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Anomalous lead in the vicinity of Olivers Hill, northwest Tasmania

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Olivers Hill is situated about 25 miles southwest of Devonport in northwest Tasmania. It stands some 2000 feet above sea level and is composed largely of Ordovician Roland Conglomerate and Moina Sandstone. These rocks unconformably overlie Cambrian quartz porphyry which does not outcrop prominently in the area. Both the Cambrian and Ordovician rooks are intruded by Devonian (Dolcoath) granite which occurs as a small stock 1½ square miles in area about a mile northwest of Olivers Hill. Partial cover of Tertiary basalt and sediments, Pleistocene fluvioglacial sediments, and Recent talus and alluvium occurs throughout the district.

A zone of anomalous lead, with maximum values exceeding 5000 ppm, has been found in soil samples taken along the northeast slopes of Olivers Hill over a distance of about a mile, although it is cut by remnants of a Tertiary basalt flow for some 1600 feet. Lead appears to be quite mobile, with values of about 300 ppm occurring several hundred feet down drainage from points of maximum values in the range 1000–1500 ppm. The reason for the unusually high mobility of the metal is probably to be found in the formation of soluble lead-humate complexes. Ferro-manganese outcrops extensively along the trend of the anomaly and this appears to be a pre-basalt feature. Much of it is lead rich, with values from 1–3% lead being quite common. The geochemistry of base metals has not been previously investigated in the area although there has been some prospecting and mining of gold and cassiterite. Small lodes of silver-lead were mined at Round Mount, about two miles north of Olivers Hill, up into the 1920s and exploration of those deposits has continued spasmodically since.

The soil cover consists of iron-rich clay and sand flanked by humus-rich sand. Both types are known concentrators of metals, particularly lead, but there appears to be no correlation between the amount of iron oxides or humus and the lead content in this case. The lead values range from less than 10 ppm to over 5000 ppm and the frequency distribution curve is of a truncated positively skewed form. Taking the median value of 350 ppm as representative of the average local background, these soils are strongly enriched. The average figure in the literature is 10 ppm with a range of 2 to 200 ppm. Maximum values of the anomaly exceed the median by 15 x or more. Zinc and copper values are far lower than lead, reaching maxima of about 600 ppm and 140 ppm respectively. Relative to their local background these values are anomalous and give trends similar to those found for lead.

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