

# Mine Closure, Reclamation, and Remediation

Tetra Tech provides services related to closing and reclaiming mining, milling, and smelter sites and facilities to allow post-mining land use and meet site divestiture goals. These services include site characterization studies, geochemical testing, in situ monitoring, remedial investigations and feasibility studies, ecological studies, engineering evaluations, cost analyses, preparation of construction bid packages, and construction inspection and oversight.

**Closure planning**—Our design team provides customized closure and reclamation strategies and designs based on site-specific conditions by defining approaches, measures, and materials that will contribute to success while isolating and modifying unsatisfactory or costly elements of closure and reclamation plans.

**Decommissioning, demolition, and salvage**—Tetra Tech provides comprehensive decommissioning and demolition support services, including asset identification and recovery plan, demolition execution plan, hazard analysis and abatement plan, cost estimation, regulatory performance standards, and construction scheduling.

**Grading and contouring**—Tetra Tech provides design services for the development of grading plans, plans and profiles, and cut-and-fill material balances, as well as the design of embankments and similar earthworks and spillways, and storm water conveyance structures.

**Closure covers and liners**—Tetra Tech has designed site-specific engineered covers and liner systems around the world, including soil caps, native soil liners, and multi-component geocomposite systems. Our services include cover source identification, quantity estimates, and handling plans; hydrologic and geotechnical testing; infiltration and seepage analysis; cover performance monitoring systems; revegetation; and monitoring.

**Closure monitoring**—Our closure monitoring and tracking systems effectively assess the designs and stabilization measures, including both their functionality and their ability to meet design criteria and regulatory compliance and maintenance needs.

**Bond release advocacy and strategies**—Tetra Tech works with clients and regulatory agencies to document the condition of reclaimed areas, assess the conditions relative to permit requirements, and offer innovative solutions to historical issues to achieve bond release.



## Services

- Closure and reclamation plan development from strategic level to construction level
- Cost estimation, including asset retirement obligation, life of mine, and financial assurance and bonding
- Facility decommissioning
- Alternatives analyses and feasibility studies
- Mine waste geochemical characterization and management
- Acid rock drainage prevention and mitigation
- Mine water treatment and water management
- Mine subsidence analysis
- Closure of abandoned mine lands
- Coal seam and mine fire abatement
- Tailings and heap leach closure
- Closure cover design and hydrologic analysis
- Erosion and sediment control design and analysis
- Revegetation planning, design, and performance monitoring
- Closure bond cost review and estimation
- Post-closure site management and monitoring to ensure environmental compliance
- Post-reclamation monitoring to document reclamation success
- Liability transfer and guaranteed fixed price remediation
- Lease relinquishment support
- Divestiture strategies

**Tetra Tech** is a leading provider of consulting, engineering, program management, construction management, and technical services. The Company supports government and commercial clients by providing innovative solutions to complex problems focused on water, environment, energy, infrastructure, and resource management. With 13,000 employees worldwide, Tetra Tech's capabilities span the entire project life cycle.



**White Pine Copper Mine Remedial Action Plan and Closure**

Tetra Tech managed the closure of a 27,400-acre former copper mine, tailings, mill, smelter, and refining complex under a negotiated consent decree. The project required more than 17 years of planning, design, implementation, site inspections, monitoring, maintenance, and submission of annual reports. Tetra Tech developed and designed grading and capping plans and a lined waste repository, including direct revegetation (with no imported soil) and limited capping of approximately 5,930 acres of tailings. The main facilities have been converted to an industrial park and transferred to an economic development corporation.



**Recipient of the 2007 Phoenix Awards™ for Brownfield Projects (Region 8 Award)**

Murray Smelter, once the largest primary lead smelter in the United States, was in the central business district of Murray City, Utah. Tetra Tech facilitated a cooperative redevelopment plan to address legacy arsenic lead contamination, including demolishing the smelter facilities and smokestacks, facilitating off-site disposal of heavily contaminated materials, and placing lower-level debris into lined repositories capped by new roadways. Today the site houses a medical campus, a light rail station, and retail stores.

**Global Project Sites**



**900+**

Environmental remediation and mine closure projects completed

**\$5 Billion**

Restoration project costs for more than 300 closure projects

**Top Mines Worldwide**

Across the entire United States, Canada, Argentina, Brazil, Mexico, Dominican Republic, Chile, Peru, Nicaragua, Australia, Southeast Asia

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