CONCEPT

Mining Environmental Management and Mine Closure: Water, Tailings and Rehabilitation

3 – 7 May 2027
London - Central London four-star



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Introduction:

Mining environmental management fails when acid drainage appears years after waste rock was placed, tailings facilities are raised without clear accountability, and closure plans carry cost estimates nobody can defend. The result is seepage liabilities, community opposition and closure bills far above the financial assurance set aside. This Core Concept course gives mine practitioners a working method across the life of mine, from baselines and water balance to waste rock geochemistry, tailings governance, dust and blasting, rehabilitation and closure costing. Participants build a Mine Environmental Risk Register and Closure Plan Review Pack.

Course Objectives:

- Map the environmental aspects of pits, waste rock dumps, tailings facilities and haul roads across each phase of the life of mine
- Build a site water balance and plan acid-base accounting and kinetic tests to predict acid mine drainage and select treatment
- Classify waste rock by acid-forming potential and design placement and encapsulation to limit seepage
- Assess tailings storage facility governance, roles and independent review against the requirements of the Global Industry Standard on Tailings Management
- Prepare progressive rehabilitation schedules, closure completion criteria and a closure cost estimate that supports financial assurance
- Run community engagement and environmental monitoring and reporting that track mine performance from operation to post-closure

Target Audience:

- Mine environmental staff responsible for permits, monitoring programmes and environmental reporting at operating sites
- Mining operations and planning staff who schedule pits, waste dumps and haul roads
- Tailings and water management staff who run deposition, dewatering and process water systems
- Rehabilitation and closure staff who prepare closure plans, topsoil budgets and cost estimates
- Sustainability and community relations staff who handle engagement and grievances in mining areas

Course Outline:

Day 1: Mine Environmental Aspects Across the Life of Mine

- Life-of-Mine Phases: Exploration, Construction, Operation, Closure and Post-Closure
- Mine Environmental Aspects Register for Pits, Waste Rock Dumps, Stockpiles and Haul Roads
- Mine-Specific Baseline Studies: Hydrogeology, Geochemistry, Ecology and Land Use
- Community and Stakeholder Engagement Plan for Mining-Affected Areas
- Mine Monitoring Network: Groundwater Bores, Dust Deposition Gauges and Blast Monitors

Day 2: Mine Water, Acid Mine Drainage and Waste Rock Geochemistry

- Site Water Balance: Pit Dewatering, Process Water Recycling and Storm Water Diversion
- Sulfide Oxidation Chemistry and Acid Mine Drainage Formation
- Acid-Base Accounting and Kinetic Test Programme for Mine Waste Characterisation
- Waste Rock Classification and Encapsulation of Potentially Acid-Forming Material
- Active High-Density Sludge Treatment Versus Passive Constructed Wetland Options

Day 3: Tailings Storage Facility Governance, Dust and Blasting

- Tailings Deposition Methods: Conventional Slurry, Thickened, Paste and Filtered Dry Stack
- GISTM Topic Areas, Principles and Auditable Requirements
- Tailings Governance Roles: Accountable Executive, Responsible Tailings Facility Engineer and Engineer of Record
- Haul Road and Stockpile Dust Suppression Plan
- Blast Vibration and Airblast Overpressure Control and Complaint Records

Day 4: Biodiversity, Progressive Rehabilitation and Closure Costing

- Land Disturbance Tracking and Habitat Clearing Controls for Mine Footprints
- Topsoil Stripping, Stockpiling and Respreading Procedure
- Closure Vision, Post-Mining Land Use Options and Completion Criteria
- Closure Cost Estimate Model and Financial Assurance Instruments Including Performance Bonds
- Closure Risk Assessment for Pit Lakes, Residual Seepage and Long-Term Landform Stability

Day 5: Mine Case Studies and Closure Plan Review Pack

- Copper Mine Case: Water Balance and Acid Drainage Treatment Review
- Gold Mine Case: Tailings Facility Governance Audit Against GISTM Requirements
- Quarry and Phosphate Case: Rehabilitation Progress and Closure Cost Challenge
- Annual Mine Environmental Performance Report Drafting from Monitoring Data
- Mine Environmental Risk Register and Closure Plan Review Pack Peer Review

Skills You Will Gain:

- Life-of-Mine Aspect Mapping
- Mine Water Balance Modelling
- Geochemical Waste Characterisation
- Tailings Governance Assessment
- Blast Impact Control
- Rehabilitation Scheduling
- Closure Cost Estimation
- Mining Community Engagement

Why Attend This Course:

- Return with a Mine Environmental Risk Register and Closure Plan Review Pack built from real mine case material
- Catch acid drainage, seepage and tailings accountability gaps while they are still cheap to fix
- Defend closure cost estimates and financial assurance amounts with a documented, itemised method
- Compare mine environmental practice with peers from metal, industrial mineral, phosphate and quarry operations

Conclusion:

Mining environmental management pays off when water, waste rock and tailings risks are controlled during operation and closure is planned from the first day of mining. The course moves from life-of-mine aspects and baselines, through water balance, acid mine drainage and waste rock geochemistry, to tailings governance, dust and blasting, then to rehabilitation, closure planning and cost estimation. The final day applies these methods to copper, gold, quarry and phosphate cases and produces a Mine Environmental Risk Register and Closure Plan Review Pack for use at site.