

000

69-570.

069001

MICROFILMED

GEOPEKO LIMITED

KING ISLAND GROUP

PRELIMINARY REPORT

on

INVESTIGATOR 2 AREA

by

N. R. KINNANE

KING ISLAND

JULY, 1969

001

CONTENTS

1. Summary
2. Recommendations
3. Conclusions
4. Introduction
5. Physiography
6. Geology
7. Geochemistry
 - a. Stream Sampling
 - b. Auger Sampling
 - c. Rock outcrop Sampling
8. Geophysics
9. Diamond Drilling
10. References

APPENDIX

Diamond Drill Logs - D.D.H. 149
D.D.H. 150
D.D.H. 160

Rock Sample Analyses

ACCOMPANYING PLANS

- GI2 - 1 Geological Interpretation Plan
- GI2 - 2 Regional Photo-mapping - None-Geological
- GI2 - 3 Geochemical Results - Nickel
- GI2 - 4 Geochemical Results - Tungsten - Molybdenum
- GI2 - 5 Geological Cross-Section - Diamond Drilling
- GI2 - 6 Rock Outcrop - Stream Sample Localities

002
1. SUMMARY

Outcrops of "Mine Series" rocks have been noted some 4 miles south-west of the No. 1 Orebody at King Island in a granite contact aureole formally known as Millers Block Area.

Regional Photo-mapping, geochemical auger, stream and rock outcrop sampling and a preliminary geophysical study have been made of the area. Three diamond drill holes as part of a diamond drilling programme proposed in 1956-1957 have been drilled on a section line cutting across the centre of the area.

2. RECOMMENDATION

Further work is recommended on this area. Follow up geological mapping and further auger drilling are recommended before any further work is to be proposed. Geophysical results are as yet not to hand, these may have a great bearing on further exploration programmes.

Further diamond drilling will be required at a later date. The location of drill holes will be dependant on the results of additional auger drilling proposed above.

004

3. CONCLUSIONS

GEOLOGY.

Mineralised "Mine Series" rocks carrying appreciable quantities of sulphide minerals and minor amounts of scheelite occur in this area. Geochemical results and geological evidence appear to indicate that there is every possibility of economic tungsten mineralisation in this area.

GEOCHEMISTRY

Soil samples obtained at bedrock indicated an almost complete absence of molybdenum and minor anomalous tungsten values. Some high nickel values were obtained. These are attributed to groundwater movement away from the nearby volcanics.

Stream sampling conducted some eighteen months ago on the two stream systems draining Investigator 2 to the east and west was inconclusive. The positions at which samples were taken are not accurately recorded. Assays were not attempted and only a visual estimate of the scheelite content was made using an Ultra-Violet lamp. Rock outcrop sampling proved particularly useful. In general sampling was restricted to ironstone areas. Manganese values were very high as were values for the rare earth and Group V elements. This in many ways corresponds to assays performed on material from the No. 1 Orebody.

GEOPHYSICS.

A ground magnetometer survey was conducted by Mr. R. Richardson of L. A. Richardson and Associates. Results of this survey are not available as yet.

DIAMOND DRILLING.

Three drill holes were put down on this area in 1956-57 as a result of a field survey by K. Callow (the then Geologist with King Island Scheelite (1947) Limited. Poor documentation and low core recovery are major drawbacks in interpreting these results. These holes have however proved the presence of garnet bearing "Mine Series" rocks.

4. INTRODUCTION

During the summers of 1967-1968 and 1968-1969 photo-geological mapping of the Investigator 2 area was carried out by Geology Vacation Students under the supervision of the Geologist (King Island Scheelite (1947) Limited). As a result of this mapping a geochemical sampling programme was carried out over the area.

Work done previously to this survey is poorly documented, the only records being a geologic cross-section based on the diamond drilling done and a report by K. J. Finucane (1956) which refers briefly to this area.

The area is currently held as part of Exploration Licence No. 15/66 by King Island Scheelite (1947) Limited. A portion of the Investigator 2 area is currently held by the same company under Special Mining Leases P/M 469, P/M 470, P/M 471, P/M 472 (Plan GI2 - 2)

5. PHYSIOGRAPHY

The Investigator 2 area occupies one of the highest areas on King Island with Mt. Stanley in the north-west corner of the area rising to 700 feet. The area is generally flat and dissected to the east and west by short deep valleys lined with thick tea-tree scrub. To the east the streams run onto the granite and to the west onto a flat low lying area of swamp land known as Colliers Swamp.

The elevated block which comprises the bulk of the Investigator 2 area is composed in the main of Cambrian rocks of which the "Mine Series" forms part. Older Pre-Cambrian rocks lie to the west and a Devonian granite stock to the East.

007

6. GEOLOGY

Regional photo-mapping on a scale of 1 inch:1,000 feet was conducted over this area and used as a basis for the geological interpretation plan (GI2 - 1) of the area. Photo-interpretation was used to delineate faulting and fault lines and use was made of previous mapping in particular that of K. Callow (1956) as illustrated in the report by K. J. Finucane (1957).

The area comprises a sequence of rocks locally known as "Mine Series" and of probable Cambrian age. These appear to be conformably overlain in the east by a series of Cambrian volcanics and pyroclastics. These rocks are intruded in the east by a large body of granite of Upper-Devonian-Carboniferous age. The boundary to the west is ill-defined but appears to be faulted from both topographic and photo-interpretative evidence.

"Mine Series" (Cambrian)

The "Mine Series" rocks particularly the pyroxene-garnet hornfels form the central zone of the Investigator 2 area (GI2 - 1). They strike slightly east of north and dip into the granite in the east. They are displaced by a series of cross-faults trending east-west into the granite (GI2 - 1).

In the West the "Mine Series" appears to be underlain by a quartzite-shale sequence which may correlate with the known quartzite-shale sequences in the Investigator 1 and No. 1 Orebody areas. The presence of breccia zones at the western boundary may indicate that the boundary is a faulted junction.

Lying between the quartzite and the pyroxene-garnet hornfels is a band of "Mine Series" rocks capped by ironstone. This may be equivalent to the ore sequence of the No. 1 Orebody; further field studies are needed to establish this fact.

Granite (Upper Devonian)

To the east of Investigator 2 lies a large granite stock. In drill holes D.D.H. 150 and D.D.H. 160 the relationship of the stock to the "Mine Series" sequence is illustrated (GI2 - 5).

6. Geology (Contd.)

Recent Alluvium

Recent Alluvium covers the major part of the area. In the main it consists of a thick sandy topsoil underlain by as much as seventy feet of clay. In some areas both these zones are absent and give way to ironstone and quartz gravels.

Scattered throughout this topsoil are floaters and sub-outcrops of the various rock types present in the area. Actual rock outcrops are rare.

7. GEOCHEMISTRY

a. Stream Sampling was carried out on the streams draining this area both to the east and to the west (GI2 - 6). A visual determination of the scheelite content was made using an Ultra-Violet lamp and no assays were determined. Plan GI2 - 6 illustrates the localities at which the samples were taken and relative estimates of scheelite content as made by T. Scott, Geologist with King Island Scheelite (1947) Limited. The results of this survey are inconclusive and a further controlled and properly analysed stream sampling survey should be considered.

b. Auger Sampling. 274 holes totalling 9730 feet were drilled on the Investigator 2 area using two Gemco drill rigs. Due to wet ground conditions the programme was interrupted for a short period.

Sampling and drilling techniques were based on previous experience on the Investigator 1 area. Using the Investigator 1 success as a basis it was decided that soil samples should be assayed for only Mo, W and Ni. All samples were taken at bedrock or at the limit of drilling. Two samples were taken, one being retained and the other assayed by McPhar Geophysics. Molybdenum values were in general very low if not negligible with only a few anomalous spot high's occurring. This would tend to indicate that, whereas on the Investigator 1 area, molybdenum is present in sufficient quantities to give rise to anomalies, such is not the case on Investigator 2. The placement and lack of intensity of molybdenum values suggests that they may be associated with granite dykes. Leakage along faults as at Investigator 1, of molybdenum derived from the mine sequence is negligible.

Tungsten values were in general low (GI2 - 4) although anomalous values were obtained. These areas of anomalous values will require further closely spaced follow-up auger drilling to properly delineate diamond drill prospects. Nickel values were in general very high, this being attributed to groundwater movement down and away from the nearby and slightly elevated volcanics. This would account for the spread of high nickel values onto areas known to contain sedimentary rocks.

c. Rock Outcrop Sampling. During field mapping any outcrops of interest were sampled and these samples set to McPhar Geophysics for assay. The results of this survey are appended and a locality plan (GI2 - 6) is included. Of particular interest are the high values shown by the rare earth elements and in particular by the Group V metals.

7. Geochemistry (Contd.)

From the amount of sulphide minerals present in the rock outcrops this is to be expected. The rare earths are found in appreciable quantities in the No. 1 Orebody so that a similar environment appears to exist in this area. High manganese values are directly attributed to the ironstones present in the area and may be attributed to the possible presence of garnet in these rocks. This fact will have to be determined by further field study.

8. GEOPHYSICS

During January, 1969, Mr. R. Richardson of L. A. Richardson and Associates ran a series of ground magnetometer lines across Investigator 2. Results of this survey are not as yet to hand.

9. DIAMOND DRILLING

Previous to the field work described, King Island Scheelite (1947) Limited drilled three diamond drill holes in this area (GI2 - 5). These holes were drilled during 1957 and over the intervening period due to poor documentation much of the information gained from these holes has been lost.

The diamond drill logs for these holes are appended.

10. REFERENCES

- a. EDWARDS, A.B., BAKER, G. and CALLOW, K.J. (1956)
Metamorphism and Metasomatism at King Island
Scheelite Mine. Journal, Geological Society of
Australia.
- b. FINUCANE, K.J. (1956)
Report on King Island Scheelite Mine, Grassy,
King Island. Company File.
- c. HORN, C. (1968)
Report on Geochemical Sampling at Bold Head, King
Island. Company File.
- d. KINNANE, N.R. (1968)
The Geology of the Metamorphic and Metasomatic
rocks at the King Island Scheelite Mine, Grassy,
King Island, Tasmania. Company File. (Unpublished)
- e. NYE, P.B. & KNIGHT, C.L. (1943)
The King Island Scheelite Mine Mineral Resources
Survey, Bulletin No. 11, Geological Series No. 2,
Department of Shipping and Supply.

DIAMOND DRILL CORE LOG - HOLE No. 149

Location - Millers Block - Red Hut Road
 Final Depth - 319 Feet
 Dip - -45°
 Co-Ords. - 7100S, 1985W, Approx.
 Bearing - 270°

Footage		Length		Description	Assay	
From	To	Run	Rec.		WO ₃	Mo
0	40'	40'	-	Clay:- with small boulders of agglomerate.		
40'	47'	7'	-	Clay:- with brown slate and agglomerate.		
47'	59'	12'	8"	Agglomerate:- highly weathered.		
59'	90'	31'	9.25'	Agglomerate:- highly weathered fine grey and greenish rock.		
90'	94'	4'	4'	Calcite-garnet Hornfels		
94'	100'	6'	3'	Garnet Hornfels:- honey combed and weathered garnet quartz rock with no evidence of calcite.		
100'	173'	73'	1.25'	Soft mud and sand - rock rare.		
173'	184'	11'	-	Quartzite:- fragments of hard dark grey rock with modules and veins of pyrite.		
184'	192'	8'	-			
192'	206.5'	14.5'	1'10"	Agglomerate:- some garnet and molybdenite.		
206.5'	207'	0.5'	-	Garnet Hornfels		
207'	209'	2'	-	Agglomerate		
209'	231.3'	22.3'	-	Garnet Hornfels:- leached and oxidized garnet hornfels with some pyrite.		
231.3'	240.5'	9.2'	-	Calcite-Garnet Hornfels		
240.5'	260.3'	19.8'	-	Agglomerate - Silicified		
260.3'	284'	23.7'	-			
284'	319'	35'	-	Quartzite		
<u>HOLE COMPLETED AT 319 FEET</u>						

015

069016

DIAMOND DRILL CORE LOG - HOLE No. 1-50

Location - Millers Block - Red Hut Road
 Final Depth - 433.5 Feet
 Co-Ords. - 7100S, 19500W, Approx.
 Dip - -70°
 Bearing - 270°

Footage		Length		Description	Assay	
From	To	Run	Rec.		WO ₃	Mo
0	83'	83'	-	Clay:- with boulders of aplite.		
83'	99.1'	16.1'	-	Aplite		
99.1'	133.7'	34.6'	-	Actinolite Hornfels		
133.7'	148'	14.3'	-	Olivine Hornfels		
148'	196'	48'	-	<u>Biotite-Actinolite/Pyroxene Hornfels:-</u> well bedded with core angle of 80° .		
196'	206'	10'	-	Actinolite Hornfels		
206'	260'	54'	-	<u>Biotite/Pyroxene:-</u> patches of garnet and calcite - traces of scheelite.		
				<u>SAMPLED</u>		
				275' to 275'11" 11"	0.45	
				229.5' to 229.9' 0.4'	0.05	
				244.7' to 245.2' 0.5'	0.20	
				293.9' to 294.7' 0.8'	0.09	
				330.9' to 331.0' 0.25'	0.64	
260	270.5'	10.5'	-	Biotite-Actinolite/Pyroxene Hornfels		
270.5'	282.3'	11.8'	-	<u>Calcite Hornfels:-</u> some garnet and scheelite.		
282.3'	286.3'	4'	-	Talc		
286.3'	292.8'	6.5'	-	<u>Calcite Hornfels:-</u> traces of scheelite at 290'.		
292.8'	293.4'	0.6'	-	Talc		
293.4'	306.2'	12.8'	-	<u>Calcite Hornfels:-</u> some scheelite		
306.2'	309'	2.8'	-	<u>Biotite-Actinolite Hornfels:-</u> with disseminated pyrite and traces of original structure.		
309'	310.5'	1.5'	-	Calcareous rock, probably biotite-actinolite.		
310.5'	321.0'	10.5'	-	<u>Biotite-Actinolite Hornfels:-</u> some pyroxene bands.		
321.0'	333.8'	12.8'	-	<u>Biotite/Pyroxene Hornfels:-</u> some traces of garnet and calcite. Minor scheelite.		
333.8'	334.1'	0.3'	-	Aplite		
334.1'	335.2'	1.1'	-	Biotite-Actinolite/Pyroxene Hornfels		
335.2'	443.5'	108.5'	-	Granite		
				<u>HOLE COMPLETED AT 443.5 FEET</u>		

DIAMOND DRILL CORE LOG - HOLE No. 160

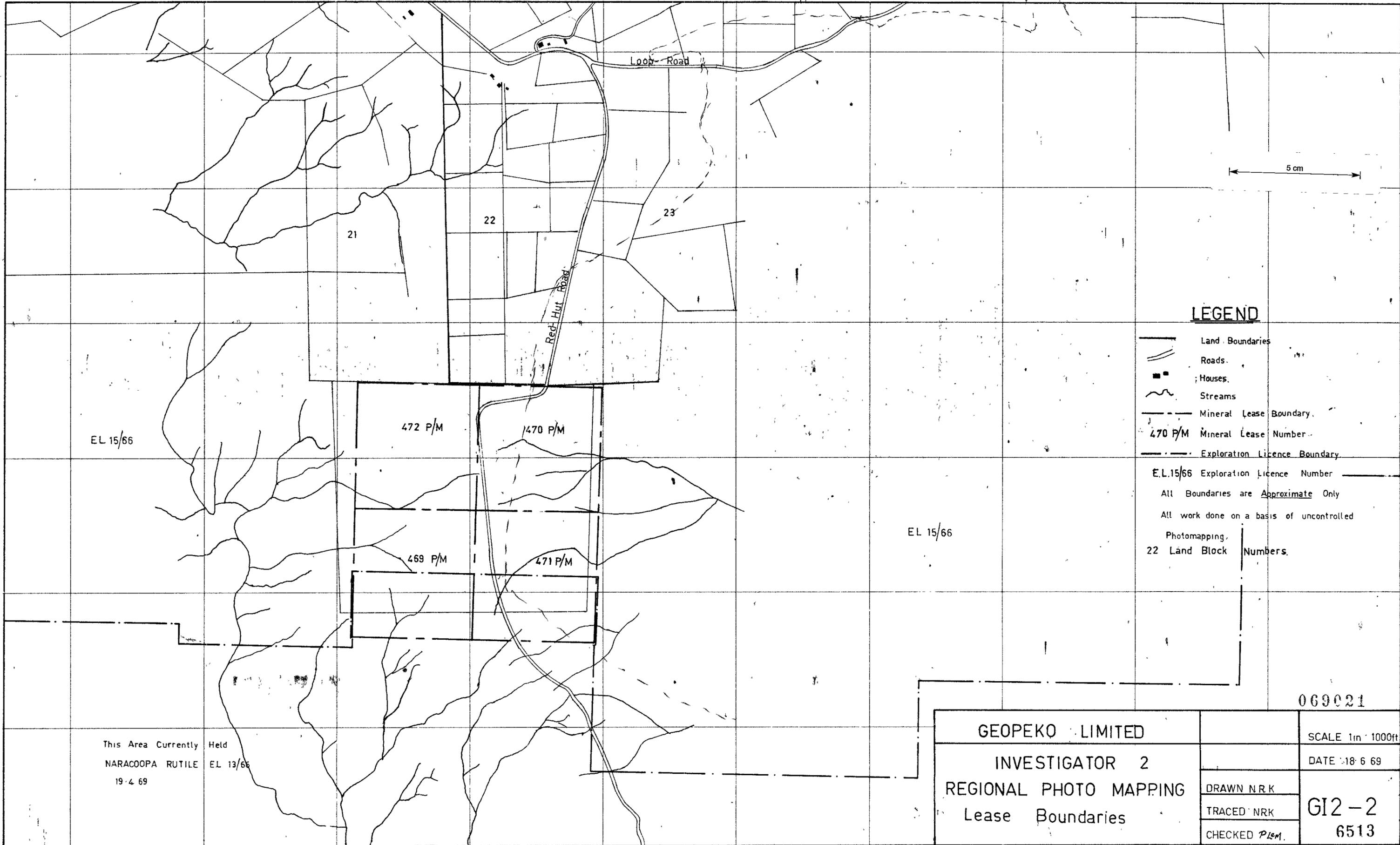
Location - Millers Block - Red Hut Road
 Final Depth - 423 Feet
 Dip - -70°
 Co-Ords. = 7100S, 18200W
 Bearing - 270°
 Commenced - 26th April, 1957.

Footage		Length		Description	Assay	
From	To	Run	Rec.		WO ₃	Mo
0	59'	59'	-	<u>Clay</u> :- some boulders.		
59'	64.2'	5.2'	-	Olivine Hornfels		
64.2'	69.3'	5.1'	-	Aplite		
69.3'	91.3'	22.0'	-	Olivine Hornfels		
91.3'	91.8'	0.5'	-	Aplite		
91.8'	99.8'	8.0'	-	Olivine Hornfels		
99.8'	101.0'	1.2'	-	Aplite		
101.0'	103.0'	2.0'	-	Olivine Hornfels		
103.0'	103.7'	0.7'	-	Aplite		
103.7'	108.3'	4.5'	-	Olivine Hornfels		
108.3'	108.5'	0.2'	-	Aplite		
108.5'	109.8'	1.3'	-	Olivine Hornfels		
109.8'	111.7'	1.9'	-	Aplite		
111.7'	114.7'	3.0'	-	Olivine Hornfels		
114.7'	137.9'	23.2'	-	Aplite		
137.9'	142.0'	4.1'	-	Olivine Hornfels		
142.0'	143.0'	1.0'	-	Aplite		
143.0'	169.5'	26.5'	-	Olivine Hornfels		
169.5'	171.0'	1.5'	-	Aplite		
171.0'	173.4'	2.4'	-	Olivine Hornfels		
173.4'	178.3'	4.9'	-	Aplite		
178.3'	180'	1.7'	-	Biotite Hornfels		
180'	194.7'	14.7'	-	Olivine Hornfels		
194.7'	206'	11.3'	-	Actinolite Hornfels		
206'	207.1'	1.1'	-	Aplite		
207.1'	218.2'	11.1'	-	Actinolite Hornfels		
218.2'	232.3'	15.1'	-	<u>Actinolite Hornfels</u> - with bands and patches of Ph with pyrrholite and traces of scheelite.		
232.3'	235.1'	3.1'	-	Aplite		
235.1'	241.9'	6.8'	-	Actinolite Hornfels		
241.9'	246.8'	4.9'	-	Aplite		
246.8'	423.0'	176.2'	-	Granite		
<u>HOLE COMPLETED AT 423.0 FEET</u>						

069018

017

SAMPLE NO.	Li	Rb	Cu	Pb	Zn	Co	Ni	Sn	Bi	Ag	Cr	V	W	Mo
SP 82	50	400	30	150	150	250	20	2	20	0.1	15	500	25	6
SP 83	40	400	50	50	100	400	25	2	2	0.1	15	500	20	2
SP 85	120	1000	400	200	400	300	400	40	3	1.0	300	600	20	10
SP 86	30	100	80	400	400	200	200	20	8	2.0	200	300	20	1
SP 87	40	200	60	15	50	150	3	1	40	0.1	8	100	<20	2
SP 88	60	1500	15	150	60	3	3	6	4	0.1	25	300	<20	2
SP 89	50	400	50	15	500	25	100	100	6	2.0	100	200	20	25
SP 90	70	600	50	50	250	400	100	3	30	0.1	20	400	30	25
SP 91	50	600	30	80	60	300	80	3	6	0.1	8	400	20	4
SP120	-	-	35	20	-	-	90	-	<20	-	-	-	2	<2
SP121	-	-	10	45	-	-	80	-	80	-	-	-	2	<2
SP122	-	-	15	40	-	-	100	-	100	-	-	-	<2	<2



LEGEND

- Land Boundaries
- Roads
- Houses
- ~ Streams
- - - Mineral Lease Boundary
- 470 P/M Mineral Lease Number
- · - · - Exploration Licence Boundary
- EL 15/66 Exploration Licence Number
- All Boundaries are Approximate Only
- All work done on a basis of uncontrolled Photomapping.
- 22 Land Block Numbers.

5 cm

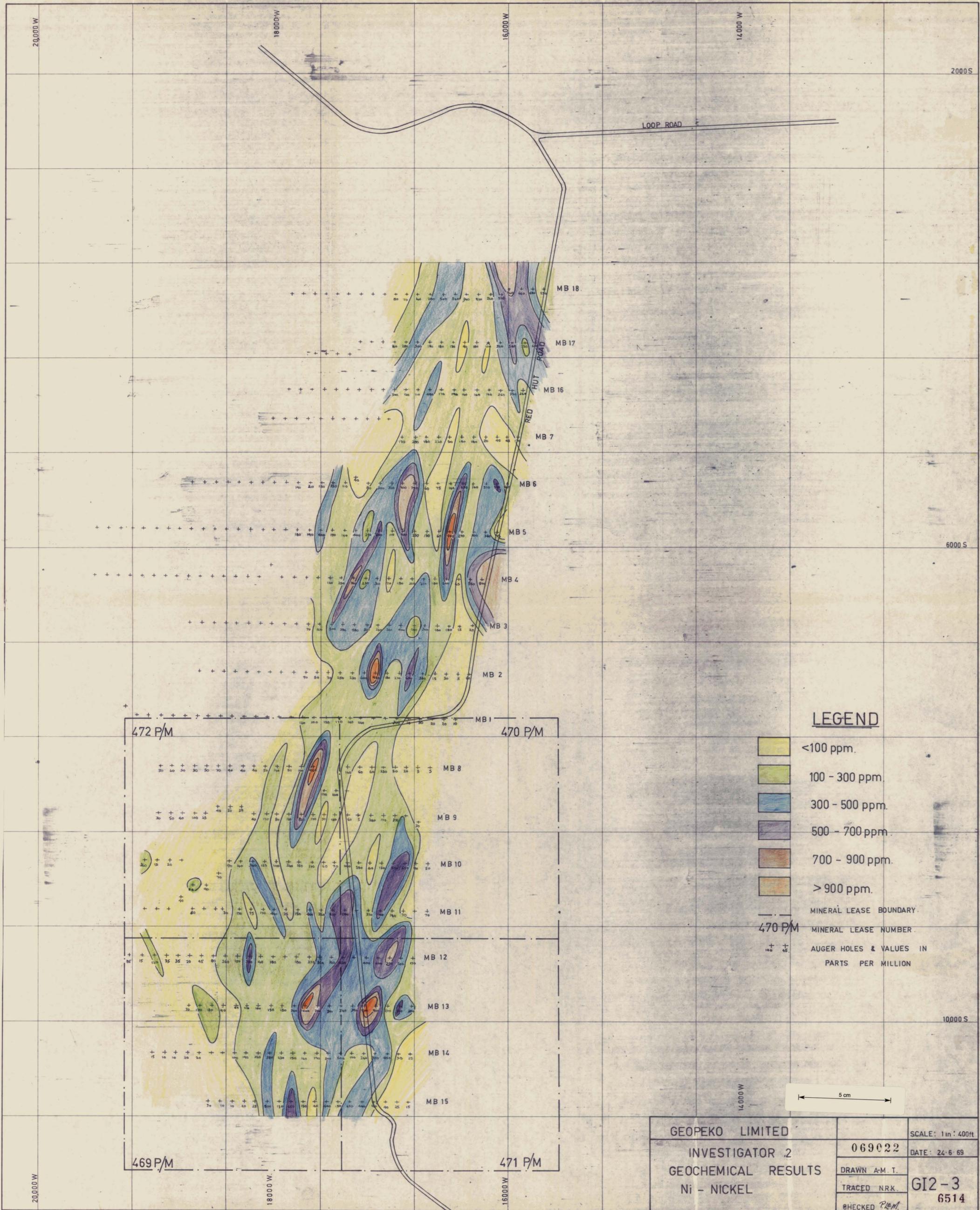
EL 15/66

EL 15/66

This Area Currently Held
NARACOOPA RUTILE EL 13/66
19-4-69

069021

GEOPEKO LIMITED		SCALE 1in = 1000ft
INVESTIGATOR 2		DATE 18-6-69
REGIONAL PHOTO MAPPING		GI2-2 6513
Lease Boundaries	DRAWN NRK	
	TRACED NRK	
	CHECKED PLM	



LEGEND

- <100 ppm.
- 100 - 300 ppm.
- 300 - 500 ppm.
- 500 - 700 ppm.
- 700 - 900 ppm.
- > 900 ppm.
- MINERAL LEASE BOUNDARY.
- 470 P/M MINERAL LEASE NUMBER.
- + AUGER HOLES & VALUES IN PARTS PER MILLION

GEOPEKO LIMITED INVESTIGATOR 2 GEOCHEMICAL RESULTS Ni - NICKEL	SCALE: 1 in : 400ft 069022 DATE: 24-6-69 DRAWN A.M.T. TRACED N.R.K. CHECKED P.L.M.
GI2-3 6514	

2000 S

LOOP ROAD

MB 18

MB 17

MB 16

MB 7

MB 6

MB 5

MB 4

MB 3

MB 2

MB 1

472 P/M

470 P/M

MB 8

MB 9

MB 10

MB 11

MB 12

MB 13

MB 14

MB 15

469 P/M

471 P/M

6000 S

10,000 S

LEGEND

- <10 ppm
- 10 - 50 ppm
- 50 - 100 ppm
- 100 - 200 ppm
- 200 - 300 ppm
- >300 ppm

--- MINERAL LEASE BOUNDARIES
 470 P/M MINERAL LEASE NUMBER

50
100
+ AUGER HOLE ASSAY VALUES - PARTS PER MILLION.
 TUNGSTEN VALUES CONTOURED
 50 MOLYBDENUM VALUES
 100 TUNGSTEN VALUES

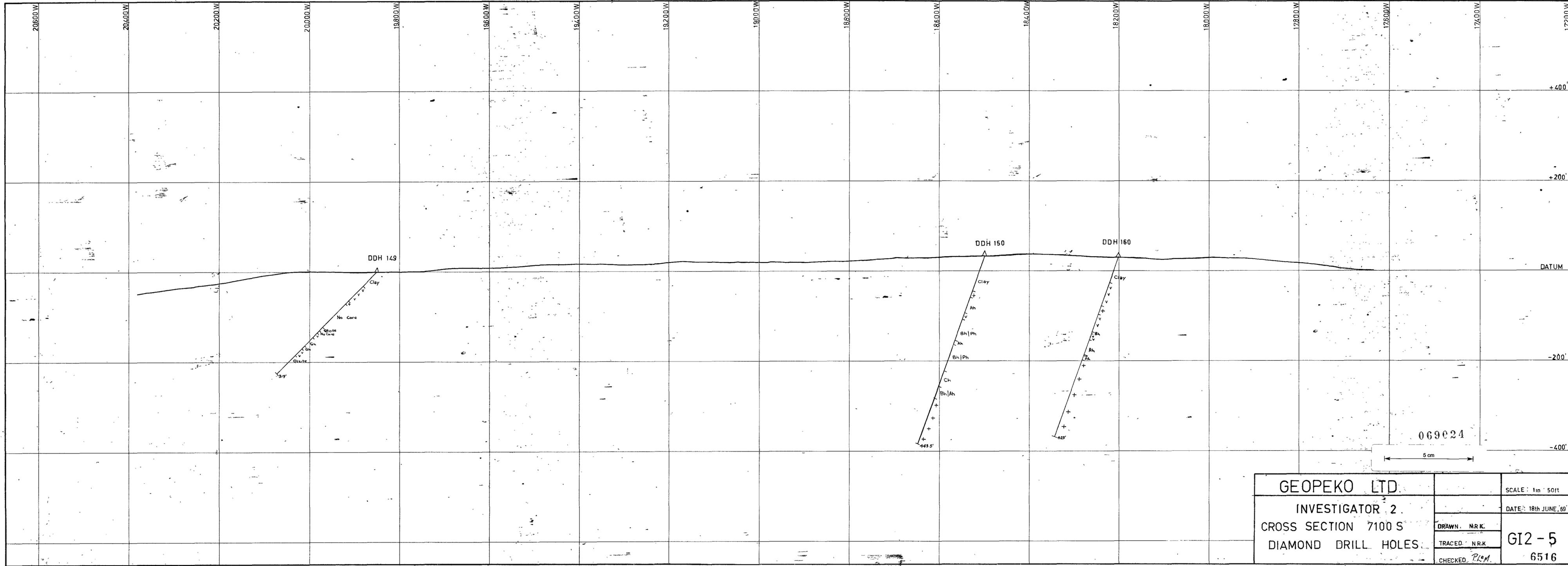
5 cm

GEOPEKO LIMITED INVESTIGATOR 2 GEOCHEMICAL RESULTS W - Mo. TUNGSTEN CONTOURS	069C23	SCALE: 1in:400ft
	DRAWN: NRK	DATE: AUG 69
	TRACED: NRK	GI2-4
	CHECKED: PLM	6515

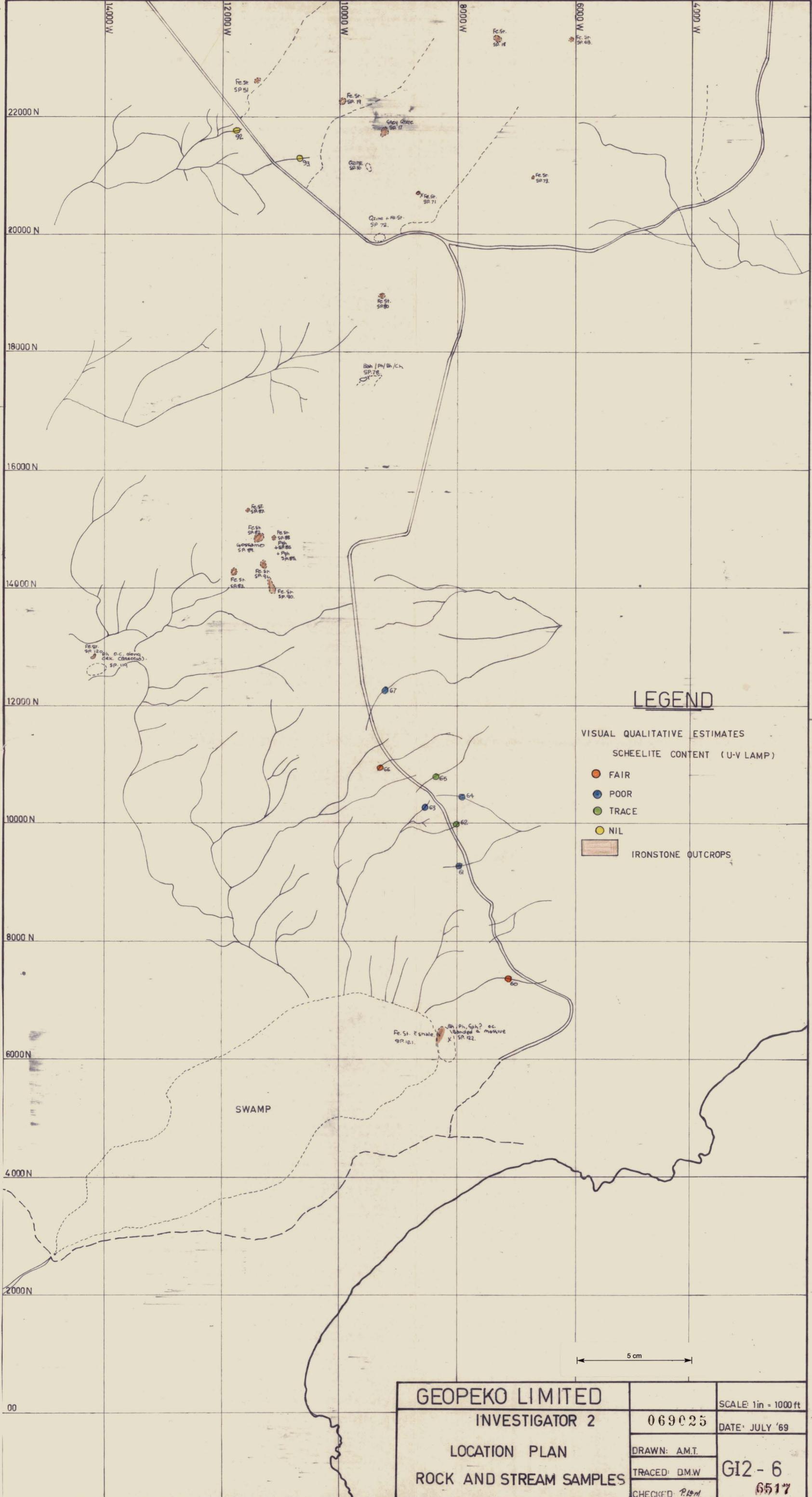
20,000 W

15,000 W

12,000 W



GEOPEKO LTD.		SCALE: 1in = 50ft
INVESTIGATOR 2		DATE: 18th JUNE, '69
CROSS SECTION 7100 S		DRAWN: N.R.K.
DIAMOND DRILL HOLES		TRACED: N.R.K.
		CHECKED: P.L.M.
		GI2-5 6516



LEGEND

- VISUAL QUALITATIVE ESTIMATES
SCHEELITE CONTENT (U-V LAMP)
- FAIR
 - POOR
 - TRACE
 - NIL
 - IRONSTONE OUTCROPS

5 cm

GEOPEKO LIMITED		SCALE: 1 in = 1000 ft
INVESTIGATOR 2		069025
LOCATION PLAN		DATE: JULY '69
ROCK AND STREAM SAMPLES		DRAWN: A.M.T.
		TRACED: D.M.W
		CHECKED: P.R.M.
		G12 - 6
		6517