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REPORT ON THE NORTH GAMBRIA DRILL CORE G1

for

RINGAROOMA MINING PTY. LTD.

by

Joshua D. Conker, B.Sc.(Hons.)

Contents: a) General Comments on the Core
b) Sampling
c) Detailed Sample Description.

a) General Comments on the Core

The host country rock is a grey-coloured porphyritic medium-grained adamellite. The greisens consist mainly of narrow, altered zones of the host adamellite commonly centred on joints and narrow crush zones. Quartz veins in these zones carry most (90%) of the visible cassiterite. The bulk of the greisen is a light to dark green, quartz- and mica-rich rock in which sulphide mineralization is common. The margins of the greisens are altered host rock in which the biotite is chloritised, and the feldspars are sericitised and saussuritised. The most obvious evidence of alteration of the adamellite is colouration of the K feldspar from white to pink, and the plagioclase from white to cream or green. The K feldspars are altered, at least in hand specimen, for greater distances from the greisens than the plagioclase. Where the density of greisens is high (for example near 30 m), the intervening host adamellite is strongly coloured, the plagioclase kaolinised and the biotite completely chloritised. Visible sulphides and cassiterite rarely occur in the altered host rock.

The genetic picture for these greisens at the North Cambria mine is fairly simple. From an unexposed source "tin granite" probably similar to the Lottah "tin sheets", hydrothermal brines carrying Sn and Cu were expelled. The brines penetrated joint and crush zones in the older grey adamellite, causing pervasive alteration and depositing cassiterite and chalcopyrite.

b) Sampling

The core has been sampled by splitting with a diamond saw or by bagging crumbled and broken rock. In general all the crumbled core has been sampled although in some cases there is little evidence for alteration or mineralisation in these samples. The bagged samples were taken by approximately selecting half of the crumbled core.

The solid core has been sampled to cover the greisens and altered host adamellite sections. Small greisens (less than 5 cm) isolated in unaltered host adamellite are noted in the following list, but in most cases were not sampled. The sampling has been carried out on a fairly detailed scale with greisen separated from the marginal altered host. This will allow assaying in detail or bulk assaying of greisen zones could be carried out.

An estimate of the approximate proportion of cassiterite for sections of the core is given as percentage figures or as number of grains and their average diameter.

The following notes on the sampling should be read in conjunction with the drill log provided by Mr. A.J. Noldart of the Tasmanian Mines Department.

c) Detailed Sample Description

Depth (m)	Sample	Description
6.60-7.12	Bagged	Crumbled oxidised host adamellite. Alteration is due to weathering.
7.64-8.36	"	as above
8.38-8.63	Split	Typical pink coloured slightly altered host adamellite. The K feldspar is pink and the plagioclase is cream coloured.
		First major greisen zone.
25.25-25.51	Split	Two 1 mm quartz veins with 2 cm wide grey greisens carrying minor sulphide. The host adamellite is only marginally altered above this sample.
25.51-25.61	"	Altered host adamellite - pink K feldspar, biotite is unaltered.
25.71-26.04	"	Pink host adamellite adjacent to grey greisen.
26.04-26.36	"	Dark grey greisen with 1.5 cm quartz vein core. Pale red translucent cassiterite occurs in the quartz vein. Two SnO_2 grains, 1 mm.
26.36-26.70	"	Intergreisen pink altered adamellite.
26.70-26.90	"	Grey quartz-rich coarse-grained greisen forming the margin of the main greisen in the next sample. Two SnO_2 grains, 2 mm in diameter.
26.90-27.00	"	Dark coloured, mica and chlorite rich greisen carrying SnO_2. Five grains, up to 4 mm in diameter.
27.00-27.10	"	Similar to 26.70-26.90 but no SnO_2 visible.
27.10-27.20	"	Pink intergreisen host adamellite. Plagioclase is altered to a cream to light green colour.
27.20-27.30	Bagged	Crumbled altered adamellite.
27.30-27.62	Split	Partially disintegrated host adamellite. 3 cm grey greisen zone.
27.62-27.75	"	Grey quartz greisen with comb quartz core carrying ten SnO_2 grains up to 6 mm in diameter. Also chalcopyrite and bornite? occur in the quartz core.

Depth (m)	Sample	Description
27.90-28.30	Bagged	Crumbled pink adamellite.
28.30-28.65	Split	Mainly very altered adamellite (biotite chloritised). 1 mm quartz vein fracture filling - SnO_2 ?.
28.65-28.80	Bagged	Crumbled pink adamellite.
28.80-29.00	Split	Mainly pink adamellite with increasing quartz and white mica content to margin of greisen.
29.00-29.30	"	Greisen zone with diffuse margins to host adamellite. Darkest part of greisen carries SnO_2 up to 8 mm in diameter and may form 1-2% of the greisen. Minor sulphides also present.
29.30-31.30	Not sampled	Altered host adamellite. One 5 cm grey greisen at 29.30. Biotite unaltered.
31.30-31.78	Split	Grey greisen with 2 cm quartz vein in core. Two SnO_2 grains, 2 mm. Greisen slightly fractured and weathered.
31.78-32.10	Bagged	Crumbled pink adamellite.
32.10-33.00	Split	Very altered adamellite. Biotite replaced by chlorite. Two fracture zones carrying quartz and minor fluorite (2 and 5 cm wide).
33.00-33.18	"	Grey greisen with fractured margins.
33.18-34.00	Bagged	Crumbled altered adamellite.
34.00-34.80	Split	Pink host adamellite. Biotite unaltered. Slightly coarser grain size.
34.80-34.90	"	Comb-quartz vein (1 cm) with 3 cm grey greisen.
34.90-35.10	Bagged	Altered adamellite.
35.10-35.20	"	Crumbled greisen zone.
35.20-36.00	Split	Pink host adamellite. Biotite unaltered. Minor increase in alteration about joints.
38.24-38.75	"	7 cm - pink host adamellite. Biotite unaltered. 7 cm - comb-quartz vein with minor sulphide and 3-5% SnO_2. 10 cm - altered host adamellite, minor sulphide and one SnO_2 grain, 3 mm in diameter. 15 cm - grey greisen.

End of first major greisen zone.

Depth (m)	Sample	Description
39.70-40.00	Split	Fractured dark coloured host adamellite.
42.40-42.60	Bagged	Grey greisen with minor sulphide.
At 42.83	Not sampled	1 cm greisen within grey unaltered host adamellite.
52.00-54.20		Core largely crumbled. Most of this material is unaltered grey adamellite. Two bagged samples taken for assay.
52.50-52.80	Bagged	Grey crumbled adamellite.
53.59-54.14	"	Greenish coloured host adamellite; the colouration may be weathering.
55.73-55.95	Split	Slightly altered host adamellite. Plagioclase light green coloured. Biotite partially altered.
55.95-56.50	"	Dark grey greisen; minor sulphide. Margins of greisen have 1-2 mm quartz filled fracture zones. In one zone one SnO_2 grain 2 mm in diameter.
57.25-57.45	Bagged	Narrow, much fractured, grey greisen.
57.50-57.90	Split	6 cm - grey host adamellite. 9 cm - quartz vein with light green mica carrying three SnO_2 grains, 3 mm in diameter. 7 cm - comb quartz; one SnO_2 grain, 1 mm in diameter. 10 cm - grey host adamellite.
58.11-58.31	"	Slightly altered host adamellite.
58.31-58.71	"	Grey greisen. Bright green mica on margins. Fractured centre of dark grey greisen with two SnO_2 grains, 2 mm in diameter.
At 59.50	Not sampled	2 cm greisen.
60.20-60.50	"	Grey greisen.
64.05-64.50	Split	Two 3 cm grey greisens about 1 mm quartz filled joints.
64.50-66.73	Not sampled	Narrow greisen veins about joints.
66.73-67.00	Split	Typical grey unaltered adamellite.
	Second major greisen zone.	
67.00-69.70	Split	Wide greisen zone which may be divided into four individual greisens separated by highly altered host adamellite. Greisens 1, 2 and 4 have quartz veins which carry cassiterite (3-5%). Adjacent to the quartz veins, the principal mica is light green in colour, and is associated with minor cassiterite.

Depth (m)	Sample	Description
69.57-70.88	Split	Highly altered, pink coloured, coarse grained host rock. Several narrow greisens with minor sulphides and possibly SnO_2.
70.88-73.84		Crumbled, partially weathered and apparently leached. Small sections of solid core are available.
72.40-72.85	Bagged	Crumbled adamellite including a 2 cm greisen about a quartz-filled joint.
		End of second major greisen zone.
73.84-82.63	Not sampled	Grey host adamellite with several narrow crumbled zones.
84.70-85.55	Bagged	Jointed greisen and crumbled host adamellite.
		Third major greisen zone.
98.50-98.70	Bagged	Isolated narrow greisen.
101.10-102.14	Not sampled	2 cm greisens about 1 mm quartz-filled joints.
102.44-103.62	Split	Slightly altered adamellite with several narrow grey greisens. Biotite unaltered in the host adamellite.
104.46-105.30	"	Slightly altered host with two 2 cm greisens. Biotite unaltered.
105.30-105.65	"	Grey greisen with a 2 cm quartz vein core carrying three SnO_2 grains at 1 mm, and two SnO_2 grains at 1 cm.
105.65-106.38	"	Altered host adamellite with intensity of alteration increasing towards greisen.
106.38-107.28	"	Several greisens showing varying proportions of quartz and development of dark micas. Sample includes a 12 cm, highly altered host adamellite section.
107.28-107.80		There appears to be discrepancy in the stated length and actual length of the core. The discrepancy can probably be accounted for in the crumbled sections. Four samples were taken from this section.
1 m	Bagged	Mixed sample of crumbled fragments of host adamellite and greisen.
30 cm	Split	Grey greisen with three SnO_2 grains 2 mm in diameter in fractured zone.
30 cm	Bagged	Pink altered host adamellite.
35 cm	Split	Fractured grey greisen.

Depth (m)	Sample	Description
107.80-110.20	Split	Multiple greisen zone with 15 cm of altered host at 108.10, 109.81. Quartz vein core carrying 1-2% SnO_2.
110.20-110.45	"	Typical pink host adamellite. Biotite unaltered.
110.45-111.15	"	Grey greisen with minor sulphides.
111.15-111.70	"	Pink host adamellite.
111.70-112.30	"	Grey greisen with 10 cm-comb quartz vein.
		End of third major greisen zone.
112.30-114.73	Not sampled.	Grey host adamellite.
114.73-115.18	Split	Grey greisen with chalcopyrite in narrow quartz-filled fractures.
126.51-126.81	"	Grey greisen about 1-2 mm central quartz vein carrying chalcopyrite. The margins are typical, unaltered, grey host adamellite.

Joshua D Cooker.

Joshua D. Cooker
7th August, 1974.

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CENTRAL MINERALOGICAL SERVICES PTY. LTD.

231 Magill Road,
MAYLANDS, S.A. 5069.

025009

REPORT CMS 74/8/24 by H.W. FANDER M.Sc.

CAMBRIA TIN PROSPECT

DIAMOND DRILL CORE ASSESSMENT

INTRODUCTION:

The report by J. Cocker was studied, and the intersections marked by B. Khoury were examined, as well as some additional zones.

Since the purpose of the examinations was to determine the grain size, association and distribution of the cassiterite, major attention was focussed on this. Should this prospect be of economic interest, then further work would be warranted, including the petrology - mineralogy of the host - rock, the nature of the alteration, and the style of the mineralisation. These details would assist mainly in exploration and in the defineation of the ore bodies.

At this stage however, such detail is perhaps not warranted; thus the comments which follow are based on quite limited examinations. They entirely confirm the assay results on the sludge samples, and are at variance with Cocker's report in several instances. It is evident that there has been an overestimation (serious in places) of the amount of cassiterite present, and misidentification in some places. Unfortunately this has an adverse effect on the prospect, though the redeeming feature (to some extent) is the relative coarseness of the cassiterite.

DESCRIPTIONS OF MINERALISED INTERSECTIONS:

A. General Comments. - Mineralisation (cassiterite, chalcopyrite - bornite) is associated in a general way with the greisening of the host - rock. These are marked by a colour change, due to the introduction of sericite, chlorite and fine muscovite, to a grey-green to yellow-green. More specifically, small fractures, carrying yellowish sericite and often flanked by narrow zones of silicification, are the locations of virtually all the cassiterite. The cassiterite is closely associated, in the majority of these microfractures, with chalcopyrite - bornite, and this feature may be a guide to tin mineralisation.

The quartz veins or "comb - quartz" veins referred to in Cocker's report do not appear to be veins in the strict sense, but rather zones of silicification closely related to the microfractures, and representing a separate phase (distinct from the greisening of the host rock). It is not clear why the term "comb - quartz" was used, since virtually all the quartz is granular or zoned and thus the term is misleading.

The cassiterite is generally coarse - grained, ranging from 0.5 mm to a maximum of 7 mm. It is strongly suspected that the coarser cassiterite consists, in many cases of aggregates of smaller crystals. Due to its occurrence in microfractures, the cassiterite appears to be fractured itself; if so, this could have an adverse effect on recovery because of excessive shattering and generation of undersize material. Thus the indicated grain sizes represent maximum sizes and must be regarded with caution.

Much finer cassiterite may also occur, but there was no particular indication of this; if present, it would constitute only a minor proportion of the total cassiterite and would not be significant at this stage.

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If it is decided to proceed with the prospect, some consideration should be given to the recovery of the copper sulphides, which are fairly coarse. No other sulphides were detected, but may be present in traces.

B. Details of Intersections. -

26.04 - 27.00 m. A chlorite - sericite greisen with occasional flakes of reddish biotite (probably phlogopite), occasional small patches of purple or mauve fluorite. Bornite occurs at 26.20 m and chalcopyrite at 26.90 m. No cassiterite was seen (may have been confused with phlogopite - see Cocker's description).

27.62 - 27.75 m. This section contains cassiterite grains in quartz (massive, granular, zoned in places), ranging in size from ½ mm to 5 mm. Chalcopyrite and bornite patches up to 3 mm also occur interstially between quartz grains. The cassiterite is a typical "clove brown" colour, and constitutes perhaps ½% of this core section (13 cm long).

28 - 30 - 28.65 m. No mineralisation was observed.

32.10 - 33.00 m. This is an extra section examined. Here, a 2 cm wide quartz zone carries some bornite (up to 5 mm in size) and several cassiterite grains (1.3 mm in size). The remainder of the section is barren.

34.80 - 34.90 m. Barren quartz zone.

38.24 - 38.75 m. A fairly massive quartz zone occurs. It does not contain 3.5% cassiterite; the brown granular mineral is siderite (a carbonate). Another, much thinner quartz zone contains some chalcopyrite and bornite (up to 8 mm in size) and occasional cassiterite grains up to 5 mm in size.

55.95 - 56.50 m. A portio n of this core section is reasonably well mineralised over a 10 cm width, containing about 1% cassiterite. This occurs in, and immediately adjacent to, thin microfractures as grains 1 - 2 mm in size. Patches of associated chalcopyrite occur. The microfractures are characterised by yellow sericite.

57.50 - 57.90 m. Massive quartz with green chlorite and yellow sericite throughout. Scattered cassiterite grains range from 0.2 mm to 2.0 mm in size and comprise ½ - ¾% of this core section. A younger fault breccia cuts the rock.

58.31 - 58.71 m. This section contains microfractures which are characterised by yellow sericite. They carry appreciable cassiterite (0.5 - 2 mm grains), butonly two such microfractures occur in the core section. Some phlogopite occurs (could be mistaken for cassiterite?).

67.00 - 69.70 m. This section contains fairly sparse, scattered cassiterite grains up to 3 mm in size; these are mostly related to quartz - sericite zones or veins. Brown granular carbonate occurs (mistaken for cassiterite?).

105.30 - 105.65 m. At 105.5 m there is a quartz - sericite fracture zone which carries isolated cassiterite grains up to 7 mm in size; they are extensively fractured.

107.28 - 107.80 m. Occasional microfractures with sericite and quartz, carry some chalcopyrite and isolated cassiterite grains up to 4 mm in size.

107.80 - 110.20 m. Isolated cassiterite grains occur, but virtually all the brown granular material is in fact carbonate.

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SUMMARY:

Cassiterite occurs sparsely throughout, but erratic and restricted in its distribution. It is generally closely related to late (i.e. young) microfractures.

The cassiterite is dominantly coarse - grained, which is an encouraging feature; the low grade is a problem, but perhaps better intersections will be drilled.

There do not appear to be any intersections, of appreciable thickness, carrying significant cassiterite.

Metallurgical problems should be at a minimum apart perhaps from the fracturing of the cassiterite.

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APPENDIX: Analytical Data

Analytical data for diamond drill sludge samples from the Cambria mine are given in the following copies of letters to Ringarooma Mining Pty Ltd. It is assumed that the sludge samples were collected during drilling.

Further, there is no statement on either letter to indicate that the sludge samples are from diamond drill hole C1, North Cambria mine, and to which this report relates.

However, from a combination of location, client's name, date of drilling, date of analyses and depth of hole, it may be deduced that the results apply to D.D.H. C1.

Persons using these results should bear in mind the above.

Peter Sollins.
5/11/81.

025013

Attn Peter Bollins
Cambria results requested 4 Nov 81

J of M	A.O.	C.G.	E.O
Received / Answered	5 NOV 1981		
DEPT. OF MINES			
REF. No.			

9th July, 1974

Ringarooma Mining Pty. Ltd.,
22 Dynon Road,
SOUTH KENSINGTON. VIC. 3031

Dear Sirs,

Please find below the additional assays requested on samples above 0.06% Sn.

Reg. No.	Your No.	% Cu	% As	% Fe
741246	CS 9	0.02	0.01	3.6
741257	CS20	0.01	0.01	3.3
741258	CS21	0.01	0.01	2.9
741259	CS22	0.01	0.01	3.2

Analyses by: ..... JE

Fee Charged: $12.00

Yours faithfully,

(H. K. Wellington),
Chief Chemist & Metallurgist.

HKW:RA

Enc.

140 of 81

Advised Bollins of these samples but can't see any core samples recd up to end 16 1978. He will look further & advise.

025014

8th July, 1974

c.c. to- H. F. Reardon,
BOTHWELL. TAS. 7411

Ringarooma Mining Pty. Ltd.,
22 Dynon Road,
SOUTH KENSINGTON. VIC. 3031

Dear Sirs,

741238 - 741275

Please find below results from assaying diamond drill sludge samples from the Cumbria Mine.

As instructed samples 741246, 741257, 741258 and 741259 being over 0.06% Sn are being assayed for Cu, Fe and As. These results will be forwarded later.

Reg. No.	Your No.	Footage (metres)	Assay (% Sn)
741238	CS 1	0 - 2.78	<0.01
239	CS 2	2.78 - 6.45	<0.01
240	CS 3	6.45 - 10.71	<0.01
241	CS 4	10.71 - 15.62	<0.01
242	CS 5	15.62 - 18.53	<0.01
243	CS 6	18.53 - 21.38	0.01
244	CS 7	21.38 - 24.70	0.02
245	CS 8	24.70 - 27.74	0.04
246	CS 9	27.74 - 30.78	0.07
247	CS10	30.78 - 35.05	0.05
248	CS11	35.05 - 38.44	0.02
249	CS12	38.44 - 41.26	0.03
250	CS13	41.26 - 44.34	0.02
251	CS14	44.34 - 48.00	0.01
252	CS15	48.00 - 52.00	0.01
253	CS16	52.00 - 58.11	0.03
254	CS17	58.11 - 61.09	0.05
255	CS18	61.09 - 64.05	0.04
256	CS19	64.05 - 67.00	0.03
257	CS20	67.00 - 70.00	0.13
258	CS21	70.00 - 72.85	0.11
259	CS22	72.85 - 75.20	0.09
260	CS23	75.20 - 77.82	0.05
261	CS24	77.82 - 80.73	0.03
262	CS25	80.73 - 83.76	0.03

Acc. No.	Your No.	Footage (metres)	Assay (% Sn)
741263	C826	83.76 - 86.55	0.02
264	C827	86.55 - 89.55	0.01
265	C828	89.55 - 92.52	0.02
266	C829	92.52 - 95.48	0.01
267	C830	95.48 -101.47	0.01
268	C831	101.47 -104.99	0.01
269	C832	104.99 -106.95	0.04
270	C833	106.95 -109.58	0.05
271	C834	109.58 -114.06	0.04
272	C835	114.06 -117.08	0.04
273	C836	117.08 -122.00	0.02
274	C837	122.00 -125.10	0.02
741275	C838	125.10 -127.80	0.01

Analyses by: .....

Fee Charged: $30.00

Yours faithfully,

(H. E. Wellington),
Chief Chemist & Metallurgist.

HEW:RA

Enc.