EARTH SYSTEMS
Environment · Water · Sustainability

Integrated Environmental Engineering – Planning for Closure

The integration of environmental engineering principles into the project planning process represents the latest in leading practice for the mining industry with broad application in many other sectors. This approach can profoundly reduce an operation's potential long-term environmental impact, minimising cost, risk and environmental bond requirements and facilitating the approvals process.

Over the past decade, the mining industry and its regulators have begun to embrace the concept that all mines should ultimately be designed for closure. In the past, very few mines have been effectively closed and relinquished due to significant and ongoing water quality issues, some of which are expected to persist for hundreds of years. While high-cost treatment in perpetuity may be unavoidable for historical mines, such long-term legacy issues can be largely avoided if environmental management principles with a view to the transition to closure are integrated into the design stage of mine planning.

Earth Systems is an industry leader in the provision of effective environmental strategies that coordinate with proposed mine operations as part of mine planning. Our team of experts in geochemical and environmental engineering is uniquely positioned to develop environmental management principles for major projects within the framework of economic, feasibility and operational constraints for each project, working with the project's mining, geotechnical and civil engineers to develop mine plans that meet or exceed regulatory requirements. Strategic engagement with regulators is a pillar of this approach, facilitating the approvals process and greatly improving the likelihood of a positive assessment.

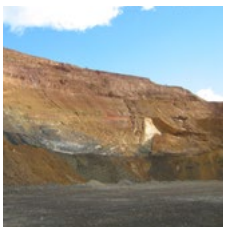
KEY ADVANTAGES

- Integrating environmental engineering at the design stage and planning for closure minimises closure costs by allowing closure strategies to be implemented as part of routine operations, and maximises the likelihood of successful relinquishment of the site.
- Regulators now expect to see the integration of a consistent long-term environmental strategy into the life of mine plan, from construction through operation and beyond closure.
- Geochemical engineering and environmental planning at the design stage can greatly reduce the cost and duration of short- and long-term water treatment and management and avoid the need for extremely costly remediation works and earth movements on or post closure.

SERVICES PROVIDED

- Feasibility-stage integrated environmental engineering;
- Pre-construction geochemical engineering of waste rock dumps, tailings storage facilities, open cuts, underground mines and other potential sources of pollution;
- Development of effective water resource and water quality management strategies including 'zero discharge' strategies and groundwater management;
- Effective engagement and coordination with geotechnical and civil engineers and mine planners to develop feasible and cost-effective environmental management strategies;
- Comprehensive closure and rehabilitation planning aimed at successful site relinquishment;
- Multi-criteria options assessment and geochemical, water balance and water quality modelling;
- Regulator engagement and liaison with government agencies, water and environment authorities, and local communities to foster positive relationships and ensure that stakeholder concerns and requirements are fully addressed;
- Assistance with approvals and cost-effective compliance with environmental protection notices;
- Closure design and field and laboratory trials of closure strategies;
- Operations and closure cost minimisation;
- Development of whole-of-operation environmental management plans, from construction to post closure.



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