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COMINCO EXPLORATION PTY. LTD.

Report to the Tasmanian Mines Dept.

Exploration Licence 1/63.

For Six Months to August 11th 1974.

by

P.G. Stuart-Smith.

Submitted on behalf of

Cleveland Tin N.L.

1.

1. SUMMARY

The main objective of the exploration programme completed in the last six months was to extend the geochemical cover of EL 1/63 in search for Cleveland type mineralisation.

To achieve this objective the following programme was planned:

- i) grid mapping and soil sampling along strike of the Cleveland mine and reconnaissance line sampling across a major portion of EL 1/63;
- ii) a combined stream sediment and water geochemical programme to cover 40 square kms of EL 1/63;
- iii) follow-up soil geochemistry on soil geochemical anomalies located by previous surveys.

The above programme was completed.

Compilation of data is either in progress or completed.

Both soil, stream sediment and water geochemical programmes produced anomalies which are not yet resolved. Some follow up soil geochemistry was completed and more is proposed.

2. INTRODUCTION

In August 1971, Cominco Ltd. acquired 54% equity in Aberfoyle Ltd. subsequently, Cominco Exploration Pty. Ltd. were appointed exploration consultants to the Aberfoyle Group of Companies, including Cleveland Tin N.L.

Lease 27 M/71 (previously 43 M/66) and surrounding EL 1/63 are 100% owned by Cleveland Tin N.L.

EL 1/63 is granted for six monthly intervals with the next renewal date being August 11, 1974.

The area is located at latitude $41^{\circ}28'S$, Longitude $145^{\circ}24'E$ and the mine township is Luina, approximately 98 km SW from the Tasmanian north coast port of Burnie.

a) Previous Exploration

Previous work including line cutting, geochemical soil sampling, geological mapping and self potential geophysics are reported by Ransom and Simpson (1973) and Sale (1974). Plates CT 112 A,B,C, are compilations of all geochemical and geological work done on EL 1/63.

b) Objectives

Based on the recognition of a mineralogical halo surrounding the Cleveland orebody, programmes of soil, stream sediment and water geochemistry were designed to test a major part of EL 1/63 for Cleveland type mineralisation. Follow up soil geochemistry was also planned to delineate anomalies located in previous geochemical programmes.

3. EXPLORATION AND DEVELOPMENTA. Reconnaissance and research

Investigation of mineralogical zoning at the Cleveland mine is continuing in the course of an M.Sc. study. The presence of mineralogical zoning, and the presence of a large anomalous Sn halo in soil around the Cleveland lode system offer useful guidelines for future exploration.

B. Prospecting

Not applicable.

C. Geological Mapping

Geological mapping was completed along 15.4 km of traverse lines cut during the 1973/74 summer season. Plates 112 A,B,C are compilations of this work and that done previously. Mapping was detailed and planned as a routine adjunct to soil geochemical sampling.

D. Geochemical worki) Soil geochemistry

Reconnaissance soil sampling, planned to complement earlier soil geochemical and geological work, was completed along strike of the Cleveland mine and across a major part of EL 1/63.

A total of 2345 samples were collected over a total line distance of 28.5 km. All samples were of submic material taken at 12.5m intervals along cut lines pegged at 25m horizontal distance intervals.

Follow-up 5m spaced soil sampling was completed on five soil geochemical anomalies located within 27M/71.

All soil samples were dried, broken down by rolling, and the -80# fraction sieved off for analysis. Analyses were by emission spectrography for Sn, As, Ag, Bi.

Currently emission spectrographic analyses are available for 1957 samples.

Atomic Absorption Spectrophotometer analysis for Cu, Zn is planned for all samples.

Results for analyses of soil samples now available are presented with previous work as a composite soil geochemical plan (scale 1:5000) showing anomalous Sn contours (refer

plates CT 112A,B,C.) Anomalous Sn to be consistent with previous work was arbitrarily taken as 50 ppm. (Hawkes and Webb, 1962 quote "average" Sn soil values as 10 ppm). Twenty six reconnaissance soil geochemical anomalies north and along strike from the Cleveland orebody are significantly lower in order and extent than those attributable to ore grade mineralisation. Previous prospecting and pitting on the western flank of Crescent Spur, indicated that most of the anomalies are due to cassiterite bearing quartz veins in mica sandstone. (Refer R.V. Sale 1974 - previous six monthly report).

Further reconnaissance and follow up soil geochemical sampling is proposed over significant anomalies. 179 reconnaissance soil samples were taken in the Magnet Dam area to locate the source of stream sediment geochemical anomalies. At present the results are unavailable.

ii) Stream sediment and water geochemistry

Following a limited but encouraging fluoride-in-water orientation around the Cleveland mine last year (refer Sale 1974) a concurrent regional programme of stream sediment and water geochemistry was planned to cover most of EL 1/63.

Approximately 43.5 square km of EL 1/63 were covered and in a total of 264 samples of sediment and water collected (average sample density 6.1/sq.km).

Moving bed load samples were taken and wet sieved on location, the -80# fraction being retained for analyses.

All samples were analysed by emission spectrography for Sn, As, Ag, Bi and further selected analyses for Cu Pb Zn are planned.

Fluoride ion content in water samples were measured using a fluoride ion sensitive electrode similar to that described by Pluger & Friedrich (1975).

Results of all emission spectrographic analyses and F^- measurements are plotted on plates CT 153-7.

Anomalous Sn has arbitrarily been taken as 50 ppm and anomalous Ag, Bi, and As, as 0.1, 1 & 50 ppm respectively. For Ag, Bi and As these are the detection limits of the spectrographic technique used.

Anomalous fluoride has been taken as 26 ppb. Unlike Sn, F^- measurements do not plot as separate populations, so threshold has been calculated statistically as two standard deviations above the mean.

Interpretation of F^- measurements has been hampered by the dilution effect of rainfall and varying Ph and stream velocity. Ph recordings and visual estimates of stream velocity indicated that F^- content increased with lower Ph and annulled by the addition of a buffer.

Eleven anomalous areas are indicated, further prospecting and soil geochemistry is proposed.

E. Geophysical Work

Nil

F. Trenching - Nil

G. Diamond Drilling

Nil

4. GEOLOGY

The basis for present geological interpretation (refer plate CT 116) is the EL 1/63 progress report for six months ending June 30th 1973.

Photo interpretation and geological traverses across previously unmapped areas in the centre of EL 1/63 have revealed a major structural discontinuity. Correlation across this implies that the Magnet Range sequence may be a continuation of, or a facies equivalent of the Deep Creek basic volcanic formation.

Consequently the Magnet Range sequence will receive greater attention in future exploration programmes.

5. FINANCE

Expenditure for the period as follows:

Geology	\$ 7,793
Surveying	5,075
Geochemistry	12,567
Tenure	203
	<u>\$25,638</u>

6. CONCLUSIONS

The 1973/74 summer field programme in covering a major portion of EL 1/63 has revealed numerous geochemical anomalies in soils, stream sediments and waters. These will require further work in the next field season. Geological mapping revealed previously unrecorded geological structures, necessitating alterations to the interpretation.

7. REFERENCES

- Hawkes, H.E. (1962) Geochemistry in mineral Exploration
Webb, J.S.
- Pluger, W.L. (1973) Determination of total and cold-extractable
Friedrich, G.H. fluoride in soils and stream sediments with
an ion sensitive fluoride electrode.
Ins.Min.Met.Proc. 4th Int. Geoch.Expl.Symp.
pp 421-427
- Ransom, D.M. (1973) Progress Report-CLEVELAND TIN NL 6 months
Simpson, D.C. ending June 30, 1973.
CEPL unpub. report for Tas. Mines Dept.
- Sale, R.V. (1974) Progress report-CLEVELAND TIN NL 6 months
ending December 31, 1973.
CEPL unpub. report for Tas. Mines Dept.

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8. ATTACHMENTS

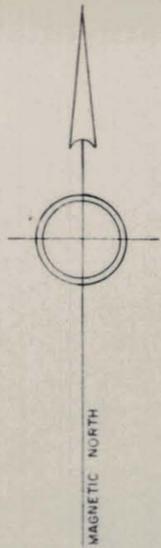
Plate CT 116	Regional Geology El. 1/63, Tasmania	1:50000
Plates CT 112 A-C	Summary maps: Fact geology and Sn soil geochemistry	1:5000
Plates CT 112 A-C	Summary maps: Geological and geochemical coverage 1973/74.	1:5000
Plates CT 133-136A	Stream geochemical plans Sn, Ag, As, Bi, F resp.	1:25000

Submitted: PG Stuart-Smith
 P. Stuart-Smith
 Geologist

Endorsed by L.V. Gentle
 L.V. Gentle
 Chief Geologist.

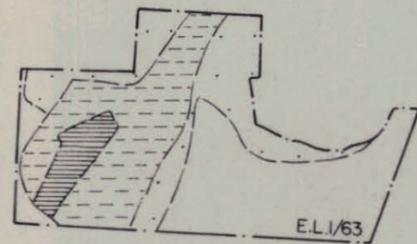
Dist: Tas.Mines Dept
 Cleveland Tin
 File 74/7

PGS-S/IMK



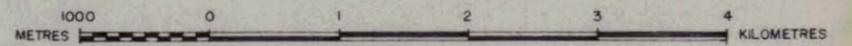
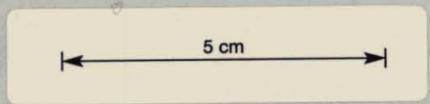
LEGEND

- TERTIARY Basalt
- DEVONIAN Granite
- PRECAMBRIAN / CAMBRIAN
 - Ultramafic rocks
 - Black argillite
 - Micaceous sandstone, volcanic arenite
 - Brown arenites, argillites and cherts
 - Basic volcanics, tuffs, lavas of spilitic composition
 - Grey shales and chert (Hall's Formation)
 - Micaceous sandstone and chert layers
- Road and track
- Creek
- Tramway
- Mine
- E.L. Boundary
- M.L. Boundary
- Geological boundary
- Fault
- 45° Dip and strike of bedding



RELIABILITY DIAGRAM

- Detailed outcrop and float/soil mapping 1:1000 scale
- 1:5000 scale outcrop mapping and detailed stream traversing
- Regional stream and ridge traversing 1:10,000 and 1:50,000 scale
- Remainder photo interpretation and regional magnetics



Scale 1: 50,000

74-1036

CLEVELAND TIN N.L.

574007

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REGIONAL GEOLOGY

E.L. 1/63

2311

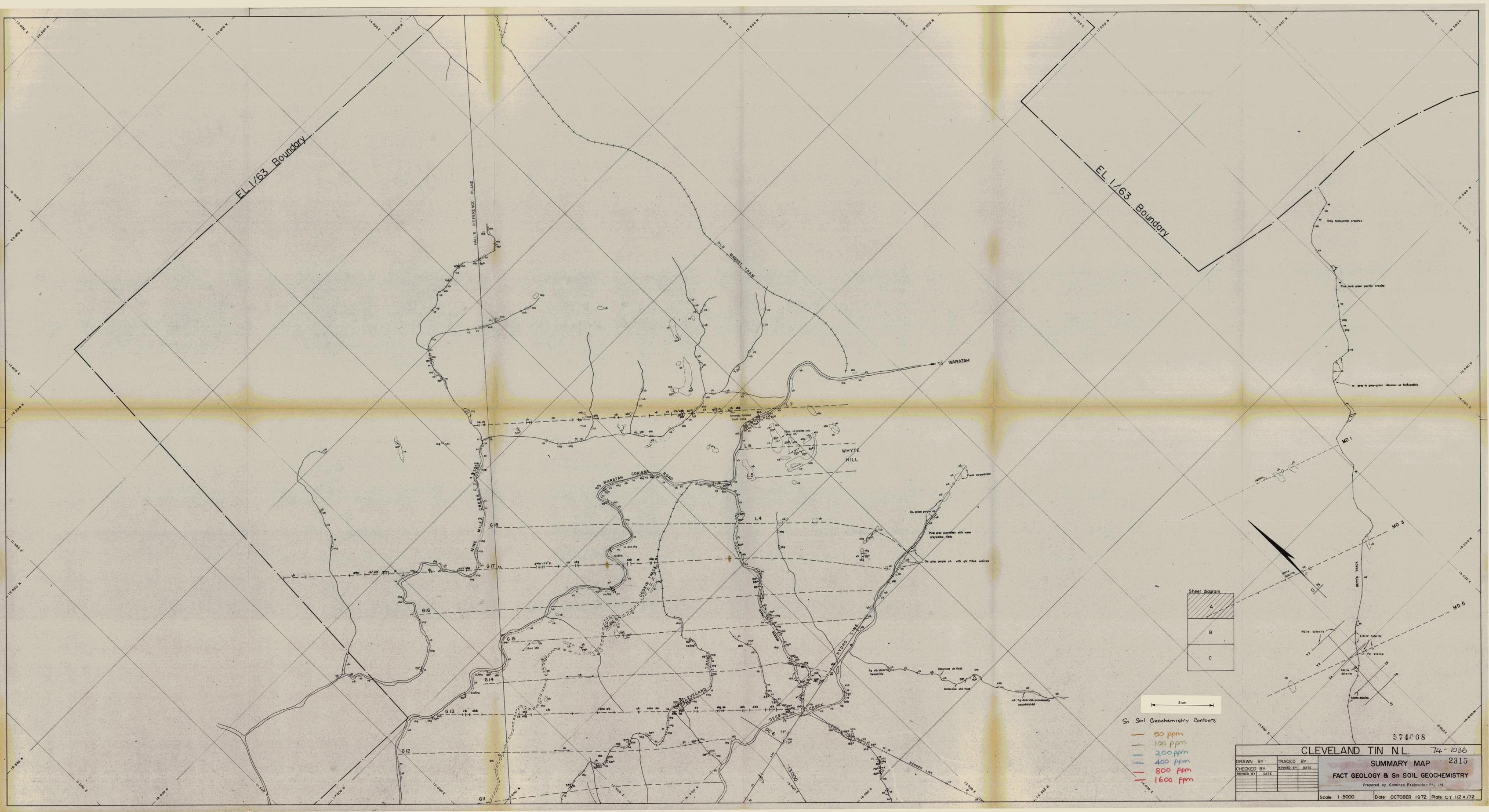
TASMANIA

prepared by COMINCO EXPLORATION PTY LTD

Scale: 1: 50,000

Date: FEBRUARY 1973

Plate: CT 116/73



EL 1/63 Boundary

EL 1/63 Boundary

HALL'S REFERENCE PLANE

OLD MAGNET TRAM

TO WARATAH

WHYTE HILL

WARATAH CORINNA ROAD

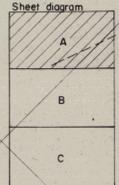
MILE CREEK

DOWNY TRAM

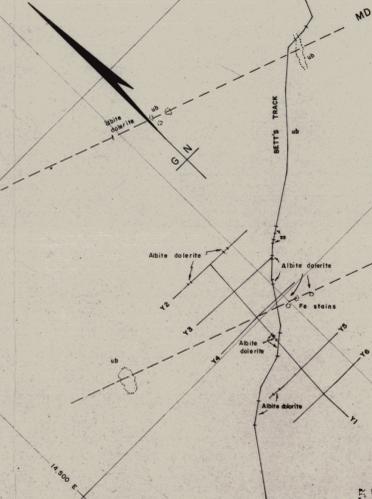
HYDRO LINE

DEEP CREEK

BADGER LINE



- Sn Soil Geochemistry Contours
- 50 ppm
 - 100 ppm
 - 200 ppm
 - 400 ppm
 - 800 ppm
 - 1600 ppm



57408

CLEVELAND TIN N.L. 74-1036

SUMMARY MAP 2315

FACT GEOLOGY & Sn SOIL GEOCHEMISTRY

Prepared by Cominco Exploration Pty. Ltd.

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CHECKED BY	REVISED BY
REVIEWED BY	DATE

Scale: 1:5000 Date: OCTOBER 1972 Plate: CT. 112 A/72



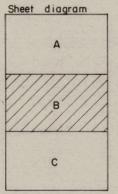
EL 1/63 Boundary

ML 27M/71

LUINA TOWNSHIP

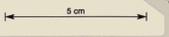
EL 1/63 Boundary

EL 1/63 Boundary



- Sn Soil Geochemistry Contours
- 50 ppm
 - 100 ppm
 - 200 ppm
 - 400 ppm
 - 800 ppm
 - 1600 ppm

574009



CLEVELAND TIN N.L. 74-1026

SUMMARY MAP 2316

FACT GEOLOGY & Sn SOIL GEOCHEMISTRY

Prepared by Cominco Exploration Pty. Ltd.

Scale: 1:5000 Date: OCTOBER 1972 Page: CT.112 B/72

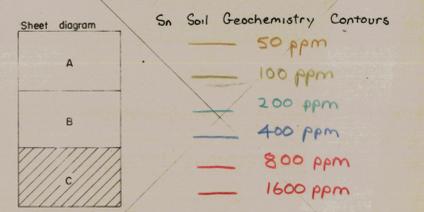
DRAWN BY	TRACED BY
CHECKED BY	REVISOR BY
REVISOR BY	DATE

LEGEND

- ss Micaceous sandstone
- vb Basic volcanic, probably lavas, spaltic mineralogy
- vt Basic tuff, includes tuffaceous shales, lithic & lapilli beds, tuff breccias & volcanic arenites
- shg Grey shale or mudstone
- shb Brown & purple shales or mudstones
- ch Chert, undifferentiated
- ub Rocks of ultrabasic affinity, includes serpentinite, pyroxenite, gabbro, dolerite, both coarse & fine grained occasionally amygdaloidal probably related to Hazelwood River Complex.
- ba Dominantly dark to black argillites containing rarer arenaceous layers & micaceous varieties

- Grid lines
- Survey Points
- Rock outcrops
- Distribution of float on grid lines
- Dips on bedding
- Dips on faults
- Dips on cleavage
- Fold axes
- Creeks with rock outcrops indicated

NOTE: Where rock type symbols are not outlined float is normally indicated. Exceptions are data plotted from regional creek traverses.



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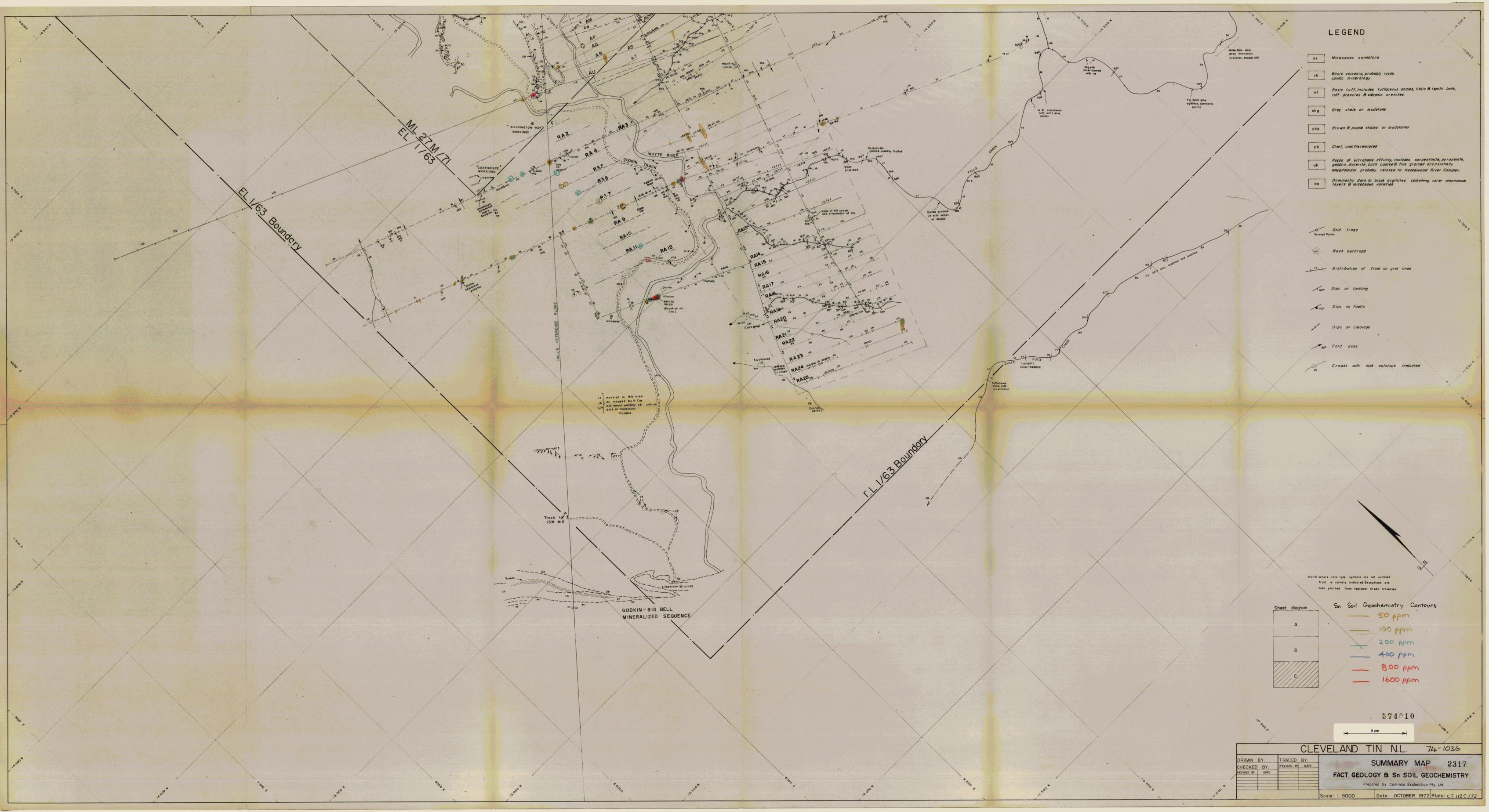


CLEVELAND TIN N.L. 74-1036

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CHECKED BY:	REVISED BY:
REVISION:	DATE:

SUMMARY MAP 2317
FACT GEOLOGY & Sn SOIL GEOCHEMISTRY
 Prepared by Cominco Exploration Pty. Ltd.

Scale: 1:5000 Date: OCTOBER 1972 Plate: C.T. 112 C / 72



EL 1/63 Boundary

EL 1/63 Boundary

HALL'S REFERENCE PLANE

OLD MARKET TRAM

TO WARATAH

WHYTE HILL

WARATAH CORINNA ROAD

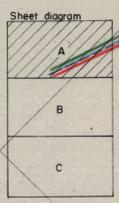
BODVY TRAM

HYOND LINE

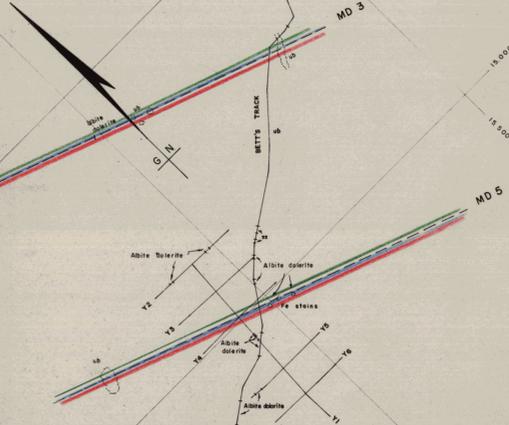
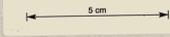
CLEVELAND

DEEP

BADGER LINE



- 5.0m soil sampling
- 12.5m soil sampling
- geological mapping
- line cutting



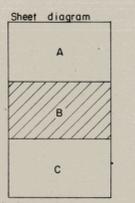
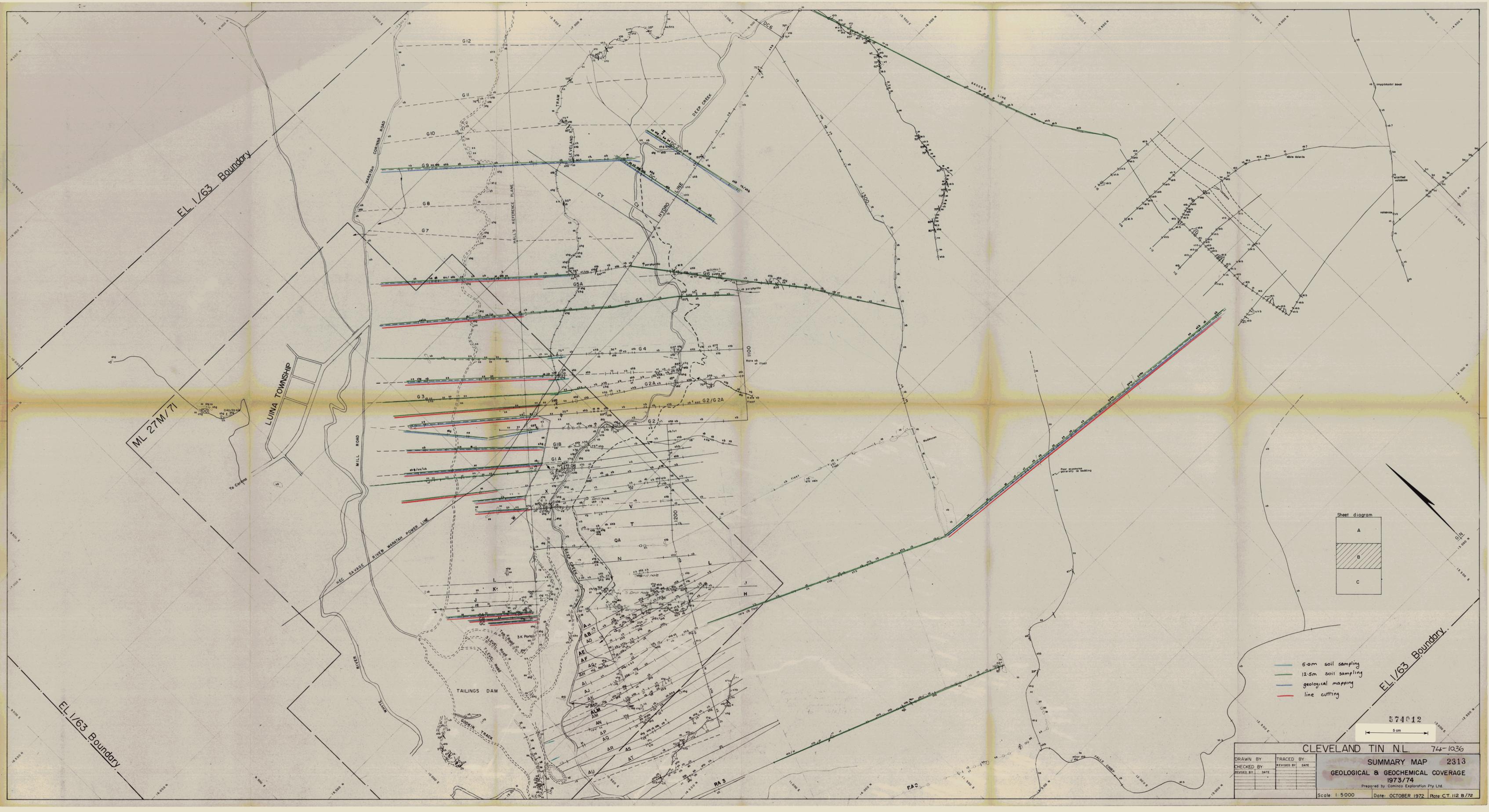
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CLEVELAND TIN N.L. 74-1036

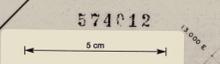
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REVISION:	DATE:

SUMMARY MAP 2312
 GEOLOGICAL & GEOCHEMICAL COVERAGE
 1973/74
 Prepared by Cominco Exploration Pty. Ltd.

Scale: 1:5000 Date: OCTOBER 1972 Plate: CT. 112 A/72



- 5.0m soil sampling
- 12.5m soil sampling
- geological mapping
- line cutting



574012

CLEVELAND TIN N.L. 74-1036

SUMMARY MAP 2313

GEOLOGICAL & GEOCHEMICAL COVERAGE

1973/74

Prepared by Cominco Exploration Pty. Ltd.

Scale: 1:5000 Date: OCTOBER 1972 Plate: C.T. 112 B/72

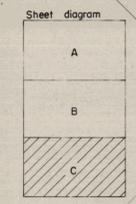
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REVISION DATE	DATE

LEGEND

- ss Micaceous sandstone
- vb Basic volcanic, probably lavas, spilitic mineralogy
- vt Basic tuff, includes tuffaceous shales, lithic & lapilli beds, tuff breccias & volcanic arenites.
- shg Grey shale or mudstone
- shb Brown & purple shales or mudstones
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- Fold axes
- Creeks with rock outcrops indicated

NOTE: Where rock type symbols are not outlined float is normally indicated. Exceptions are data plotted from regional creek traverses.



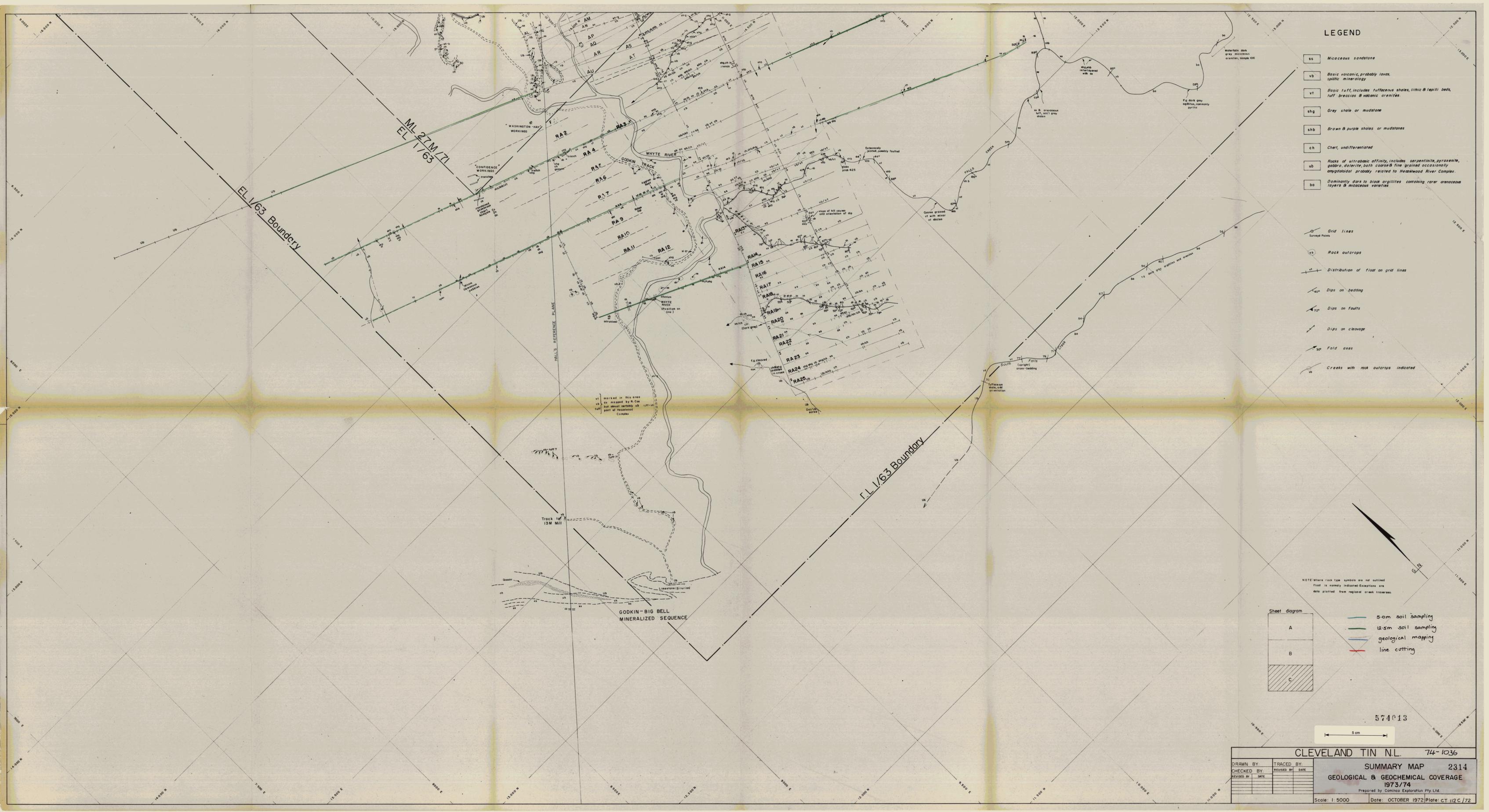
- 5.0m soil sampling
- 12.5m soil sampling
- geological mapping
- line cutting

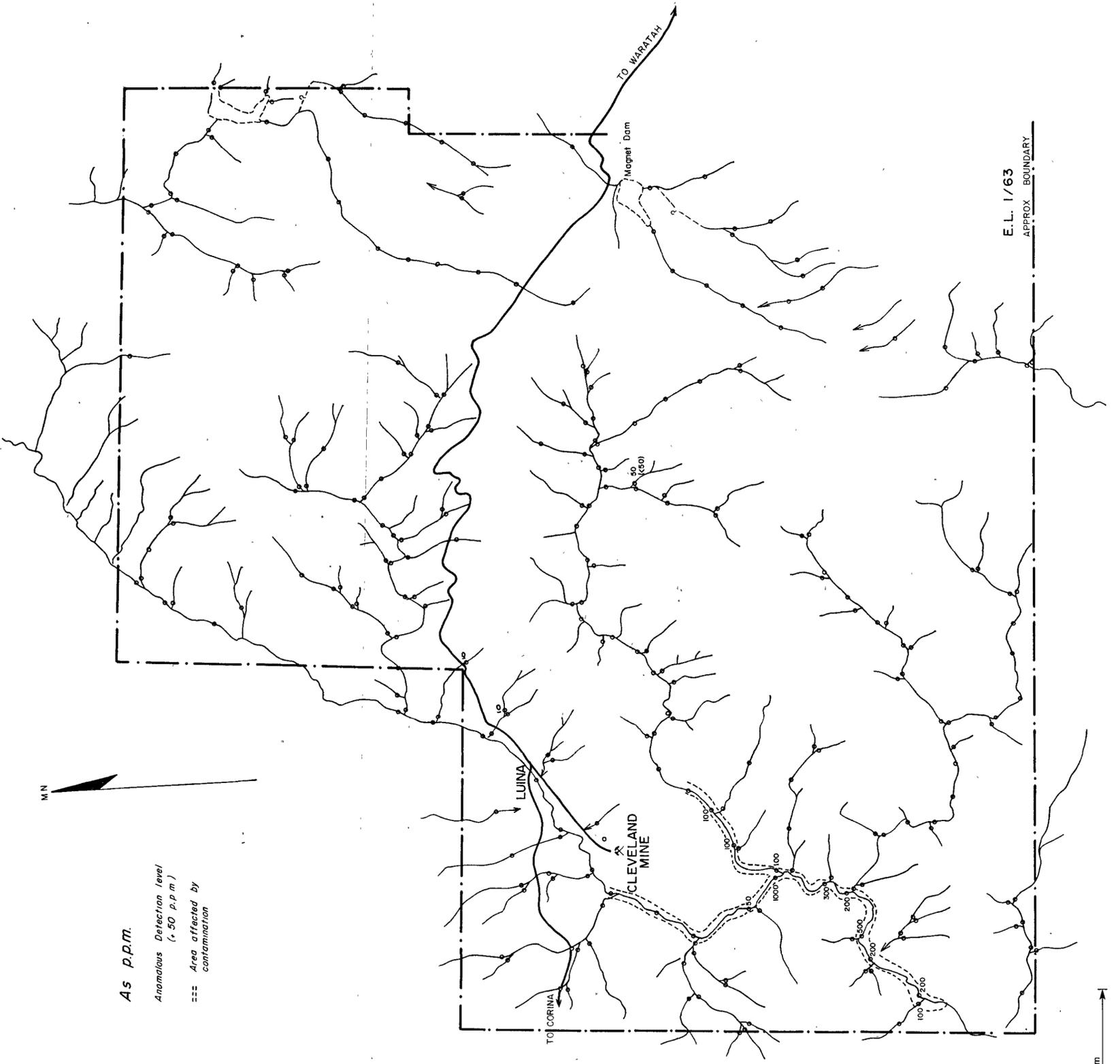


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CLEVELAND TIN N.L. 74-1036

DRAWN BY	TRACED BY	SUMMARY MAP	2314
CHECKED BY	REVISED BY	GEOLOGICAL & GEOCHEMICAL COVERAGE	
REVISED BY	DATE	1973/74	
		Prepared by Cominco Exploration Pty Ltd.	
		Scale: 1:5000	Date: OCTOBER 1972 [Plate: CT 112C/72]





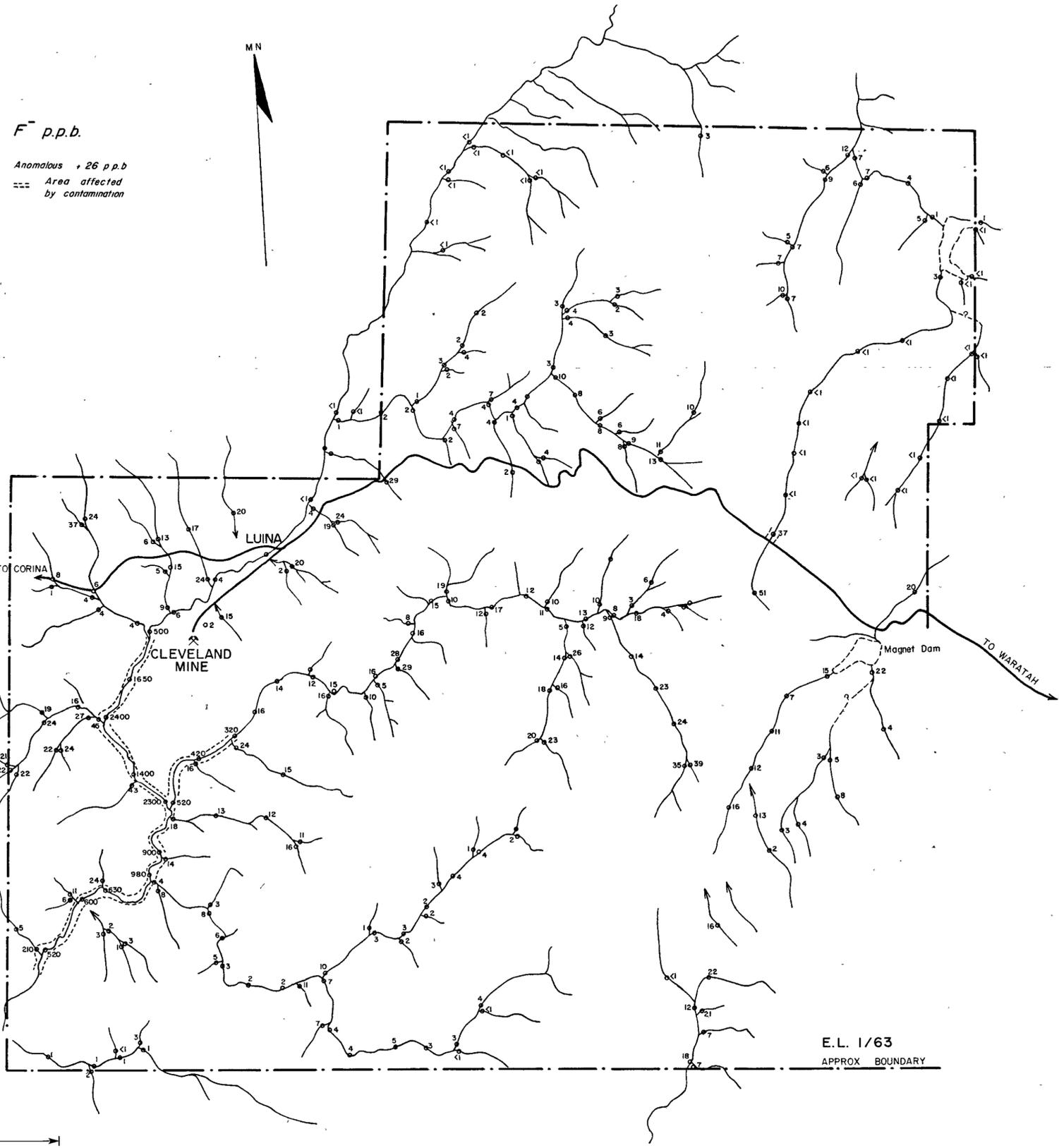
As p.p.m.
 Anomalous Detection level
 (> 50 p.p.m.)
 --- Area affected by
 contamination

E.L. 1/63
 APPROX BOUNDARY

574015

CLEVELAND TIN N.L. 74-1036					
DRAWN BY			TRACED BY P.F.		
CHECKED BY			REVISED BY	DATE	
REVISED BY	DATE				
Location code K 55/5/35			Scale 1:25,000	Date August 1974	Plate CT 134

NORTH WEST TASMANIA
 CLEVELAND TIN E.L. 1/63
 STREAM SOIL GEOCHEMISTRY 2313
 ARSENIC (p.p.m.)



F⁻ p.p.b.
 Anomalous + 26 p.p.b.
 --- Area affected
 by contamination

Location code: K 55/5/35	Scale: 1:25,000	Date: August 1974	Plate: CT 1360
DRAWN BY: P.F.		TRACED BY: P.F.	
CHECKED BY:	REVISOR BY:	DATE:	
REVISOR BY:	DATE:	DATE:	
CLEVELAND TIN N.L. NORTH WEST TASMANIA CLEVELAND TIN E.L. 1/63 STREAM SOIL GEOCHEMISTRY FLUORIDE (p.p.b.) 574018 74-1036 2322			

5 cm

E.L. 1/63
 APPROX BOUNDARY