

1/20

DIAMOND DRILL HOLE LOG

| | | | |
|-----------|------------|-------------|------------|
| Hole ID | MS9 | Project | Queenstown |
| Hole Type | Diamond | Tenement No | |
| Year | 1999 | Prospect | Beatrice |
| Geologist | Kim Denner | Date | 3/8/99 |

PASMINCO EXPLORATION

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|-----------|--------|----|----|----|-------------|---|------------|----------------|
| | Code | Colour | | | | | | | |
| 0 | | | | | | mm | | | |
| 0-5 | | | | | | | <p>0.0-38.0m Dark Grey Quartz (3-5mm), feldspar (3mm laths and blocks often agglutinated), hornblende phyric porphyry. Minor chlorite alteration of the mafic minerals and less alteration of the feldspar.</p> | | |
| 5-10 | | | | | | | | | |
| 10-15 | | | | | | | | | |
| 15-20 | | | | | | | | | |
| 20 | | | | | | | | | |

Bdx

3mm
Cb veinlet
7-5mm
Cb veinlet

DIAMOND DRILL HOLE LOG

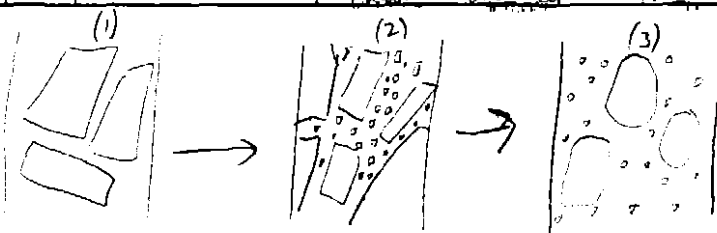
2/20

PASMINCO EXPLORATION

| | | | |
|-----------|-----|-------------|-----|
| Hole ID | M59 | Project | |
| Hole Type | | Tenement No | |
| Year | | Prospect | |
| Geologist | | Date | 3/8 |

Sample #

| Depth | 331 | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|------|--------|----|----|----|-------------|--|------------|----------------|
| | Code | Colour | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | 29-34.3m orange-yellow sericite alteration. | | |
| 35 | | | | | | | | Se | |
| 40 | | 770 | | | | | 38.0-73.5m. Banded quartz feldspar porphyry. Breccia present from simple crackle breccia (1) matrix breccia with milled/subrounded enclaves (2) and subrounded clasts with milled/subrounded enclaves (3). The matrix to this breccia is a dark black chromite altered? that was | | |

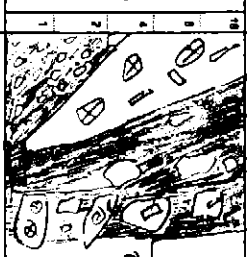
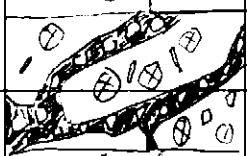

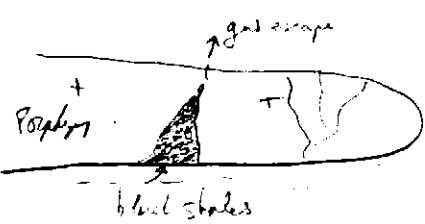
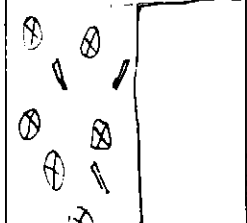
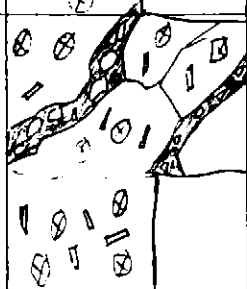




645180

DIAMOND DRILL HOLE LOG

| | | | |
|-----------|-----|-------------|-----|
| Hole ID | MS9 | Project | |
| Hole Type | | Tenement No | |
| Year | | Prospect | |
| Geologist | | Date | 3/8 |

PASMINCO EXPLORATION

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|-----------|--------|----|----|----|---|---|------------|----------------|
| | Code | Colour | | | | | | | |
| 40 | | | | | |  | Probably a black shale, brecciated style and location of the breccia indicates that it formed from fluid expelling which varied from passive → crushed breccia small explosion → milled breccia. | | |
| | 771 | | | | | | | | |
| | 772 | | | | | | | | |
| 45 | | | | | |  | The breccia probably formed from the quartz feldspar porphyry placed over wet sediments and water in the sediments heated | | |
| | 773 | | | | | | | | |
| | 774 | | | | | | | | |
| 50 | | | | | |  |  | | |
| | 775 | | | | | | | | |
| | 776 | | | | | | | | |
| | | | | | |  | | | |
| | 777 | | | | | | | | |
| 55 | | | | | |  | | | |
| | 778 | | | | | | | | |
| | | | | | |  | | | |
| | 779 | | | | | | | | |
| 60 | | | | | |  | | | |
| | 781 | | | | | | | | |

DIAMOND DRILL HOLE LOG

PASMINCO EXPLORATION

4/20

| | | | |
|-----------|-----|-------------|-----|
| Hole ID | M59 | Project | |
| Hole Type | | Tenement No | |
| Year | | Prospect | |
| Geologist | | Date | 3/8 |

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|-----------|--------|----|----|----|-----------------|--|--------------------|---------------------|
| | Code | Colour | | | | | | | |
| 60 | | | | | | mm - - - - - | | Structure | |
| | | 782 | | | | | | | |
| | | 783 | | | | | | | |
| 65 | | 784 | | | | | | | |
| | | 785 | | | | | This matrix is well rounded and has no black shale, | | |
| | | 786 | | | | | | | |
| 70 | | 787 | | | | | | | |
| | | 788 | | | | | | | 2% disseminated py. |
| | | 789 | | | | | - 73.5-78m. black shale with varying proportions of grey-white sandy matrix beds typically < 5mm bedding is very disrupted (30%) Contains carbonates | S ₀ OAS | |
| | | 790 | | | | | | | |
| | | 791 | | | | | | | |
| 80 | | | | | | | | | |

645182

DIAMOND DRILL HOLE LOG

5/20

PASMINCO EXPLORATION

| | | | |
|-----------|-----|-------------|-----|
| Hole ID | MS9 | Project | |
| Hole Type | | Tenement No | |
| Year | | Presept | |
| Geologist | | Date | 3/8 |

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation | |
|-------|-----------|------------|----|----|----|-------------|---|-----------------------|---------------------------------|--|
| | Code | Colour | | | | | | | | |
| 80 | | | | | | | | | | |
| | | 792 | | | | | 780-905m black shale, similar to the above unit but much less 5-10% sandy interbeds, contain carbonite. | | | |
| | | 793 | | | | | | | | |
| 85 | | 794 | | | | | | | | |
| | | 795 | | | | | | S ₀ 077 | | |
| | | 796 | | | | | | | | |
| 90 | | | | | | | 70.5-92m, very irregular very sandy lens to 25mm, within black shale. 920-105m as at 735-78m. | | | |
| | | 797 | | | | | | | S ₀ 032 | |
| | | 798 | | | | | | | | |
| 95 | | | | | | | | S ₀ 045 | | |
| | | 799 | | | | | | | | |
| | | 305 943 | | | | | | | | |
| | | 944 | | | | | | S ₀ 017 | S ₀ zone 13 2m | |
| 100 | | | | | | | | | | |

645183

6/20

DIAMOND DRILL HOLE LOG

PASMINCO EXPLORATION

#305

| | | |
|-----------|-----|-------------|
| Hole ID | MS9 | Project |
| Hole Type | | Tenement No |
| Year | | Prospect |
| Geologist | | Date 3/8 |

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|-----------|--------|----|----|----|-------------|--|----------------------------------|----------------|
| | Code | Colour | | | | | | | |
| 100 | | | | | | | | | |
| | | 945 | | | | | 102-104m So ~ 11% bedding intersects on 25mm So parallel richly pyritic sandy bed, | So 00 So 37 So 00 | |
| | | 946 | | | | | | | |
| 105 | | 947 | | | | | 105-115.5m as at 78-90.5m, irregular bedding. | So 072 | |
| | | 948 | | | | | 108-108.5m black shale in brecciated vegetative zone of rounded quartz clast and siliceous | | |
| | | 949 | | | | | 108.5-119.8m as at 73.5- | So 037 | |
| 110 | | | | | | | 78m. | | |
| | | 950 | | | | | | | |
| | | 951 | | | | | | So 044 | 5mm py. |
| 115 | | 952 | | | | | | So 050 | |
| | | 953 | | | | | | So 00 | |
| 120 | | 954 | | | | | ~ 50mm pyrite (40%) carbonate nodules, | So 22 | |

645184

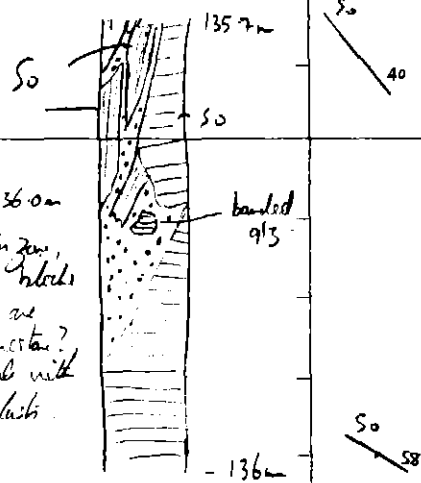
7/20

DIAMOND DRILL HOLE LOG

PASMINCO EXPLORATION

| | | | |
|-----------|-----|-------------|--------|
| Hole ID | MS9 | Project | |
| Hole Type | | Tenement No | |
| Year | | Prospect | |
| Geologist | | Date | 4/2/99 |

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|-----------|--------|----|----|----|-------------|--|----------------------|---------------------------|
| | Code | Colour | | | | | | | |
| 120 | | | | | | | | | |
| | | 955 | | | | | 119.8 - 201.5m Black shale with 5-10% sandy interbeds. | S ₀ 32 | |
| | | 956 | | | | | | | |
| 125 | | 957 | | | | | 124.8 - 125.1m - Pyrite limy beds, at 125.1 - 100mm wide sulphide graded bed. | S ₀ 29 | |
| | | 958 | | | | | | | |
| | | 959 | | | | | | S ₀ 48 | |
| 130 | | | | | | | | | |
| | | 961 | | | | | 130.8 - 131.4m : pyrite limy interbeds to 4mm, pyrite is partially or totally replacing selected beds | S ₀ 31 | |
| | | 962 | | | | | 131.6m kink bands, | | |
| | | | | | | | | S ₀ 40 | |
| 135 | | 963 | | | | | | | |
| | | 964 | | | | | | | disseminated Gault py. |
| | | 965 | | | | | 135.7 - 136.0m steep breccia zone, up to 25mm blocks of shale, clasts are dominantly limestone? and black shale with rare cherty clasts. | S ₀ 58 | min py. |
| 140 | | | | | | | | | |



645185

ajw

DIAMOND DRILL HOLE LOG

PASMINCO EXPLORATION

| | | | |
|-----------|-----|-------------|-----|
| Hole ID | MS9 | Project | |
| Hole Type | | Tenement No | |
| Year | | Prospect | |
| Geologist | | Date | 4/8 |

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|-----------|--------|----|----|----|-----------------|---|------------|----------------|
| | Code | Colour | | | | | | | |
| 160 | | | | | | mm - - - - - | | | |
| | | 976 | | | | | | 50 46 | |
| | | 977 | | | | | | | |
| 165 | | 978 | | | | | 165-168.3m small (typically c 10mm) carbonate filled fracture gashes, minor pyrite. | 50 42 | |
| | | 979 | | | | | | | |
| | | 981 | | | | | 169-174m graphitic fracture surfaces. | | |
| 170 | | 982 | | | | | | | |
| | | 983 | | | | | | | |
| 175 | | 984 | | | | | 174.4m - graded bed, faces sphale. | 50 44 | |
| | | 985 | | | | | | | |
| 180 | | 986 | | | | | * black shale sample (collected by Marcus Hope) | 50 33 | |

645187

DIAMOND DRILL HOLE LOG

PASMINCO EXPLORATION

| | | | |
|-----------|-----|-------------|--------|
| Hole ID | M59 | Project | |
| Hole Type | | Tenement No | |
| Year | | Prospect | |
| Geologist | | Date | 4/8/79 |

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|-----------|--------|----|----|----|-------------|--|----------------------|------------------------|
| | Code | Colour | | | | | | | |
| 180 | | | | | | mm | | | |
| | | 487 | | | | | | S ₀ 32 | |
| | | 988 | | | | | | S ₀ 22 | |
| 185 | | 989 | | | | | | | |
| | | 990 | | | | | | | |
| | | 991 | | | | | 188.1m - 3mm S ₀ parallel to veinlet with a core of dark black mineral sphalerite? 189.1 - 189.4m, 3-5mm carbonate veinlets, | S ₀ 8 | 3mm (15) Py Cb |
| 190 | | | | | | | | | |
| | | 992 | | | | | | S ₀ 41 | |
| | | 192.5 | | | | | | | |
| | | 993 | | | | | Broken and 192.5 - 197.1m faulted zone within black shale, abundant pyrophyllite on fracture surfaces, 30-50mm crack zones at 196.5m and 197.05 | | |
| 195 | | 195 | | | | | | | |
| | | 994 | | | | | | | |
| | | 197.1 | | | | | | | |
| | | 995 | | | | | | S ₀ 37 | S ₂ m Py |
| 200 | | | | | | | | | |

11/20

DIAMOND DRILL HOLE LOG

PASMINCO EXPLORATION

| | | | |
|-----------|-----|-------------|--------|
| Hole ID | MS9 | Project | |
| Hole Type | | Tenement No | |
| Year | | Prospect | |
| Geologist | | Date | 9/8/99 |

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|-----------|--------|----|----|----|-------------|---|--|----------------|
| | Code | Colour | | | | | | | |
| 200 | | | | | | | | | |
| | | 996 | | | | | 201.5 - 215.9m Black shale interbedded with orange-yellow massive ashly beds to 10cm. From 201.5 - 201.6 a sandy limestone bed is intersected and from 203.1 - 204.6m irregular thin bands, 205.4 - 206m broken faulted ground almost 10-20m pyritic sandy limestone beds intersected. | S ₀ / 39 S ₁ / 34 | |
| | | 997 | | | | | | S ₀ / 38 | |
| 205 | | 998 | | | | | | | |
| | | 999 | | | | | | | |
| | | 330 | | | | | | | |
| | | 601 | | | | | | | |
| 210 | | 602 | | | | | | S ₀ / 38 | Sum / Py |
| | | 603 | | | | | | | |
| 215 | | 604 | | | | | | S ₀ / 22 | |
| | | 215.9 | | | | | 215.9 - 227.3m Relatively massive black shale unit. | | |
| | | 605 | | | | | | | |
| | | 606 | | | | | | S ₀ / 40 | |
| 220 | | | | | | | | | |

645189

DIAMOND DRILL HOLE LOG

12/20

PASMINCO EXPLORATION

330

| | | | |
|-----------|-----|-------------|--------|
| Hole ID | MS9 | Project | |
| Hole Type | | Tenement No | |
| Year | | Prospect | |
| Geologist | | Date | 4/8/99 |

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|-----------|--------|----|----|----|-------------|---|------------|----------------|
| | Code | Colour | | | | | | | |
| 220 | | | | | | | | | |
| | | 607 | | | | | 221.2m 10mm crush zone | 50 45 | |
| | | 608 | | | | | * black shale geochemistry sample. | 50 22 | |
| 225 | | 609 | | | | | | | |
| | | 610 | | | | | 227.3 - 238.2m faulted and disrupted graphitic weakly pyritic black shale. Crush zones and the extent of deformation increases towards | 50 30 | |
| | | 611 | | | | | to porphyry contact. | | |
| 230 | | 612 | | | | | Common variably pyritic limestone nodules from 230 - 233.1m, graphitic occurs predominantly on shear planes but the bulk of the shale suggests a graphitic shale. | | |
| | | 613 | | | | | 234.5 - 234.8m pyritic limestone | | |
| 235 | | 614 | | | | | Contact with porphyry is sharp | | |
| | | 615 | | | | | | | |
| | | 616 | | | | | | | |

645190

13/20

DIAMOND DRILL HOLE LOG

PASMINCO EXPLORATION

| | | | |
|-----------|-----|-------------|--------|
| Hole ID | MS9 | Project | |
| Hole Type | | Tenement No | |
| Year | | Prospect | |
| Geologist | | Date | 5/8/99 |

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|-----------|--------|----|----|----|-------------|---|------------|----------------|
| | Code | Colour | | | | | | | |
| 240 | | 617 | | | | | 238.2 - 247.2m Light - dark green quartz ($\frac{1}{2}$ 4mm), blocky feldspar (to 4mm), hornblende (rather $\frac{1}{2}$ 5mm) phyric porphyry. | | |
| | | 618 | | | | | | | |
| 245 | | | | | | | | | |
| | | | | | | | | | |
| 250 | | | | | | | 247.2 - 300m Mottled dark green - red quartz feldspar phyric porphyry as above. The red colouration is due to K- feldspar alteration which is dominant but the domains increase downhole. The domains are orientated at 50° to VCA The quartz size increases downhole. | K-feld | |
| | | | | | | | | | |
| 255 | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 260 | | | | | | | | | |

increasing intensity ↓

645191

DIAMOND DRILL HOLE LOG

14/20

PASMINCO EXPLORATION

| | | |
|-----------|-----|-------------|
| Hole ID | MS9 | Project |
| Hole Type | | Tenement No |
| Year | | Prospect |
| Geologist | | Date |

5/8/99

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|-----------|--------|----|----|----|-------------|----------|------------|----------------|
| | Code | Colour | | | | | | | |
| 260 | | | | | | | | | |
| 265 | | | | | | | | | |
| 270 | | | | | | | | | |
| 275 | | | | | | | | | |
| 280 | | | | | | | | | |

645192

15/20

DIAMOND DRILL HOLE LOG

PASMINCO EXPLORATION

| | | |
|-----------|-----|-------------|
| Hole ID | MS9 | Project |
| Hole Type | | Tenement No |
| Year | | Prospect |
| Geologist | | Date |

5/8/99

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|-----------|--------|----|----|----|-------------|----------|------------|----------------|
| | Code | Colour | | | | | | | |
| 280 | | | | | | | | | |
| 285 | | | | | | | | | |
| 290 | | | | | | | | | |
| 295 | | | | | | | | | |
| 300 | | | | | | | | | |

645193

16/20

DIAMOND DRILL HOLE LOG

PASMINCO EXPLORATION

| | | | |
|-----------|-----|-------------|--------|
| Hole ID | M59 | Project | |
| Hole Type | | Tenement No | |
| Year | | Prospect | |
| Geologist | | Date | 5/8/99 |

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralization |
|-------|-----------|--------|----|----|----|---------------|--|------------|----------------|
| | Code | Colour | | | | | | | |
| 300 | | | | | | mm - 1 2 3 | | | |
| | | 619 | | | | | From 299 - 304 the porphyry is magnetite, contains ? of magnetite, <u>300.0 - 387.5m</u> | | |
| | | 621 | | | | | Hematite red quartz feldspar porphyry as above, this unit is strongly feldspar altered (probably albite), this | K, | |
| 305 | | 622 | | | | | unit also contains grains of magnetite (altered) quartz yellow Carborundum are intersected from 319 - 348m. | Al | |
| | | 623 | | | | | | | |
| | | 624 | | | | | | | |
| 310 | | | | | | | | | |
| | | 625 | | | | | | | |
| | | | | | | | | | |
| 315 | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 320 | | | | | | | | | |

645194

17/20

DIAMOND DRILL HOLE LOG

PASMINCO EXPLORATION

| | | | |
|-----------|-----|--------------|--------|
| Hole ID | MS9 | Project | |
| Hole Type | | Treatment No | |
| Year | | Prospect | |
| Geologist | | Date | 5/8/99 |

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|-----------|--------|----|----|----|-----------------|----------|------------|----------------|
| | Code | Colour | | | | | | | |
| 320 | | | | | | mm - - - - - | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 325 | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 330 | | | | | | | | | 913/66 47 |
| | | | | | | | | | |
| | | | | | | | | | |
| 335 | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | 913/66 49 |
| 340 | | | | | | | | | |

645195

DIAMOND DRILL HOLE LOG

PASMINCO EXPLORATION

| | | | |
|-----------|-----|-------------|--------|
| Hole ID | MS9 | Project | |
| Hole Type | | Tenement No | |
| Year | | Prospect | |
| Geologist | | Date | 5/8/99 |

| Depth | Lithology | | Cu | Pb | Zn | Graphic Log | Comments | Alteration | Mineralisation |
|-------|-----------|--------|----|----|----|-------------|----------|------------|----------------|
| | Code | Colour | | | | | | | |
| 340 | | | | | | | | | |
| 345 | | | | | | | | | |
| 350 | | | | | | | | | 92 ch. 44 |
| 355 | | | | | | | | | |
| 360 | | | | | | | | | |

645196

