CONTENTS ENVELOPE 6813

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TENEMENT HOLDER: Roebuck Resources NL.

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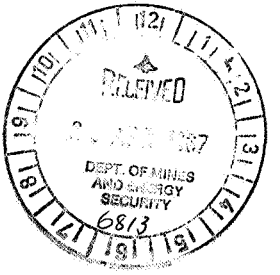
ROEBUCK RESOURCES N.L.
EXPLORATION LICENCE 1369
KANGAROO ISLAND, SOUTH AUSTRALIA
QUARTERLY REPORT FOR THE PERIOD
26TH NOVEMBER 1986 to 25TH FEBRUARY 1987



TECHNICAL REPORT NO. 41

PERTH, APRIL 1987

BY: S.B. WARNE

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FIGURES

1. INTRODUCTION

A 17 km^2 area near Antechamber bay, Kangaroo Island was applied for as an Exploration Licence on the 14th July, 1986. Our exploration targets in the area are a commercial gem tourmaline deposit and a commercial white kaolin deposit. Historical records indicate the presence of both gem tourmaline and kaolin in a weathered pegmatite. Both were mined in the past, with the kaolin (china clay) being mined on a significant scale. (Lockhart Jack, 1926).

2. EXPLORATION

During the quarter, activities were confined to obtaining 1:10,000 photo coverage, making contact with land holders within the area covered by the licence, a field visit for land holder discussions, general viewing of pegmatite areas, submitting requests to clear a small area of regrowth scrub covering the main old workings and permission to use declared equipment for trenching.

Reconnaissance indicates the extent of old pittings sited on pegmatite occurrences is much more extensive than previously recorded. Most of these other workings are within cropped paddocks and in some cases only identifiable due to colour anomalies on photos. Collectively they indicate a much more extensive strike length of the pegmatite system.

Extensive areas of off-white kaolinitic clays were noted to be developed on Kanmantoo group rocks now covered by a veneer of Tertiary-Recent sediments. A typical sample of this material was collected (from Ian Wilson's Dam) to determine its nature. It appeared to be a good quality brick clay similar to that used by the Hog Bay Company to produce cream coloured bricks at Penneshaw.

3. GENERAL

Following an approach from the Department of Mines and Energy, the joint venturers accepted an offer from the

Department to supervise initial evaluation of the clay deposit using visiting Indonesian geologists. The purpose of this is to provide the visitors with practical field experience in evaluation of clay deposits. This is expected to commence in late April, 1987.

for S.B. WARNE
Consulting Geologist

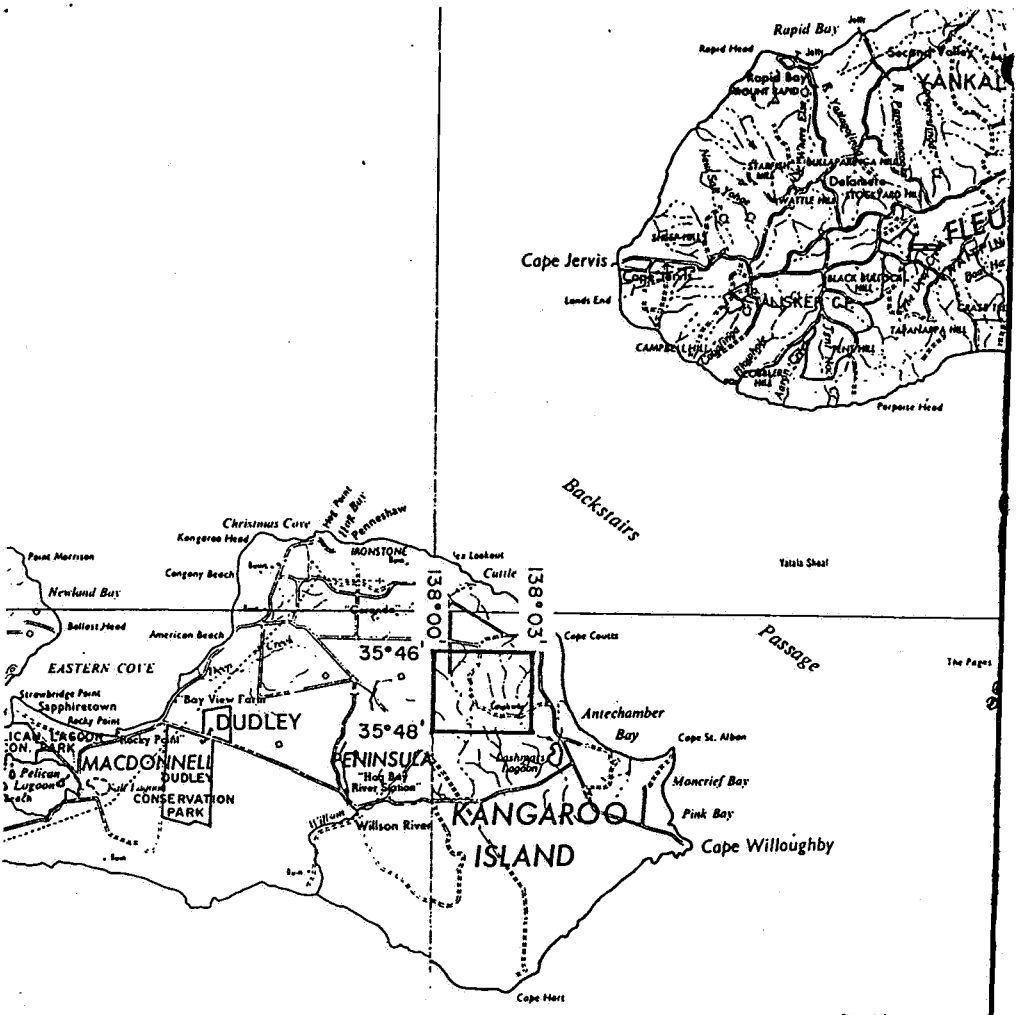


Figure 1.

SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

NOTE: There is no warranty that the boundary of this Exploration Licence is correct in relation to other features on the map. The boundary is to be ascertained by reference to the Australian Geodetic Datum.

4. EXPENDITURE

EXPLORATION EXPENDITURE
E.L. 1369 - KANGAROO ISLAND
THREE MONTHS ENDED 25.2.87

Geologist - In House		308
Mines Department Fees		156
Mining Tenements - Administration		96
Stamp Duty		4
		564
*Overhead Costs		85
	TOTAL:	$ 649

*Office services, depreciation, depletion, rentals, amortisation of assets, auditing.

5. REFERENCE

Lockhart Jack, R. 1926 - Clay and Cement in South Australia. G.S.S.A. Bulletin 12.

ROEBUCK RESOURCES N.L.

E.L. 1369

ANTECHAMBER BAY,

KANGAROO ISLAND, S.A.

QUARTERLY REPORT FOR THE PERIOD

27TH FEBRUARY 1987 TO 26TH MAY 1987

BY: S.B. WARNE

TECHNICAL REPORT NO. 49

PERTH, MAY 1987

CONTENTS

Figures

1. INTRODUCTION

Exploration Licence 1371 was granted for one year commencing 27th November, 1986, to investigate the possibility of commercial gem tourmaline and clay deposits.

An approach from the Department of Mines and Energy during the first quarter to carry out first phase exploration, in order to give a visiting Indonesian field geologist appraised experience, was accepted. The writer, in company with J.L. Keeling, Senior Geologist, Minerals Resources Branch, visited the site 14th April, 1987, to discuss a programme and arrange for the use of machinery with local contractors. Permission was subsequently granted by the Department of Mines and Energy to clear scrub of old workings, with a bulldozer in the area and carry out costeaning with a backhoe.

2. EXPLORATION

The following summary of work completed to 26th May, 1987 was provided by J.L. Keeling:-

BACKGROUND - Dudley pegmatite is located 10.5 km southeast of Penneshaw on Section 79, hundred Dudley, District Council of Dudley.

The deposit was originally worked for gem tourmaline during the 1890's and was later reworked between 1904 and 1910 producing milled feldspar, silica and kaolin for ceramics and clay for a brickworks at Penneshaw established in 1907. Production ceased primarily because markets on the mainland and interstate could not be supplied competitively. Flooding of the workings during a particularly wet winter aggravated the situation.

Geological investigation of the pegmatite by S.A. Department of Mines and Energy was arranged with the EL holders as a

field study project for Indonesian geologist, Rachmat.

FIELD WORK

22nd - 23rd April, 1987

Scrub in the area of main workings cleared using a D6 Caterpillar bulldozer. Lines cleared thorugh remaining scrub for access for mapping and trenching.

28th April, - 1st May, 1987

Inspection of outcrop in creek sections and other pegmatites in the area. Hand clearing of scrub in main workings and collection of tourmaline samples from dumps to determine mineralogical associations. Lines pegged for trenching.

4th May - 8th May 1987

Backhoe trenching of lines K2, K3, K4, K5 and K6 compelted, trenches logged and sampled.

19th May - 21st May 1987

Backhoe trenching of lines K0, K1 and K7 completed, trenches logged sampled. All trenches backfilled and compacted except for part of line K1. Stadia survey of workings and trenches completed. Bulldozed tracks through scrub fence.

3. CONTINUING WORK

Five samples representative of variation in fresh pegmatite were prepared for thin section to identify and determine feldspar quality and nature of contaminants.

One sample of clay from trench K2 was selected for preliminary kaolin investigation using XRD and sedimentation techniques.

One sample of feldspar and one sample of quartz were submitted for chemical analysis.

On completion of this laboratory work and compilation of geological plans, a final report will be prepared by the Mineral Resources Branch, Department of Mines and Energy.

4. DISCUSSION OF RESULTS

A discussion of preliminary results was provided by J.L. Keeling, 16th June, 1987, as follows:-

"Dudley pegmatite is an elongate igneous body intruded into Kanmantoo Group fine-grained metasandstone and schist of Cambrian age, probably during early stages of Late Cambrian to Early Ordovicician Delamerian Orogeny. The pegmatite comprises principally feldspar, as microcline perthite and quartz, often as medium-grained graphic intergrowths with minor amounts of muscovite and mica and tourmaline and a trace of garnet.

Eight trenches of length 60 to 90 m, 1 to 1.8 m depth and average 70 m apart, show the pegmatite to persist over 600 m varying in width from 80 m in trench K1 to 3 separate bodies totalling less than 10 m in trench K7 and 1 body of 7 m in trench K0.

Partly kaolinised pegmatite is restricted to higher elevations as a remnant weathering profile. Depth of kaolinisation is probably less than 10 m and may be only 2 to 3 m on hillslopes. Patches of pale orange-brown iron-staining and high grit content, principaly quartz and mica with minor black tourmaline indicate high quality white kaolin is unlikely to be available in commercial quantities.

Gem tourmaline from earlier workings varies from dark blue to green and appears restricted to narrow late stage zones associated with coarse muscovite and/or large quartz crystals

(often smoky quartz). Mica and quartz zones, generally less than 1 m wide, are more common near the margins of the pegmatite and are elongated parallel to strike of the pegmatite.

A small (less than 10 mm long) green tourmaline was found in coarse mica in trench K3 at 51.5 m and a yellow-green cyrstal between 37 and 38 m in K2. Green and blue-green tourmaline, mostly fractured was found in a mica zone 0.3 m wide at 68.5 m in trench K1 which also intersected crumbly green tourmaline in mica at 75 m and produced a small dark green tourmaline between interval 11 to 12 m.

Zoning of unweathered pegmatite, particularly on the south-eastern margin segregates feldspar from quartz and mica in bands up to 0.3 m width. The lateral extent of these segregations is untested but would provide the best target for a feldspar or silica product."

for S.B. WARNE

CONSULTING GEOLOGIST

5. EXPENDITURE

EXPLORATION EXPENDITURE
E.L. 1369 - KANGAROO ISLAND
THREE MONTHS ENDED 26.5.87

Aerial Photography		171
Contractors - Geological		1575
Contractors - Other		770
Geologist - In House		307
Lease and Hire		220
Mines Department Fee		4
Printing & Stationery		2
Telephone & Postage		55
Travel & Accommodation		937
Vehicle Expenses		53
*Overhead Costs		614
TOTAL:	$	4708

*Office services, depreciation, depletion, rentals, ammortisation of assets, auditing

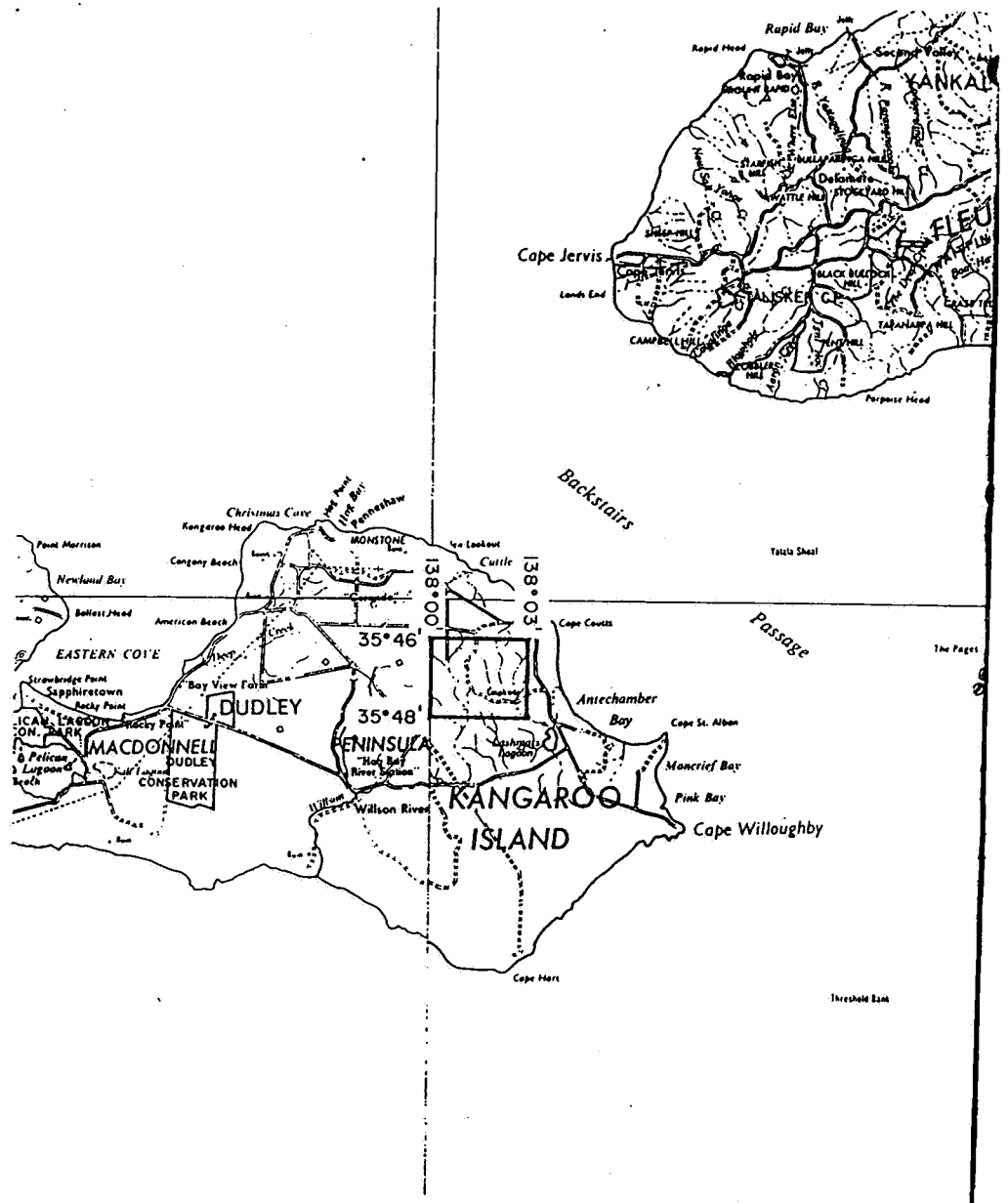


Figure 1.

SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

NOTE. There is no warranty that the boundary of this Exploration Licence is correct in relation to other features on the map. The boundary is to be ascertained by reference to the Australian Geodetic Datum

ROEBUCK RESOURCES N.L.
KANGAROO ISLAND
(EL 1369) ANTECHAMBER BAY
SOUTH AUSTRALIA
QUARTERLY REPORT FOR THE PERIOD
27TH MAY TO 26TH AUGUST, 1987

Prepared by
S.B. Warne
for
Roebuck Resources N.L.

TECHNICAL REPORT NO. 65
PERTH, OCTOBER 1987

CONTENTS

LIST OF FIGURES

1. INTRODUCTION

Exploration Licence 1371 was granted for one year commencing 27th November, 1986 to investigate the possibility of commercial gem tourmaline and clay deposit.

A programme of work was completed during May, 1987 under the supervision of J.L. Keeling, Senior Geologist, Mineral Resources Branch, Department of Mines and Energy, as a field study for visiting Indonesian geologist, Rachmat. A summary of this work was submitted to the E.L. partners and included in the previous quarterly report.

2. EXPLORATION RESULTS AND FINAL REPORT

A final report from J.L. Keeling is not yet to hand due to delays in map completion. Included in this report will be analyses of pegmatite samples and initial kaolin clay investigation of one sample.

The summary of work submitted by J.L. Keeling, viewing of draft plans, examination of samples collected by Keeling and Rachmat and the results of surveying the E.L. area by both the writer and the Department of Mines and Energy personnel suggest:

a) No other significant pegmatite bodies occur outside the zone of old workings sited on the Dudley pegmatite.

b) The limited size of the pegmatite and irregular partial kaolinisation of feldspars with iron stained patches and a high quartz-mica-tourmaline grit indicate a high quality commerical kaolin deposit is unlikely.

c) Clear dark blue and green tourmaline crystals are associated with narrow, late stage, coarse muscovite and large quartz crystal zones near and parallel to pegmatite margins.

d) Future development of the pegmatite will depend on the incidence of gem quality tourmalines. It is possible that portions of pegmatite exposed during gem search could be selectively mined for feldspar, mica or silica products.

3. FOURTH QUARTER ACTIVITIES

Subject to an assessment of the final report on the Dudley pegmatite it is intended to secure the area of the pegmatite with mineral claims before proceeding with further exploration. This appears prudent on enviromental grounds and necessary to negotiate with the land holder in regard to the more intensive exploration required for full assessment of the pegmatite body.

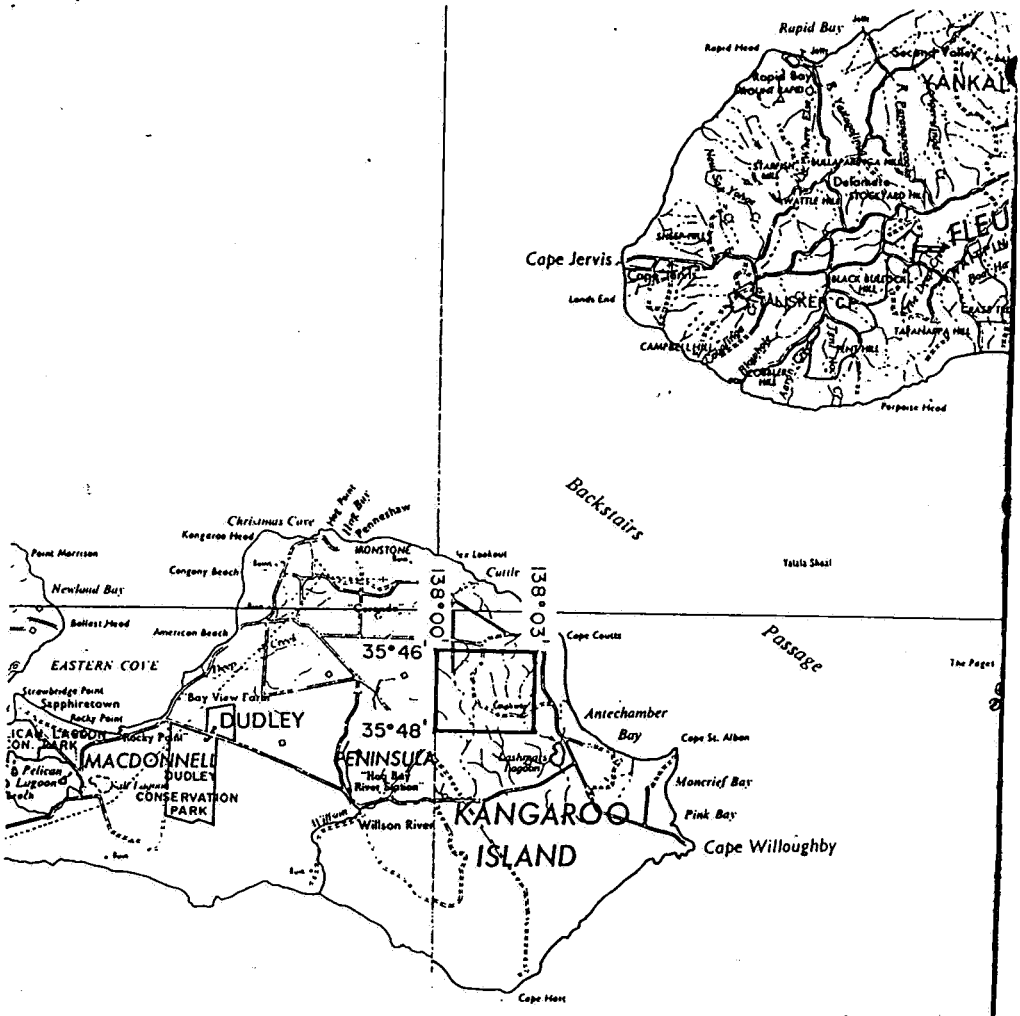
S.B. WARNE

4. EXPENDITURE

EXPLORATION EXPENDITURE
E.L. 1369 - KANGAROO ISLAND
THREE MONTHS ENDED 26.8.87

	$
Contractors - Other (Backhoe and operator)	777
Contractors - Other (Bulldozer and operator)	867
Mining Tenements - Admin	48
*Overhead Costs	254
	$ 1946

*Office services, depreciation, depletion, rentals, ammortisation of assets, auditing



LOCATION MAP

Figure 1.

SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

NOTE. There is no warranty that the boundary of this Exploration Licence is correct in relation to other features on the map. The boundary is to be ascertained by reference to the Australian Geodetic Datum

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

REPT.BK.NO. 87/119
DUDLEY PEGMATITE: PRELIMINARY INVESTIGATION FOR KAOLIN, FELDSPAR, SILICA AND GEM TOURMALINE
(Section 79, Hundred Dudley)

GEOLOGICAL SURVEY

by

J.L. KEELING
MINERAL RESOURCES BRANCH

and

RACHMAT
GEOLOGICAL SURVEY OF INDONESIA

SEPTEMBER, 1987

DME.187/87

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7. Dark blue tourmaline 47.5m long, weighing 43 carats (Bechinger collection). 36110
8. Green tourmaline crystal 18mm long (Bechinger collection). 36111

FIGURES

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

Rept. Bk. No. 87/119
D.M.E. No. 187/87
Disk No. 98

DUDLEY PEGMATITE: PRELIMINARY INVESTIGATION FOR KAOLIN, FELDSPAR, SILICA AND GEM TOURMALINE (Section 79, Hundred Dudley)

ABSTRACT

Dudley pegmatite, 10.5km southeast of Penneshaw, Kangaroo Island was worked during the 1890s and early 1900s for gem tourmaline, ceramic-grade feldspar and silica, and kaolin for brickmaking.

Pegmatite strikes northeast for 550m, is up to 80m wide and varies from a coarse-grained, perthitic microcline feldspar-quartz-muscovite rock to graphic granite and aplite, often with accessory tourmaline and rare traces of garnet.

Gem tourmaline, in mostly blue and green colours is associated with coarse muscovite and/or quartz crystals in pods and veins often elongate parallel to the strike of pegmatite.

Kaolin from weathered pegmatite is restricted in area and of poor quality.

Investigation of feldspar and silica markets is recommended together with further backhoe trenching for gem tourmaline zones.

INTRODUCTION

On December 1986, Roebuck Resources NL, S.B. Warne and Australian Emerald Company NL were granted Exploration Licence (EL) 1369 on Dudley Peninsula to investigate potential kaolin and gem tourmaline mineralisation known from a weathered pegmatite previously worked in the late 1890s and early 1900s.

An initial appraisal of the prospect by Mineral Resources Branch in conjunction with the EL holders was arranged as a suitable field project for Indonesian geologist, Rachmat (Geological Survey of Indonesia), in Adelaide on a six month training scheme sponsored by the Asian Development Bank.

The pegmatite was inspected by J. Keeling and S. Warne on 16 April 1987, followed by mapping, trenching and sampling between 22 April and 8 May. Between 19 May and 21 May, trenching was completed and the area mapped using stadia theodolite by M.W. Flintoft and S.J. Ewen (Field Assistants).

Eight samples were selected for laboratory examination by Rachmat under supervision of F. Radke (Senior Geologist, AMDEL Ltd.).

The aims of the investigation were to:

- determine the surface distribution of the pegmatite
- collect samples of kaolin, feldspar, silica and gem tourmaline for appraisal
- define areas for further work.

LOCATION AND ACCESS

Dudley pegmatite is located 10.5km southeast of Penneshaw in section 79, hundred Dudley, county Carnarvon, District Council of Dudley.

Access from Penneshaw is 4km south then east along Willoughby Road to Willson River Road which is followed south 2km to Penneshaw airport. From the airport, Hungerford Road and Pauls Road are followed easterly for 5.8 km. The deposit is reached from Pauls Road via 2.1km of farm tracks across private property (Fig.1).

Topography is moderately undulating on the edge of a plateau partly dissected by modern drainage. Land is mostly cleared and sown to pasture for sheep grazing but stands of relatively dense vegetation remain along present drainage lines.

MINERAL TENURE

The pegmatite is wholly within Exploration Licence 1369, of 17 sq. km (Fig. 1) granted to Roebuck Resources NL, S.B. Warne and Australian Emerald Company NL for a period of 12 months commencing 27 November 1986.

PREVIOUS WORK

An early description of gem tourmaline from hundred of Dudley is recorded in Brown (1904) although indirect reference to gemstones from Kangaroo Island was first reported in Brown (1899). Mining and prospecting for gem tourmaline outlined a large weathered pegmatite host and in 1905, the Kangaroo Island China Stone and Clay Company was formed to work the deposit to supply a growing Australian pottery industry. The new mining venture was widely acclaimed in the local press (S.A. Register, 1905 and 1906; Advertiser, 1906).

In 1906, L. Gee reported on the company's mining and milling operations. This was published in Brown (1908) together with a separate account of gem tourmaline prospects within the deposit.

Jones (1909) described the state of workings and commented on brick production from a newly erected plant at Hog Bay (Penneshaw).

Basedow (1911) reported the workings flooded and mining suspended after a very wet winter in 1910.

The most detailed geological report was by Jack (1917 and 1926) after workings were abandoned and included a sketch map, photographs of pits and chemical analyses of selected samples.

Descriptions of specimens of Kangaroo Island tourmaline appear in Walter (1960).

HISTORY

Early geological and newspaper reports provide the basis for the historical summary given below.

A party collecting yacka gum during the 1890s probably discovered the first gem tourmalines weathered out as loose crystals on the pegmatite surface.

More crystals were found in weathered pegmatite in pockets and clay seams often associated with large smoky quartz crystals, coarse books of mica, and feldspar. Some large and beautiful tourmaline specimens were recovered and some pockets yielded abundant gems, although many were fractured.

Main workings comprised an open cut with a shaft sunk to 15m but many shallow pits and short drives over a wide area of decomposed pegmatite mark the sites of numerous smaller occurrences of gems.

Three bags of tourmaline were sent to Germany for appraisal, cutting and polishing but the actual quantity and quality is unknown. Colours were mostly blue and green in dark and light shades with some pinks usually as watermelon tourmaline - pink crystal centres surrounded by green tourmaline. Parti-coloured tourmalines in blue, green and black were not uncommon.

Distribution of gems was erratic and prospecting haphazard and mining could not be profitably sustained. Prospecting for tourmaline uncovered white feldspar, silica and kaolin and in 1905 the Kangaroo Island China Stone and Clay Company was formed to mine and process these for sale to Australian pottery industries, at that time dependant on mineral supplies from England and Europe.

To crush feldspar, silica and chinastone (a graphic granite of quartz and feldspar), a pan mill was erected comprising two basalt rollers, each weighing 3.5 tons, running on a flat basalt base embedded in concrete (Plate 1). After crushing, fine grinding was achieved using a set of ordinary millstones. The plant was run by a 12 horse-power traction engine.

On 13 January 1906, the first shipment of crushed silica and clay was dispatched on the steamer Kooringa. This was followed in the week ending 27 January 1906 by dispatch of 60 bags of crushed silica to Sydney together with smaller consignments to local manufacturers. Orders from Melbourne potteries were supplied during April 1906.

Production was from shafts and tunnels in the main open cut (Fig. 2) and from a small open cut 60m west of the machinery building. The 'water shaft' sunk to 24m cut water of good quality which rose in the shaft to 12m. Horse tram waggons were used to haul broken ore from the main open cut and to dump waste rock. In June 1906, a wet grinding plant was ordered from Germany to augment existing machinery.

A deposit of white clay was located on adjoining section 80, 700m northwest of the main workings (Fig. 1) and was subsequently mined for refractory clay for firebricks. A 12m by 12m pit was dug to 5m depth exposing 3m of partly iron-stained white clay below 2m of overburden. Some clay from this pit was used by The Broken Hill Proprietary Company Ltd. to make firebricks to line zinc furnaces at Port Pirie.

A massive body of high purity quartz was found by shaft sinking ('silica shaft') to 6m at the northeastern end of the pegmatite (Fig. 2). A cross cut penetrated 5m of glassy and white quartz.

In December 1906, the company was restructured and finance raised to establish a brickworks at Hog Bay (Penneshaw). The works were built in 1907 and for several years produced high quality brick and some chinaware. The products, however were not sufficiently competitive to attract much interest from markets on the mainland. In December 1908, the plant was operating well below capacity, producing about 5 000 bricks per week.

An exceptionally wet winter in 1910 flooded mine workings and operations were suspended. With the prospect of declining markets, the project was abandoned and the brickworks and plant subsequently disposed of.

A cairn identifying the site of the former brickworks was erected at Penneshaw in 1986 (Plate 2).

GEOLOGICAL SETTING

The geology of Kangaroo Island is shown on KINGSCOTE (Sprigg et. al., 1954) and described in Daily et. al. (1979).

The basement geology of Dudley Peninsula is predominantly Kanmantoo Group metasediments of Cambrian age comprising micaceous metasandstone, metasiltstone and schist. A fault-bounded wedge of Adelaidean rocks in the core of an overturned anticline has been mapped along the northern coast between Alex Lookout and Sprigg Inlet (Daily et. al., 1979), (Fig.1).

In Late Cambrian and Early Ordovician times, Precambrian and Early Palaeozoic rocks were folded and intruded by granite and granitic pegmatite during the Delamerian orogeny.

Widespread glaciation during the Early Permian stripped up to 10km of rock (Daily et. al., 1979) to expose greenschist to andalusite facies metamorphics and associated intrusives.

In Late Mesozoic and Tertiary periods, planation and associated deep weathering produced a surficial lateritic profile characterised by sandy soil underlain by zones rich in nodular iron and aluminium oxides above a thick pallid and mottled zone with abundant kaolinite.

The present land surface is the result of partial dissection of the laterite surface during Quaternary and modern times.

RESULTS OF FIELD INVESTIGATIONS

Field Work

Much of the pegmatite is covered by soil and overgrown by dense low scrub, mostly regenerated growth after fires 10 to 15 years previous.

Using a D6 Caterpiller bulldozer, an area of approximately 1 ha around the old main workings was cleared and 600m of tracks cut through scrub to allow access for trenching and mapping (Fig.2, Plate 3).

Eight backhoe trenches (K0 to K7), 0.6m wide by 1 to 1.8m depth and varying in length from 60 to 90m were dug approximately 70m apart along projected strike of the pegmatite. The northeast face of each trench was logged (Fig.3, Plate 4) and bulk samples of pegmatite collected. Measurements were made from a peg at the northwestern end of each trench (Fig. 3).

On completion of field work, all trenches were backfilled and compacted.

Other pegmatite outcrops, 1.2km west of the main workings (Fig. 1) were inspected and although of similar mineralogy to Dudley pegmatite are of smaller size and do not appear to contain gem tourmaline.

In addition to trench samples, surface samples were collected from outcrop, the main open cut and areas with high feldspar and silica concentration; sample locations are shown on Figure 2.

Site Geology

Dudley pegmatite has a strike length of over 550m varying in width from 80m in trench K1 to 3 separate bodies totalling less than 10m in trench K7 and 1 body of 7m in trench K0 (Fig. 2). Thickest development is between trenches K1 and K4, much of which is in the weathered zone.

Pegmatite intrudes fine-grained biotite metasandstone with interbedded silty, mica schist and is elongate approximately parallel to the strike of bedding and schistosity at 055°. Pegmatite-metasandstone contacts dip steeply at 70° to 90° while bedding in schist and metasandstone dips south easterly at between 50° to 70°. There is no apparent mineral alteration in metasandstone or schist at the contact.

Below RL 126m, (Fig. 2) pegmatite is usually fresh and comprises a variety of rock types ranging from coarse-grained pegmatite through graphic granite to medium-grained aplite.

Mineralogy is predominantly white feldspar and grey or milky quartz with variable amounts of muscovite and black tourmaline, sometimes as radiating conical-shaped crystals up to 70mm in length.

On the eastern margin of the pegmatite, zoning is apparent as 50 to 200m wide feldspar rich and quartz-mica rich bands (Plate 5).

Coarse muscovite and large crystals of smoky and milky quartz are associated with narrow clayey zones and pods elongate parallel to strike. Zones seldom exceed 1m width and occasionally carry coloured tourmaline either as small crystals intergrown with muscovite or as larger crystals enclosed by quartz or clay.

Above RL 126 m pegmatite is weathered to variable depth. Remmant patches of friable, kaolinised feldspar are associated with pale grey to pale orange brown clay with abundant quartz, mica and minor black tourmaline. Coarse mica books are commonly iron stained and expanded but do not show significant alteration.

Distribution of Potentially Economic Minerals

Kaolin - associated with weathered pegmatite is restricted to an area above RL 126m. Clay is commonly iron stained and contains abundant grit as quartz, mica, partly decomposed feldspar and tourmaline. Kaolin associated with weathered Kanmantoo Group schist is exposed in old workings (since excavated for a dam) on section 80, hundred Dudley. Fine-grained quartz, limonite nodules and quartz veins are principle contaminants together with patches of indurated, partly altered schist.

Feldspar - found as relatively clean bands to 150 mm wide associated with minor quartz and mica in areas of zoning on the southeastern margin of the pegmatite. Lateral persistence of these bands is untested. Elsewhere, graphic granite could provide clean, coarse feldspar but would have to be benificiated to remove quartz and mica. Graphic granite is well-developed south of the old main open cut and on the western side of the pegmatite.

Quartz - The quartz body discovered in the now collapsed 'silica shaft' (Fig. 2) was not tested during this project. Dumps around the shaft are littered with quartz extracted during underground mining. Graphic granite is also a potential source of clean quartz if separated from feldspar, although muscovite and tourmaline are likely contaminants. Smoky quartz crystals up to 0.2m long associated with coarse mica and clay were found in narrow veins. Although often fractured and with abundant inclusions, crystals are occassionally of gem quality. Fractured pieces of citrine (yellow quartz) were also noted on the dump of old workings near trench K2.

Mica - Muscovite is disseminated throughout the pegmatite and is concentrated as coarse books to 100mm across associated with quartz crystals and clay in narrow veins. Some coarse muscovite is shot through with tourmaline but zones relatively free of tourmaline were intersected during trenching (e.g. trench K4).

Gem Tourmaline - Black tourmaline is a common accessory throughout the pegmatite while other coloured varieties are relatively rare. Small anhedral opaque crystals of blue tourmaline were found in aplite in the creek section between trenches K6 and K7. Gem quality tourmaline is restricted to narrow zones and pods associated with coarse mica and/or quartz crystals often in a clayey matrix. Early mining was concentrated on 'gem shaft' in the main open cut, but fragments of gem tourmaline were found on numerous old dumps as shown on Figure 2. Small crystals of gem tourmaline were found in the following trenches (Fig. 3).

- Trench K1 - one small (< 10mm long) fractured, dark-green tourmaline in mica from between 11 to 12m.
  - more than 50 crystals, mostly fractured, from a 0.3m wide mica-clay zone at 68.5m.
  - crumbly green tourmaline in mica between 70 to 75m.
- Trench K2 - one small yellow-green tourmaline crystal from between 37 and 38m.
- Trench K3 - crumbly green tourmaline in mica at 21 m and one small green tourmaline in coarse mica at 51.5m.

LABORATORY RESULTS

Petrology

Five samples of pegmatite covering the main variations in rock types were selected for thin section. The results are summarised from full descriptions in Appendix A. Sample locations are shown on Figure 2.

6526 RS 27 - Coarse-grained pegmatite from the eastern side of 'gem shaft' comprises large potash feldspar crystals showing patchy perthitic texture with finer grained plagioclase intergrown with anhedral milky grey quartz. The rock is very fresh with negligble alteration of feldspar. Muscovite flakes are included within larger feldspar grains and trace amounts of zoned pleochroic blue tourmaline crystals to 2mm long were recorded.

6526 RS 28 - Graphic granite from the southern end of 'water shaft' comprising large microcline crystals intergrown with irregular anhedral grey quartz. Disseminated fine-grained plagioclase crystals are present as inclusions within larger potash feldspar crystals while tourmaline exhibits finely textured graphic intergrowths with quartz.

6526 RS 29 - From 'water shaft', coarse, even-grained pegmatite comprising mostly white perthitic microcline crystals with grey, coarse-grained quartz patches. Muscovite is disseminated through the rock as fine flakes.

6526 RS 30 - Aplite from outcrop near the creek comprises a granular mozaic of microcline, quartz and plagioclase with up to 10 per cent blue to brownish-green tourmaline crystals to 3mm long. Small red garnets were present in trace amounts.

6526 RS 31 - From a narrow vein of pegmatite in contact with Kanmantoo Group. Pegmatite comprises almost equal proportions of microcline perthite and plagioclase with quartz, muscovite and biotite, in contact with quartz-biotite schist.

Comments

All samples contain potash feldspar in excess of 40 percent; up to 80 percent in sample 6526 RS 29. Potash feldspar, usually microcline with patchy perthitic texture varies in size from 2mm to greater than 10mm and is invariably fresh with minor inclusions of muscovite, quartz and plagioclase. Tourmaline, where present is usually as intergrowths with interstitial quartz and muscovite.

Chemistry

Chemical analyses of selected samples of feldspar, quartz and graphic granite collected during previous and current investigations are listed in Table 1.

Table 1:

Chemical analyses of feldspar and quartz - Dudley pegmatite

	Jack (1917) No. 1 Chinastone from main open cut	Jack (1917) No. 2 Feldspar from feldspar shaft	6526 RS 34 Feldspar from S.E. margin
SiO_2	70.20	66.10	66.0
TiO_2	-	-	< 0.010
Al_2O_3	18.90	20.28	18.7
Fe_2O_3	1.02	0.84	0.17
MnO	-	-	< 0.010
MgO	-	-	< 0.010
CaO	0.08	0.12	0.03
Na_2O	2.58	2.58	2.52
K_2O	5.74	8.76	9.85
P_2O_5	-	-	0.36
LOI	0.67	0.50	0.47
TOTAL	99.19	99.18	98.1

	Jack (1917) Silica shaft dump	Keeling (1981) A 1194/81 silica shaft dump	6526 RS 33 silica shaft dump
SiO_2	98.7	98.8	97.4
TiO_2	-	< 0.02	0.01
Al_2O_3	0.92	0.08	0.31
Fe_2O_3	0.07	0.05	0.11
MnO	-	< 0.01	< 0.010
MgO	0.07	0.02	0.01
CaO	0.12	0.10	0.06
Na_2O	-	0.04	0.09
K_2O	-	< 0.02	0.06
P_2O_5	-	< 0.02	0.02
LOI	0.05	0.16	0.13
TOTAL	99.93	99.30	98.2

Clay Mineralogy

A bulk sample of clay (6526 RS 32) from 13 to 25m in trench K2 was selected for examination at AMDEL Ltd.

Procedure

A dried, weighed sample was soaked in distilled water then washed through sieves of apeture 300 and 53 microns (µm) to remove coarse grit fraction.

The plus 53 µmfraction was dried and powdered for examination using the X-ray diffractometer.

A weighed subsample of minus 53 µm was taken and dispersed in water with the aid of deflocculants and an electric blender, and allowed to sediment to produce a minus 2 µm e.s.d. size fraction by the pipette method. The resulting dispersion was examined by plummet balance to determine its solids content, and was then used to produce orientated clay preparations on ceramic plates. Two plates were prepared, both being saturated with Mg^{++} ions, and one in addition being treated with glycerol. When air-dried, these were examined in the X-ray diffractometer.

Results

The proportion of sample comprising plus 53 µm , minus 53 µm and minus 2 µm is given in Table 2, together with a semi-quantitative listing of the bulk mineralogy of each size fraction.

Comments

In the minus 53 µm fraction, kaolin is dominant but is poorly-crystalline (either disordered or present as halloysite) and of fine grain size (mostly < 2 µm). Clay is pinkish brown and the main contaminant is muscovite. Quartz content is very low at about 2 per cent.

Grit content is high at 31 percent and is predominantly quartz and muscovite with lesser amounts of black tourmaline.

Table 2:

Mineralogy of clay sample 6526 RS 32

	Percent	Mineralogy	
plus 53 µm	31.1	Muscovite	D
		Quartz	SD
		Tourmaline	Tr
minus 53 µm	68.9	Kaolinite	D
		Muscovite	A
		Quartz	Tr
minus 2 µm	53.7	Kaolinite	D
		Illite	Tr

Semiquantitative Abrreviations

D = Dominant. The most abundant component, regardless of percentage.

SD = Sub-dominant. The next most abundant component providing percentage level is judged above about 20.

A = Accessory. Components judged to be present between the levels of roughly 5 and 20 percent.

Tr = Trace. Components judged to be below about 5 percent.

GEM TOURMALINE

Several specimens of gem tourmaline were collected from the dump south of the main open cut and others were found during trenching, particularly in trench K1.

Further examples of Kangaroo Island tourmaline were examined from collections of the South Australian Museum and R. Bechinger (private gem cutter).

Large (> 10mm long) crystals of transparent tourmaline sometimes in a kaolin matrix are found in pockets or veins generally associated with books of coarse muscovite and/or quartz crystal.

Tourmaline intergrown with muscovite is generally pale to dark green and often elongate with crystal faces flattened due to interference from growth of adjacent mica sheets. Some fine, clean, thin crystals were extracted from mica but none were large enough to facet.

At 68.5m in trench K1, numerous transparent tourmalines were found as randomly orientated, mainly small fractured crystals associated with pale grey kaolin and coarse, orange-brown mica in a zone 0.3m wide in contact with highly weathered, friable feldspar and quartz. Crystals vary in length from 3 to 15mm and from 1 to 20mm wide and are of medium to dark-green colour usually with a yellowish or, less commonly, bluish tint. Crystal terminations are rare with crystals usually truncated by a rough fracture surface sometimes coated with opaque black or dark blue tourmaline. Many crystals appear to be broken fragments of larger crystals (Plate 6).

Thin elongate crystals 1 to 2mm wide are usually clean but larger crystals commonly show extensive internal fracturing, prominant surface striations and subhedral shape. Several crystals have a vitreous, black to dark blue core and some contain thin slivers of white feldspar intergrown along fracture surfaces. The largest clean stone yielded a cut gem of only 0.7 carats.

Specimens collected from old open cut dump, indicated that larger tourmaline crystals of better quality were found intergrown with quartz. Dark blue to greyish blue tourmalines up to 50mm long were found in smoky and milky quartz. Crystal faces vary from smooth and glassy to being prominantly striated and are sometimes coated with a thin layer of kaolin which enabled them to be removed readily from surrounding quartz.

Green tourmalines were found as small loose crystals or in association with books of muscovite and only one specimen, showing fine mid-green colour was found in grey and milky quartz.

All specimens were fractured to varying degrees - hence their being discarded during mining.

Fine specimens from mining during the 1890s are held in Bechinger and S.A. Museum collections and include a 43 carat clean, dark blue crystal 47.5mm long with cross section 10mm by 11mm and a smaller green crystal 18mm by 9mm (Plates 7 and 8).

Large blue crystals are well represented in both collections and may have been relatively abundant or were preferentially retained as specimens, being somewhat dark when cut. Colour varies from pale to dark blue with grey-blue colours predominanting. One small crystal in the S.A. Museum collection is hemimorphic in blue and purple.

Specimens of pink tourmaline examined were all bi-coloured stones, generally watermelon tourmaline with pink centres and green crystal faces, but at least one pink crystal was surrounded by blue.

Green crystals vary from dark green, yellow-green to blue-green often with dark blue or black terminations. One yellow-green crystal appears golden-yellow when viewed down the 'C' axis.

DISCUSSION

Use and specifications for kaolin, feldspar, quartz and mica are summarised in Appendix B. Potential for minerals from Dudley pegmatite to meet these specificatins is discussed below.

Kaolin: formed by weathering of feldspar is restricted in area, contains a high grit content (31 percent) and is a pinkish brown colour after washing. The minus 53 micron fraction is a mixture of kaolin and muscovite with kaolin the only significant mineral present below 2 micron size. XRD traces showed kaolin is poorly crystalline (possibly with significant halloysite?) and would be unsuitable for use in paper coating and some filler/extender uses.

Clay may be suitable, after washing, for coloured ceramics or, as dug, for brick clay.

Kaolin derived by weathering of Kanmantoo Group schist was not tested during this investigation. Previous chemical analyses (Jack, 1917), the presence of iron oxide nodules, fine-grained quartz and irregular nature of the weathering profile suggest this clay would be suitable only for use in brick clay blends and possibly low-grade refractory bricks.

Feldspar and Silica: Investigations were of a preliminary nature and core drilling, trial excavation and further laboratory testing would be required to evaluate the deposit fully. Zoned areas on the southeastern margin of the pegmatite might be mined selectively to produce a feldspar product but the bulk of pegmatite would require crushing and beneficiation (e.g. flotation) to produce commercial grades of feldspar, possibly with a silica by-product.

Because of the relatively high potash content (up to 9.8 percent) in feldspar, ceramic and filler/extender markets should be investigated. Further work is required to establish reserves of recoverable feldspar with consistant chemistry and acceptable brightness (whiteness).

Although quartz associated with feldspar often contains some mica and tourmaline, large quartz segregations like that in 'silica shaft' are a potential source of high-grade lump silica for ceramic, filler and possibly decorative uses.

Mica: Muscovite mica is disseminated thoughout the pegmatite and found as coarse books in pods and veins. Mica relatively free of tourmaline and quartz and suitable for wet grinding for filler/extender markets could be anticipated as a by-product if pegmatite was mined extensively for other minerals.

Gemstones: Dudley pegmatite is one of only 2 recorded locations in Australia which have produced facet-grade gem tourmaline, the other being near Spargoville in Western Australia (Walter, 1960).

The pegmatite has not been prospected systematically and has high potential for further discoveries of gem pockets.

The tourmaline zone intersected in Trench K1 should be opened up by backhoe to determine both lateral extent and gemstone concentration.

Pegmatite in the weathered zone between trenches K0 and K4 include a number of small workings and should be prospected by a series of closely spaced backhoe trenches particularly near the margins and at right angles to the strike of the pegmatite. Zones of coarse mica and/or quartz crystals should be opened up for possible gem tourmalines.

Smoky quartz is relatively common in veins and pods and citrine fragments were noted from old workings. Both are likely to be found in gem quality.

Unless pegmatite is worked for other minerals (i.e. feldspar and quartz), gemstone mining in areas of fresh rock would, by necessity be a haphazard gouging operation.

SUMMARY AND RECOMMENDATIONS

Dudley pegmatite is a complex igneous body intruded into Kanmantoo Group metasandstone and schist during the Delamerian orogeny in Late Cambrian to Early Ordovician times.

Subsequent weathering, generally confined to rock above RL 126m, has extensively altered feldspar to kaolin. Depth of weathering is variable but feldspar below the weathered profile shows no sign of alteration.

The deposit was worked in the 1890s for gem tourmaline and from 1905 to 1910 for feldspar, silica and kaolin for pottery and brick manufacture.

Geological mapping and trenching have traced the pegmatite for 550m, striking 055° and varying in width from 80m in trench K1 to three subparallel intrusions totalling less than 10m in trench K7.

Rock type ranges from coarse-grained pegmatite to graphic granite and aplite but mineralogy is similar, comprising microcline feldspar with patchy perthitic texture, quartz and muscovite with variable minor amounts of plagioclase and tourmaline.

Petrology and chemical analyses provide a preliminary assessment of potential economic minerals and are the basis for the following recommendations.

- Kaolin associated with weathered pegmatite is restricted in area, has high grit content, poor colour and low crystallinity and consequently further work is not recommended.
- The deposit is a potential source of potash feldspar and silica but further work including core drilling, trial excavation and laboratory testing should proceed only if markets can be identified.

Prospect for further discoveries of gem tourmaline is considered good and excavation by backhoe of the tourmaline zone at 68.5m in trench K1 is recommended together with systematic backhoe trenching across the margins of pegmatite in the weathered zone between trenches K0 and K4. Intersections of coarse mica and/or quartz crystals should be followed up as potential sites for gem tourmaline mineralisation.

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APPENDIX A :

Petrological descriptions by

Rachmat and F. Radke (AMDEL Ltd.)

SAMPLE: 6526 RS27: TSC48746

Rock Name:
Pegmatite

Hand Specimen:
This is a medium to coarse grained rock comprised of dull white to pale pink feldspar intergrown with milky grey quartz. Microchemical tests show that some portions of the rock contain large potash feldspar crystals while other portions with a finer grain size contain no potash feldpsar.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Potash feldspar	40
Plagioclase	30
Quartz	20
Muscovite	10
Tourmaline	1

This is a mineralogically and texturally variable sample. One portion of the thin section consists of a large patchy perthite crystal similar to sample 6529 RS29. This region would represent the potash feldspar-rich areas noted in hand specimen.

The finer grained portions consist mainly of plagioclase intergrown with smaller amounts of quartz. The plagioclase shows some variation in grain size within different areas. Within some areas the plagioclase forms a fine grained mosaic of lath-shaped crystals with a typical grain size of about 0.2 mm. Other areas consist of much larger subhedral plagioclase laths up to 4 mm long. In general the coarser grained plagioclase-rich areas contain intergrowths of anhedral quartz.

The rock is transected by a vague weakly developed set of fractures which tend to have a subparallel orientation. Overall the rock is very fresh showing virtually no alteration of the feldspar. Small muscovite flakes are disseminated through the rock and tend to be included within larger feldspar grains. Some larger muscovite flakes up to 1 mm in size occur interstitial to the feldspar grains.

Traces of tourmaline were noted in one portion of the rock as zoned pleochroic blue crystals up to 2 mm long. The outer margins of the tourmaline crystals tend to contain small poikilitic quartz inclusions.

This is a late stage acid intrusive rock with pegmatitic affinities showing a variation in mineralogical and textural features.

SAMPLE: 6526 RS28: TSC48747

Rock Name:
Graphic Granite

Hand Specimen:
This sample consists mainly of large white potash feldspar crystals containing graphic intergrowths of grey quartz. Microchemical tests show that the feldspar consists almost completely of potash feldspar.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Microcline	60
Quartz	30
Plagioclase	5
Tourmaline	4
Muscovite	1

This sample consists mainly of large microcline crystals intergrown with irregular anhedral quartz which tends to form elongate intergrowths in optical continuity with each other. These quartz intergrowths would represent the graphic intergrowths noted in hand specimen. Locally the potash feldspar has a weakly developed beaded to ribbony perthitic texture and in general it lacks the patchy perthitic textures present in samples 6526 RS27 and 6526 RS29.

Some plagioclase is disseminated through the rock as subhedral to anhedral prismatic crystals up to 2 mm in size which tend to occur as inclusions within larger potash feldspar crystals. In some cases the plagioclase is concentrated marginal to quartz intergrowths.

Tourmaline tends to be concentrated in vague vein-like structures as anhedral crystals up to 4 mm wide. Within these vein-like structures the tourmaline tends to be intergrown with quartz and plagioclase. In particular the tourmaline forms finely textured graphic intergrowths with quartz within some areas.

The rock is very fresh showing virtually no alteration of any minerals although locally the plagioclase contains minor amounts of finely divided muscovite/sericite.

This is a tourmaline-bearing granitic rock with a well developed graphic texture.

SAMPLE: 6526 RS29: TSC48748

Rock Name:
Pegmatite

Hand Specimen:
This sample consists of white feldspar intergrown with grey coarse grained quartz patches up to about 1 cm wide. Microchemical tests show that the feldspar consists of potash feldspar with fine irregular plagioclase intergrowths.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Perthitic microcline	80
Quartz	15
Muscovite	3
Plagioclase	2
Opaques and semi-opaques	Tr

This thin section consists mainly of perthitic microcline comprised of a large, optically continuous microcline crystal with patchy perthite intergrowths of albite twinned plagioclase. The irregular perthite intergrowths are also in optical continuity.

Quartz forms anhedral crystals up to several millimetres wide. Minor plagioclase occurs as euhedral to subhedral twinned crystals up to 1 mm long which are typically intergrown with the quartz.

Muscovite occurs as disseminated flakes up to 1.5 mm long. Some muscovite also forms fine, flaky aggregates intergrown with quartz. Traces of opaques occur as disseminated grains.

This is a pegmatitic rock comprised mainly of perthitic microcline.

SAMPLE: 6526 RS30: TSC48749

Rock Name:
Aplite

Hand Specimen:
This is a fine-grained rock comprised mainly of dull white feldspar intergrown with grey quartz. The rock also contains disseminated black tourmaline crystals up to approximately 1 or 2 mm wide. Some areas of the hand specimen not included thin section exhibit minor amounts of a disseminated red mineral as crystals up to about 1 mm wide. This mineral was microscopically identified as garnet in temporary oil mounts.

Thin Section:
An optical estimate of the constituents gives the following :

	%
Potash feldspar	45
Quartz	30
Plagioclase	10
Tourmaline	10
Muscovite	3
Sericite/clay	Tr-1
Garnet	Tr
Biotite	Tr
Unidentified mineral	Tr
Opaques	Tr

This sample consists mainly of an allotriomorphic granular quartz and feldspar mosaic with a typical grain size between 0.3 and 2 mm. The feldspar consists of polysynthetically twinned plagioclase which tends to form subhedral, weakly prismatic crystals and microcline which forms anhedral crystals. The quartz also typically forms anhedral crystals. Some of the microcline exhibits a very weakly developed perthitic texture.

Tourmaline is unevenly disseminated through the rock as weakly prismatic crystals up to 3 mm long. The tourmaline crystals generally exhibit concentric zoning in pleochloric colours ranging from blue to brownish-green. Some of the tourmaline contains fine poikilitic inclusions.

Although the thin section was not cut from the more garnet rich portion of the rock traces of garnet were noted as small crystals up to 0.2 mm wide. The garnet shows some marginal replacement by a finely divided phyllosilicate best termed sericite/clay and locally small phyllosilicate patches which could represent completely altered garnet crystals are present. An unidentified mineral with low birefringence and high relief was also noted in this sample and although it could represent anomalously an isotropic garnet it is considered to represent a different mineral. At least one of these grains shows some marginal alteration to small muscovite flakes.

Muscovite is disseminated through the rock as flakes up to 1 mm in length. Some muscovite occurs as inclusions within feldspar grains. Traces of biotite were noted locally as small remnants within larger muscovite flakes suggesting that at least some of the muscovite has formed by a replacement product of biotite.

Opaques are disseminated through the rock as small grains up to 0.1 mm wide.

This is a relatively fine-grained acid igneous rock with an aplitic texture.

SAMPLE: 6526 RS31: TSC48450

Rock Name:

Granite and Contact with Biotite Schist

Hand Specimen:

This sample consists mainly of a medium grained rock comprised of pale tan to dull white feldspar intergrown with grey quartz. This rock is in contact with a finer grained schistose rock with a darker grey colour. The schistosity is oriented parallel to the contact with the granitic rock. Where the granitic rock is in contact with the schist it exhibits a foliation or possibly fracture set oriented approximately perpendicular to the contact. Microchemical tests show that the granite contains disseminated potash feldspar crystals up to a few millimetres wide.

Thin Section:

An optical estimate of the constituents in the two different lithologies gives the following :

Granite	%	Schist	%
Potash feldspar	40	Quartz	60
Plagioclase	30	Biotite	30
Quartz	20	Feldspar	5
Muscovite	5	Muscovite	4
Biotite	3	Zircon	Tr
Opaques	Tr-1	Opaques	Tr-1

Most of the thin section was cut from the granitic portion of the rock which consists of an essentially allotriomorphic granular quartz and feldspar mosaic. The rock contains some larger perthite crystals up to several millimetres in size intergrown with quartz and plagioclase which generally forms smaller crystals rarely exceeding 1 mm in size. Some of the plagioclase crystals exhibit vague subhedral shapes and also have slightly deformed character with weakly bent twin lamellae. The larger microcline crystals contain some inclusions of quartz and plagioclase and also locally have a fine, perthitic texture.

Both muscovite and biotite are disseminated through the granitic portion of the rock as flakes ranging up to 1 mm in size. There is a tendency for the muscovite and biotite flakes to be concentrated in vague bands oriented approximately perpendicular to the contact. This would account for the weakly fractured or foliated texture noted in the hand specimen of the granite. Some of the biotite has a slightly degraded character with a fibrous texture and a reddish-brown, weakly birefringent character although most of the biotite appears quite fresh with a dark brown, intensely pleochroic colour. Minor opaques were also disseminated through the granitic portion of the rock as small grains up to 0.1 mm wide.

The schist consists mainly of granoblastc quartz intergrown with biotite flakes up to 0.8 mm long which exhibit a strong lepidoblastic foliation. Minor muscovite is also intergrown with the schist as small flakes up to 0.5 mm wide which are typically orientated at an angle to the general foliation direction. Minor feldspar is intergrown with the granoblastic quartz.

This sample consists of a fine to medium grained granite in contact with a biotite schist.

APPENDIX B :

Summary of use and specifications for kaolin, feldspar, quartz and mica.

Summary of use and specifications for kaolin, feldspar, quartz and mica.

Kaolin

White kaolin, composed of predominantly fine-grained, crystalline kaolinite has many industrial uses, the most important being for filling and coating paper, as a body in fine ceramics and as a filler/extender in paint, rubber and plastic.

Specifications vary depending on end use but in general a high purity product of high brightness (whiteness) and specific size range is required.

Specifications commonly include:

- Low grit content - i.e. no particles above 53 micron.
- High brightness - Reflectance values for light of wavelength 4570 A° should be greater than 75 percent with values above 80 percent preferred.
- Particle size and size distribution - Particles less than 10 micron but greater than 0.1 micron are required usually with a high porportion less than 2 micron.
- Particle shape - thin crystalline plates are preferred, i.e. particles must have a high aspect ratio.
- Viscosity - Clay which flows readily at a high solids content is required for coating applications.

Kaolin, as mined, is normally benificiated by washing and sedimentation to meet specifications.

Feldspar

Feldspar is used principally in the manufacture of glass and ceramics and to a much lesser extent as a filler and mild abrasive.

In glass, minor amounts of feldspar (usually < 5 percent) are added to soda-lime-silica glass as a source of alumina and alkalis improving the workability of a glass batch and increasing resistance of the finished glass to chemical attack (Kephart and De Napoli, 1981). Largest consumption is in container glass manufacture.

In ceramics, feldspar is used as a flux which forms a glass in the fired body and imparts strength, density and the power to ring when struck (Grimshaw, 1971).

Up to 15 percent by weight of feldspar is used in fine earthenware, fine stoneware, chinaware, poreclain and sanitary ware.

Feldspar is also a common consituent of glazes and enamels used in the ceramics industry.

Principal markets for feldspar in ceramics are in sanitaryware, tile manufacture, high intensity electrical porcelain and vitrified hotel chinaware.

Specifications for glass and ceramic-grade feldspar vary depending on other constituents used in production blends but should be of consistent chemical and physical properties.

Typical specifications are:

- Glass grades: quartz < 6 percent
  CaO < 2 percent
  Al_2O_3 > 17 percent
  $Na_2O + K_2O$ > 11.5 percent (high Na_2O preferred)
  Fe_2O_3 < 0.1 percent
- Ceramic grades: K_2O > 8 percent (Na_2O preferred in some blends)
  quartz > 5 percent
  Fe_2O_3 < 1 percent
- Filler grades: . high chemical purity
  . high brightness
  . low iron

Quartz

Quartz, as a source of lump silica, is finely milled mainly for use in ceramic bodies, ceramic glazes and enamels, as a filler in rubber and plastic, an extender in paints and as an abrasive agent in soaps and scouring pads.

General specifications require:

- Chemical SiO_2 > 97 percent
  Al_2O_3 < 0.5 percent
  Fe_2O_3 < 0.2 percent
- Physical . consistent colour
  . high brightness

Very high purity quartz has uses in optical and electronic industries.

Mica

Sheet and ground mica are common by-products of pegmatite mining. Sheet mica is still produced largely by hand splitting and is used mainly by electrical and electronic industries as an insulating and supporting component.

Ground mica is used as an extender and filler in paints, undercoats and primers, as well as in various sealing compounds and in plaster and wallborad, adhesive, brake lining and welding electrode flux.

Two grades are commercially produced:

- Dry ground mica - suitable for oil well drilling muds, roofing materials and plaster board manufacture.
- Wet ground mica - for paint and rubber industries.

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PLATES

PLATE 1. Basalt pan mill used to crush pegmatite mined between 1905 to 1910. Penneshaw May, 1987.
Slide No. 36104

PLATE 2. Cairn identifying the site of Hog Bay brickworks which operated between 1907 and 1910. Penneshaw, view easterly. May 1987.
Slide No. 36105

PLATE 3. Area of pegmatite after scrub cleared. Main open cut behind trees at centre right. View southerly. May 1987.
Slide No. 36106

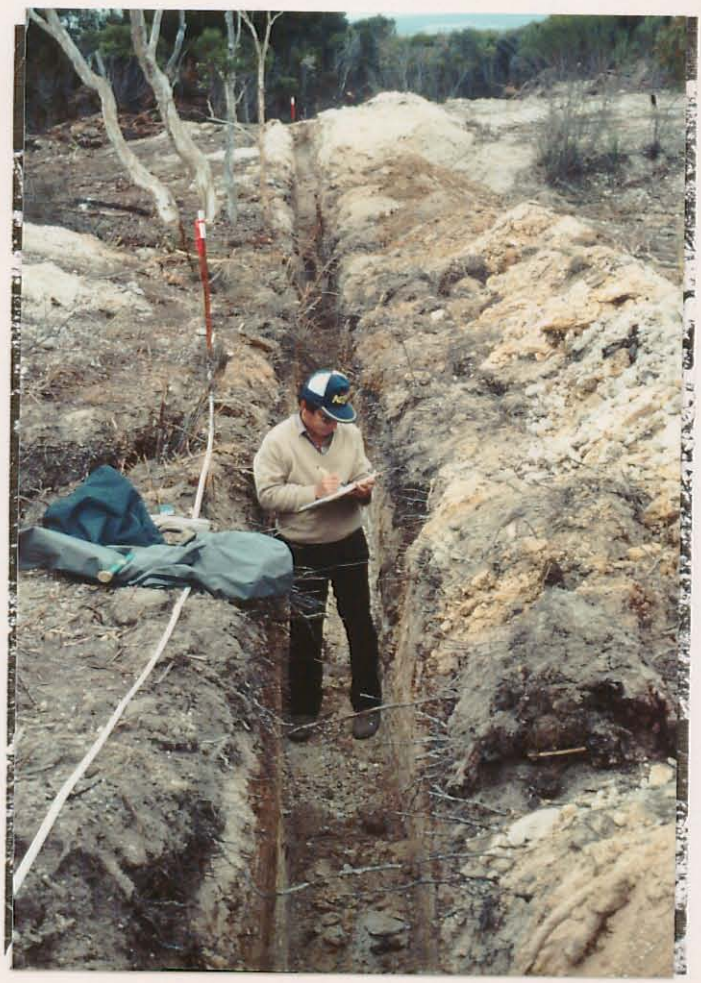


PLATE 4. Trench K4 during field logging. View south easterly. May 1987.
Slide No. 36107

PLATE 5. Zoned pegmatite south of creek showing quartz-mica rich band (dark) and feldspar-rich band (light).
Slide No. 36108

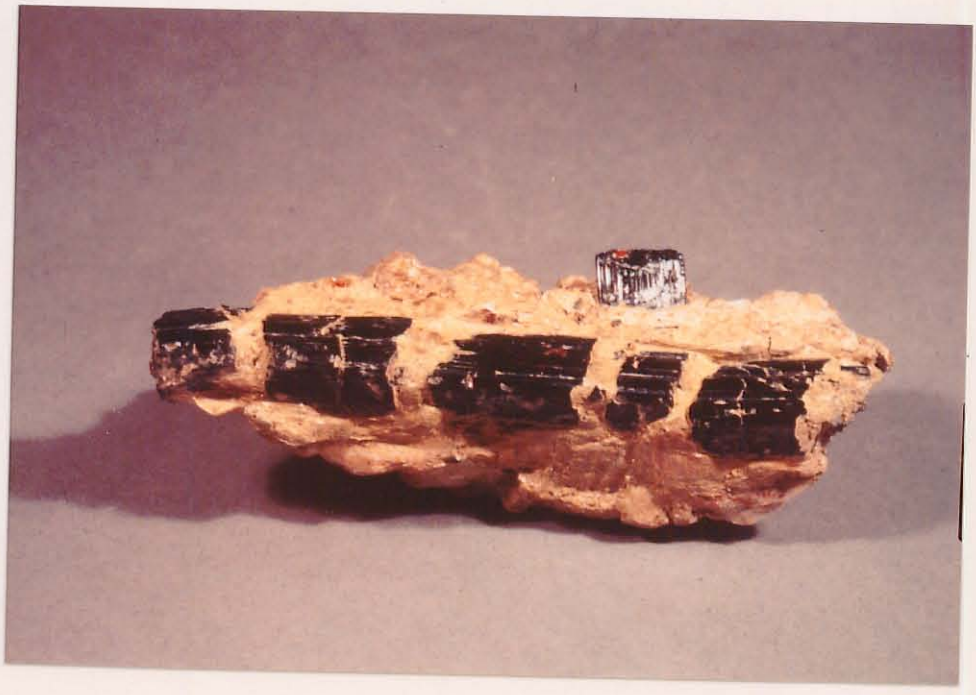


PLATE 6. Broken crystal of dark green tourmaline from 68.5 m in trench K1. Matrix is yellow-brown kaolin and coarse mica.
Slide No. 36109

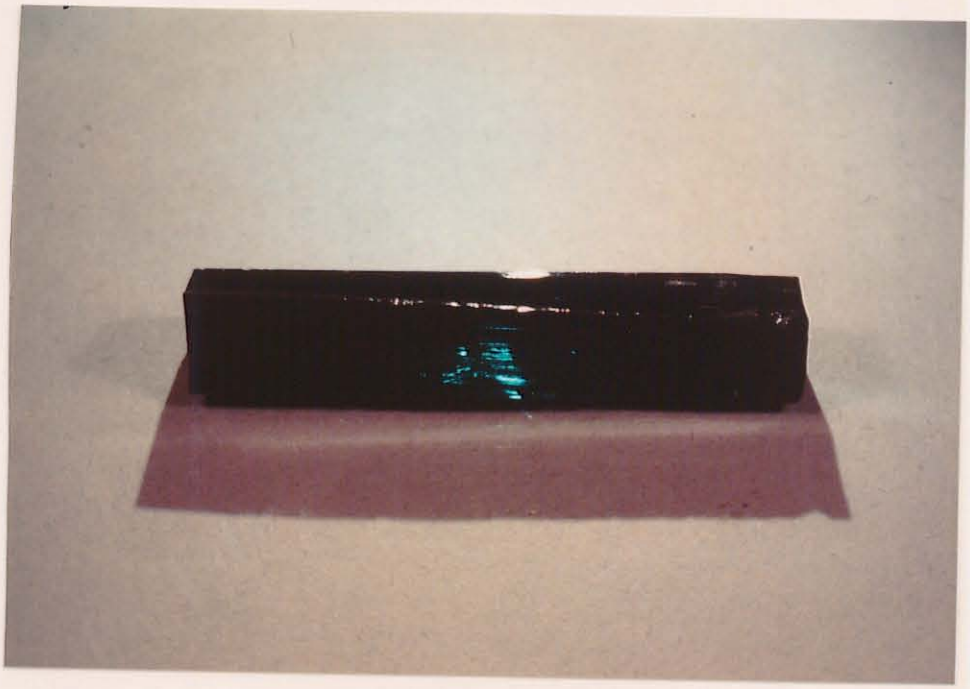


PLATE 7. Dark blue tourmaline 47.5 mm long, weighing 43 carats (Bechinger collection).
Slide No. 36110

PLATE 8. Green tourmaline crystal 18 mm long.
(Bechinger collection).
Slide No. 36111

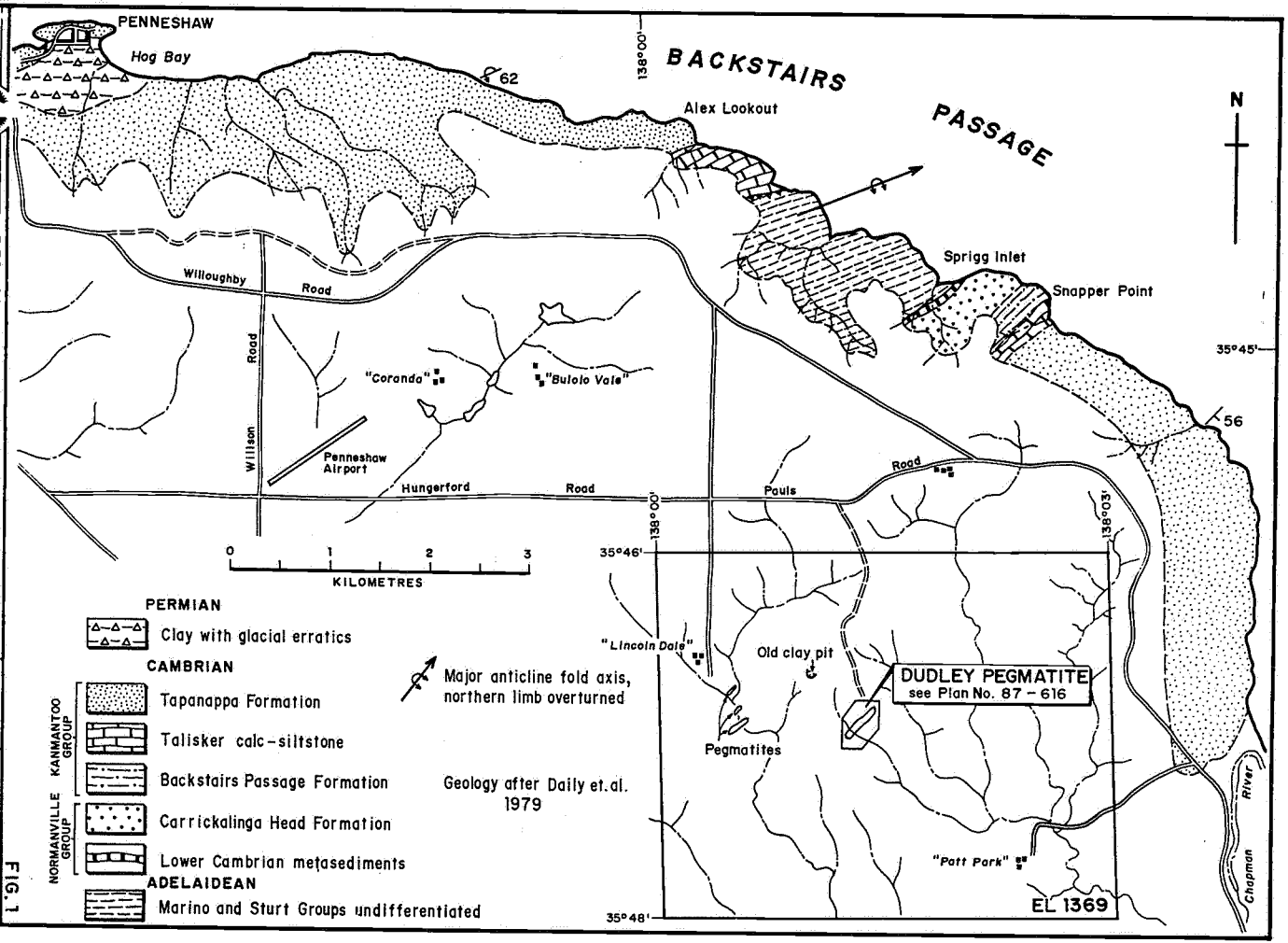
LOCALITY PLAN and REGIONAL GEOLOGY

DUDLEY PEGMATITE

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

COMPILED J.K.
DRAWN M.B.
DATE Aug '87
CHECKED
SCALE 1:50000
PLAN NUMBER S 19470

FIG. 1



N

quartz vein

△ STN. 1
135·00

△ STN. 2
133·26

△ STN. 3
125·64

△ STN. 4
121·93

△ STN. 5
125·28

△ STN. 6
126·13

△ STN. 7
123·12

△ STN. 8
114·28

TRENCH K0

TRENCH K1

TRENCH K2

TRENCH K3

TRENCH K4

TRENCH K5

TRENCH K6

TRENCH K7

trace of dark green tourmaline and citrine

"Silica Shaft"

6526 RS 33

6526 RS 32

Pegmatite

Weathered

black tourmaline and citrine fragments on dump

green tourmaline in clay / mica zone 0·3m wide

coarse mica, milky quartz, clay, dark blue to dark green tourmaline fragments

"Feldspar Shaft"

smoky quartz, mica and fractured dark green and blue – green tourmaline

"Water Shaft"

6526 RS 28

6526 RS 29

"Gem Shaft"

6526 RS 27

MAIN OPEN CUT

DUMP

RUIN

6526 RS 34

clean feldspar and quartz segregations

6526 RS 30

Aplite with small opaque blue tourmaline and trace of garnet

65

55

6256 RS 31

Zoned pegmatite with bands of clean feldspar

medium to coarse – grained pegmatite with patches of large black tourmaline crystals

128 126 124 122 120 118 116 114 112 110 108 106 104 102 100

LEGEND

PEGMATITE : Coarse – grained pegmatite, graphic granite and aplite comprising predominantly perthitic microcline, quartz and muscovite with variable minor amounts of plagioclase and tourmaline. Extensively kaolinised above RL 126m. Gem tourmaline and smoky quartz crystals in narrow veins and pods.

KANMANTOO GROUP – TAPANAPPA FORMATION : Fine – grained, grey metasandstone and quartz – biotite schist.

65 Strike and dip of bedding

55 Strike and dip of banding in pegmatite

Quarry or scrape

Shaft or pit, now mostly collapsed

Trench, from old workings

K1 Backhoe trench and number (for Logs, see Plan No. 87-617)

6526 RS 33 Sample location and number

Area of scrub

Boundary of cleared scrub

Fence

Creek

108 Contour, 2m interval, approx. A. H. D.

△ STN. 8 Survey Station with elevation

Stadia Survey by M. W. Flintoft and S. J. Ewen, 20-5-87, SFB 816

SCALE
0 20 40 60 80 100 METRES

FIG. 2

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA

DUDLEY PEGMATITE
SEC. 79 HD. DUDLEY
SITE GEOLOGY, SAMPLE and TRENCH LOCATION

COMPILED J. K	C.D.O. 7 10·87 DATE
DRAWN M.B.	SCALE 1·1000
DATE Sept '87	PLAN NUMBER 87-616
CHECKED	

4461

NW

SE

0 10 20 30 40 50 60 70 80 90 M

DEPTH IN METRES

TRENCH K0

TRENCH K1

TRENCH K2

TRENCH K3

NOT EXCAVATED

TRENCH K4

TRENCH K5

CREEK CHANNEL NOT EXCAVATED

TRENCH K6

TRENCH K7

Horizontal Scale : 1 : 200
Vertical Scale : 1 : 50

LEGEND

- Dump – clay, feldspar, quartz and mica excavated from old workings.
- Creek deposits – SILT, moderately sandy with minor gravel.
- Soil overburden – SAND, fine – grained, moderately clayey, grey to black; gravelly sand in trenches K 4 and K5.
- Pegmatite – highly weathered, feldspar mostly altered to pale orange – brown to grey kaolin.
- Pegmatite – perthitic microcline feldspar, quartz and muscovite with accessory tourmaline. Friable and easily dug. Areas of graphic granite (g) and feldspar rich zones (f).
- Pegmatite – as above, but hard and difficult to excavate.
- Kanmantoo Group (Tapanappa Fm.) – metasandstone and quartz – biotite schist, fine – grained, grey – weathers to yellow – brown sandy clay.
- Pegmatite, small veins and pods
- Coarse muscovite zones
- q Quartz vein
- △ q Smoky quartz and milky quartz crystals in pegmatite
- Coloured tourmaline crystals
- Peg – datum for trench measurements

For location, see Plan No 87 – 616

FIG. 3

DEPARTMENT OF MINES AND ENERGY SOUTH AUSTRALIA

DUDLEY PEGMATITE

SEC. 79 HD. DUDLEY

LOGS OF BACKHOE TRENCHES

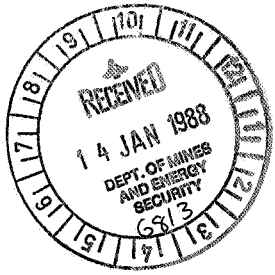
COMPILED J. K.	CDO 7.10.87 DATE
DRAWN M.B.	SCALE As shown
DATE Aug '87	PLAN NUMBER 87 – 617
CHECKED	

4461

ROEBUCK RESOURCES N.L.
REPORT FOR THE PERIOD
27TH NOVEMBER 1986
TO
26TH NOVEMBER 1987
KANGAROO ISLAND
EL 1369, ANTECHAMBER BAY
SOUTH AUSTRALIA

Prepared by
S.B. Warne
for
Roebuck Resources N.L.

TECHNICAL REPORT NO. 80
PERTH, DECEMBER 1987



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LIST OF FIGURES

APPENDIX

SUMMARY

Preliminary testing of Dudley Pegmatite has shown the body is up to 80 m in width and over 500 m in length. Gem quality tourmalines were recovered during testing and potential for gem quality, coloured silica stones indicated. Some potential for feldspar, silica and mica products may exist if the pegmatite was mined for gem quality stones and markets indentified.

Further work is required to define the limits of the Dudley Pegmatite and locate pockets of gem tourmaline and quartz.

Results of this preliminary work are sufficiently encouraging to suggest other poorly exposed pegmatites in the area should be tested by trenching to determine whether they represent portions of larger bodies with significant mineralogy.

1. INTRODUCTION

Exploration Licence 1369 near Antechamber Bay, Kangaroo Island, was granted to Roebuck Resources N.L., S.B. Warne and The Australian Emerald Company N.L. to explore for gem tourmaline and other pegmatite minerals, including kaolin, at and near the old Hog Bay China Clay workings (Dudley Pegmatite).

Following reconnaissance of the area, an offer by the Department of Mines and Energy, South Australia to carry out a preliminary investigation of the Dudley Pegmatite was accepted. This work was subsequently completed by J.L. Keeling of the Mineral Resources Branch and Rachmat of the Geological Survey of Indonesia and was fully reported in Department of Mines and Energy Report Book No. 87/119, "Dudley Pegmatite: Preliminary Investigation for Kaolin, Feldspar, Silica and Gem Tourmaline (Section 79, Hundred of Dudley)" - Open File Report.

The above report by Keeling and Rachmat adequately describes the location, geological setting and previous work in the area and, together with the results of field investigations, should be read in conjunction with this annual report.

2. EXPLORATION

2.1 S.A. Department of Mines and Energy

A preliminary report on Dudley Pegmatite by J.L. Keeling summarised work completed (Appendix 1). The pegmatite was investigated by eight backhoe generated costeans and the exposures mapped and sampled. Kaolin, feldspar, quartz, mica and gem tourmaline were considered as potentially economic minerals at the prospect. Keeling and Rachmat (Report Book 87/119) commented as follows:

"Kaolin: formed by weathering of feldspar is restricted in area, contains a high grit content (31 percent) and is a

pinkish brown colour after washing. The minus 53 micron fraction is a mixture of kaolin and muscovite with kaolin the only significant mineral present below 2 micron size. XRD traces showed kaolin is poorly crystalline (possibly with significant halloysite?) and would be unsuitable for use in paper coating and some filler/extender uses.

Clay may be suitable, after washing, for coloured ceramics or, as dug, for brick clay.

Kaolin derived by weathering of Kanmantoo Group schist was not tested during this investigation. Previous chemical analyses (Jack, 1917), the presence of iron oxide nodules, fine-grained quartz and irregular nature of the weathering profile suggest this clay would be suitable only for use in brick clay blends and possibly low-grade refractory bricks."

"Feldspar and Silcia: Investigations were of a preliminary nature and core drilling, trial excavation and further laboratory testing would be required to evaluate the deposit fully. Zoned areas on the southeastern margin of the pegmatite might be mined selectively to produce a feldspar product but the bulk of pegmatite would require crushing and beneficiation (e.g. flotation) to produce commercial grades of feldspar, possibly with a silica by-product.

Because of the relatively high potash content (up to 89.8 ?) percent) in feldspar, ceramic and filler/extender markets should be investigated. Further work is required to establish reserves of recoverable feldspar with consistent chemistry and acceptable brightness (whiteness).

Although quartz associated with feldspar often contans some mica and tourmaline, large quartz segregations like that in "silica shaft" are a potential source of high-grade lump silica for ceramic, filler and possibly decorative uses."

"Mica: Muscovite mica is disseminated throughout the pegmatite and found as coarse books in pods and veins. Mica relatively free of tourmaline and quartz and suitable for wet grinding for filler/extender markets could be anticipated as a by-product if pegmatite was mined

extensively for other minerals."

"Gemstones: Dudley Pegmatite is one of only 2 recorded locations in Australia which have produced facet-grade gem tourmaline, the other being near Spargoville in Western Australia (Walter, 1960).

The pegmatite has not been prospected systematically and has high potential for further discoveries of gem pockets.

The tourmaline zone intersected in Trench K1 should be opened up by backhoe to determine both lateral extent and gemstone concentration.

Pegmatite in the weathered zone between trenches K0 and K4 include a number of small workings and should be prospected by a series of closely spaced backhoe trenches particularly near the margins and at right angles to the strike of the pegmatite. Zones of coarse mica and/or quartz crystals should be opened up for possible gem tourmalines.

Smoky quartz is relatively common in veins and pods and citrine fragments were noted from old workings. Both are likely to be found in gem quality.

Unless pegmatite is worked for other minerals (ie. feldspar and quartz), gemstone mining in areas of fresh rock would, by necessity be a haphazard gouging operation.

2.2 Joint Venture Exploration

A number of isolated pegmatite outcrops were located away from Dudley pegmatite on ploughed slopes midway between ridge tops and streams. The pegmatites are vein like, parallel to the bedding strike of Kanmantoo Group sediments and form a distinct northeast-southwest trending diagonal zone across the exploration licence. Most of the pegmatite veins have been tested by shallow prospecting pits with more extensive workings on one silica richer prospect approximately two kilometres northeast of Dudley Pegmatite.

Backhoe trenching of the Dudley Pegmatite indicated the body was far more extensive and continuous in nature than could be appreciated from disconnected old workings in a soil and laterite covered area. This suggests backhoe testing of other pegmatite, all of which are poorly exposed (silica rich sections stand in relief), is warranted to see if the exposures are portions of larger pegmatite intrusions.

S.B. WARNE

3. EXPENDITURE

EXPLORATION EXPENDITURE
E.L. 1369 - KANGAROO ISLAND
TWELVE MONTHS ENDED 26.11.87

Aerial Photography	171
Contractors - Geological	1,575
Contractors - Other	2,999
Geologist - In House	615
Leasing and Rental	220
Mines Department Fees	338
Mining Tenements - Admin	144
Printing & Stationery	7
Stamp Duty	4
Telephone and Postage	99
Travel and Accommodation	975
Vehicle Expenses	53
*Overheads	1,080
Total:	$ 8,280

*Office services, depreciation, depletion, rentals, ammortisation of assets, auditing.

BACKSTAIRS PASSAGE

APPENDIX 1

Preliminary Report on Dudley Pegmatite

J. Keeling - Department of Mines and Energy

June, 1987

00034

DEPARTMENT OF MINES AND ENERGY
SOUTH AUSTRALIA
191 Greenhill Road, Parkside

TELEPHONE: (08) 274 7500
TELEGRAMS: Domex
TELEX: AA88692
FACSIMILE No. 272 7597
PLEASE ADDRESS ALL CORRESPONDENCE TO:
The Director-General
PO Box 151
Eastwood, S.A., 5063
In reply, please quote

19 June 1987

DME187/87

S. B. Warne,
25 Nashwauk Cres.,
MOANA SA 5169

Dear Sir,

Kangaroo Island E.L.1369

Please find enclosed a summary of work done and preliminary results of geological investigations on Dudley pegmatite, section 79, hundred Dudley.

A full report with plans is in preparation and will be forwarded in due course.

Yours faithfully,

for R. K. JOHNS
DIRECTOR GENERAL
DEPT. OF MINES & ENERGY

Exploration Licence 1369 - Roebuck Resources NL, S. B. Warne and Australian Emerald Company NL.

Dudley Pegmatite - Kaolin and gem tourmaline prospect.

Summary of Work Completed to 12 June 1987.

Background - Dudley pegmatite is located 10.5 km southeast of Penneshaw on section 79, hundred Dudley, District Council of Dudley.

The deposit was originally worked for gem tourmaline during the 1890's and was later reworked between 1904 and 1910 producing milled feldspar, silica and kaolin for ceramics and clay for a brickworks at Penneshaw established in 1907. Production ceased primarily because markets on the mainland and interstate could not be supplied competitively. Flooding of the workings during a particularly wet winter aggravated the situation.

Geological investigation of the pegmatite by S. A. Department of Mines and Energy was arranged with the EL holders as a field study project for Indonesian geologist, Rachmat.

Field Work -

22 - 23 April - Scrub in the area of main workings cleared using a D6 Caterpillar bulldozer. Lines cleared through remaining scrub for access for mapping and trenching.

28 April - 1 May - Inspection of outcrop in creek sections and other pegmatites in the area. Hand clearing of scrub in main workings and collection of tourmaline samples from dumps to determine mineralogical associations. Lines pegged for trenching.

4 - 8 May - Backhoe trenching of lines K2, K3, K4, K5 and K6 completed, trenches logged and sampled.

19 - 21 May - Backhoe trenching of lines K0, K1 and K7 completed, trenches logged and sampled. All trenches backfilled and compacted except for part of line K1. Stadia survey of workings and trenches completed. Bulldozed tracks through scrub fenced.

Laboratory Work -

... Five samples representative of variation in fresh pegmatite were prepared for thin section to identify and determine feldspar quality and nature of contaminants.
... One sample of clay from trench K2 was selected for preliminary kaolin investigation using XRD and sedimentation techniques.
... One sample of feldspar and one sample of quartz were submitted for chemical analysis.

Discussion of Preliminary Results -

... Dudley pegmatite is an elongate igneous body intruded into Kanmantoo Group fine-grained metasandstone and schist of Cambrian age, probably during early stages of Late Cambrian to Early Ordovician Delamerian Orogeny. The pegmatite comprises principally feldspar, as microcline perthite and quartz, often as medium-grained graphic intergrowths with minor amounts of muscovite mica and tourmaline and a trace of garnet.
... Eight trenches of length 60 to 90 m, 1 to 1.8 m depth and average 70 m apart, show the pegmatite to persist over 600 m varying in width from 80 m in trench K1 to 3 separate bodies totalling less than 10 m in trench K7 and 1 body of 7 m in trench K0.
... Partly kaolinised pegmatite is restricted to higher elevations as a remnant weathering profile. Depth of kaolinisation is probably less than 10 m and may be only 2 to 3 m on hillslopes. Patches of pale

orange-brown iron-staining and high grit content, principally quartz and mica with minor black tourmaline indicate high quality white kaolin is unlikely to be available in commercial quantities.

... Gem tourmaline from earlier workings varies from dark blue to green and appears restricted to narrow late stage zones associated with coarse muscovite and/or large quartz crystals (often smoky quartz). Mica and quartz zones, generally less than 1 m wide, are more common near the margins of the pegmatite and are elongate parallel to strike of the pegmatite.
A small (<10mm long) green tourmaline was found in coarse mica in trench K3 at 51.5 m and a yellow-green crystal between 37 and 38 m in K2. Green and blue-green tourmaline, mostly fractured was found in a mica zone 0.3 m wide at 68.5 m in trench K1 which also intersected crumbly green tourmaline in mica at 75 m and produced a small dark green tourmaline between interval 11 to 12 m.

... Zoning of unweathered pegmatite, particularly on the south-eastern margin segregates feldspar from quartz and mica in bands up to 0.3 m width. The lateral extent of these segregations is untested but would provide the best target for a feldspar or silica product.

On completion of laboratory work and compilation of geological map, a final report will be prepared.

16/6/87

J. L. KEELING
SENIOR GEOLOGIST
MINERAL RESOURCES BRANCH

00038

ROEBUCK RESOURCES N.L.
REPORT FOR THE PERIOD
27TH NOVEMBER 1987
TO
26TH FEBRUARY 1988
KANGAROO ISLAND
EL 1369, ANTECHAMBER BAY
SOUTH AUSTRALIA

Prepared by
S.B. Warne
for
Roebuck Resources N.L.

TECHNICAL REPORT NO. 88
PERTH, FEBRUARY 1988

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List Of Figures

SUMMARY

The main area of the Dudley Pegmatite was stock fenced under agreement with the landholder to allow further testing to proceed.

The coloured tourmaline zone previously identified by Keeling and Rachmat, 1987 in Trench K1 was further investigated and four further trenches completed to test either side of the zone and the nature of the Silica Shaft area.

A small prospect 800 metres east of Dudley Pegmatite near the west boundary of Section 78, Hundred of Dudley was inspected. Gem quality, terminated, yellow coloured quartz (citrine) crystals were recovered from rain washed spoil from old diggings.

1. INTRODUCTION

Exploration Licence 1369 was originally granted for one year commencing 27 Novmeber, 1986. A one year extension was applied for and granted from 27 November, 1987.

Testing during 1987 indicated the Dudley pegmatite was a larger body than initially realized, had potential for gem quality tourmalines and possibly other minerals, particularly quartz varieties and felspar.

Extension of the licence term was requested to define the limits of Dudley Pegmatite, locate further gem quality tourmaline pockets and test the potential of other poorly exposed pegmatite occurrences in the area.

2. EXPLORATION

Much of the proposed detailed testing of the Dudley Pegmatite is sited on cleared land on which sheep are pastured. Agreement was reached with the landholder (R.D.W. Buick) to fence off the main area to be trenched. While fencing was in progress the opportunity was taken to complete four short trenches near Trench K1 and the Silica Shaft area.

2.1. FENCING

An irregular area of approximately six hectares of cleared and part cleared land was enclosed with sheep and lamb fencing and two access gates provided. The north-east boundary is sited parallel to and a short distance southwest of Trench KO. No southwest boundary exists as the northwest and southeast boundaries were run into scrub forming a natural sheep barrier.

The Dudley Pegmatite runs outside the fenced area to the northeast. The most easterly corner post hole penetrated course mica and Trench KO cut a narrow pegmatite section toward its northern end.

2.2. TRENCHES (SEE PLANS 1 AND 2)

TRENCH K1

The gem tourmaline pocket located at 68.5 metres was re-opened and excavated adjacent to the occurrence to a depth of 3.5m. Coloured tourmalines occurred irregularly in a brownish then white clay-mica zone adjacent to friable, granular quartz-felspar pegmatite carrying abundant black tourmaline. A few coloured tourmalines occurred in quartz-felspar rock near contact with the mica rich pocket. The tourmaline bearing material formed a pocket 0.3m wide nearer the surface, extended along strike to the northeast for approximately 1.5m. At 3m depth the pocket appeared to pinch out but may have been obscured by mullock accumulating in the pit. The pit was left open for later careful cleaning, inspection and access to adjacent tourmaline bearing pegmatite.

A large number of green coloured tourmaline were recovered as broken fragments of larger crystals and all but two examples were heavily fractured. One of the two clear crystals was suitable for cutting. Both were striated, slightly flattened tourmalines developed in coarse mica. Washing of clay yielded abundant small, clear pale green, dark green, light blue, ash-grey, thin, unterminated prisms.

TRENCH K9 17M LENGTH.

Completed to see if the coarse mica - tourmaline zone persisted along strike to the northeast. A small pit at

5-7m was found to be sited directly on a band of coarse mica carrying a number of broken smokey quartz crystals, one terminated smokey quartz and irregular black tourmaline masses. This appeared to be of similar nature to the K1 coarse mica zone.

A terminated smokey quartz crystal was recovered at 10m associated with a thin course mica zone.

One coloured tourmaline was recovered from excavated material but its source could not be determined (possibly near 10m).

Trench K10

Completed to determine whether K1 mica-tourmaline zone extended south-west.

No coloured tourmalines were noted but course mica zones with crystals of smokey quartz were cut 6-8m, 14m and an isolated crystal found at 24.5m.

Trench K8 and 8A.

These trenches were cut to test the Silica Shaft prospect. Trench 8A had to be offset as K8 could not be extended continuously due to 1-1.5m pits at the site of old collapsed workings.

In Trench K8 20-22m a zone of coarse mica with associated smokey quartz crystals occurred in contact with a 2m sliver of milky quartz-veined Kanmantoo sediments. This same zone may have also been cut 0-4m in K8A.

From 34-47m in K8 alternate mica rich pegmatite and quartz-veined Kanmantoo sediments occurred.

K8A was excavated across the zone of collapsed workings and cut rubble from old workings overlying a boulder zone and a deep shaft infilled with kaolinized pegmatite. The boulder zone was composed of well rounded, high purity quartz boulders, smaller quartz boulders and quartz gravel with minor volume Kanmantoo sediment boulders (less than 10 per cent). A brown clay on the northwest edge of the shaft appeared to represent an old soil.

Old reports record the Silica Shaft was sunk to 6m and a cross-cut intersected massive white, glassy quartz. However, it appears possible silica may have been open pitted from the boulder bed since the old workings seem to represent a large collapsed and infilled pit. No mullock surrounds the area as for other workings of the prospect but discarded Kanmantoo sediment boulders are at surface.

The shaft intersected by K8A appears to have been sunk later than the pit as Kaolinized dump material overlies rubble part-filling the pit.

Trenches 8, 8A, 9 and 10 were backfilled and their positions marked by a star picket 1m away from the commencement point of each. A sample of boulder bed material was left at surface immediately above its subsurface occurrence on the northern side of Trench 8A.

3. CITRINE PROSPECT

An open pit and two shafts (along strike) occur 800m east of Dudley Pegmatite on Sections 78, Hundred of Dudley, near its boundary with Section 79.

The workings are near the edge of a paddock in a narrow patch of bushy regrowth. Ploughing has scattered portions of former mullock heaps.

The workings were sunk through brown clay typically derived from weathering of Kanmantoo sediments. Very little mined rock material remains at the site. Three samples of Kanmantoo quartzite with quartz crystals developed in an open fracture and portion of one citrine crystal were retrieved.

The open space quartz consists of clear, interlocking and individual terminated crystals varying in colour from perfectly clear and uncoloured to clear straw-coloured (citrine) and minor smokey varieties. Fine grained mica formerly filled the remaining portion of the open space (fracture). Disseminated pyrite, oxidised to iron oxides occurs in the quartzite parallelling the fracture boundary; oxidised pyrite smears also occur on joint planes. The citrine crystal fragment was dark yellow, unflawed, uniformly coloured and measured approximately 1.5cm x 0.75cm.

Upslope to the east of the workings suboutcrop indicates numerous quartz/pegmatite veins invade Kanmantoo sediments parallel to their strike. Some chalcedonic silica and jasper was observed as loose boulders and rare examples of pyrite/quartz gossan found.

The citrine prospect warrants backhoe trenching to expose and trace the quartz bearing fracture. Prospecting may indicate the presence of other gem bearing fractures in this area.

S.B. Warne

4. EXPENDITURE

EXPLORATION EXPENDITURE
EXPLORATION LICENCE 1369
KANGAROO ISLAND
27.11.87 TO 26.2.88

Contractors - Geological	$ 3025
Contractors - Other	1413
Freight & Delivery	320
Land Compensation	900
Leasing & Rental	445
Loose Tools & Equipment	1352
Mines Department Fees	-
Mining Tenements - Admin	72
Printing & Stationery	5
Telephone & Postage	98
Travel & Accommodation	1104
Vehicle Expenses	259
*Overheads	1349
TOTAL:	$10342

*Office services, depreciation, depletion, rentals, ammortisation of assets, auditing.

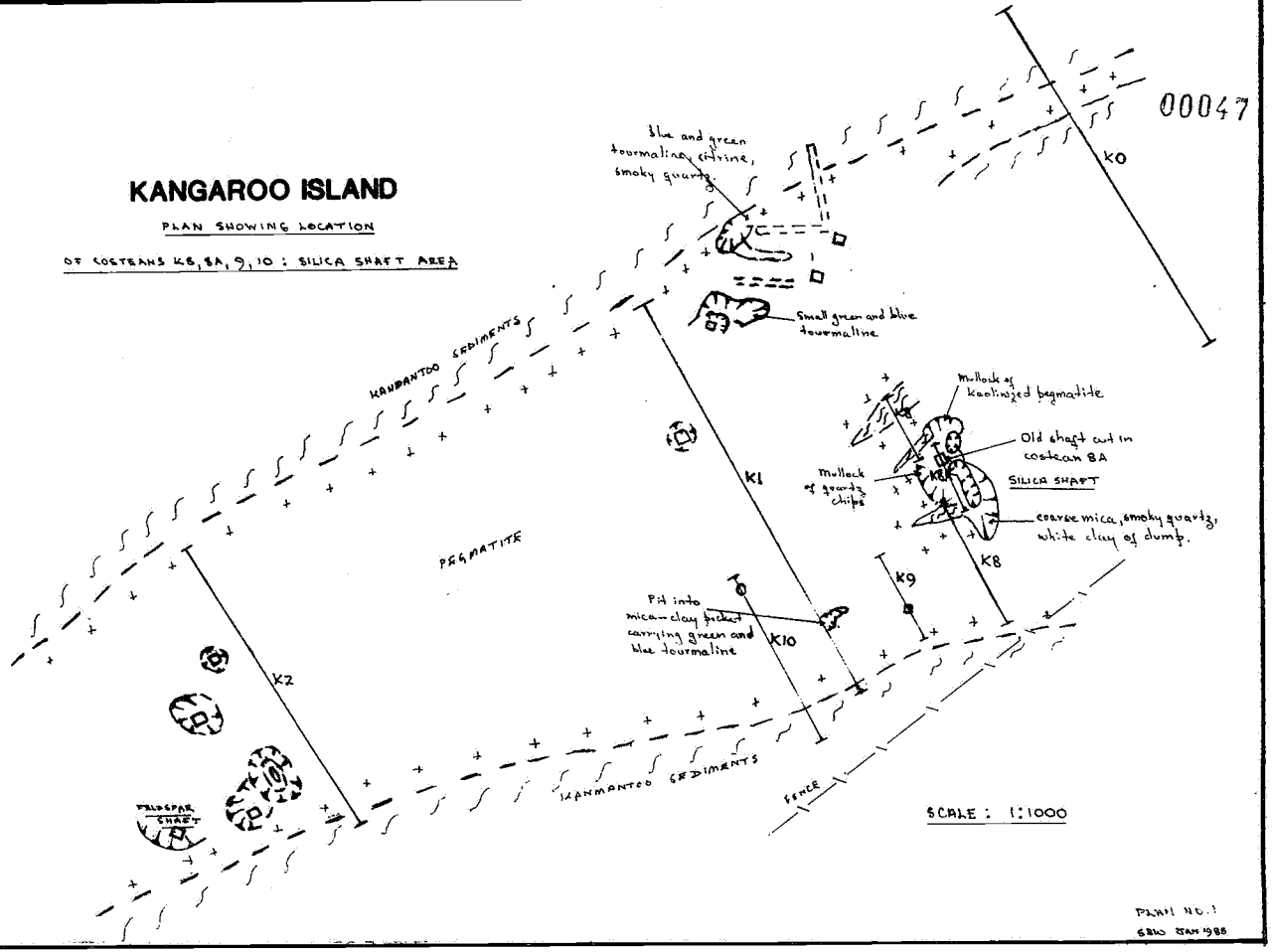
U.S.A !?

00047

KANGAROO ISLAND

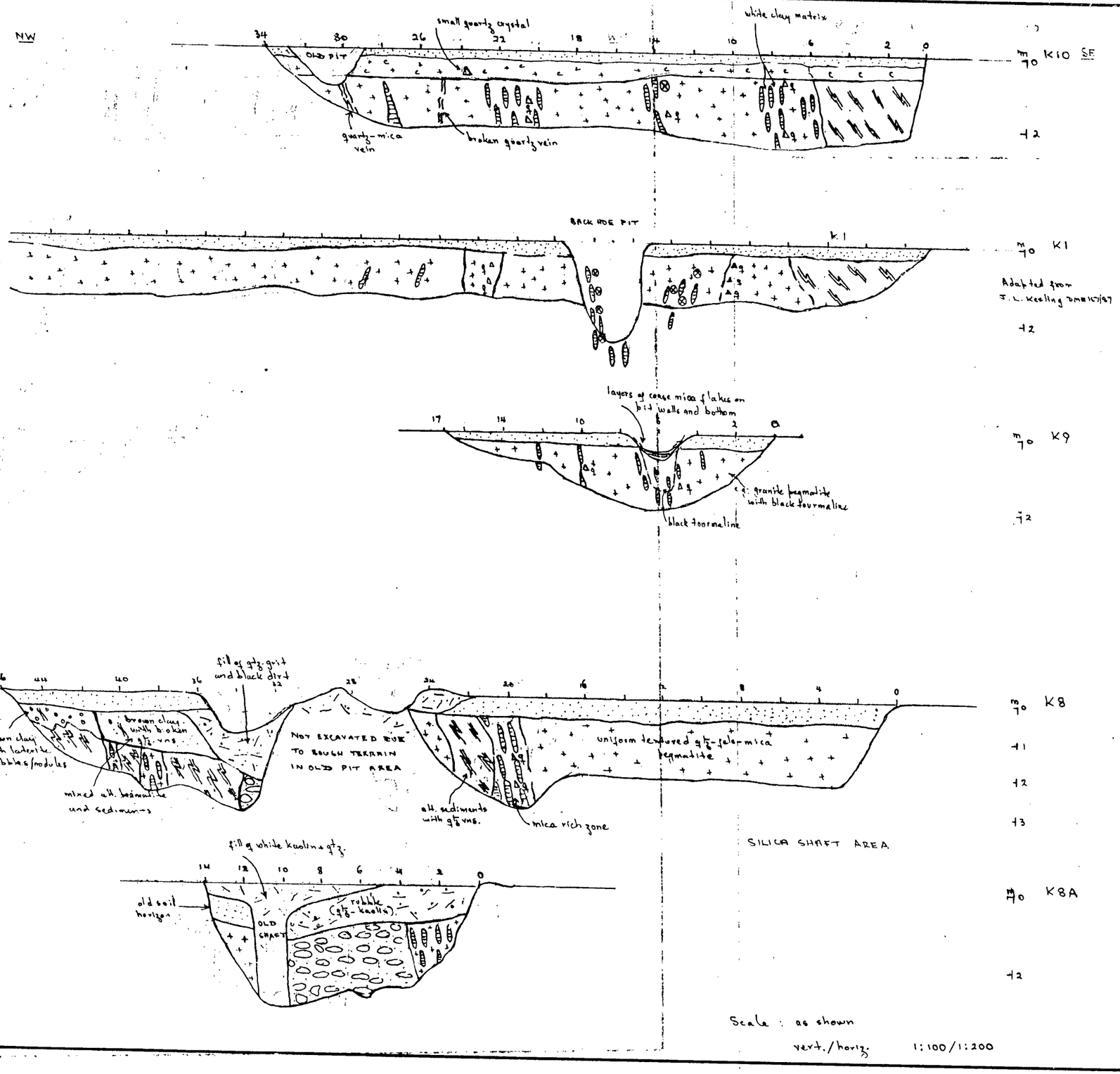
PLAN SHOWING LOCATION

OF COSTEANS K6, 8A, 9, 10 : SILICA SHAFT AREA



PLAN NO. 1

GRID JAN 1988



LEGEND

KANMANTOO SEDIMENTS: meta-sandst and quartz-biotite schist.

PEGMATITE: quartz-feldspar-biotite-tourmaline

BOULDER BED: Recent. Well rounded quartz boulders and large slabs with rounded edges, minor boulders of Kanmantoo sediments. Possibly reworked Permian glacial deposits.

SOIL: fine grained podsol sandy soil with dark colour due to humic content

Brown clay from weathering of Kanmantoo and pegmatite rock. Developed in situ.

Mullock from old workings

Zones of coarse muscovite in pegmatite

Smoky quartz crystal(s) in pegmatite

Coloured tourmaline crystal observed in pegmatite.

Scale: as shown

vert./horiz. 1:100/1:200

KANGAROO ISLAND

DUDLEY PEGMATITE

LOGS OF TRENCHES K8, K8A, K9, K10 and Relationship to K1

Plan No. 2
S.B. Warne, Jan 88

6813-1

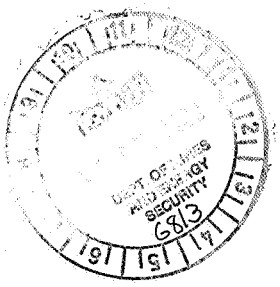
S B Warne
Jan 88

00049

ROEBUCK RESOURCES N.L.
KANGAROO ISLAND
EL 1369
ANTECHAMBER BAY
SOUTH AUSTRALIA
REPORT FOR THE PERIOD
27TH FEBRUARY, 1988
TO
26TH MAY, 1988

Prepared by
S.B. Warne
for
Roebuck Resources N.L.

TECHNICAL REPORT NO. 100
PERTH MAY, 1988



CONTENTS

1. INTRODUCTION

Exploration Licence 1369 was granted on the 27th November, 1986 for one year and a one year extension granted from 27th November, 1987.

Extension was granted to allow further testing to define the Dudley Pegmatite, locate other gem tourmaline pockets within it and explore other pegmatite occurrences within the E.L. area.

2. EXPLORATION

i) Fifteen backhoe trenches, totalling 505 m were completed across the Dudley Pegmatite between Gem Shaft and former Trench KO.

ii) A former open cut feldspar working immediately east of the old ruin (south of Gem Shaft) was partially cleared out to expose the nature of the occurrence.

iii) Fill in the Gem Shaft pit was partially removed by backhoe to view the nature of pegmatite in the vicinity of the former gem pocket.

iv) Three short costeans were cut across the citrine occurrence (800 m east of Duley Pegmatite).

v) Other pegmatite veins were located on the licence but did not warrant assessment.

2.1 Dudley Pegmatite Trenching

Trenching indicated pegmatite north of the Feldspar Shaft is disrupted by a drag fold structure which effectively cuts the prospect area into two portions.

The northern zone appears to be a single sill about 25 m in width which forms an irregular arcuate fold between Silica Shaft and workings in scrub to the west.

The southern zone is much wider probably due to coalescence of adjoining sills.

Coarse-mica-tourmaline-smoky-quartz-feldspar segregations appear to occur in the roof and central portions of coarse grained pegmatite of muscovite granite composition.

The coarse mica zone appears to be fairly continuous within the sills; coloured tourmaline is common but gem material rare and only one further pocket was intersected.

An enlargement of the pit in which an earlier gem tourmaline was found proved disappointing. The near surface clay zone hosting fractured gem material merged into coarse mica-quartz-feldspar with abundant coloured, but opaque, tourmalines.

All trenchings were logged. Plans covering this work are in preparation.

2.2 Old Feldspar Pit

This pit followed a southwest trending, 2 m wide feldspar segregation, for 60 m to a depth of over 4 m. Purity of the material varies from clean to around 20% quartz and along strike is associated with varying volumes of mica along its margins which partially invades the feldspar section. Hand cobbing would produce small volumes of high quality material for specialist use.

2.3 Gem Shaft

Cleaning out of the pit adjacent to the shaft with a backhoe cut indicated gem material was found in a setting identical to both other known occurrences, viz., in a coarse mica zone adjacent to large feldspar segregations and with sporadic smoky quartz crystal development. Gems occurred in a larger zone of coloured tourmalines most commonly as growths in and through mica books.

2.4 Citrine Prospect

Three costeans across the short line of working cut thin quartz veins in Kanmantoo sediments. The veins dip 45° easterly and only veins beneath the main working carried minor rock crystal, smoky quartz, citrine. Prior mining was confined to soils and regolith above the veins. The occurrence is of a minor nature but of interest because of the high quality of crystals.

A number of smaller pegmatite veins were located, mainly on grazing land, which all appeared inconsequential. A swarm of silica veins east of the citrine prospect warrant further attention.

S.B. WARNE

EXPENDITURE

EXPLORATION EXPENDITURE
EXPLORATION LICENCE 1369
KANGAROO ISLAND
27.2.88 TO 26.5.88

Contractors - Geological	$ 6825
Contractors - Other	1810
Drafting	11
Freight & Delivery	14
Land Compensation	-
Leasing & Rental	1399
Loose Tools & Equipment	332
Mines Department Fees	-
Mining Tenements - Admin	25
Printing & Stationery	78
Sundries(Public Liability Insurance)	350
Telephone & Postage	102
Travel & Accomodation	1143
Vehicle Expenses	259
*Overheads	1852
TOTAL:	$14200

*Office services, depreciation, depletion, rentals, ammortisation of assets, auditing.

00055

ROEBUCK RESOURCES N.L.
REPORT FOR THE PERIOD
27TH MAY 1988
TO
26TH AUGUST 1988
KANGAROO ISLAND
EL 1369, ANTECHAMBER BAY
SOUTH AUSTRALIA

Prepared by
S.B. Warne
for
Roebuck Resources N.L.

TECHNICAL REPORT NO. 103
PERTH, SEPTEMBER 1988

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1. INTRODUCTION

Exploration Licence 1369 was granted on the 27th November, 1986 for one year and a one year extension granted from 27th November, 1987.

During the first two quarters of 1987-88 further backhoe trenching was completed across the Dudley pegmatite to better define the body. This work showed the pegmatite to be disrupted in its central portion effectively dividing the prospect into two separate portions. Gem tourmaline and quartz varieties appeared to be consistently occurring associated with massive feldspar and feldspar-silica intergrowths in the central and assumed roof zone of the pegmatite.

2. THIRD QUARTER ACTIVITIES

No ground work was undertaken during the winter period due to boggy access conditions across private land and flooding of sample sites. Work was restricted to assessing samples collected during backhoe trenching.

2.1 Trenches K23, K11 (see Plan)

Both these trenches cut feldspar zones with associated coarse mica flakes, abundant quartz crystals and coloured tourmalines.

In K23, a profusion of large smokey and milky quartz crystals (up to 20 cm x 10 cm prisms) occurred in a kaolin-coarse mica zone. Washings indicated coloured tourmalines occurred near the base of quartz crystals where they formerly terminated irregularly against feldspar. Only very small tourmaline crystals of gem quality were observed in this setting.

A few large blue tourmaline prisms were found intergrown with smokey quartz crystals. They occurred as around 0.5 cm fractured prisms passing completely through the quartz prisms with random orientation.

All quartz crystals are fractured but large portions of some smokey quartz crystals which escaped fracturing are of cuttable quality with colour varying from lightly smokey to shades of golden brown (dark citrine).

The same zone appeared to be cut in trench K11 truncated by a bouldery patch of massive brown chalcedony at its eastern end possibly representing a fault.

The width of crystal bearing zone in K23, K11 were +4m and 3.2m respectively; K23 also carried a second unrelated 2.5m zone in contact with Kanmantoo sediments at its western end.

2.2 Smokey Quartz

Smokey quartz crystals were recovered from all trenches. They are generally fractured, one prism end terminated and are occasionally of cuttable quality. These crystals apparently lined former open fractures in the pegmatite and, when they occur, do so in tightly packed profusion. Crystals also formed irregularly in the main mass of granite pegmatite in small isolated pockets and irregularly as isolated crystals.

2.3 Citrine

Sample washing indicated fragments of clear citrine occur throughout the pegmatite. Some quartz crystals terminate as fractured citrine and some quartz intergrown with mica and feldspar in the main body of the pegmatite is also citrine. Colour varies from pale yellow to golden yellow. Most samples are fractured but some larger, clear, irregular pieces may have a proportion of cuttable material. Little attention had been paid to citrine content in previous work, partly because colour is not apparent without washing.

3. EXPENDITURE

EXPLORATION EXPENDITURE
EXPLORATION LICENCE 1369
KANGAROO ISLAND
27.5.88 TO 26.8.88

Contractors - Geological	50
Contractors - Other	-
Drafting	363
Freight & Delivery	3
Land Compensation	-
Leasing and Rental	-
Loose Tools & Equipment	-
Mines Department Fees	-
Mining Tenements - Admin	-
Printing & Stationery	95
Sundries (Public Liability Insurance)	-
Telephone and Postage	13
Travel and Accommodation	-
Vehicle Expenses	-
*Overheads	79
Total:	$ 603

*Office services, depreciation, depletion, rentals, ammortisation of assets, auditing.

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ROEBUCK RESOURCES NL

DUDLEY PEGMATITE

KANGAROO ISLAND

LOCATION OF OLD WORKINGS AND BACKHOE TRENCHES COMPLETED 1987-1988

K12 ——— Backhoe trench

Old pits and collapsed shafts, trenches

Shaft

Old mullock heaps

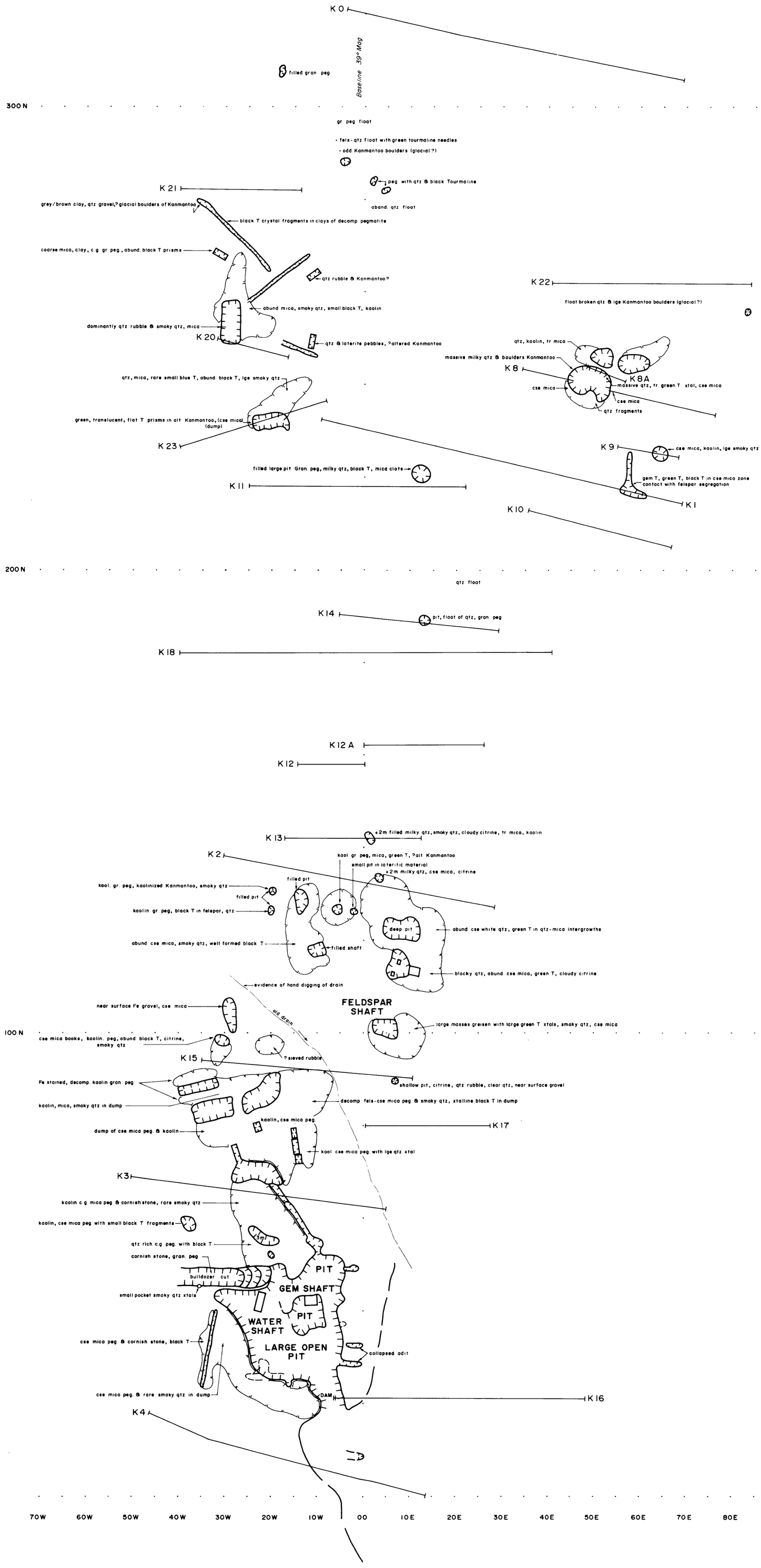


FIGURE 1

6813-1

00060

ROEBUCK RESOURCES N.L.
REPORT FOR PERIOD
27TH AUGUST, 1988
TO
26TH NOVEMBER, 1988
KANGAROO ISLAND
EL 1369
ANTECHAMBER BAY
SOUTH AUSTRALIA

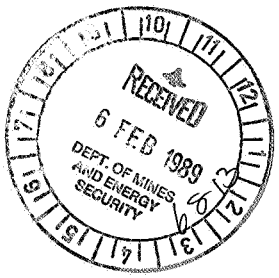
Prepared for

Roebuck Resources N.L.

by

S.B. Warne

TECHNICAL REPORT NO.106
PERTH, NOVEMBER 1988



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Appendix

1. INTRODUCTION

Exploration Licence 1369 was granted on 27th November, 1986 for one year and a one year extension granted from 27th November, 1987. A further application for a one year term commencing 27th Novemer, 1988 has been made.

During the first two quarters of 1987-88 further backhoe trenching was completed across Dudley pegmatite better defining the body. Third quarter activities were confined to sample assessment which continued into the fourth quarter. Further trench mapping was carried out during the quarter.

2. FOURTH QUARTER ACTIVITIES

2.1 Trenching

Mapping of trenches was completed and is presented in the Appendix.

Trenches were left open to allow washing of removed material by winter rains. This proved unsuccessful as heaps did not wash; kaolin from felspar weathering formed an outer casing which shed rain. It is intended to wash selected trench material 1989 to better assess gem content.

2.2 Quartz Crystal

A number of crystals were cut to assess material. It was found much clear, cutting-quality quartz could be recovered from fractured stones and many crystals with an opaque (few millimetres thick) casing of late stage silica masked high quality smokey quartz comprising most of the crystal. Colour varies from ash-grey to dusky yellow-orange hues. Colourings in this material suggests stones may react interestingly to heat treatment.

2.3 Assessment of Prospect Potential

The only immediate potential lies in the mining and sale of gem material, viz: tourmaline, citrine, smokey quartz.

a) Tourmaline

Occurs irregularly in pockets. To date, no large pocket commensurates with the original gem pit has been located. Some potential for gems exists in unworked colluvium near the original pit and apparently, in the crystal zones cut by trenches K11 and K23.

b) Citrine

At the citrine prospect gem material can be expected to occur irregularly in open veins of greisenized Kanmantoo sediments but there is no way of determining how much without "open pitting" the prospect. The potential of numerous veins up slope is unknown.

In the Dudley Pegmatite, citrine occurs as irregular pieces from weathering of granite pegmatite and fractured quartz crystal citrine terminations. The suitability of these pieces has not been assessed.

c) Smokey Quartz

This material varies from charcoal grey to golden brown (dark citrine) and offers the greatest volume of available gem material.

In any mining operation the only consistently recovered gem material will be smokey quartz varieties and citrine. This lower value material would have to support the project with the hope for bonanza gem tourmaline discoveries.

For all of the above it is assumed mining will be restricted to the weathered zone, thus the available

reserve is limited. Underground mining could not be contemplated unless shown there are specific structural controls for gem occurrences and the gem value for mined rock is an economic proposition.

d) Other Minerals

Although felspar, china stone and mica occur these are low value commodities. In the inital stages at least, bulk mining for these minerals would be incompatible with gemstone mining.

Prior to bulk mining for pegmatite minerals considerable reserve drilling would need to be carried out and this could only be justified if markets were assured.

There may be a small demand for specialist materials such as high quality felspar, china clay, quartz which could be met in conjunction with gem mining.

2.4 Mining Method

The only feasible method appears to be systematic removal of weathered zone material, washing of material to remove clay and fine rock, followed by visual assessment of washed and graded oversize.

Removal of weathered zone would be predominantly by loader/ backhoe with hand mining in rich crystal pockets.

2.5 Mining Reserves

There appears to be around 700 m strike of pegmatite with with crystal potential which would yield around 14,000 m^3

of material near the old Gem Pit and additional volumes from other pegmatite zones, the total volume of better material is of the order of 20-30,000 m^3.

Additional weathered rock covering most of the pegmatite would yield limited smokey quartz and perhaps citrine.

2.6 Economics

There is no data on which to assess the value of the prospects. At this stage, mining appears high risk, the value of mined material not market tested and ultimately dependent on whether sold as 'rough' or used as stock for jewellery manufacture.

The prospects will produce gems but there is considerable uncertainty in regard to distribution and the relative yields for varieties.

Before any decision can be made, a pilot testing operation needs to be carried out to determine the economic characteristics of carat yields and values in rough and jewellery form.

S.B. WARNE

3. EXPENDITURE

EXPLORATION EXPENDITURE
EXPLORATION LICENCE 1369
KANGAROO ISLAND
27.8.88 TO 26.11.88

Contractors - Geological	2025
Contractors - Other	150
Drafting	11
Freight & Delivery	11
Geologist - In House	1200
Land Compensation	-
Leasing and Rental	-
Loose Tools & Equipment	-
Mines Department Fees	-
Mining Tenements - Administration	-
Printing & Stationery	99
Sundries (Public Liability Insurance)	-
Telephone and Postage	59
Travel and Accommodation	260
Vehicle Expenses	98
*Overheads	586
Total:	$ 4499

*Office services, depreciation, depletion, rentals ammortisation of assets, auditing.

APPENDIX

Backhoe Trench Sections

LEGEND


Grey podsol soil


Spoil from old shafts. Kaolin rich


Quartz - felspar- muscovite Granite. Generally medium grained, irregular course grained pegmatite patches


Karmantoo sediments
Weathered to brown clays near surface

q — Quartz vein material: usually fractured- milky

♦ — Smoky quartz crystal(s)

Coarse mica occurring as sheets, usually with area greater than 5cm x 5cm.

C — Citrine

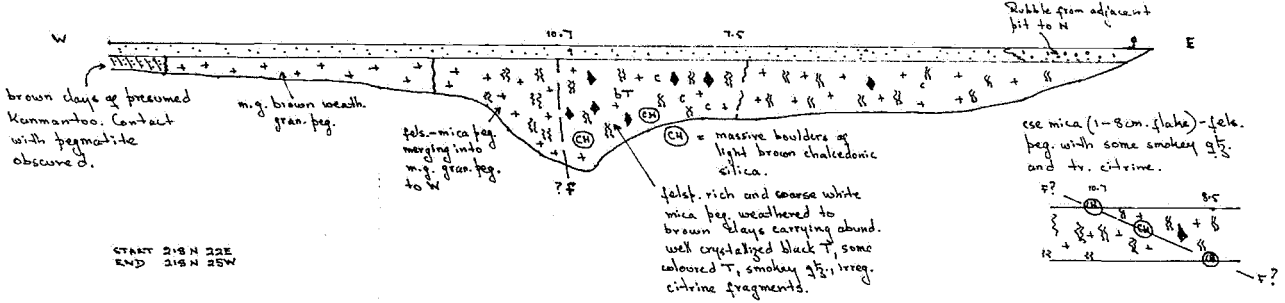
T_B — Black tourmaline prisms or masses.

T_a — Coloured tourmaline prisms; translucent or clear

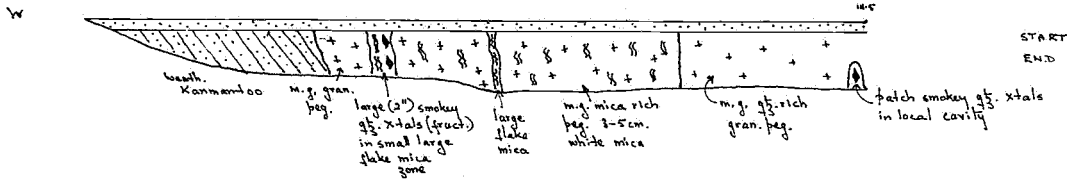
Fault

Scale : Horizontal 1 : 100
Vertical 1 : 100

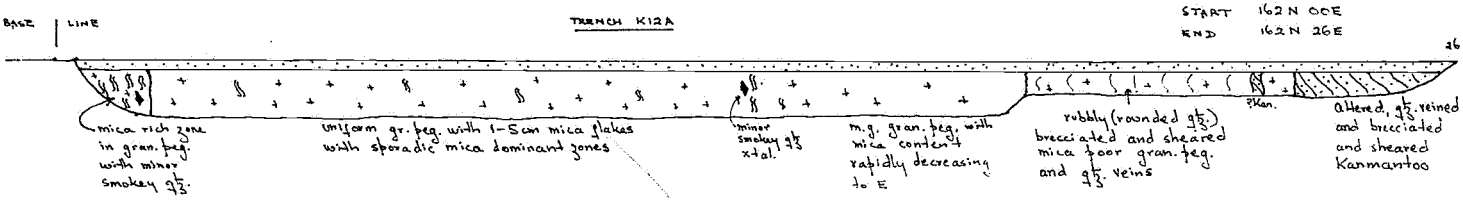
TRENCH K11



TRENCH K12

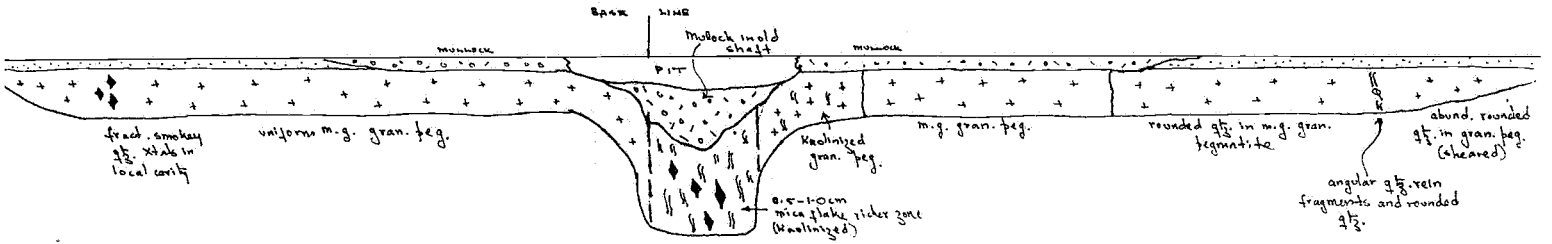


TRENCH K12A



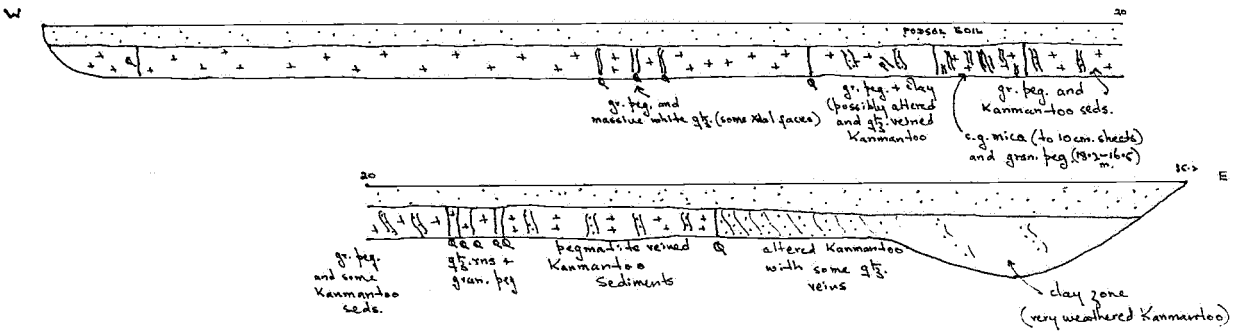
TRENCH K13

START 1142N 12.4E
FINISH 1142N 17E0.



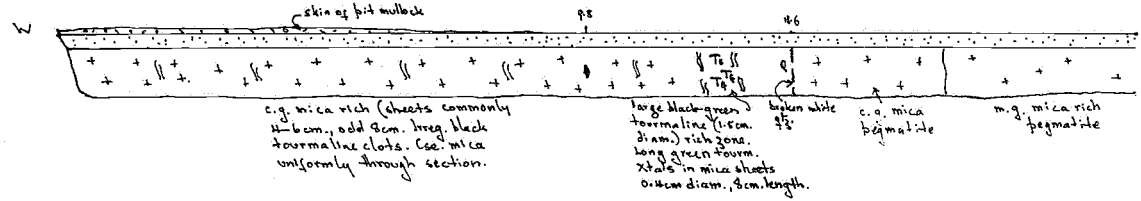
TRENCH K14

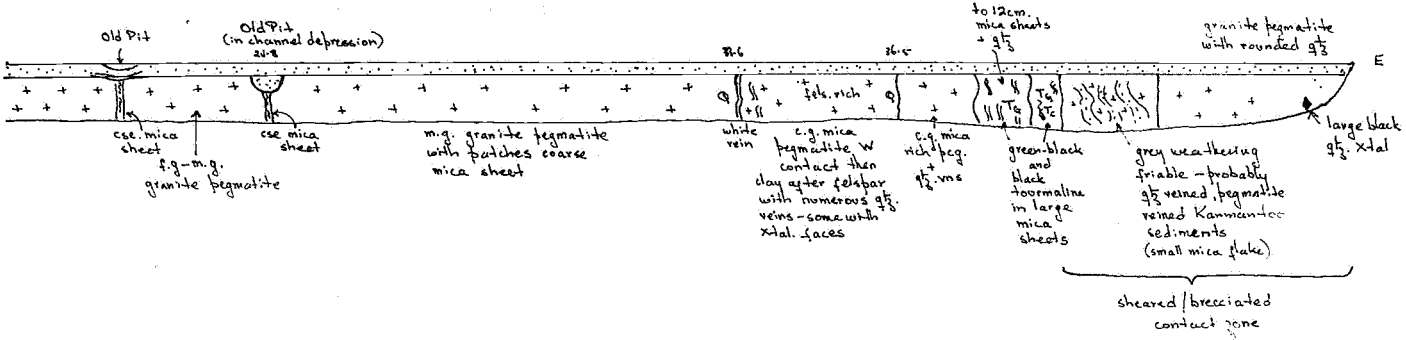
START 190.4N 5.2W
END 187.6N 30E



TRENCH K15

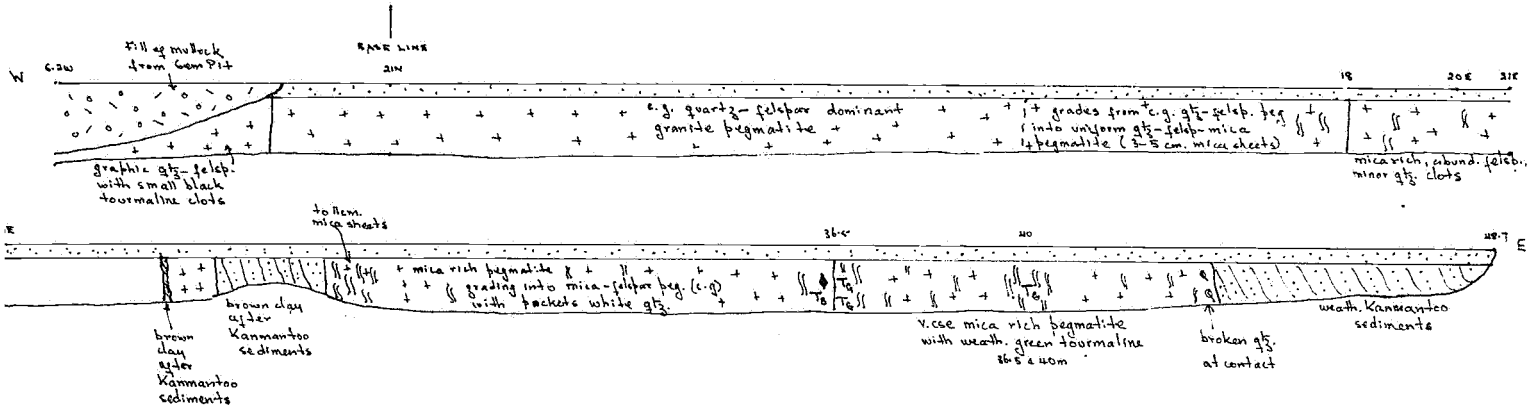
START 94N 35W
END 90·1N 10·3E



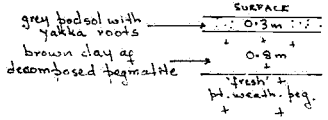


TRENCH K16

START 21N 6·2W

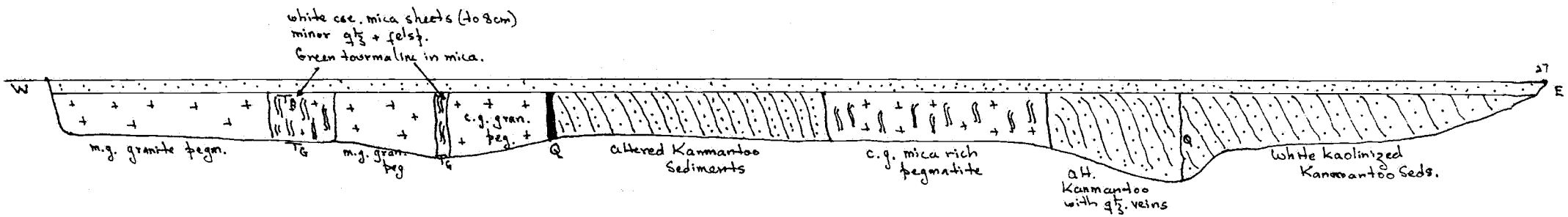


Profile at 21N



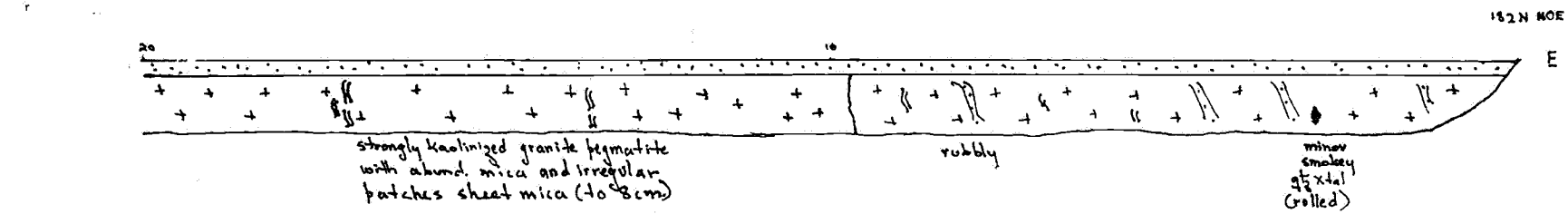
TRENCH K17

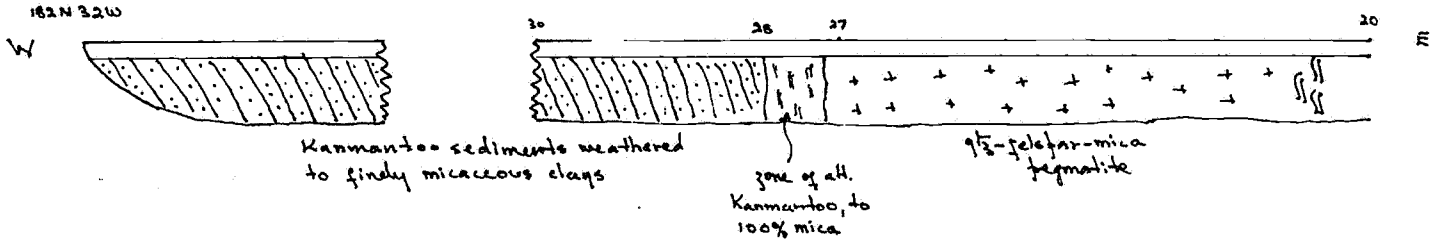
START 80N 00E



TRENCH K18

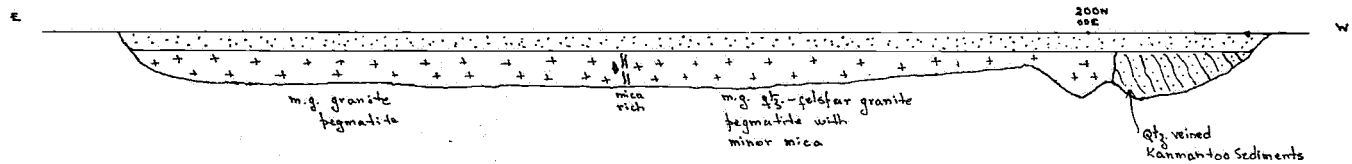
START 182N 40E
END 182N 32W





TRENCH K19

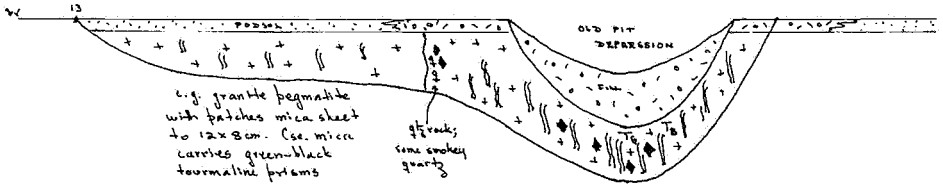
START 200N 3.4W
END 200N 18 E



SECTION LOOKING SOUTH

TRENCH K20

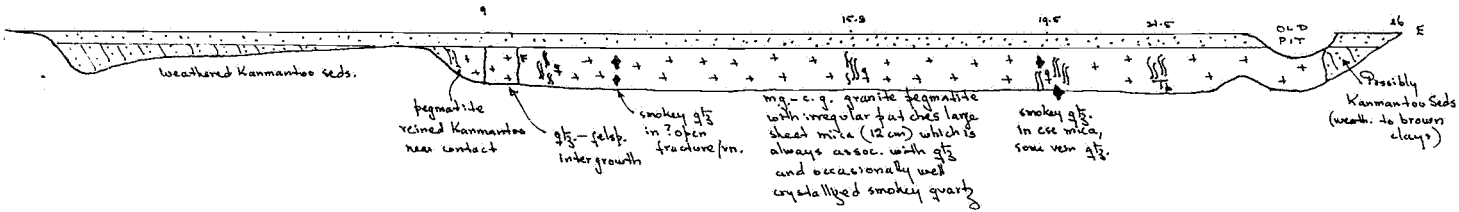
End trench 15.1m on bearing 76°M from 240N 20W
Trench direction 112°M



m.g. gran. pegmatite with large patches cse mica sheets to 12x7cm. large fractured smokey qtz (some citrine) assoc. with cse mica. Some small gam tourmaline at base large qtz prisms.
Prisms black tourmaline (fragments 2x1cm) & clots granular black T.

TRENCH K21

START 282N 20W



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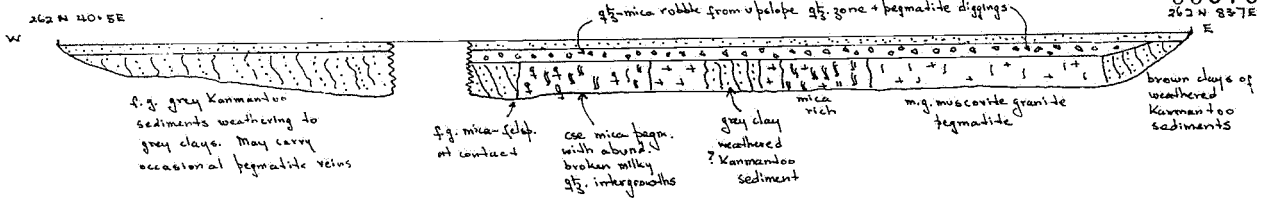
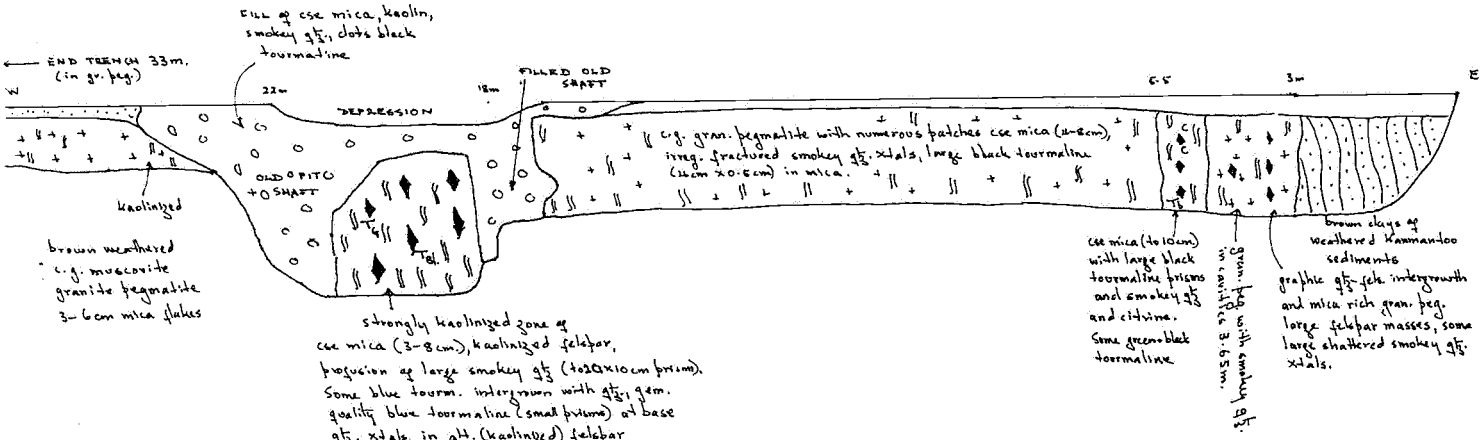
TRENCH K22



TRENCH K23

START 231 N 30W
END 33m at 110° Magnetic.



6813-3

ROEBUCK RESOURCES NL

DUDLEY PEGMATITE

KANGAROO ISLAND

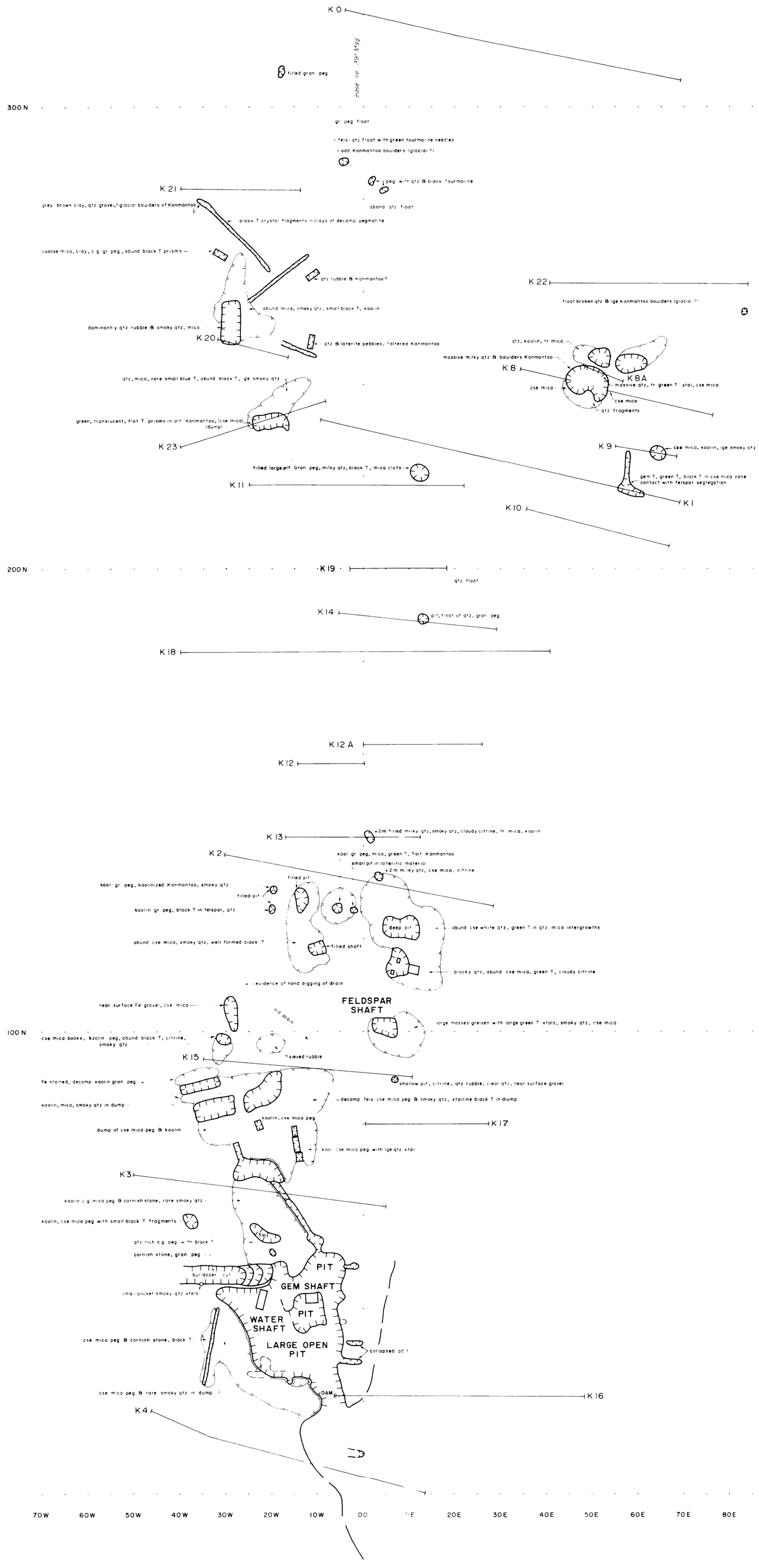
LOCATION OF OLD WORKINGS
AND
BACKHOE TRENCHES COMPLETED 1987-1988

K12 —— Backhoe trench

Old pits and collapsed shafts, trenches

Shaft

Old mullock heaps



SCALE 1 : 500

FIGURE 1

6813-2

ROEBUCK RESOURCES N.L.

REPORT FOR THE PERIOD

27TH NOVEMBER, 1988

TO

26TH FEBRUARY, 1989

KANGAROO ISLAND

EL 1369

ANTECHAMBER BAY

SOUTH AUSTRALIA

Prepared for

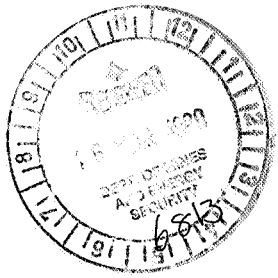
Roebuck Resources N.L.

by

S.B. Warne

TECHNICAL REPORT NO. 109

PERTH, FEBRUARY 1989



CONTENTS

1. INTRODUCTION

Exploration Licence 1369 was originally granted on 27th November, 1986. Extensions of the one year term were applied for and granted on 27th November, 1987 and 1988.

Testing to date has indicated the Dudley pegmatite has been stressed by folding and fault movements following emplacement. This has resulted in fracturing of gem quality quartz varieties and tourmalines. The body has potential for small scale mining of gems. Limited volumes of felspar may find a market niche in time; Kaolin developed in the near surface weathering zone constitutes a minor deposit contaminated with quartz and muscovite.

2. ACTIVITIES

A compensation agreement with the local landholder was renegotiated for a further one year term.

A visit by Ian Wilson of ECC International Ltd. was arranged to view the deposit. Wilson confirmed the minor Kaolin potential of the prospect.

A general re-assessment of exploration results was completed by the joint venture partners. The Australian Emerald Co. N.L. advised Roebuck Resources N.L., through S.B. Warne, their directors would make a decision on further involvement in the project by February 28, 1989.

3. EXPENDITURE

EXPLORATION EXPENDITURE

EXPLORATION LICENCE 1369

KANGAROO ISLAND

27.11.88 TO 16.2.89

Contractors - Geological	375
Contractors - Other	-
Drafting	-
Freight & Delivery	4
Geologist - In House	-
Land Compensation	-
Leasing and Rental	-
Loose Tools & Equipment	-
Mines Department Fees	-
Mining Tenements - Administration	-
Printing & Stationery	-
Sundries (Land Owner Compensation)	900
Telephone and Postage	7
Travel and Accommodation	-
Vehicle Expenses	-
* Overheads	193
Total:	$1,479

Office services, depreciation, depletion, rentals ammortisation of assets, auditing.

KANGAROO ISLAND

EL 1369

ANTECHAMBER BAY

SOUTH AUSTRALIA

REPORT FOR THE PERIOD

27TH FEBRUARY, 1989

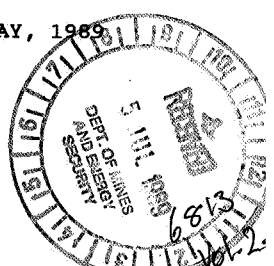
TO 26TH MAY, 1989

PREPARED BY

S.B. WARNE

TECHNICAL REPORT NO. 111

PERTH, MAY, 1989



CONTENTS

1. INTRODUCTION

Exploration Licence 1369 was originally granted 27th November, 1986. Extensions of the one year term were applied for and granted 27th November, 1987 and 1988.

Testing of the Dudley Pegmatite has indicated gem quality quartz varieties and tourmaline crystals have been fractured by post-emplacement fold stresses. Gem tourmaline occurs in isolated pockets of the pegmatite in association with quartz crystals and course mica developments.

2. ACTIVITIES

a. General:

As part of reassessment of exploration results selected exposures of the pegmatite were carefully examined during the quarter for gem quality material. This work confirmed coloured tourmalines occur irregularly and fairly generally in the pegmatite, but gem quality material only in isolated pockets associated with milky and smokey quartz crystals. Very small red and blue gem quality tourmalines occurred near the base of quartz crystals in contact with felspar intergrowths; occasional larger (fractured) blue crystals are developed within quartz crystal. No gem tourmalines of facetting size were found.

b. Quartz Crystal:

A small percentage of quartz crystal, usually fractured, but occasionally in well preserved crystals, is a dark, clear smokey material suitable for facetting. Trial facetting of this material indicated larger stones can be cut to yield a dark honey-coloured (dark citrine) stone; smaller facetted material is ashen-grey and does not display the citrine hue.

Smokey/citrine quartz varieties occur throughout the pegmatite.

c. Eluvial Deposits:

South of the gem shaft, in thick regrowth scrub, there are extensive old pits and trenches in eluvial deposits. It is assumed these workings were completed to search for gem tourmalines shed from the pegmatite. The area has not been sampled to date.

d. Clay Problem:

All work on the area has been in the weathered zone of the pegmatite where stiff kaolin clays developed from felspar decomposition present a real problem. Gem material is usually completely masked by this clay and a method of washing clay to free potential gem material needs to be developed.

3. EXPENDITURE

EXPLORATION EXPENDITURE

EXPLORATION LICENCE 1369

KANGAROO ISLAND

27.2.1989 TO 26.5.1989

Contractors - Geological	1,620
Contractors - Other	1,650
Drafting	-
Freight & Delivery	11
Geologist - In House	-
Land Compensation	-
Leasing and Rental	322
Loose Tools & Equipment	-
Mines Department Fees	-
Mining Tenements - Administration	-
Printing & Stationery	-
Sundries (Land Owner Compensation)	-
Telephone & Postage	12
Travel & Accommodation	1,266
Vehicle Expenses	-
* Overheads	732
Total:	5,613

* Office services, depreciation, depletion, rentals ammortisation of assets, auditing.

ROEBUCK RESOURCES N.L.

REPORT FOR THE PERIOD

27TH MAY, 1989

TO

27TH AUGUST, 1989

KANGAROO ISLAND

EL 1369

ANTECHAMBER BAY

SOUTH AUSTRALIA

Prepared for

Roebuck Resources N.L.

by

S.B. Warne

TECHNICAL REPORT NO. 114

PERTH, AUGUST, 1989

CONTENTS

1. INTRODUCTION

Exploration Licence 1369 was originally granted 27th November, 1986. Extensions of the one year term were applied for and granted 27th November, 1987 and 1988.

Testing to date has indicated gem quality quartz is widely distributed in the pegmatite and gem tourmalines occur rarely in unpredictable small pockets.

2. ACTIVITIES

No activity was carried out on Kangaroo Island as the prospect area is water saturated during winter and unapproachable across private lands.

QUARTZ VARIETIES

A selection of quartz varieties were cut to evaluate their suitability for mounting.

Smokey quartz varieties cut as small, pale ash coloured brilliants were suitable for mounting but local cutting costs exceed retail values of finished articles.

Best results were obtained from dark citrine cut as larger gems to produce unusual rich honey coloured stones, with a smokey background. This type of material is not plentiful, but appears in sufficient amount to produce distinctive "Kangaroo Island" citrines!

3. EXPENDITURE

Contractors - Geological	$1,250
Contractors - Other	$1,200
Telephone and Postage	$ 35
Travel	$ 150
Overheads	200
	$2,835