

Certification Standards**Site Sustainability Protocol****Introduction**

The life cycle of the lead acid battery starts with mining operations and for those companies producing primary lead or lead concentrate, preparing and maintaining a site remediation, reclamation or closure plan is an essential part of the business. Modern geological survey methods mean that the useful working life of any mineral deposit can be determined and consequently national legislation around the world requires companies to submit mine closure and remediation plans with the initial applications for new mining operations and in many cases annually, for existing facilities to renew their permits.

A typical site remediation, reclamation or closure plan provides an outline of the post-mining land use together with an explanation of the ongoing pollution prevention measures and the methods of reclamation necessary when the mine closes to achieve the post mining land use agreed between the mining company, the local community and the municipal authorities.

However, the best plans are those that remain flexible throughout the life of the mine so that any minor changes to the operation or planned post mining land use can be accommodated as soon as possible, thereby avoiding having to develop a modification to the plan at a later date which could result in unnecessary delays associated with the implementation of the plan.

Ideally, when mineral deposits are exhausted a mine site will either be returned to its original use in an environmentally sound condition or begin a new life that has been determined and agreed in consultation with the municipal authorities and community groups, as an economic resource in order to sustain the local population beyond the life of the mine.

Whilst site remediation, reclamation or closure plans are a natural part of the mining business, such processes are not normally associated with battery manufacturing, ULAB recycling plants or collection centers and certainly not with garages or battery retailers. It is fair to say that battery recycling or used battery collection businesses are not running with closure in mind, far from it, and the same principle applies to garages and retailers. However, history has shown that sudden currency fluctuations and changes in business zoning have, on occasions, lead to the forced and unplanned closure of certain lead industry businesses followed by protracted liability claims arising from alleged contamination of the business premises.

Furthermore, there have also been instances where changes in planning regulations have permitted the construction of housing developments on land adjacent or close to either existing battery manufacturers or secondary smelters. In due course, and in most cases not surprisingly, such developments have lead to public pressure by resident's associations to either close the business or pay compensation for alleged population lead exposure.

Whatever the circumstances or the business operation, sound long, medium and day to day management of environmental matters will ensure that closure, whether planned or unforeseen, can be a process free of litigation and liability issues. Indeed, at a time when property buyers are becoming increasingly concerned about liabilities associated with contaminated land, in a case of unforeseen closure, battery manufacturing or recycling premises free of lead, acid and smelting residues and in a sound environmental condition is a valuable asset to the company and the shareholders and not a liability to them or the community.

The Green Lead philosophy is that a site used for mining, battery manufacturing, recycling or retailing should be regarded as asset that requires care and attention in order to ensure that it does not become a liability. However, unlike the legislative requirements of the Mining Remediation Plans for financial bonds or liability insurance for closure, Green Lead focuses on maintaining the sustainability of the site in respect of socio-economic values and institutional aspects. The emphasis for Green Lead is on setting standard procedures and practices that either reduce or eliminate adverse environmental effects; potential impacts on human health; and probable impacts on aquatic life and wildlife.

This approach will have huge benefits in the developing world, where the development of industrial sectors and the scramble for job creation has all too often been at the expense of the local ecosystems and agriculture. Prime examples include instances where river¹ and aquifer², water resources, have been requisitioned for use by industry leaving local farmers without adequate supplies for their crops. Green Lead Sustainability criteria requires companies in locations where water is a scarce commodity to ensure that process water consumption will not be to the detriment of the local agricultural demands or lead to the contamination of groundwater supplies. The GL focus is on informed choices and sustainable solutions to manage the environment effectively and thereby maintain the social and economic value of the land. In this way, industry can co-exist with the local "way of life" during the period that a business is active at a site, as the local economy will be sustained throughout operations. This approach means that when there is closure, communities return very quickly to a way of life that is self sufficient, based on local resources, skills and experience.

¹ So near to God, so far from Heaven, by Surekha Sule, InfoChange News & Features, Dec 2004.

² Down To Earth, Indian Government urges states to step up enactment of groundwater laws, August 31, 2004

It is now clear, that the aims of an effective Sustainability Plan cannot be defined simply in terms of environmental protection, but full account must be taken of the socio economic factors and especially the aspirations of local community groups. In this context, a Green Lead Certified Sustainability Plan requires the involvement of the local community in its development, implementation and monitoring and close out phases.

To further confound matters, the criterion for the Green Lead Sustainability Plan recognizes that there can never be a “Generic” solution for every company and location because there is such a wide range of environmental variables, process technologies and social factors, such as:

- ? The nature of any prior contamination and the discharges and/or emissions from the current process;
- ? The physical characteristics of the Site and the surrounding land;
- ? The use or zone characteristics of the surrounding land, either current or planned;
- ? The environmental setting, in particular ecosystems, fauna and flora;
- ? The metrological and hydro-geological characteristics related to the real and potential impacts on the eco systems;
- ? The socio-economic impacts on local communities;
- ? The local and regional legal, administrative, institutional, and procedural frameworks;

These variations mean that the appropriate methodologies need to be determined on a site-specific basis. The choices, either at a strategic policy level or for a particular site, also need to take into account the time scale of ongoing operations and whether there will be a requirement for after care when operations cease. Such an assessment can be very complex, and whilst the Green Lead Sustainability standard does not set out the means to make the necessary decisions, it does require a number of key information sets to be collected and analyzed as part of the decision making process.

The Green Lead Standard for Site Sustainability therefore defines the data necessary for analysis so that informed choices can be made for the adoption of the appropriate methodologies for land management. Furthermore, it also lays down the principles that need to be followed to ensure that a representative cross section of interested parties is involved in developing, monitoring and updating the Site Sustainability Plan.

Finally, it should be noted that the financial criteria requires a treatment, remediation or disposal charge to be allocated and set aside for any solid by-product or waste material produced in the mining, manufacturing or smelting processes so that funds will always be available to “clean up” a site after closure.

1. Core Criteria for a Site Sustainability Plan

The extent of the technical details required will vary depending on whether the “site” is either a mine or smelter, a retail outlet or a ULAB collection center, but the following six elements are the core criteria.

1.1 Background Information

- ✓ Location and assessment of the site, particularly the geology and topography, including building construction, demolition or site reuse
- ✓ Historical background, especially any indigenous associations
- ✓ Previous use and activities on the site, including any wildlife situations
- ✓ Description of the proposed lead industry activities and the timeframe
- ✓ Description of the physical, biological and socio-economic components
- ✓ Report on any legislative requirements or permits necessary to operate

1.2 Description of the Business Activities

- ✓ General description and aims of the Business;
- ✓ Description of current or proposed business activities on the site;
- ✓ Ecological description of the site and the surrounding area, identifying local fauna and flora, any migration routes, areas of special scientific interest, protected habitats or endangered species;
- ✓ Geology and mineralogy vulnerabilities - not applicable to retailers unless the premises are liable to flooding due to Monsoon rains and so on:
 - ❖ Regional geology
 - ❖ Structural geology
 - ❖ Mineralization
 - ❖ Geological resources
 - ❖ Regional Metrology
 - ❖ Potential for capture/drainage
- ✓ If applicable, a description of the Mining and/or Manufacturing or Process technologies;
- ✓ An explanation of the how the company will manage any adverse risks arising from activities on the site, particularly threats to the environment, the workers and, where applicable, local communities;
- ✓ Detailed assessment of sustainable water utilization, including conservation measures and liquid effluent management systems;

- ✓ Comprehensive account of the management processes for hazardous and non hazardous solid wastes, and any other toxic bi-products;
- ✓ Full explanation of the steps being taken to conserve energy and capture waste heat.
- ✓ List of the chemicals used or to be used and the precautions that will or are taken for their storage, use and disposal;

2. Site Monitoring and the Maintenance of Sound Performance

The basic principle for the location of monitoring equipment, whether for atmospheric, aquatic or terrestrial monitoring is to choose a place that provides a representative sample of the levels of pollutants at the source, the pathways and the likely receptors, albeit a monitoring station may be located off-site in the grounds of a local school or hospital in order to obtain a representative sample.

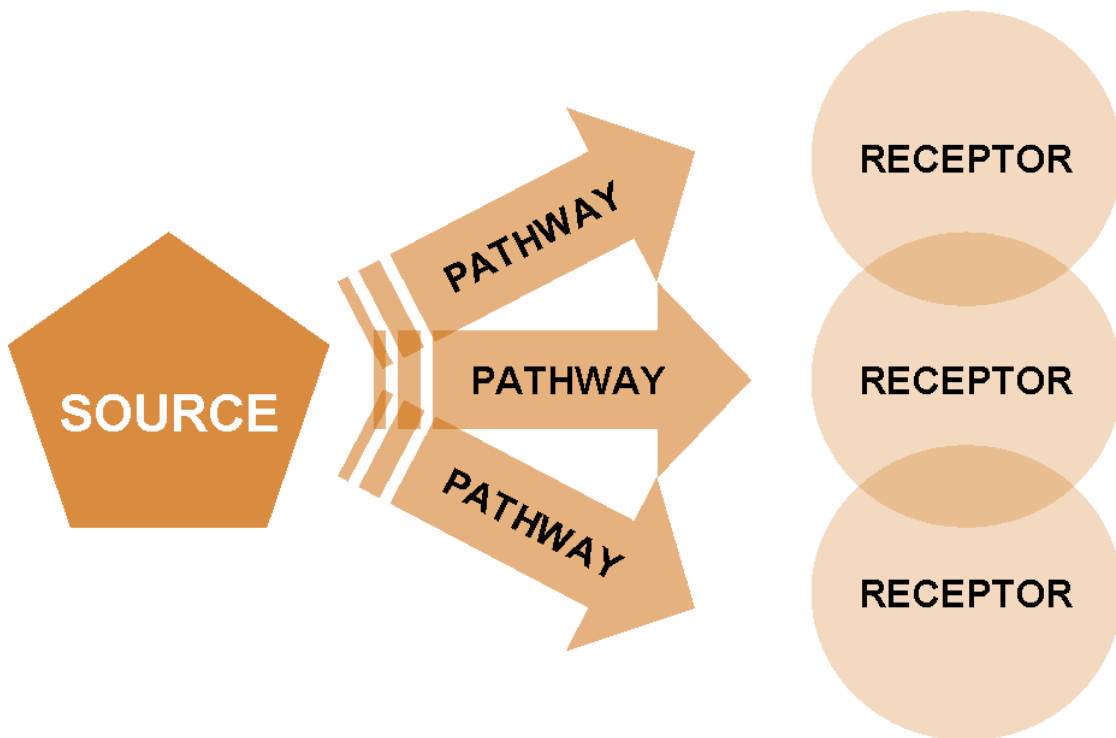
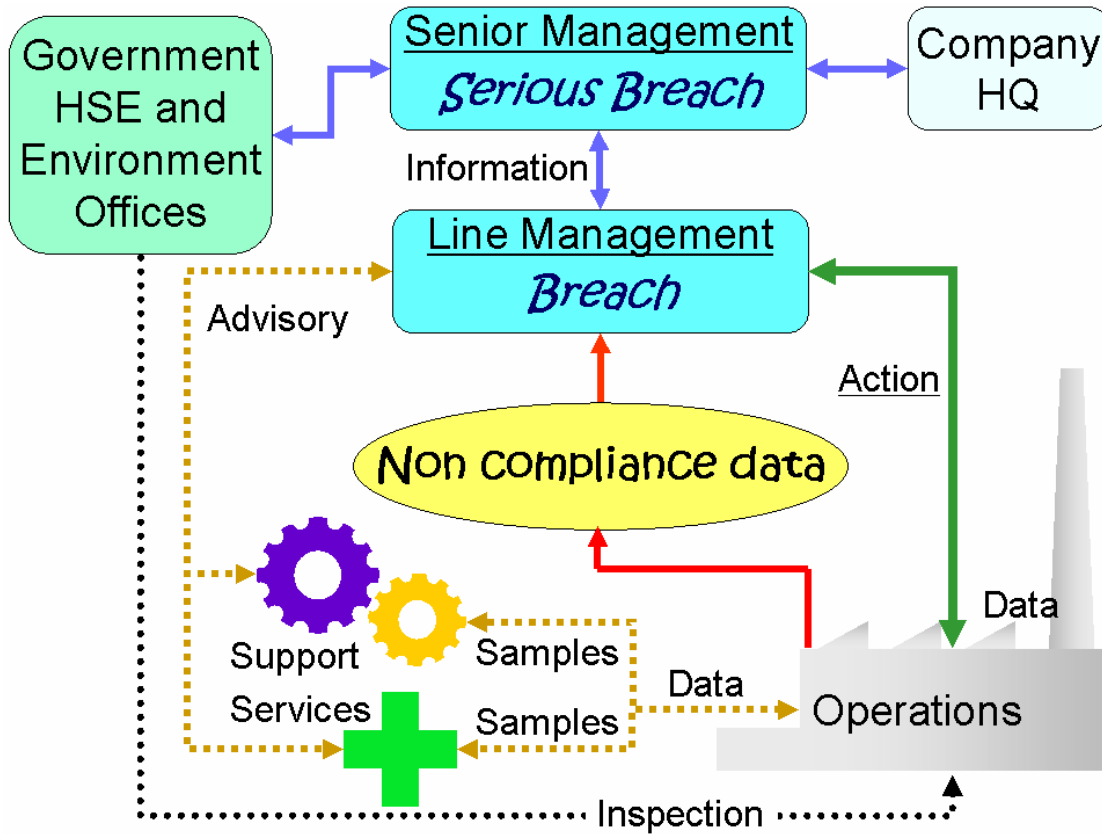


Fig. 1 - The Contamination Pathways

- ✓ Scale maps of the Site showing potential pollutant sources, contamination pathways and the locations of all monitoring stations, sampling probes and sampling points must be produced for each contaminant that is measured as a legal requirement. The maps must also show the locations of any water sources, sites of special interest, other industrial premises, houses, schools and hospitals and indicate prevailing winds and average monthly rainfall data.

- ✓ A Dynamic Action Model showing the reporting tree and action sequences when a non-compliance is detected. If the reporting responsibilities and actions vary for atmospheric, aquatic, terrestrial and personal monitoring results, then the different Model charts must be prepared and available for inspection.



Legend






-  Non Compliance Reporting
-  Operations Communications
-  Support Services, Lab Results, Advisory Links
-  Senior Management and External Communication Contacts
-  Government Enforcement Notice

Fig. 2 – Reporting Lines for a Non - Compliance

- ✓ The reporting tree must also define the role of each reporting line. That is, whether the person is responsible for taking “action” and measures that will correct the “non compliance”, or whether the responsibilities are to provide advice and information.
- ✓ The level of incidents that have to be reported to Senior Management and external bodies such as the appropriate Government Inspectorate must be defined.
- ✓ The communication and intervention levels between the company and the local environmental inspectorate must also be shown.
- ✓ The Action notations on the chart must show clearly the steps that have to be taken to correct any deviation in environmental containment.

3. Containment, Storage and Treatment of Solid Waste

A lead acid battery retailer, battery service center or used lead acid battery collector that either stores at any time, or transports at any one time in one vehicle 10 or fewer ULAB that have been removed from motor vehicles or are equivalent in type and equivalent to, or smaller in size than, such batteries is exempt from managing those batteries as hazardous waste provided that the batteries retain their vent caps, are not drained, are stored under cover in an upright position and are transferred to an organization that recycles ULAB. Despite this exemption, damaged batteries must be handled in a manner that minimizes acid leakage. Containers with damaged batteries must be clearly marked in a weather-resistant manner with the date that the first battery was placed inside the container. Transfers of ULAB batteries must be recorded on manifests or bills of lading in a manner consistent with Hazardous Waste.

In every other respect, this Standard requires organizations that produce hazardous or toxic waste as either an intermediate by-product or as a final disposal material during one or any of the operations in the life cycle of the lead acid battery to:

- i. Have in place a *Hazardous Materials Management Plan* to reduce and eventually eliminate the production of hazardous waste through changes in production, operations, or the use of alternative technologies.
- ii. In those instances where there is no known procedure or technology that will eliminate the production of a specific hazardous by-product or waste material, then, where legally possible, to have on the site where any hazardous waste is produced a method of containment and a treatment process that renders any hazardous waste materials inert and safe for either sale, recovery or disposal as a non hazardous waste.
- iii. In cases where legislation will not permit the on-site treatment of hazardous waste materials, temporary containment facilities must confirm to the following requirements:

- The composition of all hazardous materials used or reused, generated or stored on the site must be known, listed and their storage bins labeled with the name and composition of the waste material, its origin and destination or fate, date of production, nature of the hazard or risk posed by the material and the safe method of movement stated. The words “Hazardous Waste” must also be included on the label.
- In industry, the risks associated with each of the hazardous materials must be identified recorded and briefed to all personnel who may come into contact with the waste in the course of their work.
- The site or premises must have an Emergency Response Plan that is current and includes the following information:
 - a. A description of the actions facility personnel will take to respond to fires, explosions, or any unplanned release of hazardous waste to air, soil, or surface water at the facility;
 - b. A description of any arrangements agreed to by local law enforcement agencies, fire departments, hospitals, contractors, and local emergency response teams to coordinate emergency services for the facility;
 - c. The names, addresses, and phone numbers (office and home) of all persons qualified to act as an Emergency Coordinator. Where more than one person is listed, one must be named as primary Emergency Coordinator, and the others must be listed in the order in which they will assume responsibility as alternates;
 - d. A list of all emergency equipment at the facility [e.g. fire extinguishing and spill control equipment, communications and alarm systems (internal and external), and decontamination equipment, where such equipment is required. It must include the location and physical description of each item, and a brief outline of its capabilities;
 - e. An evacuation plan for facility personnel, and civilian populations where that may be relevant. The plan must be briefed to all facility personnel and describe signals used to begin evacuation, primary and alternate evacuation routes, and the phone number for the Offices of the Emergency Services.
- On site temporary storage may be necessary for a number of reasons such as:
 - ❖ Treatment processes do not always keep pace with operations
 - ❖ It is more economical to store waste and transport it in bulk
 - ❖ Wastes are separated for different disposal locations or methods
 - ❖ Pretreatment, dewatering or settlement is required prior to processing or shipment for disposal. In the case of tailings dams; best practice must be adopted and the sites inspected at least every three months by the environmental monitors and the appointed Dam Engineer.

In the case of temporary storage facilities the type of barrier and leachate collection system constructed at the site will depend on the physical properties and contaminant concentrations in the sediments and/or residues to be stored, but will have the following characteristics:

- ❖ The barrier will prevent the release, dispersal or discharge of any of the hazardous waste into the air, water or onto land.
- ❖ Collected leachate shall be contained and treated in a manner that complies with prevailing local and national legislation.
- ❖ Hazardous waste containers must be placed on a continuous smooth and impervious material to prevent penetration in the event of leakage or spillage. The container shall be labeled and must adequately contain the waste to prevent dispersal into the air.

4. Transporting Hazardous Waste from an Operational Site

Whether hazardous waste is being removed from the site as part of an ongoing “Site Sustainability Plan” or due to specific remediation the following conditions will apply:

- i. The hazardous waste shall be completely enclosed or covered during transportation, including parking times.
- ii. Removal vehicles or wagons shall be constructed to be easily cleaned and cleaned after each separate shipment.
- iii. Shipments of hazardous waste will comply with all local, national and international legislation and protocols, including the Basel Convention’s transboundary movement regulations where they are applicable to Parties to the Convention.
- iv. All personnel handling the waste or involved in the collection, transport, administration and disposal must be trained in the legal requirements and safe handling methods, including emergency procedures.

5. Site Restoration

For historical reasons or unforeseen economic circumstances an operational site, or part of it, may have to be restored ahead of the date expected under the terms of the Site Sustainability Plan. So it is essential that any Site Sustainability Plan shall have contingencies to cover such eventualities. Under the Contingency Element of the Plan the following will apply:

- i. There will be a detailed analysis of the prevailing ground conditions, including any buildings or mine shafts, and a quantitative probability based risk assessment of the proposed remediation measures to allow the site to be used in a sustainable and cost effective way.

- ii. Every effort will be made to avoid off-site disposal of mining tailings, furnace residues, refining and manufacturing drosses and any other hazardous waste.
- iii. Any explosive materials detected must be disposed of under the appropriate legislation for dangerous materials.
- iv. Where appropriate, indigenous vegetation will be introduced to encourage a return to a “natural” state and support the return of local wildlife.
- v. There must be a communication plan for the Contingency Element of the Site Sustainability Plan that involves engagement with local communities and/or indigenous peoples or both.

5. Annual Review

The Site Sustainability Plan will be reviewed annually by the General Site Manager, the local community group, the local authority and noted by the Board of the Parent Company and if it meets the required standard will be approved.

BW Feb. 2005