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MC 5204 AND MC 5205

BOB NOB PROSPECT, MOUNT PAINTER DISTRICT [NORTH OF ARKAROOLA CREEK]

PROGRESS AND FINAL REPORTS TO CLAIM OPTION RELINQUISHMENT, FOR THE PERIOD 2/6/1968 TO 1/10/1969

Submitted by
Kennecott Explorations (Australia) Pty Ltd
1969

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Government of South Australia
Primary Industries and Resources SA

[This report probably by S.B. Warne: March 1969 as referred to in following report:]

Bob Nob Prospect, M.C's 5204, 5205

Correct! S.B. Warne.

020

PROSPECT HISTORY

Mineral claims 5204 and 5205, held by Messrs. G.A. Greenwood and R.L. Lander of 42 Cedar Avenue, Warradale, and 13 Buttrose St., East Glenelg respectively, located on Arkaroola station in the Mt. Painter Region of the Northern Flinders Ranges (for location see Plate 1) were offered to Kennecott Explorations (Australia) as an iron ore prospect in mid-1968.

Earlier in the year the deposit had been investigated by D.V. Furber, Geologist-in-Charge, the Broken Hill Proprietary Company Limited. Furber reported the prospect as a low grade haematite quartzite ore averaging 22.7% Fe, 64.7% SiO_2 with an above valley floor tonnage of 2.5 - 3 million tons.

On a visit to the prospect by C.C. Brooks (June, 1968) in the presence of the claimholder, anomalous radioactivity was noted and subsequently Kennecott negotiated an option over the claims and overseighted the renewal of claim work suspensions under the South Australian Mining Act, 1930-1962 until the first of April, 1969.

In August, 1968, Field Assistants D.R. Osborne and A.J. McDonough laid out a 200 feet interval grid pattern and completed a ground magnetic and scintillometer survey over the prospect. The scintillometer readings were obtained using Technical Associates Pug 1 with the instrument held at waist height, the probe fixed to the instrument and pointing vertically downwards. This model detects all energy levels and is not capable of discriminating between radioactivities derived from uranium, thorium and potassium.

Geologic mapping was completed in November, 1968. This work

was aimed at

(1) relating the geology to the ground magnetic and scintillometer survey generally.

(2) ascertaining the source of the radioactivity.

(3) utilising the information obtained from this accessible prospect to assess similar anomalously radioactive granitic areas within Special Mining Leases 199, 213 and 236 held by Kennecott Explorations (Aust.) Ltd. (refer to Plate 1) within the more rugged areas of the same Mt. Painter region.

From the investigations carried out it was concluded that the observed radioactivity was directly related to potassium rich granites.

As uranium mineralisation was not observed on the prospect or detected in accurate assays, it was decided in March, 1969, to relinquish the option over the claims.

G E O L O G Y

General - (See Plate 2)

Bob Nob is centred on an outcrop of laminated haematite quartzite.

Stratigraphically this quartzite is regarded as lying at the base of the Adelaide System where it was later strongly faulted along the zone of unconformity against the underlying "Older Granite" of the more ancient Mount Painter Complex and the overlying remaining basal beds (Callana Beds) which are calc-silicate rocks with minor quartzite beds in the south of the prospect area.

Shearing within the granite beneath the Bob Nob quartzite has produced a wide zone of quartz-muscovite-felspar schists which grade northwards into stressed quartz-felspar porphyry granite.

BOB NOB QUARTZITE

This bed is best developed and preserved on the western side of the prospect; a possible fault separates it from the eastern exposure. Magnetic contours indicate that the bed continues beneath scree and alluvium to a faulted zone approximately 300 feet south of the mapped surface outcrop.

The eastern section of quartzite has been skewed 45°E by shearing, strongly fractured, quartz veined, and between lines 600 and 700 at 350N a large, fractured, tabular mass has been faulted over an adjacent section down the dip-slope accompanied

by brecciation to yield haematite flour and produce a double layer of the haematite quartzite at line 8 — 200 N.

The haematite content of the quartzite grades from near zero to one hundred per cent, but overall the haematite content is quite dominant. An independent assessment of the above surface tonnage of approximately 2 x 10^6 tons confirmed Furber's estimate of 2.5 to 3 x 10^6 tons.

Haematite also occurs within the schists to the east of Bob Nob along planes of schistosity, as veins within quartz and as platings on fracture or joint planes. In the schists large, well developed, splendant, rhombohedral crystals of specular iron up to six inches across are common. This same crystalline aspect occurs within the quartzite deposit, indicating a recrystallization of iron oxides.

Overlying the haematite quartzite is a bed of fine grained quartz grit which has been strongly stressed to produce flattened quartz grains giving the rock a schistose appearance. Although some quartz-muscovite schists occur within this bed, it must be regarded as a quartzite, and being devoid of haematite it is in direct contrast to the iron rich Bob Nob quartzites.

SCHISTS

These are typically quartz-felspar-muscovite schists with developments of biotite in more strongly stressed zones.

The schists grade into sheared granite rocks northwards from the Bob Nob quartzite and near the mapped boundary of schist/sheared granite on the eastern side of the prospect, an interfingering of

granite and schist indicates clearly a lessening of shearing stresses northwards.

The boundary between the schists derived originally from the granite and the mapped granite outcrop was mapped on the appearance of the porphyry texture of rounded blue quartz and pink felspar laths on weathered surfaces.

GRANITE

Foliation produced by shearing commonly produced schists and gneisses with a pronounced augen structure possibly facilitated by primary directional structures within the granite. The schistosity of the granite and schists is identical at their contact but the angle of dip within the granite increases slightly northwards.

More intense shearing within the granite, associated with lenticular quartz infillings of fractures, in all cases produced biotite schists or in pegmatitic areas, biotite (phlogopite?) pods with well developed tourmaline crystals within the biotite masses and as encrustations on accompanying quartz. These latter sheared areas had characteristically low radioactivity.

FAULTING

Some aspects of faulting have already been discussed under previous headings.

The major faulting of the prospect contains brecciated schists and infillings of quartz-felspar rock. Generally the intrusions are very coarse grained but smaller veinings into brecciated schist rocks are medium grained and more typically granitic. The quartz felspar developments in faulted zones indicate a remobilization of granite porphyry and inherent radioactivity associated with the granite has been transferred to the felspar fractions.

The crush zone of the eastern section of the prospect was traced further eastwards. It continues as a course separation of quartz and felspar into a pegmatitic zone with abundant milky quartz and smaller local zones of quartz-muscovite pegmatite carrying pods of biotite-tourmaline and quartz-tourmaline rock.

Compressive movement, wedging schists between the crush zone and granite derived schists, convoluted the schists immediately to the east of Bob Nob into a small anticlinal piercement that elevated and intensely fractured the incompetent overlying Bob Nob quartzite.

Smaller faults having a north-south trend with displacements of a few to approximately 150 feet were mapped. No significant intrusives or mineral developments were associated with any of them, and they were considered to be pressure release fractures between the granite and main crush zone.

GROUND MAGNETICS (see Plate 3)

The magnetic contours parallel the trend of bedding and schistosity except in the southeast area where the pattern is disrupted by shearing.

The haematite beds are readily traceable within the pattern but the resultant anomaly is not above broad elongated highs within adjacent granitic rocks.

Mapped faults correlate with magnetic lows. The major fault zone parallels a 400 gamma trough and the granite-schist contact coincided with marked lows between 3-600 N and 4-600 N and at 7-700 N, 13-700 N.

RADIOACTIVITY (see Plate 4)

Radioactivity was found to be generally several times background throughout the sheared granitic rocks with the highest counts associated with felspar rich zones.

A high on the eastern side of the prospect is directly related to a brecciated quartz-felspar intrusive infilling within a sheared zone of schists. In this area only the felspars gave rise to higher radioactive counts; quartz in veins, reefs and pegmatites in all cases yielded only near background counts.

Schists also gave radioactivity counts of several times background but higher counts over schists as indicated in the survey were escalated by scree from quartz-felspar outcrops.

A sample of quartz-felspar rock from 0-600 N giving three times background readings, typically pink in colour with quartz

occurring as fine disseminate grains, haematite as fine accessory grains and crystalline tourmaline infilling cavities gave the following assay results.

Uranium	less than 0.005 parts per million
Thorium	0.010 p.p.m.
Lanthanum	200 p.p.m.
Yttrium	50 p.p.m.
Cerium	1000 p.p.m.

Thus the radioactivity of this rock type is considered to be due to radioactive potassium within felspar lattices and thorium existing as trace amounts with the rare earth mineral manazite (Ce, La, Di)PO_4 and possibly and to a lesser extent accessory Xenotime (YPO_4).

Similarly, a clayey fault breccia lying beneath the haematite quartzite at 12-600 N and giving more than six times background readings did not contain detectable uranium on analysis.

BASIC ROCK

Small outcrops of a dark, basic, non-lineated rock were mapped at 0-650 N and 11-750 N. The Australian Mineral Development Laboratories (Report MP 1477-69 Dec. 1968 by A. Kelly) identified the rock as a coarse grained amphibolite (meta gabbro).

Thin section examination disclosed a composition of calcicoligoclase plagioclase (60%), actinolite (25%), magnetite as closely grouped 50-100 micron grains (4%), ilmenite containing tiny "spindles" of exsolved haematite (4%), quartz (4%), accessory biotite and haematite. A basic igneous intrusive origin was deduced for this rock followed by a period of non-dynamic metamorphism.

CONCLUSION

The anomalous radioactivity of the Bob Nob prospect is related to potassium rich granites carrying accessory thorium bearing rare earth minerals.

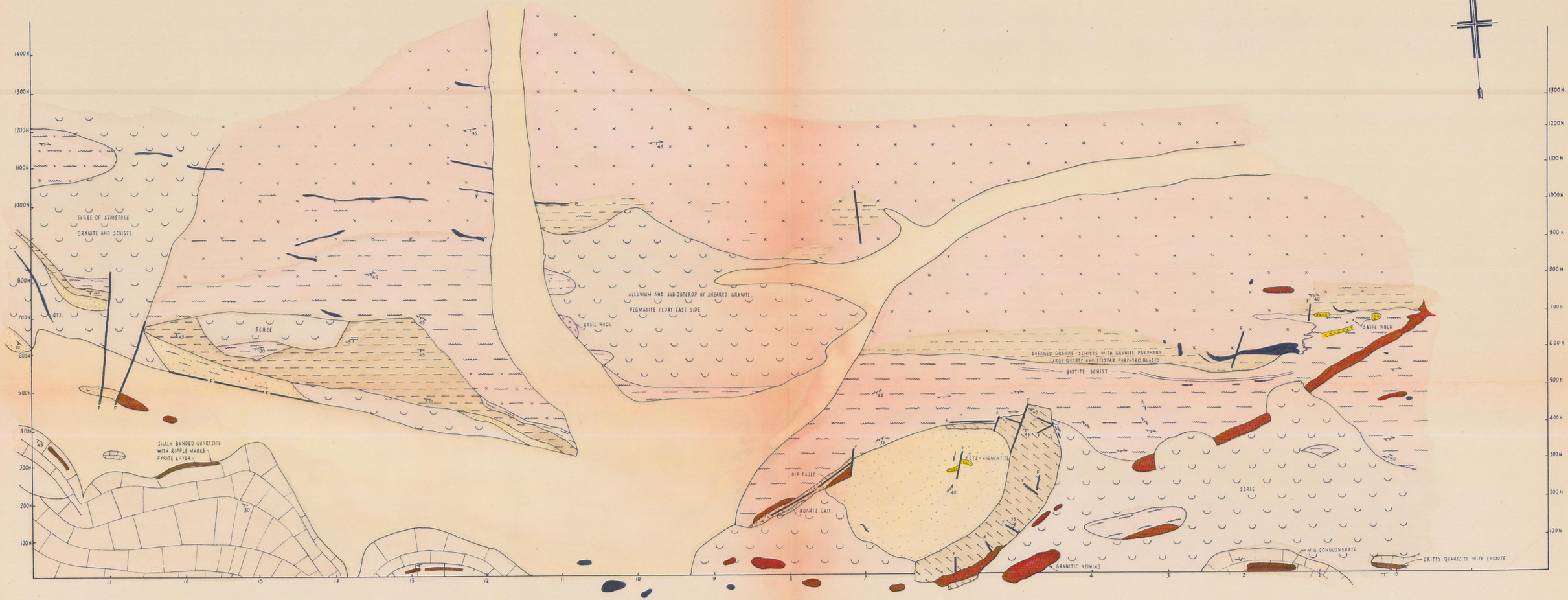
No significant uranium mineralisation is evident and radioactivity due to potassium and thorium satisfactorily accounts for the anomalies surveyed on the mapped grid pattern.

RECOMMENDATION

As no significant mineralisation was found on the Bob Nob prospect it is recommended that

(1) Kennecott Explorations (Aust.) Pty. Ltd. relinquish the options held over Mineral Claims Nos. 5204 and 5205 held by Messrs. G.A. Greenwood and R.L. Lander.

(2) The option be relinquished before the end of March, 1969, to avoid the obligation of obtaining a renewal of labour suspension conditions for the claims. The present Claim Suspension Certificates issued by the S.A. Mines Department (numbered 1557 and 1558 of Book 10) expire on the first of April, 1969.



LEGEND

- ALLUVIUM
- SCREE
- GRANITE WITH LARGE ROUNDED BLUE QUARTZ AND PINK FELSPAR PHENOCRYSTS
- QUARTZ - FELSPAR - MUSCOVITE SCHISTS WITH LOCAL DEVELOPMENTS OF BIOTITE SCHISTS
- LAMINATED HAEMATITE QUARTZITE AND HAEMATITE ROCK
- CRUSHED FINE GRAINED QUARTZ ROCK WITH FLATTENED QUARTZ GRAINS, PSEUDO SCHISTOSE APPEARANCE MINOR QUARTZ - MUSCOVITE SCHIST
- CRUSH ZONE ROCKS OF BRECCIATED SCHISTS, QUARTZ - FELSPAR ROCK AND QUARTZ VEINING
- MAINLY CALC - SILICATE ROCKS, GENERALLY WITH TREMOLITE NEEDLES, SOME ACTINOLITE ROCK DEVELOPMENT. WITH THIN BANDS OF SHALEY LAMINATED QUARTZITES AND GRITS
- HAEMATITE DEVELOPMENTS ASSOCIATED WITH INTRUSIVE BODIES
- QUARTZ BODIES
- SCHISTOSITY
- FAULT

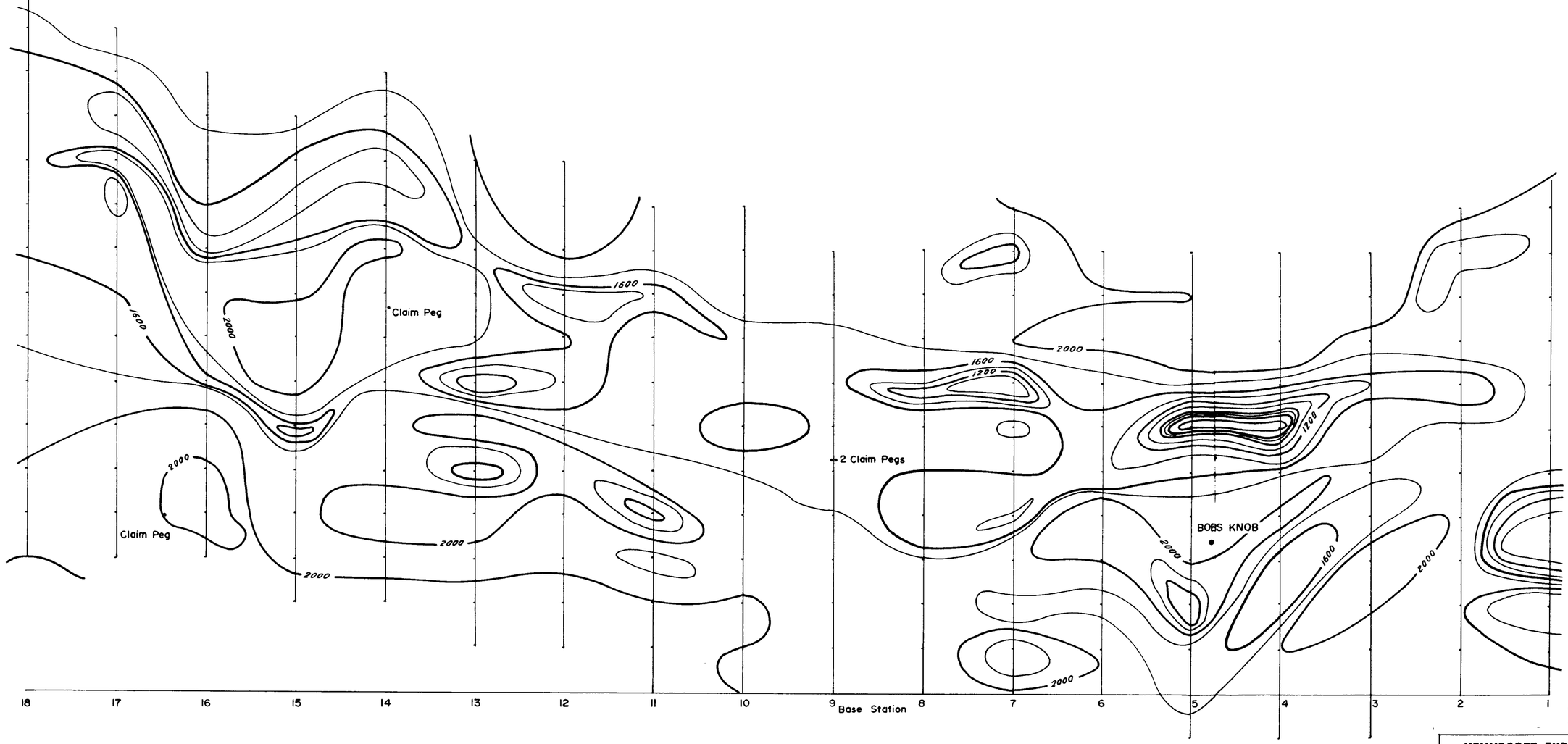
KENNECOTT EXPLORATIONS (AUSTRALIA) PTY. LTD.

BOBS KNOB GRID
GEOLOGY

BY S.B. WARNE

Plate 2.

SCALE: 1" = 200 Feet	PLATE NO. 233 - 1968
DATE BY: J.R STEVENS	DATE: OCTOBER 1968



ENV 1367-4

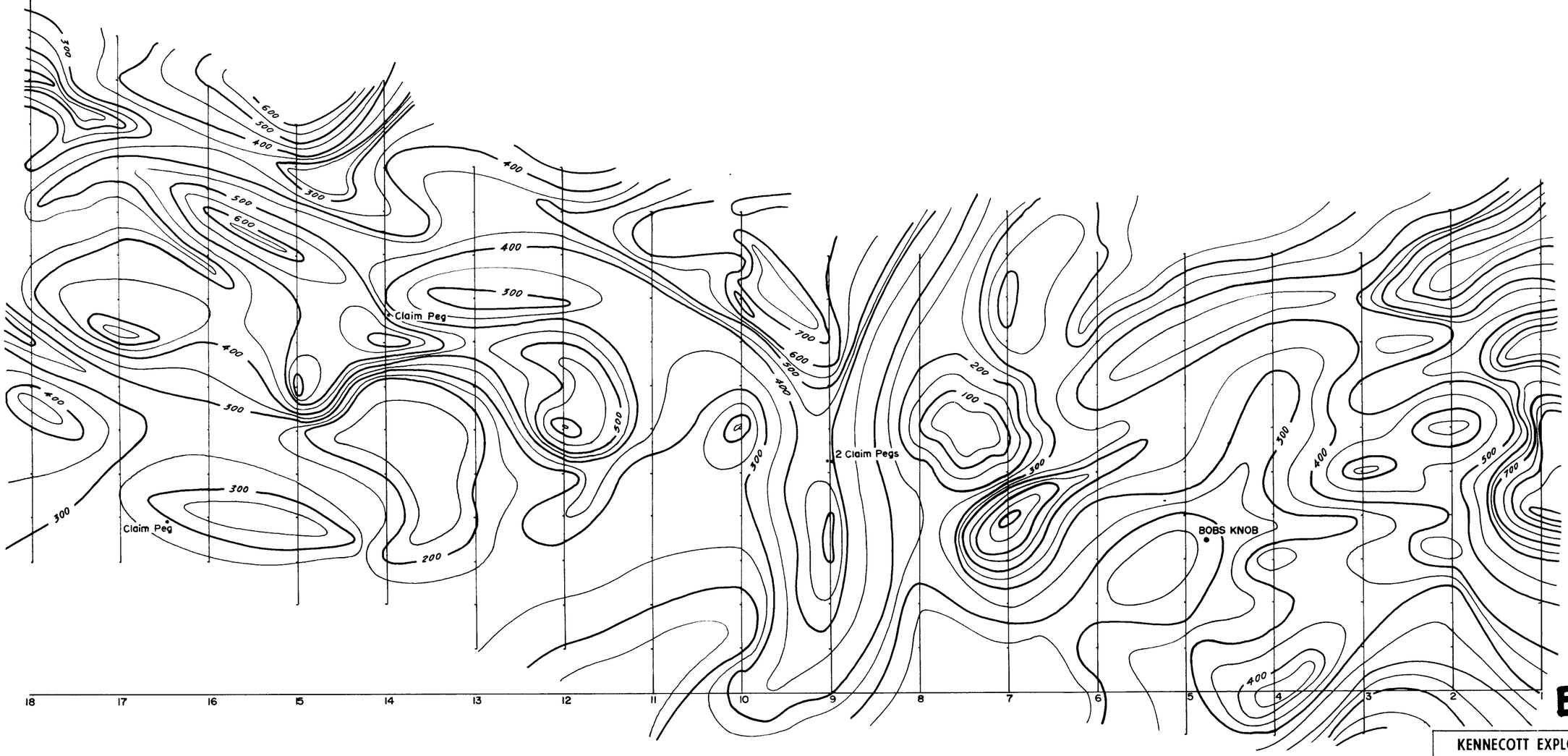
KENNECOTT EXPLORATIONS (AUSTRALIA) PTY. LTD.

GROUND MAGNETICS
BOBS KNOB GRID

DATA by B.R.O. and A.J.McD.

Plate 3.

SCALE: 1" = 200 feet	PLATE NO 229 - 1968
DATE BY: J. R. Stevens	DATE: August 1968



**2 Claim Pegs

ENV 1367-5

KENNECOTT EXPLORATIONS (AUSTRALIA) PTY. LTD.

SCINTILLOMETER SURVEY
BOBS KNOB GRID

DATA by A.J.McD. and B.R.O. Plate 4.

SCALE: 1" = 200 feet	PLATE NO 230 - 1968
DATE BY: J.R. STEVENS	DATE August 1968

C O N T E N T S

INTRODUCTION

Mineral Claims 5204 and 5205 were first investigated by D.V. Furber of the Broken Hill Proprietary Company Limited in early 1968, to test their value as an iron ore prospect. The work carried out by Furber indicated a low grade, low tonnage deposit of haematite-quartzite of no economic value to that company.

In June, 1968, Kennecott Explorations (Australia) Pty. Ltd. obtained an option over the claims following an observation by C.C. Brooks, Adelaide office, that anomalous radioactivity occurred on the claim areas. Detailed geophysical work, geological mapping and assays of selected samples indicated that the observed radioactivity was directly related to a potassium rich granite carrying accessory thorium bearing rare earth minerals. This work was fully described in Warne S.B., Bob Nob Prospect: Mineral Claims 5204, 5205; March 1969.

Prior to relinquishing the claims as a uranium prospect, as recommended in the March report, it was decided to ensure the area did not carry other metals which could possibly make it a worthwhile asset.

This report records the results of assays carried out by Kennecott Explorations (Australia) Pty. Ltd. and for completeness also those carried out by The Broken Hill Proprietary Company Limited on the prospect area.

CONCLUSIONS

Previous work concluded anomalous radioactivity of the Bob Nob prospect to be associated with potassium rich granite carrying trace uranium and thorium mineralization. The assays of chipline samples confirm this conclusion.

Scan assays for other metals show the prospect area to carry insignificant mineralization generally. Low niobium, yttrium and barium values associated with faulting on the east side of the prospect area, low uranium and niobium values in the quartz-felspar-muscovite schists and low vanadium and tungsten values associated with the haematite-quartzite on the west side of the prospect area of general, but not economic, interest.

RECOMMENDATION

Kennecott Explorations (Australia) Pty. Ltd. relinquish the options held over Mineral Claims Nos. 5204 and 5205 held by Messrs. G.A. Greenwood and R.L. Lander.

Labour suspension conditions have been granted on the claims by the S.A. Mines Department under claim suspension Certificate numbered 2158 and 2159 of Book 12 expiring on the 1st day of October 1969.

The Broken Hill Proprietary Company Assays

Two continuous chip lines were taken across the haematite-quartzite bed on the more accessible western side of the prospect. The positions of the sample lines are shown on PLATE 1, AREA 1 plan (prepared by D.V. Furber, B.H.P.).

(Note that AREA 2 plan on PLATE 1 refers to a small massive haematite deposit 1½ - 2 Miles west of Mt. Jacob, North Flinders Ranges, visited by Furber in conjunction with his assessment of the Bob Nob Claims).

The chip samples were assayed by the B.H.P. and results indicated the orebody to be a low grade haematite-quartzite with a high silica content. Furber concluded that the low grade of the ore, limited size of the deposit and its inaccessibility rendered it of little economic importance.

The results of the B.H.P. assays are tabled on page 6.

B.H.P. ASSAY RESULTS -- BOB NOB CLAIMS -- 1968

Sample No.	Fe %	SiO_2 %	Al_2O_3 %	Ignition Logs %	P %	Mn %	S %	TiO_2 %	V %	Cr %	Sn %	Cu %
1	62.9	4.9	2.8	1.8	0.05	0.1	0.03	0.70	0.020	0.010	0.010	0.008
2	22.7	64.7	0.3	0.6	0.02	0.1	0.02	0.40	0.004	0.030	0.020	0.002

KENNECOTT EXPLORATIONS (AUSTRALIA) PTY. LTD. CHIP SAMPLE ASSAYS

See page N°2

Three chip line samples were completed and aimed at testing possible metal contents in the various geologic situations of the mineral claim areas. Sampling was carried out by Geological Assistants B.R. Osborne and T.S. Skuse taking chip samples of the freshest available outcrop and of the same visual size at one foot intervals. Outcrop was continuous except on LINE 1; no samples were taken in areas of float.

The positions of the three sample lines are shown on Plan 2.

The first chip line, on LINE 1 from 500 N to 800 N was aimed at sampling the faulted zone at the eastern end of the mapped prospect area. Anomalous radioactivity was previously noted as being associated with feldspar rich sections of the crush zone mapped in this zone.

The second chipline, on LINE 5 from 0 N to 450 N was aimed at sampling the crush zone rocks at a second location, the haematite quartzite over its best exposure and the quartz-felspar-muscovite schist zone bordering the granite.

The third chipline, on LINE 12 from 400 N to 800 N was aimed at sampling the haematite quartzite as well as schists above and below this bed on the western side of the prospect.

All assays were carried out by the Australian Mineral Development Laboratories (Report AN110/70 of 8-8-69).

Uranium and thorium assays were carried out by accurate techniques (uranium by fluorimetry); all other determinations were semi-quantitative spectrographic analyses. The assay results are listed in Table 2 and confirm the general conclusions of the first report.

Of additional interest are the following observations:

1. The sheared, brecciated and quartz intruded schist zone on the east edge of the mapped area (LINE 1)
   (a) yielded the only combined uranium-thorium assay value (U, 15 p.p.m.; Th, 100 p.p.m.)
   (b) gave barium assays of 2000 to 3000 p.p.m. compared to less than 1000 p.p.m. values for the rest of the area.
   (c) contained yttrium values of 50 to 600 p.p.m. compared to values of 15 to 50 p.p.m. in haematite-quartzite and 20 to 100 p.p.m. in schists of the western side of the prospect.
   (d) carried niobium values of 20 to 50 p.p.m.
2. Slightly anomalous vanadium and tungsten values of 100 p.p.m. and 150 p.p.m. were detected associated with the haematite-quartzite on LINE 12.
3. Quartz-muscovite-feldspar schists on Line 12 yielded niobium values of 20 to 60 p.p.m. and uranium values of 15 p.p.m.

TABLE 2

ASSAY RESULTS LINE 1

Element	U	Th	Cu	Pb	Zn	Sn	Bi	Ag	Ga	Ge	Sb	Ba	Y	La	Ce	Nd	Pr
Detection limit	10	50	0.5	1	20	1	1	0.1	1	1	30	50	10	100	300	300	100
Sample No. Footage	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
C35901 500-519	10	<50	50	5	20	25	1	0.4	30	1	*	500	40	*	*	*	*
C35902 600-632	15	100	30	8	20	5	1	0.1	30	*	*	1000	600	*	*	*	*
C35903 700-750	<10	<50	50	10	30	8	1	0.1	30	1	*	1000	100	*	*	*	*
C35904 750-800	<10	<50	100	15	*	8	1	0.1	30	*	*	1000	60	*	*	*	*

* = not detected at limit quoted

TABLE 2 (Cont.)

ASSAY RESULTS LINE 1

Element		Ti	B2	Sc	Eu	V	W	Mo	Ta	Nb
Detection limit		100	100	50	50	10	50	3	100	20
Assay No.	Footage	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
C35901	500-519	3000	*	*	*	30	*	*	*	30
C35902	600-632	2500	*	*	*	20	*	*	*	20
C35903	700-750	3000	*	*	*	*	*	3	*	50
C35904	750-800	2500	*	*	*	*	*	50	*	50

* = not detected at limit quoted

TABLE 2 (cont.)

ASSAY RESULTS LINE 5

Element		U	Th	Cu	Pb	Zn	Sn	Bi	Ag	Ga	Ge	Sb	Ba	Y
Detection limit		10	50	0.5	1	20	1	1	0.1	1	1	30	50	10
Sample No.	Footage	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
C35905	0-50	<10	< 50	15	3	30	8	*	0.1	10	*	*	300	15
C35906	50-100	<10	< 50	10	3	*	10	1	0.1	3	1	*	200	40
C35907	100-150	<10	< 50	10	3	*	15	1	0.1	3	1	*	150	40
C35908	150-200	<10	< 50	10	3	*	15	1	0.1	3	1	*	80	40
C35909	200-250	<10	< 50	5	3	*	20	1	0.1	3	1	*	80	15
C35910	250-300	<10	< 50	25	3	50	10	*	0.1	3	*	*	300	30
C35911	300-350	<10	< 50	8	3	30	15	3	0.1	3	*	*	100	15
C35912	350-400	<10	< 50	20	3	30	15	*	0.1	3	1	*	80	15
C35913	400-450	<10	< 50	8	3	20	30	1	0.1	3	1	*	80	50

* = not detected at limit quoted

TABLE 2 (Cont.)

ASSAY RESULTS LINE 5

Element		La	Ce	Nd	Pr	Ti	Er	Sc	Eu	V	W	Mo	Ta	Nb
Detection limit		10	300	300	100	100	100	50	50	10	50	3	100	20
Assay No.	Footage	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
C35905	0-50	*	*	*	*	5000	*	*	*	50	*	*	*	*
C35906	50-100	*	*	*	*	1500	*	*	*	20	*	*	*	*
C35907	100-150	*	*	*	*	1000	*	*	*	20	50	3	*	*
C35908	150-200	*	*	*	*	1500	*	*	*	15	*	*	*	*
C35909	200-250	*	*	*	*	2500	*	*	*	20	*	3	*	*
C35910	250-300	*	*	*	*	2000	*	*	*	50	50	*	*	*
C35911	300-350	*	*	*	*	1500	*	*	*	20	*	*	*	*
C35912	350-400	*	*	*	*	2000	*	*	*	20	*	*	*	*
C35913	400-450	*	*	*	*	2000	*	*	*	20	*	5	*	*

* = not detected at limit quoted

TABLE 2 (cont.)

ASSAY RESULTS LINE 12

Element		U	Th	Cu	Pb	Zn	Sn	Bi	Ag	Ga	Ge	Sb	Ba	Y
Detection limit		10	50	0.5	1	20	1	1	0.1	1	1	30	50	10
Sample No.	Footage	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
C35914	400-450	< 10	<50	50	1	30	3	*	0.1	3	*	*	100	20
C35915	450-500	15	<50	50	1	20	3	*	0.1	3	*	*	100	30
C35916	500-550	< 10	<50	20	3	30	6	1	0.1	3	1	*	80	30
C35917	550-600	15	<50	10	15	*	10	2	0.1	20	*	*	400	50
C35918	600-650	<10	<50	8	10	20	15	1	0.1	30	*	*	400	50
C35919	650-700	15	<50	8	15	*	8	1	0.1	50	*	*	600	30
C35920	700-750	15	<50	30	8	20	8	*	0.2	30	*	*	600	60
C35921	750-800	15	<50	20	15	*	8	1	0.1	30	*	*	800	100

* = not detected at limit quoted

TABLE 2 (cont.)

ASSAY RESULTS LINE 12

Element		La	Ce	Nd	Pr	Ti	Er	Sc	Eu	V	W	Mo	Ta	Nb
Detection limit		10	300	300	100	100	100	50	50	10	50	3	100	20
Sample No.	Footage	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
C35914	400-450	*	*	*	*	1500	*	*	*	100	150	*	*	*
C35915	450-500	*	*	*	*	3000	*	*	*	100	150	*	*	*
C35916	500-550	*	*	*	*	2500	*	*	*	30	50	3	*	*
C35917	550-600	*	*	*	*	4000	*	*	*	50	80	*	*	20
C35918	600-650	*	*	*	*	4000	*	*	*	50	*	5	*	30
C35919	650-700	*	*	*	*	4000	*	*	*	15	*	3	*	60
C35920	700-750	*	*	*	*	4000	*	*	*	15	*	*	*	60
C35921	750-800	*	*	*	*	3000	*	*	*	10	*	3	*	40

* = not detected at limit quoted

LEGEND

- Faults
- Major basement — Adelaide System Unconformity and Decollement
- Formation Boundaries
- Group and Geological Boundaries
- Track

RECENT

- outwash and floodplain deposits

ORDOVICIAN

- younger granite suite
- pegmatites
- breccia

PROTEROZOIC

- Wilpena Group — Pw
- Umberatana Group — Pu
- Burra Group — Pb
- Callana Beds — Pc
- amphibolites

LOWER ? PROTEROZOIC

- Mount Painter Complex
- older granite suite
- radium creek metamorphics

SCALE

miles 4 3 2 1 0 1 2 4 miles

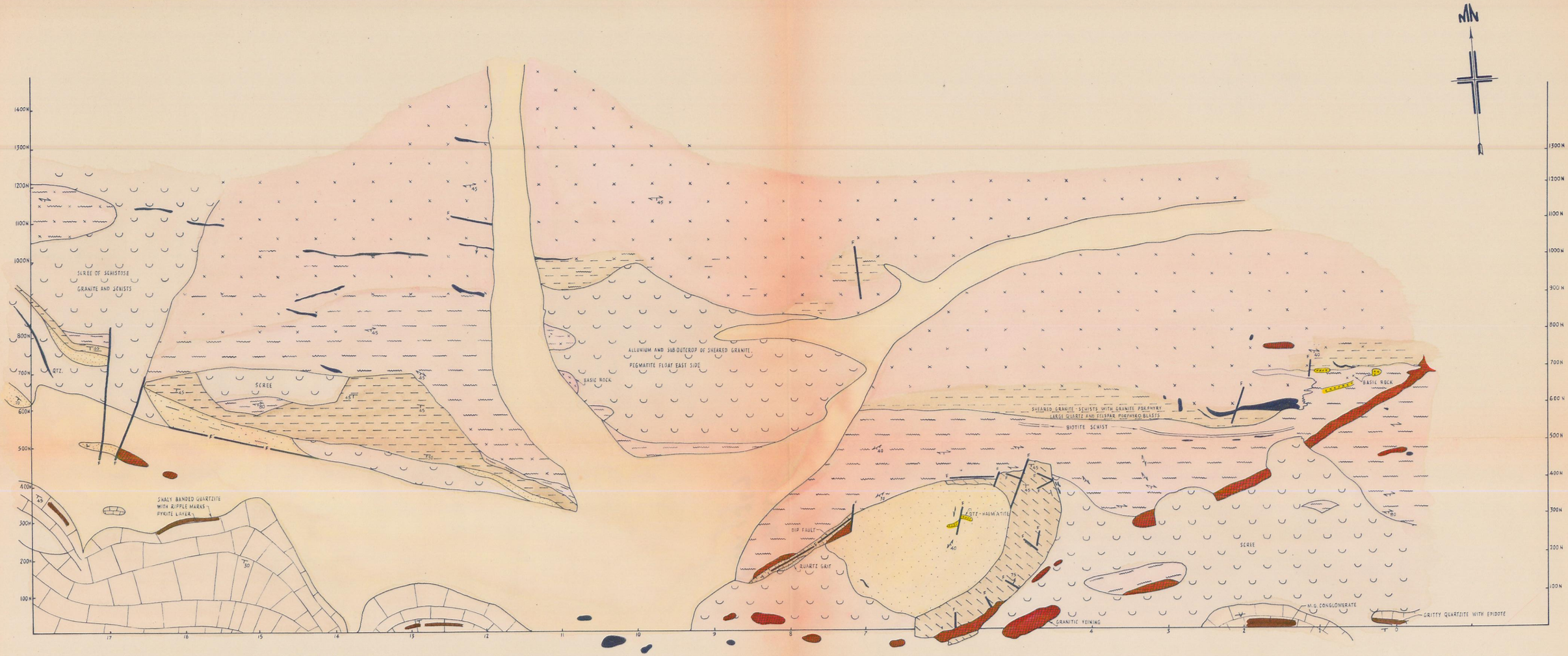
KENNECOTT EXPLORATIONS (AUSTRALIA) PTY. LTD.

Generalised Geology MOUNT PAINTER District

Plate 1.

SCALE: 1" = 4 miles	PLATE No.: 241-1969
DRAWN BY: J.R. Stevens	DATE: January 1969

ENV 1367 - 1



LEGEND

- ALLUVIUM
- SCREE
- GRANITE WITH LARGE ROUNDED BLUE QUARTZ AND PINK FELSPAR PHENOCRYSTS
- QUARTZ - FELSPAR - MUSCOVITE SCHISTS WITH LOCAL DEVELOPMENTS OF BIOTITE SCHISTS
- LAMINATED HAEMATITE QUARTZITE AND HAEMATITE ROCK
- CRUSHED FINE GRAINED QUARTZ ROCK WITH FLATTENED QUARTZ GRAINS, PSEUDO SCHISTOSE APPEARANCE MINOR QUARTZ - MUSCOVITE SCHIST
- CRUSH ZONE ROCKS OF BRECCIATED SCHISTS, QUARTZ - FELSPAR ROCK AND QUARTZ VEINING
- MAINLY CALC - SILICATE ROCKS, GENERALLY WITH TREMOLITE NEEDLES, SOME ACTINOLITE ROCK DEVELOPMENT. WITH THIN BANDS OF SHALEY LAMINATED QUARTZITES AND GRITS
- HAEMATITE DEVELOPMENTS ASSOCIATED WITH INTRUSIVE BODIES
- QUARTZ BODIES
- SCHISTOSITY
- FAULT

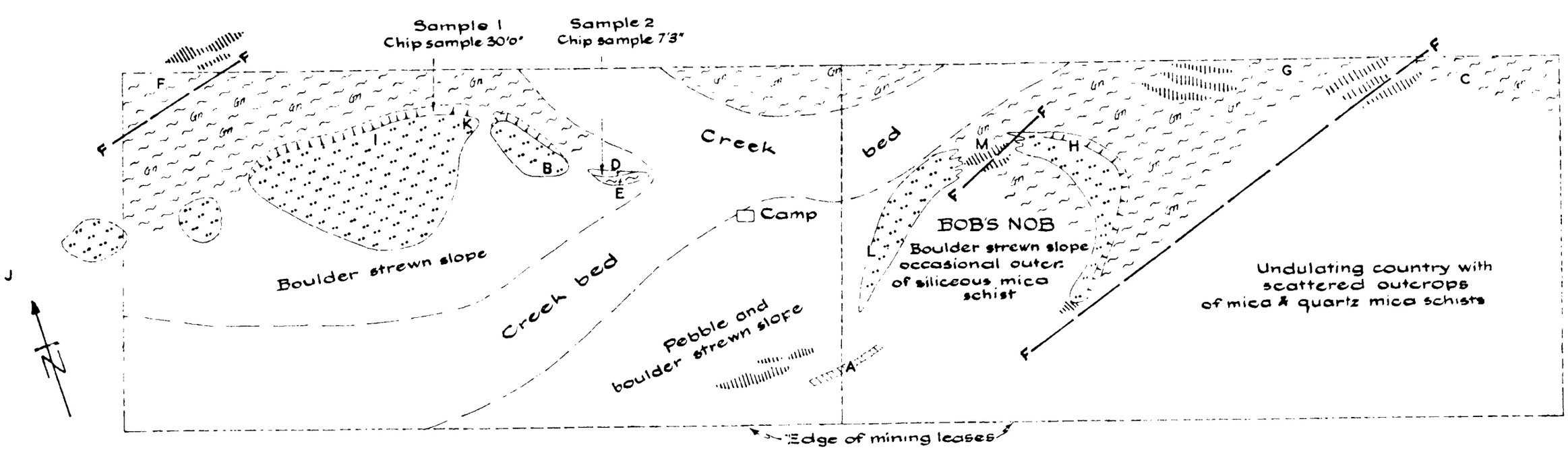
KENNECOTT EXPLORATIONS (AUSTRALIA) PTY. LTD.

BOBS KNOB GRID
GEOLOGY

BY S.B. WARNE

Plate 2.

SCALE: 1" = 200 Feet	PLATE NO. 233 - 1968
DATE BY: J.R STEVENS	DATE: OCTOBER 1968



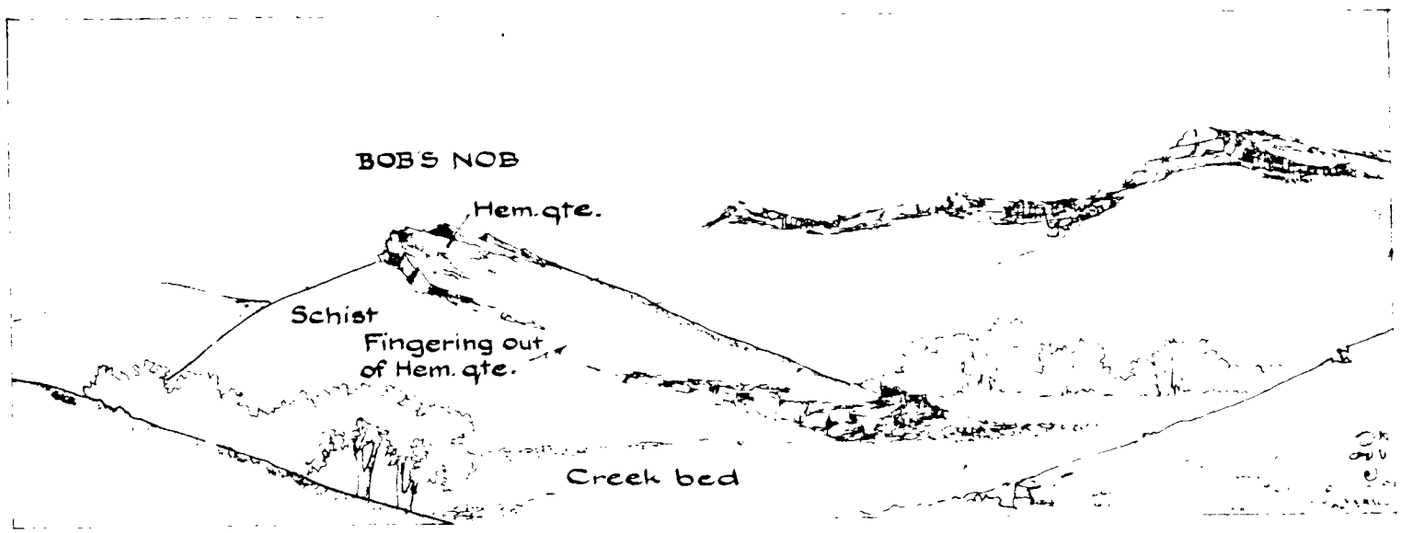
AREA 1

Scale: 1" - 100 yds.

AREA 2

Scale: 1" - 100 yds.

- Hematite - limonite
- Hematite quartzite
- Shaly mudstone
- Quartz mica schist & Augen gneiss
- Quartz veining
- F—F Fault
- A Letters refer to hand samples



VIEW Looking South East at BOB'S NOB

Plate 1

A.V.

ENV 1367 - 3

D.V.F. 68