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GEOLOGICAL REPORT

of

STANLEY RIVER AREA

MT. LINDSAY PROSPECT

SCHEDULE 6B - 1964

by

J. K. Couper

July, 1964

Attachments:

Vertical Magnetic Intensity Map No. A 119	Scale 1" = 200'
Geological & Topographic Map No. A 118	Scale 1" = 100'
" " " No. A 120	Scale 1" = 100'
" " " No. A 122	Scale 1" = 40'
" " " No. A 123	Scale 1" = 40'

SUMMARY

A gossan lode indicated to contain 740 tons per vertical foot grading 1% Sn. had been partly outlined. Further trenching, sampling and diamond drilling will be necessary.

630,000 cubic yards of Tin-Monazite bearing gravels are indicated and should be tested in due course.

INTRODUCTION

Geological reconnaissance mapping and detailed mapping and sampling of two potential ore bodies were carried out. This is in accordance with item 1 (c) of the "Proposed Geological Reconnaissance Programme for 1964 - Schedule 6 B of Mt. Lindsay-Stanley Reward Area" by J. L. Morton dated 11th December, 1963.

Items 1 (a) and 1 (b) covering the survey, magnetic-dip-needle survey and incidental topographic and geological mapping, were performed by I. R. Worth and are set out in the report dated 1st May, 1964.

A Summary Report of the geology compiled from old records was prepared by L. Cordner dated 7th May, 1964.

Prior to our interest in the area, Rio Tinto carried out sampling of the Stanley Reward Lode and performed a magnetic survey over part of the area.

LOCATION

The area surveyed is located about $1\frac{1}{2}$ miles west-south-west of Mt. Lindsay in the valley of the Stanley River.

ACCESS

Access is by jeep track north from Zeehan to the Pieman River. North from the Pieman River the track extends for 9 miles to the Stanley Reward Tinfield from which the track extends for another $3\frac{1}{2}$ miles to Mt. Lindsay.

TOPOGRAPHY

A broad flat plain occupies an area marking the contact of sedimentary rocks and the granite of the Parsons' Hood massif. The hills to the east and west rise sharply over granite and sedimentary rocks respectively. The Stanley River meets the plain at the southern end

after crossing granite country. Livingstone Creek has its source in sedimentary rocks.

EXAMINATION

Examination of the area was carried out by the writer between 13th May and 6th June, 1964. The party consisted of the writer and two assistants. The work carried out was as follows:

1. Geological Reconnaissance of the area between 10000E to 17000E; 10,500N to 12500N covered by the attached 100 scale maps, A 118 and A 120. Mapping consisted of traverses along the magnetic grid lines; deviations were made where necessary to follow contacts and areas not traversed by the grid.
2. Detail mapping and sampling of the Stanley Reward trenches, adit and outcrop between 15000E and 15700E; 12100N and 12300N, see attached 40 scale plan No. A 123. Sixty channel samples totalling 300' were prepared by breaking down to pass 1/4" screen, quartered, and duplicate samples bagged. Much of the area is covered by either alluvium or ore dumps or both. Where possible this layer was removed.
3. Detail mapping and sampling of the Magnetic anomaly areas between 11000E and 11600E; 11600N and 12100N, see attached 40 scale plan No. A 122. Twenty seven channel samples were taken from two adits, total length of channel samples 135 feet also 27 chip samples taken at 10' intervals across the outcrops.
4. Loaming: An exercise was carried out over the Stanley Reward alluvial area following the grid lines set out by Rio Tinto. Numerous dishes of wash, sand and loam were washed concurrently with the reconnaissance mapping to determine the distribution of tin values in the alluvials.

5. Survey Line A survey line to link the area with Mt. Lindsay bears grid north from Station S 105. The line is extended only to approximately 3/4 mile or 3/8 of the distance to Mt. Lindsay.

GENERAL GEOLOGY

In the area investigated, two stanniferous lode formations, consisting for the most part of limonite and haematite, form contact deposits along the boundary of the Parson's Hood granite massif and sedimentary rocks. The Stanley Reward Lode is formed in rocks of the same series as at Mt. Lindsay, the second lode to the west is formed in a different series of rocks. The two series are separated by an unconformity. Extensive shallow deposits of tin bearing alluvials consist mostly of granitic detritus, and quartz-tourmaline detritus derived from tin bearing fissure veins, one of these veins is located within the area.

The general joint pattern for the whole region can be seen on aerial photographs, one system trends 30° west of true north and the other between 20° and 50° east of true north. The iron rich emanations, which are also associated with the quartz-tourmaline veins follow the former system, generally speaking the quartz-tourmaline veins and faults tend to follow the latter system, though one large vein reported, follows the former.

STANLEY REWARD LODGE FORMATION *

An outcrop of limonite and haematite with some magnetite, caps a lode of unknown vertical extent.

The lode has been sampled and mapped in detail between 16200E and 16300E, and between 16400E and 16500E. The area between these localities has not been sufficiently tested to determine whether lode actually joins them, but from available geological data it would appear that it does. The eastern margin of lode has not been determined. The body could then be said to have a potential length of 300 feet, and

*

See Drawing No. A 123

the width is estimated to be approximately 25 feet. This represents a potential of 740 tons per vertical foot with an indicated grade of 1% Sn. Associated tin bearing clays which have been partly sluiced away extend the lode at its western limit to 50' wide.

The lode dips at an average of 70° in directions varying from 5° east of north (grid) at its western limit to 15° west of north (grid) at its eastern limit.

The rocks of the foot-wall are soft, light coloured, generally mottled grey and yellow clay and harder claystone. These have been mapped elsewhere and evidence suggests that they are of the same series of rocks as those at Mt. Lindsay.

The rocks of the hanging wall consist of fresh white clay and claystone with thin parallel tourmaline veins. This band varying in width from 10' separates the lode from the granite, the contact of which roughly parallels the lode.

The tin bearing rocks can be divided into four types:-

1. Limonitic-Haematitic Gossan This is the main lode material. It consists of hard massive limonite and haematite with occasional patches of magnetite and some pyrite.
2. Limonitic Clay Yellow-brown clay occurring mainly in the hanging wall.
3. Earthy Haematitic Gossan Red friable clayey material, may contain some hard lumps of haematitic material.
4. Limonitic Clayey Sand Yellow and brown friable sand slightly clayey to touch, developed only in the footwall at the western limit.

Distribution of Tin Values

Hard limonitic-haematitic gossan at 15,465E in trench 1 averages

- 5 -

1.349% Sn. over 26', in trench 1A at 15,485, 1.956% Sn. over 31".
At the western end in trench 3 at 15,285E, 0.837% Sn. over 20';
in trench 3A at 15,245E 0.897% Sn. over 15'; and trench 4 and
part of the adit combined at 15,215E, 1.095% Sn. over 30'.

Limonitic clay in trench 2 at 15,420 gave 0.907% Sn. over 15'.

Earthy haematitic gossan in trench 3A gave 1.777% Sn. over 15';
in trench 4, 1.81% Sn. over 5'.

Limonitic clayey sand from the adit averages for the two walls
0.418% Sn. over 15'.

Overall sections of the ore zone are from the tables 1, 2 & 3:

Trench 1	1.132% Sn.	35'	(33' True width)
1A	1.956% Sn.	31'	(20' True width)
2	0.907% Sn.	15'	(12' True width)
3	0.610% Sn.	28.5'	(25' True width)
3A	1.337% Sn.	30'	(30' True width)
4 & adit	0.778% Sn.	50'	(50' True width)

Average value 1.10% Sn.

Structural Control

The ore zone is associated with the same type of structure as the deposit at Mt. Lindsay, that is, a lens resulting from forces causing a flexure in the sediments. The shear link in the case of the Stanley Reward lode at its western end trends 20° east of true north or 24° west of grid north, this trend coincides with the regional pattern.

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Summary of Samples

Stanley Reward Lode

Table II

Sample No.	Width feet	Value %Sn.	W&V	Accum width	Accum W&V	Averages	
Trench No. 3A		15240 E					
543	5'	0.36	1.80	5	1.80	Limonitic haematitic gossan. 0.897% Sn. over 15'	
538	5'	0.95	4.75	10	6.55		
539	5'	4.38	6.90	15	13.45		
540	5'	3.13	15.65	20	29.10	Earthy haem- atitic gossan 1.777% Sn. over 15'	
541	5'	1.22	6.20	25	35.30		
542	5'	0.96	4.80	30	40.10		
	30		40.10			1.337% Sn. over 30'	
Trench No. 4		15215 E					
544	5'	1.81	9.05	5	9.05	haematitic gossan 1.81% Sn. over 5'	
545	5'	1.29	6.45	10	15.50	limonitic haematitic gossan 0.814% Sn. over 25'	
546	5'	0.47	2.35	15	17.85		
547	5'	0.52	2.60	20	20.45		
548	5'	0.33	1.65	25	22.10		
549	5'	1.46	7.30	30	29.40		
Adit. West Wall *						#	
550	5'	1.02	5.10	35	34.50		
East Wall *						#	
555	5'	1.48	7.40	40	41.90		
West Wall *						#	
551	5'	0.55	2.75	45	44.65		
552	5'	0.17	0.85	50	45.50		
553	5'	0.66	3.30	55	48.80	limonitic clayey sand 0.46% Sn. over 15'	
East Wall *						#	
556	5'	0.24	1.20	60	50.00		
557	5'	0.27	1.35	65	51.85		
558	5'	0.62	3.10	70	54.45	limonitic clayey sand 0.377% Sn. over 15'	
	70		54.45			1.095% Sn over 30'	

0.778% Sn.
over 30'

* Sampled in same band of material.

Represents average of both walls.

LODE AT GEOPHYSICAL ANOMALY AREAS. See Drawings A122 & A119

This is a limonite-haematite body, the material has a form reflecting that of radiating crystal aggregates of tourmaline and is in fact a pseudomorph after tourmaline. The body is 800 feet long, cut roughly in two by a fault, and varies in width from 25 to 100 feet.

The attitude of the body is nearly vertical, but tending to dip toward the south (grid).

The body is located entirely within sedimentary rocks, the favourable horizon, a remnant of which occurs in No. 2 adit is a clay or shale. The wall rocks consist of sandstone and shale metamorphosed in part to quartzite and slate. A band of ferruginous sandstone resulting from invasion of iron solution into the wall rocks, borders the body.

Distribution of Values

Two adits were sampled. Adit No. 1 assayed 0.173% over 60' of lode. Adit No. 2 assayed a trace only, both in lode and the associated clays. Chip samples taken across the top of the outcrop assayed nil or trace, save for one sample at 11000E 0.29% Sn.
 one " at 11400E 0.30% Sn.
 two " at 11600E 0.37% Sn.
 & 0.11% Sn.

Each of these samples represents 10 feet of lode width.

Structural Control

Localization of the lode is controlled by:

- (a) Faulting
- (b) Favourability of the country rock.

The fault, see drawings Nos. A 122 and A 118, has been inferred from the following evidence:-

1. Geophysical: The vertical magnetic intensity map, drawing No. A 119, indicates two magnetic high anomalies, each coincide with the two parts of the lode as mapped. A magnetic low exists north

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Of Station S 50 on grid line 114E.

- 2. The strike of one group of quartz-tourmaline veins in Castle's Creek, which is grid north of the area, approximates 20 degrees east of true north but may be up to 50 degrees (old records). Accepting a strike of 20 degrees, adjusted to grid north will be 24 degrees west of grid north. This coincides with the regional pattern.
- 3. The occurrence of vein quartz and angular debris of quartz-tourmaline in the vicinity of 11200E and 11600E indicates the proximity of a quartz-tourmaline vein, which may be related to the vein in Castle's Creek.

Using this data it is possible to infer a fault or vein bearing approximately 24° west of grid north at 11500E. This would in fact be the channel for the mineralizing medium.

STANLEY REWARD ALLUVIALS

A flat containing about 30 acres of tin bearing alluvials extends between 15800E and 1700E; 11500N and 12500N. See Drawing No. A 120.

The upper layers of the ground have been worked out. Panning of various sands and gravels from the worked section revealed only minor amounts of tin remain but monazite is present in larger quantities, both occur only as slimes.

In the lower reaches of the flat close to the river, the wash is generally fine granitic sand with occasional pebbles. The upper reaches of the flat contain a coarser wash for the most part consisting of pebbles of granite, tourmaline granite, and vein material with minor amounts of sedimentary rock detritus and a clayey gravel matrix.

The maximum depth of wash seen in this section is 8 feet in the water race close to Station S 20.

Surface to 2'6"	Loam
2'6" to 4'6"	Wash - mostly pebbles +3"
4'6" to 8'	Wash - mostly pebbles -3" matrix of sand & clay.

unbottomed.

The bottom of the ground was not observed, as no provision was made in this program for excavating pits or drilling auger holes. Previous records report a stiff grey coherent clay - varying from a few inches to 30 feet thick, the upper surface however, being relatively even.

Assuming an average depth of wash as 3', this is over worked ground, unworked and partly worked ground, the total possible volume of wash is 130,000 cubic yards of unknown grade.

LIVINGSTONE CREEK ALLUVIALS.

Alluvials covered by from 1 to 3' of black loam extend along the plain from 11800E to 15800E and from 11000N to 12200N. See Drawings Nos. A 118 and A 120.

The depth of the alluvials increases downstream to the east. Depths observed average 6' over granite bottom.

The wash is mostly composed of hardened slates and sandstone, but the area north of 11500N contains a good deal of quartz-tourmaline rock, granite, and granitic sand.

Tin and monazite appear in the wash, but only sparingly, the best colours occur along Livingstone Creek, and parallel the granite-sedimentary rock contact. The quartz-tourmaline stone and the tin are derived from the head of Livingstone Creek where it crosses a vein at 11600E. Monazite is derived from the granite.

South of 11500N the wash is composed entirely of sedimentary rock detritus, except for Livingstone Creek where some colour occurs due to re-working, the wash contains no tin.

The total area of probable tin bearing wash between 11800E and 15800E; 11500N and 1200N is about 54 acres of average depth about 6' i.e. 530,000 cubic yards.

CONCLUSIONS

Results of the 1964 program reveal:-

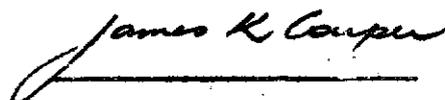
1. An ore body 300' long and 25' wide averaging over 1% metallic tin giving a potential of 740 tons per vertical foot and open on the eastern end.
2. A lode 800 feet long and 100ft. wide assaying poorly.
3. 130,000 cubic yards of sand and gravel wash, bearing tin and monazite.
4. 500,000 cubic yards of coarse wash bearing tin and monazite.

RECOMMENDATIONS

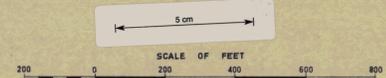
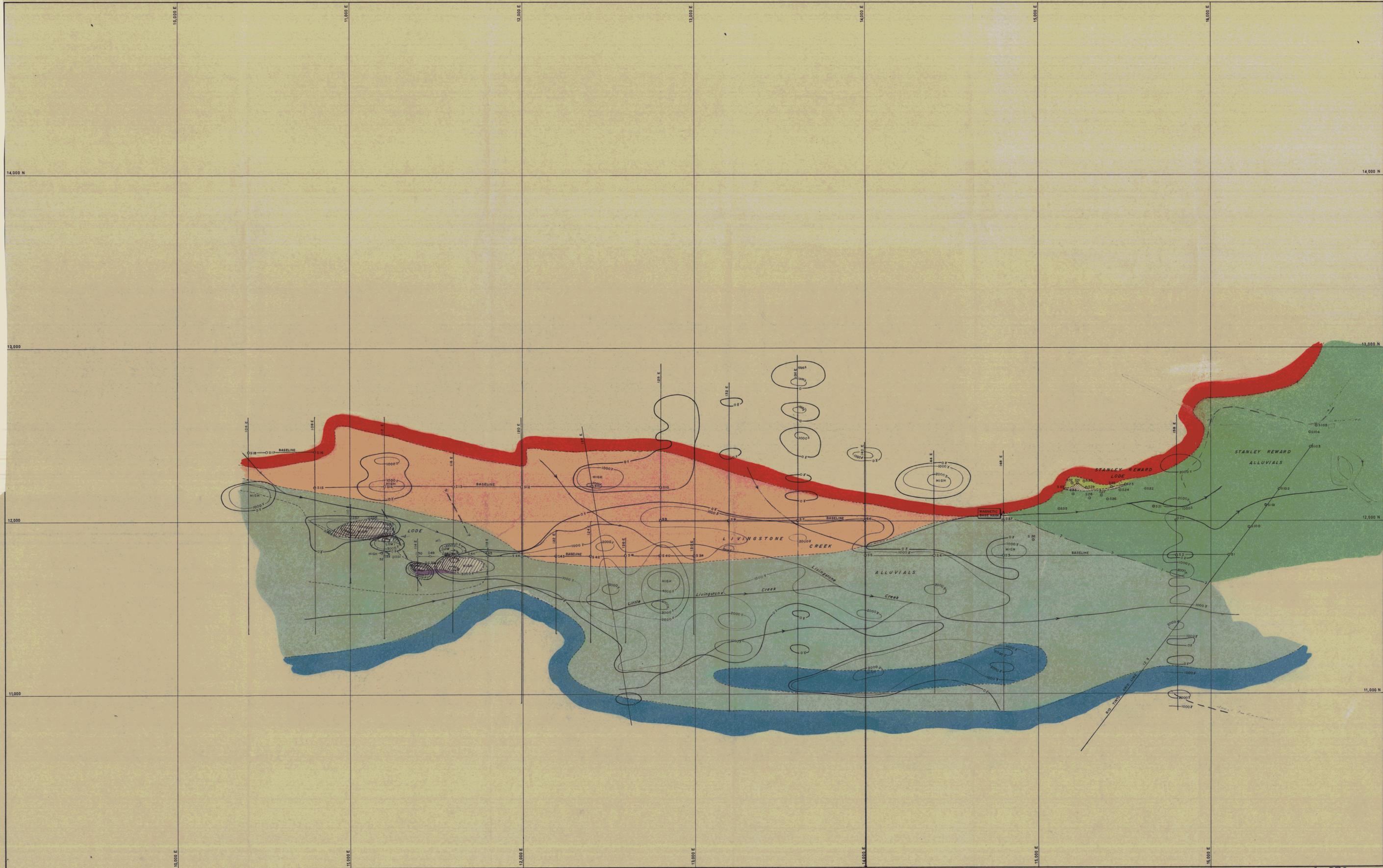
More work is necessary on the ore zone located between 15200E and 15500E to determine continuity between the two sections already examined and to test for extensions to the east. For these purposes trenches and samples should be cut at 15325E, 15350E, 15375E, 15525E, 15550E and so on. On completion of this work diamond drilling should be laid out to test for depth extensions.

Results of the second lode are not encouraging, and no further work is recommended.

The alluvials should be tested by pitting and auger drilling to assess their worth.



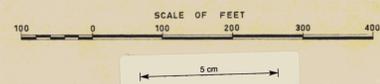
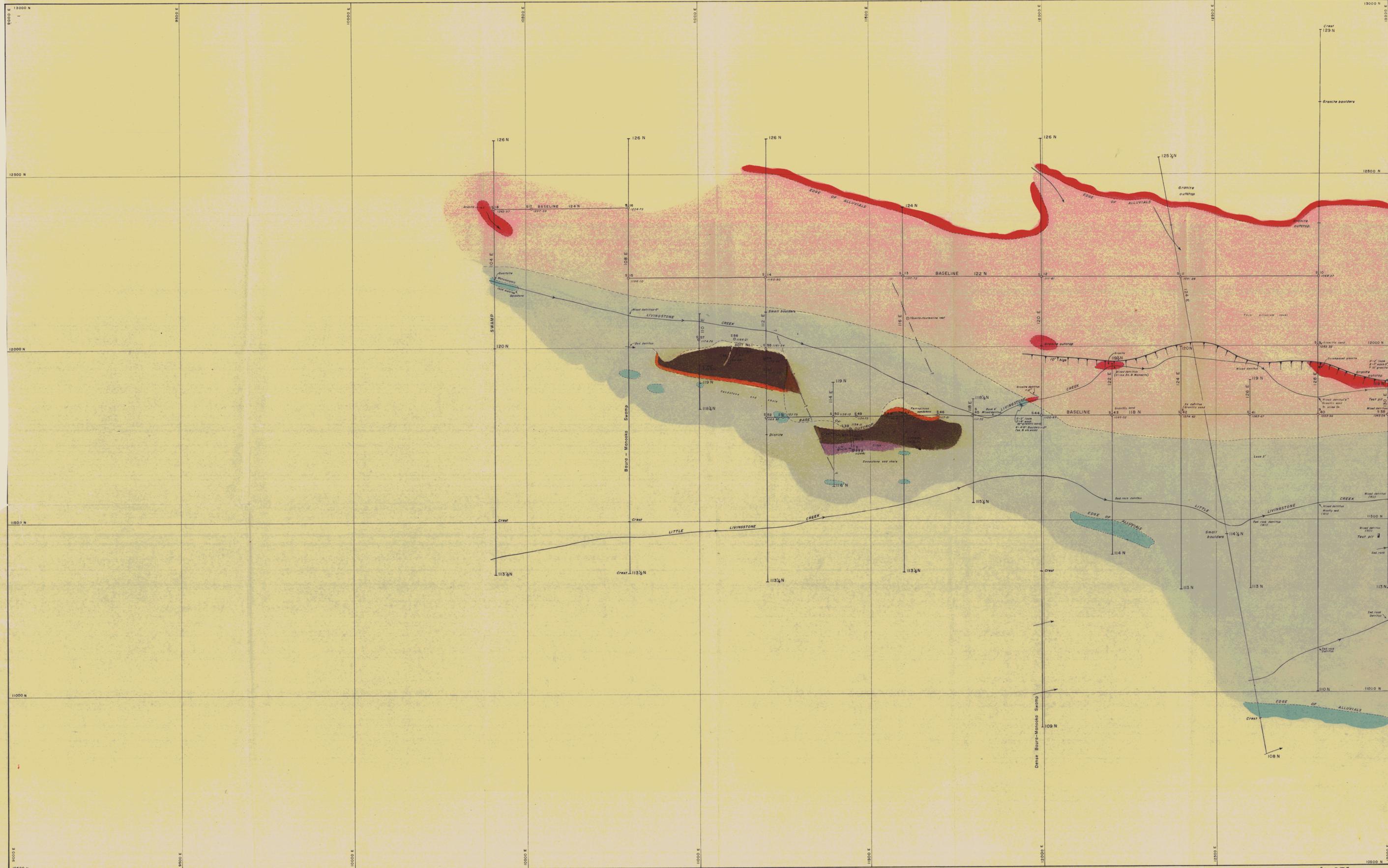
J. K. Couper



LEGEND

ABERFOYLE TIN DEVELOPMENT PARTNERSHIP
 MT. LINDSAY PROSPECT — STANLEY REWARD AREA
 GEOPHYSICAL PLAN OF VERTICAL MAGNETIC INTENSITY CONTOURS

64-376 268014
 Prepared by: J.L. MORTON
 of R.HARE AND ASSOCIATES
 Drafting by: GEODRAFTING SERVICES
 Drawn by: C.J.H. Date: _____
 DRAWING No A 119 3467



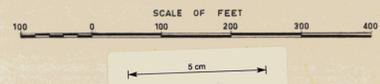
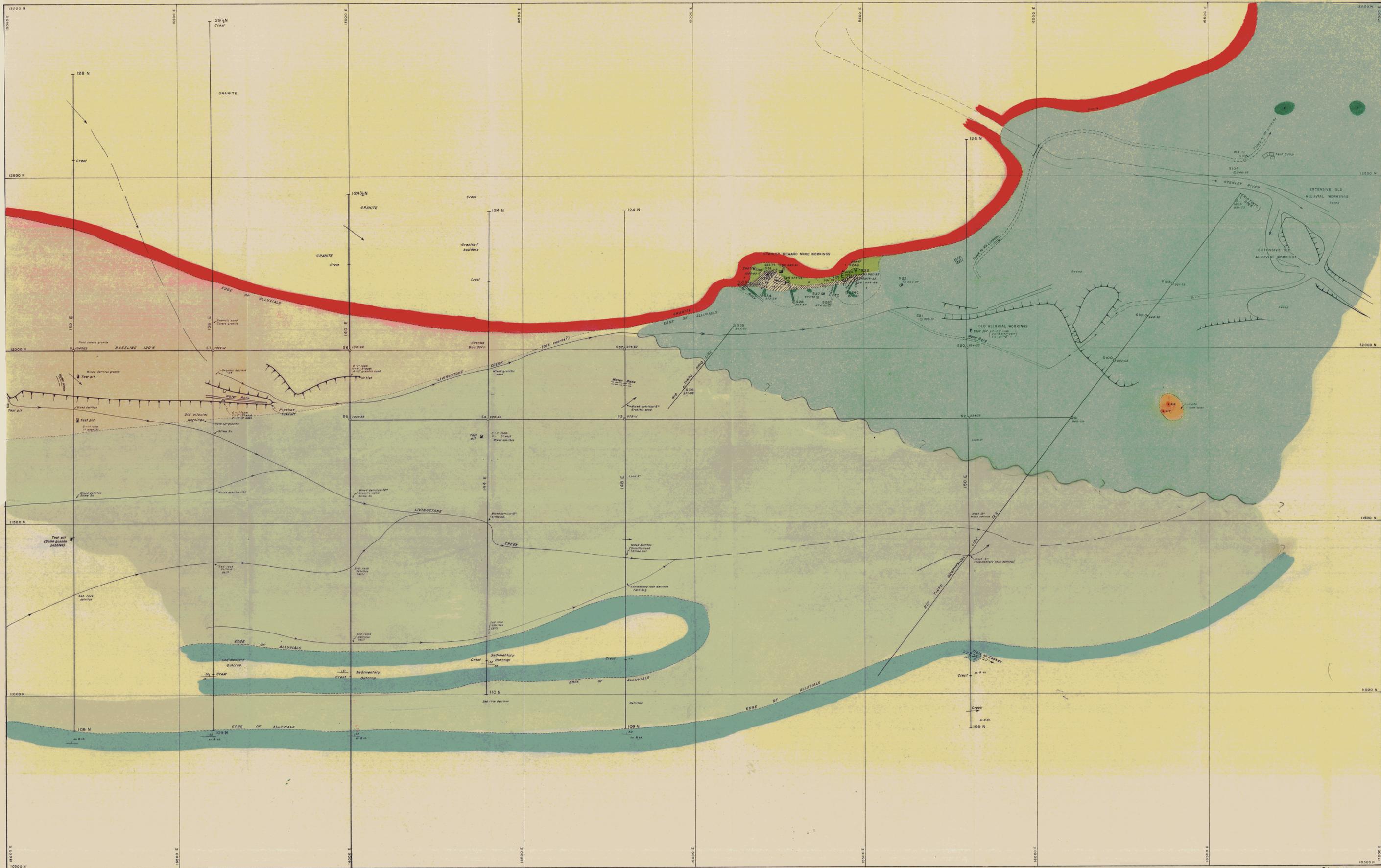
- LEGEND**
- Lithologic basement gneiss
 - Periglacial alluvium
 - Clay
 - Sandstones and shales or quartzites and slates
 - Fresh grey and yellow or white and yellow marlled clays (soft) claystones
 - Fresh white clay with ferruginous veins
 - White granite
 - Sandstones and shales or quartzites and slates

**ABERFOYLE TIN DEVELOPMENT PARTNERSHIP
MT. LINDSAY PROSPECT — STANLEY REWARD AREA
GEOLOGICAL AND TOPOGRAPHICAL MAP**

- LEGEND**
- Outline of surface opening
 - Outline of underground opening
 - Geological control position accurate
 - Geological control position approximate
 - Sink and dip
 - Fault
 - Average strike
 - Geological control position inferred
 - Sink and dip
 - Fault
 - Average strike



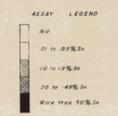
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Prepared by: I. WORTH
of R. HARE AND ASSOCIATES
Drafting by: GEODRAFTING SERVICES
Drawn by: C. J. H. Date: 26/3/15
DRAWING No. A 118 3466



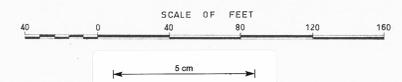
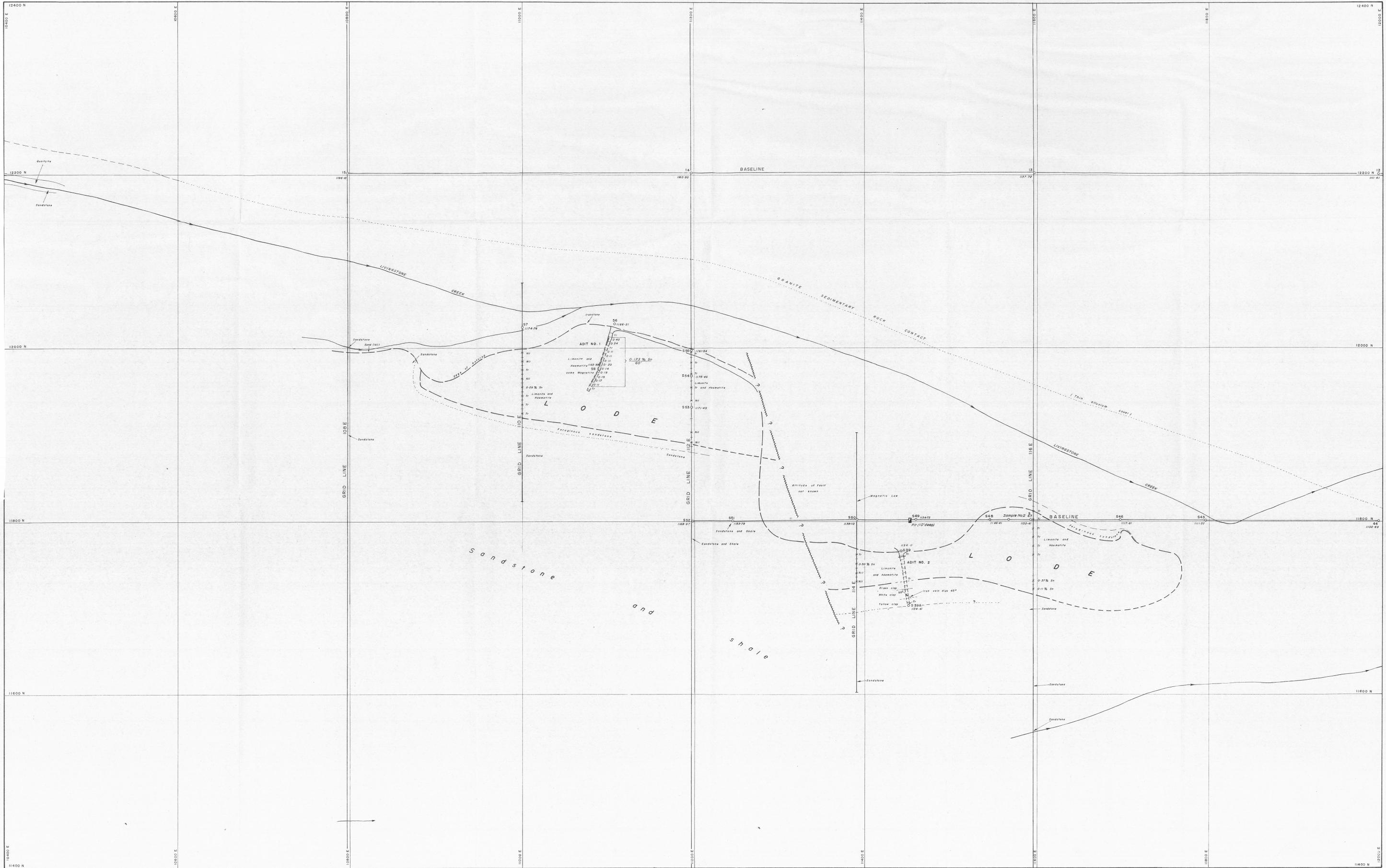
- LEGEND**
- Limonite hematite gossan
 - Limonite clay
 - Earth hematite gossan
 - Limonite clayey sand
 - Fresh grey and white to white and yellow weathered clay and/or shaly sand
 - Fresh white clay with thin silty sand
 - White granite
 - Dolerites and chert or quartzites and slates

**ABERFOYLE TIN DEVELOPMENT PARTNERSHIP
MT. LINDSAY PROSPECT — STANLEY REWARD AREA
GEOLOGICAL AND TOPOGRAPHICAL MAP**

- LEGEND**
- Outline of surface opening
 - Outline of underground opening
 - Geological contact position accurate
 - Geological contact position approximate
 - Geological contact position inferred
 - Strike and dip
 - Fault
 - Average velocity



64-37C
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DRAWING No. A. 120
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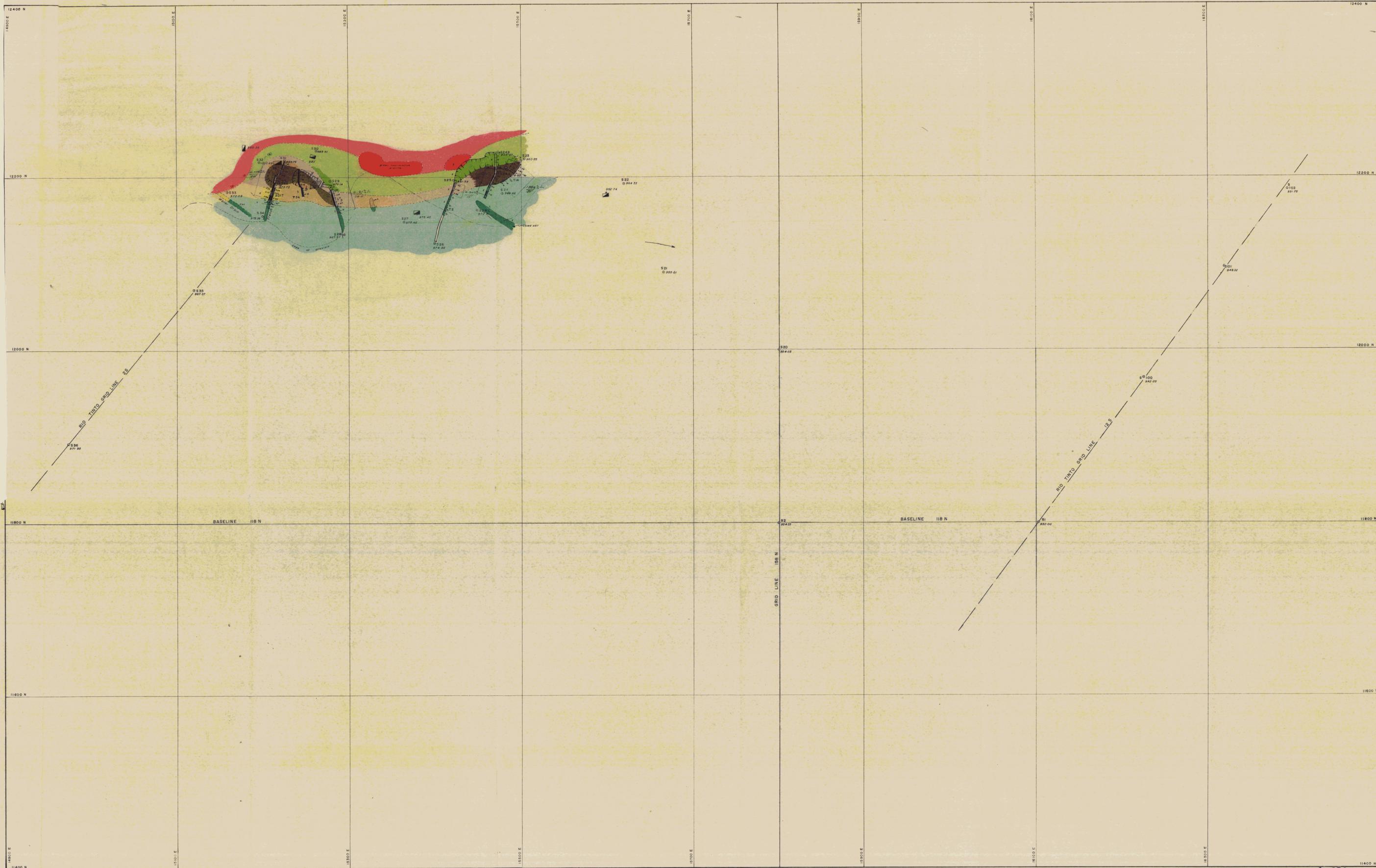
LEGEND

**ABERFOYLE TIN DEVELOPMENT PARTNERSHIP
MT. LINDSAY PROSPECT — STANLEY REWARD AREA
GEOLOGICAL AND TOPOGRAPHICAL MAP**

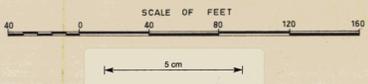
LEGEND

ASSAY LEGEND

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ABERFOYLE TIN DEVELOPMENT PARTNERSHIP
 MT. LINDSAY PROSPECT — STANLEY REWARD AREA
 GEOLOGICAL AND TOPOGRAPHICAL MAP



- LEGEND**
- Limestone karstic gneiss
 - Fresh gray and yellow or white and yellow mottled clays and/or claystones
 - Limestone clay
 - Fresh white clay with four-hole veins
 - Earthy karstic gneiss
 - White granite
 - Sandstones and shales of quartzites and limestones
 - Limestone clayey sand

- LEGEND**
- Outline of surface opening
 - Outline of underground opening
 - Geological contact position accurate
 - Geological contact position approximate
 - Strike and dip
 - Fault
 - Average slope
 - Geological contact position inferred



64-376
 Prepared by: I. WORTH
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