



Land Rehabilitation and Management

Rehabilitation of disturbed or degraded land is an essential element of a wide range of human activities. Rehabilitation to a specified standard is often a condition of approval applied before the commencement of an activity that disturbs some land area. Landloch can guide clients to achieve successful rehabilitation that will not only minimise costs but also satisfy regulatory requirements, enhance the client's profile with neighbouring land users, and protect their social licence to operate.

Achieving rehabilitation goals depends on a wide range of considerations, with complex interactions between landform, soils, vegetation and climate to be integrated. Each of these factors must be addressed to ensure rehabilitation targets are met.

Landloch has unique and comprehensive skills in assessing, modifying and managing soils to provide a full range of ecosystem services, ranging from nutrient supply to soil water for plant growth and from soil structure to erosion control. Our assessments may include long-term computer simulations of:

- Soil water balance and plant growth;
- Solute balance modelling, and/or; and
- Impacts of vegetation growth and cover (including rock and tree debris) on runoff and erosion.

Landloch's considerable capability in monitoring revegetated areas and establishing closure criteria has provided our team with invaluable experience and knowledge of the factors that affect vegetation establishment and ecosystem development. Sites for which Landloch has provided rehabilitation advice and undertaken works include:

- Mine sites across Australia;
- Coal seam gas pipeline and compressor station areas;
- Commercial and residential developments; and
- Infrastructure projects such as roads, drainage diversions and power lines.

Contributing to the success of land rehabilitation and management is the early identification of relevant materials. Use of material properties and characterisation data ensures that the appropriate rehabilitation and management methodologies are identified to reduce or avoid failure and excessive long-term maintenance costs. Knowledge of material properties may also enable a site to stockpile specific materials and resources necessary for its rehabilitation.

Landloch services include:

- Material sampling, analysis, and assessment;
- Development of amendment and fertiliser and amendment strategies;
- Assessment of erosion risk and of the need for material/soil amendment and/or surface treatments to reduce erosion potential;
- Considerations of profile water and solute balances and requirements for soil profile construction;
- Advice with respect to vegetation selection and planting methods;
- Development of closure (completion or success) criteria;
- Recommendations with respect to soil handling and placement;
- Vegetation management and weed control;
- Advice with respect to overall revegetation methodology; and



- Development of management systems to guide rehabilitation programs.

Landloch was a major contributor to landform design and rehabilitation management systems for Minara Resources' Murrin Murrin Nickel Operation, which received a Department of Mines and Petroleum, Golden Gecko Award for Environmental Excellence in Western Australian mining in 2008.

Landloch also provided extensive rehabilitation advice to Cristal Mining, who achieved an Excellence Award for *Going Beyond Best Practice* from the NSW Minerals Council in 2012.