

Abstract

Gold was first discovered on the southern slopes of Harbour Cone on the Otago Peninsula in 1872. Initial sampling of mineralised rocks in the Battery Creek area returned 4.6-33.7 g/t gold. A subsequent study describes a pyrite-bearing syenite with up to 2.55-21.8 g/t gold. More recent investigations failed to find any significant mineralised rocks.

In this study the Battery Creek area is mapped in detail and the exposed rock units are described along with the locations of the historic workings which include a shaft and several small adits. Lithological units in Battery Creek formed as a product of Miocene volcanism in (21-10 Ma). The main volcanic unit that blankets the area are tuffaceous layers and dolerite deposits.

Three hydrothermally altered and mineralised units were identified. These are an unexposed syenite, that is cut by a narrow (20 cm wide) fracture zone and containing disseminated pyrite that have replaced the primary igneous kaersutite phenocrysts; a pyroclastic lapilli tuff layer with pumice lapilli that have been replaced by pyrite and a dolerite with a fine network of narrow pyrite-bearing veinlets. Laser Ablation Inductively Coupled Mass Spectrometry of the mineralised dolerite and lapilli tuff were analysed for trace elements and confirmed the presence of pyrite in these rocks, however, neither samples were enriched in gold.

Two small grains of gold up to 0.2 mm across were recovered by sluicing approximately 50 cubic litres of gravel from Battery Creek 70 metres downstream from the old shaft. This suggests that the pyrite-bearing rocks in the old workings and the catchment area upstream are the most likely source for the Battery Creek gold.