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## 7. ALLUVIAL TIN IN THE LOWER SCAMANDER RIVER VALLEY

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### ABSTRACT

An area of some 20 square miles about the lower reaches of the Scamander River has been mapped and examined geologically (fig. 10). A site is recommended for testing for alluvial tin deposits and a limit to the extent of dredgeable ground is suggested.

### INTRODUCTION

During visits to the Scamander River between March and June, 1966 the river flats and lower slopes of the surrounding hills were mapped to delineate the extent of the Tertiary cover and to locate sites for a drilling programme designed to investigate the occurrence of a possible stanniferous deep lead and/or alluvial deposits.

The area is accessible via the Upper Scamander road leaving the Tasman Highway approximately 2 miles S of Scamander.

Information was plotted directly onto enlarged aerial photographs at a scale of 1 inch = 500 feet and the map reduced by pantograph and then photographically for publication.

### HISTORY OF PREVIOUS GEOLOGICAL INVESTIGATION

The hilly wooded country inland from Scamander, composed mainly of Silurian sedimentary rocks, carries many small mineral lodes and has been subject to intensive prospecting and some limited mining activity. The Scamander Mineral Field has been featured in several reports, and an attempt at alluvial tin mining in the Scamander River valley was mentioned by Waller (1901). Interest was centred on river terrace gravel deposits and although some localized rich patches were proved the results generally were discouraging.

Comment by Twelvetrees (1911) indicated that alluvial tin mining activities were short lived, and no further reference to the district was recorded until a syndicate of local residents attempted to interest Rio Tinto (Australian) in the Scamander River flats as a dredging proposition. Rattigan (1957) mentioned shafts sunk in the gravel between Kellys Creek and the Scamander River, attributed to the Siamese Tin Syndicate, and samples of fine-grained tin panned from selected exposures of gravel between Kellys Creek and Hendersons Lagoon.

The general geology of an area between Falmouth, Scamander and St Helens is contained in a report with accompanying geological maps by Walker (1957). In strong support of a suggestion by Twelvetrees (1911) that the original mouth of the Scamander River formed at Falmouth, Walker maintained that the gap in the low hills now carrying the Upper Scamander road, and Hendersons Lagoon further SE, define the course of the ancient river.

### STRATIGRAPHY

The basement rocks of the area are well-jointed, locally-indurated sandstone, siltstone and shale of the Mathinna Beds of Silurian age. These rocks are folded and outcrops display a dominant NW-SE bedding strike. Exposures are good in river cliff faces and road cuttings; elsewhere shale fragments and an abundant float of angular blocks of sandstone indicate outcrops of Mathinna Beds.

The Silurian sediments are extensively invaded by varieties of granite to the N and S of Scamander, but only minor outcrops of a quartz-monzonite rock occur near the Scamander River.

Tertiary sediments occur at a variety of heights above sea-level and are divisible into two main types: (i) a fluvatile valley fill; and (ii) a well sorted beach deposit.

- (i) The valley fill deposits are composed of an ill-sorted torrent wash of boulders commonly attaining a diameter of over 1 foot in a variable sand, clay or gravel matrix. They are mainly confined to terraces near the Scamander River at elevations between river level and 200 feet above sea level. Erosional removal of the matrix leaves a heavy lag deposit of cobbles, mainly of Silurian sandstone, and pebbles of vein quartz. Pebbles of granite and fossiliferous Permian rocks from areas to the S and W occur rarely.
- (ii) The well-sorted beach deposit is of coarse white sand with occasional perfectly-rounded quartz pebbles up to 6 mm in diameter. These deposits cap the hills to the W of Hendersons Lagoon at heights between 160 feet and 320 feet and are too extensive and too uniform to be attributed to a fluvatile origin.

Pleistocene to Recent deposits include present beach sands and river bars at the coast, with a belt of stable dunes to the W. Inland, estuarine flats predominantly of alluvium, but with occasional pebble banks, carry an impersistent mantle of blown sand which extends onto the slopes of the hills to the W of the Tasman Highway. A hill-wash of sand and rounded pebbles derived from unconsolidated Tertiary coastal marine deposits locally obscures the older sediments of the area. Flats of alluvium, forming a succession of terraces, occur about the creeks in the extreme S and in the lower reaches of the Scamander River valley where the river is static and brackish, or forms a subdued tidal estuary with tidal effects varying with the state of the sand bar at the river mouth.

Heavy deposits of Recent torrent wash are common adjacent to the present course of the Scamander River. Whilst it is composed mainly of Silurian sandstone, boulders of granite become progressively more common in these deposits upstream, and boulders of St Marys Porphyrite (Walker, 1957) occur in tributaries from the S.

### SOURCE OF DISTRIBUTION OF ALLUVIAL TIN

The hills immediately N of the area mapped, in particular the Pyramid and the Pinnacles, are composed of Mathinna Beds which have acted as host rock for tin mineralization (Jack, 1963). The drainage of these hills is entirely by tributaries of the Scamander River, including Arm Creek and Kellys Creek, and tin derived from these sources can be expected in the Tertiary and Recent sediments of the Scamander Valley.

The present mapping has indicated that from a distance 2 miles from the coastline Mathinna bedrock outcrops frequently among the Tertiary sediments and Recent alluvial flats, suggesting that the present river is only shallowly etched into the bedrock floor of the Scamander River valley. Tertiary fluviatile sediments, although of considerable lateral extent, are of shallow depth, and occur as capping on benches of Mathinna Beds.

The tortuous course of the Scamander River is not related to meanders in a flood plain, but is largely dictated by resistant beds in the Silurian sediments which strike northerly across the valley. Local deposits of tin may occur associated with the rock bars across the valley, but their total extent would be small and their location difficult.

Between 1 and 2 miles from the coast the Scamander River runs through a swampy alluvial flat. The river now drains through an impressive gorge to the sea at the Scamander township, but it may have joined directly through the site of Hendersons Lagoon to the coast at Falmouth at a time when the river ran at a higher level. The constriction between low hills (marked 'A' on fig. 10), now partly filled with Tertiary gravel, could have affected the deposition of tin carried by the river, causing local deposition in still water NW of the present swamp area or under estuarine conditions to the S of the constriction.

A geophysical traverse with resistivity equipment E-W across the gap between outcrops of Mathinna Beds at 'A' indicates the presence of a deep buried channel in this locality.

### RECOMMENDATIONS

An E-W line of drill holes to test for traces of tin and to confirm the configurations of the channel at 'A' is recommended, to be followed by parallel lines of test holes some 400 yards N and S of 'A' should the preliminary drilling prove promising.

Potential dredgeable ground includes Hendersons Lagoon and the surrounding coastal plain and the swampy flats for 1.5 miles N of 'A'. However, the total thickness of Tertiary and Recent deposits in these areas is unknown and the overburden may prove to be too extensive for dredging operations.

### REFERENCES

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