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HOBART.

# JEDS PTY. LTD.

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GEOPHYSICAL AND EXPLORATION CONSULTANTS

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REPORT ON EXPLORATION IN THE WELD RIVER AREA

EXPLORATION LICENCE 3/70

TASMANIA

**MICROFILMED**

REFERENCE 3/70/3

FOR: Inland Mining N.L.  
72 Kings Park Road  
WEST PERTH 6005

INTRODUCTION

Exploration Licence 3/70, situated approximately 30 miles west of Hobart, consists of an area of 300 square miles and is traversed from northwest to southeast by the Weld River. The rocks are mainly Precambrian sediments with some Jurassic dolerite and Permo-Triassic sediments in the eastern section.

PREVIOUS EXPLORATION

A partial photo interpretation was previously carried out by Hall Relph and Associates Pty. Ltd. and a large number of rock specimens were collected. These specimens were identified by Hall Relph and Associates Pty. Ltd. but they could not be located by your company.

Original reports of ultrabasics made by Twelvetrees and Lewis were examined and the reported locations are shown on Boulter's attached map (Plate 1).

EXPLORATION PROGRAM

At the request of Inland Exploration N.L. an exploration program consisting of geological reconnaissance and an aeromagnetic survey were proposed to the Tasmanian Mines Department. As a consequence of this proposal the licence was renewed and the geological program was commenced. Tenders were requested for the aeromagnetic survey from Geophysical Resources Development Company and McPhar Geophysics Pty. Ltd.

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The former tender was received and forwarded to your company after it was indicated that the McPhar tender had been forwarded direct to Inland Exploration N.L. As the company has now decided to carry out the aeromagnetic survey using its own resources, preliminary flight plans have been considered.

GEOLOGY

A fault system defines part of the edge of the Palaeozoic rocks known as the Tyennan Block. Part of this fault system runs along the Weld River and also through the Adamsfield ultrabasics approximately 10 miles northwest. The reported Weld River ultrabasic rocks may be related to, and similar to those at Adamsfield. Exploration at Adamsfield carried out by B.H.P. has shown strong magnetic anomalies which are correlated with the ultrabasics.

The geological program was designed to examine several areas of reported outcrop of ultrabasic rocks. It was considered most economical to use a minimum size party and the helicopter transport available from the Hydro Electric Commission at Hermit Valley. Two separate field trips were made and the details of these are given in the enclosed reports by the field geologist, C.A. Boulter. The localities visited were determined by the previous reconnaissance and local information from Hendrick Meerding who has spent considerable time in this area. Seventeen sediment samples were sent for heavy mineral separation to the Tasmanian Department of Mines.

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RESULTS

The previous rock sampling programs should be disregarded as a basis for further exploration. The current exploration does not substantiate the location of the rock types previously identified and as shown on maps in the possession of the company. It can only be concluded that the original specimens were stream boulders! A rock identified in the field as a pyroxenite was sectioned and a petrological examination made by M. Rubenach. His report is attached. All stream sediment samples tabled by the Mines Department were barren.

CONCLUSIONS

The amphibolite identified by Rubenach, indicates an area in which further ground reconnaissance should be concentrated. However at this stage it is considered that an aeromagnetic survey would be the most effective exploration method. Nearby ultrabasics, probably similar to those in the Weld River, give rise to large magnetic anomalies and as access on the ground is extremely slow and expensive the airborne technique would most efficiently locate any areas of interest. Further ground reconnaissance could be commenced in the 1971/72 summer field season.

for Jeds Pty. Ltd.

J. E. Shirley  
B.Sc., A.A.I.M.M., S.E.G.

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REPORT ON EXPLORATION  
IN THE WELD RIVER AREA, E.L.3/70

15 Jan to 29 Jan 1971

REFERENCE 3/70/1

FOR: Inland Mining N.L.  
8 Cliff Street  
Milsons Point, N.S.W.

BY: JEDS PTY. LTD.  
11 Taroona Crescent  
Taroona, Tasmania

C. A. Boulter, B.Sc. (Geologist)

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### INTRODUCTION

Ultramafic and mafic igneous complexes are common in the Cambrian sediments of Tasmania and they have been reported from several localities in areas of Proterozoic outcrop, particularly from the Weld valley region. These latter are generally less well known because they lie in inaccessible areas with thick vegetation cover. Interest in these deposits lies in their known association with asbestos, chromite, platinoids and copper-nickel mineralisation.

### REGIONAL GEOLOGY

The area under consideration lies near the centre of the exposed portion of the Jubilee Block which is regarded as being mainly 'younger' Precambrian in age. The structural geology and stratigraphy of the Jubilee Block are very poorly known because its greater part is made almost inaccessible by dense rainforest. The lack of knowledge of this area is reflected in the literature where it is seen that the boundary of the block with Cambrian and younger sequences has been changed from time to time. Many reports mention work carried out in this region but all are of a reconnaissance nature.

Available information suggests large folds in the north of the block which trend NW or NNW. Most of the anticlines have cores of quartzite, while the synclinal areas are occupied mainly by dolomite such as that found at Tim Shea, in the Upper Weld Valley, and south of Mt. Bowes. Most of the folds appear to be isolated by major faults. The folds plunge steeply to the NW, and have steeply dipping limbs which in some cases may be overturned. Previous reconnaissance work indicates that the rocks for the most part are less deformed and less metamorphosed than those of the Iyennan Geanticline ('older' Precambrian). It is reported that some sequences, however, show deformation and metamorphism approaching that of the 'older' Precambrian. These may represent inliers of older rocks preserved in structural highs.

It is apparent that the stratigraphy and structure of the block is fairly complex and there are probably both disconformities and unconformities within the sequence. One trough of probable Cambrian rocks is known to the west of Mt. Mueller and other such troughs may be present elsewhere in the block.

Serpentinite outcrops have been reported from just southeast of Mt. Mueller and in the Weld River by Twelvetrees (1909) and Lewis (1924). The location of these two bodies is shown on the sketch map (Plate 1) included, as is the location of two ultrabasic masses given by the Geological Map of Tasmania (1961) from unknown sources.

#### PRESENT EXPLORATION

The purpose of the present work was to investigate more fully the indications of ultrabasic material which were found by an exploration party in April 1970. The map and locality list from this work showed one outcrop of serpentinite ? (No.76) and two outcrops of metamorphosed gabbro (No.38 and 44). The area of the supposed serpentinite was examined first, this being approximately in the general region of localities 2, 3 and 4 as shown on Plate 2. Outcrop in this area is very restricted, numbers 2 and 3 are exposed because of undercutting by meandering while number 4 is the lower slope of a steep ridge. Both 2 and 3 show strong shearing due to faulting but the original lithologies are still discernible. In both cases a black quartzite is dominant with laminated siltstones and shales also to be found. The direction of faulting exercises strong local control over the course of the river. A light grey quartzite occurs at locality 4 while a little further upstream a green siltstone outcrops.

The area between these outcrops was an almost flat river terrace only four feet above the present level of the river. This was traversed several times to search for outcrop but none was found even in the roots of large felled trees. Only well rounded cobbles from the river gravels were found. An east-west ridge running south of locality 3 proved to have only float being capped by black quartzite with gritty siltstone,

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fine conglomerate and siltstone found at lower levels. Another low ridge trending north-south runs to the west of locality 2 but this would apparently be an old river terrace judging from rounded cobbles found near the top and its relatively wide flat top.

Because the outcrops failed to prove the existence of a serpentinite body in this area, stream sediment samples were taken in several places up and down stream. These may give some idea of the possible presence of such a body.

The second area of interest was the reported occurrences of metamorphosed gabbros at localities 38 and 44 on the original map. Locality 38 corresponds to somewhere in the region of locality 22 on Plate 2. This section of the river is relatively straight and quiet flowing where the river appears to cut into several feet of coarse river gravels as seen in the banks. From the few indications of the regional strike available they would suggest that from locality 18 to 23 the stream follows a strike section and thus would account for the outcrops in this section all being of a similar light coloured quartzite. The outcrop is fairly frequent along this stretch but is virtually always only just seen beneath the present day river gravels except at either end. No metamorphosed gabbro was found in situ though in places much green siltstone occurred in the river gravels.

Locality 44 on the original map corresponds approximately to locality 20 on Plate 2. At this point on the river a cobble conglomerate outcrops for some distance. Virtually 80% of the cobbles are quartzite of various colours while some 10% is of a green in part sheared material. Because of a certain amount of weathering it is impossible to determine exactly its nature though it does appear to be too hard for serpentinite. Upstream from the conglomerate a light green but very well weathered rock outcrops but as this gradually passes into green and progressively less weathered siltstone it would appear to be of no significance. Though no outcrops of definite igneous rocks of interest occur in this immediate area a little way downstream

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at locality 19 several cobbles of a sheared or flow banded gabbroic rock are found in the river gravel. This area is also the location of the serpentinite body reported by Lewis in 1924.

Little sense can be made of the geology in the region between camps 1 and 3 because of several difficulties. The lack of outcrop and in places very dense rainforest with much young horizontal gives little hope of gaining an overall picture. The succession is dominated by quartzite and it is unfortunate that most outcrops were of massively bedded material and hence little information concerning the attitude of the beds was available. In the most suitable lithology, found at locality 24, it was possible to see that there the main bedding direction was NW-SE and dipping steeply. Besides small order folds trending NW there was also the suggestion of crossfolding to a lesser degree about a N-S axis. How this is reflected on the regional scale is impossible to tell and its expression in the thick competent and dominant quartzites unknown. Rocks of a similar age elsewhere in Tasmania show five phases of folding. The several conglomerate occurrences only hint at the undoubted complex history of this particular area.

#### ECONOMIC GEOLOGY

As definite outcrops of ultramafic rocks were not located little knowledge of mineralisation in the area was gained. The sheared gabbros studied showed no evident sulphide occurrences while the rest of the ultramafic (?) material was too highly weathered. Approximately half-way between camp 1 and camp 2 the track cuts a small stream which carries a considerable amount of vein quartz. This may be related to the outcrops of granite shown on the original locality map and could be worth following.

## CONCLUSIONS

Before making a final assessment of the outcrops mentioned above it would be preferable to examine some of the material collected in more detail i.e. thin sections or polished sections as necessary. Also the stream sediments collected throughout the area may point to some anomaly in these particular localities.

- Lewis, 1924. Notes on a geological reconnaissance of Mt. Anne and the Weld River Valley. Pap. Roy. Soc. Tasm., 1923, 9-24.
- Twelvetrees, 1909. Western exploration - a report on a journey to the Gordon River. Tasm. Parl. Pap. (1909), No.21. Appendix B; 25-35.

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REPORT ON EXPLORATION  
IN THE WELD RIVER AREA, E.L.3/70

15 Feb to 19 Feb 1971

REFERENCE 3/70/2

FOR: Inland Mining N.L.  
8 Cliff Street  
Milsons Point, N.S.W.

BY: JEDS PTY. LTD.  
11 Tarroona Crescent  
Tarroona, Tasmania.

C. A. Boulter, B.Sc. (Geologist)

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The primary aim of this exploration was to investigate the nature of the outcrop of Cambrian ultrabasic intrusives shown on the regional air photo interpretation map of the Weld River. The base camp was set up some miles further south than intended due to unfavourable river conditions. In order to follow up further information on the previous area (see report 3/70/1) I was taken by helicopter to camp one. Approximately half a mile downstream from here where the river turns to run south-west a gabbroic rock was found in outcrop. Closely associated with this were possible pyroxenite rocks, though unfortunately due to lack of time the area could not be studied further.

As the tracks were very difficult to follow the river was found to provide the quickest means of travel. The nature of the terrain is emphasized by the fact that it took 42 hours for the journey back to the base camp. From this point several possible routes to the interpreted outcrop of ultrabasic were tried but all proved far too slow. In order to examine the area efficiently it would seem that better tracks would have to be cut so that exploration parties could walk in and be supplied by air-dropped materials.

CONCLUSION

The Weld River area would appear to contain several ultrabasic masses and it seems possible that more may exist. The major problem appears to be locating the area of outcrop as exploration on the ground is very difficult in this type of country. Further ground exploration of anomalies located during the planned aeromagnetic survey should provide more information on the potential of the area.

PETROLOGICAL DESCRIPTION - WR2-3A

The rock is composed largely of light brown amphibole grains. These have a distinct preferred orientation and the individual grains have been a little brecciated. It also contains about 10% anhedral weathered albite grains, which are largely concentrated in patches. Thin veins composed of fresh albite and a little amphibole are present. Magnetite grains are very small and very rare.

The rock is an amphibolite formed by low grade alteration and deformation of a basic (or ultramafic) rock. The small amount of feldspar and the almost complete lack of iron oxides suggests it has formed by alteration of a plagioclase ultramafic rock, or has formed on a contact of serpentinite with sediments or basic rocks. If it had formed from normal Cambrian or Precambrian dolerites or gabbros, a lot more iron oxides and feldspar would be expected.

M. Rubenach, B.Sc.

*M. Rubenach*

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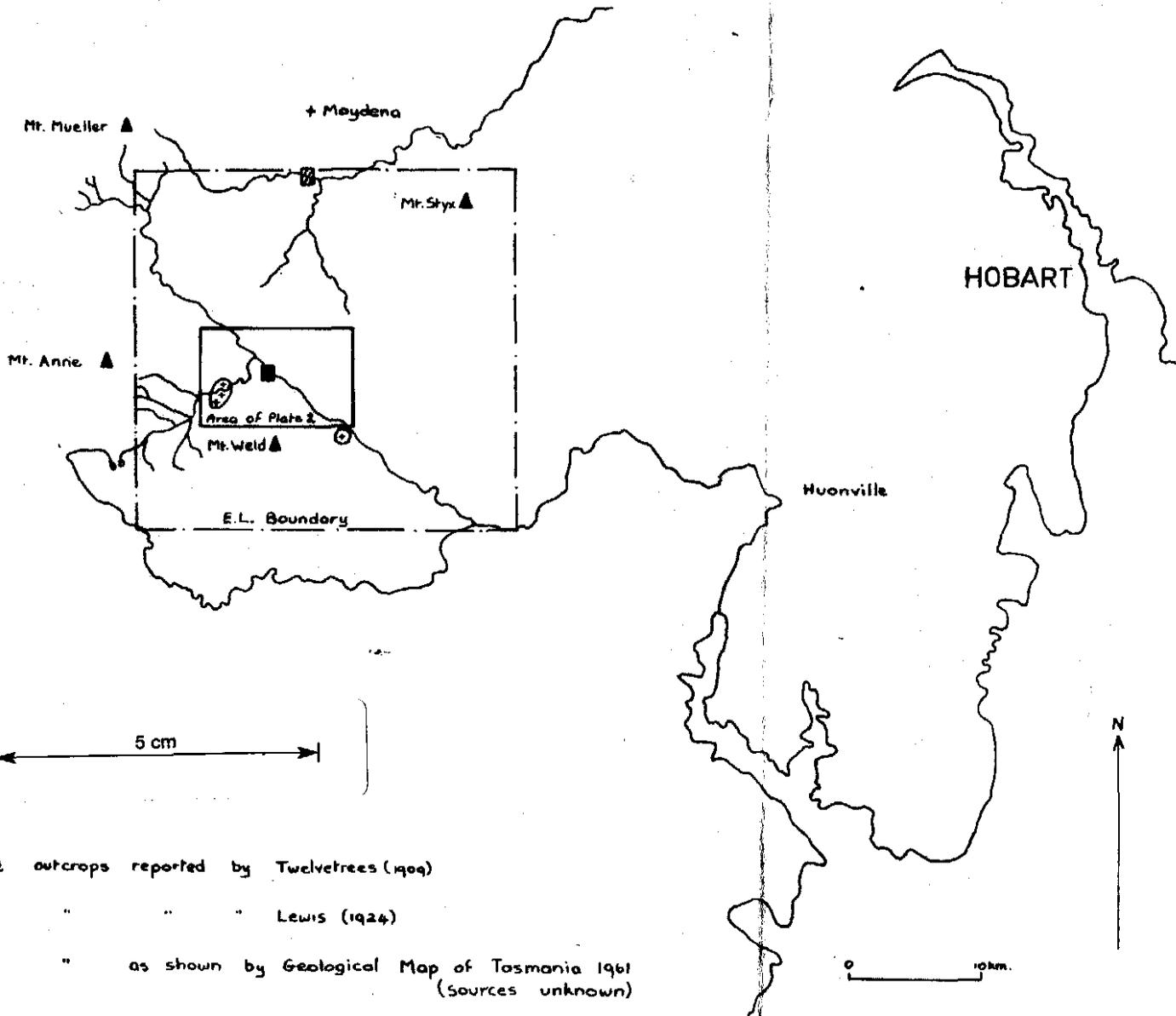
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Plate 1 - EL 3/70

Reported ultrabasic outcrops

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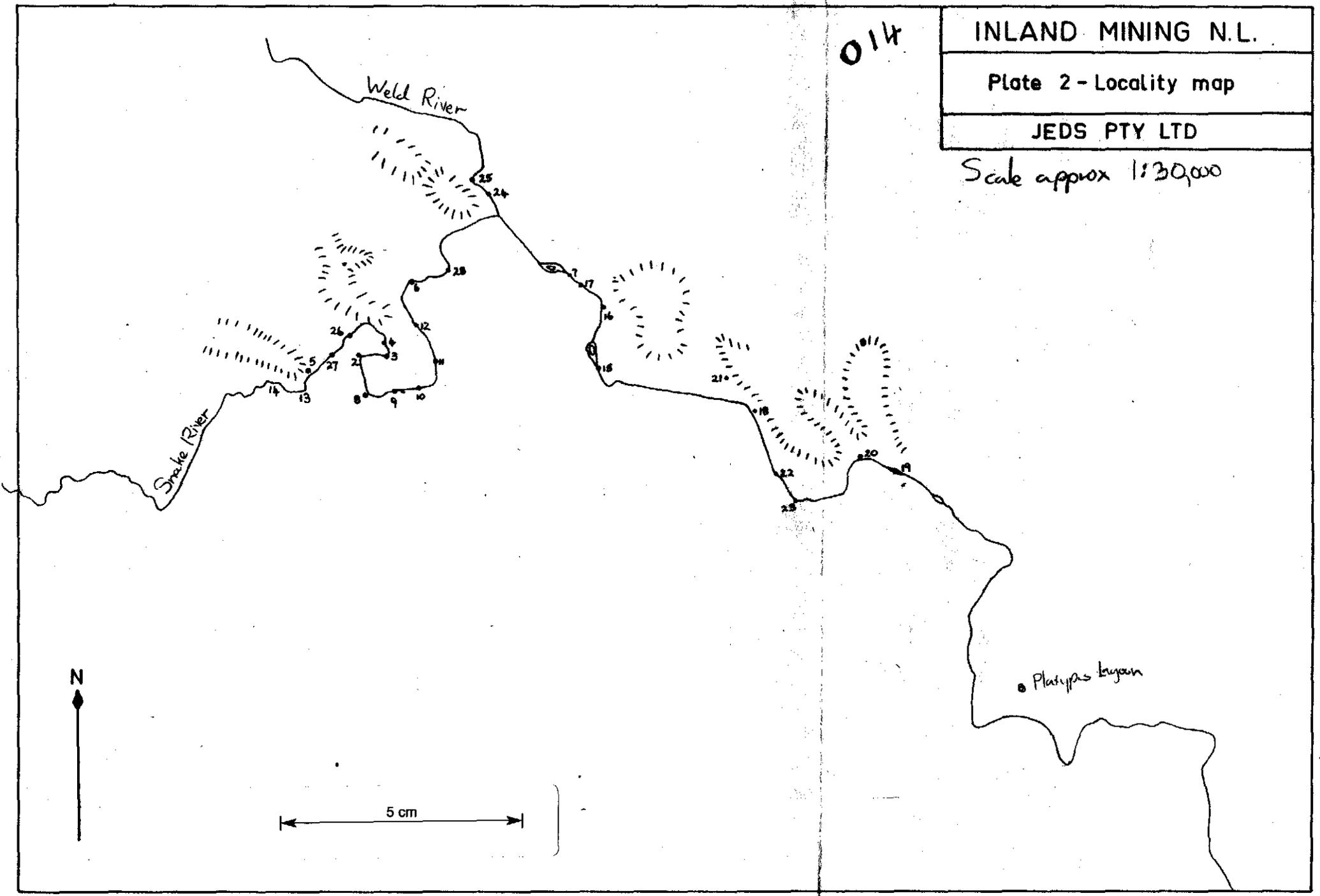
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Plate 2 - Locality map

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Scale approx 1:30,000



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5 cm

Platypus Lagoon