QUEENSTOWN NORTH PROJECT
COMPRISING:
WALFORD PEAK EL 24/96
QUEENSTOWN EL 6/98
BEATRICE EL 20/98
LAKE MARGARET EL 10/99
LINDA EL 13/99

ANNUAL REPORT
FOR THE PERIOD ENDING OCTOBER 2000

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1 SUMMARY

Pasminco's exploration in Tasmania is focussed on key horizon(s) within the Mt Read Volcanics. The most important contact is at, or near, the top of the CVC. Within this project this contact is recognised at West Sedgwick as the contact between the CVC and the Tyndall Group, and a similar stratigraphic position is postulated at Walford Peak and Beatrice.

At West Sedgwick the top of the Central Volcanic Complex is exposed. Sections of the old grid were rehabilitated to enable access for partial leach geochemical sampling and mapping. A 1:5000 scale geological map is produced that incorporates geological mapping and aeromagnetic interpretation. The top of the CVC was partial leach sampled with soil samples collected on 200m spaced lines at 25m centres. This programme involved the rehabilitation and cutting of approximately 36 line kilometres of grid, the collection of 1314 samples for partial leach analysis and eight rock chip samples. No obvious anomalies are currently identifiable in the geochemical data.

At the Beatrice prospect extensive exploration program (including 3748m of diamond drilling) has now been completed. On the basis of the results of drilling to date (DDH MS7-MS13) no further exploration is warranted in the Itat Creek area of the Beatrice Prospect, although potential still exists for a small (<1 mt) shallow resource in the DDH MS1/MS11 area. However, it is recommended that the planned DHEM survey be completed in MS13 to confirm that the shales are the source of the MS11 DHEM anomaly.

The western PL anomaly, despite testing by DDH MS12, remains largely unexplained and could be the focus of further work, however, given the attenuated host sequence it is un likely that a Pasminco sized orebody is present beneath the western PL anomaly. Any further work would largely be on the basis of finding a definitive explanation for the anomaly. Similarly the results of further PL sampling of the Linda Valley anomaly do not provide strong encouragement for further work..

2 INTRODUCTION

This report summarises exploration work completed on the North Queenstown Project in the period 31 October 1999 to 31 October 2000. The Queenstown North Project covers an area extending from just north of Queenstown to Mt Selina (Figure 1). The project was formed by the amalgamation of reporting and expenditure commitments for EL 24/96 Walford Peak, EL 6/98 Queenstown, EL 20/98 Lake Beatrice EL 10/99 Lake Margaret and EL 13/99 Linda.

Work during the year has concentrated on two main areas; the Beatrice Prospect and the West Sedgwick area.

At Beatrice (EL 6/98) the following work was completed:

- A study of mineralisation and alteration (Honours thesis by M. Hope).
- Drill testing of 3 targets for 1355.5m.
- DHEM in two drill holes.

At West Sedgwick (EL 6/98 and 10/99) the following work was completed:

- 41 line km of grid and access lines were cleared.
- The grid and access lines were geologically mapped and partially surveyed with DGPS.
- 1314 'B' horizon partial leach soil samples and 8 rock-chip samples were collected and analysed.

Additionally, a small (94 sample) partial leach soil sampling program was completed on EL 13/99 Linda Valley, to close-off an anomaly located by the 1998/1999 Beatrice soil surveys, and a reconnaissance visit was made to the East Beatrice prospect to commence re-establishing access.

2.1 Attribution

The following personnel were responsible for the work carried out on the Queenstown North Project Area during this period of tenure:

Senior Geologist	Andrew McNeill, Pasminco Exploration Rosebery.
Contract Geologist	Kim Denwer, Pasminco Exploration Rosebery.
Senior Geophysicist	Chris Dauth, Pasminco Exploration Melbourne.
Contract Geophysics	Outer Rim Exploration Services.
Report Complitaltion	Kirsten Simpson, Pasminco Exploration Melbourne.

3 TENURE

The Queenstown North Project comprises EL 24/96 Walford Peak, EL 6/98 Queenstown, EL 20/98 Lake Beatrice, EL 10/99 Lake Margaret and EL 13/99 Linda. (Table 1). The project was initially formed by the amalgamation of reporting and expenditure commitments for EL 24/96 Walford Peak, EL 6/98 Queenstown and EL 20/98 Lake Beatrice on 23rd March 1999. EL's 10/99 Lake Margaret and EL 13/99 Linda were subsequently amalgamated after their granting on 27th July 1999 and 12th July 1999 respectively.

EL 6/98 Queenstown comprises two blocks; the southern block is contiguous with EL 20/98, however, the northern Moxon Saddle block is isolated and abuts Pasminco's Tullah EL (22/90). Joint reporting for the Moxon Saddle block of EL 6/98 and the Tullah EL was approved in February 1998 and the reader is referred to the Tullah (EL 22/90) annual reports for results from this area.

Table 1. Queenstown North Project; constituent Tenements.

Licence Number	Licence name	Date Granted	Area (Sq km)
EL 24/96	Walford Peak	26th November 1996	44
EL 6/98	Queenstown	30th January 1998	33
EL 20/98	Lake Beatrice	4th November 1998	10.47
EL 10/99	Lake Margaret	27th July 1999	5
EL 13/99	Linda	12th July 1999	6.5

4 REGIONAL GEOLOGY

Three VHMS prospective geological environments occur around a core of Owen Conglomerate forming the West Coast Range in the area covered by the Queenstown North Project (Figure 2; derived from the published 1:25,000 scale government geology maps). These environments are the Walford Peak area on the eastern flank of the range, the West Sedgwick area on the western flank of the range and the Beatrice area on the northern flanks of the Comstock Valley that cuts through the range.

4.1 Walford Peak (EL 24/96)

Weber et al. (1997) describe the regional geology of this area in detail. The eastern edge of the Walford Peak area comprises Precambrian Tyennan basement, a metamorphic terrain described as mainly lower greenschist facies phyllites and quartzites. This basement is unconformably overlain by elements of the Cambrian Mt Read Belt comprising the Sticht Range Beds and correlates of the Tyndall Group. To the west, and overlying the Tyndall

Group correlates, are the siliciclastic Cambro-Ordovician Owen Conglomerates. The contact between the Tyndall Group and Owen Conglomerate is variable and may be conformable and gradational, unconformable or faulted.

The middle Cambrian Sticht Range Beds comprises sediments from pebble-cobble conglomerates to siltstones and minor black shales (with a largely metasedimentary provenance) and minor volcaniclastic units. There is an apparent gradational relationship between the Sticht Range Beds and the overlying Tyndall Group.

The Tyndall Group comprises a volcanic conglomerate unit (the Dora and Selina conglomerates) underlain by quartz phyric lavas, intrusives and volcaniclastics. In the northern part of the area the Tyndall Group volcanics are intruded by the Murchison granite, a Cambrian intrusive complex about 7.5 km long and 3 km wide.

4.2 West Sedgwick (EL 6/98 and EL 10/99)

The western part of the West Sedgwick area is dominated by mixed volcaniclastics and sediments of the Yolande River sequence that have been intruded by felsic-mafic porphyries. The eastern part of the area is dominated by feldspar±hornblende-phyric volcanics of the Central Volcanic Complex. The volcanics contain dacitic lavas and volcaniclastics typical of the Central Volcanic Complex and also contains abundant variably magnetic, andesitic (feldspar-hornblende-phyric) hyaloclastite lavas and subvolcanic intrusions. The andesitic volcanics are similar to the Anthony Road Andesite occurring 10 km to the north. Several black shale horizons occur within this package and these have generated good IP anomalies.

The Central Volcanic Complex is overlain by Tyndall Group rocks at Zig Zag Hill and also 8 km north in the Basin Lake area. It is probable that there is a continuous thin sliver of Tyndall Group between the top of the Central Volcanic Complex and the Great Lyell Fault for the length of the contact, although this contact is partly obscured by glacial deposits of variable thickness, see below. To the east of the Great Lyell Fault (GLF) the Owen Conglomerate is exposed. In the Zig Zag Hill area there are some structural complexities associated with the north-south Great Lyell Fault and east-west cross structures.

In the northern part of the West Sedgwick the Cambrian geology is obscured by glacial deposits. The glacial deposits are dominated by two major moraines. The largest is the 1.3 km long Hamilton Moraine, the second moraine occurs on the 800m long east-west ridge south of the Lake Margaret pipeline.

4.3 Beatrice (EL 6/98, EL 20/98 and EL 13/99)

Boyd (1994) describes the geology of the Beatrice area in detail. The Beatrice area lies on the steep southern slopes of Mt Sedgwick where the prospective volcanics are exposed in a window through the Owen Conglomerate formed by the valleys of Itat and Porphyry Creeks. Lavas, volcaniclastics and a black shale unit striking N-S are interpreted on published maps (Corbett and Jackson, 1987) as being CVC correlates. A large quartz feldspar porphyry sill (or series of sills) intrudes these rocks. Volcanic sandstones and conglomerates of the

Tyndall Group and the Cambro-Ordovician Owen Conglomerate unconformably overlie these units.

The top of Mt Sedgwick is columnar jointed Jurassic Dolerite interpreted as a remnant of a dolerite sheet (The lack of a strong magnetic signature suggests it is not a plug) that intrudes Permian tillite, which is exposed on the SE flank of the Mountain.

5 PREVIOUS EXPLORATION

5.1 Beatrice Prospect (EL 6/98 and EL 13/99)

The Mt Lyell Mining and Railway Company, Goldfields, BHP and RGC have completed work at the Beatrice Prospect in the twenty three years since discovery of the prospect. The pre-Pasminco exploration was documented in the 1998/1999 annual report (Denwer et al., 2000) and will not be repeated here.

Pasminco Exploration completed the following work at the Beatrice Prospect during 1998/99 (Denwer et al., 2000):

- Detailed 1:1000 scale mapping.
- Compilation of previous mapping.
- Relogging of the six old holes (MS1-MS6).
- A 580-sample MMI soil-sampling programme.
- A 4-line, 8.8 km pole-dipole induced polarisation survey.
- An orientation 2 line, 4.0 km CSAMT survey.
- 4 diamond drill holes for 2392.6m (MS7-MS10).
- Downhole EM on the four drill holes.

5.2 West Sedgwick Prospect (EL 6/98 and EL 10/99)

The West Sedgwick area covers the western and southwestern flanks of Sedgwick Bluff (not Mt Sedgwick itself). The first exploration in the area was in 1957 when Rio Tinto Australian Exploration (RTAE) completed a TEM survey. Since this time the area has been explored by Mount Lyell Mining and Railway Company (MLMRC), Pickand Mathers and Co. International (PMI), Goldfields Exploration, BHP and RGC Exploration. A full review of this exploration was documented in Denwer et.al (2000).

Pasminco Exploration completed the following work at West Sedgwick during 1998/99 (Denwer et al., 2000):

- Logging of the previous holes drilled at West Sedgwick (WS1-WS8)
- A full literature review of previous work was completed and
- A partial leach geochemistry programme was proposed to test for mineralisation particularly beneath glacial cover.

5.3 Walford Peak (EL 24/96)

For a comprehensive review of previous exploration in the Walford Peak area the reader is referred to Weber, Murphy and Aliano (1997) and Denwer et.al (2000).

Pasminco Exploration completed the following work on the Walford Peak prospect during 1998/99 (Denwer et al., 2000):

- Detailed mapping (at 1:5,000) and rock-chip sampling (65 samples) of the Lake Dora – Lake Spicer area

5.4 East Beatrice (EL 20/98)

The East Beatrice area is here defined as the area between the Beatrice Lava Dome, in the west and Lake Beatrice in the East. The geology in this area (see Corbett and Jackson, 1987) can be interpreted to be a repetition of that seen in Itat Creek on the eastern limb of a major anticlinal structure. The rocks of interest, shales and volcaniclastics, are underlain by CVC lavas of the Beatrice Dome, to the west, and are unconformably overlain by upper Tyndall Group volcaniclastic conglomerates to the north and east.

Previous exploration in this area has been completed by RGC (as part of EL 9/66) and Aberfoyle (as part of EL 5/85). Initial work by RGC in the period 1978-1980 (Meares et al, 1980) included establishment of a grid (the eastern part of the MSAZ grid) followed by regional geophysics (gradient array IP), soil sampling and mapping. The mapping located minor occurrences of sphalerite and galena in shales closely associated with spotty highs in soil geochemistry (up to 440 ppm Pb and 710 ppm Zn, in separate samples).

No further serious work was conducted until 1990 when Aberfoyle established a new grid (on AMG) and completed a combined UTEM and mapping program, with limited soil geochemistry in the area of the sphalerite-galena occurrences (Noonan, 1990). No significant UTEM responses were located and mapping failed to re-locate the sulphide occurrences, however, soil sampling repeated, but failed to expand, the soil anomaly located by RGC. Additionally three samples were submitted for Pb Isotope analysis (Noonan, 1990). It was concluded that the samples had an initial PB-isotopic composition close to that of Rosebery,

but, that the samples, which all had low Pb contents, had been affected by addition of radiogenic Pb.

6 WORK COMPLETED DURING THE 1999-2000 REPORTING PERIOD

6.1 Beatrice Prospect

Work during the current reporting period at the Beatrice prospect included:

- Completion of an Honours thesis by M. Hope.
- Drill testing of 3 targets for 1355.5m
- DHEM in two drill holes

6.1.1 Geology

During the reporting period M. Hope submitted his Honours thesis titled "The Geology, Alteration and Mineralisation of the Beatrice Prospect, western Tasmania" (a copy has been lodged with the MRT library in Hobart). The major conclusions of this study were that:

Textural evidence indicates mineralisation pre-dates the Devonian cleavage, however no textural evidence to support stratiform mineralisation was observed.

Three distinct alteration assemblages were recognised; sericite alteration is related to diagenesis and metamorphism; Chlorite alteration shows a systematic increase in intensity toward mineralisation, and potassic alteration, at depth, is overprinted by chlorite + magnetite.

Lead isotopes indicate mineralisation occurred during the Cambrian (although the signature is inhomogeneous), with zinc ratios suggesting metals have been transported by a fluid saturated with respect to both lead and zinc. Sulfur isotopes are supportive of a reduced seawater source of sulfur and the possible link to VHMS style mineralisation.

To follow-up the thesis, more recent holes were logged and a brief report and summary logs of holes MS1 to MS11 were completed (see Appendix 1).

6.1.2 Drilling

Three diamond drill holes (MS11-MS13) were completed for 1355.5m. DDH MS11 and MS13 were drilled by Diamond Drilling Tasmania using a CS1000 P4 rig, whereas DDH MS12 was drilled by Low Impact Diamond Drilling Services using a Hydracore 28 rig. The rigs were positioned using a Squirrel Helicopter from Helicopter Resources. Access to the sites was either on foot (MS12) or by 6-wheel motor bike.

A summary drill log was completed at site and the drill core was then taken from the drill site to Pasminco's core farm at Tullah. The core was measured (for recoveries), photographed, geologically logged and magnetic susceptibility measurements were made (readings taken at each core block, or in some cases on 1m intervals). Drill core was cut and samples analysed

by Analabs for Ag, As, Bi, Ca, Cd, Cu, Co, Fe, K, Mg, Mn, Na, Ni, Pb, Sb, Sn and Zn using ICPMS, Au by 50g fire assay and Ba by pressed powder XRF.

Drill logs, down hole surveys and collar details are included in Appendix 2, assay results in Appendix 3 and magnetic susceptibility measurements are presented in Appendix 4.

DDH MS10

At the time of writing the 1998/1999 annual report not all assay results (from shallower than 394.6m and deeper than 483.6m) were available from this hole. All results have now been received and significant intersections, on the basis of Zn content, include:

At a 0.5% Zn cut-off:

370.0-374.8m. 4.8m @ 0.16% Pb, 0.19% Zn and 6.5 g/t Ag

507.0-523.0m, 16.0m @ 830 ppm Pb, 0.55% Zn and 4.3 g/t Ag

533.1-570.2m, 33.1m @ 300 ppm Pb, 0.26% Zn and 1.8 g/t Ag

620.0-633.5m, 13.5m @ 0.14% Pb, 0.8% Zn and 5 g/t Ag

At a 1.0% Zn cut-off:

517.0-519.2m, 2.2m @ 0.36% Pb, 2.3% Zn and 13.4 g/t Ag

535.0-536.0m, 1.0m @ 0.18% Pb, 1.6% Zn and 9.3 g/t Ag

562.8-563.8m, 1.0m @ 0.15% Pb, 1.05% Zn and 5.3 g/t Ag

620.7–622.5m, 1.8m @ 0.67% Pb, 4.7% Zn and 22.5 g/t Ag

DDH MS11

Following the drilling of MS10 a re-interpretation of the geology of the Beatrice prospect indicated there was potential for significant mineralisation (with a strike length > 400m) within the coarse and (or) fine volcaniclastic sequences footwall to the Itat Creek Fault. There was also potential for these horizons to host mineralisation in the hangingwall of the fault and below previous drilling (DDH MS1 and MS4; note however, that this position is closed-off by DDH's MS2 and MS3 on section 1400N). DDH MS11 is therefore proposed to test both the hangingwall and footwall of the Itat Creek Fault, below a significant Zn-Cd MMI anomaly in the central part of the Beatrice Grid (1600N). Hole MS11 was collared, adjacent to the old MS1 collar, on 1/10/99 and completed on 10/11/99 at a depth of 602.3m. A summary log of the hole is as follows:

Table 2: MS11 Summary Drill Log

From	To	
0.0	127	Ash volcaniclastic, minor volcaniclastic sandstone; variably chlorite±sericite altered; weak base metal+pyrite mineralisation with exception of 59-63m weak- moderate base metal veining.
127	150.1	Volcaniclastic sandstone with minor ashy volcaniclastic; variably chlorite or silica-hematite-chlorite altered, weakly mineralised; pyrite >galena>sphalerite.
150.1	151.4	Abrupt contact to semi-massive sulphide; Galena > pyrite > sphalerite; gangue strongly chlorite altered; sulphide content decreases downhole.
151.2	185	Volcaniclastic sandstone; strongly chlorite altered below 167m; increasing K-feldspar below 180m. Weak Pyrite>galena>sphalerite mineralisation.
185	197.3	Variably silica-K-feldspar altered ashy volcaniclastic; faulted contact to:
197.3	248.3	Green-pink volcaniclastic sandstone-breccia; pumice, limestone and felsic lava clasts; only trace pyrite.
248.3	338	Strongly chlorite-Kfeldspar/hematite altered volcanic; appears more like a lava breccia than volcaniclastic sandstone. Essentially un-mineralised.
338	486	Volcaniclastic sst to breccia interbedded with minor ash volcaniclastic; clasts of limestone (to 3-4cm diameter), pumice and felsic lava; narrow zones of k-feldspar alteration; essentially un-mineralised.
486	602.3	Ash volcaniclastic and minor volcaniclastic sandstone. Trace base metals (sphalerite +/- galena).

The stratigraphy in MS11 was as expected to about 248m, however, correlation with contacts in MS1 suggests a steeper (near vertical) dip than originally interpreted from bedding at surface. However, where successful core orientations are recorded deeper in the hole (at 230m, 370m, 430m and 444.5m; see drill log) dips are moderate (31-61°) to 210-304° AMG. The zone of semi-massive sulphide at 150-151m is 55m vertically below the high grade (2m @ 0.14% Cu, 2.7% Pb, 5.1% Zn and 22 g/t Ag) intersection in MS1 and is considered to correlate with that intersection. There are however, some major differences, most notably the increased percentage of galena in mineralised zones and an apparent increase in the amount of

"granitic" alteration and veining (coarse qtz-carb-chl-hematite veins). The monotonous sequence of volcaniclastic sandstones and ash volcaniclastics intersected from 248m to the end of hole was not expected. On the basis of prior interpretations we expected to intersect the Itat Creek Fault at about 370-380m; no significant structure was intersected in the hole and this implies that either the Itat Creek Fault is vertically or steeply west dipping (neither of these alternatives fit well with our current interpretation) or that the fault is less well defined, becoming narrow shear or alteration zones at depth. As it was not obvious if the Itat Creek Fault was intersected, the potential ore position west of the fault may not have been tested.

The interval 33.0-160.0m was cut and the core assayed. Significant results, on the basis of Zn content, include:

<u>At a 0.1% Zn cut-off:</u>

38.0-48.0m, 10.0m @ 0.12% Pb, 0.31% Zn and 2.61 g/t Ag

57.0-63.5m, 6.5m @ 0.18% Cu, 1.85% Pb, 1.81% Zn, 23 g/t Ag and 1.8 g/t Au

93.0-106.0m, 13.0m @ 0.16% Pb, 0.41% Zn and 3.2 g/t Ag

128.0-134.0m, 6.0m @ 0.14% Pb, 0.25% Zn and 12.6 g/t Ag

150.1 - 153.0m, 2.9m @ 749 ppm Cu, 7.85% Pb, 2.82% Zn, 34 g/t Ag and 0.1 g/t Au

158.0-160.0m, 2.0m @ 0.14% Pb, 0.2% Zn and 2.9 g/t Ag (not closed-off)

<u>At a 1.0% Zn cut-off:</u>

58.0 - 63.5m, 5.5m @ 0.21% Cu, 2.13% Pb, 2.08% Zn, 28 g/t Ag and 2.13 g/t Au

150.1 - 151.7m, 1.6m @ 0.13% Cu, 14.1% Pb, 5.02% Zn, 58 g/t Ag and 0.15 g/t Au

As noted above, the intersection at 150.1-151.7m is correlated with the high grade intersection in MS1 and the intersection at 58.0-63.5m is correlated with that at 62.0-69.0m in DDH MS1.

Magnetic susceptibility readings (Appendix 4) were generally low (<0.2 x $X10^{-5}$ SI units) with spiky high values, to 7.7 $X10^{-5}$ SI units, associated with a zone of massive magnetite veins, to 25cm thick from 517.6-521.8m.

A two loop DHEM survey was completed in this hole by Outer Rim Exploration Services using a CRONE 3-component PEM system. A detailed report on the survey is included as Appendix . A significant conductor, centred on 390m downhole, with a time constant of 0.45 msec was located by this survey. The anomaly was modelled to be above and to the south of the DDH MS11 drill trace. A follow-up drill hole was recommended (see MS13 below).

DDH MS12

Principal component analysis of the Beatrice PL soil survey, completed in 1998/99, revealed three anomalous factor 1 (Cu, Ag, Zn and Cd) zones. The westernmost of these anomalies (on lines 800-1200N) was covered by the 1999 pole-dipole IP and earlier RGC IP surveys; both surveys indicate the presence of resistivity features coincident with the PL anomaly, however, geophysical advice indicates they probably reflect shallowly buried shale at <100m depth (or peperite as in DDH MS9) rather than viable geophysical targets.

The Western anomaly has a comparable size (500 x 200m) and Zn response ratio (ZnRR = 1.1-14.9) to the Itat Creek anomaly (ZnRR = 0.2 -21.2) and thus represents a valid target. The main unknown is the geology; virtually the entire anomaly area is underlain by porphyry, however, as indicated above, geophysical data suggest shale, and presumably the target underlying volcaniclastic sequence at depths of <100m. Due to the rugged terrain the best drill site was a compromise; it is located on line 900N at the eastern margin of the anomaly and a shallow dipping hole (-48) was required to test under the peak of the anomaly.

DDH MS12 was collared on 7/12/99 and drilled to completion at 285.0m on 8/2/00 (including a stoppage of 8 days due to a lack of water). A summary log of the hole is as follows:

Table 3: DDH MS12 Summary Log

From	To	
0.0	86.2	Pink-red quartz-feldspar porphyry. Un-mineralised.
86.2	145.6	Volcaniclastic breccia to coarse sandstone with porphyry, limestone and shale clasts, minor black shale; weakly pyritic with trace base metals.
145.6	285.0	Faulted contact to: pink-green feldspar-phyric lava; weak pyrite and chalcopyrite mineralisation in veins.

Stratigraphy in MS12 was as expected to 145.6m depth, however, below this depth massive feldspar-phyric lavas (very CVC like) were intersected. It is currently interpreted that MS12 tested a considerably thinned host sequence, the result of either fault complications or thinning of the host sequence on the western margin of the 'Itat Creek' basin. No significant mineralisation was intersected and no successful core orientations were completed in the hole. The partial leach soil anomaly has been ascribed to the disseminated mineralisation (see below) in the thinned host sequence and(or) leakage up faults (such as that at 145.6m). Note that this interpretation does not address the source of the resistivity anomaly (no peperitic breccia such as that in MS9 is present to explain the anomaly).

Results of core assays from MS12 were as expected, with generally low base metal grades reaching a maximum of 1.6m @ 0.13% Zn (130.1-131.7m) and 2m @ 0.21%Pb (123.5-125.5m). Cu values are low (<150ppm) as are Au (< 5ppb) and Ag (<4 g/t).

Magnetic susceptibility readings (Appendix) were generally low (70% of readings < 0.1 $x10^{-5}$ SI units)with spiky high values, to 6.0 $X10^{-5}$ SI units, in two main zones: 250.3-253.5m and 213.0-216.0m. No obvious cause for these high values was seen in the core.

A single loop DHEM survey was completed in this hole by Outer Rim Exploration Services using a Crone 3 component PEM system. A detailed report on the survey is included as Appendix 6 . No significant conductors were located.

DDH MS13

Drilling of DDH MS11, to test the Itat Creek partial leach soil anomaly, resulted in the definition of a significant sub-vertical DHEM conductor centred on 385320mE, 5347760mN, 390mRL and beneath the soil anomaly. The anomaly has a time constant in the order of 0.45 msec. This is relatively low and would represent quite a small or poorly conductively (coupled) conductor, however, experience in Tasmania suggests that such conductors may still be good exploration targets (C. Dauth pers. comm.).

The target occurred in the last main gap in drilling where there is 250-300m of strike potential. Geological interpretations, with both vertical and east dips on the Itat Creek Fault, indicated that the conductor may be in the footwall of the Itat Creek Fault and centred at the top of the coarse volcaniclastic unit, where base metal anomalous mineralisation has been intersected by previous drilling (MS8 and MS10).

A secondary aim of the hole design was to get a third intersection (approximately 30m south of MS1/MS11) of the shallow mineralised zone, which would indicate some continuity and provide encouragement for further drilling.

DDH MS13 was collared on 14/2/00 and was completed at 468.2m on 21/3/00. A summary log is as follows:

Table 4: DDH MS13 Summary Log

From	To	
0.0	71.2	Green ash volcaniclastic and minor vlcl sandstone; chlorite spotting prominent from 56-71.2m; variable sphalerite+galena veining @53-59.2m.
71.2	97.0	Massive green-pink weakly feldspar-phyric lava/intrusive; sugary spherulitic texture; trace disseminated pyrite.
97.0	111.0	Green ash volcaniclastic; chlorite spotted (79-100.5m); variable sphalerite+galena veining

111.0	134.9	Massive pink-green feldspar±quartz-phyric lava/intrusive.
134.9	152.2	Volcaniclastic sandstone with minor ash vlcl; weak sphalerite+galena veining 134.9-136m.
152.2	160.1	Dominantly ash volcaniclastic (chlorite spotted in part); trace sphalerite+galena in veins.
160.1	215.0	Interbedded vlcl sandstone/conglomerate and minor ash vlcl; generally weak base metal mineralisation except 170-175m where up to 1% Pb+Zn (visual estimate) in veins.
215.0	296.6	Brown-green volcaniclastic sandstone, with minor vlcl conglomerate (limestone clasts) and ash volcaniclastic; weak pyrite mineralisation. Faulted contact to:
296.6	380.5	Interbedded ash volcaniclastic, shale and minor Vlcl. Sst. Variable pyrite (1-5%) and base metals (trace-3%) in veins and disseminations (below 330m). Faulted contact to:
380.5	408.5	Volcaniclastic sandstone and breccia (limestone and pumice clasts) with minor ash. Sphalerite >Py>Gn (1-5%) in veins and disseminated.
408.5	441.9	Pyritic (3-10% Py) black shale, with graphitic shear zone from 409.8 – 413.2m. Minor pyrrhotite.
441.9	468.2	Interbedded shale, vlcl sst, ash volcaniclastic and minor vlcl breccia. Pyrite to 1-2% but no obvious base metals.

Apart form the two unexpected lava/intrusive units the stratigraphy in MS13 is very similar to that of MS1/11. The main difference being the lower intensity of mineralisation and the lack of obvious chalcopyrite in MS13 when compared with MS1 and MS11; MS13 appears to close off the potential for a shallow mineralised zone to the south, but, more drilling is required to close it off to the north. The stratigraphy to 296.6m was as expected, however, it is not clear which of the faults at 296.6 and 380.5m are the Itat Creek Fault. Whichever the case, the fault has a much different character to that seen in MS6 and MS10. The coarse volcaniclastics below 380.5m have variable base metal mineralisation, similar to that in MS10 and MS8 (in the footwall of the Itat Creek Fault) and contrast with the coarse volcaniclastics at a similar depth in MS11, which are essentially un-mineralised. Therefore it is interpreted that the sequence below at least 380.5m is in the footwall of the Itat Creek Fault. Core orientations at 308-322m give steep (85-89°) dips to both east and west, however, orientations at 329-341m and 427-439m give shallower dips (25-70°) dominantly to the west – northwest.

It would appear that the DHEM anomaly resulted from the pyritic/pyrrhotitic, and in part graphitic, shales below 408.5m. A DHEM survey was proposed to confirm this conclusion, however, at the time of writing this survey had not been completed.

A large part of DDH MS13 was cut and 123 samples were submitted for assay. Significant results, on the basis of Zn content, include:

At a 0.1% Zn cut-off:

45.5 – 71.2m, 25.7m @ 3.5 g/t Ag, 0.22% Pb, 0.46% Zn

134.8 – 180.8, 46m @ 3.4 g/t Ag, 759 ppm Pb, 0.13% Zn (not closed off)

332.0 – 412.2m, 80.2m @ 8.6 g/t Ag, 0.24% Pb, 0.54% Zn

At a 1.0% Zn cut-off:

52.4 – 53.5m, 1.1m @ 3.2 g/t Ag, 0.47% Pb, 1.2% Zn

349.4 – 351.4m, 2.0m @ 5.1 g/t Ag, 0.58% Pb, 1.7% Zn

355.4 – 356.2m, 1.8m @ 9.5 g/t Ag, 0.46% Pb, 1.54% Zn

363.7 – 366.5m, 2.8m @ 6 g/t Ag, 0.62% Pb, 1.18% Zn

376.7 – 368.7m, 2.0m @ 6.6 g/t Ag, 0.3% Pb, 1.02% Zn

380.6 – 382.6m, 2.0m @ 68.7 g/t Ag, 0.97% Pb, 1.04% Zn

The results are as expected with the interval from 45.4-71.2m corresponding to the shallow zone of mineralisation in MS1/MS11 and the interval at 134.8-180.8m corresponding to the deeper higher grade zone in MS1/MS11 (but, broader and much lower grade in MS13). The elevated Zn from 332-412.2m correlates with mineralisation intersected in MS10 in the footwall of the Itat Creek Shear. Au is elevated in the lower part of the 134.8 –180.8m intersection, averaging 0.17 g/t over 10.8m (170-180.8m), with a maximum of 0.37 g/t Au. Outside this zone Au results are low with the exception of a single spike of 0.17 g/t Au (356.2 – 356.4m) associated with high Pb (1.99%) and 15 g/t Ag (in a narrow zone of strong galena-carbonate veining). In contrast to the intersections in MS1 and MS11 Cu results were low in MS13, with maxima of 85 ppm and 163 ppm in the shallow and deeper zones respectively.

Magnetic susceptibility readings (Appendix 4) were all low with spiky high values, to $0.4X10^{-5}$ SI units, associated with the pyrrhotite in the black shales from 408.5-441.9m.

6.2 West Sedgwick.

The top of the Central Volcanic Complex is exposed at the West Sedgwick prospect and this key horizon has been explored spasmodically for over forty years. Despite all the exploration completed here there is still untested near surface potential in the northern area beneath scree and glacial moraine cover. Various geophysical surveys in the southern portion of the prospect has sterilised the potential for a near surface (<150m) conductor however the depth potential (>150m) has only been tested in the Agglomerate Hill and Zig Zag Hill area.

The top of the CVC was partial leach (PL) sampled with soil samples collected on 200m spaced lines at 25m centres. This programme involved the rehabilitation and cutting of approximately 36 line kilometres of grid and the collection of 1314 samples for PL analysis.

6.2.1 Griding:

The old BHP and Shell grids at West Sedgwick were refurbished to facilitate access for geological mapping and partial leach sampling. A total of 31225m of the east-west grid lines were refurbished. An additional 5400m of baselines and 4400m of access tracks were cut. Plate 2 shows the layout of this grid with respect to the old grid and also the accesses. Cobbing Contracting (Tas) Pty Ltd completed the grid work.

The southern area is accessed from an old horse track, which commences from a vehicle track at 5346000 mN 380000 mE. The central southern area is accessed from lines 7000N, 7400N, 7800N and 8450N that join vehicle tracks accessed from the Lake Margaret Road. The central northern area is accessed from the Lake Margaret water racetrack and also from a corded foot track that commences at the back of the winder house at the top of the Lake Margaret pipeline. The northern area is accessed via a level walking track off the Basin Lake road (which in turn is accessed from the Anthony Road approximately 1 km south of Tyndall Creek).

The old grid pegs and many of the current pegs were given AMG coordinates by the grid contractors. The DGPS work has demonstrated that although the pegging is based on AMG coordinates there are some major discrepancies. The latter part of the griding uses a four-digit coordinate system to reflect this.

There were some discrepancies with the peg labelling from the old grid to the new grid. Although it is difficult to be certain of what the specific problem was it appears that the original BHP grid did not have the 381000 mE line as its primary baseline. Variations to the grid are: the baseline at 0775E was originally 0750E. There is 250m spacing between 7800N and 8050N that results in all the lines from here to 9450N having a northing 50m greater than the original northing. There is no baseline connection between 9450N and 9600N and north from 9600N; this area is treated as a separate grid.

6.2.2 Mapping:

Fifteen field days were spent mapping the 40-km of grid lines and accesses plus relevant creek sections. Outcrop on the grid is poor with <2% outcrop and this is predominantly of the resistant unaltered volcanics. The northern part of the grid is covered by glacials and the outcrop here is very limited. However there was sufficient outcrop to enable approximate geological boundaries to be drawn and this coupled with the good helicopter borne magnetic data from previous explorers allowed a good geological interpretation.

The geological interpretation is presented in Plate 1 and an aeromagnetic image is also presented in Plate 3.

Mixed volcaniclastic and sediments of the Yolande River Sequence (YRS) dominate the western part of the mapped area. Felsic-mafic porphyries typified by the Crown Hill Andesite have intruded these rocks.

The eastern part of the area is dominated by feldspar±hornblende-phyric volcanics of the Central Volcanic Complex (CVC). The volcanics contain dacitic lavas and volcaniclastics typical of the Central Volcanic Complex and also contains abundant variably magnetic, andesitic (feldspar-hornblende-phyric) hyaloclastite lavas and subvolcanic intrusions. Several black shale horizons occur within this package and these have generated good IP anomalies.

It is difficult to be certain within the grided just where the contact between the YRS and CVC is located. The sediments in the western part of the grided area (labelled SS**) are clearly YRS and the dacitic volcanics in the eastern part of the grided area (labelled VDDA) are clearly CVC. It is suspected that the contact between these units is gradational.

It is uncertain why the andesite has variably magnetic characteristics. On the magnetic map there are clearly delineated anomalies that are associated with the magnetic hornblende phyric andesitic porphyries. Identical rocks are non-magnetic. It can also be seen from the magnetics that there are significant magnetic anomalies with no mapped andesite, this suggests that the andesite occurs sub-surface. These andesites are similar to the Anthony Road Andesite occurring 10 km to the north.

In the northern part of the grid prominent magnetic responses are noted. There are no rocks exposed in this area but it is probable that this response is from similar andesites. MRT (Corbett and Jackson, 1987) have mapped outcropping quartz-feldspar porphyry in the Yolande River just to the west of the grid area

Tyndall Group rocks at Zig Zag Hill and also 8-km north in the Basin Lake area overlie the Central Volcanic Complex. It is probable that there is a continuous thin sliver of Tyndall Group between the top of the Central Volcanic Complex and the Great Lyell Fault for the length of the contact, although this contact is partly obscured by glacial deposits of variable thickness.

The Cambrian rocks are separated from the Ordovician Owen Conglomerate by the Great Lyell Fault (GLF).

In the Zig Zag Hill area there are some structural complexities associated with the north-south Great Lyell Fault and east west cross structures.

In the vicinity of 5438700mN 380600mE a zone of intense sericite alteration is mapped. The original lithology was not recognised and the strongly cleaved and altered unit was mapped as schist. Only minor pyrite is associated with this alteration.

In the northern part of the grid glacial deposits obscure the Cambrian geology. Two major moraines dominate the glacial deposits. The largest is the 1.3 km long Hamilton Moraine, the second moraine occurs on the 800m long east-west ridge south of the Lake Margaret pipeline.

6.2.3 Geochemical Sampling:

B-horizon soil samples were collected at 25m intervals on the 31225m of east-west grid. Samples were collected at or near the peg and involved digging a hole with a pick, removing the organic rich A-horizon and collecting approximately 500g of sample. A small additional amount of soil was collected at each sample site and placed in a chip tray for reference and to allow colour assignment. The samples were placed in clip lock plastic bags and once returned to the field office the bags were opened to prohibit anaerobic reduction reactions. The bags were left opened until a batch of 300 samples was collected and then they were closed for dispatch.

Three duplicate samples were collected for every 100 samples and these duplicate samples were replicated at the lab. The duplicate field sample enabled evaluation of the site variance and the replicate sample enabled evaluation of the laboratory variance.

A total of 1314 samples were collected and were despatched to Amdel in South Australia as 6 batches (SDS's), although one SDS had only 1 west Sedgwick sample. The samples were analysed using partial leach technique DL42 followed by ICP. Elements analysed were Ag, As, Au, Ba, Bi, Cd, Cu, Co, Mo, Ni, Pb, Ni, Zn, Zr and the rare earth elements Ce, Eu, Gd, La and Sm.

The raw assay results are shown in appendix 7 - as excel spreadsheet named: West Sedgwick Partial Leach Raw Data: the replicate and duplicate data is appended as excel spreadsheet West Sedgwick Sorted Split Data: and the standards are appended as West Sedgwick Partial Leach Standards.

Soil colour was assigned using Munsell Colour chart with 19 colours used. The colours were 10R2/2, 5YR2/2, 5YR2/1, 3/0, 2/0, 10YR4/2, 5YR5/2, 5YR4/1, 10R4/2, 10R3/4, 10YR 7/4, 10YR 6/6, 5YR5/6, 5YR 7/2, 10YR 8/2, 5YR 8/1 8/0, 6/0 and 5/0 (see appendix 8). At the interpretation stage 19 colours was too difficult to digest and these 19 colours were simplified to 6 colours. The 6 colours used were black, brown, red-brown, orange, cream and grey. The original 19 Munsell colours were grouped viz:

Black: 10R2/2, 5YR2/2, 5YR2/1, 3/0 and 2/0

Brown: 10YR4/2, 5YR4/1

Red-Brown: 5YR5/2, 10YR4/2 and 10R3/4

Orange: 10YR 7/4, 10YR 6/6 and 5YR5/6

Cream: 5YR 7/2, 10YR 8/2, 5YR 8/1 and 8/0

Grey: 6/0 and 5/0

It is difficult to assess the raw partial leach data as the background partial leach response changes significantly with soil colour. When colours are compared against the elements black soils have a higher Zn, Cd and lower residual pH. The orange soil forms preferentially over the andesites and has associated elevated Zr, Ce and As (Table 5). The soil colour distribution on the grid is shown in figure xx.

Table 5: Comparison of median element values with soil colours

	Ag Median	As Median	Ba Median	Cu Median	Cd Median	Ce Median	Eu Median	Ni Median	Zn Median	Zr Median	pH Median
Black	0.0036	0.47	1.3	8.5	0.14	0.29	0.008	0.2	9.3	0.12	8.3
Brown	0.0056	0.51	3	9.7	0.13	0.42	0.010	0.18	5.5	0.12	8.8
Cream	0.0053	0.43	3.1	3.7	0.04	0.43	0.095	0.09	2.0	0.23	9.5
Grey	0.0058	0.39	3.7	6.4	0.06	0.44	0.008	0.1	2.6	0.24	9.4
Orange	0.0083	2.3	4.8	3.4	0.05	2.6	0.036	0.2	2.1	2.75	9.7
Red-brown	0.0074	2.0	4.9	6.1	0.08	1.8	0.035	0.3	3.6	1.2	9.4

The data was then levelled to soil colour using XQ levelling software. This data is represented as a function of the median. The levelled partial leach data is located in Appendix 7. Images were produced for each element using this XQ level software with the geological outlines superimposed. No obvious anomalies attributable to mineralisation are obvious in the dataset but the data will be further analysed once fuller partial leach coverage of the Mount Read volcanics is accumulated. There are however strong lithological and soil type affinities:

Cd and Zn are strongly elevated in the northern part of the grid. It is unclear why there are two populations. This may indicate that the effect of the high organic content within the black soils (most common in northern section see (Figure 4, Zn image with geological outlines) has not been fully compensated for by the levelling process.

Cu and Pb are anomalous within the felsic CVC volcanics and the basal Owen Conglomerate. (Figure 5, Cu image with geological outlines).

Y, La, Co, Ba and As are high in and around the sub-volcanic andesite porphyry intrusives (Figure 6, La image with geological outlines). These elements are not elevated in the north suggesting that the aeromagnetic anomalies (see above) may not from an andesite.

Sm, Gd, Eu, Au and Ag have a similar distribution to the Y, La, Co, Ba and As suite with an additional broad E-W high on line 48200mN (Figure 7, Sm image with geological outlines). The significance of this E-W high is uncertain and is still being investigated.

Bi and Mo are elevated around the sub-volcanic andesite porphyry intrusives suggesting weak mineralisation associated with the andesites (Figure 8, Mo image with geological outlines). There is a subtle circular feature in the north suggesting a similar style of mineralisation around these northern intrusives. Ba is strongly elevated around the southern intrusives but is not anomalous around the northern intrusives.

A total of 8 rock chips were collected during mapping. Analyses are attached in appendix 8. Results were disappointing with very low basemetal results. The best result of 0.22 ppm Au and 3.9 ppm Ag was from a sericite altered volcanic with 10% pyrite.

6.3 Linda Valley

A review of the 1998/99 Partial leach sampling program at the Beatrice Prospect (on EL 6/98) indicated the presence of three Zn soil anomalies one of which, in the SE corner of the grid, was not closed off and potentially extended onto EL 13/99 Linda Valley (Denwer et al., 2000). To detail this anomaly a total of 2.8 line km of new grid was cut and surveyed with DGPS and then sampled for partial leach geochemistry.

Sampling procedures were as outlined for the West Sedgwick program (section 6.2.3) and a total of 100 samples were collected (see figure 3 for sample locations) and despatched to Amdel for analysis. The samples were analysed using partial leach technique DL42 followed by ICP-MS with data recorded for Ag, As, Au, Ba, Bi, Cd, Cu, Co, Mo, Ni, Pb, Ni, Zn, Zr and the rare earth elements La, Ce, Sm, Eu, and Gd.

Although standard results were generally good, a major concern with this data was the high number of samples with low (<8.0) post digest pH readings. Approximately 30% of the samples from this area had low pH's compared with <10% normally. The reasons for this are not obvious; there seems to be no correlation between soil colour (or colour group as defined above in section 6.2.3), post-digest pH and(or) soil Zn assay. The main conclusion is however, that the Linda Valley survey has not increased the size or coherence of the Zn anomaly and it now appears that the anomaly is spatially coincident with the base of the Owen Conglomerate. No further work is recommended at this time.

6.4 East Beatrice

A combined mapping and partial leach soil sampling program was planned for this area, but, apart from a reconnaissance visit, to assess the sate of the 1990 Aberfoyle grid lines and to establish a helipad (at 5346520mN, 388020mE), no work was completed due to budgetary constraints. It is now planned that this work will be completed during January-February 2001.

7 CONCLUSIONS & RECOMMENDATIONS

7.1 Beatrice Prospect

An extensive exploration program (including 3748m of diamond drilling) has now been completed at the Beatrice Prospect. On the basis of the results of drilling to date (DDH MS7-MS13) no further exploration is warranted in the Itat Creek area of the Beatrice Prospect, although potential still exists for a small (<1 mt) shallow resource in the MS1/MS11 area. However, it is recommended that the planned DHEM survey be completed in MS13 to confirm that the shales are the source of the MS11 DHEM anomaly.

The western PL anomaly, despite testing by DDH MS12, remains largely unexplained and could be the focus of further work, however, given the attenuated host sequence it is un likely that a Pasminco sized orebody is present beneath the western PL anomaly. Any further work would largely be on the basis of finding a definitive explanation for the anomaly. Similarly the results of further PL sampling of the Linda Valley anomaly do not provide strong encouragement for further work.

7.2 West Sedgwick

The main exploration tools used at the West Sedgwick prospect were geological mapping and partial leach geochemistry. There are no obvious anomalies recognised in the partial leach dataset. However, Pasminco's interpretation of partial leach data is becoming increasingly more sophisticated and this data will be revisited as the partial leach database for the top of the CVC increases.

7.3 Lake Dora – Lake Spicer

Although no work has been completed during the last 12 months it is recommended that samples of mineralisation be submitted for Pb-isotope analysis to determine the affinities of the mineralisation in this area. Further exploration would depend on the results of this work.

7.4 East Beatrice

It is recommended the proposed, but deferred, PL sampling and geological mapping program over the possible eastern repetition of the Itat Creek host sequence be completed during the coming year.

8 EXPENDITURE

Total expenditure for all work undertaken by Pasminco Exploration within the Queenstown North Project area (EL's 24/96, 6/98, 20/98, 10/99, 13/99) for the twelve-month period to the end of October 2000 was $441,958. A summary of the expenditure breakdown is given below:

Personnel	$109,945
Travel and Accommodation	$6,398
Geological Consultants	$29,708
Geochemical Consultants & Assays	$42,450
Geophysical Surveys & Contractors	$9,338
Other Contractors	$56,478
Drilling Contractors	$105,181
Stores & Supplies	$593
Vehicles Plant & Equipment	$1,285
Land	$7,868
Computing	$2,788
Office	$29,478
Administration Fee 10%	$40,176
Total Project Expenditure	$441,958

9 KEYWORDS & LOCALITY

Keywords

ZINC, LEAD, COPPER, GOLD, MOUNT READ VOLCANICS, GEOCHEMISTRY, GRIDING, DIAMOND DRILLING, DHEM, PARTIAL LEACH SOIL, TYNDALL GROUP, CVC

Location

1:250K QUEENSTOWN SK55-5

1:100K MT. SEDGWICK, LAKE DORA, SEDGWICK BLUFF, ITAT CREEK, ZIG ZAG HILL, LAKE SPICER, LAKE BEATRICE

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