

4.6. Air Quality

a) Operations shall identify and manage emissions to air from point sources, fugitive sources, mobile sources and from process activities associated with combustion, materials storage and other sources relating to HZL activities.

b) Operations shall apply air quality prevention and mitigation measures where measured (in the case of operational activities) or predicted (in the case of new projects) air quality levels.

c) Operations shall ensure no new systems or processes are installed that use ozone depleting substances (ODSs) that are scheduled for phase-out under the *Montreal Protocol on Substances that Deplete the Ozone Layer*. For systems and processes that are already in place, operations shall ensure these are managed to meet phase-out dates outlined by the Montreal Protocol.

d) Operations shall ensure GHGs relating to direct or indirect emissions are managed and controlled in accordance with international requirements.

4.7. Energy

a) Operations shall ensure an energy management programme ISO 50001 is in place to identify energy sources and monitor energy consumption.

b) Operations shall ensure opportunities for the reduction of energy consumption and implementing energy efficiencies are identified, tracked and implemented where appropriate.

c) Operations shall ensure energy programmes meet the requirements of the *HZL Energy and Climate change Management Policy* and the *Energy and Carbon Management Technical Standard*.

4.8. Water Quality and Wastewater

a) Operations shall identify and manage wastewater emissions relating to discharges to surface water, sewer systems, land application of treated effluent, and local septic systems. The process shall include confirmation of the location, routes, and integrity of drainage systems and discharge points and the appropriate segregation of wastewater streams.

b) Operations shall ensure opportunities for reducing wastewater discharges (both in volume and in wastewater quality) are identified, tracked and implemented where appropriate through applying process and technological modifications and wastewater treatment processes.

c) Operations shall apply wastewater quality prevention and mitigation measures where measured (in the case of operational activities) or predicted (in the case of new projects) wastewater quality levels are insufficient. Operations shall ensure wastewater water quality is managed in accordance with the requirements as set out in the IFC EHS Guidelines.

d) Operations shall ensure wastewater management programmes meet the requirements of the *HZL Water Management Policy*, *Water Management Technical Standard* and *Resource Use and Waste Management Technical Standard*.

4.9. Hazardous Materials

a) Operations shall ensure the use, storage, handling, transportation and disposal of hazardous materials is managed in an effective manner to prevent release, or impact, to the environment or impact human health. Where release or impact to the environment cannot be avoided, uncontrolled releases shall be minimized.

b) Levels of risk to the environment from hazardous materials shall be established through an effective risk management process (see also *Stakeholder Materiality and Risk Management Management Standard*). Where specific hazard assessments are required, assessment shall be performed by competent internal or external resources and shall utilize internationally- accepted methodologies (e.g. Hazardous Operations Analysis - HAZOP, Hazard Identification – HAZID, etc.).

c) Where the handling or storage of hazardous materials exceeds local, regional or international threshold limits and is considered a major hazard, appropriate risk management plans shall be developed to prevent the catastrophic release of toxic, flammable, reactive, or explosive materials into the environment and impact the health and safety of HZL personnel and other stakeholders.

d) Operations shall consider reducing the use of hazardous materials and/or consider less hazardous substitutes where hazardous materials are used in current operations or in planned projects.

e) Where pest management activities are undertaken, and chemical pesticides are used, operations shall ensure the selection of chemical pesticides are low in human toxicity, are known to be effective against target species and have minimal effects on non-target species and the environment.

f) Operations shall not manufacture, purchase, store, or use hazardous materials that are banned under international conventions. In addition, operations shall not purchase, store or use pesticides that fall under the *WHO Recommended Classification of Pesticides by Hazard Class (1a or 1b) or Class 2* pesticides unless, in relation to the latter, the host country to the HZL operation has appropriate controls (through restriction of use, provision of training and appropriate equipment) in place to manage distribution and use of these chemicals.

4.10. Waste

a) Operations shall ensure the use, storage, handling and disposal of waste materials is managed in an effective manner to prevent release, or impact, to the environment.

b) Operations shall ensure opportunities for reducing waste and adopting waste hierarchy of control principles (avoidance, reduce, reuse/recycling) are identified, tracked and implemented where appropriate through applying process and technological modifications and to minimise off-site waste disposal.

c) Operations shall ensure waste management programmes meet the requirements of the *Resource Use and Waste Management Technical Standard*.

4.11. Environmental Noise

a) Operations shall ensure noise emanating from HZL activities is managed in an effective manner so as to not impact the environment of surrounding communities beyond the operational boundary.

b) Operations shall reduce noise emissions by apply noise prevention and mitigation measures where measured (in the case of operational activities) or predicted (in the case of new projects) noise levels exceed the applicable noise levels at the most sensitive point of reception (e.g. permanent or seasonal residences, schools, hotels, parks, etc.) OR where noise levels result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site. Applicable noise level (close to the point of reception) guidelines, as set out by the IFC and the World Health Organization, WHO), are as follows:

- Residential, institutional, educational receptors – 55 dBA (07.00 – 22.00 hours);
- Residential, institutional, educational receptors – 45 dBA (22.00 – 07.00 hours);
- Industrial, commercial receptors – 70 dBA (07.00 – 22.00 hours);
- Industrial, commercial receptors – 70 dBA (22.00 – 07.00 hours).

4.12. Visual Impact

a) Operations shall prevent and minimise negative visual impacts through consultation with local communities.

b) Visual impacts shall be considered for new projects during the ESIA process and for existing operations in operational management plans. Plans (including mitigation measures) shall include consideration of visual impacts during post-closure.

4.13. Land Use and Biodiversity

a) Operations shall ensure HZL activities are managed in an effective manner so as to not impact land use, biodiversity and ecosystem services.

b) Operations shall implement a risk assessment process that considers direct and indirect impacts on biodiversity and ecosystem services and, where avoidance of impacts is not possible, seeks to minimise impacts and restore land use, biodiversity and ecosystems are defined. This process will be conducted in accordance with the HZL Management Standard on *Stakeholder Materiality and Risk Management.*

c) Operations shall ensure land use, biodiversity and ecosystem services management programmes meet the requirements of the *HZL Biodiversity Management Policy* and the *Biodiversity Management Technical Standard*.

4.14. Contaminated Land (including water)

a) Operations shall ensure contamination of land and water (on-site and off-site) from HZL activities is prevented to avoid the risk to human health and ecological receptors. Contamination shall be avoided through the prevention and/or control of release of hazardous materials (including waste materials and wastewater).

b) The assessment of risk associated with contaminated land and water (and the need for further assessment and action) shall include consideration of the contaminants/pollutants, the receptors and the exposure pathways. The assessment of contamination risks shall consider current and future land use and other development plans (e.g. a more sensitive use of the land such as residential).

c) Operations shall ensure that, during new projects and/or construction/demolition activities, an assessment of the historical use of the land is undertaken to identify the potential presence of hazardous materials/pollutants.

d) Where historical contamination is known or exists, operations shall determine whether HZL is responsible for mitigation measures.

e) Where contamination is known or suspected during new projects or during ongoing current operational activities, operations shall identify the cause of contamination to prevent further release and, where feasible, the land shall be remediated to acceptable standards as determined through the risk assessment process. This may include the need for detailed site investigations and quantitative risk assessments and modelling.

5. ROLES AND RESPONSIBILITIES

HZL operations and sites shall ensure that roles and responsibilities for implementing and complying with this Standard are allocated. Key responsibilities shall be included in job descriptions, procedures and/or other appropriate documentation.

6. COMPLIANCE AND PERFORMANCE

Each HZL operation shall ensure it complies with the requirements of this standard. Performance against meeting the requirements of this Standard shall be assessed periodically, documented and, where required, reported to HZL. The assessment of performance shall include setting and reporting on key performance indicators (KPIs) where these have been established at HZL Company or local level. The evaluation of performance shall include, as a minimum, confirmation that:

- A documented environmental and social impact assessment is current and available.
- All environmental-related operational permits are in place and permit requirements are complied with;

- Monitoring results to establish environmental threshold or pollutant parameters are not exceeded (e.g. in relation to water quality, wastewater, hazardous materials storage, environmental noise, etc.);
- Pollution prevention techniques are adopted and are effective in minimizing potential release to the environment and consider the release of pollutants beyond the operational site boundary (e.g. that may affect the local community);
- Measures (technical, financial and cost effective) for improving efficiency in relation to the consumption of water, energy and other resources have been identified, and where feasible, have been implemented;
- The use, storage, handling and disposal of hazardous materials is managed in an effective manner to prevent release, or impact, to the environment;
- Less hazardous substitutes are considered and used in current operations or in planned projects;
- Hazardous materials (including pesticides) that are banned under international conventions or are not used or stored or where materials are required to be phased-out, a replacement/substitution programme is in place;
- Where known or suspected contamination of land (on-site and off-site) has been identified, appropriate risk assessments have been undertaken;
- The EMS has been, and continues to be, certified to the ISO14001 internationally recognized environmental management system standard.

7. SUPPORTING INFORMATION

Reference	Description
ICMM (International Council of Mining and Metals)	The ICMM has produced and published good practice guidance on a range of health, safety, environment and community issues relating to mining. http://www.icmm.com/library
International Finance Corporation Performance Standards Guidance Notes	The IFC has published Guidance Notes to guide the implementation of the full range of performance standards. These are available on the website. The guidance is currently being updated and draft versions are available however these have not yet been finalized and formally published. http://www.ifc.org/ifcext/sustainability.nsf/Content/PerformanceStandards
ISO 14011:2004	Guidelines for environmental management systems. http://www.iso.org
World Health Organization (WHO)	Guidelines for Community Noise, World Health Organization, 1999. http://www.who.int/docstore/peh/noise/guidelines2.html

8. REVIEW

This Technical Standard shall be periodically audited and reviewed to determine its accuracy and relevance with regard to legislation, education, training and technological changes. In all other circumstances, it shall be reviewed no later than 12 months since the previous review.

9. RELATED DOCUMENTATION

A summary of the references and supporting documents relevant to this document is provided in the following table.

Doc. Ref.	Document name
	HZL Code of Conduct
POL 06	Environment Management
POL07	Water Management
POL 03	Biodiversity Management
POL 10	Energy and Climate change Management
MS 02	Stakeholder Materiality and Risk Management
TS 07	Biodiversity Management
TS 09	Resource Use and Waste Management
TS 14	Water Management
TS 16	Energy and Carbon Management