

1 Introduction

Kelly bought a copper mine. The old company sold a gold mine (Blainey 1978).

The history of the Mount Lyell copper mine in western Tasmania, Australia, has been as enigmatic as its beginnings. Even after a century of production and exploration, the vast mineral wealth of the mine has yet to be determined. It has been the site of historical accomplishments in metallurgical, mining and railway technology, with the opening of its railways and smelters in 1896 having been described as 'one of the seven wonders of Australia' (Blainey 1978). The mine served as an economic focal point for the development of western Tasmania with towns, railways and governments all dependent on the fate of the mine. Yet the technological miracles of yesteryear have lead to environmental impacts on an almost unimaginable scale. The existing and on-going pollution associated with the historic mining practices does not meet the present expectations of society, and the development of 'new' industries on the west coast, such as ecotourism and aquaculture which depend on a 'clean' environment, are being jeopardised by the legacy of mining.

The goal of collecting technical information and designing a remediation strategy to address environmental damage resulting from historic mining practices at Mount Lyell has been the motivation behind the Mount Lyell Remediation Research and Demonstration Program (MLRRDP). The MLRRDP is a cooperative Tasmanian and Commonwealth Government program involving Environment Tasmania and the Supervising Scientist (*oss & eriss*). This report summarises the outcomes of the MLRRDP and will serve as a starting point for the Government and the present operator of the Mount Lyell mine to advance the remediation of the region.

2 An environmental history of Mount Lyell

2.1 Setting

The Mount Lyell mine is located in western Tasmania approximately 25 km inland from the Southern Ocean in rugged mountains (figure 2.1). Queenstown, the town which grew around the mine, is about 300 m above sea level in the King River catchment. The mine site straddles the divide between the mainstem of the King River and one of its tributaries, the Queen River. The rivers flow southwestward into Macquarie Harbour, a 276 km² enclosed bay connected to the Southern Ocean via a narrow, shallow inlet. The King River is the second largest freshwater source to the harbour, with the larger Gordon River entering the harbour in the south.

The geographic setting of the Mount Lyell mine has exacerbated the environmental problems which have occurred as a result of mining. The mine is in the heart of the 'Roaring Forties'. Because the region is characterised by very high rainfall (approx. 2800 mm/year) there has always been a need to discharge water from the mine in order to keep it dry and allow mining. The sulphidic nature of the orebody combined with the circulation of these large volumes of water have resulted in an extensive acid drainage problem.

The development and survival of the Mount Lyell mine depended on a railway link with the coast through the rugged, inaccessible mountains of western Tasmania. A railway link which generally followed the course of the Queen and King Rivers was established connecting Queenstown with Strahan, a town on the northern end of Macquarie Harbour. Strahan and Teepokana, a port on the lower King River, became important shipping centres for the export of copper and import of mining supplies.