RENISON LIMITED

E.L. 17/77

WILSON RIVER AREA

WESTERN TASMANIA

ANNUAL REPORT 1979 / 80

(1) Dept.
(2) WB
(3) JN file

for A.F. ROSS,
SENIOR EXPLORATION GEOLOGIST

November 1980

Copies: Renison (2)
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SUMMARY

During 1979/80 ground surveys in the Harman River Area were successful in delineating several line anomalies, which will require further evaluation in 1980/81.

At Tadpole Hill anomalous geophysical and geochemical responses over an inferred strike length of 600m are associated with abandoned tin workings enclosed in granite.

A total of $68,085 was expended on exploration activities E.L. 17/77 during 1979/80.

During 1980/81 a total of $68,915 is budgetted for surveys on the Tadpole Hill - Harman River Grid area and a reconnaissance stream sediment survey in the remote areas of the Huskisson Syncline.

1. INTRODUCTION

E.L. 17/77, Wilson River area, is located north of Renison Bell, western Tasmania, and covers an area of 114 square kilometres (Fig. 1).

The main geological features are the Huskisson Syncline comprising Cambrian to Devonian sediments and ultrabasics, intruded by the Upper Devonian Meredith Granite. Renison Limited has been conducting exploration for endo- and exo-granitic primary Sn - W deposits in the region since November 1977.

This report details work undertaken during 1979/80 and proposals for further work are outlined.

2. LICENCE TENURE

Renison Limited is the holder of E.L. 17/77, renewed to 8th March 1981.

During the year, a 15 square kilometre area in the south of the Licence (vicinity of Merton Hill and the Huskisson River) was transferred from E.L. 17/77 to E.L. 2/63. The latter is subject to a joint venture agreement between certain Aberfoyle Group companies, Consolidated Gold Fields (Australia) Limited and Renison Limited.

3. EXPENDITURE

During 1979/80, $68,085 were expended on exploration activities. Costs incurred on the Merton Hill area are included in E.L. 2/63 expenditure.

To date, a total of $137,381 has been expended on E.L. 17/77 comprising:

1978	$12,187
1979	$57,109
1980	$68,085

Itemised expenditure is presented in Appendix 1.

4. PREVIOUS WORK

The reader is referred to Schellekens (1978) for a summary of work completed by other parties. Since the granting of E.L. 17/77, Renison Limited has undertaken:

(a) an airborne input E.M., magnetic survey of the area (Butt, 1978)

(b) photogeological interpretation of the Meredith Granite and surrounding area (Boshier, 1979)

(c) establishment of 9 kilometres of four-wheel-drive track into the Harman River area

Results of these programmes have been reported by Renison Limited in 1978 and 1979.

5. WORK COMPLETED IN 1979/80

Work has been directed towards ground evaluation of the granite contact zone between Parson's Hood and Mt Ramsay. This zone has some potential for the development of metasomatic replacement deposits in

(a) carbonate beds in Cambrian - Ordovician sediments,

(b) altered ultrabasic rocks,

(c) faults.

In addition, previous work indicated potential for tin in greisen zones within the granite such as at Tadpole Hill.

Due to the relative inaccessibility of much of the Licence area, detailed ground evaluation was restricted and therefore undertaken in only the Harman River area. In the period November 1979 to February 1980, approximately 26 line kilometres of cut grid line, 400 metres apart, were established.

Upon this grid, the following surveys were carried out:

(a) Geological Mapping. Coverage achieved in 1979/80 was incomplete. Personnel involved were D. Turvey (student geologist) and the writer. The assistance of A.V. Brown, Government Geologist, in areas south of the granite contact, is acknowledged.

(b) Geochemical Soil Sampling. Auger samples to bedrock or to auger limit (0.8m) were taken at 25 metre intervals by contractor, P. Ashton. Samples were oven dried, sieved and the minus 180 micron fraction submitted to the Renison Assay Laboratory. Determinations for Sn, As by X.R.F. and Cu, Pb, Zn by A.A.S. were made.

(c) Magnetics. Readings were taken at 25 metre intervals using a Geometrics G816 Proton Magnetometer, sensor height 2.6m, by contractor, P. Ashton.

(d) Induced Polarisation and Resistivity. The gradient array time domain method was used and carried out by contractor, Scintrex Pty Ltd. Details of the survey are reported in Appendix 2.

It should be noted that a similar programme of work was undertaken in an adjacent area in E.L. 2/63 to the south. The Harman River Grid consists of 12 lines, 400 metres apart numbered from 4N to 26N. Only data generated within E.L. 17/77 is discussed in this report. The remainder of the information is presented in

"E.L. 2/63, Mt Lindsay Area, Western Tasmania, Annual Report 1979/80" by A. Ross, Renison Limited, Unpubl. Report.

6. LOGISTICS

The style of exploration carried out in 1979/80 on the Harman River Grid represented a departure from logistics traditionally employed on remote exploration areas in the Pieman region.

Apart from track cutting of grid lines, all other work detailed in section 5 above was completed in the period from 14th January to 23rd February, 1980, and was supported totally by helicopter for the daily deployment of field crews.

A tabulation of production is presented below for the entire Harman River Grid (Table 1).

SURVEY TYPE	COVERAGE (LINE KM)	READINGS OR SAMPLES TAKEN	NUMBER OF PERSONNEL
Geochemical Soil Sampling	53	1918	3
Magnetics	52	2090	2
I.P.	48	2000	5
Geological Mapping	37		3

7. DATA PRESENTATION

Data from the Harman River Grid is presented at a scale of 1:5000 in plan and composite line profile form.

The N.E. to S.W. oriented grid is bisected by a common boundary of E.L. 17/77 and E.L. 2/63. Since this boundary is nearly coincident with standard 1:5000 sheet edges, most data for E.L. 17/77 is presented on Corinna D1/2 standard plans. Additional E.L. 17/77 data located on Corinna D1/4 is obtainable from the composite line profiles.

8. RESULTS

8.1. Geology (Fig. 2a)

The area under discussion lies at the northern extremity of the western limit of the Huskisson Syncline. Here Cambrian to Ordovician ultrabasics and sediments are in contact with Devonian Granite. This contact is semi-circular in plan, strongly dissected by drainage and characterised by a dramatic contrast in topographic

levels between the higher relief of the granite and the lower relief of ultrabasic lithologies.

The main rock units distinguished during mapping are:

(a) Granite. The dominant lithology is a coarse to medium grained biotite granite. Minor fine grained phases are also evident. Local minor metasomatic/hydrothermal alteration is noted on the plans and sections with the more significant areas of alteration occurring in the Tadpole Hill area.

(b) Ultrabasic rocks of the Websterite Hill Complex. Lithologies include an undifferentiated suite of serpentinites, dunites, pyroxenites and minor gabbroic and basaltic rocks. Mapping by A.V. Brown suggests a basal dunite rich sequence exists to the west and is overlain by a pyroxenite rich sequence in the central ultrabasic area.

(c) Siluro-Ordovician Sediments. Immediately overlying the ultrabasics is a sequence of limestones and quartzites in the section along the Little Wilson River (Corinna D1/4). Thus, on Corinna D1/2, Gordon Limestone is inferred in the granite embayment on Line 16E.

Residual soils are developed throughout the area, except in the swamp flats about the Harman River, and on a ridge in the central ultrabasic lithologies where no soil profile is developed.

8.2. Geochemistry (Fig. 2b - 2f)

The soil geochemical responses are discussed in relation to the main geological units.

8.2.1. Tin (Fig. 2b)

(a) Granite

Features which may be related to primary mineralisation are:

- A 500m wide zone on Line 26N, 9W to 14W with values greater than 25ppm, which can be traced to Line 24N, 11W to 12W. The highest values are encountered downhill from shallow abandoned workings on Tadpole Hill, in an area mapped as coarse grained granite.

- A 300m wide zone on Line 24N, 14.5W to 17.5W, associated with alteration in coarse grained granite.

- A 150m wide zone on Line 22N, 7.5W to 9W, associated with coarse grained granite.

- An inferred zone of fine grained granite (perhaps a stanniferous younger intrusion) from 26N, 5W, through 24N, 4W, to 22N, 6W is not associated with significant tin values.

- A 200m wide zone on Line 22N, 16.8E to 18.8E is associated with fine grained granite.

- A 100m wide zone on Line 18N, 22.5E to 23.5E is associated with coarse grained granite.

- On Line 26N, 1.5W to 2W is associated with coarse grained granite.

Other tin values approach the limit of detection or are of minor interest, and best explained by alluvial concentration of tin. These are not extensive.

(b) Ultrabasics

- A zone of patchy values on Line 22N, 14E to 16E, Line 20N, 17E to 19E, may be attributable to alluvial concentration.

- Values encountered on Line 22N, 11E and Line 20N, 14E may be worth investigating due to the close proximity of mapped fine grained granite dykes.

- A zone on Line 20N, 2E to 4E, and close to mapped fine grained granite dykes, extends to Line 18N. May be result of alluvial contaimination.

(c) Siluro-Ordovician Sediments

A zone on Line 16N, 19E to 21E, which is developed in a non-granitic soil, may be related to potential tin mineralisation developed in limestone or altered ultrabasics.

8.2.2. Arsenic (Fig. 2c)

The majority of responses approach the detection limit in granitic and ultrabasic derived soils. Zones of interest are:

(a) Granite

- Tadpole Hill Zone. Encountered on Lines 26N, 10.5W to 13W, with weaker responses on Line 24N, 11W, and Line 22N, 10.5W.

- Line 24N, 16W to 18W.

- Line 18N, 15E to 17.5E.

(b) Ultrabasics

- Line 22N, 8W to 9W.

- Line 22N, 6E (one point anomaly).

(c) Siluro-Ordovician Sediments

- Line 16N, 19.5E to 20.25E.

8.2.3. Copper (Fig. 2d)

Most values are close to detection limit.

(a) Granite. All responses less than 10ppm.

(b) Ultrabasics. One point anomalies located at Line 22N, 100W, and Line 18N, 15E.

(c) Siluro-Ordovician Sediments. Line 16N, 20E.

8.2.4. Lead (Fig. 2e)

Most values are less than 50ppm except the following responses.

(a) Granite. Tadpole Hill zone - patchy values associated with workings. Also Line 24N, 9E and 11E.

(b) Ultrabasics. One point anomalies at 00 and 2W.

8.2.5. Zinc (Fig. 2f)

(a) Granite. Values are low; no significant features.

(b) Ultrabasics. Higher background values with values of interest above 200ppm, which occur in two main areas;

- Line 22N, 00 to 1.5W; Line 20N, 2W to 3W (swamp).
- Line 22N, 5W to 6.5W; Line 20N, 7E to 10E.

Also,

- Line 20N, 14.5E
- Line 16N, 20E.

8.3. Magnetics (Fig. 2g)

The responses are reflective of the main lithological units. For example,

(a) Granite. Magnetically inert, including the geochemically anomalous Tadpole Hill area.

(b) Ultrabasics. The lower dunite rich zone exerts a lower magnetic response than the pyroxenite rich sequence to the west.

(c) The anomaly at 16N 19E is coincident with anomalous soils responses and is associated with carbonate lithologies, either altered ultrabasics or limestone.

8.4. Induced Polarisation and Resistivity (Fig. 2h, i, j)

The reader is referred to Appendix 2 for details. Further brief comments follow.

The survey revealed four areas of anomalous responses, designated A, B, E, and F. Zone A is the more extensive being discernible on three lines and is related to the geochemically anomalous zone at Tadpole Hill. Zones B, E and F are enclosed within ultrabasic rocks adjacent to the granite contact.

9. CONCLUSIONS AND RECOMMENDATIONS

9.1. Harman River Grid

Reconnaissance surveys in 1979/80 have outlined certain anomalous zones which require further evaluation in 1980/81. Of prime interest is the Tadpole Hill area, where a group of shallow workings are associated with anomalous geochemical and geophysical responses over an apparent strike length of 600 metres. The zone is open to the north.

It is recommended that the Tadpole Hill Zone be further investigated by establishing 200m in-fill grid lines between Lines 22N and 26N and also by extra lines 27N, and 28N. Upon these lines, mapping and soil geochemical sampling is proposed.

Details of the proposed grid are:

(i) Baseline. Commencing at Line 26N, 12W. South to Line 22N. North for 400m. Total 1200 metres.

(ii) Cut Lines. Numbered 23N, 25N, 27N, 28N and extending 500 metres either side of the new baseline. Total 4000 metres.

(iii) Total grid would thus be 5.2 kilometres.

In addition, the anomalous zones discussed in sections 8.2. and 8.4. should be evaluated by a combination of line mapping and geochemical magnetics resampling where necessary.

All the above work should be completed during January - February 1981, dependent upon helicopter availability and contract field crews.

9.2. Huskisson Syncline Area

A large area is underlain by sediments and ultrabasics of the Huskisson Syncline, which are prospective for Devonian metasomatic replacement deposits. However, much of this area is poorly accessed.

At this stage there are few areas which are of sufficient interest to warrant the establishment of cut grid lines and detailed line geochemical and geophysical surveys. The establishment of road and camp facilities to service such grid line programmes would incur considerable expense.

Therefore, to gain some geological appreciation of and to outline areas worthy of more detailed work, a reconnaissance stream sediment sampling programme is proposed. It may be argued that much of the area has been covered by this work (e.g. Union Carbide, Comstaff, Pickands Mather), however, a review of previous surveys suggests that their sampling densities were too low to meaningfully explore a highly prospective area. For example, the outcropping stanniferous - sulphide mineralisation at Merton Hill was not detected by these stream sediment surveys.

An orientation stream sediment survey about the Merton Hill prospect has been recently carried out. Once the parameters (e.g. sieve fraction, sample density) are determined, then planning of a larger survey in E.L. 17/77 should commence.

Recommended scales for data compilation are 1:5000. The drainage map compiled by P. Boshier (Hunting Photogeology Study) is an excellent base for field plotting.

The more remote areas should be accessed by helicopter and fly camps during January and February 1981, followed by those areas adjacent to roads in the south of the

9.3. Meredith Granite Area

Much of the northern part of the Licence area is underlain by granite. It is also remote and access by helicopter is the only available method.

The style of mineralisation anticipated in this area is likely to be concealed and inert to geophysical detection methods. A photogeological study has been carried out but a comparison with other granitic areas suggests that aerial photographic lithological interpretation is rarely successful.

However, recognition of structural features in lineament analysis is regarded as a sound basis for delineation of target areas in these terrains.

It is recommended that forthcoming Landsat imagery be analysed in conjunction with the available photogeological structural maps over the coming year, to provide a basis for selection of target areas in 1981/82. Such target areas should be prospected by stream sediment surveys.

If this approach is not successful in defining structurally anomalous areas, then thought should be given to reducing the area of E.L. 17/77 in 1981/82.

10. PROPOSED EXPENDITURE

A budget of $68,915 is proposed for these activities in 1980/81. Expenditure breakdown is as follows:

Harman River Grid - evaluation of line anomalies - establishment of Tadpole Hill grid and related surveys	$12,000
Reconnaissance Stream Sediment Survey	$40,915
Meredith Granite Interpreation	$1,000
Salaries	$15,000
	$68,915

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RENISON LIMITED
GEOLOGY DEPARTMENT

020024

EL17/77 WILSON RIVER AREA RESPONSIBILITY 069 P/E 24/ 6/80

ACCOUNT NUMBER	ACCOUNT NAME	PERIOD TO DATE ACTUAL	PERIOD TO DATE VARIANCE	YEAR TO DATE ACTUAL	YEAR TO DATE VARIANCE
010690702	SALARIES	408	131 L	9064	3869 G
010690703	SALARY LOADING	62	62 L	15-	1075 G
010690705	CONSUMABLES	54	225 G	1163	11408 G
010690708	VEHICLES			1116	1116 L
010690710	TRAVEL & ACCOMMODATION			2757	2757 L
010690720	RENISON SERVICES - SURVEY			768	2511 G
010690721	RENISON SERVICES - ASSAY			4080	6863 G
010690722	RENISON SERVICES - RESEARCH			120	120 L
010690723	RENISON SERVICES - OTHER				
010690730	OUTSIDE SERVICES - GEOLOGICAL			394	394 L
010690731	OUTSIDE SERVICES - GEOPHYSICAL	10824	10824 L	12306	10656 L
010690732	OUTSIDE SERVICES - GEOCHEMICAL			4365	2715 L
010690733	OUTSIDE SERVICES - TRK CUTTING			9789	44437 G
010690735	OUTSIDE SERVICES -SITE ACC DEV			1000	1000 L
010690736	OUTSIDE SERVICES-DIAMOND DRLNG				
010690737	OUTSIDE SERVICES - OTHER			20643	20643 L
010690740	LEASE PAYMENTS			534	534 L
	ROUNDING			2	1 L
0106999999	TOTAL EL17/77 WILSON RIVER	11348	10792 L	68085	30227 G

Appendix 2

020025

A REPORT ON

GRADIENT ARRAY EIP RECONNAISSANCE SURVEY

OVER THE HARMAN RIVER GRID, E.L.17/77

NEAR ZEEHAN, TASMANIA

ON BEHALF OF

RENISON LIMITED

BY

A.W. HOWLAND-ROSE

MSC.DIC.AMAUSIMM.FGS.

GEOPHYSICIST

SCINTREX PTY.LTD.

SYDNEY, N.S.W.

JUNE 1980

TAS-074E

SUMMARY

Over the 48 kilometres of grid covered by the gradient array electrical induced polarization survey at Harman River, some seven areas of anomalous induced polarization have been located which have been designated zones A to G.

A realistic assessment of the economic merit of the anomalous induced polarization can only be made when additional geo-parameters such as magnetic field, geochemistry and detailed geology are considered.

N.B. This report deals with data acquired in the Wilson River exploration licence (17/77) only. Comments and data relative to the adjoining Mt. Lindsay exploration licence (2/63) are not included in this report.

INTRODUCTION

At the request of Mr. L.A. Newnham, Chief Geologist for Renison Limited, Scintrex Pty. Ltd. carried out a gradient array reconnaissance survey over the Harman River grid.

The survey was undertaken over some 19¼ double and 6½ single operator days between 14th January and 23rd February 1980. The crew leader was Scintrex senior operator Mr. B. Ekstrom assisted by Mr. M. Joseph, B.Sc. (second operator) and field hands A.Hudson and I. Newby and operator P. List.

Organisation and field supervision was undertaken by Mr. A. Ross, Senior Exploration Geologist for Renison, while the author visited the area during the course of the survey.

This survey was one of the few carried out in Tasmania which was wholly helicopter supported. The crew was lifted in and out of the area daily, and the heavy 10/15 kilowatt motor generator was moved from set-up to set-up by helicopter. The use of the helicopter and the minimal travelling time undoubtedly led to the excellent production achieved on the survey.

In all, about 2000 stations were read from 10 gradient array set-ups involving some 48 kilometres of line. Very limited moving source follow-up was carried out also.

METHOD

Brief comments on the method are appended to this report.

EQUIPMENT AND OPERATION

A Scintrex 10/15 kilowatt transmitter was employed to energise the large gradient array spreads employed in the reconnaissance survey. The currents employed ranged between 3.5 to 5 amps at high voltages. The minimum output voltage required to achieve good data was employed due to possible leakage from the energising cables.

The energising pulse employed was a two second on, two second off, reverse and repeat square wave. The reading programme consisted of a 2 second programme read on a single slice under the decay curve, with three slices being taken at regular intervals and in areas of particular interest.

The current dipoles employed are as set out below:-

2400W and 2100E on 24N
200W and 3000E on 18N
2400W and 3000E on 18N
2500W and 700E on 12N
300W and 2900E on 12N
3400W and 200W on 6N
1000W and 2200E on 6N
2100W and 500W on 6N
100E and 1000E on 20N

As can be seen the current dipole ranged from 3.2 kilometres to 5.4 kilometres with a 1.6 kilometres dipole being employed to read sections of lines 4N, 6N and 8N where extremely low current densities were encountered. The potential dipole employed was 25 metres, read at 25 metre intervals with closer spacings being taken over particularly sharp changes in chargeability or resistivity.

DATA PRESENTATION

The gradient array data has been contoured on the standard 1:5000 Renison survey sheet D1/2 of the Corinna sheet.

Profiles are presented on the standard Renison 1:5000 composite line profiles.

DISCUSSION OF RESULTS

The data is first discussed in terms of the significant anomalous induced polarization areas, and then in terms of overall form.

The comments made refer wholly to the geophysical data as such. Those chargeable horizons which show very low resistivities, high chargeabilities and slow decay forms are considered to be the most significant based on the argument that the classic pyrrhotite-tin veins show this type of response. As with all geophysical data the real merit of any anomaly depends on the correlation of the geophysical data with geochemistry, geology, and in this case, additional geophysical information such as magnetic field data.

Significant Anomalies

These are reviewed by region, generally from north to south. Each anomaly is identified alphabetically on both profiles and on the contour interpretation of the data.

ZONE 'A'

Line 26N ... A broad increase in the chargeability from backgrounds of about 12 millivolts/volt ±2 millivolts/volt in the west and 6 millivolts/volt ±3 millivolts/volt in the east was noted between about 1125W and 1325W. Two specific maxima of 16 millivolts/volt were recorded at 1238W and 1325W. Two specific maxima of 16 millivolts/volt were recorded at 1238W and 1188W. There is no significant change in the observed apparent resistivity of 3500 ohm-metres, thus the source is disseminated in nature, and a gradual build-up from zero against background to the maximum value makes a judgement of the maximum depth to source difficult. On anomaly form this is estimated at 100 metres which is certainly excessive. Over the maximum the decay form is slow (Mn=+5%), inferring a coarse grained source.

Line 24N ... On line 24N some 400 metres south of 26N, a sharp, distinct anomaly of 24 millivolts/volt above the 4 millivolts/volt background to the west and 18 millivolts/volt on the 8 millivolts/volt background to the east was recorded. On this line the anomaly has a shallow depth to source of no greater than 40 metres, with two quite distinct sources inferred at 1312W and 1350W. Again high 3000 ohm-metres resistivities were recorded which show little if any change from background. While the chargeability response is significantly narrower than on line 26N, lesser responses of 10 millivolts/volt and 8 millivolts/volt at 1250W and 1150W may be 'fishtail' effects from the same body. The decay form is again slow at +6%, inferring slightly coarser than normal grain size for the causative material.

On Line 22N no significant responses were recorded, however, slightly higher than background (4 millivolts/volt) values of 8 to 10 millivolts/volt between about 1125W and 1200W may? represent the southern strike extension of Zone A.

ZONE 'B'

A single line anomaly centred at about 940W on line 20N of about 24 millivolts/volt above the average background of 10 millivolts/volt is accompanied by a distinct increase in resistivity from the 1000 ohm-metres background to 3000 ohm-metres. The source is interpreted as being narrow, certainly less than 20 metres wide, and has a maximum depth to source of

20 metres (perhaps less, the potential dipole being the limit of resolution for depth). The decay form at 967W is normal, while the decay form within the maximum chargeability value is about +4.5%, inferring a slightly coarser than normal grain size to the source.

ZONE 'E'

A significant series of moderate chargeability highs was located on line 22N with no clear correlation on either lines 24N or 20N.

'E1' was seen as a 22 millivolts/volt response over a 6 millivolts/volt background centred at 270W with no appreciable change in the background resistivity of 1000 ohm-metres ($\pm$). A second relatively minor source was inferred as a shoulder at 225W. The source(s) therefore are inferred to be at 270W (and 225W) and are inferred to be disseminated in origin. Sub-zone 'E2' was seen as two maxima of 22 millivolts/volt and 18 millivolts/volt at 160W and 125W respectively. Again no appreciable change in resistivity infers a disseminated origin, while the curve shape infers a depth of the order of 30 metres ($\pm$). A single sharp 33 millivolts/volt maximum at 088W again with no distortion in the apparent resistivity, is designated zone 'E3'. The maximum depth is 15 metres and the source is a narrow near surface disseminated zone. The most easterly anomaly, sub-zone 'E4', was seen at 037W as a substantial 30 millivolts/volt above the 18 millivolts/volt background. No distortion in the resistivity again infers a wholly disseminated source. The maximum depth to source inferred is about 30 to 35 metres.

The decay forms measured over this zone indicate a normal decay over 'E4', 'E3'; a slightly slower decay over 'E2', and normal decays over 'E1'.

ZONE 'F'

A series of single line chargeability responses was defined on line 20N, and not seen definitely on the lines to the immediate north or south. In detail the two significant responses occur on an array overlap between #4 and#3. The western response was defined at 460E where a 23 millivolts/volt above background anomaly was defined from rocks whose apparent resistivities show no contrast with the less polarizable section. The absolute magnitude of the lower resistivity is about 300 ohm-metres, a fairly low level. The maximum depth to source is estimated at about 40 to 50 metres.

Maximum ('F2') defined on array #3 (which confirms 'F1' also) was seen as a 71 millivolts/volt maximum at 630E and a 76 millivolts/volt maximum at 590E. A slight decrease in apparent resistivity for the 600 to 750 ohm-metres background to 250 ohm-metres was noted centred within 'F2' at 600E, coincident with lower 58½ millivolts/ volt reading. The interpretation of the source is that weakly interconnected sulphides and/or graphite were defined from about 580E to 650E at a maximum depth of 30 metres.

The decay form within 'F1' and 'F2' is near normal (ΔMn = +3%).

COMMENTS ON THE ELECTRICAL PROPERTIES ARE THEY RELATE TO THE GEOLOGY AS KNOWN AT 23RD OCTOBER, 1979.

As remarked earlier the chargeability and resistivity data has been contoured on to Renison standard sheets for the area at the scale of 1:5000. These are shown in Plates 1 & 2. Also a summary of electrical properties map has been constructed which displays the salient characteristics of both contour interpretations.

Resistivity Data

The western margin of the area is defined by granite. The resistivity data records the granite Cambrian contact as a sharp change in resistivity of about tenfold. To the north of the grid, granites have been mapped between lines 22N and 24N, however, no significant contrast in resistivity has been noted to mark this granite/Cambrian boundary. The gradient array data shows only lower resistivities typical of the Cambrian sediments. This is an unexpected result and not easily explained. The north-eastern contact between the Cambrian/Ordovician sediments and the granite is again marked by a tenfold change in resistivity with the granite, as would be expected, being significantly more resistive.

The Cambrian Ordovician sediments enclosed by the granites appear to have a distinct trend about normal to the grid lines which appears valid notwithstanding the 400 metres interline spacing. This is particularly true of the alternations of resistive (3000 ohm-metres+) and conductive (700 ohm-metres-) units seen between the access road and the eastern granite contact. A number of distinct resistive 'marker' horizons can be

identified which are considered 'real' features and not a function of the line spacing. These occur as narrow features in the west and as much wider features in the east. These features have been marked on the electrical property summary map (plate 3).

From the resistivity data only the granite unit on the east and west flanks of the area are distinctly seen. The northern margin is not seen distinctly, nor are the boundaries of the Cambrian Crimson Creek, Cambrian Ultrabasic or Ordovician or Silurian sediments of the eastern section clearly delineated in terms of resistivity alone.

Chargeability Data

The bulk of the area has a chargeability background in the range 10 to 20 millivolts/volt. Against this low background a number of linear induced polarization anomalies such as zones 'A' and 'B' were located.

In summary, the electrical properties of chargeability and resistivity while showing an overall similarity with the known geology, also show a number of marked contrasts with it.

CONCLUSIONS

1. The most significant induced polarization responses are summarised by zone below.

ZONE 'A'

An increase of 14 to 16 millivolts/volt above background culminating in two distinct maxima at 1188W and 1240W on line 26N, and a more resistive maximum of 24 millivolts/volt at 1312W and 1350W on line 24N, have been designated zone 'A'. The maximum depth to source on line 26N is 100 metres (but is certainly excessive), while on line 24N the maximum depth to source is 40 metres. The resistivities are a high 3500 ohm-metres which clearly infers the source to be disseminated in nature. If anything, slight increases were observed which would indicate the host to the chargeable material is more resistive than the enclosing rocks. The decay form on line 24N shows a slightly slower than normal decay form ($\Delta Mn = +6\%$),

inferring a coarser than normal grain size to the chargeable material. On line 26N the decay form is similarly slow (ΔMn = +5%).

ZONE 'B'

A single 24 millivolts/volt above the average 6 millivolts/volt level was recorded on line 20N at 940W. A coincidental threefold increase in the apparent resistivity to 3000 ohm-metres clearly infers the host to the mineralisation to be resistive relative to the enclosing rocks. The maximum depth to source is less than 20 metres. This response cannot be identified on either line 18N or 22N.

ZONE 'E'

A series of 20 millivolts/volt ($\pm$) responses was defined on line 22N between 0 and 300W at 270W and 225W (E1), 125W and 160W (E2),090W (E3) and 037W(E4). None show any distortion in the resistivity and have normal to near normal decay forms. The interpreted sources range from 15 metres (E3) to 35 metres (E1). The source is disseminated sulphide or graphite of average grain size.

ZONE 'F'

Two chargeability maxima of 24 millivolts/volt (F1), 71 millivolts/volt (F2) and 76 millivolts/volt (F2) above background were noted at 450E, 630E and 590E on line 20N. The accompanying apparent resistivities are low, but only F2 shows any depression in this level. The decay form is near normal (ΔMn = +3%). The interpreted source is disseminated sulphides and/or graphite at a depth of 30 to 40 metres.

2. The limited pole-dipole detail carried out on lines 26N and 20N added little to the data derived from the gradient array survey.

3. The geophysical data will require careful study in conjunction with the magnetic field data, revised geology, and geochemistry before the significance of this work can be assessed.

033

APPENDIX 3

020034

ROCK SPECIMENS COLLECTED BY A.V. BROWN

HARMAN RIVER AREA

No.	Name
562	Serpentinised pyroxenite } metaserpentinite
563	Serpentinised pyroxenite }
564	Medium to coarse grained non-porphyritic granite
565	Serpentinised pyroxenite
566	Serpentinised pyroxenite
567	Serpentinised pyroxenite
568	Serpentinised dunite
569	Harzburgite
570	Orthopyroxenite
571	Orthopyroxenite
572	Granite
573	Undifferentiated ultrabasic
574	Undifferentiated ultrabasic
575	Undifferentiated ultrabasic
577	Serpentinised dunite
578	Serpentinised dunite
579	Serpentinised dunite
580	Serpentinised dunite
581	Dunite
582	Quartz feldspar porphyry
583	Metaperidotite
584	Silicified ultramafic
585	Metadunite
586	Metaperidotite
588	Serpentinised dunite
589	Harzburgite
590	Harzburgite
591	Pyroxenite
592	Metaperidotite
593	Pyroxenite
594	Undifferentitated ultrabasic
595	Pyroxenite
596	Gabbro and harzburgite
597	Pyroxene bearing dunite
598	Pyroxene bearing dunite
599	Pyroxene bearing dunite

No.	Name
600	Dunite
601	Medium grained biotite granite
602	Pyroxenite
603	Metaperidotite
604	Metaperidotite
605	Metapyroxenite
606	Metapyroxenite
607	Pyroxenite
609	Meta-serpentinised pyroxenite (fibrous amphibole)
610	Metadunite
611	Contact hybrid zone
612	Carbonate
623	Quartzite
627	Quartzite; sulphide mineralisation nearby.
628	Quartzite
629	Quartzite
630	Quartzite
631	Carbonate
632	Carbonate
633	Quartzite
634	Altered basaltic lava
635	Altered basaltic lava
636	Altered basaltic lava
637	Quartzite
638	Quartzite
639	Quartzite
640	Altered gabbro
641	Altered gabbro
642	Hybrid ultramafic
643	Serpentinite
644	Gabbro
645	Pyroxenite
646	Coarse grained biotite granite
647	Hornfelsed metasediment
648	Gabbro
649	Undifferentiated serpentinite
650	Hornfels
651	Silicified ultramafic
652	Dunite
653	Gabbro

No.	Name
654	Metaperidotite
655	Metaperidotite
656	Fine grainted gabbro
657	?
658	Gabbro
659	Meta-ultramafic
660	Serpentinised dunite
661	Undifferentiated serpentinite
662	Dunite
663	Dunite
664	Serpentinised dunite
665	Pyroxene bearing dunite
666	Dunite
667	Dunite
716	Metaperidotite
717	Metaperidotite
718	Serpentinite
719	Metaserpentinite
720	Deformed websterite
721	Deformed websterite
722	Altered websterite
723	Serpentinised dunite
724	Gabbro
725	Gabbro
726	Gabbro
727	Gabbro
745	Undifferentiated serpentinite
746	Carbonate
747	Quartzite
748	Meta-ultrabasic
749	Metaserpentinite

3149
Harman River area
RENISON LTD.
E.L. 17/77
RENISON LTD.
E.L. 18/73
ABERFOYLE
E.L. 2/63
E.L. 17/77
area 2
RENISON LTD.
E.L. 42/71
Renison Bell
Renison Mine Complex
RENISON LTD.
E.L. 42/71
RENISON LTD.
E.L. 11/76
Federation area
MT. LYELL MG. & RLY. Co. Ltd.
S.P.L. 129
Corinna
Pieman River
Rosebery
Tullah
Murchison
Granville Harbour
Trial Harbour
Remine
Zeehan
Mt. Heemskirk
Mt. Agnew
Mt. Zeehan
Mt. Dundas
St. Dizier
Henty River
SOUTHERN OCEAN
TASMANIA
BURNIE
LAUNCESTON
HOBART
TULLAH
ROSEBERY
RENISON
ZEEHAN
020037
Permian + younger
Silurian + Devonian Sediments
Ordovician Sediments
Cambrian Sediments + Volcanics
Precambrian Units
Cambrian Basic + Ultrabasic Intrusives
Devonian Granite Intrusives
Traverse Line Systems
RENISON LIMITED
LOCALITY MAP
GEOLOGIST :
DRAUGHTSMAN : F. A. Colson
DATE :
REVISIONS :
SCALE 1:50,000 METRES
MAP 1:1,000,000
3149
DRAWING No.
FIG. 1
5 cm
80-1506

E.L. 17/77

TADDLE HILL
Old workings

52256

52259

52165

Helipad
Walking track
Grid line, 100m pegs
Sample location (A.Brown)
Survey control station

Mapping by A.Ross, A.Brown, P.Bashier, D.Turvey
Compiled by: A.Ross.

020035

REFERENCE

INTRUSIVES

DEVONIAN
- MERIDITH GRANITE
  - Coarse to medium grained biotite granite (Dg | Leston Hunting reference)
  - Fine grained muscovite - biotite granite (Dg 2) occasionally porphyritic
  - Microgranite (Dgm)
  - Alteration - tourmaline, chlorite

CAMBRIAN
- HEBBERTS HILL COMPLEX
  - Ultrabasic rocks (€k)
  - Silicification (alteration)

SEDIMENTS

CAMBRIAN
- CRIMSON CREEK FORMATION (€c) Hornfelsed volcaniclastic sediments, minor gabbro.

ORDOVICIAN
- GORDON LIMESTONE (Og) Grey massive limestone

SILURIAN
- CROTTY QUARTZITE (Sc) Quartzite and undifferentiated sediments

TERTIARY
- Ironstone, laterite scree developed on ultrabasics (Ts)

QUATERNARY
- Recent alluvium (Qra)

RENISON LIMITED

CORINNA D1/2

GEOLOGY

GEOLOGIST	A. Ross
DRAUGHTSMAN	TODS
DATE	September 1980
REVISIONS	

SCALE 1:5000 METRES (100 0 100 200)

DRAWING No FIG. 2 (a)

30-1506 3150

3151

360 000 E
361 000 E
362 000 E
363 000 E
364 000 E

539 00000 N
5 390 000 N
5 389 000 N
5 388 000 N

LEGEND

>1000 ppm
500 - 1000 ppm
200 - 500 ppm
75 - 200 ppm
25 - 75 ppm
<25 ppm

2nd Line and 100m pegs
No soil sample

AMG NORTH

D3/4
D1/1
D1/2
D2/1
CORINNA D1
D1/3
D1/4

020039

RENISON LIMITED

CORINNA D1/2

SOIL GEOCHEMISTRY - TIN (ppm)

GEOLOGIST A ROSS	SCALE 1 5000 METRES
DRAUGHTSMAN F A COLSON	100 0 100 200
DATE APRIL 1980	
REVISIONS	5 cm
	DRAWING No Fig. 2 (b)

80-1506

3151

360 000 E
361 000 E
362 000 E
363 000 E
364 000 E
5390 00000 N
5 390 000 N
5 389 000 N
5 388 000 N
5 388 000 N
360 000 E
361 000 E
362 000 E
363 000 E
LEGEND
>150 ppm
50 - 150 ppm
10 - 50 ppm
<10 ppm
Grid Line and 100m pegs
- No soil sample
B3/4
D1/1
D1/2
D2/1
CORINNA D1
D1/3
D1/4
AMG NORTH
80-1506
3152
020040
RENISON LIMITED
CORINNA D1/2
SOIL GEOCHEMISTRY - ARSENIC (ppm)
GEOLOGIST A ROSS
DRAUGHTSMAN P COLSON
DATE MAY 1980
SCALE 1 5000 METRES
100 0 100 200
REVISIONS
5 cm
DRAWING No
Fg 2 (c)
80-1506
3152

360 000 E
361 000 E
362 000 E
363 000 E
364 000 E
539 00000 N
5 390 000 N
5 389 000 N
5 388 000 N
361 000 E
362 000 E
363 000 E
364 000 E
26
24
22
20
18
16
14
LEGEND
>100 ppm
80 - 100 ppm
60 - 80 ppm
<20 ppm
Grid Line and 100m pegs
- No soil samples
D3/4
D1/1
D1/2
D2/1
CORINNA D1
D1/3
D1/4
AMG NORTH
020041
3153
80-1506
RENISON LIMITED
CORINNA D1/2
SOIL GEOCHEMISTRY - COPPER (ppm)
GEOLOGIST A. ROSS
DRAUGHTSMAN F.A. COLSON
DATE APRIL 1980
REVISIONS
SCALE 1 5000 METRES
100 0 100 200
5 cm
DRAWING No
Fig 2 (d)
80-1506
3153

360 000 E

361 000 E

362 000 E

363 000 E

364 000 E

539 00000 N

538 000 N

5 389 000 N

5 388 000 N

26

24

22

20

18

16

14

LEGEND

>50 ppm

20 - 50 ppm

<20 ppm

Grid Line and 100 m pegs

- No soil sample

B3/4

D1/1 D1/2 D2/1

CORINNA D1

D1/3 D1/4

AMG NORTH

80-1506 3154

020042

RENISON LIMITED

CORINNA D1/2

SOIL GEOCHEMISTRY - LEAD

(ppm)

GEOLOGIST A ROSS

DRAUGHTSMAN F COLSON

DATE MAY 1980

REVISIONS

SCALE 1:5000 METRES

0 100 0 100 200

5 cm

DRAWING No. Fig 2(e)

3155

360 000 E
361 000 E
362 000 E
363 000 E
364 000 E

539 00000 N
5 390 000 N
5 389 000 N
5 388 000 N

LEGEND

>1100 ppm
500 - 1100 ppm
250 - 500 ppm
100 - 250 ppm
<100 ppm

Grid Line and 100m pegs
No soil sample

D3/4
D1/1 D1/2 D2/1
CORINNA 01
D1/3 D1/4

AMG NORTH

020643

RENISON LIMITED

CORINNA D1/2
SOIL GEOCHEMISTRY - ZINC
(ppm)

GEOLOGIST	A ROSE
DRAUGHTSMAN	F COLTON
DATE	MAY 1980
REVISIONS	

SCALE 1 5000 METRES
100 0 100 200
5 cm
DRAWING No
Fig 2 (f)

80-1506

3155

3156

360 000 E
361 000 E
362 000 E
363 000 E
364 000 E

539 00000 N
5 390 000 N
5 389 000 N
5 388 000 N

True North
Magnetic North
4°E

LEGEND

- >64000 GAMMAS
- 63500 – 64000
- 63000 – 63500
- 62500 – 63000
- 62000 – 62500
- <62000

D3/4
D1/1 D1/2 D2/1
CORINNA D1
D1/3 D1/4

020044

NOTE NEW + NOISY

RENISON LIMITED

CORINNA D1/2

PROTON MAGNETICS

GEOLOGIST	A ROSS	SCALE 1 5000 METRES
DRAUGHTSMAN	F COLDEN	100 0 100 200
DATE	JUNE 1980	
REVISIONS	5 cm	DRAWING No Fig 2 (3)

80-1506

3156

3157

360 000 E

361 000 E

362 000 E

363 000 E

364 000 E

539 00000 N

5390 000 N

5 389 000 N

5 388 000 N

ARRAY 1

ARRAY 2

ARRAY 3

ARRAY 4

Legend

ARRAY 1 - Electrodes at 2400W+2100E on 24N

3 - 200W+3000E on 18N

4 - 2400W+3000E on 18N

5 - 2500W+700E on 12N

6 - 3000W+2900E on 12N

7 - 3400W+200W on 6N

8 - 1000W+2200E on 6N

9 - 2100W+500W on 6N

10 - 100E+1000E on 20N

- <1000 OHM-METRES
- 1000-3000
- 3000-10000
- >10000

D1/1 D1/2 D2/1 D1/3 D1/4

CORINNA D1

AMG NORTH

SURVEYED & COMPILED BY SCINTREX

JAN. FEB 1980

Job N° TAS-074-E

RENISON LIMITED

020015 CORINNA D1/2

GRADIENT ARRAY EIP SURVEY

RESISTIVITY CONTOUR MAP

GEOLOGIST

DRAUGHTSMAN

DATE

REVISIONS

SCALE 1:5000 METRES

100 0 100 200

Fig 2 (h)

DRAWING No PLATE 2.

SHT 1 of 2.

5 cm

80-1506

3157

3158

350 000 E
360 000 E
370 000 E
380 000 E
390 000 E

539 00000 N
5 390 000 N
5 389 000 N
5 388 000 N
5 387 000 N
5 386 000 N

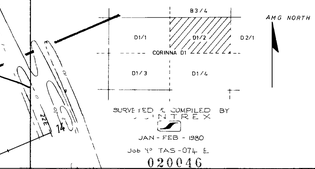
ARRAY 1
ARRAY 2
ARRAY 3
ARRAY 10

A
E
F

Legend

ARRAY 1 - Electrodes at 2400W+2100E on 24N
3 - 200W+3000E on 18N
4 - 2400W+3000E on 18N
5 - 2500W+700E on 12N
6 - 300W+2900E on 12N
7 - 3400W+200W on 6N
8 - 1000W+2200E on 6N
9 - 2100W+500W on 6N
10 - 100E+1000E on 20N

- >100 MILLIVOLTS PER VOLT
- 80-100
- 60-80
- 40-60
- 20-40
- <20



SURVEYED & COMPILED BY
JUNEX
JAN - FEB - 1980
Job No TAS-074-E
020046

RENISON LIMITED

CORINNA D1/2

GRADIENT ARRAY EIP SURVEY
CHARGEABILITY CONTOUR MAP

GEOLOGIST	SCALE 1 5000 METRES
DRAUGHTSMAN	100 0 100 200
DATE	
REVISIONS	DRAWING No PLATE 1 Sht 1 of 2

5 cm

Fig 2 (1)

80-1506

3158

3159

360 000 E

362 000 E

364 000 E

366 000 E

368 000 E

539 00000 N

5 390 000 N

5 389 000 N

5 388 000 N

5 387 000 N

Legend

- Chargeability high
- Major areas of high induced polarization
- less resistive / resistive
- resistive axes
- conductive axes
- conductive areas

A

E

F

D1/1

SURVEYED & COMPILED BY
SCINTREX
JAN FEB 1980
Job N° TAS-076-E

020017

RENISON LIMITED

CORINNA D1/2
GRADIENT ARRAY EIP SURVEY
INTERPRETATION PLAN

5 cm

Fig 2 (j) PLATE 3 SHT 1 of 2

80-1506 3159

3160

Geochemistry
PPM

I P Data
CHARGEABILITY IN MILLIVOLTS/VOLT (——)
RESISTIVITY IN Ohm-METRES (----)

NOTE REDUCED SCALE
C6 C7 C8 C9
ZONE 'C'

Total Magnetic Field (γ)
SCALE
COARSE
FINE

Topography & Geology
HEIGHT ABOVE SEA LEVEL (METRES)

SCRUBBY CREEK
SCRUBBY CREEK SANDRA CREEK
CREEK
ROAD
POLTOCK CREEK
LITTLE WILSON RIVER

02004S

RENISON LIMITED

HARMAN RIVER GRID
LINE 14
EL 2/63 EL 17/77

SCALE 1 5000 METRES

DRAWN	A ROST
TRACED	F COLLINS
DATE	July 1980
SCALE	1 5000
DRAWING No	HRG 306

I.P. DATA
Gradient Arrays 5 & 6
Current Dipoles located at
12N 2800W 700E (Array 5)
12N 300W 2900E (Array 6)
—— Chargeability
---- Resistivity

MAGNETICS
5000 Scale
1000 Scale
* Erratic magnetometer reading

GEOCHEMISTRY
Sn
Cu
Pb
Zn
As

GEOLOGY (Mapping by A Brown 1974 to 21E with additional data from P Ashton) (6004) Rock chip sample location (A Brown)

DEVONIAN
INTRUSIVES
MERRITH GRANITE
(+) Coarse to medium grained biotite granite (Dg) Lawton Hunting reference)
(+ +) Fine grained muscovite biotite granite (Dg 2) occasionally porphyritic
(x x x) Microgranite (Dgm)
Alteration tourmaline chlorite

CAMBRIAN
WEBSTERITE HILL COMPLEX
Ultrabasic rocks (Cb)
Silicification (alteration)

CAMBRIAN
SEDIMENTS
CRIMSON CREEK FORMATION (Cc)
Variably interbedded metasediments minor gabbro

ORDOVICIAN
GORDON LIMESTONE (Og)
Grey massive limestone

SILURIAN
CROTTY QUARTZITE (Sc)
Quartzite and undifferentiated sediments

TERTIARY
Ironstone laterite scree developed on ultrabasics (Ts)

QUATERNARY
Recent alluvium (Qra)

EL 2/63 | EL 17/77

80-1506 Fig 3 (a) 3160

3161

Geochemistry PPM

I P Data (CHARGEABILITY IN MILLIVOLTS/VOLT (——) RESISTIVITY IN Ohm-METRES (- - - -))

NOTE REDUCED SCALE

ZONE 'C'

Total Magnetic Field (γ) COARSE SCALE

Topography & Geology HEIGHT ABOVE SEA LEVEL (METRES)

020049

EL 2/63 | EL 17/77

RENISON LIMITED	DRAWN: A ROFF
HARMAN RIVER GRID	TRACED: P CALDER
LINE 16	DATE: July 1980
EL 2/63 EL 17/77	SCALE: 1 5000
SCALE 1 5000 METRES	DRAWING No. HRG 307

I P DATA

Gradient Array: S & K

Current dipole lengths of: 100 ft (30.5m) n=1 to 6; 150 ft (45.7m) n=1 to 4; 200 ft (61.0m) n=1 to 3

Chargeability

Resistivity

MAGNETICS

5000 Scale

1000 Scale

Erratic magnetometer reading

GEOCHEMISTRY

Sn

Cu

Pb

Zn

As

GEOLOGY (Mapping by A Ross Jan 1980 27 SH to 29 SE) 1606 Rock chip sample location (A BROWN)

DEVONIAN

INTRUSIVES

MERRITH GRANITE

Coarse to medium grained biotite granite (Dg1 Leston Hunting reference)

Fine grained muscovite biotite granite (Dg2) occasionally porphyritic

Microgranite (Dgm)

Alteration tourmaline chlorite

CAMBRIAN

WEBSTERITE ULTRA BASIC COMPLEX

Ultrabasic rocks (€b)

Silicification (alteration)

CAMBRIAN

SEDIMENTS

DRAGON CREEK FORMATION (€c) Mottled siltstone/clastic sediments minor gabbro

ORDOVICIAN

GORDON LIMESTONE (Og) Grey massive limestone

SILURIAN

CROTTY QUARTZITE (Sc) Quartzite and unidentified sediments

TERTIARY

Ironstone laterite scree developed on ultrabasics (Ts)

QUATERNARY

Recent alluvium (Qra)

80-1506 3161 Fig 3 (b)

3162

← EL 2/63 | EL 17/77 →

RENISON LIMITED	DRAWN	A ROSS
HARMAN RIVER GRID LINE 18 EL 2/63 EL 17/77	TRACED	F COLSON
	DATE	APRIL 80
	SCALE	1 5000
SCALE 1 5000 METRES (100 0 100 200 300)	DRAWING No	HRG 308

I P DATA

Gradient Arrays 3 & 4
Current dipoles located at
18N 200W 3000E (Array 3)
18N 2400W 3000E (Array 4)
—— Chargeability
---- Resistivity

MAGNETICS

5000 Scale
1000 Scale
* Erratic magnetometer reading

GEOCHEMISTRY

Sn
Cu
Pb
Zn
As

GEOLOGY (Mapping by D Turvey Jan 1980 00 to 27E only, no line mapping available from 00 to 24W, although limited data from P Ashton) * Rock chip sample location (D.Turvey) 604 (A Brown)

DEVONIAN — MEREDITH GRANITE

INTRUSIVES
- Coarse to medium grained biotite granite (Dg1 Loxton Hunting reference)
- Fine grained muscovite biotite granite (Dg2) occassionally porphyritic
- Microgranite (Dgm)
- Alteration tourmaline chlorite

CAMBRIAN — WEBSTERITE HILL COMPLEX
- Ultrabasic rocks (€s)
- Silicification (alteration)

SEDIMENTS

CAMBRIAN — CRIMSON CREEK FORMATION (€c) Hornfelsed volcaniclastic sediments minor gabbro

ORDOVICIAN — GORDON LIMESTONE (Og) Grey massive limestone

SILURIAN — CROTTY QUARTZITE (Sc) Quartzite and undifferentiated sediments

TERTIARY — Ironstone laterite scree developed on ultrabasics (Ts)

QUATERNARY — Recent alluvium (Qra)

80-1506

Fig 3 (c) 3162

5 cm

Geochemistry

PPM

I P Data

CHARGEABILITY IN MILLIVOLTS/VOLT (——)

RESISTIVITY IN Ohm - METRES (----)

Total Magnetic Field (δ)

SCALE: COARSE

Topography & Geology

HEIGHT ABOVE SEA LEVEL - (METRES)

020051

F1

F2

B

PAILS RIVULET

HARMAN RIVER

ROAD

highly altered ultramafic with hematite

light green highly altered ultramafic

LITTLE WILSON RIVER

CREEK

pyrite

numerous fine grained dykes

5 cm

EL 2/63 | EL 17/77

GEOLOGY (mapping by D Turvey Jan 1980 00 to 26E only A Brown 00 to 8.25W contact 1175W observed by P Ashton) * Rock chip sample location (D Turvey) [RG6] (A Brown)

DEVONIAN
- MERDITH GRANITE
  - Coarse to medium grained biotite granite (Dg1 Lawton Hunting reference)
  - Fine grained muscovite biotite granite (Dg2) occasionally porphyritic
  - Microgranite (Dgm)
  - Alteration tourmaline chlorite

INTRUSIVES

CAMBRIAN
- WEBSTERITE ROSA COMPLEX
  - Ultrabasic rocks (€u)
  - Silicification (alteration)

CAMBRIAN
- SEDIMENTS
  - CRIMSON CREEK FORMATION (€c) Micaceous, chloritic sediments minor gabbro

ORDOVICIAN
- GORDON LIMESTONE (Og) Grey massive limestone

SILURIAN
- CROTTY QUARTZITE (Sc) Quartzite and undifferentiated sediments

TERTIARY
- Ironstone lateritic scree developed on ultrabasics (Ts)

QUATERNARY
- Recent alluvium (Qra)

IP DATA

Gradient Arrays 3 & 3/0

Current dipoles located at
18N 2200W 3000E (Array 3)
18N 3400W 3000E (Array 3/0)
20N 1000E 1000E (Array 10)

—— Chargeability
---- Resistivity

MAGNETICS

5000 Scale

1000 Scale

* Erratic magnetometer reading

GEOCHEMISTRY

Sn
Cu
Pb
Zn
As

RENISON LIMITED	
HARMAN RIVER GRID	
LINE 20	
EL 2/63 EL 17/77	
SCALE 1 5000 METRES	
DRAWN	A ROSS
TRACED	F COLSON
DATE	APRIL 80
SCALE	1 5000
DRAWING No	HRG 309 FIG 3(d)

80-1506

3163

Geochemistry
PPM
1000
800
500
200
150
100
50
10
No Sample
No Soil
No Assay
20W
15W
10W
5W
0
5E
10E
15E
20E

I P Data
CHARGEABILITY IN MILLIVOLTS/VOLT (——)
RESISTIVITY IN Ohm - METRES (----)
24
20
16
12
8
4
0
40000
5000
1000
500
300
A?
E1
E2
E3
E4
NR

Total Magnetic Field (X)
65000
64000
63000
62000
61000
60 000
COARSE SCALE

Topography & Geology
HEIGHT ABOVE SEA LEVEL - (METRES)
800
600
400
200
0
CREEK
possible ultrabasic pod
fine grained gneiss
HARMAN RIVER
LITTLE WILSON RIVER
coarse granite alluvium in creek
578
574
572
571
570.4
569
568
567
565

020052

RENISON LIMITED

HARMAN RIVER GRID
LINE 22`
E L 17177

SCALE 1 5000 METRES
100 0 100 200 300

DRAWN	A ROSS
TRACED	F COLSON
DATE	APRIL '80
SCALE	1 5000
DRAWING No	HRG FIG 310 3(c)

80-1506

3164

5 cm

I P DATA
Gradient Array 1
Current spokes located on line 24 bearing 2100 E
Chargeability
Resistivity
NR Heavy reading

MAGNETICS
5000 Scale
1000 Scale
* Erratic magnetometer reading

GEOCHEMISTRY
Sn
Cu
Pb
Zn
As

GEOLOGY (Mapping by D Turvey Jan 1980) * Rock chip sample location (D Turvey) 650 (A Brown)

DEVONIAN
MERRIDITH GRANITE
INTRUSIVES
Coarse to medium grained biotite granite (Dg1 Leston Hunting reference)
Fine grained muscovite biotite granite (Dg2) occassionally porphyritic
Microgranite (Dgm)
Alteration tourmaline, chlorite

CAMBRIAN
WEBSTERITE MILL COMPLEX
Ultrabasic rocks (€u)
Silicification (alteration)

CAMBRIAN
SEDIMENTS
CRIMSON CREEK FORMATION (€c) Hornfelsed volcaniclastic sediments minor gabbro

ORDOVICIAN
GORDON LIMESTONE (Og) Grey massive limestone

SILURIAN
CROTTY QUARTZITE (Sc) Quartzite and undifferentiated sediments

TERTIARY
Ironstone, laterite scree developed on ultrabasics (Tu)

QUATERNARY
Recent alluvium (Qra)

Geochemistry
PPM
1000
800
500
200
150
100
50
10
20W
15W
10W
5W
0
5E
10E
15E
20E
No Sample
No Sample
No Sample (River)

I P Data
CHARGEABILITY IN MILLIVOLTS/VOLT (——)
24
20
16
12
8
4
0
A
NR
NR
RESISTIVITY IN Ohm - METRES (----)
10000
8000
2000
1000
500
200
100

Total Magnetic Field (δ)
64000
63000
62000
61000
60 000
COARSE SCALE
20W
15W
10W
5W
0
5E
10E
15E
20E

Topography & Geology
HEIGHT ABOVE SEA LEVEL - (METRES)
800
600
400
200
0
CREEK
chlorite actinolite alteration
tourmaline alteration
intense tourmaline alteration
poor outcrop grassy colluvium
CREEK
CREEK
CREEK
HARMAN RIVER
ultrabasic/granite contact 20m granite
Old walking track
CREEK
CREEK
CREEK
LITTLE WILSON RIVER
20W
15W
10W
5W
0
5E
10E
15E
20E

RENISON LIMITED

HARMAN RIVER GRID
LINE 24
EL 17/177

SCALE 1 5000 METRES
100 0 100 200 300

DRAWN	A ROSS
TRACED	F COLSON
DATE	APRIL 80
SCALE	1 5000
DRAWING No.	HRG F16 311 3(f)

I P DATA
Gradient Array 1
Current dipoles located on line 24 0400W 2100E
—— Chargeability
---- Resistivity
NR Noisy reading

MAGNETICS
5000 Scale
1000 Scale
Erratic magnetometer reading

GEOCHEMISTRY
Sn
Cu
Pb
Zn
As

GEOLOGY (Mapping by D Turvey Jan 1980) * Rock chip sample location (D Turvey) 650 (A Brown)

INTRUSIVES
DEVONIAN
MERIDITH GRANITE
Coarse to medium grained biotite granite (Dg) (Louton Hunting reference)
Fine grained muscovite biotite granite (Dg2) occasionally porphyritic
Microgranite (Dgm)
Alteration - tourmaline, chlorite
CAMBRIAN
WEBSTERITE HILL COMPLEX
Ultrabasic rocks (Cs)
Silicification (alteration)
CAMBRIAN
SEDIMENTS
CRIMSON CREEK FORMATION (Cc) Hornfelsed volcaniclastic sediments minor gabbro
ORDOVICIAN
GORDON LIMESTONE (Og) Grey massive limestone
SILURIAN
CROTTY QUARTZITE (Sc) Quartzite and undifferentiated sediments
TERTIARY
Ironstone laterite screes developed on ultrabasics (Ts)
QUATERNARY
Recent alluvium (Qra)

80-1506
3165
5 cm

Geochemistry

PPM

1000 800 500 200 150 100 50 10

20W 15W 10W 5W 0

I P Data

CHARGEABILITY IN MILLIVOLTS/VOLT (——)

24 20 16 12 8 4 0

A

RESISTIVITY IN Ohm - METRES (- - - -)

10000 5000 2000 1000 500 200 100

Total Magnetic Field (δ)

FINE SCALE (- - - -)

62000 800 600 400 200

20W 15W 10W 5W 0

Topography & Geology

HEIGHT ABOVE SEA LEVEL - (METRES)

800 600 400 200 0

CREEK

tourmaline

quartz tourmaline

Old workings shaft and trenches

TADPOLE HILL

tourmaline chlorite actinolite alteration

CREEK

aplite dykes

heavy vegetation cover

CREEK CREEK

020054

20W 15W 10W 5W 0

RENISON LIMITED

HARMAN RIVER GRID

LINE 26

EL 17/77

SCALE 1 5000 METRES

100 0 100 200 300

DRAWN	A ROSS
TRACED	F COLSON
DATE	APRIL 80
SCALE	1 5000
DRAWING No	HRG FIG 312 3(9)

I P DATA

Gradient Array 1.
Current dipoles located on line 24 2400W 2100E

—— Chargeability
- - - Resistivity

MAGNETICS

5000 Scale

1000 Scale

* Erratic magnetometer reading

GEOCHEMISTRY

Sn
Cu
Pb
Zn
As

GEOLOGY (Mapping by D Turvey Jan 1980) * Rock chip sample location (D Turvey)

DEVONIAN

MERIDITH GRANITE

INTRUSIVES

+ Coarse to medium grained biotite granite (Dg1 Lexton Hunting reference)

+ + Fine grained muscovite biotite granite (Dg2) occassionally porphyritic

x x x Microgranite (Dgm)

Alteration tourmaline chlorite

80-1506

3166

5 cm