

1985/54. The Leech Hill drill hole, Mt Read Volcanics, Bradshaws Road

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INTRODUCTION

Mapping of the Mt Read Volcanics at Leech Hill, in the Bradshaws Road area (Murchison Quadrangle), revealed an unusual pyritic alteration zone in a felsic tuff unit closely associated with andesite near the boundary between the western volcano-sedimentary sequence and central volcanic sequence. As surface exposure was poor due to extensive cover of glacial moraine, it was decided to drill a moderately deep hole to determine the stratigraphic relationships if possible, and to test the alteration zone for any significant mineralisation. The hole, drilled over five months in early 1984, did not penetrate to the stratigraphic top of the alteration zone.

GEOLOGY

The western volcano-sedimentary sequence in the Bradshaws Road area (Corbett, 1981; 1984) comprises a thick sequence of felsic vitric tuff, vitric-crystal tuff, vitric-lithic tuff and shale, with frequent bedding indicating a marine origin. The sequence dips and faces east near Leech Hill (fig. 1), and has an apparently interfingering contact with the central volcanic sequence of feldspar-phyric lava, ignimbritic tuff, and andesite. Large intrusive bodies of andesite occur in the contact area, and virtually surround Leech Hill, a low wooded rise composed of sericite-pyrite schist after felsic vitric-lithic tuff (of western sequence type). A thin, steeply east-dipping shale unit occurs on the lower western flank of Leech Hill, and may correlate with a thin shale exposed at a track junction on the old (pre-Hydro) Bradshaws Road, where only a thin sliver of schistose felsic tuff is preserved between andesite bodies. Alternatively, the shale units may be impersistent lenses. An extensive cover of Pleistocene moraine, with boulders of Owen Conglomerate, obscures outcrop over much of the area, outcrop being mainly restricted to hills and bulldozed tracks.

RESULTS

The drill hole, angled east under Leech Hill at 45° (flattening to 23°), reached 504 m (rig capacity), placing the end of the hole directly under the crest of Leech Hill (fig. 1). This means that only the lower two-thirds of the 300 m wide alteration zone was tested. The hole was collared in andesite, and drilled 300 m of andesite before entering the main alteration zone in felsic tuff (see section). The easternmost 50 m of andesite was slightly altered. A series of andesite dykes was intersected within the schist zone, confirming the intrusive nature of the andesite in this area. Two thin shale-vitric ash units were intersected, the westernmost one (associated with lithic tuff horizons) giving an east-facing. The easternmost unit may correlate with the shale unit mapped at the surface.

The core through the alteration zone from 300 m to 500 m was sampled every 20 m and assayed for major and trace elements (including Cu, Pb, Zn, As, Ag and Au) by the Department of Mines Launceston laboratories. Maximum values were 280 ppm Cu, 230 ppm Pb, 570 ppm Zn, and 27 ppm As. Silver values were all below detection limit (11 ppm) as were gold values (0.05 ppm). Total iron content ($\text{Fe}_2\text{O}_3 + \text{FeO}$) ranged up to 9%. Na_2O values were uniformly low (0.3 to 0.7%). No obvious systematic trends are evident in the data, which are appended.

REFERENCES

- CORBETT, K.D. 1981. Stratigraphy and mineralization in the Mt Read Volcanics, western Tasmania. *Economic Geology* 76:209-230.
- CORBETT, K.D. 1984. Geological maps and summary of Cambrian stratigraphic units and relationships in the Henty River-Williamsford area. *Unpubl. Rep. Dep. Mines Tasm.* 1984/84.

[27 November 1985]

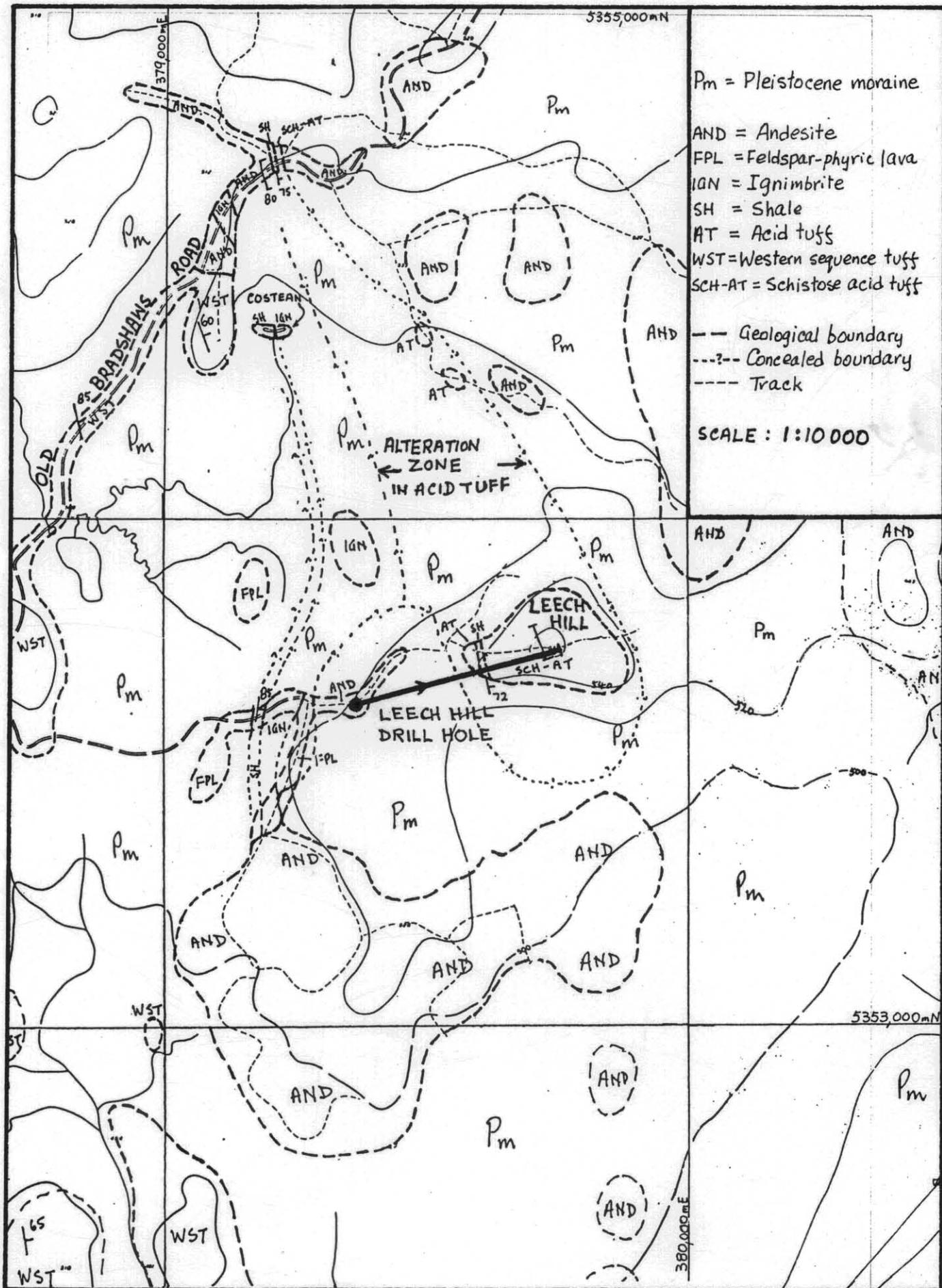


Figure 1. Geology of the Leech Hill area.

5 cm

PROJECT: Mt Read Volcanics and Associated Sequences
OBJECTIVE: To clarify stratigraphy on western side of Leech Hill and determine depth and nature of pyritic alteration zone at Leech Hill
PROPOSED BY: K. Corbett LOGGED BY: K. Corbett May 1984

LOCATION: Leech Hill, off Bradshaws Road near Tyndall Range
MAP SHEET: TYNDALL - 8014-III GEOL. ATLAS: MURCHISON - 51
A.M.G. CO-ORDS: 379365.5 mE 5353632.7 mN
COLLAR R.L.: 525.5 TOTAL DEPTH: 504 m
COLLAR DIP: -45° AZIMUTH: 065° M
DATE COMMENCED: 21.11.83 DATE COMPLETED: 10.5.84
DRILL RIG: Longyear 38
DRILL CREW: W. West

HOLE SIZE:

| | | | |
|----|--------|-----|---|
| HQ | 0 to | 147 | m |
| NQ | 147 to | 367 | m |
| BQ | 367 to | 504 | m |
| | to | | m |
| | to | | m |

HOLE CONDITION AFTER COMPLETION:
Clear

SURVEY DATA INSTRUMENT: Eastman Single Shot

| DEPTH | INCLINATION | | AZIMUTH | | COMMENTS |
|-------|-------------|-----|-------------|---------|----------|
| | As read | Dip | As read, °M | °A.M.G. | |

| | | | | | |
|-----|--|----|-----|--|--|
| 231 | | 38 | 064 | | |
| 362 | | 30 | 063 | | |
| 501 | | 23 | 063 | | |

| SUMMARY GEOLOGICAL LOG | | |
|------------------------|--------|--|
| From (m) | To (m) | ROCK DESCRIPTION |
| 0 | 250 | Andesite, fresh to weathered, with quartz-carbonate-chlorite veins, minor pyrite and galena. Probably intrusive. |
| 250 | 275 | Altered andesite, chloritised phenocrysts, minor pyrite. Probably intrusive. |
| 275 | 280 | Felsic crystal-vitric tuff, quartz-phyric; minor pyrite and galena on veins |
| 280 | 303 | Andesite intrusive, hornblende-phyric, minor pyrite |
| 303 | 311 | Vitric tuff, minor pyrite |
| 311 | 316 | Shale with interbedded tuff, facing east |
| 316 | 320 | Andesite intrusive, altered, hornblende-phyric, disseminated and veinlet pyrite |
| 320 | 342 | Sericite-pyrite schist, mainly after vitric-lithic tuff |
| 342 | 345 | Altered hornblende andesite dyke, some pyrite |
| 345 | 361 | Sericite-pyrite schist 5-10% pyrite in patches, traces galena |
| 361 | 365 | Altered hornblende andesite |
| 365 | 490 | Sericite-pyrite schist, traces galena, two small andesite dykes |
| 490 | 503 | Altered andesite dyke, abundant pyrite |
| 503 | 504 | Sericite-pyrite schist after vitric-lithic tuff |

| SUMMARY GEOCHEMICAL DATA (g/t unless specified) | | | | | | | | | |
|---|----|--------|----------|--|--|--|--|--|--|
| From | To | Length | Rec. (%) | | | | | | |
| | | | | | | | | | |

REPORT REFERENCE: Unpublished Report Tasmania Department of Mines 1985/54

OTHER COMMENTS:

| TASMANIA DEPARTMENT OF MINES GEOLOGICAL SURVEY BRANCH | | DIAMOND DRILL CORE GEOLOGICAL RECORD | | | | | | HOLE No. LEECH HILL 1 | REF. No. SHEET No. 2 of 5 | | |
|--|--------|--------------------------------------|-----------|-----------|-----------|-------------|-----|--|---------------------------|-------|--------|
| INTERVAL | | REC. (%) | Core lift | Core loss | Depth (m) | Graphic Log | Min | DESCRIPTION | SPECIMEN | | |
| From (m) | To (m) | | | | | | | | Number | Depth | Prep'n |
| 0 | 16 | 12.5 | | | | | | Very weathered, bleached broken andesite, brown-stained, some broken quartz veins. | | | |
| 16 | 25 | 83 | | | | | | Weathered bleached andesite with broken patches. | | | |
| 25 | 38 | 100 | | | | | | Partially weathered andesite, carbonate vesicles weathered out, some hornblende phenocrysts. | | | |
| 38 | 50 | | | | | | | Fresher andesite, some carbonate vesicles preserved, chloritised hornblendes. | | | |
| 50 | 55 | | | | | | | Partly weathered and broken andesite, leached vesicles, some clayey broken patches. Some chlorite-quartz veins to 30 mm width. | | | |
| 55 | 65 | " | | | | | | Slightly weathered vesicular andesite with leached vesicles. | | | |
| 65 | 71 | | | | | | | Fresh andesite, grey-green, carbonate vesicles and blebs to 20 mm across. Small chloritised ferromagnesians. 5 mm quartz-pyrite-galena vein at 69 m. | | | |
| 71 | 72 | " | | | | | | Rather weathered andesite with several quartz-pyrite-galena veins to 5 mm. | | | |
| 72 | 78 | " | | | | | | Fresh andesite. | | | |
| 78 | 80 | " | | | | | | Slightly weathered andesite, several quartz-pyrite-galena veins to 2 mm. | | | |
| 80 | 90 | " | | | | | | Fresh andesite, small carbonate vesicles, carbonate veins, breccia texture at 87 m. | | | |
| 90 | 91 | " | | | | | | Slightly weathered andesite with several thin chlorite veins, one with galena. | | | |
| 91 | 93 | " | | | | | | Fresh andesite with few thin quartz-chlorite veins. | | | |
| 93 | 96.5 | " | | | | | | Andesite with broken weathered patches associated with quartz-chlorite (±pyrite) veins. | | | |
| 96.5 | 121 | " | | | | | | Mostly fresh andesite with broken patches. Scattered quartz-chlorite-carbonate-pyrite-galena veins to 15 mm. Some vesicular texture. No obvious ferromagnesians. | | | |
| 121 | 147 | " | | | | | | Fresh andesite, mostly vesicular texture. Little or no mineralisation. | | | |
| 147 | 250 | " | | | | | | Fresh andesite, some vesicular texture. Minor pyrite as disseminations and on veins. | | | |
| 250 | 273 | " | | | | | | Slightly altered andesite, network of fine chlorite veins in places. Fairly fine-grained towards east side (downhole). | | | |
| 273 | 275 | " | | | | | | Altered andesite, slightly wispy texture; remnants of ferromagnesian minerals. Minor pyrite. | | | |
| 275 | 280.1 | " | | | | | | Felsic tuff, fine-grained grey uniform quartz-phyric crystal-vitric. Minor pyrite and galena on veins. | | | |
| 280.1 | 303 | " | | | | | | Andesite, porphyritic in hornblende (chloritised) and feldspar. Minor pyrite mineralisation. | | | |
| 303 | 311 | " | | | | | | Vitric tuff, pale, fine-grained, with layer of coarser green tuff 16 mm thick at 304 m. Contact with andesite sharp, marked by 10 mm of chlorite-sericite. Pyrite on some thin veins. | | | |
| 311 | 312.5 | " | | | | | | Bedded vitric ash grading to grey mudstone-shale. | | | |
| 312.5 | 313.5 | " | | | | | | Crystal-vitric tuff, green, fine-grained, grading to vitric ash. | | | |
| 313.5 | 314.6 | " | | | | | | Mudstone-shale, laminated, grey, with vitric ash layers. Several layers and lenses of fine-grained pyrite up to 6 mm thick, parallel to bedding. Core-bedding angle 40°. Schistosity ±parallel to bedding. | | | |
| 314.6 | 315.1 | " | | | | | | Lithic tuff unit with clasts to 20 mm, erosional contact at base with shale clasts indicates east-facing. | | | |
| 315.1 | 315.3 | " | | | | | | Mudstone, bedded, grey, sandy | | | |
| 315.3 | 315.6 | " | | | | | | Lithic tuff unit with clearly erosional contact on shale indicating east-facing. Some shale clasts. | | | |
| 315.6 | 320.2 | 100% | | | | | | Andesite, hornblende-phyric, rather altered. Chloritised hornblendes to 8 mm long. Minor disseminated and veinlet pyrite. Scattered small clasts cored by xenoliths. | | | |
| 320.2 | 324.6 | " | | | | | | Vitric ash, green to white, faintly bedded, very sericitic. Scattered to abundant ovoid green flecks to 10 mm across could be devitrification structures. Some of these contain pyrite. Also some disseminated and veinlet pyrite. | | | |
| 324.6 | 329 | " | | | | | | Schistose green lithic tuff, clasts to 30 mm. Many small green wispy clasts like pumice. Disseminated and veinlet pyrite common with lenses up to 10 mm thick. Some clasts are pyritised. | | | |
| 329 | 330.9 | " | | | | | | Vitric tuff, pale, very sericitic. Abundant disseminated and veinlet pyrite. | | | |
| 330.9 | 341.7 | " | | | | | | Sericite-pyrite schist after vitric-lithic tuff. Many wispy sericite clasts like pumice. Disseminated and veinlet pyrite common, with concentrations along some foliation planes. Core-schistosity angle 42°. | | | |

| TASMANIA DEPARTMENT OF MINES GEOLOGICAL SURVEY BRANCH | | DIAMOND DRILL CORE GEOLOGICAL RECORD | | | | | | HOLE No. LEECH HILL 1 | REF. No. SHEET No. 3 of 5 | | |
|--|--------|--------------------------------------|-----------|-----------|--------------|----------------|-----|--|---------------------------|-------|--------|
| INTERVAL | | REC. (%) | Core lift | Core loss | Depth (m) | Graphic Log | Min | DESCRIPTION | SPECIMEN | | |
| From (m) | To (m) | | | | | | | | Number | Depth | Prep'n |
| 341.7 | 344.5 | 100% | | | | | | Andesite, hornblende-phyric, bleached at contacts. Hornblendes altered to chlorite. Some disseminated pyrite but less abundant than in schist. Probably intrusive. | | | |
| 344.5 | 361 | " | | | | | | Sericite-pyrite schist after vitric-lithic tuff, pale, felsic, with small wispy sericite clasts prominent, mostly parallel to schistosity. Abundant disseminated and veinlet pyrite, with some concentration in small clasts and as cross-cutting veins to 10 mm wide. Traces of galena. | | | |
| 361 | 364.7 | " | | | | | | Altered green andesite; chloritised remnants of hornblendes; abundant disseminated pyrite. | | | |
| 364.7 | 386.7 | " | | | | | | Sericite-pyrite schist, pale, disseminated and veinlet pyrite, traces galena. Some quartz-carbonate veins. Fragmental texture in places. Core-schistosity angle 54° at 381 m. Galena-rich vein 100 mm long at 372.5 m. | | | |
| 386.7 | 388.2 | " | | | | | | Andesite, altered, hornblende-phyric, some disseminated pyrite. | | | |
| 388.2 | 458 | " | | | | | | Sericite-pyrite schist; up to 15% pyrite in patches. Faint fragmental texture in places. Some quartz-carbonate veins. | | | |
| 458 | 460.5 | " | | | | | | Andesite, altered, some feldspar and possible ferromagnesian phenocrysts. Abundant disseminated pyrite. | | | |
| 460.5 | 466 | | | | | | | Schistose vitric ash, jointly bedded, fine-grained, sericitic. Core-bedding (and schistosity) angle 55° at 464 m. | | | |
| 466 | 490.1 | | | | | | | Schistose vitric-lithic tuff, fragmental texture, abundant pyrite. | | | |
| 490.1 | 503 | | | | | | | Andesite, altered with prominent white tabular phenocrysts. Abundant disseminated and veinlet pyrite. | | | |
| 503 | 504.05 | | | | | | | Schistose vitric-lithic tuff, pale, abundant pyrite including veins to 10 mm wide. END OF HOLE. Logged K. Corbett May 1984. | | | |

| TASMANIA DEPARTMENT OF MINES GEOLOGICAL SURVEY BRANCH | | DIAMOND DRILL CORE GEOCHEMICAL DATA | | | | | | | | | | | | HOLE No. LEECH HILL 1 | | | | | |
|---|-------|---|--|---------------|----------|--------------------------------|---------|---------|---------|---------|---------|---------|---------|---------------------------------|-----------|----------|---------|---------|---|
| SAMPLE TYPE* HC/DC = half/qr core - cut HS/DS = half/qr core - split ALL = whole core CUT = cuttings, chips G = fillet grind S = sludge, slurry | | LABORATORY Department of Mines, Launceston | | | | | | | | | | | | A.M.G. CO-ORDS: 379365.5 mE | | | | | |
| | | ANALYTICAL TECHNIQUE | | | | | | | | | | | | 5353632.7 mN | | | | | |
| | | DETECTION LIMIT | | | | | | | | | | | | COLLAR R.L.: 525.5 | | | | | |
| | | | | | | | | | | | | | | COLLAR DIP: -45° AZIMUTH: 065°M | | | | | |
| SAMPLE | | INTERVAL | | Sample Length | Rec. (%) | SAMPLE LOCATION (m) | | | | | | | | | | COMMENTS | | | |
| No. | Type* | | | | | 300-301 | 320-321 | 340-341 | 360-361 | 380-381 | 400-401 | 420-421 | 440-441 | 460-460.5 | 460.5-461 | | 480-481 | 500-501 | |
| | HC | | | 1 m | | SiO ₂ | 56.05 | 69.80 | 69.50 | 55.62 | 65.82 | 68.96 | 69.68 | 73.44 | 54.85 | 68.85 | 70.66 | 54.71 | Samples comprised one metre lengths of cut half-core taken every 20 metres. The sample at 460 m was halved to allow for an andesite-schist contact. Sample lithologies were as follows: andesite (300-301, 460-460.5, 500-501) vitric tuff (320-321) sericite-pyrite schist (340-341, 360-361, 380-381, 400-401, 420-421, 440-441, 460.5-461, 480-481). Major elements are given in percentages. Trace elements in ppm. |
| | | | | | | Al ₂ O ₃ | 13.07 | 12.32 | 12.95 | 14.06 | 13.84 | 11.51 | 11.18 | 11.72 | 12.89 | 13.87 | 15.06 | 12.70 | |
| | | | | | | Fe ₂ O ₃ | 1.50 | 2.42 | 3.55 | 6.86 | 3.48 | 4.27 | 5.41 | 4.79 | 2.14 | 3.64 | 3.91 | 5.97 | |
| | | | | | | FeO | 4.33 | 2.26 | 0.69 | 2.51 | 0.69 | 0.69 | 0.76 | 0.33 | 3.93 | 0.76 | 0.33 | 3.11 | |
| | | | | | | TiO ₂ | 0.38 | 0.38 | 0.33 | 0.41 | 0.39 | 0.35 | 0.31 | 0.35 | 0.39 | 0.44 | 0.52 | 0.40 | |
| | | | | | | MnO | 0.12 | 0.07 | 0.03 | 0.13 | 0.12 | 0.12 | 0.10 | 0.03 | 0.29 | 0.06 | 0.0 | 0.28 | |
| | | | | | | CaO | 6.82 | 1.90 | 1.27 | 3.11 | 2.22 | 1.93 | 1.58 | 0.44 | 5.62 | 1.12 | 0.18 | 3.99 | |
| | | | | | | MgO | 2.78 | 1.29 | 1.18 | 3.34 | 1.74 | 1.41 | 0.95 | 0.36 | 4.97 | 1.11 | 0.31 | 4.35 | |
| | | | | | | K ₂ O | 3.21 | 3.09 | 3.72 | 3.25 | 3.56 | 3.05 | 2.96 | 3.17 | 2.78 | 3.73 | 3.75 | 2.10 | |
| | | | | | | Na ₂ O | 0.80 | 0.66 | 0.30 | 0.72 | 0.52 | 0.47 | 0.44 | 0.43 | 0.35 | 0.53 | 0.73 | 0.79 | |
| | | | | | | P ₂ O ₅ | 0.19 | 0.08 | 0.05 | 0.13 | 0.07 | 0.07 | 0.05 | 0.08 | 0.19 | 0.10 | 0.12 | 0.18 | |
| | | | | | | S | 0.08 | 1.84 | 2.56 | 5.12 | 3.04 | 3.30 | 4.35 | 4.12 | 1.41 | 3.56 | 3.08 | 5.37 | |
| | | | | | | CO ₂ | 8.09 | 2.52 | 2.02 | 4.26 | 3.34 | 2.93 | 2.20 | 0.44 | 8.21 | 1.54 | 0.11 | 5.30 | |
| | | | | | | H ₂ O ⁻ | 0.09 | 0.09 | 0.09 | 0.11 | 0.12 | 0.08 | 0.08 | 0.06 | 0.04 | 0.07 | 0.11 | 0.10 | |
| | | | | | | H ₂ O ⁺ | 2.25 | 2.14 | 1.94 | 2.67 | 2.07 | 1.86 | 1.90 | 1.90 | 2.57 | 2.03 | 2.07 | 2.67 | |
| | | | | | | Br | 145 | 58 | 59 | 105 | 96 | 76 | 64 | 70 | 115 | 78 | 91 | 135 | |
| | | | | | | Rb | 110 | 105 | 115 | 105 | 110 | 94 | 91 | 96 | 91 | 115 | 105 | 71 | |
| | | | | | | Y | 19 | 38 | 43 | 17 | 37 | 36 | 39 | 22 | 20 | 34 | 37 | 19 | |
| | | | | | | Zr | 130 | 270 | 290 | 100 | 300 | 270 | 260 | 230 | 120 | 220 | 230 | 115 | |
| | | | | | | Nb | 4 | 10 | 10 | 4 | 8 | 8 | 9 | 7 | 5 | 8 | 9 | <3 | |
| | | | | | | Ni | 18 | 5 | <3 | 20 | 4 | 5 | 4 | 7 | 18 | 11 | <3 | 16 | |
| | | | | | | Ba | 1250 | 750 | 1050 | 900 | 1400 | 1250 | 1450 | 8300 | 1250 | 1450 | 1350 | 730 | |
| | | | | | | Cr | 64 | 36 | 43 | 76 | 45 | 66 | 83 | 69 | 71 | 76 | 57 | 105 | |
| | | | | | | V | 135 | 30 | 6 | 200 | 21 | 30 | 17 | 61 | 155 | 86 | 51 | 155 | |
| | | | | | | Sc | 16 | 12 | 12 | 28 | 9 | 10 | <9 | 10 | 20 | 17 | 13 | 20 | |
| | | | | | | Pb | 5 | 18 | 20 | 170 | 78 | 27 | 200 | 230 | 20 | 28 | 26 | 105 | |
| | | | | | | Zn | 93 | 52 | 33 | 290 | 120 | 40 | 570 | 21 | 330 | 59 | 31 | 400 | |
| | | | | | | Cu | 39 | 35 | 21 | 71 | 32 | 41 | 280 | 30 | 135 | 64 | 19 | 165 | |
| | | | | | | Co | 15 | <6 | 7 | 16 | 9 | 8 | 8 | 8 | 12 | 11 | 8 | 20 | |
| | | | | | | Sb | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | |
| | | | | | | Ag | <11 | <11 | <11 | <11 | <11 | <11 | <11 | <11 | <11 | <11 | <11 | <11 | |
| | | | | | | Au | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | |
| | | | | | | As | <10 | 30 | <10 | <10 | <10 | 12 | 12 | <10 | 18 | <10 | <10 | 27 | |

5 cm

TASMANIA DEPARTMENT OF MINES
GEOLOGICAL SURVEY BRANCH

DIAMOND DRILL HOLE PLOT

HOLE No. LEECH HILL 1
REF. No. SHEET No. 5 of 5

A.M.G. CO-ORDS: 379365.5 mE COLLAR R.L.: 525.5 COLLAR DIP: -45°
5353632.7 mN TOTAL DEPTH: 504 AZIMUTH: 065°M

SCALE 1:2500
(Bar scale must be shown)

