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GEOPEKO LIMITED

KING ISLAND GROUP

PROGRESS REPORT

EXPLORATION LICENCE 4/68

by

L. SZABO

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1. RECOMMENDATION

It is recommended that a total of 312 auger holes be sunk in the area of E.L. 4/68.

If this phase warrants the extension of exploration, some agreement should be reached with Hawkes Alluvial Tin Limited to sink an additional 182 auger holes in E.L. 18/68.

In Anomaly 8, either an I.P. or V.L.F. survey is recommended.

L. Szabo
L. Szabo,
SENIOR GEOLOGIST.

January, 1970.

2. SUMMARY

Outcrop mapping was carried out in very difficult field conditions with inadequate equipment.

An assessment of the potential of the area has been made in the present report on the basis of regional gravity and magnetic surveys, and very sparse outcrops.

Nine anomalous areas have been outlined, three of which could be favourable to mineralisation being associated with granitic intrusions.

A fourth anomaly, to the south of E.L. 4/68, has also been found and may indicate a sulphide or chromite mineralisation.

An exploration programme has been outlined to provide further information on the potential of the area. Due to lack of time approximately 5 square miles located near the south east corner of E.L. 4/68 have not been investigated.

3. INTRODUCTION

In May, 1969, King Island Scheelite (1947) Limited secured an option to E.L. 4/68. Following this an exploration programme comprising geological mapping, auger and diamond drilling, and geochemical surveys, was worked out by the author. (Appended to this report.) This programme was disregarded and instead outcrop mapping in the scale 1 inch = 1000 feet was ordered by the Supervising Geologist.

The area of exploration licence is flat-lying, swampy and sand covered; and for these reasons -

(i) the outcrops are extremely scarce, with the exception of the Mt Counsel area and the Sea Elephant River bend where granites and spotted contact - sediments outcrop prominently. Elsewhere only six minor outcrops have been found and mapping was completed mainly on floaters, gravels and rock fragments, the sources of which are unknown.

(ii) the mapping team doing the present work was equipped with a Land Rover and hand tools (shovel, axe, scrub-cutter etc.). Previous workers had been equipped with bulldozers, Snocats, drilling facilities etc.

(iii) this report proposes to give a geological explanation of the area, based on sparse outcrops, magnetic and gravity surveys.

4. PHYSIOGRAPHY

The area of the exploration licence, approximately 55 square miles, is situated on the eastern half of King Island, at an intermediate position between the northern and eastern coasts, covering the largest swampy region of King island. This swamp has developed around and adjacent to the Sea Elephant River which forms the main drainage system for a quarter of the Island, carrying approximately 10 million cubic yards of water p.a. into the sea (40 inches of rainfall).

The area can be divided into four north-south strips -

- (i) recent coastal dunes, 1/4 mile wide.
- (ii) long permanent swamp, 1/2 mile wide.
- (iii) old coastal dunes, 1/2 mile wide.
- (iv) flat and slightly undulating swampy region, 6 miles wide, with isolated sand hills and numerous creeks.

The road network is relatively good, but the three tracks forming the only access to the interior of the Exploration Licence area often become unpassable due to heavy rains and flooding.

Several wooden bridges in key positions have also been ruined by the floods.

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5. PREVIOUS WORK

(i) Several decades ago J. Curtain and others carried out prospecting and development work on some tin leases in the Reekara area, sinking several shallow shafts which encountered cassiterite and scheelite bearing quartz-tourmaline veins.

Findings proved not to be of economical importance, however, they indicated the presence of tungsten and tin mineralisation in that area.

(ii) In 1929 F. Blake, and in 1952 Dr M. D. Garretty, summarised the exploration in the beach sand areas located to the north of Naracoopa. The heavy mineral content of these sands were not regarded as economic (1, 5).

(iii) In 1954 King Island Scheelite (1947) Limited put down two inclined holes, each 225 feet deep, to test the extent of the tourmaline veins encountered in J. Curtain's shafts, carrying 6.70% WO_3 and 0.64% Sn (6).

The drilling intersected a regionally altered sequence comprised of mica schists and muscovite quartzite with minor pegmatite, quartz, and tourmaline veins, but indications of economic mineralisation were not found.

(iv) In 1964 forty-six scout holes were sunk in the swamp between Mt Counsel and the Reekara farmlands. Four holes located at intermediate positions between J. Curtain's shafts and the known alluvial tin deposits encountered tin mineralisation (3). At a later date Hawkes Alluvial Tin Limited annexed this area.

(v) In a non-dated report P. N. Johnston evaluated a scout drilling programme along the eastern coast. The scout holes revealed possible weathered granitic rock to the east of Mt Counsel (7).

(vi) In 1958, in connection with an option offer by Quest Exploration Pty Ltd, Mr P. M. Frank evaluated the area. He recommended that the offer be refused as he had found no geological evidence to suggest the existence of economic deposits in the area (4).

6. PRESENT WORK(i) Geology

The following statements are inferences only and are based on extremely sparse outcrops, doubtful floaters and rough geophysical information.

The area is comprised of regionally metamorphosed sediments striking approximately N - S, decreasing in metamorphic grade to the east, and are essentially composed of mica schists and quartzites.

In the south west part of the area the rocks are of much lower grade of metamorphism explained by a postulated fault striking NW - SE dipping towards the north east, and verified by geophysical contours.

A large elongated granitic body dipping to the east forms the sub-outcrop bounded by the Sea Elephant River, the eastern coast and the northern boundary of the Exploration Licence.

Several aplitic and granitic offshoots of this body occur in the Mt Counsel area where they have caused extensive high grade contact metamorphism to the existing rocks (to the sillimanite-andalusite facies?). These contact rocks are characterised by elongated aggregates of mafic and felsic minerals; similar associations occur in the Sea Elephant River area where they are closely connected with the granitic body nearby.

Directly west of the Mt Counsel area a granitic body is situated outside the Exploration Licence limit but whose contact effects are clearly delineated and lie mostly within the Exploration Licence area. Consequently, the contact metamorphism may be a result of the flanking intrusions.

It is not known whether the two granitic bodies have the same source.

Between these two granites in the vicinity of the Reekara Settlement shafts have been sunk on quartz-tourmaline veins with patches of scheelite and cassiterite. It has not been ascertained from which granite body these veins originated.

The regionally metamorphosed rocks are covered by Quaternary deposits, of which two regions deserve attention -

(1) mineable secondary tin deposits occurring in the Sea Elephant River alluvium.

6. PRESENT WORK (Contd.)

(i) Geology (Contd.)

(ii) Economic concentrations of heavy minerals (rutile and zircon) occurring in the more recent sands of Naracoopa Bay.

The older sands are missing in Naracoopa Bay, and appear to have been reworked into the more recent dunes resulting in economic concentrations of heavy minerals.

Elsewhere on the coast where both older and younger sands are present this reworking has not taken place and for this reason payable beach sands are lacking.

(ii) Structure

Because of limited information detailed structural assessment would be unreliable, however, on the basis of regional gravity and magnetic surveys, a major fault has been postulated with a high degree of certainty. This fault runs NW - SE, the northern side being down-thrust and dislocated to the east.

(iii) Geochemistry

Previous to this work 46 scout holes were put down between Mt Counsel and the Reekara Settlement. Four of these holes provided evidence of tin mineralisation, however, tungsten content was not investigated.

In the present work rock chips from likely floaters and outcrops were analysed for eleven elements to provide a reference for any forthcoming geochemical survey (Appendix A). Assays for the 12th element (Li) have not yet been received.

The results and average content and range for each rock type are tabulated and attached.

(iv) Geophysics

Previous to this work magnetic and gravity surveys were carried out on a regional scale of 1" = 1 mile. Subsequently this work was enlarged by a factor of two for the present work.

Nine anomalies were outlines whose characteristics follow -

Anomaly 1 (A1)

Sharps gravity low and magnetic lows indicative of a granitic body with excellent correspondence with outcrops. This body extends from the Sea Elephant River to the northern limit of E.L. 4/68 including the area west of Mt Counsel.

6. PRESENT WORK (Contd.)(iv) Geophysics (Contd.)Anomaly 2 (A2)

Elongated magnetic lows sub-parallel to decreasing gravity contours, verified by granite outcrops and granitic detritus. This represents granitic/aplitic dykes.

Anomaly 3 (A3)

Granite intrusion has been postulated on the basis of magnetic lows and gravity contours.

Anomaly 4 (A4)

Similar to A3, but has not been verified by outcrops.

Anomaly 5 (A5)

This anomaly is characterised by sharp magnetic highs located between two granite bodies, and interpreted as being parts of the contact zone with high content of magnetic minerals. This area lies to the south of Mt Counsel, where high grade contact metamorphic rocks occur with a low magnetic susceptibility.

Anomalies 6 & 7 (A6 & A7)

Similar to A5.

Anomaly 8 (A8)

Relative magnetic low and considerable gravity high interpreted as dense non-magnetic mineral accumulations. It is felt that the anomalies are due to sulphide or chromite deposits with or without economic potential.

Assays from rocks from this area (2) yield -

Gold	1 dwt	7 grs	
Silver	2 ozs	6 dwt	12 grs
Lead	3.86%		
Copper	0.02%		
Zinc	3.74%		
Arsenic	10.88%		

The possible occurrence of chromite is partly based on mapped outcrops of large basic dykes near the area in question. This anomaly lies outside Exploration Licence 4/68.

Anomaly 9 (A9)

Magnetic highs and slight gravity deviations indicate possible presence of an ultramafic body, floaters of which have been found in this area.

6. PRESENT WORK (Contd.)(v) Mineralisation

Indications of the following mineralisation are present in the area -

- (i) Mineralisation associated with the intrusions -
 - a) tungsten and tin mineralisation in quartz-tourmaline veins.
 - b) possible sulphide or chromite mineralisation.
- (ii) Secondary mineral deposits -
 - a) mineable cassiterite in the alluvium of the Sea Elephant River.
 - b) Economic beach sand deposits (rutile, zircon) in Naracoopa Bay.

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7. CONCLUSION

(i) Exploratory Work

More advanced techniques and equipment are required than conventional traversing and outcrop mapping.

(ii) Mineralisation

The area appears to have good economic potential (with the exception of beach sand deposits) but this can only be developed using adequate techniques.

(iii) Geophysics

The magnetic and gravity methods employed here are useful for a broad guide.

(iv) Beach Sand Deposits

At present these have no economic significance except for the Naracoopa Bay area.

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8. PROPOSAL

(i) It is recommended that detailed exploration be carried out in the anomalous areas.

Auger holes should be sunk on E - W lines spaced half a mile apart at 400 feet intervals (as indicated on plan 4/68 - 1).

This programme calls for 312 auger holes, chip samples from which are to be analysed for Li, Ba, Sr, Be, W, Mo, Ni, Zn, Mn, Cr, Sn, Cu, Pb and Bi.

(ii) If the above programme yields favourable results, permission should be obtained for an auger drilling programme in Exploration Licence 18/68 using the above grid on lines indicated (182 holes).

(iii) Either an induced polarisation (I.P.) or a very low frequency (V.L.F.) radiosignal measurements should be carried out on Anomaly 8 to achieve further control for planning diamond drilling.

9. REFERENCES

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Heavy Mineral Beach Sand Deposit, Fraser River
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Report, Unpublished.
6. HUGHES, T. D., 1955,
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Scout drilling of the East Coast Area of King
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ROCK TYPE	ELEMENT PPM											
	W	Mo	Ni	Sn	Cu	Pb	Zn	Mn	Ba	Sr	Li	Cr
IGNEOUS ROCKS												
GRANITIC ROCK	<2 2-15	2 2-2	15 25-35	2	12 5-25	25 20-40	42 10-75	245 10-200	238 150-475	130 57-305		130 60-250
APLITE	2	2-2	7 25-15	2	14 10-20	20 20-30	17 10-30	95 10-100	117 20-25	70 50-250		175 110-220
PEGMATITE	2	2	2	2	12	20	20	20	20	20		175
QUARTZ-TORMALINE VEIN	2	2	25	25	5	20	5	25	150	20		185
QUARTZ	2	2	9	2	16	20	15	17	50	55		175
MAFIC IGNEOUS ROCKS	2	2	2	2	2	20	20	50	20	20		15
SEDIMENTARY ROCKS												
QUARTZITE, LIGHT GREY	2	2	12	2	16	20	10	150	20	50		100
QUARTZITE, DARK GREY	2	2	5	2	8	20	10	20	20	20		15
SHALE	2	2	12	25	18	20	25	90	60	28		42
LIMESTONE	2	2	20	16	14	50	18	70	20	35		21
CONTACT ALTERED ROCKS												
BLACK BARRETT QUARTZITE	2	2	15	25	16	25	75	200	700	80		71
MUSCOVITE BIOTITE (QUARTZED) HORNFELS	2	2	33	25	28	20	50	300	500	20		93
SPOTTED SEDIMENTS WITH DARK MINERAL AGGREGATES	2	2	12	2	12	20	17	320	90	75		61
SPOTTED SEDIMENTS WITH LIGHT MINERAL AGGREGATES	2	2	25	2	10	20	10	70	600	20		30
LACERITE ROCKS												
IRONSTONE	2	2	31	2	26	72	37	212	20	20		76
PERMINENT SANDSTONE	2	2	41	2	15	68	28	320	20	20		76
REGIONAL ALTERED ROCKS												
MICA SCHIST	2	2	10	2	16	20	26	141	505	10		74
AMPHIBOLITE	2	2	5	2	230	20	10	20	20	20		300

LEGEND

CONCENTRATE



HIGH

MEDIUM

LOW



AVERAGE



RANGE

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GEOPEKO LTD		
APPENDIX A		Date: Jan '69
TABLE OF TRACE ELEMENT CONTENT		Drawn: L Szabo
		Traced: AMI
		Checked:

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EXPLORATION PROGRAMMEFORNEW EXPLORATION LICENCE (CURTAINS AREA)I Preliminary Evaluation1. GENERAL

The Curtains Area, approx. 50 Sq. Miles, is located on the Eastern half of the Island, approx. at an intermediate position between the Northern and Eastern coasts.

The area is covered predominantly by swamps, and, in minority, scrubs and farmlands.

The road network is relatively good but away from the roadways travel, even by four wheel drive, is limited because of the swampy areas.

Two Companies, Naracoopa Rutile Ltd., and Hawkes Alluvial Ltd., hold Exploration Licences and Mineral Leases in this area.

2. GEOLOGY

Very limited outcrops occur in the area resulting in difficulties to sketch up the geological contour.

The existing outcrops indicate the presence of a more or less altered sedimentary series with some intrusive granite bodies dolerite dykes and quartz veins.

The altered series has tentatively been placed in the upper part of pre-Cambrian.

Due to the limited outcrops, the regional structure can only be sketched on the basis of aerial magnetic contour as follows:-

A slightly folded anticline with Northerly axis is the main structural element which is divided into two parts by a probable fault located between the Phoque and Sea Elephant Bays.

To South of the fault the area is made up approx. Northerly striking beds of following series:-

Volcanics, comprising mainly basalt and tuffs.

Impure carbonate rocks and transitional varieties to calcareous shale.

Tillite

Sandstone and shale with interbedded pyroclastics.

The specification above shows the probably chronological sequence from older rock to the younger one, starting at the bottom.

To North of the fault mainly quartzitic mica schist and some bedded sandstone with black shale were mapped. This area was probably faulted down and dislocated South-Easterly.

3. PREVIOUS EXPLORATION

- 3.1 Along the coast extensive beach sand mineral exploration was carried out. The investigational work was restricted the zircon and rutile content of heavy mineral fraction. Information has not been found concerning any secondary scheelite occurrence.
- 3.2 About 5 miles West of Point Cowper, alluvial tin occurrence was mined. Since the alluvial deposit proved to be uneconomic, extensive shafting was carried out to localize the primary tin occurrence. This work revealed several veins and veinlets containing more or less cassiterite and scheelite.
- 3.3 In 1954 King Island Scheelite (1947) Limited conducted exploration sinking three shafts and putting down two 225 foot diamond drill holes in mica schist and quartzite schist, approx. 2 miles North of above mentioned locality.
- The shafts revealed thin tourmaline-quartz veins with patchy scheelite mineralization and some traces of tin. Since the drill holes failed to intersect economic mineralization, the exploration was interrupted. At present Hawkes Alluvial holds Exploration Licence (18/68) in this area.

4. POSSIBLE ECONOMIC MINERALIZATIONS

The previous exploration indicates the presence of following mineralizations:-

4.1 W, Sn, Mo

Economic grade mineralization may occur in the area connected with granite body at the North-Eastern corner of E. L.

Depending on the lithological conditions, the possible varieties of occurrence are as follows:-

- 4.1.1. If the pre-Cambrian sediments intruded by granite contain carbonate rocks or at least calcareous horizons, the Carbonate could be replaced by Wolframite. In this case Grassy
(TUNGSTATE)

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typed occurrence may be expected.

4.1.2. In the absence of carbonate rocks, the mineralization can occur as fissure veins in the granite and nearby invaded sedimentary rocks. (Reekara typed).

4.2 Zircon, Rutile, Cassiterite, Scheelite, etc. may occur as secondary deposits in the beach sand and drifts.

An exploration programme is proposed to test the locality and potential of possible mineral occurrences.

II Exploration Programme

1. Reconnaissance Phase

Due to limited outcrops reconnaissance geological mapping cannot be carried out by conventional traversing. For this reason reconnaissance Auger drilling and stratigraphic diamond drill holes are proposed. The diamond drill sites will be considered on the basis of Auger results.

In the sandy areas sampling and micro-mineralogical investigation are proposed to trace and localize the source of possible scheelite or cassiterite.

Detailed Plan and Expenditure Budget

Regional mapping (¹⁰⁰⁰ 1/2 mile to 1") and preparation of Auger lines, surface sampling	.... 1 Month	800
Stratigraphic Auger drilling, 10,000 ft.	.... 3 Months	\$4,000.00
Assays, 300 samples, W, Mo, Sn, Ni	....	1,350.00
Micro-mineralogical investigation, 200 samples	....	400.00
Thin sections, 50 samples, approx.	...	150.00
Stratigraphic diamond drilling, 3,000 ft.	.... 1 Month	30,000.00
		<hr/>
	5 Months	\$35,900.00

Personnel

- 1 Geologist
- 1 Experienced Field Assistant
- 1 Field Assistant (occasionally)
- 1 2 Gemco drillers (~~experienced~~)
- 1 2 drill helpers
- 1 draftsman (occasionally)

Equipments:~~1 Holden Utility~~

2 Land Rovers

2 Gemco rigs

2 Tractors

2 Diamond drill rigs

1 Microscope (part time)

Rock room equipment

Services: usual workshop, store, accountance, etc.

2. Geochemical survey is proposed in the warranting areas chosen on the basis of reconnaissance results.

Auger drilling, approx. 15,000 ft. 4 Months \$6,000.00

400 Assays, W, Mo, Sn, Ni. 1,800.00

4 Months \$7,800.00

Personnel:

1 Geologist

1 Field Assistant

2 Gemco drillers

2 Drill helpers

1 Draftsman (occasionally)

Equipment:~~1 Holden Utility~~

2 Land Rovers

2 Gemco rigs

2 Tractors

Services: usual

3. Detailed Diamond Drilling Programme will be set up on the basis of geochemical results.

Combined Expenditure Budget: (Excl. wages and salaries as well as equipment and services)

Reconnaissance Phase \$35,900.00

Geochemical Survey 7,800.00

Total \$43,700.00

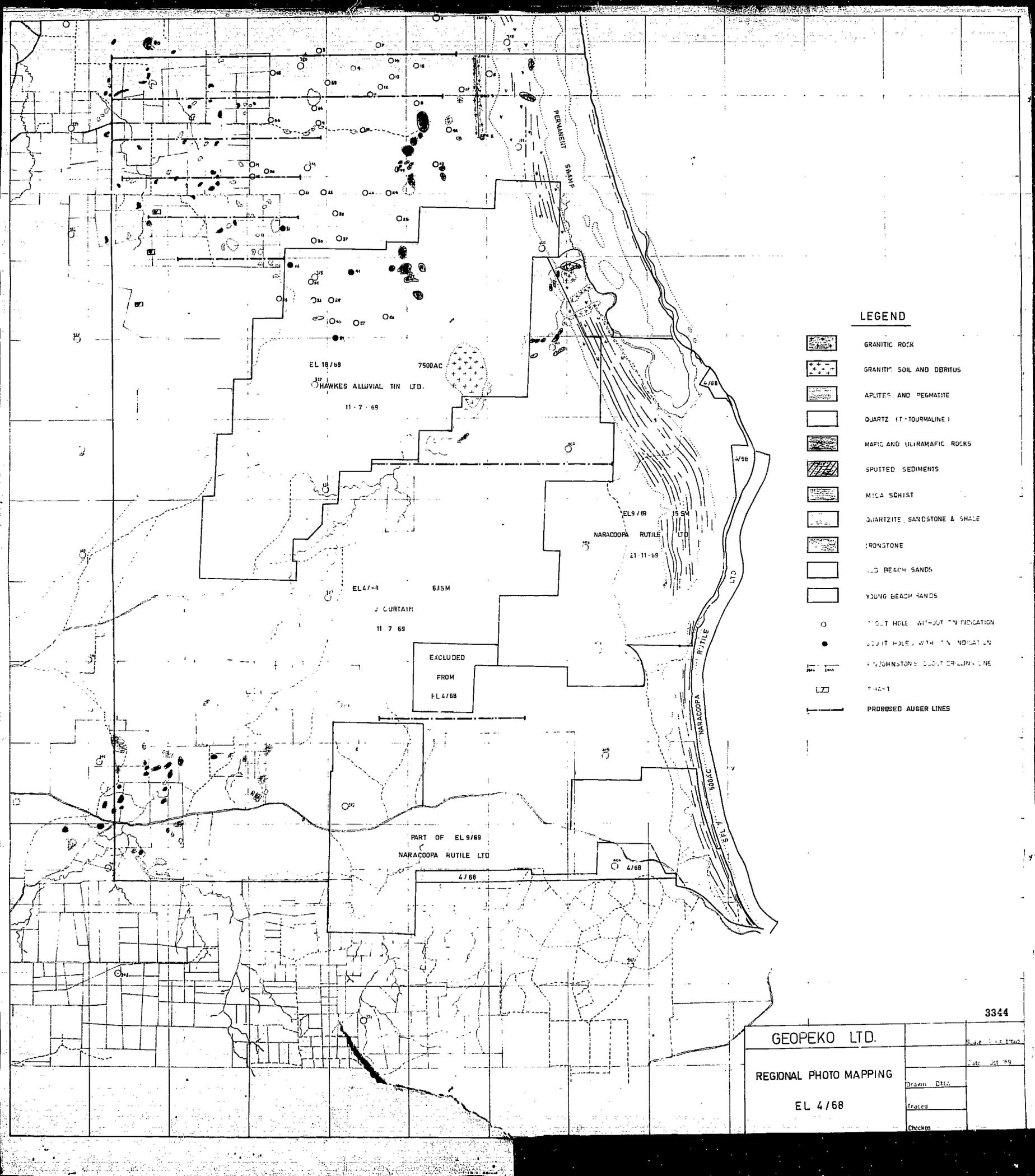
4. The Geophysical Consultant should be contacted concerning the necessity of surface magnetic and gravity surveys.

Grassy, 22nd May, 1969.

L. Szabo,
SENIOR GEOLOGIST.

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why not to do the
low drilling
in one



LEGEND

- GRANITIC ROCK
- GRANITIC SOIL AND DEBRIS
- APLITES AND PEGMATITE
- QUARTZ (TOURMALINE)
- MAFIC AND ULTRAMAFIC ROCKS
- SPOTTED SEDIMENTS
- MICA SCHIST
- QUARTZITE, SANDSTONE & SHALE
- IRONSTONE
- OLD BEACH SANDS
- YOUNG BEACH SANDS
- PROSPECT HOLE WITH INDICATION
- PROSPECT HOLE WITHOUT INDICATION
- JOHNSTON'S PROSPECT DRILLING LINE
- FAULT
- PROPOSED AUGER LINES

EL 18/68
7500AC
HAWKES ALLUVIAL TIN LTD.
11-7-69

EL 9/69
15 SW
NARACOOPA RUTILE LTD.
21-11-69

EL 4/68
635M
J. CURTAIN
11-7-69

EXCLUDED
FROM
EL 4/68

PART OF EL 9/69
NARACOOPA RUTILE LTD.

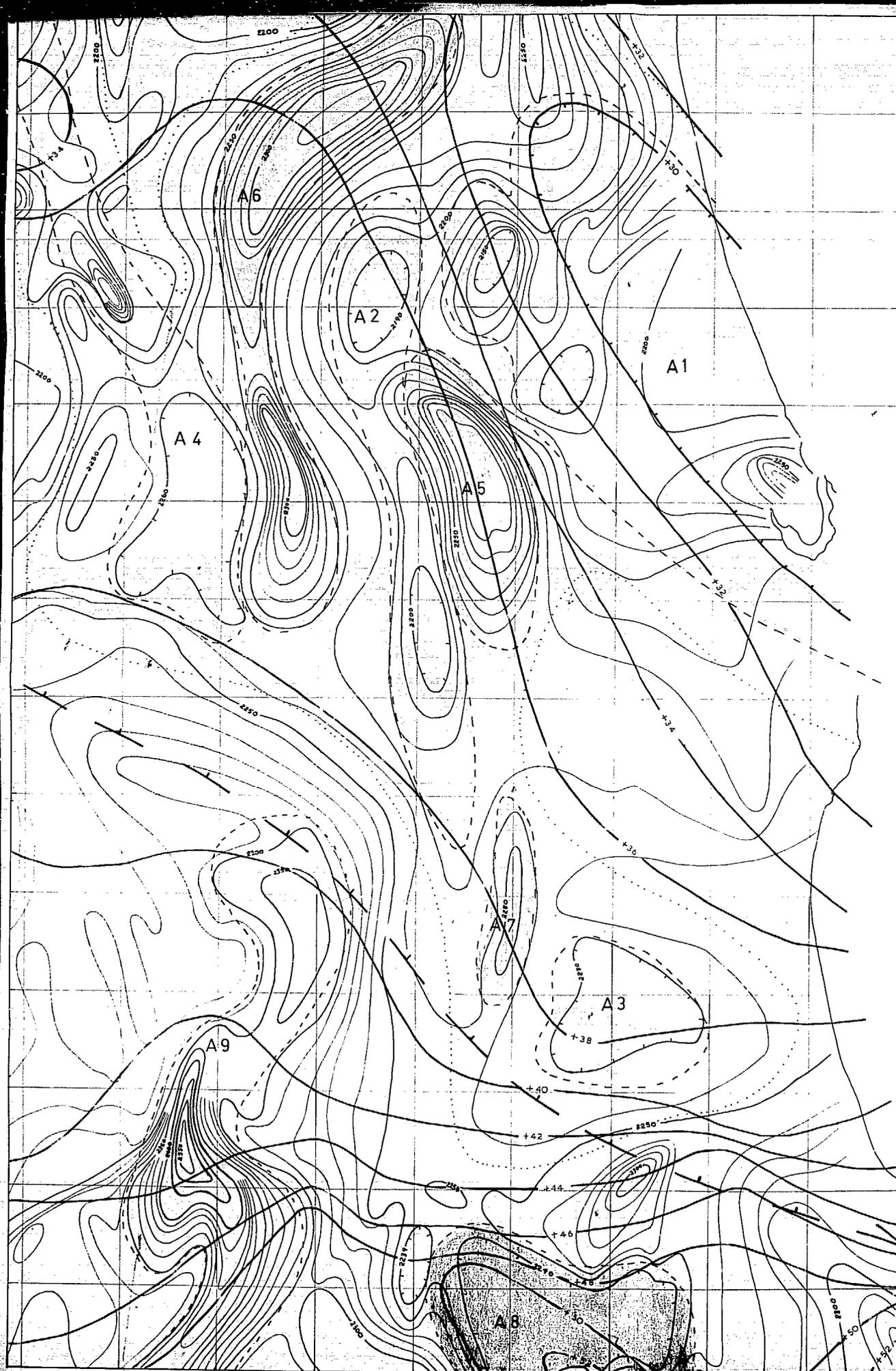
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REGIONAL PHOTO MAPPING

EL 4/68

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Scale	1:12,500
Date	Oct 1969
Drawn	D.M.
Traced	
Checked	



LEGEND

	THE BRAD MAJOR FAULTS
	POSSIBLE FAULT ZONES, INTRUSIONS, CONTACTS, AND OTHER FEATURES OF INTEREST
	CONTACTS
	AREAS OF INTEREST
	ELEVATION CONTOURS
	2250
	232
	234
	236
	238
	240
	242
	244
	246
	250

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GEOLOGICAL INTERPRETATION

BASED ON GEOPHYSICAL CONTOUR

AND SPARSE OUTCROPS

EL 4/69

SCALE: 1:50,000

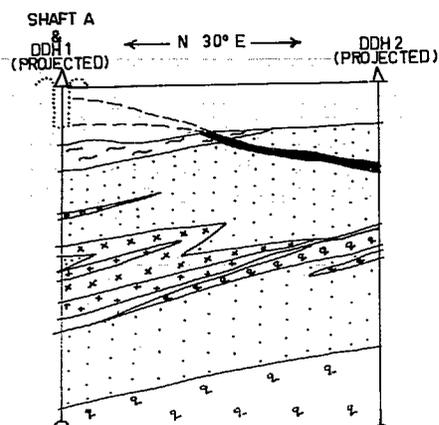
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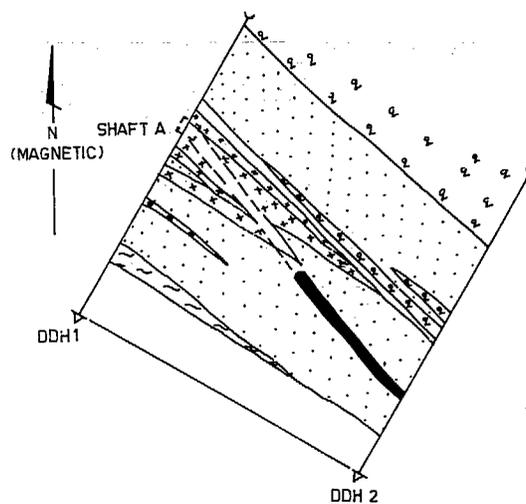
TRACED: A.M.T.

CHECKED:

VERTICAL PROJECTION



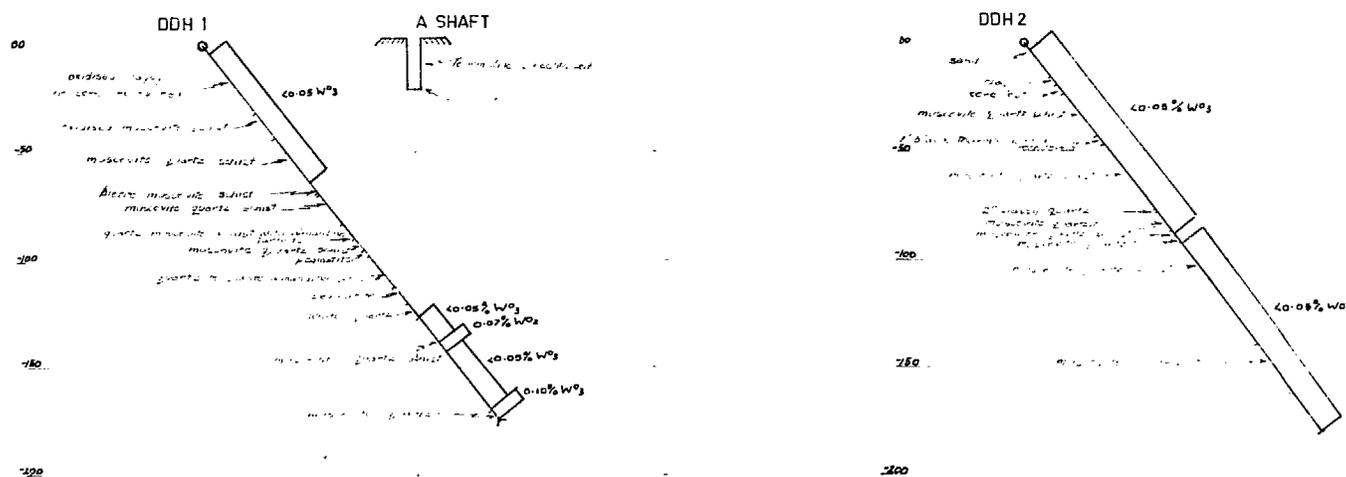
HORIZONTAL PROJECTION



LEGEND

-  MICA SCHIST
-  MICA QUARTZITE SCHIST
-  BIOTITE MUSCOVITE SCHIST
-  GARNET & QUARTZ MICA SCHIST
-  MUSCOVITE QUARTZITE SCHIST
-  PEGMATITE
-  QUARTZ
-  TOURMALINE VEIN
-  NO CORE

DRILL HOLE SECTIONS AND ASSAYS



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GEOPEKO LTD REEKARA PROSPECT DRILL HOLE CORRELATION AND ASSAYS	Scale: 1in = 50ft
	Date: JAN. 70
	Drawn: L.SZABO
	Traced: D.M.W.
Checked:	