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COMSTAFF PROPRIETARY LIMITED
EXPLORATION LICENCE 1/68

MEREDITH GRANITE PROJECT
1972/1973 SUMMER FIELD SEASON REPORT

AUSTRALIAN ANGLO AMERICAN LIMITED

MELBOURNE

Incorporated in the State of Victoria

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MEREDITH GRANITE PROJECT

1972/1973 SUMMER FIELD SEASON REPORT

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MEREDITH GRANITE PROJECT

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1. SUMMARY

Two areas of anomalous tin and wolfram values were delineated during the 1971/1972 geochemical research programme. Two grids were laid to examine these areas.

The tin mineralisation in both areas is associated with quartz-tourmaline veined greisens and widely spaced quartz tourmaline veins in the granite. The mineralised greisen on Tadpole Hill (Grid 1) contains a potential ore zone but at 12,090 tonnes per vertical foot grading .2455% tin, is not an economical proposition. No further work is recommended unless the ground south of Exploration Licence 1/68 becomes available.

2. INTRODUCTION

2.1. Location (see TAS 2-470)

The Meredith Granite covers an area of approximately 160 square miles and outcrops in the southern half of Exploration Licence 1/68. The two areas under investigation this season are six and eight miles south of the Mount Stewart mine respectively.

2.2. Physical Features

The areas under investigation comprise open mountainous country where exfoliation weathering has caused the predominance of outcrop to occur as N-S trending ridges. River valleys are generally narrow, filled with alluvium, and densely vegetated.

2.3. Access

Access to the areas under investigation this summer season is solely by helicopter, they are inaccessible to ground parties.

2.4. Previous Work (see also 1971/1972 Summer Field Season Report - Meredith Granite Project).

Evidence of prospecting in the form of trenches, small shafts, water races and old camps occur throughout the Meredith area. The main interest appears to have been in searching for alluvial tin, but greisens, aplites, pegmatites and quartz-tourmaline veins were also prospected.

On Tadpole Hill, which lies in Grid I, a greisen zone was prospected by trenching and shaft sinking. There is no evidence of any old workings in the vicinity of Grid II.

A geochemical research programme was carried out on the Meredith Granite during the 1971/1972 summer field season to define areas of high background on the basis of whole rock trace element concentrations (for details see S.R. Yardley's Report op.cit.). Soil, stream and panned concentrate samples were collected associated with specified granite masses, to complete the geochemical picture.

Two areas of anomalous tin and wolfram values were delineated on the basis of correlated rock, soil and stream geochemistry and heavy concentrate mineralogy. These areas termed Zones A and B were regarded as potential targets for further exploration.

2.5. Objectives

Two grids were auger sampled as a follow up to the Meredith reconnaissance programme of the 1971/1972 summer field season.

Grid I was placed on Tadpole Hill to examine an area of high background from where a sample of "greisenised" granite indicated economic tin grades.

Grid II was placed to follow up the anomalous rock, soil and stream sediment results along the Meredith range.

The objective was to locate a viable economic body of tin and/or tungsten mineralisation occurring in a stockwork of anastomosing quartz veins in a granitoid mass, or as a cupola deposit.

2.6. Method

Soil samples were collected on 50' centres as close to bedrock as possible. The samples were dried and the -80 mesh fraction sieved out. This fraction was despatched to Geochemical & Mineralogical Laboratories at Rushcutters Bay, near Sydney., for analysis while the oversized material was retained at Waratah.

At GEOMIN the sieved samples were ground to -200 mesh in the Sieb-Technik mill then analysed for tin using a colorimetric technique.

3. GEOLOGY (see also "The Meredith Granite" by J.L. Stockley, an unpublished B.Sc. honours thesis carried out under Comstaff's supervision).

3.1. General (see TAS 2-471)

The Meredith Granite is an equigranular biotite granite with a marginal porphyritic biotite adamellite subvariant, and is of Upper Devonian age. It is intruded into sedimentary and igneous rocks ranging in age from Precambrian? to Devonian. It is irregular in outline and has sharp boundaries with the contact metamorphosed country rocks.

3.2. Grid I (see TAS 2-472)

The main rock type in the gridded area is coarse-grained, equigranular biotite granite. The granite is closely jointed, the dominant joint orientation being NNW-SSE. Joints of this orientation are commonly mineralised with tourmaline, quartz and cassiterite. The less prominent joint patterns, WSW-ENE and WNW-ESE are seldom mineralised.

Widely spaced quartz tourmaline veins with associated cassiterite occur throughout the grid. These veins are usually 1/2 to 2 inches wide and are generally parallel to the dominant NNW-SSE jointing. Quartz-tourmaline nodules occur scattered throughout the granite, with which there does not appear to be any associated tin mineralisation. Podiform zones of greisenised material occur with the long axes parallel to the predominant quartz-tourmaline vein and joint orientation.

Generally, the greisens are less than 10 feet wide but one significant outcropping greisen occurs in the southern part of the grid. It has a maximum width of 400' and an approximate strike length of 1200'. It is a coarse-grained quartz-muscovite-tourmaline rock with minor topaz and zircon.

Tourmalinisation is intense, it occurs as a secondary mineral partially replacing the primary minerals, infilling interstices and fractures, and in veins associated with quartz. Cassiterite with chalcopyrite, sphalerite and pyrite occur in the greisen. The colour of the tourmaline is generally black or dark brown but where associated with tin it is usually blue or green.

3.3. Grid II

Grid II lies on coarse-grained biotite granite with widely spaced quartz-tourmaline veins, infilled joints and minor greisens. The dominant joint and vein orientation is NNE-SSW. It is similar to the area covered by Grid I in most respects. No significant concentrations of quartz-tourmaline veins or areas of pervasive tourmalinisation which may be associated with tin mineralisation were found.

4. GEOCHEMISTRY

4.1. General

Soil samples were collected as close to bedrock as possible. The nature of the samples varied according to the depth of weathering and the thickness of alluvium. Consequently, soil samples contained fresh unweathered granite particles, weathered granite particles, sand, clay, and organic material in variable proportions. This variation in the sample constituency is reflected in the tin content in the -80 mesh fraction.

4.2. Grid I (see TAS 2-472)

Values of tin in the -80 mesh fraction of the soil samples vary from less than 2 to 720 ppm. The cumulative frequency

4/ plot is very irregular

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plot is very irregular with no obvious threshold values. The soil values are contained at 100 and 200 ppm based on the cumulative frequency data from Grid II which has more "background" granite samples.

A soil anomaly which measures 2000' by 500' was outlined in the SE part of the grid. The anomaly appears to be transported downslope from the mineralised greisen which outcrops on the hill top and it is considered likely that mechanical action was the main transporting agent. Other isolated anomalous values are scattered throughout the grid. These are probably due to cassiterite occurring in the widely spaced quartz-tourmaline veins.

A limited number of rock samples were collected representing different rock types exposed on the grid. This was done to help interpret the soil geochemistry and to find which rock type or mineral had significant tin contents. It was found that veins of quartz and green tourmaline had the highest tin content:

<u>Sample Number</u>	<u>Rock type</u>	<u>Sn (ppm)</u>	<u>W (ppm)</u>
TA 077	Quartz-muscovite greisen	180	20
TA 078	Quartz-tourmaline vein	2,450	30
TA 079	Quartz-tourmaline nodule	35	<10
TA 080	Tourmalinised greisen	550	20

4.3. Grid II (see TAS 2-473)

Values of tin in the -80 mesh fraction of the soil samples vary from less than 2 to 1240 ppm. The cumulative frequency plot gives threshold values of 100 and 200 ppm Sn.

Small isolated anomalies occur scattered through the grid. These appear to be due to widely spaced quartz-tourmaline-cassiterite veins and infrequent podiform greisens. None of these anomalies are considered to be significant.

5. TRENCHING AND EVALUATION

The main greisenised and quartz-tourmaline-cassiterite veined area on Grid I was chip and channel sampled to examine the grade and economic potential of the tin mineralisation. Four existing shallow trenches were chip sampled at 1' intervals. Every five samples were combined to give an average value over 5'. The tin value in the chip samples was found to be generally high, ranging from 20 ppm to 4.4% (see TAS 2-474). The most consistently high values came from samples collected in trench T1 which lies at 90° to the strike of the greisen and the quartz-tourmaline veining. The trench was cleaned out, deepened, extended, and then channel sampled. The channels were cut on the cleanest wall as close to the base of the trench as possible. The floor was not sampled as the trench was infilled with water.

The samples representing 5' sections were forwarded to GEOMIN where they were jaw crushed to -1/8" before 25% of the samples was split out and pulverised to -200 mesh. The tin content was determined by colorimetry, and if greater than 1% by

5/ atomic absorption

atomic absorption spectrometry (A.A.S.). The tungsten, lithium, and molybdenum content was determined by A.A.S. also. The tin values in the channel samples are consistently lower than in the corresponding chip samples (see TAS 2-474) and range from 2 to 8800 ppm. This disparity may be due to:

- 1) The chip samples were collected from weathered granite near the soil/bedrock interface. Here there is a concentration of cassiterite due to the break down of the quartz-tourmaline-cassiterite veins and the greisens. The channel samples were collected from fresher rock near the base of the trench. Consequently, it is considered that the concentration of cassiterite in the weathered granite drops off with depth as the weathering effect decreases.
- 2) There was a bias, when chip sampling, to chip the prominent quartz-tourmaline-cassiterite veins rather than the weathered granite.

The best channel sample values in trench T1 are from 225' to 385' which averages .2455% Sn. This includes 226' to 246' at .3160% Sn, 251' to 271' at .2890% Sn, and 326' to 356' at .3340% Sn. The tungsten, lithium, and molybdenum values are low.

Assuming a strike extension of this mineralisation 500' to the north and south and a specific gravity of 2.67, the possible tonnage is 12,090 tonnes per vertical foot grading .2455% over an area of 160' by 1000' square. This is most certainly sub-economic.

6. ALLUVIAL TIN POTENTIAL

Narrow alluvium filled valleys occur throughout the Meredith area, some of which have been exploited for alluvial tin. Most of these, however, are too small to be considered as potential alluvial tin prospects of acceptable size. An alluvium filled valley on the Harman river lies SE of Grid I. This valley is considered to be a suitable trap for alluvial tin as it is on a river which drains a portion of the Meredith Granite known to contain tin mineralisation. The valley covers an area of 206 acres of which 78 acres lie inside Exploration Licence 1/68 held by Comstaff Pty.Ltd. The remainder lies in Exploration Licence 2/63 held by Aberfoyle Tin N.L.

Assuming an average depth of 15' of alluvium in the valley, the possible yardage potential of that part which lies in Exploration Licence 1/68 is 1.9 million cubic yards.

7. GEOPHYSICS

A radiometric survey was carried out using a Scintrex BGS-IS scintillometer in a Hughes 500 helicopter flying at an average height of 50' above the ground. Traverses were made on E-W flight lines, a quarter mile apart. The intention was to search for diffuse uranium mineralisation in brecciated ferruginous zones or high grade uranium mineralisation in fractured and brecciated granite. No anomalous radioactive response was given, nor were any brecciated zones located.

8. CONCLUSIONS

The tin mineralisation on Grid I is associated with a quartz-tourmaline veined greisen, and widely spaced quartz-tourmaline veins in granite. The size and grade of a potential ore zone within a prospective greisen is too small at 12,090 tonnes per vertical foot grading .2455% tin.

On Grid II the tin mineralisation is associated with small areas of veined greisen, widely spaced quartz-tourmaline veins and infilled joints. No prospective areas of tin mineralisation were found.

A brief survey of tin ore bodies in the world indicates that primary tin mineralisation within a granitoid mass is not a likely economic proposition, unless it is associated with a roof zone or cupola deposit. There is no evidence that the tin mineralisation on Meredith is associated with roof zones within the granite, as contact type rocks are absent, so the possibility of finding a cupola deposit is considered to be very remote.

9. RECOMMENDATIONS

It is recommended that no further work be carried out in searching for primary mineralisation within the granite.

10. REFERENCES

Stockley, J.L., 1972. The Meredith Granite: Geology and Geochemistry. Unpublished B.Sc. Hon.'s thesis, University of Tasmania, Hobart.

Yardley, S.R., 1972. Meredith Granite Project - 1971/1972 Summer Field Season Report. Comstaff Pty.Ltd.

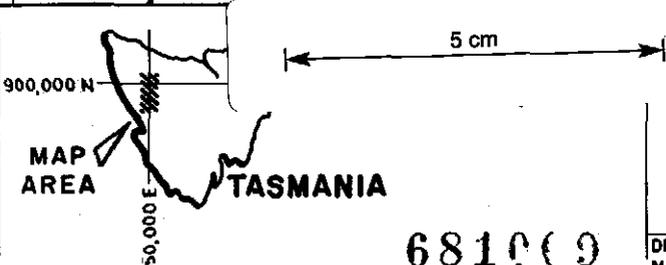
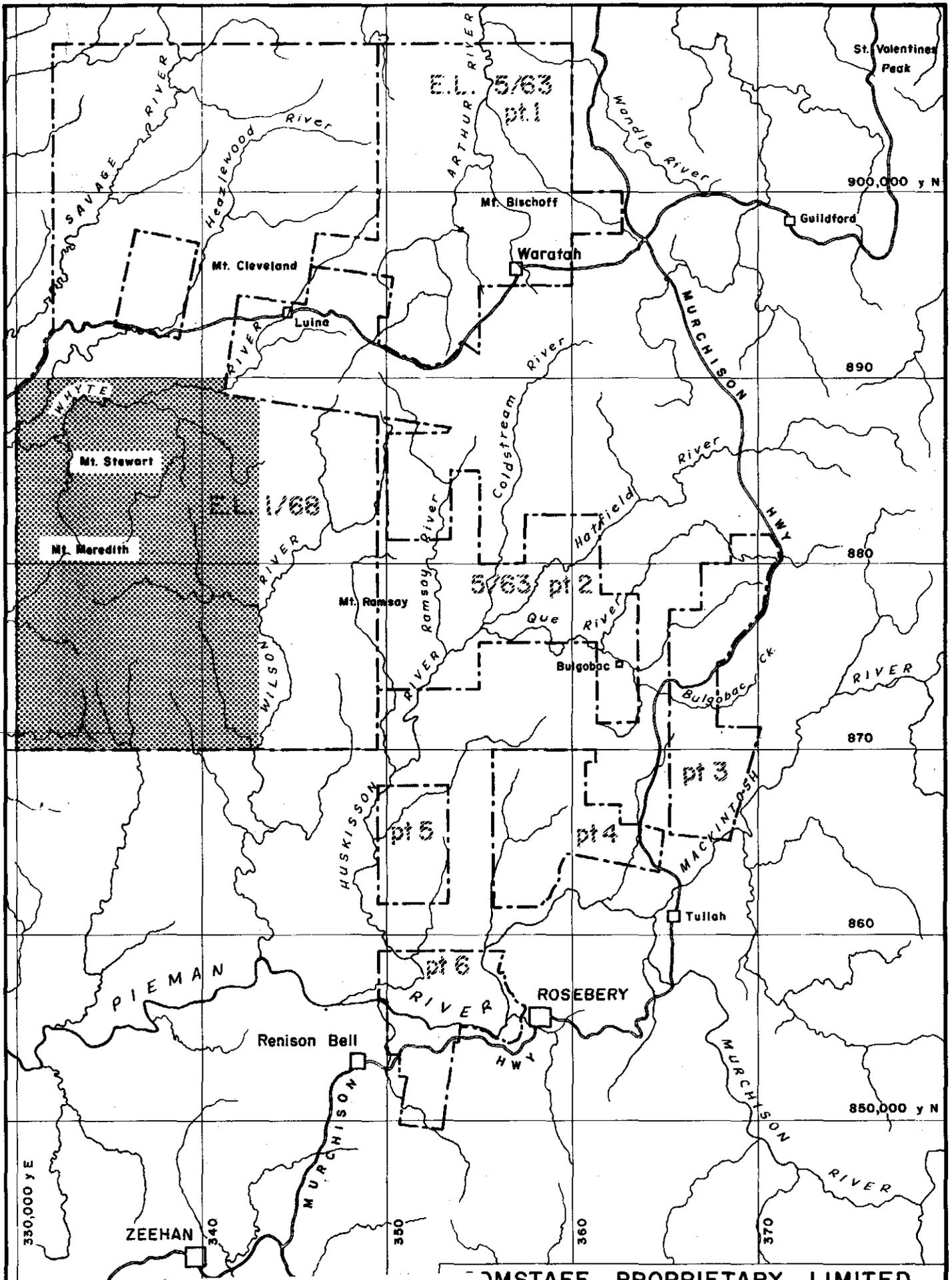
11. LIST OF PLANS

TAS 2-470	Meredith Granite Project, Location Plan, Summer Field Season 1972/1973	1:250,000
TAS 2-471	Meredith Granite Project, Geology and Grid Locations	1:50,000
TAS 2-472	Grid I Geochemistry	1:5,000
TAS 2-473	Grid II Geochemistry	1:5,000
TAS 2-474	Grid I Trench Sampling	
TAS 2-475	Grid I Geology	1:5,000

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Approved by:
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Chief Geologist.

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LOCATION MAP

681009

DRAWN MAY, 73 R. Bottomley COMPILED

SCALE 1:250,000

DWG. TAS-2-470

LEGEND

- e/s ORDOVICIAN + SILURIAN
- e CAMBRIAN
- Pc-C CAMBRIAN ? Schist
- al Alluvial prospect inside EL 1/68
- +g+ Granite
- ub Ultrabasics
- Geological boundary
- - - EL boundary



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MEREDITH GRANITE PROJECT

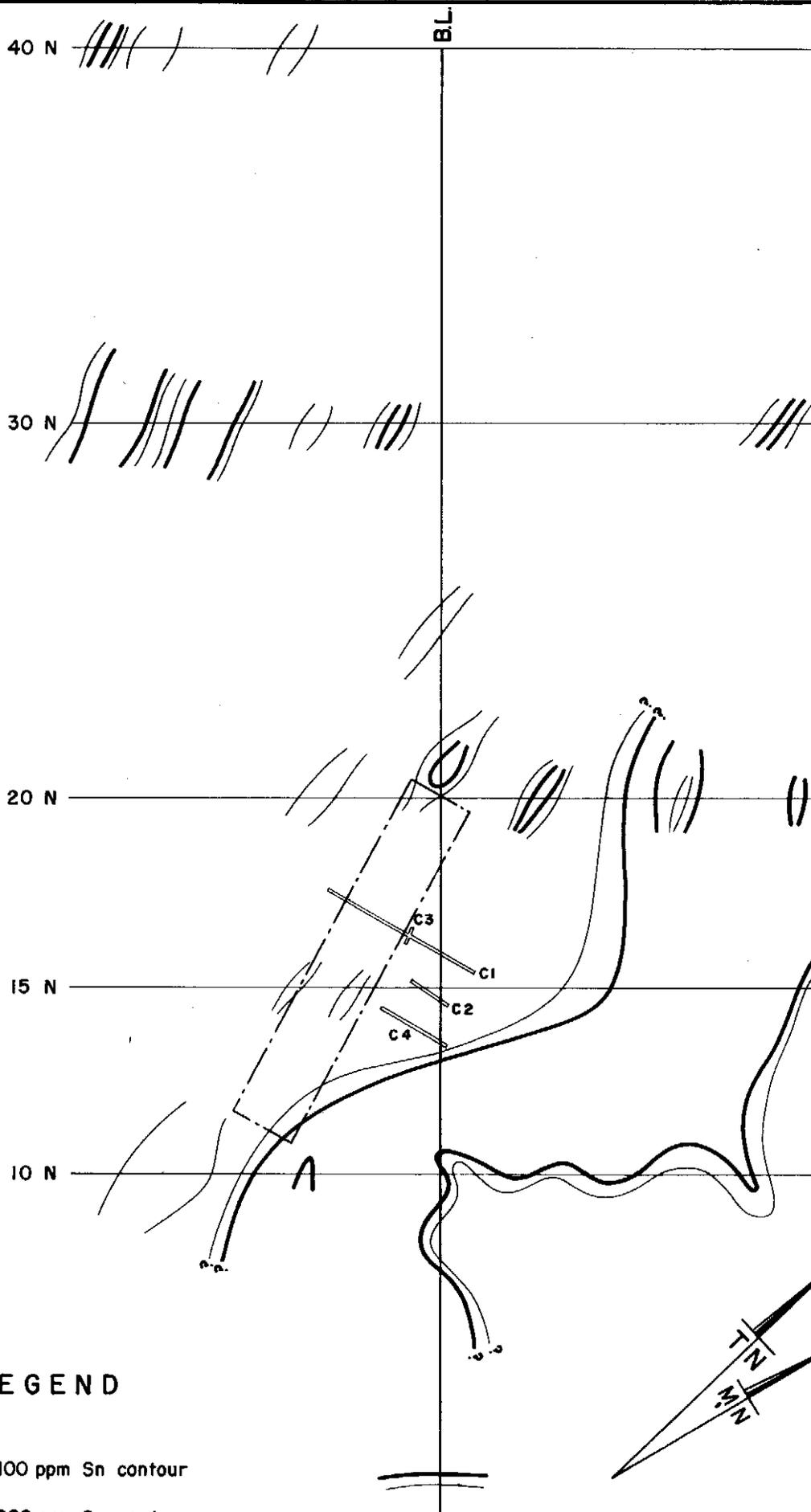
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GEOLOGY AND GRID LOCATIONS

DRAWN *R. Edwards* COMPILED G.P. SCALE 1:50,000 DWG. No. TAS-2-471
 MAY 73

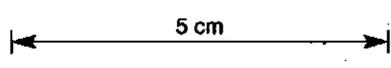
010

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LEGEND

-  100 ppm Sn contour
-  200 ppm Sn contour
-  C1 Trench
-  0.246% Sn extrapolated from trench



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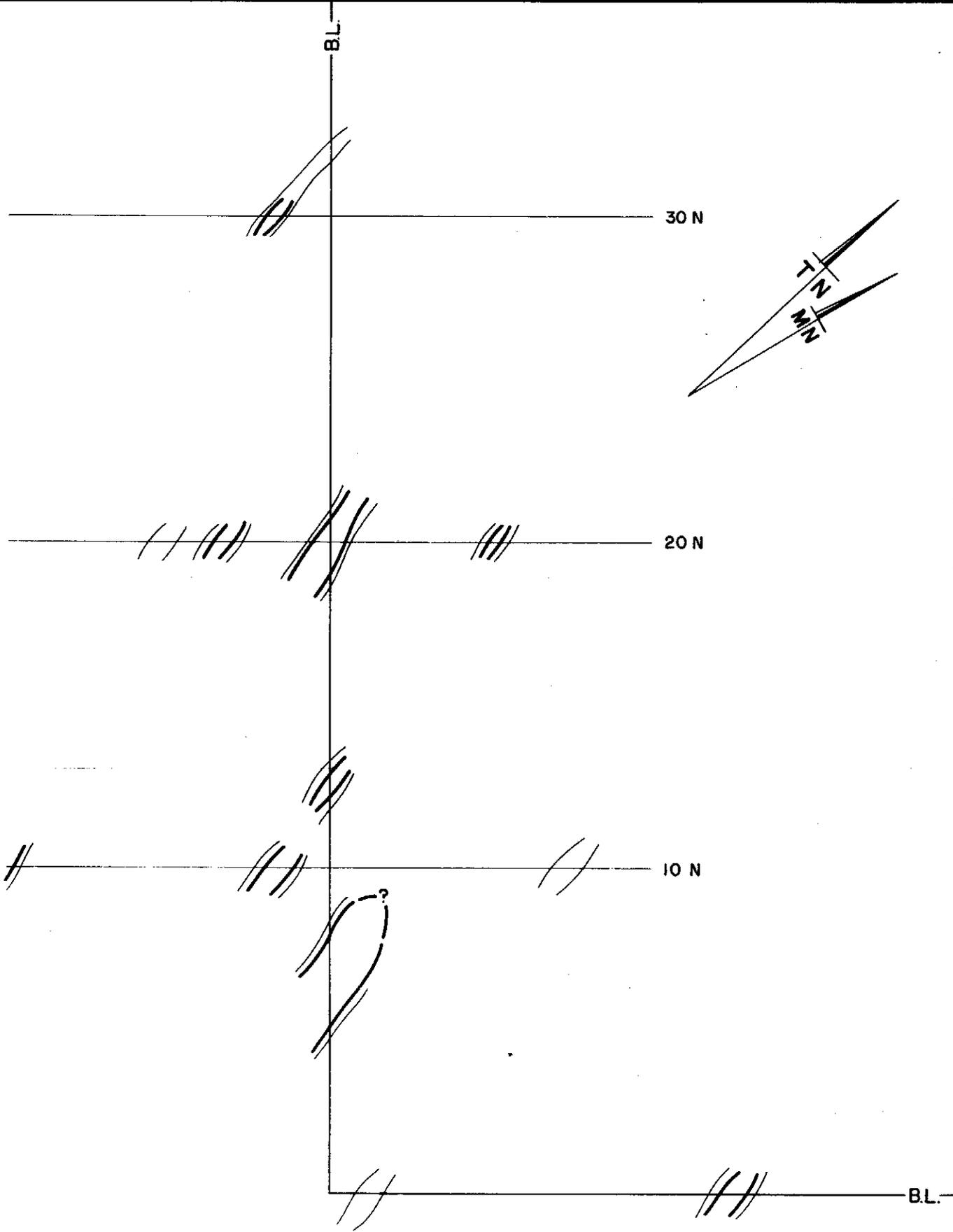
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GRID 1, SOIL GEOCHEMISTRY - Sn

DRAWN MAY 73 *R. Bateman* COMPILED G.P. SCALE 1:5000 DWG. No. TAS-2-472

011

681012



LEGEND

-  100 ppm Sn
-  200 ppm Sn

5 cm

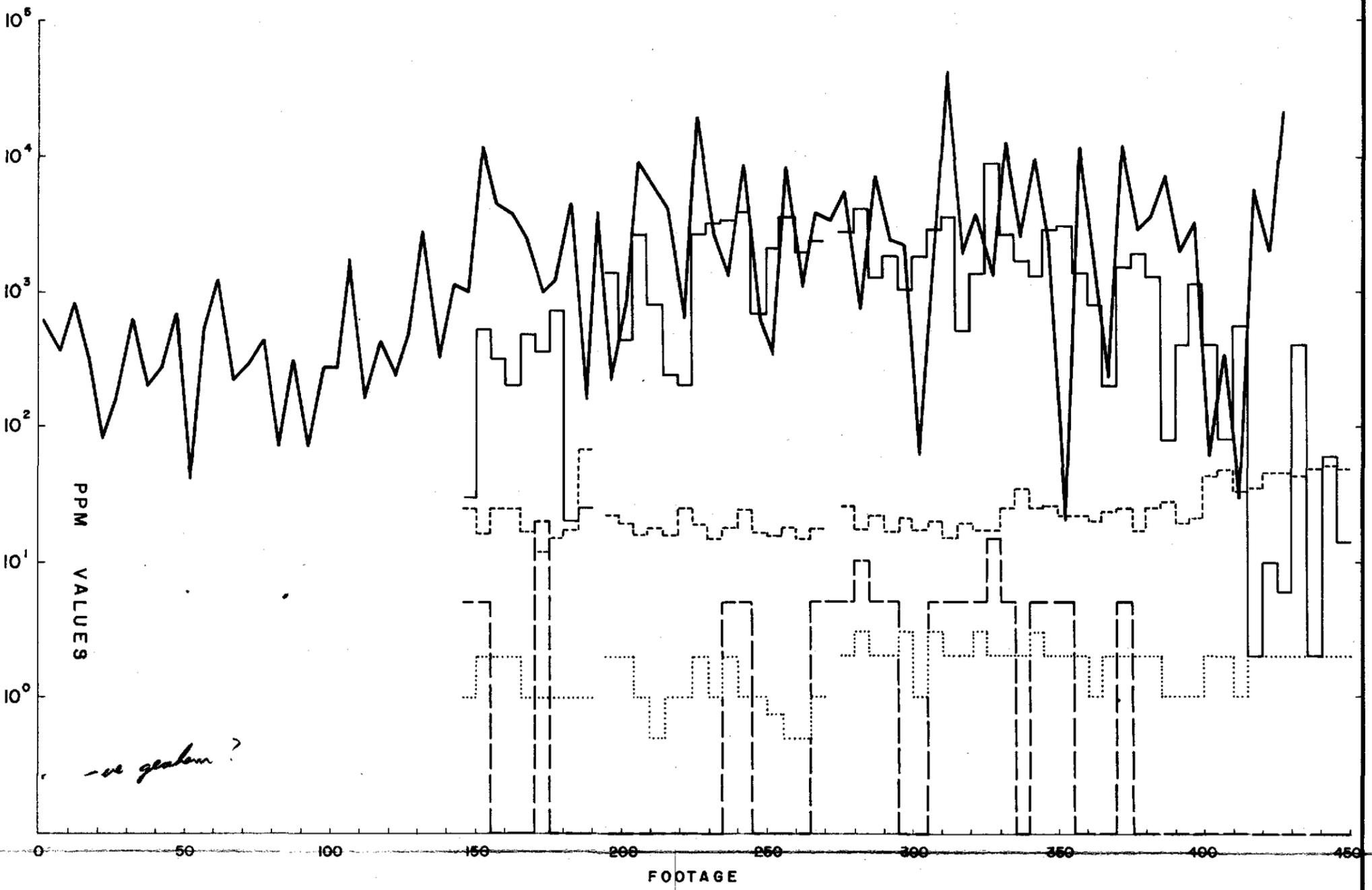
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1972/73 SUMMER SEASON REPORT

GRID 2, SOIL GEOCHEMISTRY - Sn

DRAWN MAY 73 <i>R. B. ...</i>	COMPILED G P	SCALE 1:5000	DWG. No. TAS-2-473
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LEGEND

CHIP SAMPLES

Sn - TIN

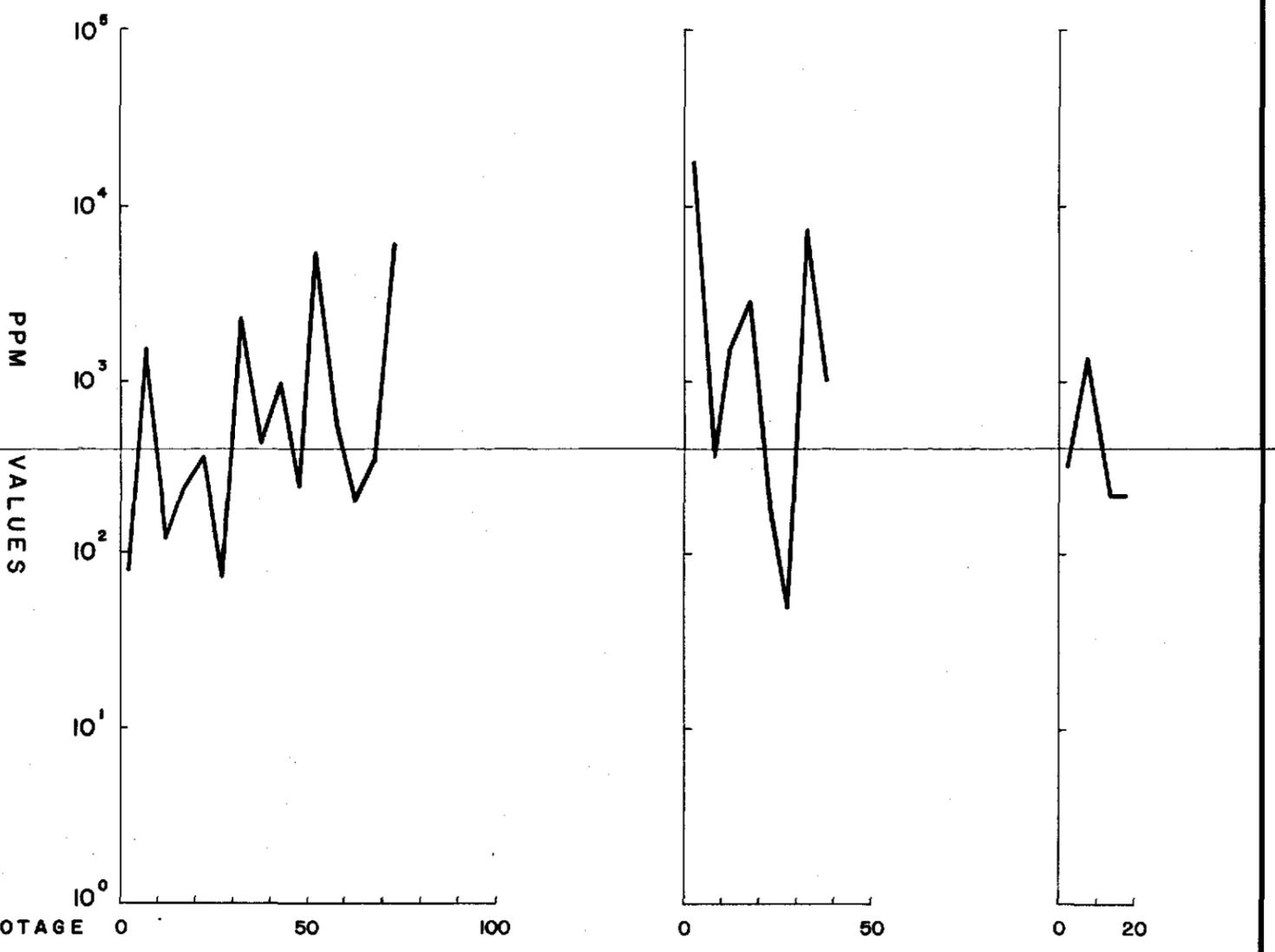
CHANNEL SAMPLES

Sn - TIN

W - TUNGSTEN

Li - LITHIUM

Mo - MOLYBDENUM



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1972/73 SUMMER SEASON REPORT

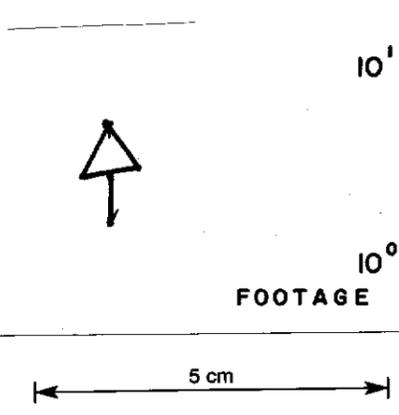
GRID 1, TRENCH GEOCHEMISTRY

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COMPILED G.P.

SCALE

DWG No. TAS-2-474



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681014

40 N

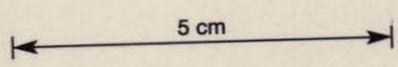
BL

30 N

20 N

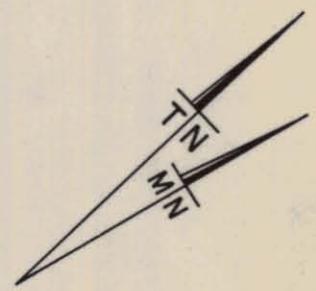
15 N

10 N



LEGEND

- gi** Biotite granite
- ge** Quartz - tourmaline - muscovite greisen
- qz** Tourmaline - quartz veins
- Observed outcrop boundary, approx.
- - - - - ? - - - - - Inferred outcrop boundary
- gs** Strike and dip of joint vein
- c1** Trench



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MEREDITH GRANITE PROJECT
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GRID 1, GEOLOGY

DRAWN MAY 73 R. Bateman	COMPILED G.P.	SCALE 1 : 5,000	DWG. No. TAS-2-475
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