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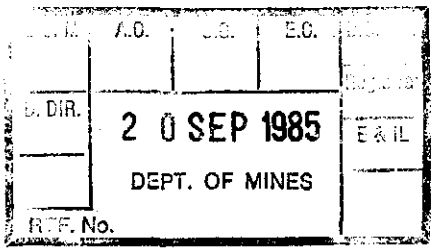
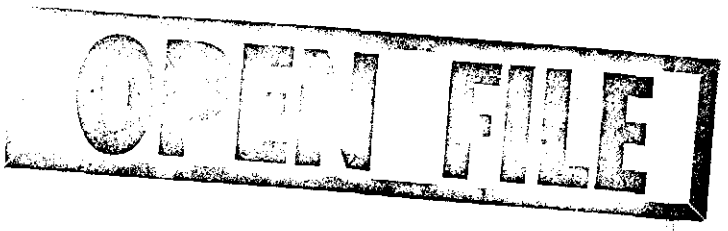


SUPPLEMENTARY REPORT ON COSTEANING ACTIVITIES WITHIN ML 77M/77 & EL 11/77 RATTLER HILL AUGUST, 1983 AMAX / A.C.M. JOINT VENTURE

R.M. Vivian

October, 1983



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1. SUMMARY/CONCLUSIONS

Summary

1. Two costeans RHC 1 and RHC 2, 157m and 152m in length respectively, were excavated at Rattler Hill during the 8th and 9th August, 1983.

2. The work programme comprised geological mapping on a 1:500 scale and channel rock chip sampling of each costean. Samples were analysed for Sn, W, F.

3. Rock types exposed in the costeans include equigranular, porphyritic and siliceous greisenised adamellite-granites. The former two rock types are typically highly to moderately weathered and contain widely spaced quartz-greisen veins, commonly less than 5cm thick. Siliceous greisenised rock occurs as subparallel lenses separated by narrow widths of weathered to silicified adamellite-granite.

4. Dominant strike direction for both quartz-greisen veins and siliceous greisen lenses is 284^{o} magnetic. Dip is steep to subvertical towards the north.

1. (Cont)

5. Cassiterite, as disseminated subhedral to euhedral grains to 5mm in size, occurs in the quartz-greisen veining. While not observed in the siliceous greisen itself, its widespread presence is indicated by elevated tin assay results for that rock type.

6. Grade values greater than 0.1% Sn define, in each costean, a single mineralised greisen zone consisting of a number of siliceous greisen lenses. Surface geology suggests the two costean greisen exposures may be continuous between the costeans.

7. In costean RHC 1 the griesen zone is 52.4m in width and comprises six lenses varying in width from between 1m to 23m. Average grade is 0.15% Sn and the best interval is 0.43% Sn over 5m within the zone.

8. In costean RHC 2 the greisen zone is 33.1m wide and averages 0.17% Sn. It consists of five sub-parallel lenses varying in width from between 1m to 6m. The best interval in the zone is 0.24% Sn over an 8m wide greisen lens.

1. (Cont)

Conclusions

1. The present work programme has identified weak cassiterite mineralisation associated with quartz-greisen veins and a siliceous greisen zones within adamellite-granite at Rattler Hill.

2. The low grade tenor of mineralisation and the absence of significant tonnages of ore material downgrade the economic potential of this prospect.

2. RECOMMENDATION

Further exploration of ML 77M/77 and EL 11/77 is not recommended.

3. INTRODUCTION

This report, detailing results of a two costean programme conducted at Rattler Hill during August, 1983, supplements a report on work carried out in late 1982 entitled "A Report on Exploration Activities within ML 77M/77 and Environs, Rattler Hill" by R. Yeates, dated February, 1983.

The above report had defined a broad zone of mineralised greisen characterised by a 0.2% Sn cut off approximately 175m in strike length and 110m wide. Within this zone a number of areas of anomalous geochemistry were defined by the 4,000ppm Sn contour. The extent of mineralised greisen to the east was unknown.

The purpose of the costeaning programme was twofold. First, to test the eastward strike extension of the zone. Second, to test the continuity of tin values across the geochemical highs northeast from grid location 1150N/1900E through 1200N/1950E to near drill hole DRH 1 (Plate 1).

As the area to the east lies within EL 11/77, held by Mineral Holdings Australia Pty. Ltd., permission was sought and granted to access the land for the purposes of excavating a costean.

3. (Cont)

Two costeans RHC 1 and RHC 2, 157m and 152m in length respectively, were excavated by a contracted D6D bulldozer and backhoe at Rattler Hill during the 8th and 9th August, 1983. The costeans were mapped on a 1:500 scale and sampled at 2m intervals or at an interval appropriate to the width of quartz-greisen veining. Samples were analysed for Sn, W, F. Bad weather hampered the programme which was not completed until late August, 1983.

Costean locations and geology are shown on Plate 1. Analytical results are tabulated in Appendices I and II.

4. COSTEAN GEOLOGY

Rock types exposed in the costeans include medium grained equigranular to porphyritic adamellite-granites and siliceous greisen. Except for some small fresh exposures, the former two rock types are typically moderately to heavily weathered in the costeans and contain widely spaced quartz-greisen veins and numerous hairline fractures.

The siliceous greisen is characteristically a greenish-grey, vitreous, massive rock with associated yellow-orange oxide lined cavities. Fine grained, dark quartz eye phenocrysts (remnants of the original igneous texture) are invariably present.

In each costean five to six sub-parallel siliceous greisen lenses occur and range from 1m to 23m in width. The lenses, which are separated by short intervals of heavily weathered to siliceous adamellite-granite, form greisen zones 52.4m wide in RHC11 between 75m - 127m, and 33.1m wide in RHC2 between 90.3m - 123.4m.

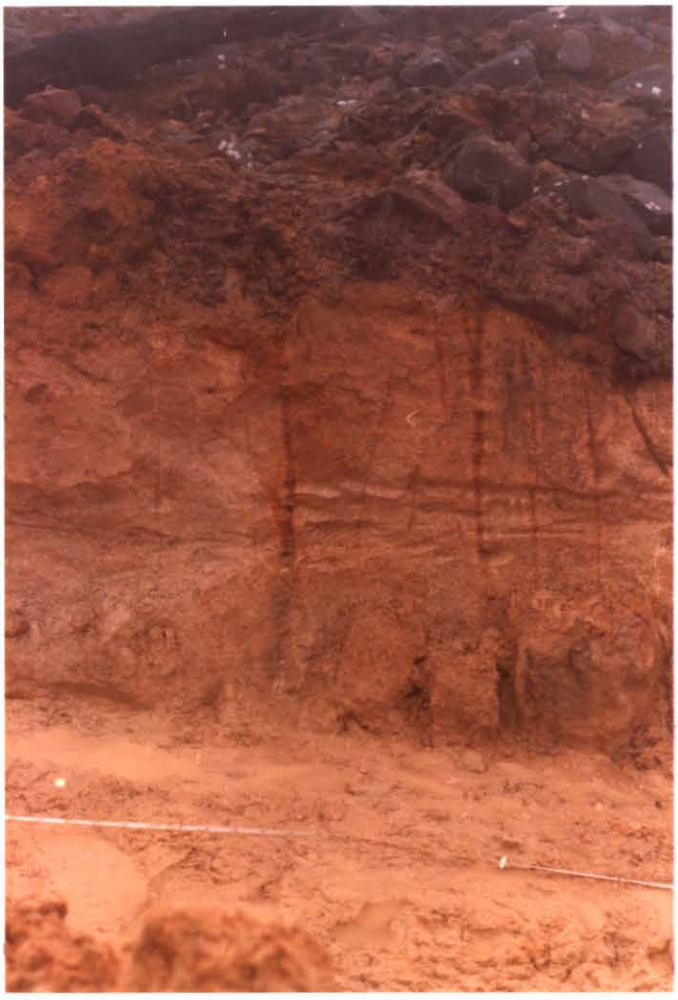
Intensity of siliceous greisen alteration is variable within the wider lenses and is expressed by an abundance of cavities, obliteration of the original igneous texture and a porous, less siliceous rock.

Strike directions vary between 260° to 320° magnetic, though 284° magnetic is the direction. Dip is steep to sub-vertical to the north.

4. (Cont)

Quartz-greisen veins occur in both the weathered adamellite-granite and greisen lenses but are less numerous in the latter rock. They consist of either entirely grey siliceous greisen or grey-white, columnar to drusy quartz bordered by up to 2cm wide greisen wallrock selvadges.

The veins are widely spaced, less than 5cm thick and constant in width (refer Photograph 1). Some of the larger veins, however, may pinch and swell or bifurcate over their exposures. The inter-vein area is usually highly ironstained and altered to clay. Orange-brown iron oxide stainings are also commonly developed along the margins of veins, greisen lenses and in hairfractures (refer Photograph 2). A few clay-filled shears occur in the costeans and show small scale displacements of quartz-greisen veins.



Photograph 1
Widely spaced quartz-greisen veins

Photograph 2
Quartz veining in highly weathered granite

5. MINERALISATION

5.1 General Description

Costean channel samples were taken at 2m intervals, or at an interval appropriate to the width of visibly mineralised quartz-greisen veining. All samples submitted for Sn, W, F analysis are tabulated in Appendices I and II. Those not assayed have been stored in Launceston.

Tungsten values, in general, are at or below the detection limit of 10ppm. Only a few tungsten values to 20ppm are recorded - these occurring in samples with elevated tin values.

Similarly, fluorine shows a strong sympathetic relationship to tin values with anomalous fluorine values associated with elevated tin values. As noted in the previous report on Rattler Hill, the fluorine is probably present in mica lattices as neither fluorite nor topaz was identified from petrographic examinations.

Cassiterite, as disseminated subhedral to euhedral grains to 5mm in size, occurs as a central void filling in drusy and columnar white quartz in quartz-greisen veins in adamellite-granite. Some cassiterite-bearing veins are also present in the greisen lenses and post date the early generation of greisenisation.

5.1 (Cont)

In addition, cassiterite, as disseminations and aggregates, occurs in intimate association with waxy, grey-green flakes of pinite that line vughs present in siliceous greisen material.

The consistent elevated tin assay results from siliceous greisen lenses suggest that this form of mineralisation is widespread in this rock though it is not as obvious as in the quartz-greisen veins; no doubt due to the dark colouration of the rock and the fine grained nature of the cassiterite in the greisen.

Sulphide mineralisation is present as trace pyrite in vein quartz and as rare sooty arsenopyrite in vughs in siliceous greisen. Malachite, staining fracture planes, was noted from one locality.

The characteristics of mineralisation in each costean are detailed below. Please note that in grade computations a 200ppm grade was assigned to unassayed sample intervals.

5.2 Costean RHC 1

This costean is characterised by a 52.4m wide mineralised zone between 74.6m to 127m, comprising six sub-parallel greisen lenses that vary in width from 1m to 23m. The total 52.4m zone averaged 0.15% Sn.

5.2 (Cont)

The two highest tin values, 0.53% and 0.90% Sn (from sample intervals RHC 1, 91m - 92m, RHC 1, 92m - 93m), reflect the presence of 5mm wide cassiterite-bearing quartz veins in the greisen. Best average grade centred on these intervals is 0.43% Sn over 5m.

Outside the 51.4 zone in the costean, the quartz-greisen veins are only weakly mineralised with no individual vein recording greater than 2,300ppm Sn. Background Sn values for the sampled weathered host rock are less than a few hundred ppm.

5.3 Costean RHC 2

The most extensive distribution of tin values greater than 1,000ppm is contained in a 33.1m wide greisen zone between RHC2, 90.3 - 123.4m.

Here the costean exposes five sub-parallel lenses that average 0.17% Sn. The best interval is 0.24% Sn over 8m that encompasses a 1cm wide cassiterite-bearing vein.

Outside the greisen zone, best composite grade across quartz-greisen veining is 0.24% Sn over 7.8m between 68.2 and 76m. This is related to 1mm sized cassiterite disseminated vein quartz and associated with coarse grey-green waxy mica and malachite staining.

5.3 (Cont)

The quartz-greisen veining located between RHC2, 46m to 51m appears to be a surface expression of similar mineralisation intersected in drill hole DRH1 between 36m and 41m drill depth.

5.4 Comments

On the basis of surface geology the two costean greisen exposures appear to represent the same continuous zone. If this is the case, a single greisen zone 150m long, and varying in width from 30m to 52m wide, is defined. Depth of greisen as indicated by the drill holes is less than 30m. Thus the possible resource is less than 400,000 tonnes (using specific gravity = 2.7), with a grade much less than 0.2% Sn.

A separate greisenous zone defined by small sporadic outcrops and by drill hole DRH 2 intersections, to approximately 32m drill depth, may occur south of the above zone. The quartz-greisen veins encountered in the initial intervals of costean RHC 1 may well be an expression of greisenisation weakening and dissipating towards the east.

APPENDICES

APPENDIX 1

COSTEAN RHC 1 GEOCHEMISTRY RESULTS

Sample Interval (m)				Sn	W	F
				(ppm)		
RHC 1	0	-	2	60	x	3700
RHC 1	2	-	4	Not assayed		
RHC 1	4	-	6	75	x	2000
RHC 1	6	-	8	Not assayed		
RHC 1	8	-	10	50	x	2400
RHC 1	10	-	11.5	Not assayed		
RHC 1	11.5	-	13.5	410	x	2400
RHC 1	13.5	-	15.5	Not assayed		
RHC 1	15.5	-	16.5	85	x	1800
RHC 1	16.5	-	17.5	Not assayed		
RHC 1	17.5	-	19.5	40	x	2400
RHC 1	19.5	-	21.5	250	x	1900
RHC 1	21.5	-	23.5	80	x	900
RHC 1	23.5	-	25.5	55	10	1800
RHC 1	25.5	-	26	65	x	1700
RHC 1	26	-	26.5	1700	10	5400
RHC 1	26.5	-	27	35	x	1500
RHC 1	27	-	27.5	560	x	2000
RHC 1	27.5	-	28	980	x	1800
RHC 1	28	-	28.5	1150	x	2800
RHC 1	28.5	-	30	170	x	1500
RHC 1	30	-	32	Not assayed		
RHC 1	32	-	34	50	x	1700
RHC 1	34	-	36	50	x	900
RHC 1	36	-	38	280	x	1700
RHC 1	38	-	39.5	90	x	2000
RHC 1	39.5	-	40.5	1300	x	3400
RHC 1	40.5	-	42	40	x	1200
RHC 1	42	-	43	680	x	2500
RHC 1	43	-	45	130	x	1500
RHC 1	45	-	46.2	80	x	1500

Sample Interval (m)				Sn (ppm)	W	F
RHC 1	46.2	-	47	1900	x	2000
RHC 1	47	-	48	35	x	1200
RHC 1	48	-	48.4	760	20	3200
RHC 1	48.4	-	50	40	x	1200
RHC 1	50	-	52	90	x	1500
RHC 1	52	-	54	35	x	2300
RHC 1	54	-	54.6	50	x	2100
RHC 1	54.6	-	56.3	55	x	2700
RHC 1	56.3	-	56.6	1400	x	3800
RHC 1	56.6	-	58	45	x	1600
RHC 1	58	-	60	Not assayed		
RHC 1	60	-	62	75	x	1200
RHC 1	62	-	63.7	45	x	2000
RHC 1	63.7	-	64.4	2300	10	1900
RHC 1	64.4	-	68	Not assayed		
RHC 1	68	-	70	65	x	900
RHC 1	70	-	71	1700	x	2400
RHC 1	71	-	72	1200	x	2400
RHC 1	72	-	73	70	x	300
RHC 1	73	-	74	130	x	1600
RHC 1	74	-	74.6	200	x	1300
RHC 1	74.6	-	75.6	920	x	1300
RHC 1	75.6	-	76.6	2850	x	1700
RHC 1	76.6	-	77.6	4250	x	1700
RHC 1	77.6	-	80	Not assayed		
RHC 1	80	-	82	100	x	1000
RHC 1	82	-	84	Not assayed		
RHC 1	84	-	85	460	x	1300
RHC 1	85	-	85.4	Not assayed		
RHC 1	85.4	-	86.5	1550	10	700
RHC 1	86.5	-	88.5	Not assayed		

	Sample Interval (m)			Sn	W (ppm)	F
RHC 1	88.5	-	90	60	x	900
RHC 1	90	-	91	1800	x	1000
RHC 1	91	-	92	5300	20	1800
RHC 1	92	-	93	9000	10	1700
RHC 1	93	-	94	3050	10	300
RHC 1	94	-	95	2550	x	700
RHC 1	95	-	97	Not assayed		
RHC 1	97	-	98	240	x	800
RHC 1	98	-	99	790	x	100
RHC 1	99	-	100	4050	10	1600
RHC 1	100	-	102	Not assayed		
RHC 1	102	-	104	670	x	700
RHC 1	104	-	105	2350	x	700
RHC 1	105	-	107	2400	x	1600
RHC 1	107	-	109	4150	x	1400
RHC 1	109	-	111	1950	x	1600
RHC 1	111	-	113	1050	10	700
RHC 1	113	-	115	1500	10	2900
RHC 1	115	-	117	290	x	1700
RHC 1	117	-	119	1250	10	1100
RHC 1	119	-	121	200	x	2100
RHC 1	121	-	123	520	x	2300
RHC 1	123	-	125	1650	x	1900
RHC 1	125	-	127	1500	x	1900
RHC 1	127	-	129	230	10	1100
RHC 1	129	-	131	170	10	1600
RHC 1	131	-	133	Not assayed		
RHC 1	133	-	135	35	x	1500
RHC 1	135	-	139	Not assayed		
RHC 1	139	-	141	160	x	1300
RHC 1	141	-	143	Not assayed		

Sample Interval (m)				Sn (ppm)	W (ppm)	F (ppm)
RHC 1	143	-	145	100	x	800
RHC 1	145	-	147	Not assayed		
RHC 1	147	-	149	95	x	1100
RHC 1	149	-	151	Not assayed		
RHC 1	151	-	153	360	x	700
RHC 1	153	-	155	Not assayed		
RHC 1	155	-	157	85	10	800
Detection Limit:				10	10	100
Analytical Method (Analabs)				402	401	129

APPENDIX II

COSTEAN RHC 2 GEOCHEMISTRY RESULTS

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	Sample Interval (m)			Sn	W	F
				(ppm)		
RHC 2	0	-	2	35	10	700
RHC 2	2	-	4	Not assayed		
RHC 2	4	-	6	30	10	1200
RHC 2	6	-	8	Not assayed		
RHC 2	8	-	10	60	x	1300
RHC 2	10	-	12	Not assayed		
RHC 2	12	-	14	50	x	1400
RHC 2	14	-	16	Not assayed		
RHC 2	16	-	18	100	10	800
RHC 2	18	-	20	170	10	1200
RHC 2	20	-	22	110	15	2000
RHC 2	22	-	24	Not assayed		
RHC 2	24	-	26	80	x	1500
RHC 2	26	-	28	70	x	3200
RHC 2	28	-	29.5	Not assayed		
RHC 2	29.5	-	31	2150	10	2600
RHC 2	31	-	33	Not assayed		
RHC 2	33	-	35	1650	10	2100
RHC 2	35	-	37	Not assayed		
RHC 2	37	-	39	50	x	3400
RHC 2	39	-	41	160	10	2400
RHC 2	41	-	45	Not assayed		
RHC 2	45	-	46	45	10	1700
RHC 2	46	-	47	3500	15	2300
RHC 2	47	-	48	1900	20	3000
RHC 2	48	-	49	1650	x	300
RHC 2	49	-	50	1750	20	2600
RHC 2	50	-	50.7	1000	10	3000
RHC 2	50.7	-	52	600	x	2400
RHC 2	52	-	54	Not assayed		
RHC 2	54	-	56	140	10	1800

Sample Interval (m)				Sn (ppm)	W (ppm)	F (ppm)
RHC 2	56	-	58	110	10	2200
RHC 2	58.7	-	58.9	4500	10	3600
RHC 2	58	-	60	250	15	2200
RHC 2	60	-	62	130	x	1600
RHC 2	62	-	64	140	x	1800
RHC 2	64	-	66	Not assayed		
RHC 2	66	-	68	100	x	2000
RHC 2	68	-	68.2	Not assayed		
RHC 2	68.2	-	68.5	5150	10	3900
RHC 2	68.5	-	70	Not assayed		
RHC 2	70	-	72	550	10	2300
RHC 2	72	-	72.4	4400	15	2500
RHC 2	72	-	74	4550	x	2300
RHC 2	74	-	76	1500	x	2100
RHC 2	76	-	78	Not assayed		
RHC 2	78	-	80	360	x	2000
RHC 2	80	-	82	300	x	1400
RHC 2	82	-	84	Not assayed		
RHC 2	84	-	86	130	x	2200
RHC 2	86	-	88	Not assayed		
RHC 2	88	-	90.3	250	x	1700
RHC 2	90.3	-	92.3	4950	x	2100
RHC 2	92.3	-	94.3	1300	x	3100
RHC 2	94.3	-	96.3	2150	x	2900
RHC 2	96.3	-	98.3	1000	x	1900
RHC 2	98.3	-	99	260	x	1700
RHC 2	99	-	101	310	x	1700
RHC 2	101	-	103	1200	x	2100
RHC 2	103	-	105	150	x	1500
RHC 2	105	-	107	240	x	1600
RHC 2	107	-	109	860	x	1600

Sample Interval (m)				Sn	W	F
				(ppm)		
RHC 2	109	-	111	1800	10	3300
RHC 2	111	-	113	1300	10	3800
RHC 2	113	-	115	1200	10	2700
RHC 2	115	-	117	2500	10	2900
RHC 2	117	-	119	3400	10	3900
RHC 2	119	-	120.7	4950	20	4700
RHC 2	120.7	-	122.4	Not assayed		
RHC 2	122.4	-	123.4	1000	10	4300
RHC 2	123.4	-	125	410	x	2200
RHC 2	125	-	126	170	x	1400
RHC 2	126	-	126.8	130	10	1500
RHC 2	126.8	-	136	Not assayed		
RHC 2	136	-	138	240	x	2100
RCH 2	138	-	140	Not assayed		
RHC 2	140	-	142	240	x	1500
RHC 2	142	-	144	Not assayed		
RHC 2	144	-	146	740	x	2000
RHC 2	146	-	148	Not assayed		
RHC 2	148	-	150	720	x	2300
RHC 2	150	-	152	450	x	1800
Detection Limit:				10	10	100
Analytical Method (Analabs):				402	401	129

PLATE 1

SEE FICHE NUMBER 2.

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