Pasminco Rosebery Mine

BURNS PEAK EL 44/88

JOINT VENTURE ANNUAL REPORT

NOVEMBER 1997 - 31ST DECEMBER 1998

VOLUME 1 OF 3

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J/V ANNUAL REPORT - EL 44/88
BURNS PEAK – PASMINCO R'BERY
EDWARDS, MURPHY, WHITBREAD
Vol 1 of 3

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PASMINCO ROSEBERY MINE
JOINT VENTURE ANNUAL REPORT
1st NOVEMBER 1997 TO 31ST DECEMBER 1998

EXECUTIVE SUMMARY

Exploration on the retained portion of EL44/88 during the period from 1st November 1997 to 31st December 1998 consisted of diamond drilling at Browns Tunnel and Southern Trenches, MMI soil sampling and IP surveys in the North Kershaw-Chester area, preliminary mining studies at Browns Tunnel and the commencement of metallurgical studies on samples from Browns Tunnel. Work on the remainder of the EL is described in the relinquishment report submitted in November 1998.

11 diamond drill holes totalling 1,219.8m were drilled at Browns Tunnel with a further 4 diamond holes totalling 336.2m completed at Southern Trenches. The Browns Tunnel resource, at various cut-offs and parameters is as shown below:

	Tonnes kt	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe* %	TMU $	Class
No Min. Mining Width									
$20 TMU cutoff	180	1.3	4.4	0.4	31	0.6	2.8	79	Inferred
$40 TMU cut-off	90	2.1	7.4	0.6	47	1.0	2.4	131	Inferred
$60 TMU cutoff	62	2.8	9.6	0.8	58	1.3	2.5	170	Inferred
3m Min. Mining Width									
$40 TMU cutoff	104	1.9	6.8	0.6	45	0.9	2-11	120	Inferred
$50 TMU cut-off	99	1.9	6.9	0.6	46	0.9	2-11	124	Inferred
$60 TMU cutoff	90	1.9	7.4	0.6	49	0.9	2-11	132	Inferred

Both tonnes and grade have decreased ~~from the~~ from the previously quoted resource.

A small pod of high grade mineralisation based on one section only was defined at Southern Trenches:

	Tonnes kt	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe* %	TMU $	Class
No Min. Mining Width									
$20 TMU cutoff	17	8.9	12.3	1.0	48	6.7	2.7	283	inferred
$40 TMU cut-off	10	14.7	19.9	1.6	77	11.3	3.8	465	inferred
$60 TMU cutoff	9	15.5	20.8	1.7	81	11.9	3.7	486	inferred
3m Min. Mining Width									
$40 TMU cutoff	10	17.3	21.9	2.0	93	11.0	4-10	508	Inferred
$50 TMU cut-off	10	18.3	23.4	2.1	96	12.1	4-10	544	Inferred
$60 TMU cutoff	10	18.3	23.4	2.1	96	12.1	4-10	544	Inferred

Expenditure on exploration EL 44/88, including the relinquished area, in the period reported was $479,702.

Proposed work for 1998/99 will initially involve completion of metallurgical and pre-feasibility studies at Browns Tunnel, following which options for future work in this area will be reviewed.

In the North Kershaw-Chester area further interpretation and integration of the results of the IP and MMI soil sampling surveys will be undertaken to see if any worthwhile drilling targets can be generated.

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1. INTRODUCTION

EL 44/88 covered 34 km^2 of Cambrian Mount Read Volcanics and lies 6 km northwest of the Tullah township and north of Lake Rosebery (Figure 1). The principal target on the licence is volcanic hosted auriferous base metal massive sulphide deposits similar to mineralisation at Rosebery and Hercules. The EL includes old workings at Chester and the Pinnacles (including Browns Tunnel and Southern Trenches).

In December 1998 the licence was reduced to 9.9 sq kms, subject to an application for an 18 month extension of tenure, with the remaining ground being dropped.

Details of the work completed on the relinquished portion of the licence is contained in a relinquishment report submitted in November 1998 (Murphy and Denwar, 1998).

This report documents work undertaken on the retained portion of EL44/88 Burns Peak in the period November 1997 to 31st December 1999. The work has included 2 diamond drilling programmes at Browns Tunnel and Southern Trenches, an orientation MMI soil sampling programme over Southern Trenches and IP and soil sampling surveys south of Southern Trenches.

2. TENURE

EL 44/88 was initially granted for a renewable one year term on the 9th December 1988 to Noranda Pty Limited. Following the successful tender Noranda Pty Ltd and Pasminco Limited formed a Joint Venture involving EL44/88. Pioneer Minerals Australia Limited became a third member of the joint venture upon granting of the EL.

The Burns Peak Joint Venture was executed on the 6th March 1990, between the three companies, having been effectively in place since granting of the EL. The licence was reduced to 50% of the original area at the end of the 5th year of tenure. The 10th and final year of tenure ended on the 9th December 1998. An application for an 18 month extension over a 9.9 sq km area covering Browns Tunnel, Southern Trenches and the North Kershaw-Chester area was lodged in November 1998.

Until the 1st July 1990, Geopeko, the exploration division of North Broken Hill Peko Ltd managed the EL under contract to Pasminco. From that time until end June 1997 Pasminco Exploration has managed the project. From the 1st July 1997 Pasminco Rosebery Mine has managed the project.

Exploration expenditure was shared equally between the joint venture partners until June 1993, when Noranda elected not to contribute to the July -December 1993 programme. Pioneer Minerals Australia was renamed Plutonic Resources Limited and

"Pasminco Australia limited" has been substituted on all licence documents in place of "Pasminco Limited".

At the end of August 1997 Plutonic signified their intention to withdraw from the joint venture and commenced negotiations with Pasminco on a suitable price and format for Pasminco to acquire Plutonic's share. Work on the EL was deferred whilst the negotiations were underway.

In December 1997 Homestake Australia launched a takeover bid for Plutonic Resources. The takeover was successfully concluded in April 1998 with the Plutonic name still being retained for pre-existing licences.

At the end of January 1998 Pasminco and Plutonic completed the purchase of Noranda's share of the joint venture with each remaining partner taking 50%, concluding approximately 2 years of negotiations. At that point interests in the joint venture were 50% Pasminco and 50% Plutonic.

Permission to commence work at Browns Tunnel - Southern Trenches was granted in May 1998 whilst Plutonic (Homestake) reviewed the Burns Peak data.

In July 1998 Plutonic indicated that they would not be contributing to past expenditure accrued from the 1st January 1998 or to any further expenditure until further notice. Interests in the joint venture as at the 1st July 1998 are Pasminco 51.26% and Plutonic 48.74%.

The EL is subject to a number of land classifications which were revised in May 1993. The current land tenure includes land vested in the Hydro-Electric Commission in the area immediately surrounding Lake Rosebery and the Transmission Lines, Multiple Use Forest Land and Deferred Forest (Fig 2). Most of the tenement is Unallocated Crown land designated as Multiple Use Forest.

3. REGIONAL GEOLOGY

Basement in western Tasmania is Precambrian age, comprising predominantly greenschist facies meta-sediments with minor basalts and dolerites. Higher grade amphibolite and eclogite facies are also present within the Precambrian. This Precambrian basement is exposed to the west of the Burns Peak licence (Figure 3).

Cambrian volcanism and sedimentation developed on this Precambrian continental crust, and is subdivided into the Eco-Cambrian tholeiitic Crimson Creek Formation (CCF) and, the mid to late Cambrian Dundas Group and the predominantly calc-alkaline, Mt Read Volcanics (MRV).

The CCF was deposited in shallow but rapidly subsiding basins (Brown, 1986). The CCF consists of basaltic lavas and volcaniclastics, turbidites, carbonates, chert and minor evaporites. This formation is exposed west of the licence.

Ultramafic cumulates and volcanic equivalents were thrust onto the CCF in the mid

Cambrian (Crawford and Berry 1991). These rocks generate strong magnetic anomalies and outcrop within the Huskisson Syncline, to the west of the licence. Ultramafics are interpreted at depth to the north of the licence.

The MRV form a 200km long by 20km wide north-south trending belt along the eastern side of the Dundas Trough, adjacent to and in some areas onlapping and intruding the Precambrian basement. The volcanics include intermediate to felsic lavas, subvolcanic porphyries and granites, volcaniclastics and basement-derived sedimentary rocks. The MRV host five economically significant volcanic hosted massive sulphide deposits.

Equivalents of the MRV underlie the entire Burns Peak licence, and vary from massive felsic lavas, volcaniclastics and subvolcanic intrusives in the southeast, to mixed provenance fine to coarse grained sediments in the north and northwest.

A package of sediments which possibly postdates the MRV occurs in the western sector of the licence, footwall to the Rosebery Fault. These carbonate siltstones, wackes and polymict conglomerates have been recently temporally correlated via fossil evidence with the Owen Conglomerate, and are considered to be part of the Dundas Group. Gradationally overlying this sequence are quartz muscovite sandstone and conglomerate largely derived from Precambrian metasediments, but with some material from felsic volcanics and ultramafics.

Regional structures which subdivide the MRV are the Rosebery Fault, which lies close to and parallels the western licence boundary, and the Henty Fault which is located 5km east of the licence.

Cambrian volcanism and sedimentation was followed by predominantly basement derived late Cambrian to Devonian age sedimentation, which includes siliciclastic conglomerate, sandstone and limestone. None of these sequences occur within the licence. At least two phases of regional compression were associated with the mid Devonian Tabberabbera Orogeny (Keele, 1991). The development of folding, cleavage and regional thrusts in lower Paleozoic rocks were associated with this event. Fold trends in the licences are N to NE.

Deformation was followed by the extensive intrusion of Devonian to Carboniferous granitoids. The Merideth Granite and associated hornfels aureole outcrop west of the Burns Peak licence (Brown, 1986). The Merideth Granite dominates the regional gravity feature in the licence area. The Devonian granites are associated with carbonate replacement Sn mineralisation at Renison Bell and Mount Bischoff, and the Pb Zn Ag vein deposits of Zeehan and possibly the Tullah Fields.

After substantial erosion of this terrane extensive Tertiary flood basalts and subvolcanic sediments were deposited. Remnants of the basalt flows are preserved to the north of the licence.

Numerous sub-economic base metal sulphide deposits occur on the western side of the EL, in a narrow belt of NE-SW mineralised rocks including the Southern Trenches, Thomas' Tunnel, Brown's Tunnel and Leo's Find workings (Figure 4). The large Chester massive pyrite workings are also documented, mainly along the western side of the EL, within the Central Volcanic Complex.

4. PREVIOUS WORK

The extensive history of exploration and mining in the area covered by the current Burns Peak EL 44/88 was summarised by Rosenhain and Mathison (1989) and this has been modified below.

EL 44/88 is currently at the end of the 10th year of tenure. Details of these activities are documented in the past nine annual reports (Rosenhain and Mathison, 1989; Lorrigan, 1990; Kirsner, Lorrigan and Rae 1991; Kirsner 1992; Poltock, Kirsner and Saxon 1993; Poltock and Saxon 1994; Saxon 1995, Quayle and Dibben 1996, Dibben 1997 and Webber, Dibben and Murphy 1997) and in the 1998 Relinquishment Report (Murphy and Denwer 1998).

Table 1 History of Exploration on EL44/88

1899	Discovery of alluvial gold in Marionoak River by Tom Strong. (Strong's Alluvial Workings)
1896	Discovery of Pinnacles Lodes by McGuiness Bros.
1899	Discovery of Chester by F Kershaw and H Sanderson (Kershaw's Iron Blow)
1899	Brown's Tunnel driven (Brown's Tunnel) est. production 300t @ 2%Zn, 2g/t Au, 44g/t Ag.
1899	Southern Trenches est. Production 55t @ +10%Zn, +8%Pb, 8g/t Au, 38g/t Ag.
1899	Thomas' Tunnel driven (Thomas' workings) est. production 50t @ 4%Zn, 7%Pb, 1g/t Au, 240g/t Ag.
1908	Mt Lyell Mining and Railway Co Ltd secured Chester Leases
1908-1913	Intensive exploration and mining development at Chester. Production 36 000t @ 37% S.
1918-1929	Minor production from Chester by Cuming Smith & Co. Production 700t @ +25% S.
1947-1959	Electrolytic Zinc Company created foot and vehicle access to the Pinnacles area. 14 small diameter diamond drill holes (PP31, 34, 36, 39, 40, 41, 42, 45, 46, 48, 50, 51, 52, 59) completed and workings and topography surveyed. Geophysical test surveys at the Pinncles (SP, ground magnetics and resistivity)
1959-1960	Geochemical, geological and geophysical surveys over Pinnacles and Chester. Techniques included Sharp vertical loop EM, Turam, ground magnetics (vertical field), gravity. "The significant feature of this coverage is that Pinnacles Mine Mineralisation is non-conducting"

1968-1972	Initial phase of gridding, geochemical sampling, geophysics (IP and EM), mapping and 3DDH at Chester (CH1-3) by Comstaff
1973-1976	Second phase of gridding, geochemical sampling, etc. 10 DDH drilled (plus CP2 redrilled) at Pinnacles and 13 DDH at Chester (CP1-23). (New metric grid, new soil sampling, new IP). Airborne EM
1976-1979	Preussag entered into Joint Venture with Comstaff. Detailed mapping and structural synthesis completed. C horizon soil geochemistry, 2 DDH, (PIM1 & 2) trial PEM and IP over Leo's Find
1980-1983	Exploration of East Chester area. New grid, grid extensions, C horizon soil geochemistry, ground magnetics. OP, DIGHEM. DDH (EAB1-4) drilled at East Chester
1984-1985	New grid at Pinnacles (EAF) mapped, C horizon soil sampling, ground magnetics and UTEM. 19 DDH (ESB1 & EAF 1-18) with the discovery of small lenses of massive sulphides and patchy gold mineralisation. New geological interpretation
1986-1988	BHP entered Joint Venture. Reinterpretation and compilation of exploration results. "Blanket" UTEM and downhole SIROTEM. New geological interpretation. Petrological studies. Wacker sampling
1988-1991	Pasminco-Noranda-Plutonic Joint Venture on new EL 44/88. Extensive geological mapping, re-appraisal of previous data, Wacker sampling, geochemistry, petrology, DHEM, CSAMT, DH-SIROTEM, Mise-a-la-Masse, aeromagnetic survey, regional and local gravity surveys, drilling of 12 DDH (BPD62-73). Rehabilitation of old tracks, costeans and workings
1991-1992	Pasminco-Noranda-Plutonic JV, exploration was managed by Pasminco and included drilling BPD74, 75, 76 geological mapping and relogging drill core at Hollway and Summit, gravity infill and interpretation, ore/pathfinder/whole rock geochemistry, down hole EM in BPD69,71,75 and compilation/computerisation of historic geochemical data
1992-1993	Pasminco-Noranda-Plutonic JV, exploration was managed by Pasminco and included drilling holes BPD77-79 geological mapping and gridding at South Kershaw-Hollway, review and compilation of previous exploration, Dipole-dipole IP at South Kershaw-Hollway, soil geochemistry at South Kershaw and ore/pathfinder/whole rock geochemistry
1993-1994	Pasminco-Noranda-Plutonic JV, exploration was managed by Pasminco and included drill holes BPD80, BPD81 and EAF2, gridding, soil/rock geochemistry, DHEM, Mise-a-la-masse, ground magnetics and mapping
1994-1995	Pasminco-Noranda-Plutonic JV, exploration was managed by

	Pasminco and included drill holes BPD82 to 86 and extension of CP7, DHEM, gridding and geological mapping in the Hollway area
1995-1996	Pasminco-Noranda-Plutonic JV, exploration was managed by Pasminco and included diamond drill holes BPD 87 at East Holloway, BT1-4 at Browns Tunnel and RC holes STRC1-7 at Southern Trenches (reported in 1997 report); DHEM, geological mapping, ground magnetics and IP in the Holloway area; gridding, ground magnetics, soil sampling and trenching in Browns Tunnel-Southern Trenches area.
1996-1997	Compilation of previous work and entry of data into GIS format as part of the Western Tasmania prospectivity review.

5. WORK COMPLETED

Work completed on the retained area of Burns Peak EL 44/88 from November 1997 to 31st December 1998 consisted of diamond drilling programmes at Browns Tunnel and Southern Trenches, a MMI soil orientation survey at Southern Trenches and IP and soil sampling surveys in the North Kershaw-Chester area covering potential extension of the prospective horizon south of Southern Trenches close to the Rosebery fault. Preliminary mining feasibility studies were carried out at Browns Tunnel and metallurgical testwork commenced.

5.1 BROWNS TUNNEL

5.1.1 Introduction

The Browns Tunnel prospect has been the focus of most of the exploration activity this year. Infill diamond drilling was conducted on the 40m spaced sections already drilled to better define the inferred resource. Preliminary financial studies were carried out to determine the potential viability of a mining operation at Browns Tunnel and metallurgical testwork is underway.

5.1.2 Geology

The overall geological interpretation is broadly similar to that described in Quayle and Dibben (1996). There is a progression from Pinnacles Rhyolite in the "hanging wall" to the west; through andesitic and dacitic lavas and pumiceous volcaniclastics; siltstones, sandstones (often chert bearing) in the 'host sequence', to rhyolitic breccias and lavas in the footwall. Localised re-interpretation has been possible due to the increased knowledge gained from the recent drilling programmes, and some detailed logging of older holes as part of an Honours project.

Base and precious metal mineralisation occurs as a series of discontinuous, relatively high grade(+10% Pb+Zn) lenses within a broad low grade halo. The mineralisation is generally confined to the 'host' package but one of the deeper lenses, the previously named Lens 2, also occurs within andesitic lavas and pumice breccias. The major controls on the mineralisation are thought to be a combination of stratigraphy and structure with mineralisation found mainly within the strongly cleaved sediment dominated "host sequence". Mineralisation lies within the cleavage with localised 'ponding' along bedding and other planes of weakness being responsible for some of the thicker, and higher grade zones. Some passive replacement of earlier sediments is evident, but most areas of mineralisation are blebs and wisps sitting in cleavage, in cracks within silica rich zones, in pressure shadows around cherty clasts, or as a matrix in highly sheared zones of chert bearing sediments.

Zinc mineralisation is late, often filling tension cracks in cherty clasts. It is post-dated by lead and copper mineralisation which may partially to completely replace the sphalerite, forming a gun metal colour fine grained sulphide rim around sphalerite cores. The timing of gold mineralisation is still unclear, although some of the better gold assays occur in low base metal zones, often associated with intense sericite-chlorite/-pyrite alteration.

The more massive rhyolitic lavas and breccias forming the footwall and hangingwall to the host rock are generally unmineralised. Whilst cleavage runs north-south the overall stratigraphy trends north-northeast giving the apparent plunge of the overall mineralised zone in this direction.

5.1.3 Geochemistry

No geochemical surveys to report.

5.1.4 Geophysics

No geophysical surveys completed.

5.1.5 Drilling

5.1.5.1 *Drilling Philosophy and Conditions*

Drilling at Browns Tunnel prior to 1997 had defined a small, potentially open pittable base metal/precious metal resource from drilling on sections 40m apart along the local grid. The recent drilling prgrammes were designed to infill on the existing sections with possible infill on the 20m spaced sections if warranted. Drill hole locations are shown on Figure 5 with hole details contained in Table 2.

All holes were drilled by Almac Drilling of Zeehan using an LF70 drill rig. Thin glacial cover exists on the western side of the prospect whilst in the remainder weathered bedrock was encountered beneath a thin soil cover.

Table 2: Drill Hole Details - Browns Tunnel

LINE	HOLE NO	GRID NORTH	GRID EAST	AMG NORTH	AMG EAST	RL	GRID AZI	DIP	TOTAL DEPTH
5290N	001B	5288.3	4888.9	384616.85	377650.03	476.5	270	-50	70.0
	002B	5289.5	4928.7	384609.88	377689.27	477.7	270	-70	60.2
	003B	5291.7	4959.9	384605.69	377720.28	472.3	270	-62	86.0
	011B	5288.3	4889.5	384616.60	377650.6	476.4	90	-57	45.0
	012B	5288.3	4890.4	384616.40	377651.5	476.4	90	-37	53.2
5330N	004B	5330.2	4901.8	384655.17	377671.24	489.6	90	-70	100.0
	005B	5329.4	4951.4	384644.19	377720.11	486.5	270	-85	209.0
	006B	5329.4	4951.4	384644.33	377719.64	486.5	270	-63	178.8
5370N	007B	5366.5	4996.9	384671.34	377771.69	489.7	270	-56	120.1
	008B	5369.5	5034.7	384666.29	377809.25	499.3	270	-55	197.5
	013B	5366.2	4995.5	384671.30	377770.30	488.5	270	-37	100.0
TOTALS									1,219.8

Note: Coordinates in local grid. Grid north = 000 degrees magnetic

The ground proved to be broken and weathered to depths of up to 40 metres and HQ triple tube was used to minimise core loss. The deeper holes were completed in NQ once solid ground was encountered. Downhole camera surveys were carried out every 30 metres and at end of hole with core orientation marks every 6 metres where possible. 40mm ID class 12 PVC was run down each hole for possible later geophysical surveys and capped with PVC casing and a screw on cap. No significant water flows were encountered.

5.1.5.2 *Drilling Results*

Diamond drill logs are contained in Appendix 1.

Significant intersections above a nominal $60 TMU economic cut-off are listed in Table 3 below.

TABLE 3: Significant Intercepts - 1998 Browns Tunnel Drilling

Hole	N (m)	RL (m)	From (m)	To (m)	Int (m)	Pb (%)	Zn (%)	Cu (%)	Ag (g/t)	Au (g/t)	Fe (%)	$ TMU
001B	5290	442	37.9	38.9	1.0	2.9	4.3	0.38	14	0.1	1.9	74
002B	5290	457	20.1	21.1	1.0	1.6	3.4	0.14	16	0.4	3.3	60
		453	25.6	27.2	1.6	1.1	3.2	0.12	32	1.8	3.0	69
		445	34.4	35.4	1.0	1.4	5.2	0.27	51	1.0	5.4	95
003B	5290		NSA									
004B	5330	433	53.8	61.2	7.4	4.2	6.7	0.27	48	2.1	4.5	139
		417	72.7	73.7	1.0	0.9	3.3	0.17	17	0.9	2.3	60
005B	5330		183.0	183.9	0.9	0.1	7.7	0.6	26	0.1	11.1	112
006B	5330	443	46.0	58.8	12.8	2.3	3.6	0.19	20	1.7	4.1	79
		340	164.8	167.7	2.9	0.1	5.3	0.13	4	0.1	3.5	73
007B	5370		NSA									
008B	5370	395	130.6	132.0	1.4	0.3	10.7	0.3	44	0.2	4.3	$79
011B	5290	456	24.4	26.3	1.9	5.5	9.6	1.97	41	1.4	5.5	194
012B	5290	454	32.5	37.1	4.6	1.6	12.1	0.94	168	0.5	6.1	209
		445	50.5	52.2	1.7	0.8	7.1	0.4	34	11.1	5.0	204
013B			NSA									

These higher grade intercepts lie within a broader lower grade halo of plus $20TMU grade mineralisation.

The results indicate that economic grade (> $60TMU) mineralisation is not as continuous as previously thought, occurring as localised steeply dipping high grade, cleavage controlled veins or lodes within a much larger halo of low grade mineralisation which overall appears to have the gentle plunge to the north-northeast as postulated by Qualye & Dibben (1996).

5.1.6 Resource Estimation

5.1.6.1 Previous Resource Estimations

Resource estimations were carried out by Comstaff in the 1960s, Pasminco Exploration in 1996 (Qualye & Dibben 1996) and more recently by Pasminco Rosebery Mine. A comparison of the resources calculated is presented in Table 4.

Table 4: Comparison of Resource Calculations- Browns Tunnel

COMPANY	Tonnes	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	$TMU (1997)	Class
Comstaff (1985)	109,000	6.6	18.8	1.3	122	4.1	-	-	inferred
Pasminco Expl (1996)	190,000	2.8	7.7	0.7	48	1	-	-	inferred
Pas R'bery (1997)	156,000	3.1	8.1	0.7	40	1.3	-	130	inferred

The 1997 calculation was done manually using interpretations on 40 metres sections for lens 1 (the shallow upper lens) only with a lower cut-off grade of $50TMU (1997 values) and an assumed SG of 3. Area of influence was assumed to be half distance to the next section and half distance to the nearest drill holes.

5.1.6.2 1998 Resource Estimate

The resource for what was previously considered Lens 1 has been updated following the latest drilling programme using the sectional method. Drilling has shown the mineralisation is present as a number of high grade lenses within a broad low grade halo. The mineralisation extends from near surface south of line 5290N to approximately 110m below surface on line 5370N.

Mineralisation outlines were digitised on cross-sections spaced 40m apart in Datamine at $20TMU, $40TMU and $60TMU cutoffs. Densities were determined using the standard Pasminco Rosebery Mine formula. No minimum mining width was assumed for this calculation.

The process was repeated assuming a 3m minimum mining width for $40TMU, S50TMU and $60 TMU cutoffs.

Details of all the calculations are contained in Appendix 2.

A summary of the results are contained in Table 5 below.

	Tonnes kt	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe* %	TMU $	Class
No Min. Mining Width									
$20 TMU cutoff	180	1.3	4.4	0.4	31	0.6	2.8	79	Inferred
$40 TMU cut-off	90	2.1	7.4	0.6	47	1.0	2.4	131	Inferred
$60 TMU cutoff	62	2.8	9.6	0.8	58	1.3	2.5	170	Inferred
3m Min. Mining Width									
$40 TMU cutoff	104	1.9	6.8	0.6	45	0.9	2-11	120	Inferred
$50 TMU cut-off	99	1.9	6.9	0.6	46	0.9	2-11	124	Inferred
$60 TMU cutoff	90	1.9	7.4	0.6	49	0.9	2-11	132	Inferred

* Fe assays incomplete in some cases.

By applying a 3m minimum mining width some internal dilution has to be included hence the tonnes have increased whilst grade is lower for than for the equivalent calculation done with no minimum width constraint.

5.1.6.3 Other Mineralisation

Another high grade pod was intersected in an old drill hole, EAF 9, on section 5330N with an adjacent lower grade interval. Whilst drilling on adjacent sections 5290N and 5370N appears to limit its along strike potential, up and down plunge extensions are possible. Depth to the top of the mineralisation is approximately 110m.

An inferred resource estimate was calculated based on the intersections on section 5330N, using a 3m mininum mining width and area of influence half distance to the next section. At a $60TMU lower cutoff the estimate is:

50kt @ 7%Pb, 17.3% Zn, 0.7% Cu, 84g/t Ag, 4.1 g/t Au ($320TMU)

5.1.7 Metallurgical Studies

A number of samples from the latest drilling programme were sent off for thin and polished section examination as part of the ore characterisation studies. Details of the studies are contained in Appendix 3.

Half core from mineralised zones from 4 holes have been submitted for testwork by Pasminco metallurgists. This work is not expected to be completed until February 1999.

5.1.8 Preliminary Mining Feasibility Studies

Preliminary mining scoping and financial studies were carried out at the end of 1997 using the defined resource at that time and based on an open pit mining operation at Browns Tunnel using two possible scenarios:

- *A Base Case mining 110,000 tonnes*: this assumed only part of the resource will be mined

- *An Optimistic Case mining 165,000 tonnes*: this assumed most of the resource will be mined

Grades were as for the overall resource, diluted by 10%.

Mining and capital cost estimates were supplied by Pasminco engineers based on a 50,000 tpa operation.

The results are summarised as follows:

	Base Case	Optimistic Case
Net Cash Flow	$62,000	$669,000
NPV @ 15%	-$3,900	$252,000
IRR	14%	33%

These results demonstrate that the project is marginally viable based on the parameters used but could be improved substantially if additional tonnes at similar grades could be defined.

The financial studies will be re-calculated early in 1999 using the updated resource estimate and revised mining cost parameters.

5.2 SOUTHERN TRENCHES

5.2.1 Introduction

Four trenches numbered ST1-4 were dug in the area by past explorers with some encouraging rock chip sampling results. In 1996 Pasminco Exploration dug 3 additional trenches, cleaned out the old trenches, the trenches were mapped and rock chip sampling carried out. 7 RC holes were drilled with one significant intersection reported in STRC 5 (Webber et al, 1997).

Diamond drilling this year was designed to confirm the significant intersection recorded in 1996 by testing along strike and down dip. One line of MMI soil sampling was carried out for orientation purposes.

5.2.2 Geology

The area was mapped in detail by Pasminco Exploration in 1996/97 (Webber et al, 1997). A north-south striking zone of shearing, alteration and mineralisation within cherty sediments and volcaniclastics was recognised lying between coherent pumice breccia units. The zone appears to be fault bounded on the western side. Zones of pyritic, sericitic and siliceous alteration were mapped with the siliceous zone containing pods of massive base metal sulphide breccia.

5.2.3 Geochemistry

A geochemical orientation survey was conducted over an area of known mineralisation within the Southern Trenches area. The survey was undertaken to investigate the suitability of partial leach (TMI) techniques in comparison to conventional geochemical techniques in detecting and delineating mineralisation below transported overburden, in this case glacial cover.

Sixty six (66) samples were collected on line 4400N directly above a high grade intercept in hole STRC5 (13m @ 11.8% Zn, 7.8% Pb, 9g Au and 0.63% Cu). Sampling procedures are outlined fully in Appendix 4 (Dronseika, 1998) and sample locations are shown in Figure 11.

The samples were initially analysed by Amdel using both conventional multi-acid digest (IC3E) and partial leach digest (IC8M) with "Deepleach" digest No's 33, 18 and 35. Analytical methods and results for this initial sampling and analysis are outlined in Appendix 4.

The samples were subsequently re-analysed using Deepleach digest No's 37 and 40. Deepleach No 37 produced a better multi-element response over mineralisation in comparison to Deepleach No' 18, 33 and 35, as did Deepleach No 40. Amdel's Deepleach No 40 is a modified version of No 37, having the same chelating agent for removing base metals but a stronger concentration of cyanide to liberate gold and precious metals. The results of the No 40 digest produced equivalent anomaly to background responses in Zn, Cd, Co and As and better anomaly to background responses in Au, Mo, Ba and Pb compared to digest No 37. A re-evaluation of the partial leach data by Leigh Bettenay (Bettenay, 1998) concluded that the presence of mineralisation is better shown by all partial leaches than by conventional "total digest" methods. This re-evaluation also concluded that Deepleach No's 37 and 40 produced the most useful data in the resident organic-rich soils. Figures 12 to 17 (from Bettenay, 1998) are profile plots of the Southern Trenches orientation line for lead, zinc, copper, silver, arsenic and cadmium respectively.

5.2.4 Geophysics

No results to report.

5.2.5 Drilling

5.2.5.1 *Drilling Philosophy and Conditions*

The Southern Trenches holes were drilled to follow up a high grade intercept (7m @ 14.11% Pb, 20.54% Zn, 1.12% Cu, 72 g/t Ag, 16.6 g/t Au, $506 TMU from 27m downhole) recorded in STRC5, a reverse circulation hammer hole drilled by Pasminco Exploration in 1996.

Almac Drilling were the drilling contractors using the same rig and the same drilling conditions as for Browns Tunnel. Drill hole details are listed in Table 6.

Table 6: Drill Hole Details - Southern Trenches

LINE	HOLE NO	GRID NORTH	GRID EAST	AMG NORTH	AMG EAST	RL	GRID AZI	DIP	TOTAL DEPTH
	009B	4409.0	4652.0	383804.52	377238.93	421.8	258	-72	73.0
	010B	4409.4	4651.1	383805.07	377238.15	421.8	270	-50	120.2
	014B	4411.2	4657.8	383805.40	377240.40	422.1	90	-89	66.7
	015B	4409.4	4653.4	383804.60	377240.4	421.8	216	-54	70.0
TOTALS									336.2

Note: Coordinates in local grid. Grid north = 000 degrees magnetic

4.2.5.2 *Drilling Results*

Drill logs are contained in Appendix 1.

Significant intersections above a nominal $60 TMU economic cut-off are listed in Table 7 below.

TABLE 7: Significant Intercepts - Southern Trenches

Hole	N (m)	RL (m)	From (m)	To (m)	Int (m)	Pb (%)	Zn (%)	Cu (%)	Ag (g/t)	Au (g/t)	Fe (%)	$ TMU
009B	4400	394	28.0	33.4	5.4	21.3	26.0	2.55	114	11.2	3.5	$593
	4400	382	43.0	44.6	1.6	0.5	4.5	0.08	1	0.1	2.8	$63
010B	4410	398	29.0	32.9	3.9	6.4	9.2	0.98	32	1.1	9.7	$178
014B	4400	404	18.6	18.9	0.3	3.0	7.4	0.02	22	0.1	1.3	$116

009B was drilled directly underneath the STRC5 hole to intersect mineralisation 15-20m down dip. A zone of massive sulphides (sphalerite-galena-pyrite and chalcopyrite) was intersected at 28.6-33.4m. There is weaker sphalerite mineralisation in the few metres surrounding this zone, and most of the sequence is weakly mineralised throughout. Faults seem to bound the more mineralised zone with faults logged at 23.1-24.3m and 44.6-46m. This intersection indicated a shallower dip of the pod than expected of 35-40 degrees, instead of the anticipated ~70 degrees, and resulted in a separation between drill holes of only around 8 metres.

010B was drilled 5m up dip and 7m along strike to the north of the RC intersection. It intersected the massive sulphide mineralisation assemblage as in 009B between 29-31.9m, and disseminated mineralisation from 31.9-32.9m. Unfortunately the zones are extremely broken (most likely within a fault), and despite the use of triple tube during drilling, 1.0m of core was lost between 29-30.2m and 0.3m was lost between 30.2 and 31.3m. The driller indicated that he encountered no cavities, and that the material must have washed away during drilling.

014B was drilled some 17m down dip of the intersection in 009B but did not intersect any significant mineralisation. It appears to have drilled just on the edge of the shear zone containing the known mineralisation.

015B was drilled to test the potential along strike continuation of the pod some 15m to the south. A narrow low grade zone (<$50TMU) was intersected in the expected ore position.

The results confirm the poddy, discontinuous nature of the mineralisation at Southern Trenches.

5.2.6 Resource Estimation

A sectional resource estimate was done for the mineralised pod drilled during the programme. Similar criteria were used as for Browns Tunnel.

The inferred resource calculated is shown in Table 8.

Table 8: 1998 Southern Trenches Resource Estimate

	Tonnes kt	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe* %	TMU $	Class
No Min. Mining Width									
$20 TMU cutoff	17	8.9	12.3	1.0	48	6.7	2.7	283	inferred
$40 TMU cut-off	10	14.7	19.9	1.6	77	11.3	3.8	465	inferred
$60 TMU cutoff	9	15.5	20.8	1.7	81	11.9	3.7	486	inferred
3m Min. Mining Width									
$40 TMU cutoff	10	17.3	21.9	2.0	93	11.0	4-10	508	Inferred
$50 TMU cut-off	10	18.3	23.4	2.1	96	12.1	4-10	544	Inferred
$60 TMU cutoff	10	18.3	23.4	2.1	96	12.1	4-10	544	Inferred

* incomplete Fe assays.

5.3 NORTH KERSHAW-CHESTER

5.3.1 Introduction

During the current reporting period, the North Kershaw grid was refurbished. A B-horizon/MMI partial leach soil sampling program (northern section) and IP survey (southern section) were subsequently carried out over the grid.

5.3.2 Geology

Not mapped in detail. Refer to Section 3 for general geological information on the area.

5.3.3 Geochemistry

A B-horizon/MMI soil sampling program was conducted in the northern section of the North Kershaw grid (Figure 18). The sampling was carried out to investigate possible southern extensions of the Browns Tunnel/Southern Trenches mineralisation, and was conducted over an area with historic multi-element stream sediment anomalism (Webber et al 1997). 263 samples were collected at 25m intervals from a nominal depth of 20cm. The sample numbers were randomised before sampling and then re-configured prior to submission to Amdel for multi-element analysis, using partial leach method IC8/40. Randomised sample numbers were employed so as to minimise possible laboratory or instrumental errors that can creep into sequential analysis and, in the case of soils, potentially generate spurious anomalies. Sample locations are shown in **Figure 18** and analytical results are presented in Appendix 5. As yet no interpretation has been undertaken on the results of this soil sampling program. A discussion and interpretation will included within the next annual report.

5.3.4 Geophysics

5.3.4.1 Introduction

A dipole-dipole IP survey was conducted over the southern portion of the North Kershaw grid. The survey was carried out to infill a gap in coverage which incorporated a 1.5km strike length of the Rosebery Fault hangingwall. A seven (7) line survey covering 13km was completed by Geoterrex during September/October. Processing and interpretation of the IP data has mapped both the Rosebery Fault and the Chester alteration zone. A full report on the survey is presented in Appendix 6. Profiles are shown on Figures 19 to 26.

All data were inverted using the Zonge inversion program RS2DIP, which inverts the data using known topography. The topographic data was extracted from the 50m HEC data set.

All profiles have been restricted to a depth of 200m below the topographic surface as this is the depth of maximum investigation.

5.3.4.2 Discussion of Results

Inversions of resistivity data infer that a conductive surface exists in various parts of the grid (Figure 26). These may correlate with weathering zones (clay). A conductive feature is indicated on the western side of the grid. This feature, although not consistent from line to line, is related to the Rosebery Fault.

There are minor conductive features located on the eastern edge of the grid, which possibly correlate with the Chester alteration zone. The Chester pyrite mine is located on line 80900N.

The chargeability data is dominated by a strong chargeable feature on the western edge of the survey area, correlating with the Rosebery Fault (Figure 27). The chargeability feature does not correlate well with the conductive feature observed in the resistivity inversion. Data for line 80300N infers that the fault is possibly thickening (or there is a second parallel fault).

As the inversion is a smooth layer process, it makes the anomaly associated with the Rosebery Fault appear as an isolated source (an artefact of the inversion process). The chargeability anomalies are either open at depth or closed, which is an indication of the depth of investigation of the inversion process. Geological evidence indicates the fault is a penetrative structure, thus the closure of an chargeability anomalies infers the depth of confident investigation. For the overall survey, the depth of confident investigation varies from 150m to 200m, which is as expected for a generally resistive earth.

There are other minor chargeability highs located throughout the survey area, including two surficial anomalies on line 80900N which may be associated with Chester.

5.3.4.3 Conclusions

The induced polarisation data indicates the location of the Rosebery Fault, and is possibly detecting the Chester alteration zone. However, no isolated anomalies have been identified, for the depth of investigation of between 150 and 200m.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 BROWNS TUNNEL

Preliminary mining feasibility studies based on the resource calculated in 1997 demonstrated that at existing tonnes and grade the deposit is only marginally economic. Drilling carried out in 1998 has shown that the higher grade pods of mineralisation have limited extent within a lower grade halo. The nature of the mineralisation makes it difficult to quantify the mineralisation adequately based on drilling.

Recommendations at this stage are:

- Complete the metallurgical studies and assess results.
- Carry out preliminary mining and pre-feasibility studies using the latest resource figures to determine the viability of the deposit.
- Following the above, assess the options available to the JV with respect to this deposit.

6.2 SOUTHERN TRENCHES

No further work is contemplated at this stage, pending the results of the Browns Tunnel studies.

6.3 NORTH KERSHAW-CHESTER

The program completed in the current year targeted two contiguous areas in the North Kershaw-Chester zone which merited detailed work. The northern one is characterised by historic stream sediment anomalism adjacent to a jog position in the Rosebery Fault. Results have been returned for this but interpretation of the survey is not currently completed and will be reported on in a subsequent report. The second area, west of Chester, has historic geochemical coverage (streams, soils) but lacked IP coverage. This survey was therefore undertaken to infill a significant gap in coverage in a highly prospect structural and stratigraphic architecture. However, the IP data has not highlighted anomalies that can be attributed to mineralisation.

7. ENVIRONMENTAL DISTURBANCE AND REHABILITATION

Drilling at Browns Tunnel utilised existing drill site and tracks where possible. Approximately 200 metres of new track was made.

Drilling at Southern Trenches utilised existing tracks and drill sites. Above ground tanks were used to catch drilling fluids and no sumps were required.

No rehabilitation work has been completed apart from clean up of drill sites and backfilling of sumps.

8. PROPOSED PROGRAMME FOR 1999

8.1 BROWNS TUNNEL

The proposed programme involves completing the metallurgical testwork by February 1999 and assessing the results.

A pre-feasibility study will then be completed to allow the JV partners to assess the future options for this prospect.

8.2 SOUTHERN TRENCHES

No further work planned pending results of Browns Tunnel assessment.

8.3 NORTH KERSHAW-CHESTER

Analysis of the partial leach soil survey will determine any follow up work in the prospect area. This will need to be integrated with other geochemical and geophysical data sets in the analysis. Should significant anomalies emerge, at least one diamond hole is envisaged to test potential targets.

9. 1998 EXPLORATION EXPENDITURE

Total exploration expenditure from November 1997 to end December 1998 was $479,703 broken up as shown on Table 9.

TABLE 9: 1998 EXPLORATION EXPENDITURE, EL44/88
1st November 1997 to 31st December 1998

ITEM	EL 44/88		
	Mine	Pasex	TOTAL
Geology	39,432.07	66,160.00	105,592.07
Geochemistry	43,995.48	20,694.00	64,689.48
Geophysics- air (line km:)			-
Geophysics- ground (line km: 12.775)		16,839.00	16,839.00
Geophysics- downhole			-
Feasibility Studies			-
Drilling (metres: 1,966.1)	140,197.80	44,557.00	184,754.80
Gridding (line km: 14)		10,000.00	10,000.00
Administration (not exceeding 10% of total)	2,751.85	27,772.00	30,523.85
OTHER:			-
Misc Supplies	6,695.60	4,131.00	10,826.60
Office		29,297.00	29,297.00
Travel & Accomm		4,103.00	4,103.00
rentals, tenement admin etc	2,658.00	2,797.00	5,455.00
Vehicle, plant & equipment	13,556.17	4,066.00	17,622.17
Sub-Total - Other			-
			-
TOTAL FOR 1998	249,286.97	230,416.00	479,702.97

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PASMINCO ROSEBERY MINE
BURNS PEAK EL 44/88
JOINT VENTURE ANNUAL REPORT
1st NOVEMBER 1997 TO 31ST DECEMBER 1998

REFERENCES

Bettenay, L., 1998. Tasmanian Soil Partial Leach Surveys. Assessment of Results and Methodology for Orientation Surveys and Grid Sampling. Report for Pasminco Australia Ltd. November 1998.

Brown, A.A., 1986. Geology of the Dundas-Mt Lindsay Mt Youngbuck Region. Geology Survey Tasmania Bull. 6

Crawford, A.J., and Berry, R.F., 1991. Tectonic Implications of the Late Proterozoic - Early Paleozoic Igneous Rock Associations in Western Tasmania : Tectonophysics

Dibben, S.M., 1997. Burns Peak EL 44/88 Joint Venture Progress Report November 1996 - February 1997. Unpublished report for Pasminco Exploration (Report No VC156)

Dronseika, E., 1998. Preliminary Orientation Partial Digest Soil Geochemistry Survey. "Southern Trenches" Area Rosebery District, Tasmania. May 1998.

Keele, R.A., 1991. The Zeehan - Red Hills - Lake Selina Traverse - A Domain Approach to the Analysis of Structural Data. CODES : AMIRA Project P291 - Structure and Mineralisation in Western Tasmania. November 1991

Kirsner, L.W., 1992. EL44/88 Burns Peak Annual report for the period November 1991 - October 1992. Pasminco Exploration Report No. T92-15

Kirsner, L.W., Lorrigan, A.N., and Rae, H.C., 1991. EL44/88 Burns Peak Annual report for period November 1990 - October 1991. Pasminco Exploration Report No. T91-13

Lorrigan, A.N., 1990. EL44/88 Burns Peak Annual Report for the period November 1989 - October 1990. Pasminco Exploration Report No. T90-1

Murphy, F.C., 1997. Western Tasmania Review. Exploration Potential of Pasminco Exploration's EL's and surrounding areas. Unpublished report for Pasminco Exploration (Report VC163)

Murphy, F.C., and Denwar, K. 1998. Burns Peak EL 44/88 Partial Relinquishment Report. Western Tasmania Review. Unpublished report for Pasminco Exploration (Report VC217)

Poltock, R.A., Kirsner, L.W., and Saxon, M.S., 1993. Burns Peak Annual Report for the Period November 1992 - October 1993. Pasminco Exploration Report No. T93-16

Poltock, R.A., and Saxon, M.S., 1994. Burns Peak Annual Report for the Period November 1993 - October 1994. Pasminco Exploration Report No. T94-13

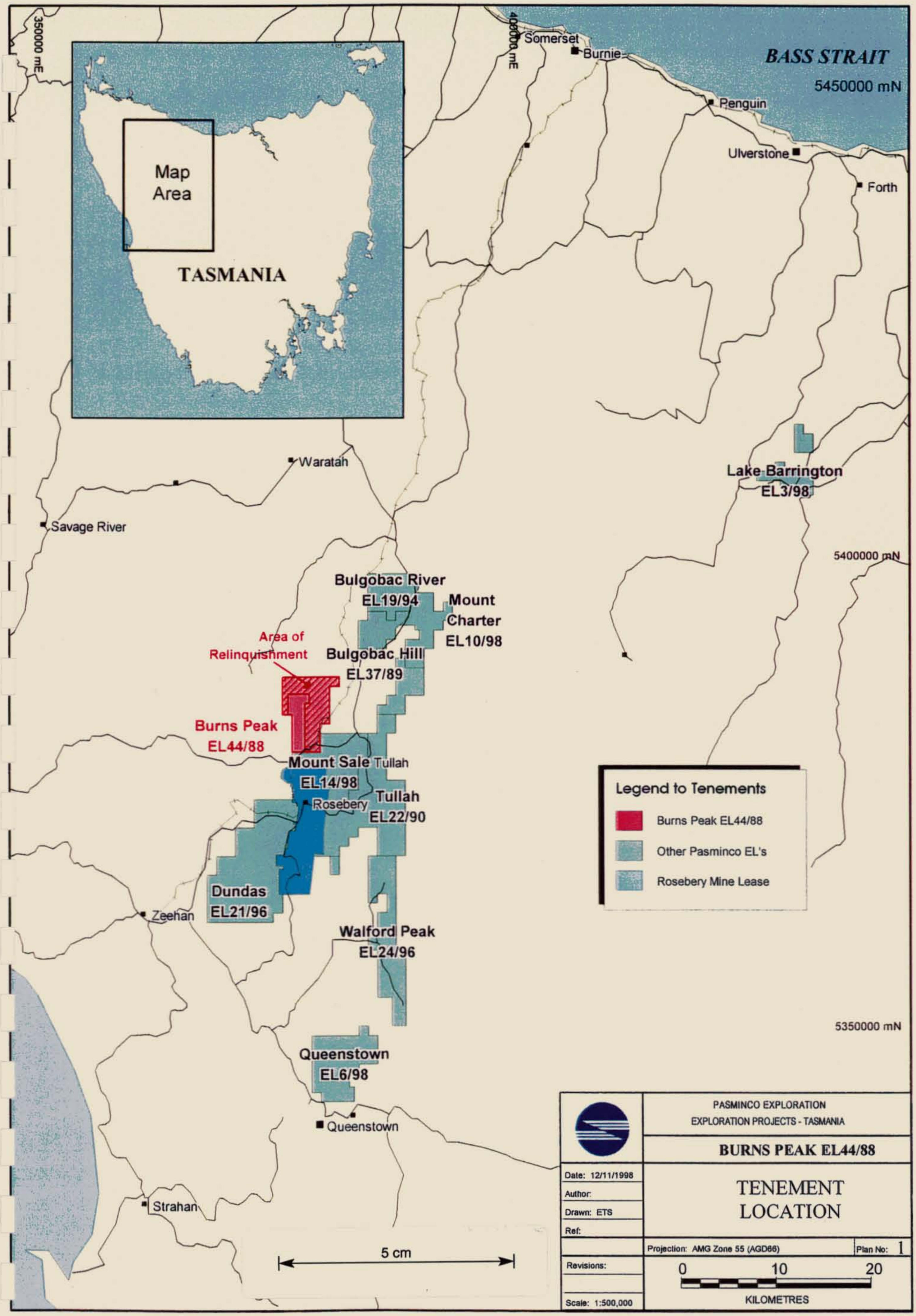
Quayle, P.M. and Dibben.S.M., 1996. Burns Peak EL 44/88 Joint Venture Annual Report, Period Ending October 1996, Pasminco Exploration Report No TA-30

Roberts, R.H 1985. Chester/Pinnacles Interim Report EL 5/63 PART 4: Browns Workings. Unpublished report for Comstaff Pty Ltd

Rosenhain, A.N. and Mathison, I.J., November 1989. EL44/88 Burns Peak. Annual Report on Exploration Activity. January 1989 - October 1989

Saxon, M.S., 1995. Burns Peak Annual Report for the period November 1994 - October 1995, Pasminco Exploration Report No. T95-19

Webber,G.B, Dibben, S.M and F.C. Murphy 1997. Burns Peak EL 44/88 Joint Venture Annual Report for the Period ending October 1997. Unpublished Report for Pasminco Exploration.


350000 mE
400000 mE
Somerset
Burnie
BASS STRAIT
5450000 mN
Penguin
Ulverstone
Forth
Map
Area
TASMANIA
Waratah
Savage River
Lake Barrington
EL3/98
5400000 mN
Bulgobac River
EL19/94
Mount
Charter
EL10/98
Area of
Relinquishment
Bulgobac Hill
EL37/89
Burns Peak
EL44/88
Mount Sale
Tullah
EL14/98
Rosebery
Tullah
EL22/90
Legend to Tenements
Burns Peak EL44/88
Other Pasminco EL's
Rosebery Mine Lease
Dundas
EL21/96
Zeehan
Walford Peak
EL24/96
5350000 mN
Queenstown
EL6/98
Queenstown
Strahan
5 cm
PASMINCO EXPLORATION
EXPLORATION PROJECTS - TASMANIA
BURNS PEAK EL44/88
Date: 12/11/1998
Author:
Drawn: ETS
Ref:
TENEMENT
LOCATION
Projection: AMG Zone 55 (AGD66)
Plan No: 1
Revisions:
0
10
20
KILOMETRES
Scale: 1:500,000

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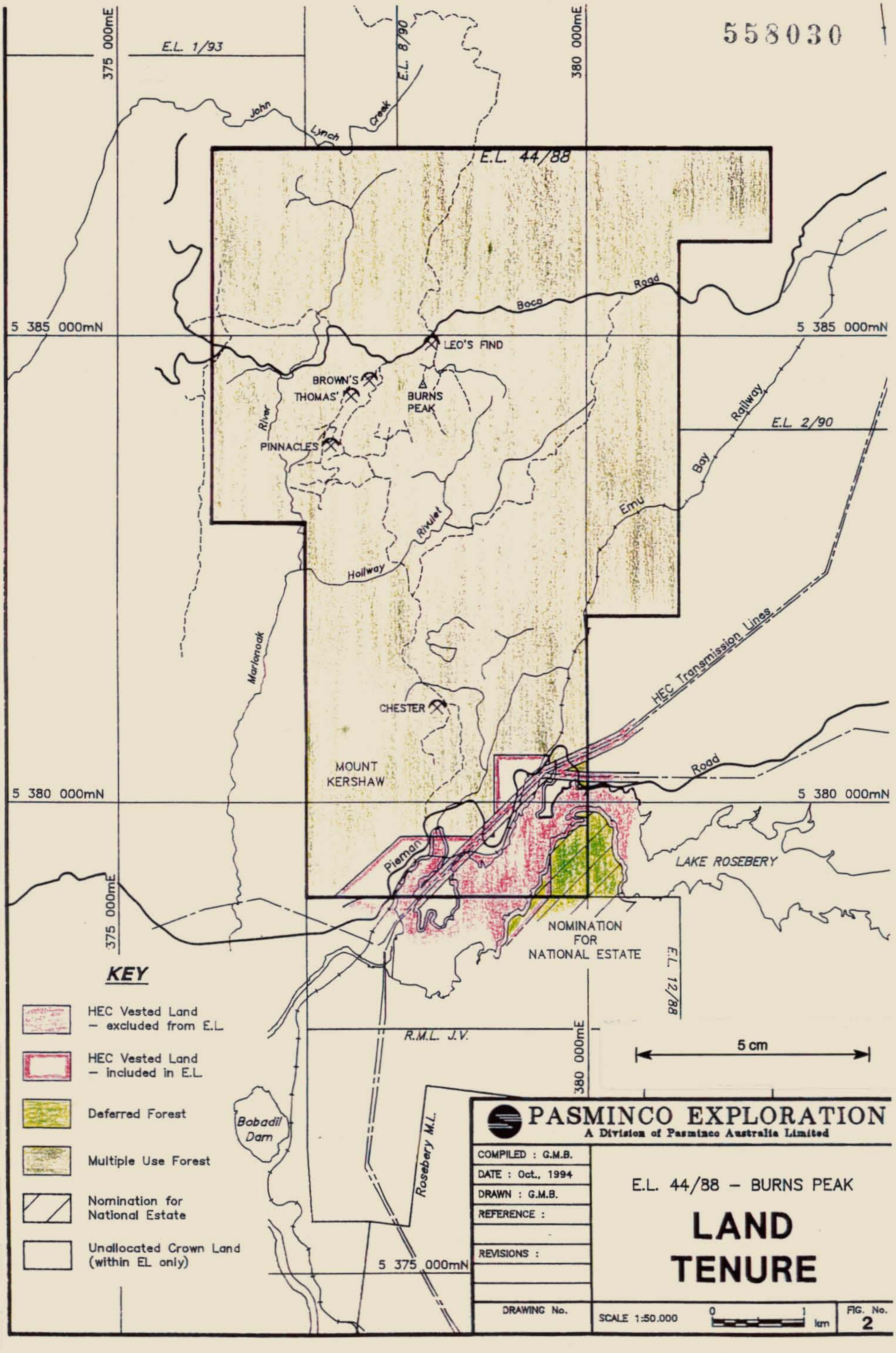


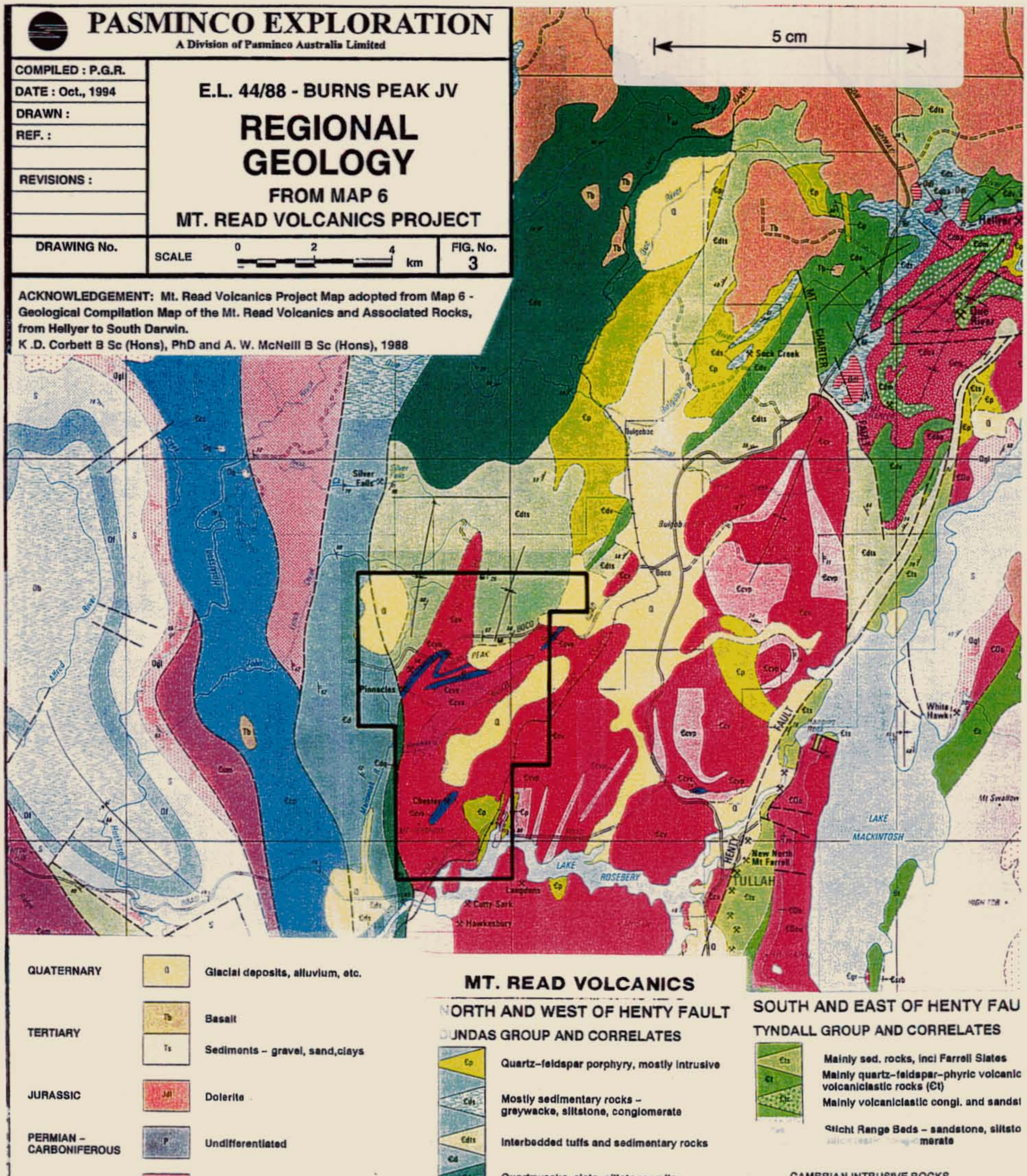
PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : G.M.B.	
DATE : Oct., 1994	E.L. 44/88 - BURNS PEAK
DRAWN : G.M.B.	
REFERENCE :	LAND TENURE
REVISIONS :	
DRAWING No.	SCALE 1:50.000 — FIG. No. 2

PASMINCO EXPLORATION
A Division of Pasminco Australia Limited

COMPILED : P.G.R.	E.L. 44/88 - BURNS PEAK JV
DATE : Oct., 1994	
DRAWN :	REGIONAL GEOLOGY
REF. :	FROM MAP 6
REVISIONS :	MT. READ VOLCANICS PROJECT
DRAWING No.	SCALE 0 2 4 km — FIG. No. 3

ACKNOWLEDGEMENT: Mt. Read Volcanics Project Map adopted from Map 6 - Geological Compilation Map of the Mt. Read Volcanics and Associated Rocks, from Hellyer to South Darwin.
K .D. Corbett B Sc (Hons), PhD and A. W. McNeill B Sc (Hons), 1988



QUATERNARY	Q	Glacial deposits, alluvium, etc.
TERTIARY	Tb	Basalt
	Ts	Sediments - gravel, sand,clays
JURASSIC	Jdl	Dolerite
PERMIAN - CARBONIFEROUS	P	Undifferentiated
DEVONIAN	Dd	Dolerite
	Dg	Granite
DEVONIAN - SILURIAN (S-D)	Db	Bell Shale
	Df	Florence Sandstone
	S	Silurian
ORDOVICIAN	Ogl	GORDON GROUP limestone
EARLY ORDOVICIAN - LATE CAMBRIAN	€Oou	Upper sandstone sequence including Pioneer Beds (€Oou)
	€Oo	Undifferentiated conglomerate and sandstone (€Oo)
	€Oon	Newton Creek Sandstone (€Oon) - interbedded sandstone siltstone and conglomerate with marine fossils

MT. READ VOLCANICS

NORTH AND WEST OF HENTY FAULT

DUNDAS GROUP AND CORRELATES

€p	Quartz-feldspar porphyry, mostly intrusive
€ds	Mostly sedimentary rocks - greywacke, siltstone, conglomerate
€dts	Interbedded tuffs and sedimentary rocks
€dq	Quartzwacke-slate-siltstone units, e.g. Stitt Quartzite
€dv	Mostly felsic volcanics - mainly tuffs
€dm	Mixed felsic and mafic volcanics and epiclastic breccias, Que-Hellyer area
€dba	Basaltic to andesitic volcanics

CENTRAL VOLCANIC COMPLEX

€cv	Mainly feldspar-phyric volcanics — dacite, rhyolite,minor andesite (€cv)
€p	Felsic porphyry, mainly intrusive
€cvp	Mainly pyroclastic rocks
€cvs	Sedimentary rocks, mainly shale and sandstone
€cva	Andesitic volcanics

SOUTH AND EAST OF HENTY FAU

TYNDALL GROUP AND CORRELATES

€ts	Mainly sed. rocks, incl Farrell Slates
€t	Mainly quartz-feldspar-phyric volcanic volcaniclastic rocks (€t)
€tc	Mainly volcaniclastic congl. and sandst
	Sticht Range Beds - sandstone, siltsto ... merate

CAMBRIAN INTRUSIVE ROCKS

	Granite
€p	Felsic porphyry
€g	Gabbro
€um	Ultramafic rocks & serpentinite

PRECAMBRIAN

Ps	Quartzite-slate sequences — correlates of Oonah Formation
Pm	Metamorphosed sequences of Tyenr Major lithological boundary trends s

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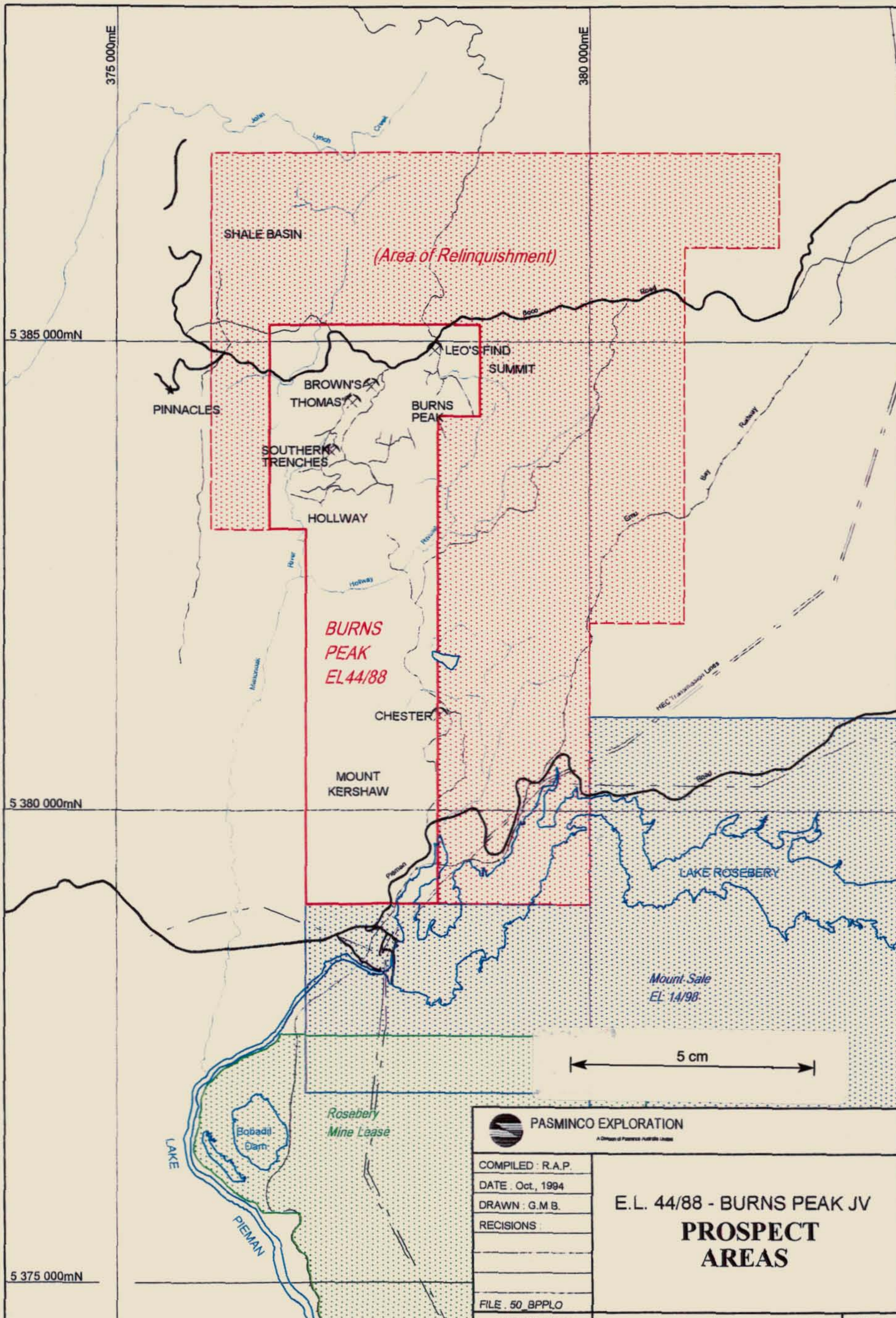

375 000mE
380 000mE
5 385 000mN
5 380 000mN
5 375 000mN
SHALE BASIN
(Area of Relinquishment)
LEO'S FIND
SUMMIT
BROWN'S
THOMAS'
BURNS PEAK
PINNACLES
SOUTHERN TRENCHES
HOLLWAY
BURNS PEAK EL44/88
CHESTER
MOUNT KERSHAW
LAKE ROSEBERY
Mount Sale EL 14/98
5 cm
Rosebery Mine Lease
Bobadil Dam
LAKE PIEMAN
PASMINCO EXPLORATION
COMPILED : R.A.P.
DATE : Oct., 1994
DRAWN : G.M.B.
RECISIONS :
FILE . 50_BPPLO
DRAWING No.
E.L. 44/88 - BURNS PEAK JV
PROSPECT AREAS
SCALE 1:50,000
0 1 km
FIG No. 4

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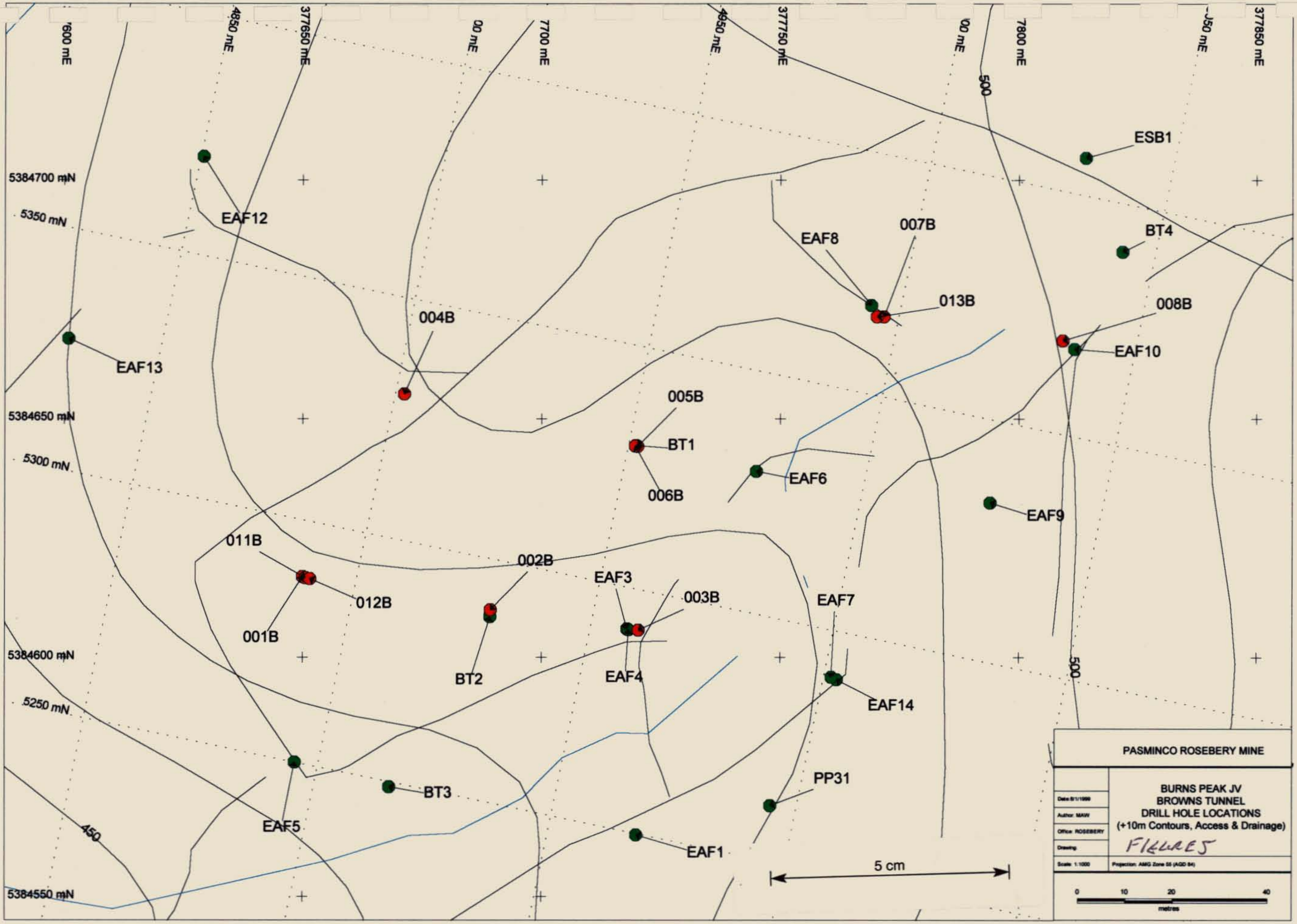
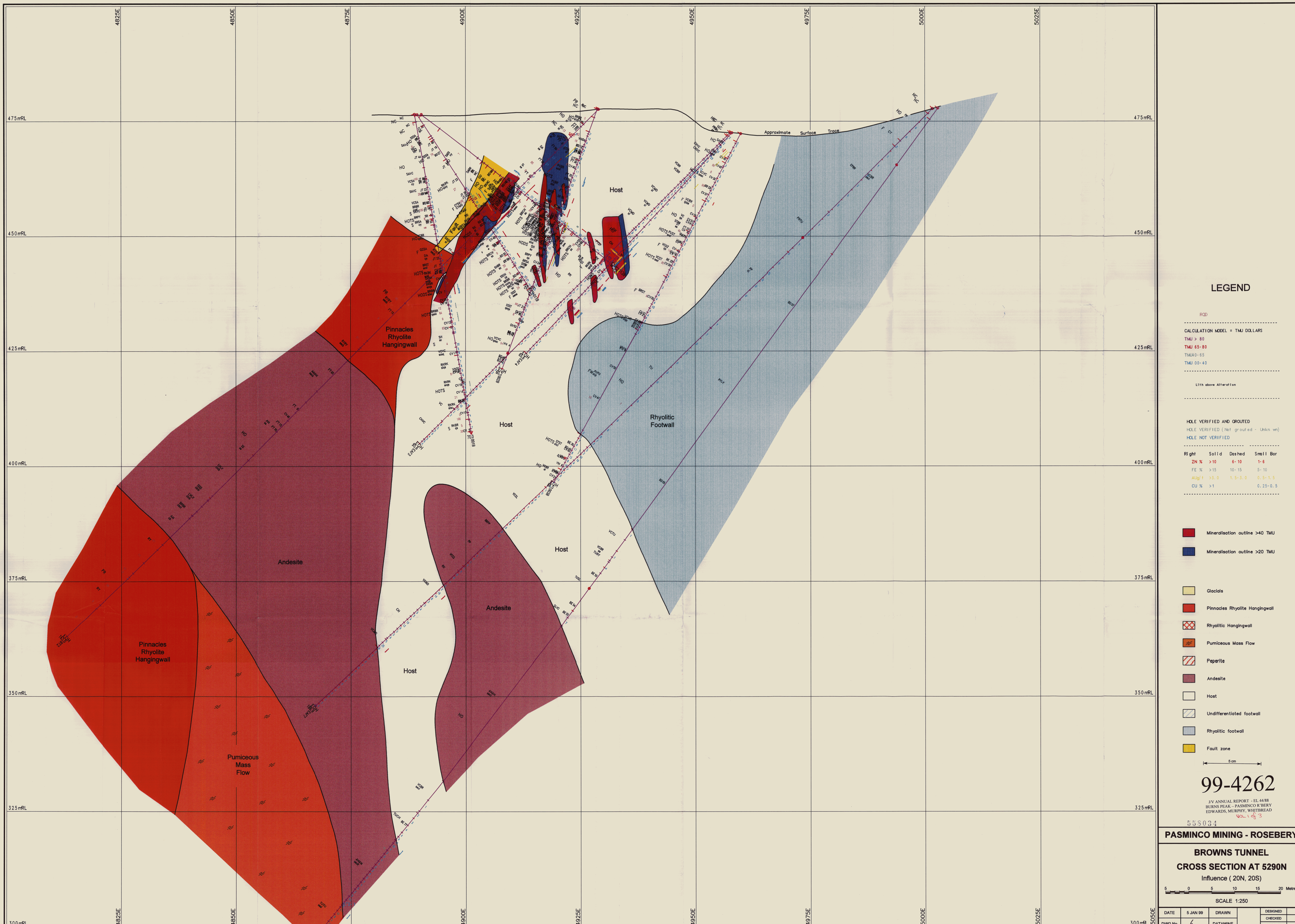


600 mE
4850 mE
377650 mE
00 mE
7700 mE
4950 mE
377750 mE
00 mE
7800 mE
377850 mE
5384700 mN
5350 mN
5384650 mN
5300 mN
5384600 mN
5250 mN
5384550 mN
500
450
ESB1
EAF12
EAF8
007B
BT4
013B
008B
004B
EAF13
EAF10
005B
BT1
EAF6
006B
EAF9
011B
002B
EAF3
003B
EAF7
012B
001B
BT2
EAF4
EAF14
BT3
PP31
EAF5
EAF1
5 cm
PASMINCO ROSEBERY MINE
BURNS PEAK JV
BROWNS TUNNEL
DRILL HOLE LOCATIONS
(+10m Contours, Access & Drainage)
FIGURE 5
Author: MAW
Office: ROSEBERY
Drawing
Scale: 1:1000
0
10
20
40
metres

558033


4825E
4850E
4875E
4900E
4925E
4950E
4975E
5000E
5025E
5050E
475mRL
450mRL
425mRL
400mRL
375mRL
350mRL
325mRL
300mRL
Approximate Surface Trace
Host
Fault
Pinnacles Rhyolite Hangingwall
Host
Rhyolitic Footwall
Andesite
Host
Andesite
Host
Pinnacles Rhyolite Hangingwall
Pumiceous Mass Flow
LEGEND
RQD
CALCULATION MODEL = TMU DOLLARS
TMU > 80
TMU 65-80
TMU40-65
TMU 00-40
Lith above Alteration
HOLE VERIFIED AND GROUTED
HOLE VERIFIED (Not grouted - Unkn wn)
HOLE NOT VERIFIED
Right Solid Dashed Small Bar
ZN % >10 6-10 1-6
FE % >15 10-15 5-10
AUg/t >3.0 1.5-3.0 0.5-1.5
CU % >1 0.25-0.5
Mineralisation outline >40 TMU
Mineralisation outline >20 TMU
Glacials
Pinnacles Rhyolite Hangingwall
Rhyolitic Hangingwall
Pumiceous Mass Flow
Peperite
Andesite
Host
Undifferentiated footwall
Rhyolitic footwall
Fault zone
5 cm
99-4262
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BURNS PEAK – PASMINCO R'BERY
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558034
PASMINCO MINING - ROSEBERY
BROWNS TUNNEL
CROSS SECTION AT 5290N
Influence (20N, 20S)
5 0 5 10 15 20 Metres
SCALE 1:250
DATE 5 JAN 99
DRAWN
DWG No 6
DATAMINE
DESIGNED
CHECKED
APPROVED


4825E
4850E
4875E
4900E
4925E
4950E
4975E
5000E
5025E
5050E
475mRL
450mRL
425mRL
400mRL
375mRL
350mRL
325mRL
300mRL
Glacials
Andesite
Approximate Surface Trace
Rhyolitic Footwall
Pinnacles Rhyolite Hangingwall
Peperite
Host
Rhyolitic Footwall
Andesite
Pinnacles Rhyolite Hangingwall
Andesite
Host
Rhyolite
Andesite
Rhyolitic Footwall
Pinnacles Rhyolite Hangingwall
LEGEND
RQD
CALCULATION MODEL = TMU DOLLARS
TMU > 80
TMU 65-80
TMU40-65
TMU 00-40
Lith above Alteration
HOLE VERIFIED AND GROUTED
HOLE VERIFIED (Not grouted - Unknown)
HOLE NOT VERIFIED
Right Solid Dashed Small Bar
ZN % >10 6-10 1-6
FE % >15 10-15 5-10
AUg/t >3.0 1.5-3.0 0.5-1.5
CU % >1 0.25-0.5
Mineralisation outline >40 TMU
Mineralisation outline >20 TMU
Glacials
Pinnacles Rhyolite Hangingwall
Rhyolitic Hangingwall
Pumiceous Mass Flow
Peperite
Andesite
Host
Undifferentiated footwall
Rhyolitic footwall
Fault zone
5 cm
99-4262
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BURNS PEAK – PASMINCO R'BERY
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PASMINCO MINING - ROSEBERY
553035
CROSS SECTION AT 5330
Influence (20N, 20S)
5 0 5 10 15 20 Metres
SCALE 1:250
DATE 5 JAN 99
DRAWN DATAMINE
DWG No 7
DESIGNED
CHECKED
APPROVED


4825E
4850E
4900E
4925E
4950E
4975E
5000E
5025E
475mRL
450mRL
425mRL
400mRL
375mRL
350mRL
325mRL
300mRL
Approximate Surface Trace
Undifferentiated Footwall
Rhyolitic Footwall
Rhyolitic Hangingwall
Host
Peperite
Pinnacles Rhyolite Hangingwall
Brecciated Rhyolitic Hangingwall (Possible Pinnacles Rhyolite)
Andesite
Rhyolitic Hangingwall
LEGEND
RQD
CALCULATION MODEL = TMU DOLLARS
TMU > 80
TMU 65-80
TMU40-65
TMU 00-40
Lith above Alteration
HOLE VERIFIED AND GROUTED
HOLE VERIFIED (Not grouted - Unknown)
HOLE NOT VERIFIED
Right Solid Dashed Small Bar
ZN % >10 6-10 1-6
FE % >15 10-15 5-10
AUg/t >3.0 1.5-3.0 0.5-1.5
CU % >1 0.25-0.5
Mineralisation outline >40 TMU
Mineralisation outline >20 TMU
Glacials
Pinnacles Rhyolite Hangingwall
Rhyolitic Hangingwall
Pumiceous Mass Flow
Peperite
Andesite
Host
Undifferentiated footwall
Rhyolitic footwall
Fault zone
5 cm
99-4262
J/V ANNUAL REPORT - EL 44/88
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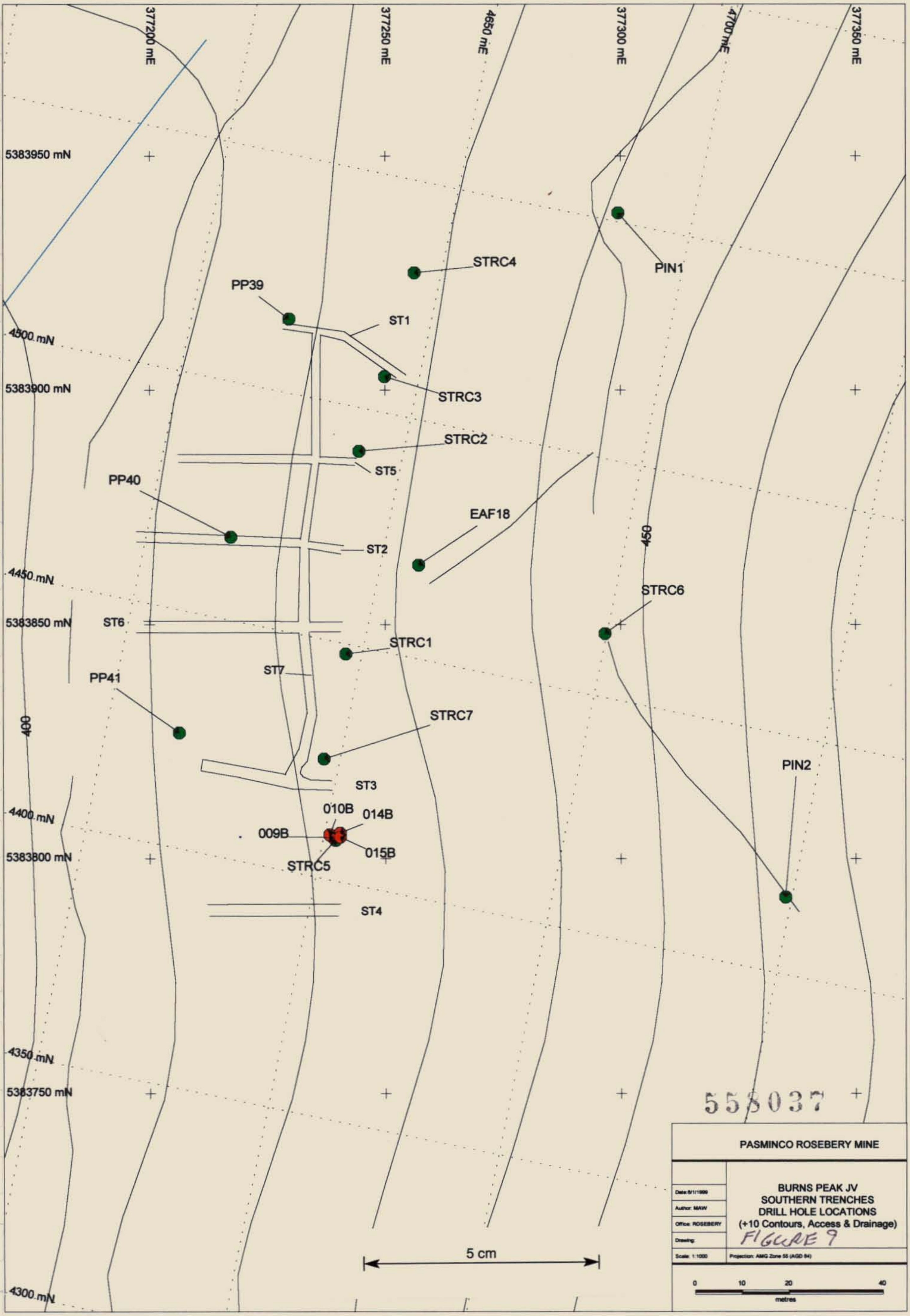
PASMINCO MINING - ROSEBERY
BROWNS TUNNEL
CROSS SECTION AT 5370N
Influence (20N, 20S)
5 0 5 10 15 20 Metres
SCALE 1:250
DATE 5 JAN 99
DRAWN
DWG No 8
DATAMINE
DESIGNED
CHECKED
APPROVED



55S037

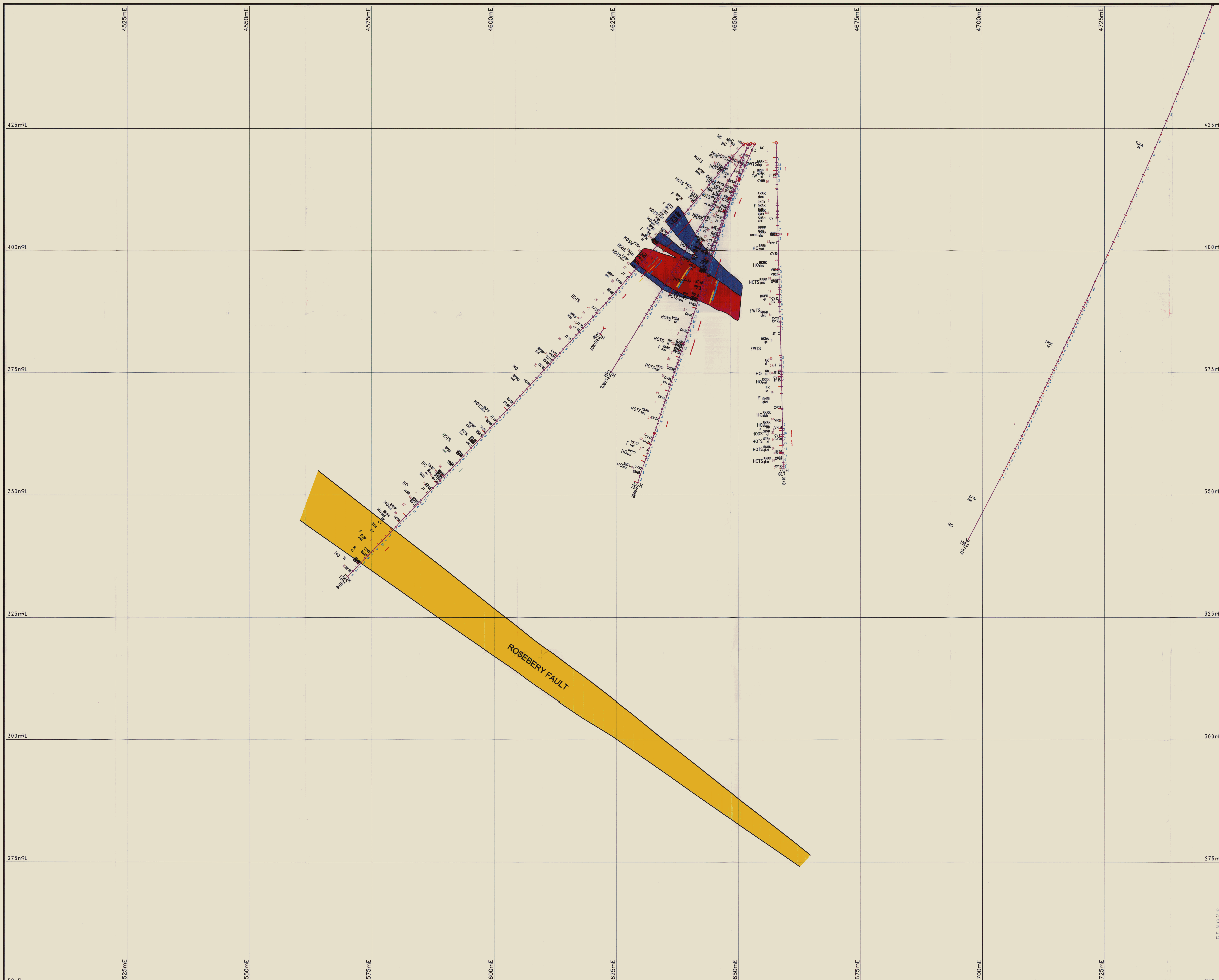
PASMINCO ROSEBERY MINE

Date: 8/1/1999
Author: MAW
Office: ROSEBERY
Drawing:
Scale: 1:1000

BURNS PEAK JV
SOUTHERN TRENCHES
DRILL HOLE LOCATIONS
(+10 Contours, Access & Drainage)
FIGURE 9

Projection: AMG Zone 55 (AGD 84)

0 10 20 40
metres



LEGEND

RQD

CALCULATION MODEL = TMU DOLLARS
TMU > 80
TMU 65-80
TMU40-65
TMU 00-40

Lith above Alteration

HOLE VERIFIED AND GROUTED
HOLE VERIFIED (Not grouted - Unkn wn)
HOLE NOT VERIFIED

Right	Solid	Dashed	Small Bar
ZN %	>10	6-10	1-6
FE %	>15	10-15	5-10
AUg/t	>3.0	1.5-3.0	0.5-1.5
CU %	>1		0.25-0.5

5 cm

Mineralisation outline >40 TMU

Mineralisation outline >20 TMU

Fault zone

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PASMINCO MINING - ROSEBERY

SOUTHERN TRENCHES
CROSS SECTION AT 4405N

Influence (20N, 20S)

5 0 5 10 15 20 Metres

SCALE 1:250

DATE	5 JAN 99	DRAWN		DESIGNED	
DWG No	10	DATAMINE		CHECKED	
				APPROVED	

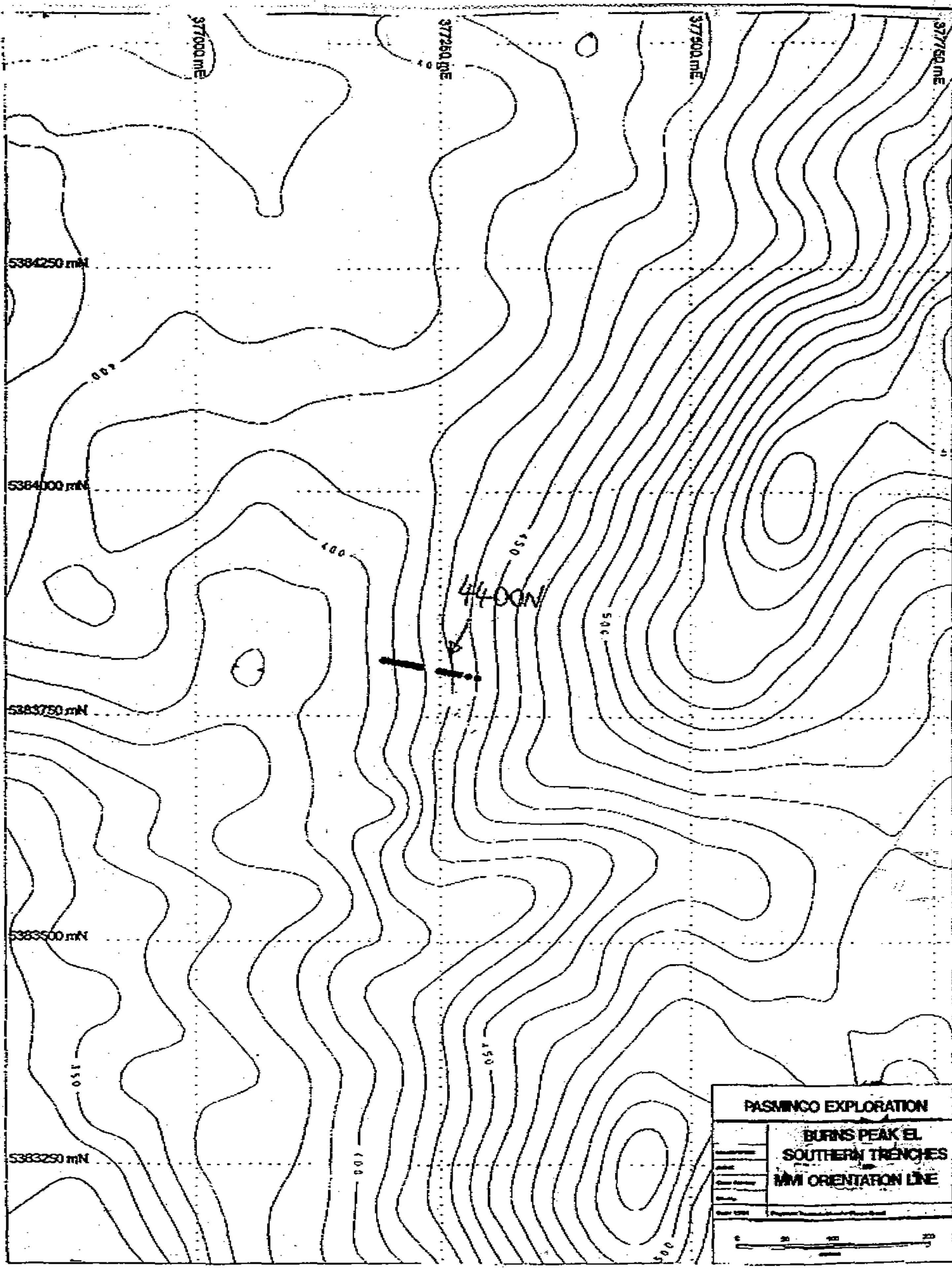


FIGURE 11

5 cm

558039

Southern Trenches Orientation Line- Profile plot of LEAD in Deepleach 40, Deepleach 37 and Deepleach 35

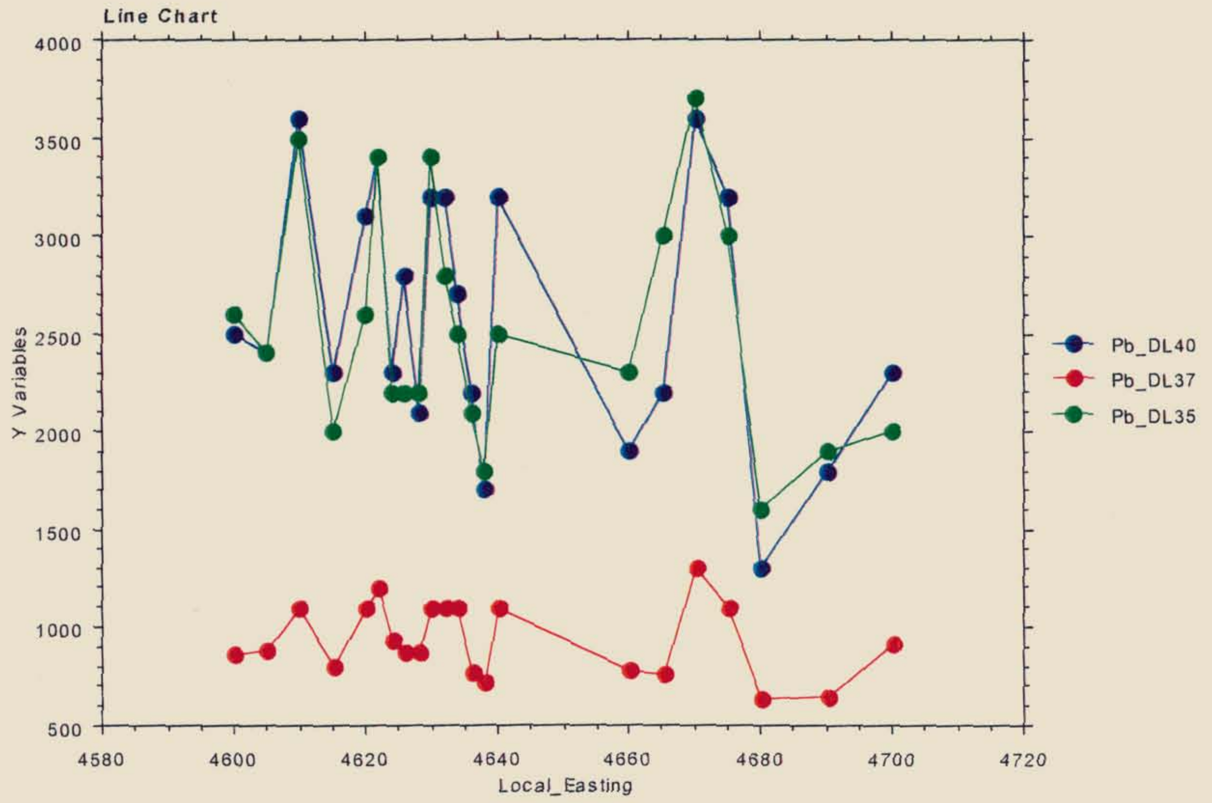


FIG 12

558041

Southern Trenches Orientation Line- Profile plot of ZINC in Deepleach 40, Deepleach 37 and Deepleach 35

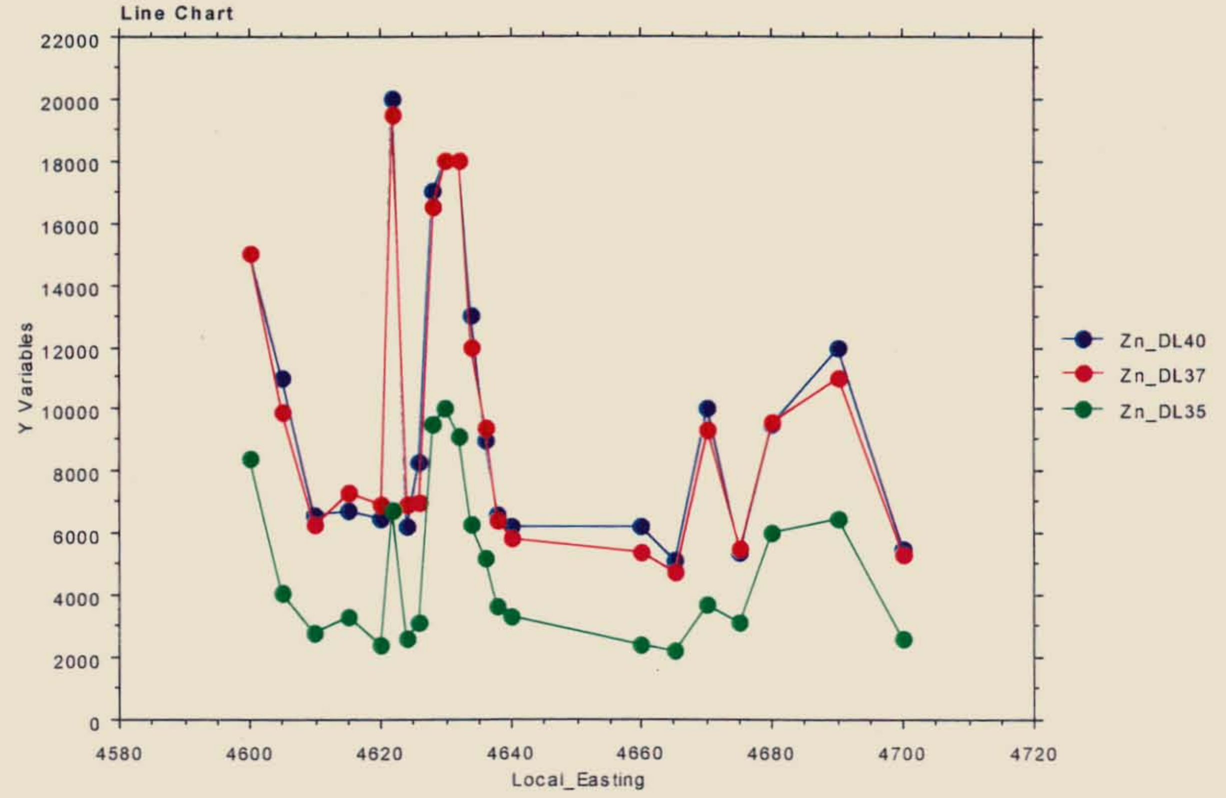


FIG. 13

Southern Trenches Orientation Line- Profile plot of COPPER in Deepleach 40, Deepleach 37 and Deepleach 35

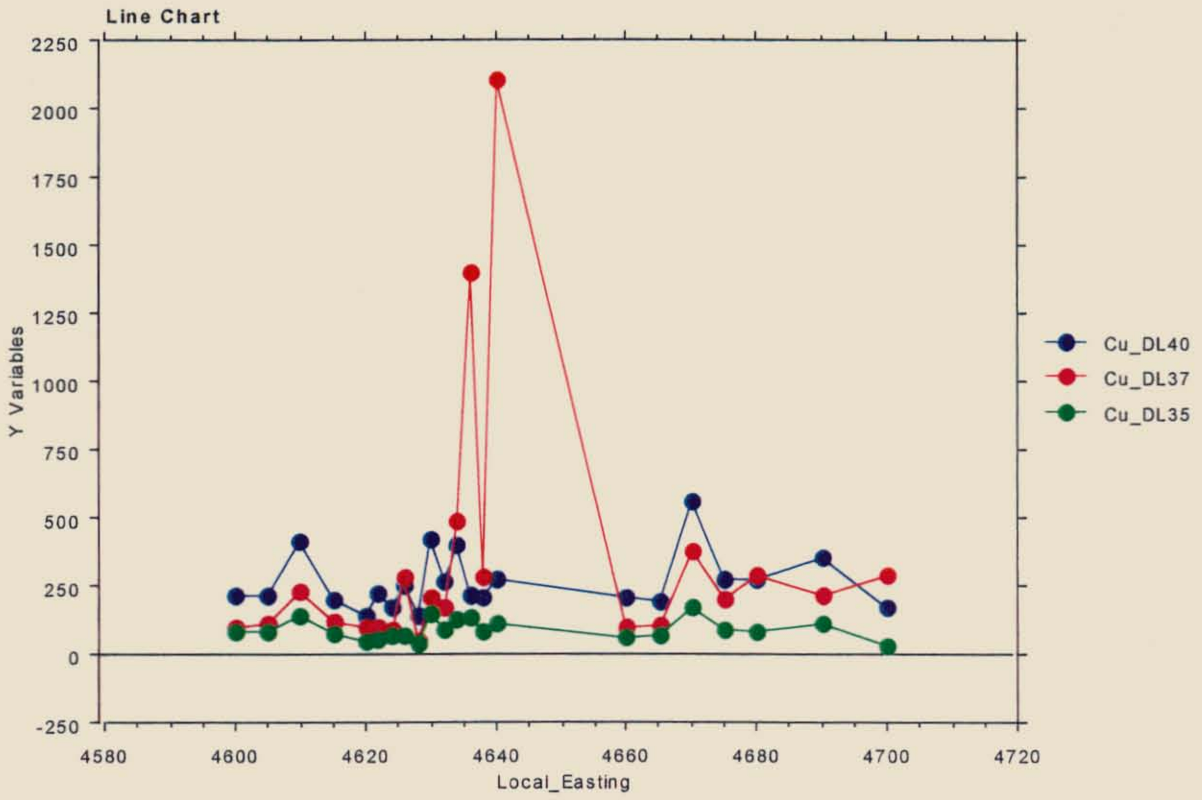


FIG 14

558043

Southern Trenches Orientation Line- Profile plot of SILVER in Deepleach 40, Deepleach 37 and Deepleach 35

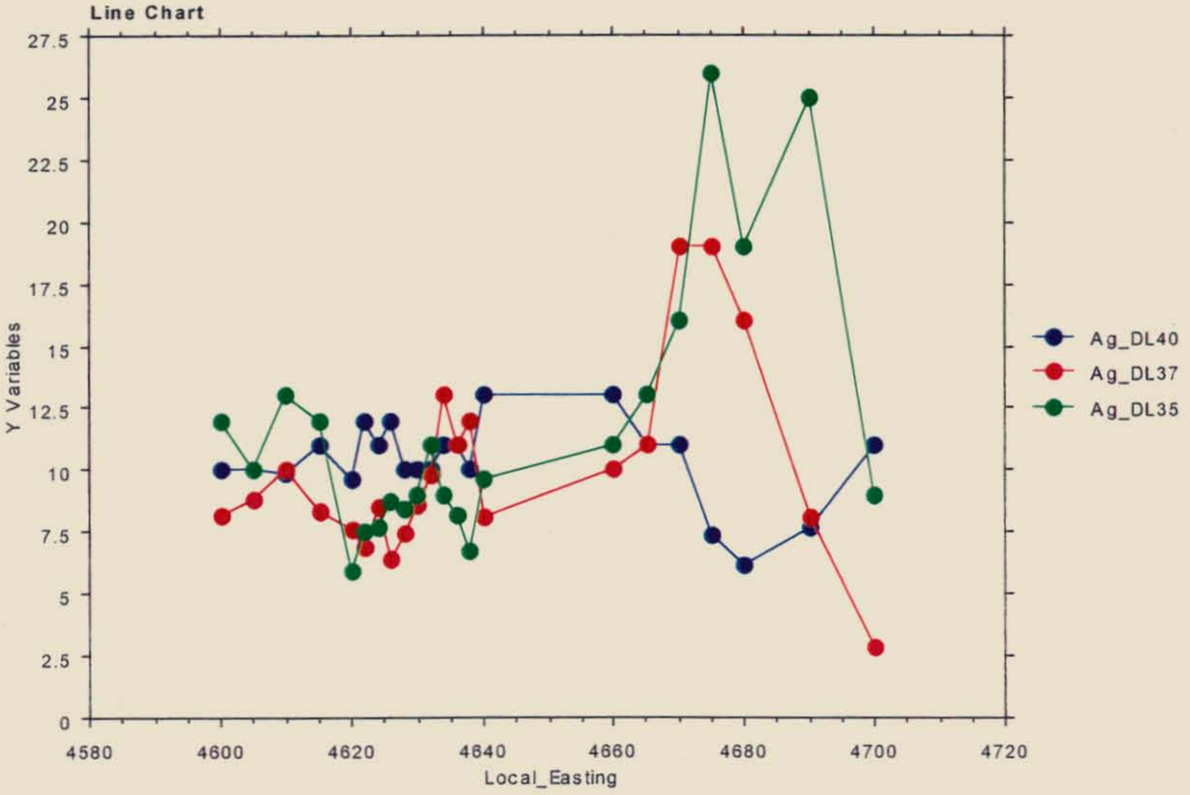


FIG 15

553044

Southern Trenches Orientation Line- Profile plot of ARSENIC in Deepleach 40, Deepleach 37 and Deepleach 35

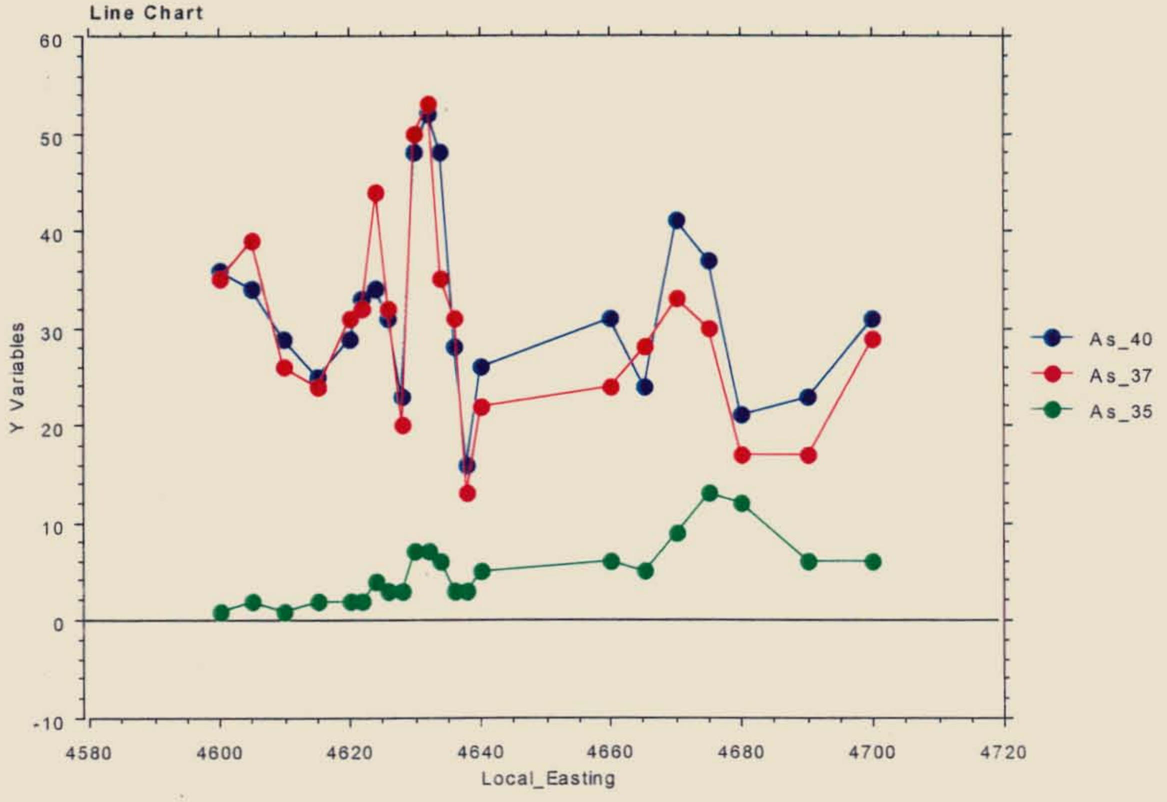


FIG 16

Southern Trenches Orientation Line- Profile plot of CADMIUM in Deepleach 40, Deepleach 37 a nd Deepleach 35

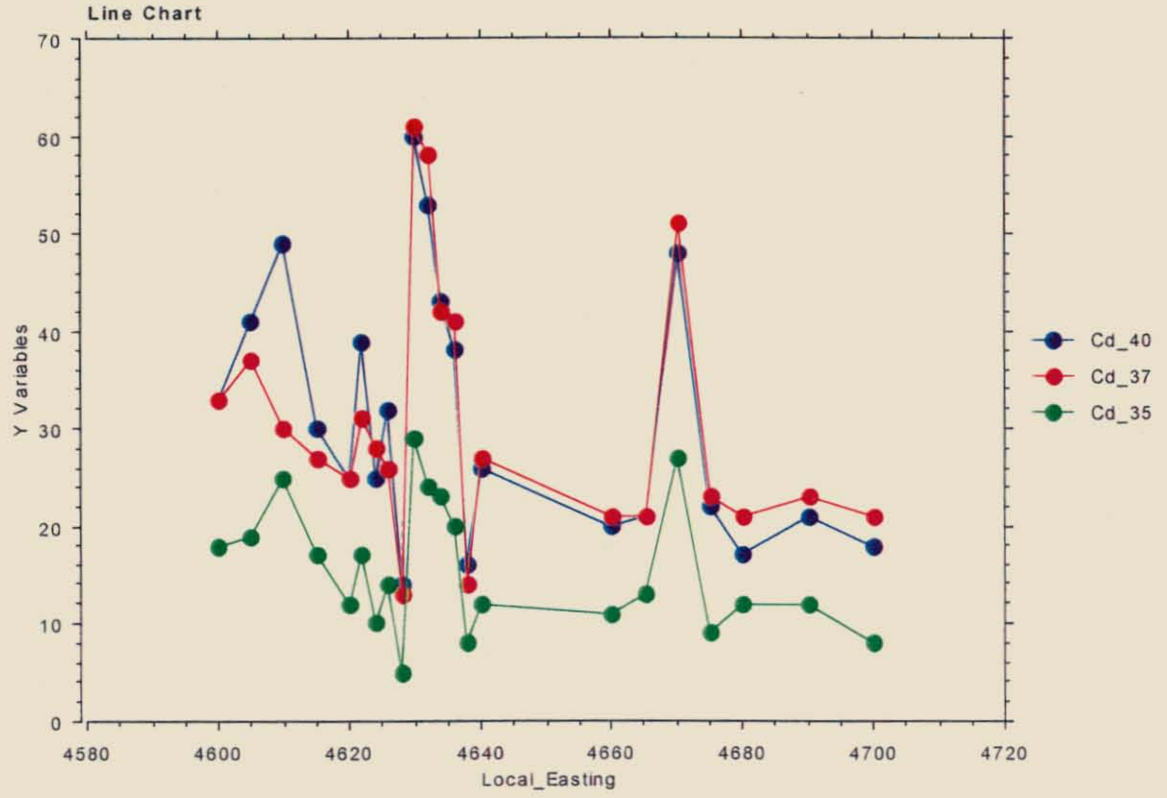
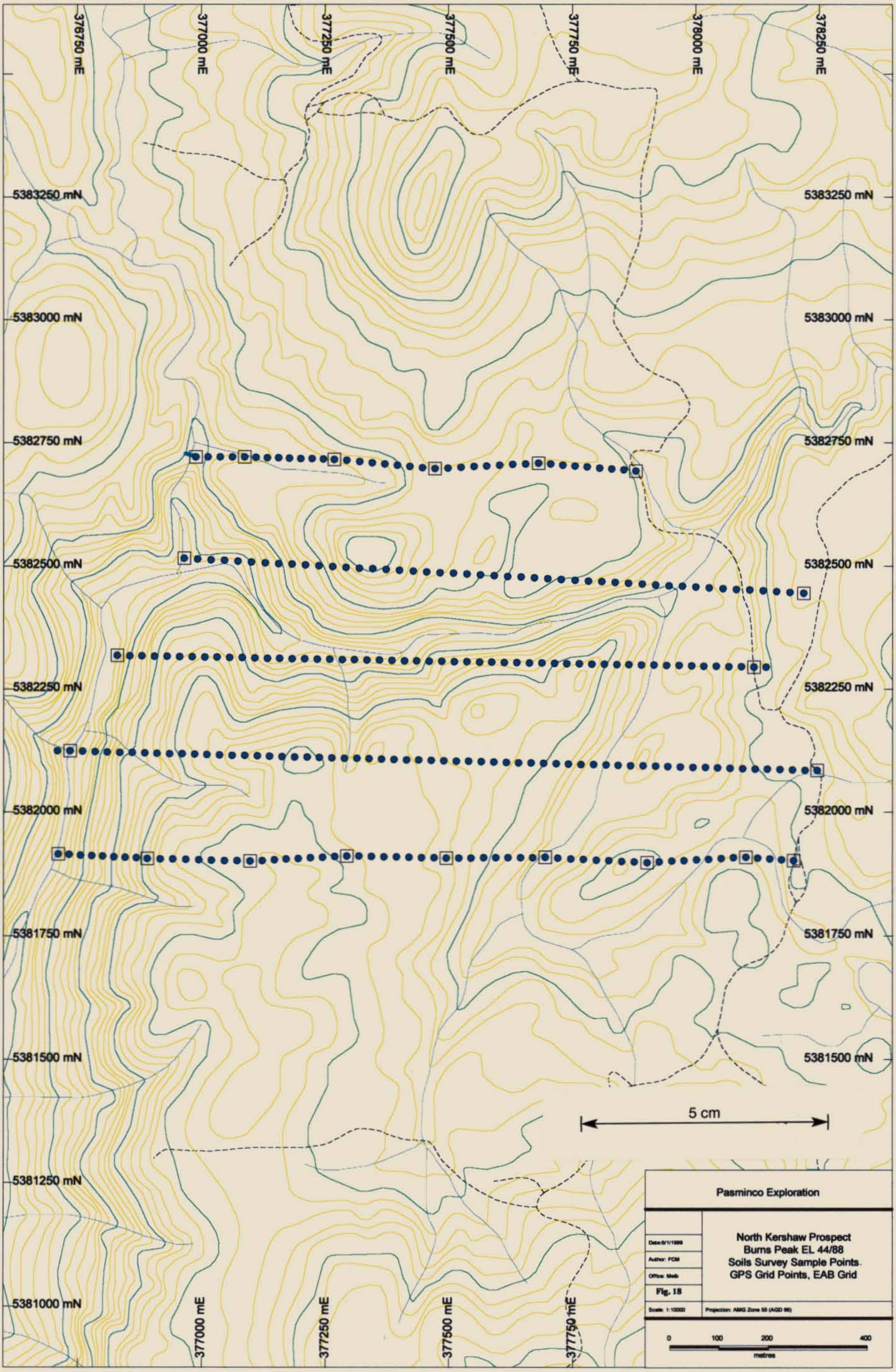


FIG 17

553046


376750 mE
377000 mE
377250 mE
377500 mE
377750 mE
378000 mE
378250 mE
5383250 mN
5383000 mN
5382750 mN
5382500 mN
5382250 mN
5382000 mN
5381750 mN
5381500 mN
5381250 mN
5381000 mN
5 cm
Pasminco Exploration
North Kershaw Prospect
Burns Peak EL 44/88
Soils Survey Sample Points.
GPS Grid Points, EAB Grid
Date:6/1/1999
Author: FCM
Fig. 18
Scale: 1:10000
Projection: AMG Zone 55
0
100
200
400
metres

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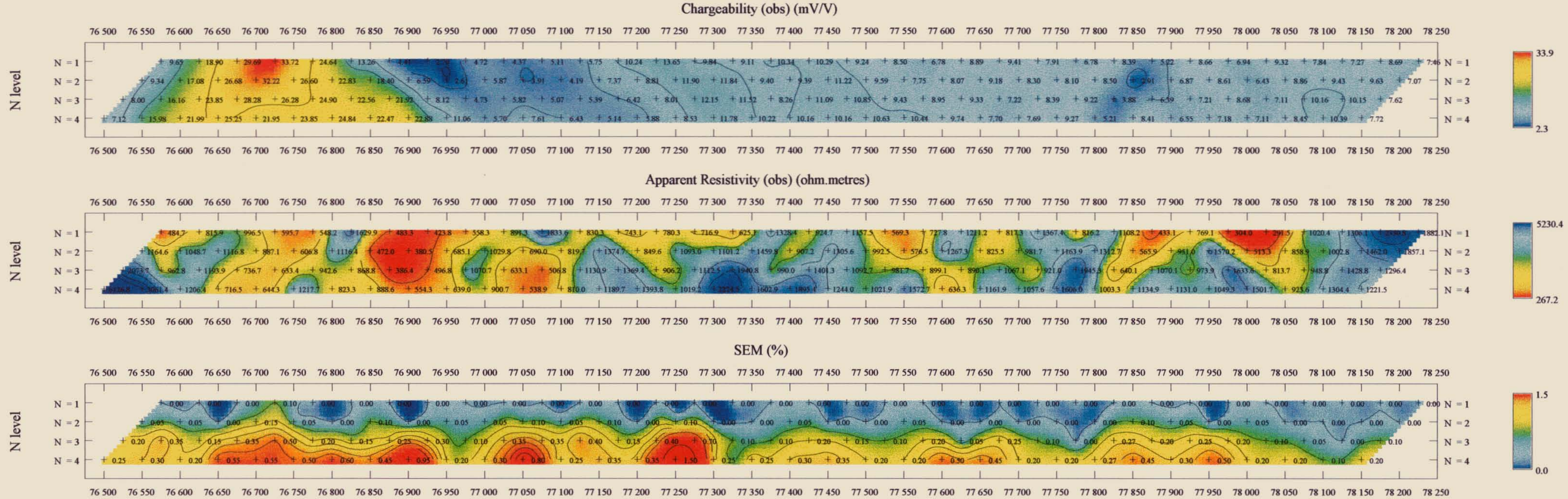

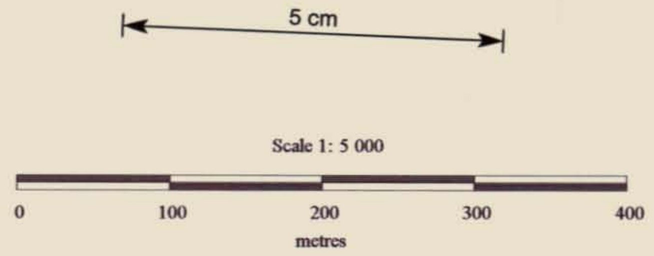

PASMINCO EXPLORATION	
BURNS PEAK EL 44/88	
North Kershaw Grid - Line 80300N	
50m Dipole-Dipole IP Contractor: Geoterrex Receiver: ELREC 6 Transmitter: Huntec Lopo M4 Transmitter Frequency 0.125Hz (2 sec on: 2 sec off)	
Author :PWB	Ref :
Drawn :	
Date : 22-Dec-1998	Report No :
Scale 1: 5 000	Plan No : 17

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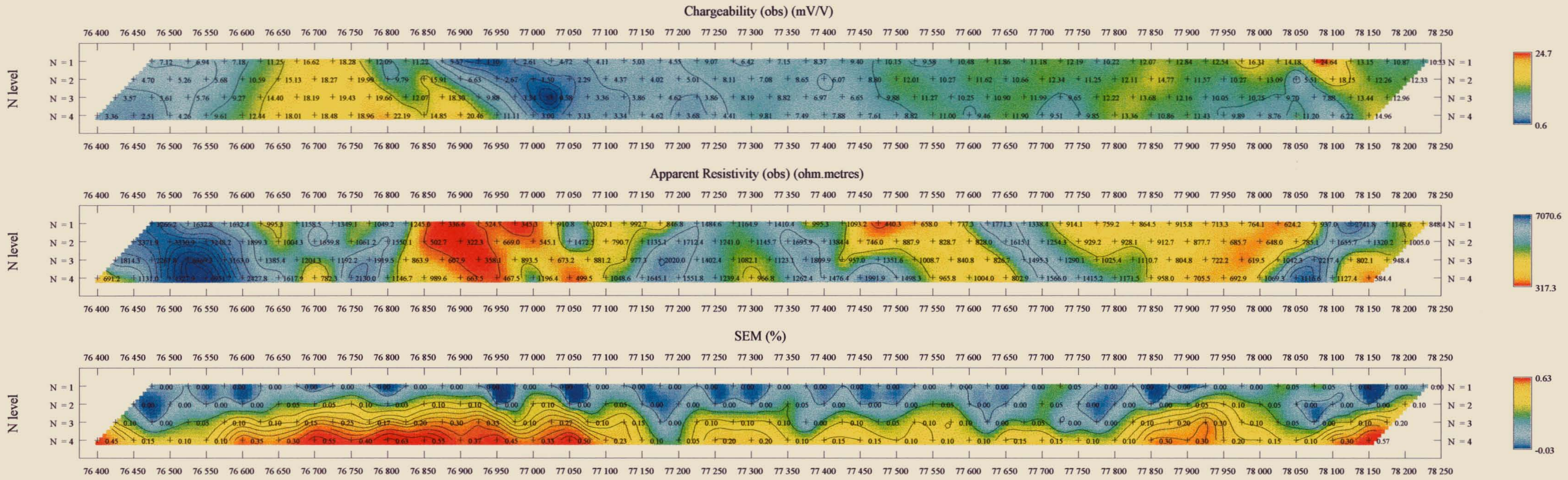

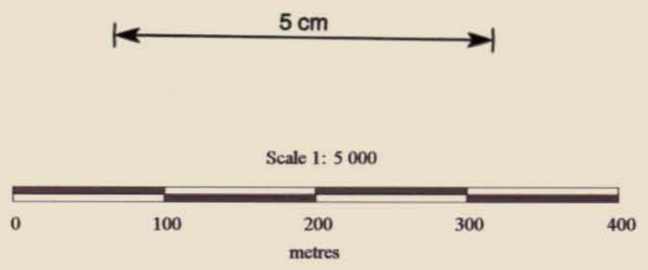

PASMINCO EXPLORATION

BURNS PEAK EL 44/88

North Kershaw Grid - Line 80500N

50m Dipole-Dipole IP
Contractor: Geoterrex
Receiver: ELREC 6
Transmitter: Huntec Lopo M4
Transmitter Frequency 0.125Hz (2 sec on: 2 sec off)

Author :PWB	Ref :
Drawn :	
Date : 22-Dec-1998	Report No :
Scale 1: 5 000	Plan No : 20

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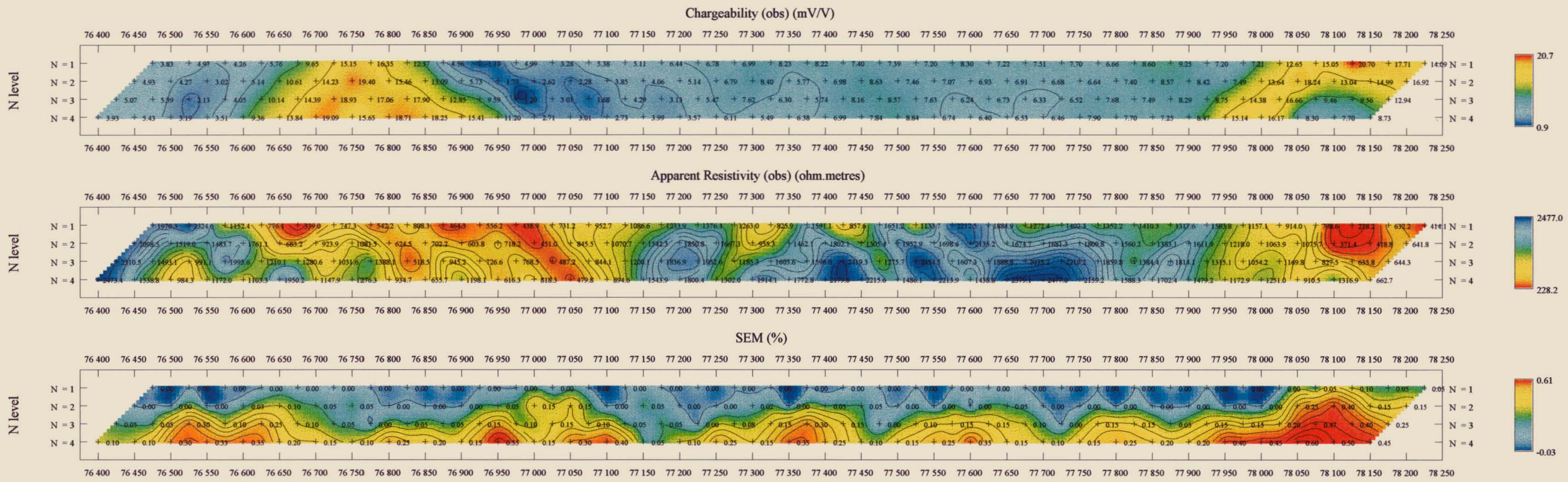

5 cm

Scale 1: 5 000

0 100 200 300 400

metres

PASMINCO EXPLORATION	
BURNS PEAK EL 44/88	
North Kershaw Grid - Line 80700N	
50m Dipole-Dipole IP Contractor: Geoterrex Receiver: ELREC 6 Transmitter: Huntec Lopo M4 Transmitter Frequency 0.125Hz (2 sec on: 2 sec off)	
Author :PWB	Ref :
Drawn :	
Date : 23-Dec-1998	Report No :
Scale 1: 5 000	Plan No : 20

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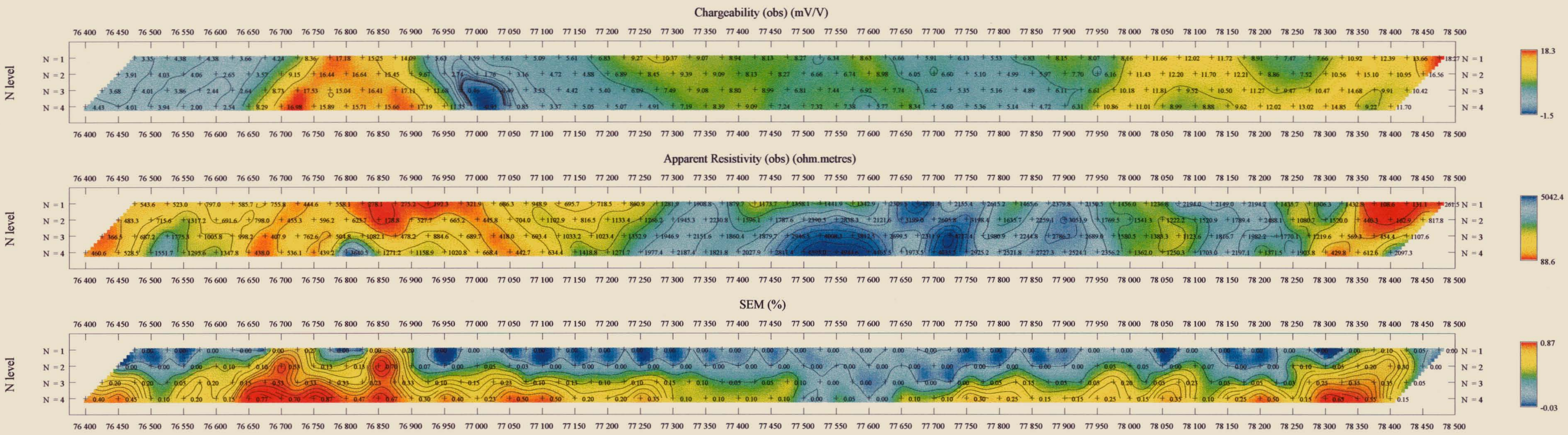

5 cm

Scale 1: 5 000

0 100 200 300 400

metres

PASMINCO EXPLORATION

BURNS PEAK EL 44/88

North Kershaw Grid - Line 80900N

50m Dipole-Dipole IP
Contractor: Geoterrex
Receiver: ELREC 6
Transmitter: Huntec Lopo M4
Transmitter Frequency 0.125Hz (2 sec on: 2 sec off)

Author :PWB	Ref :
Drawn :	
Date : 22-Dec-1998	Report No :
Scale 1: 5 000	Plan No : 22

553051

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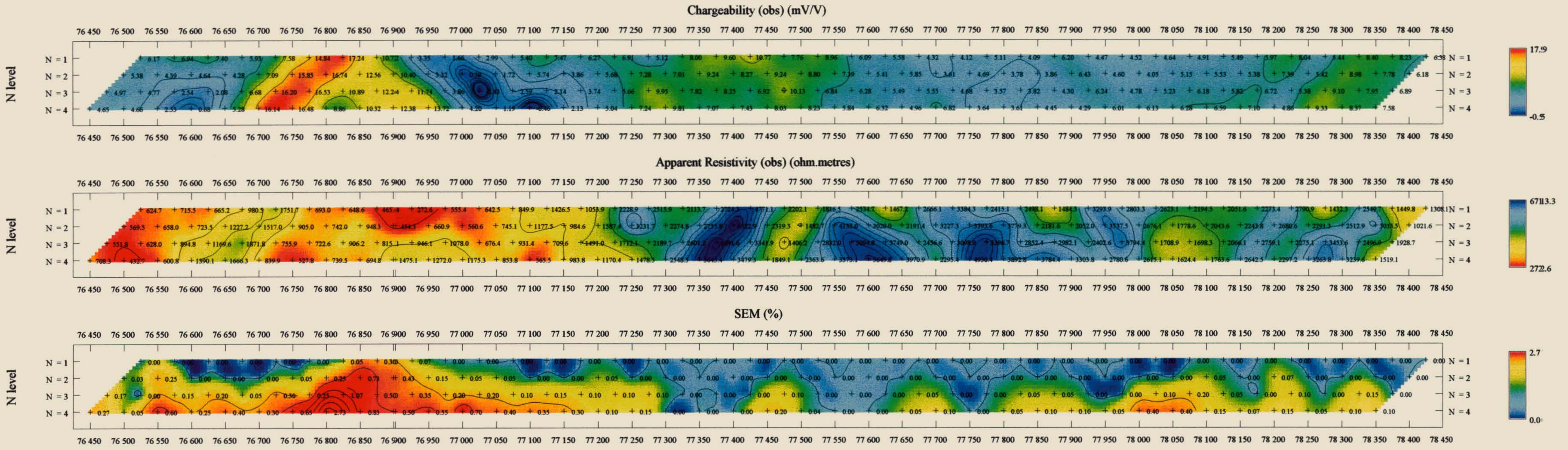

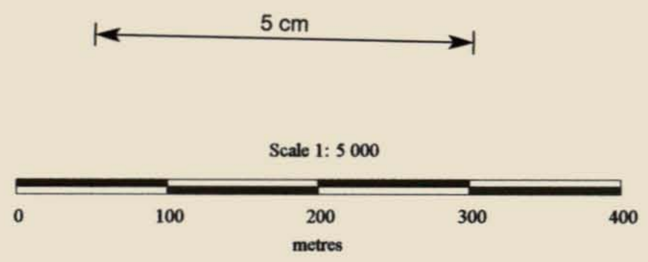

PASMINCO EXPLORATION	
BURNS PEAK EL 44/88	
North Kershaw Grid - Line 81100N	
50m Dipole-Dipole IP Contractor: Geoterrex Receiver: ELREC 6 Transmitter: Huntec Lopo M4 Transmitter Frequency 0.125Hz (2 sec on: 2 sec off)	
Author :PWB	Ref :
Drawn :	
Date : 23-Dec-1998	Report No :
Scale 1: 5 000	Plan No : 13

558052

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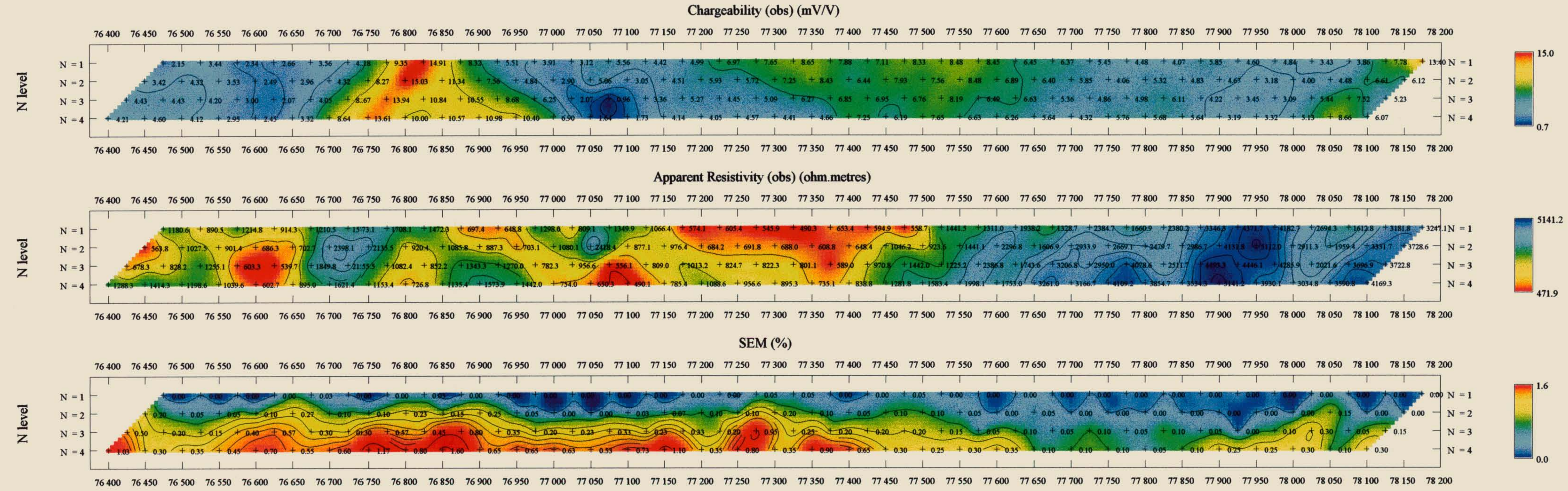

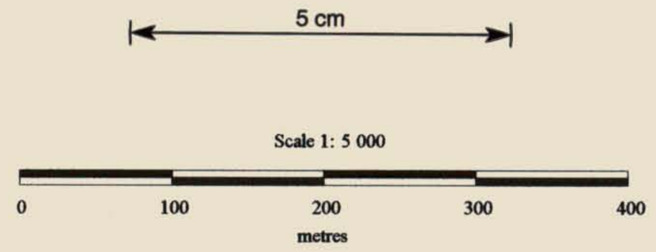

PASMINCO EXPLORATION

BURNS PEAK EL 44/88

North Kershaw Grid - Line 81300N

50m Dipole-Dipole IP
Contractor: Geoterrex
Receiver: ELREC 6
Transmitter: Huntec Lopo M4
Transmitter Frequency 0.125Hz (2 sec on: 2 sec off)

Author :PWB	Ref :
Drawn :	
Date : 23-Dec-1998	Report No :
Scale 1: 5 000	Plan No : 24

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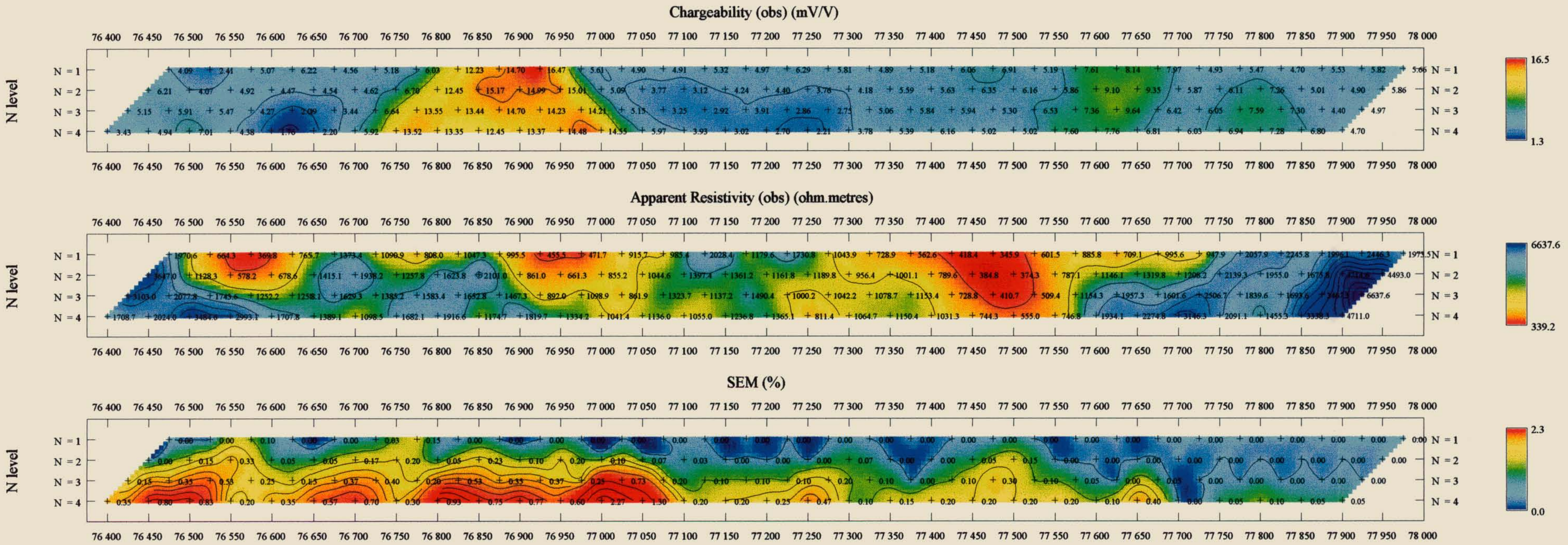

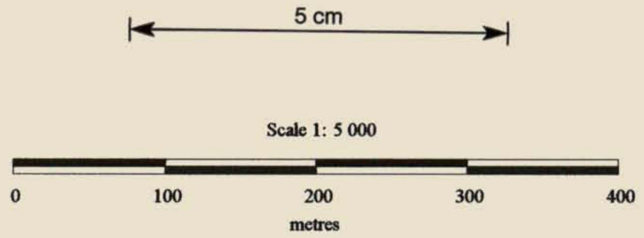

PASMINCO EXPLORATION	
BURNS PEAK EL 44/88	
North Kershaw Grid - Line 81500N	
50m Dipole-Dipole IP Contractor: Geoterrex Receiver: ELREC 6 Transmitter: Huntec Lopo M4 Transmitter Frequency 0.125Hz (2 sec on: 2 sec off)	
Author :PWB	Ref :
Drawn :	
Date : 23-Dec-1998	Report No :
Scale 1: 5 000	Plan No : 25

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5 cm

Scale 1: 5 000

0 100 200 300 400
metres

PASMINCO EXPLORATION

BURNS PEAK EL 44/88

NORTH KERSHAW IP

Stacked Inverted
Resistivity Parasections
50m dipole-dipole IP

Author :PWB	Ref :
Drawn :	
Date : 24-Dec-1998	Report No : FIGURE 26
Scale 1: 5 000	Plan No :

558055

5 cm

99-4262

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BURNS PEAK – PASMINCO R'BERY
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Scale 1: 5 000

0 100 200 300 400
metres

PASMINCO EXPLORATION	
BURNS PEAK EL 44/88 NORTH KERSHAW IP	
Stacked Inverted Chargeability Parasections 50m dipole-dipole IP	
Author :PWB	Ref :
Drawn :	
Date : 24-Dec-1998	Report No : FIGURE 27
Scale 1: 5 000	Plan No :

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Pasminco Rosebery Mine

BURNS PEAK EL 44/88

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NOVEMBER 1997 - 31st DECEMBER 1998

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EDWARDS, MURPHY, WHITBREAD
VOL 2 of 3

P.W. Edwards
F.C. Murphy
M. Whitbread

January 1999

BURNS PEAK EL 44/88

JOINT VENTURE ANNUAL REPORT

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APPENDIX 1

DIAMOND DRILL LOGS

BROWNS TUNNEL AND SOUTHERN TRENCHES

STANDARD LEGEND FOR CROSS-SECTIONS

Stratigraphic Unit	Strat. Code
FLUVIOGLACIALS	FG
DUNDAS GROUP	DG
Natone Volcanics	NV
Salisbury Conglomerate	SC
Westcott Argillite	WA
Stitt Quartzite	SQ
Chamberlain Shales	CS
White Spur Formation	WSF
MT BLACK VOLCANICS	MB
MINE HANGINGWALL SEQUENCE	HW
PINNACLES RHYOLITE	PR
BLACK SLATES	BS
PORPHYRY	POR
MINE HOST SEQUENCE	HO
Host: banded sulphides	HOBS
Host: massive sulphides	HOMS
Host: semi-masive sulphides	HOSM
Host: Disseminated sulphides	HODS
Host: Trace sulphides	HOTS
MINE FOOTWALL SEQUENCE	FW
Footwall: massive sulphides	FWMS
Footwall: semi-massive sulphides	FWSM
Footwall: disseminated sulphides	FWDS
Footwall: trace sulphides	FWTS

Stratigraphic Unit	Strat. Code
MISCELLANEOUS	
Fill	FI
Shear	SH
Shear Zone	SZ
Transition Unit	TZ
Turbidite Unit	TB
Vein	V
Vein Sulphides	VS
Fault	F
No Core	NC

Rock Description	Rock Code
Andesite	AN
Argillite	AR
Barite	BA
Breccia	BR
Conglomerate	CG
Chert	CH
Massive Chlorite	CL
Chalcopyrite	CP
Clay	CY
Dacite	DA
Dropped Core	DC
Dyke	DK
Epiclastics	EP
Galena	GA
Gossan	GO
Granite	GR
Haematite	HT
Hyaloclastite	HY
Intrusive	IN
Limestone	LM
Lava	LV
Massive Carbonate	MC
Mudstone	MD
Magnetite	MT
No Core	NC
Pisolitic Carbonate	PC
Peperite	PE
Pyrrhotite	PR
Porphyry	PO
Pyroclastic	PR
Pumice breccia	PU
Pyrite	PY
Quartzite	QT
Quartz	QZ
Rhyodacite	RD
Rock	RK
Rhyolite	RY
Saprolite	SA
Massive Sericite	SE
Schist	SH
Massive Silica	MS
Slate/Shale	SL
Soil	SO
Sphalerite	SP
Sandstone	SS
Siltstone	ST

Rock Description	Rock Code
Sill	SX
Tourmaline	TM
Tuff	TU
Volcaniclastic	VC
Undifferentiated Volcanic Rock	VR
Wormburrow Unit	WB

Alteration	Alt. Code
Barite	ba
Carboante-sericite	bs
biotite	bt
carbonate	cb
carbonate-chlorite	cc
chlorite-silica	ci
chlorite	cl
chlorite-carbonate	co
chalcopyrite	cp
chlorite-sercite	cs
clay	cy
epidote	ep
garnet	gt
haematite	ht
chlorite-quartz	lq
magnetite	mt
pyrrhotite	po
pyrite	py
quartz-carbonate	qb
quartz-chlorite	ql
quartz-sericite	qs
quartz-tourmaline	qt
silica-albite	sa
sericite-carbonate	sb
sericite-chlorite	sc
sericite	se
silicification	si
Sphalerite	sp
sericite-quartz	sq
talc	ta
tourmaline	tm

553063

Features	Feature Code
Banding	BD
Bedding	BE
Contact	CT
Cleavage	CV
Discing	DS
Fault	FT
Fluorite vein	FV
Joint	JT
Lineation	LN
Quartz Vein	QV
Shear	SR
Tourmaline vein	TV
Vein	VN
Water	WT

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 001B **Location:** Browns Tunnel 5290N 4890E

Objective: Test extension of Pasex BT2 'lens 1' mineralisation.

Result: Core loss common - has not affected best zone: 36.7-39.9m - 1.9%Pb, 3.2%Zn, 0.36%Cu, 15Ag, 0.1gAu, 2.2%Fe, $55TMU. Disappointing result.

Depth	Direct	Dip
0.0	90.0	-80.0
30.0	92.0	-79.8
59.5	91.0	-80.0
70.0	91.0	-80.0

Planned Direction: 90°
Planned Dip: -80°
Planned Depth: 70.0 m
Planned Northing: 5290 m N
Planned Easting: 4890 m E
Planned Collar R.L.: 480 m RL

Drilling Commenced: 28/05/98
Drilling Completed: 29/05/98
Actual Depth: 70.0 m
Surveyed Northing: 5288.30 m N
Surveyed Easting: 4888.90 m E
Surveyed Collar R.L.: 476.50 m RL

Date Logged: 16-Jun-1998
Logged By: Michael Whitbread
Hole Size: HQ
Hole Category: Other
Grouted:

Date Log Verified: 30-Sep-1998
Verified By: Michael Whitbread

Summary Log

One big shear zone? 0-1.7m No Core;
-20.1m Host, (oxidised);
-22.2m Sheared Ho, (end of saprolite);
-23.0m HOTS gungy shear;
(partial oxidation ends around 29m)
-37.9m HOTS, with fault at 29-30.4m;
-39.9m HODS;
-70m (EOH) HOTS, variably punctated by shearing/faulting.

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°
0.0	**1.7**	**NC**				**NO CORE**			
0.0	1.7		NC		a	No core - material soft clays (as seen from surface at drill site), possibly glacials.			
1.7	**20.1**	**HO**				**HOST SEQUENCE**			
1.7	11.7		SA VC	 cy	a	Yellow, and yellow-white oxidised material, some of which is saprolitic after volcanoclastic sandstones. Most of the preserved material appears to be fine to medium grained sandstone. Some intervals appear to have borne feldspar and/or quartz crystals (<1-2mm) with a fairly even distribution within the matrix. It is difficult to say whether crystal rich intervals were sedimentary or lavas (dacites). The unit is considerably broken, often to fragments 1-2cm wide. Rarely do pieces exceed 10cm length. Fractures are often coated with iron oxides. Fractures in 3 main orientations, down the CA, or a conjugate set running at 40-45 degrees to CA. Some of these appear to have been quartz veinlets. Orientated core at 10m.	8.0 9.3	JT JT	3° 44°

RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
13.7	9	90285	14.3	15.1	0.8	0.1	0.1	0.01	1	0.1	0.7	3
14.1	100	90286	15.1	16.1	1.0	0.1	0.1	0.01	1	0.1	1.4	3
20.5	26	90287	16.1	17.1	1.0	0.1	0.1	0.01	1	0.1	1.4	3
21.0	100	90288	17.1	18.1	1.0	0.1	0.1	0.01	1	0.1	2.1	3
24.5	8	90289	18.1	18.7	0.6	0.1	0.1	0.01	1	0.1	1.4	3
24.8	100	90290	18.7	20.1	1.4	0.1	0.1	0.02	6	0.1	2.6	4
31.8	8	90291	20.1	20.5	0.4	0.1	0.1	0.01	1	0.1	1.5	3
32.4	100	90292	20.5	21.0	0.5	0.1	0.1	0.01	1	0.1	1.7	3
35.0	19	90293	21.0	22.2	1.2	0.2	0.1	0.07	22	0.1	8.5	7
42.1	87	90294	22.2	23.0	0.8	0.2	0.1	0.07	12	0.1	3.3	6
42.9	12	90295	23.0	24.3	1.3	0.1	0.1	0.04	1	0.1	1.2	3
44.2	84	90296	24.3	25.3	1.0	0.1	0.1	0.02	1	0.1	1.7	3
45.6	9	90297	25.3	26.3	1.0	0.1	0.1	0.01	1	0.1	0.4	3
48.2	83	90298	26.3	27.7	1.4	0.1	0.1	0.01	6	0.1	0.3	4
52.6	4	90299	27.7	29.0	1.3	0.1	0.1	0.01	1	0.1	1.1	3
61.5	91	90300	29.0	30.4	1.4	0.2	0.1	0.01	1	0.1	1.2	4
62.9	21	90301	30.4	31.9	1.5	0.3	0.4	0.01	1	0.1	1.6	8
65.8	86	90302	31.9	32.9	1.0	0.2	0.3	0.01	1	0.1	1.6	6
66.4	0	90303	32.9	33.9	1.0	0.2	0.3	0.01	1	0.1	1.7	6
67.5	100	90304	33.9	34.4	0.5	0.2	0.3	0.01	1	0.1	2.8	6
69.4	5	90305	34.4	35.4	1.0	0.1	0.1	0.01	1	0.1	2.6	3
70.0	33	90306	35.4	36.7	1.3	0.4	1.6	0.13	1	0.1	3.1	23

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
11.7	14.3		BR SA VC	si si	a	Weathered, silicified, clast bearing matrix supported rock/volcanoclastic. Matrix looks to be uniform fine grained sandstone/siltstone. The clasts are silicified 'cherty' sediment 2-20mm in diamter; usually sub-rounded to sub-angular and occur sporadically throughout the unit (however they are difficult to identify). Banding is present in the matrix, however this may be liesegang banding. Despite showing numerous thin oxidised fractures, the core is reasonably competent, except for the first 10-15cm. The fractures sit either close to CA or near to 45 degrees. Some fractures contain 'vugs' with quartz crystals growing inwards. Quartz veins occur uncommonly, usually sub parallel to the 40-50 degree fracture set.	14.1 14.1 14.1	JT JT JT	16° 42° 20°		
14.3	15.1		BR SA VC	si cy	a	Shear or breccia running more or less parallel to CA through a fairly uniform 'sandstone'. Unit is oxidised. Shear/breccia is 1-2cm wide (possibly larger than core in places). Difficult to identify components due to weathering, and the initial shear event. Minor silicification of components and wall rock associated with the shear. Unit of poor competency with most fragments under 10cm in length or split down the CA; major break along the shear.	14.6 14.8	SR JT	3° 38°		
15.1	18.7		BR SA VC	 cy	a	Possible continuation of oxidised 'breccia' from previous unit. Unit very broken, most faces are coated with iron oxides, some of which exhibit box-works, possibly after sulphides. The brecciated material appears to be the volcanoclastic sandstone/dacite? from the previous units. Here it is quite splotchy, and occasionally brecciated in appearance, whether from weathering or from tectonics is difficult to say. The more competent pieces are often cut by thin (mm) quartz veinlets, or thin fractures, possibly after this veining. These fractures occur in similar orientations to those previously. Some breaks occur close to CA. Minor silcification is noted interspersed with fairly soft/clay rich intervals. Competence very bad.	16.5 17.3 17.3 17.3	JT QV JT JT	23° 55° 5° 44°		
18.7	20.1		SA VC		a	Fairly competent, moderately oxidised, medium grained volcanoclastic sandstone/dacite?. Banding is present, but is possibly liesegang (Fe oxidation fronts) banding. Rock is yellow in colour, but is leached white around the many fractures present. Goethite +/- hematite often sit in fractures, however, not as 'honeycombed' as those in the last unit.	19.4 19.4	JT BD	52° 41°		
20.1	**22.2**	**S**				**SHEAR**					
20.1	20.5		BR VC	cy si	a	Shear/breccia zone in litholoy of former unit. Heavily oxidised and altered to clays, containing <1cm 'clasts' in a fine grained matrix. At the beginning of unit there are elongated clasts of silicified material (chert?) and also patches of honeycombed iron oxides (after sulphides). Unit is not broken. Zone has irregular contacts, so it is difficult to orientate it, however it does seem to trend close to CA.					

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
90307	36.7	37.9	1.2	1.6	2.5	0.22	9	0.1	2.3	43
90308	37.9	38.9	1.0	2.9	4.3	0.38	14	0.1	1.9	74
90309	38.9	39.9	1.0	1.2	2.8	0.52	24	0.1	2.4	50
90310	39.9	40.9	1.0	0.2	0.5	0.04	23	0.1	1.9	12
90311	40.9	41.9	1.0	0.2	0.5	0.02	5	0.1	2.5	9
90312	41.9	42.9	1.0	0.2	0.5	0.02	1	0.1	7.0	8
90313	42.9	44.0	1.1	0.1	0.1	0.01	7	0.3	3.5	6
90314	44.0	44.9	0.9	0.2	0.3	0.03	4	0.1	5.1	7
90315	44.9	45.9	1.0	0.2	0.3	0.04	6	0.1	5.4	7
90316	45.9	46.9	1.0	0.2	0.7	0.04	6	0.1	2.6	11
90317	46.9	48.0	1.1	0.1	0.1	0.01	1	0.1	3.4	3
90318	48.0	48.4	0.4	0.1	0.1	0.01	1	0.1	1.7	3
90319	50.5	51.4	0.9	0.3	1.0	0.03	19	0.2	4.9	18
90320	51.4	52.4	1.0	0.1	0.1	0.04	5	0.2	2.3	5
90321	52.4	53.2	0.8	0.1	0.5	0.02	1	0.1	0.6	8
90322	53.2	54.2	1.0	0.4	0.7	0.07	5	0.1	0.9	13
90323	54.2	55.2	1.0	0.1	0.4	0.01	1	0.1	0.5	6
90324	55.2	56.2	1.0	0.1	0.3	0.01	1	0.1	0.5	5
90325	56.2	57.2	1.0	0.2	0.5	0.02	1	0.1	1.6	8
90326	57.2	58.2	1.0	0.1	0.3	0.01	1	0.1	1.8	5
90327	58.2	59.2	1.0	0.1	0.1	0.01	4	0.1	3.6	3
90328	59.2	60.2	1.0	0.1	0.1	0.01	1	0.1	6.1	3
90329	60.2	60.9	0.7	0.1	0.2	0.01	1	0.1	2.8	4
90330	60.9	61.9	1.0	0.1	0.1	0.01	5	0.1	7.5	4
90331	61.9	62.9	1.0	0.1	0.2	0.01	7	0.3	2.6	7
90332	62.9	63.9	1.0	0.1	0.4	0.01	1	0.1	1.5	6
90333	63.9	64.9	1.0	0.1	0.5	0.01	1	0.1	3.0	8
90334	64.9	65.9	1.0	0.1	0.2	0.01	1	0.1	2.6	4
90335	65.9	67.3	1.4	0.1	0.2	0.01	1	0.1	2.7	4
90336	67.3	68.5	1.2	0.1	0.2	0.01	1	0.1	1.2	4
90337	68.5	70.0	1.5	0.1	0.4	0.01	4	0.1	2.3	7
	Total Length:		53.6							

Standards

				Pb	Zn	Cu	Ag	Au	Fe	
				2.0	5.0	0.15	70	0.4	5.5	
	Variances Allowed:			20%	20%	30%	20%	20%	20%	
90338	Inserted @ 70.0m			2.0	4.6	0.16	62	*0.5*	5.9	N

Weighted Averages

From	To	Length	Pb	Zn	Cu	Ag	Au	Fe	TMU
14.3	70.0	55.7							
36.7	39.9	3.2	1.9	3.2	0.36	15	0.1	2.2	55

Thin Sections

PTS0001 38.5 m 001B_38.5 - sample number. Ore sample.

TMU Parameters

Date of Parameters: 11/07/97 **Aust-US Exch. Rate:** 0.8000

Hole No: 001B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
20.5	22.2		SA VC	cy	a	As in 18.7-20.1m, except more bleached. Lies in between shears. Has the abundant fracture sets as seen previously. Unit competent to 21.15m, after which it is quite broken (possibly .7m core loss between 20.5 and 23m is in this interval - taken up in sample assay 90293). Broken interval contains oxides after sulphides.	20.6 20.9	JT JT	33° 7°													
22.2	**23.0**	**HOTS**				**HOST - TRACE SULPHIDES**																
22.2	23.0		BR PY		a	Assay results do not suggest HOSM, thus changed to HOTS: most likely, pyrite only sulphide present. Shear zone running near parallel to CA. Shear contact visible at beginning of unit, and contains breccia fragments (<1-2cm). However most of the shear looks like disseminated to semi-massive sulphide. It is difficult to identify the mineralogy as it is a soft gungy fine grained mix, containing some visible pyrite, and was thought to possibly consist of the sulphide-mix mentioned in the PASEX Burns Peak reports. Some of this sulphide mix has been brecciated in the earlier parts of the unit. The soft gunge may be a result of limited weathering. Competency is poor to bad.	22.2	SR	8°													
23.0	**24.3**	**S**				**SHEAR**																
23.0	24.3		BR SA VC	cy	a	Continuation of the shear (possibly run back into the drill hole), or possibly another shear as part of an anastomosing system. Contains brecciated material as clasts of silica (cherty), clay and sulphide (pyrite dominant) generally to 2cm in size, contained in a fine puggy matrix. The contact of the shear shows some oxidation, while the remainder seems to be clay/sericite altered (possibly only related to the shearing itself, not weathering). As before, the shear abuts against fairly uniform massive bleached volcanoclastic sandstone/rock at the beginning of the unit. Competency is poor to bad, due to the friable nature of the material (core is fairly well preserved however). HOTS grade due to the presence of common pyrite clasts and occasional pyrite in the matrix.	23.3 23.6	SR SR	8° 22°													
24.3	**29.0**	**HO**				**HOST SEQUENCE**																

Pb Metal Price (US$/t):	$700	**Pb Recovery (%):**	68.40%
Zn Metal Price (US$/t):	$1,200	**Zn Recovery (%):**	76.20%
Cu Metal Price (US$/t):	$2,100	**Cu Recovery (%):**	45.40%
Ag Metal Price (US$/oz):	$5	**Ag Recovery (%):**	68.90%
Au Metal Price (US$/oz):	$380	**Au Recovery (%):**	64.40%

Hole No: 001B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
24.3	29.0		BR VC	cy si qs si	a	Mixed, pale creamy grey, strongly sericite/clay altered volcanoclastic sandstone and matrix supported, angular to sub-rounded breccia. Unit is mottled by small iron oxide spots and clots (after what who knows?) produced by weathering. Iron oxides occasionally coat fractures and breaks in core. The breccia might be shearing related, or possibly volcanoclastic in origin. It is possible that the sandstone intervals are merely larger clasts since the core is generally quite broken, and contacts are difficult to identify. A small clay rich zone (shear?), central to a zone of breccia is present at 26.3m. Another clay zone present just before 27.7m, after which the unit becomes moderately silicified. The breccia clasts are mainly the cryptocrystalline silica as seen earlier (altered siltstone, or chert?). Clasts usually <2-3cm in size. Pyrite clasts occasionally present. The moderately silicified interval contains small darker coloured patches, sometimes bearing pyrite disseminations. 1-5mm cavities are also noted in some of the fractures, which seem to favour the darker zones (silicified zone possibly after a pumice breccia?). 70cm core loss between 26 and 27.7m (taken up in assay sample 90298), most likely from the clay zones mentioned before. Possibly 40cm loss between 24.5 and 26m (which was taken up in Assay sample 90297). Competency bad.																
29.0	**30.4**	**F**				**FAULT**																
29.0	30.4		DA QZ	qs	a	Broken zone, containing fragments of pale creamy yellow-grey (mottled with darker green-grey patches), feldspar phyric, sericite-silica altered, volcanoclastic sandstone/dacite. Possibly dacite due to the increased visibility of evenly distributed feldspar phenocrysts as one progresses through the unit. At 30 and 30.3m, there are buck quartz fragments (and .7m core loss probably at 30.3m, taken up in assay sample 90300). Core very broken around quartz fragments. 1-3mm cavities present in quartz fragments.																
30.4	**37.9**	**HOTS**				**HOST - TRACE SULPHIDES**																
30.4	31.9		DA	qs	b	Pale creamy yellow-grey (mottled with darker green-grey patches), feldspar phyric, silica-sericite altered, volcanoclastic sandstone/dacite. Possibly dacite due to the presence of evenly distributed feldspar phenocrysts. Unit looks brecciated towards the end of unit, by fingers, veinlets and wisps of green-grey, fine grained, partially silicified material. Very weak Hots. Unit is of poor competency, with some fragments approaching 10cm. Small broken zone 31.1-31.2m. One fracture set dominates 20-30 degrees to CA.	31.7	JT	23°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
31.9	34.4		BR ST	sc si	b	Most likely shear related, sericite-chlorite altered matrix, matrix supported, breccia/volcanoclastic breccia?. The clasts consits of "cherty" silica fragments of varying size (5mm-?), and while many are rounded, elongated 'blobs' are common. A preferred orientation of clasts was not identified, occasionally the matrix does carry a strong fabric (close to CA). Weak HOTS. Small pyrite+/-sphalerite+/-sulphide-mix clasts occur sporadically throughout. Pyrite +/- sphalerite may also occur in the matrix. The matrix protolith is not identifiable. A large zone of silicified fine grained material (siltstone?) zone 33.1-33.6m is considered a large clast. This zone also bears pyrite cubes in wisps, veinlets and in small fractures. A preferred fracture set/fabric is evident in this zone (close to CA). Core of poor competency, with some fragments over 10cm but often split along CA. Small clay rich, broken zone occurs at 33.0-33.1m. Core orient at 32.5m. Orientated measurement at 32.2m Cleavage striking 195-015 dipping 68-70 degrees to the east. 2nd fabric - striking 195-015 dipping 88 degrees to the east.	33.3 34.2	JT CV	7° 12°													
34.4	35.4		BR RK	 sc si	a	Stongly sericite+/-chlorite + minor silica altered rock. Has a reasonably strong fabric in it, primarily imparted by sericite veinlets, common blebs and thin, long wisps of pyrite +/- sphalerite?+/-sulphide-mix. Sulphide trends seems to be closer (and oppositely opposed) to the CA than the sericite wisps. The trends are difficult to measure though). The sulphides seem to have preferentially replaced some former darker coloured zone of indeterminate lithology. 4cm wide cross-cutting breccia-shear with silica ('cherty') type clasts present at 35.3. Core of poor to moderate competency, with pieces breaking along a preferred fracture set ~45 degrees to CA.	34.6 34.7 34.7	JT CV CV	45° 7° 13°													
35.4	36.7		BR SH	qs qs sc	a	Dark green-grey, sericite-chlorite +/- silica altered schist/breccia. The fabric is fairly strong, defined by chlorite and sericite wisps. The unit contains elongated 'cherty' clasts, which become less visible as the unit progresses. Small greenish-yellow clasts occur occasionally to 36.2m, after which the unit develops into large zones of pale green-yellow rock with many inclusions of the small greenish-yellow clasts (up to 5mm or so). The zones are split by the dark green schistose material, which contains white feldspar remnants. A few thin quartz veins are noted, and are now cavitous. Difficult to say if material has been removed to form the cavities or not. Core of moderate competency. Orientated measurement: 36.2m, cleavage striking 195-015, dipping 58 degrees to the east - perhaps fabric wrapping around clasts.	36.0	CV	17°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
36.7	37.9		BR	qs sc	a	Clast supported breccia of light greenish yellow 'clasts' containing pinky phenocryts (after feldspar?), in a dark-green fine grained matrix. The clasts are of extremely variably sizie (mm - > core wdth) and fairly angular. Yellow zones are sericite-chlorite+/-silica altered, while the matrix seems to be a darker green version of the same. The matrix contains high proportions of pyrite +/- sphalerite+/- sulphide-mix, and occasionally sulphides comprise the matrix entirely - overall went 2.5%Zn in assays. Core is of moderate competency.																
37.9	**39.9**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
37.9	39.9		BR	sc si	a	Dark green grey, variably clast or matrix (silica and sericite-chlorite altered) supported breccia. The clasts are dominantly the 'chety' variety as seen before, of variable size and sphericity. Other clasts are sericite altered, or consist of sulphides. Stretched out clots of sericite are common (after pumice?). Weak HODS - Sulphide often dominates the matrix, the assemblage being gun-metal sulphide mix dominant, followed by pyrite, galena, sphalerite and chalcopyrite. Sphalerite occurs mainly as small roundish spots/clasts, while most others occur as thin veinlets and wisps rimming clasts or running at a high angle to CA in the matrix, or in cracks in the silica clasts. Sphalerite spots are often rimmed by the others. Core is of poor to moderate competency (many pieces under 10cm). A weakly discernible fabric run close to CA. Core orientation at 38.5m. Orientated measurements: 38.5m, cleavage N/S strike 78-80 degrees to west; 38.3m, quartz vein, 160-340 strike, dipping 58 degrees to the west.	39.1	CV	7°													
39.9	**46.9**	**HOTS**				**HOST - TRACE SULPHIDES**																
39.9	46.9		BR	qs sc	a	Shear related breccia similar to last unit, with more sporadic occurrences of sulphide (similar assemblage as before, except pyrite dominates), thus 'overall' assigned a HOTS grade. Sulphides mainly as clasts, rimming clasts, or sitting in the more intensely sheared zones. Breccia is variably: silcified, sericite altered, sheared, clast or matrix supported. The only major compositional difference with previous is the presence of a greater proportion of angular sericite altered clasts. Also have small zones of fairly massive sulphide (clast or matrix hard to tell), usually as elongated masses e.g. pyrite dominant mass at 43.8m. Some silica fragments are honeycombed with fairly evenly distributed small holes, containg remnants of sericite (possibly after feldspar?). It is possible that igneous as well as sedimentary material has been incorporated into the breccia. Meant to be 1m of core loss betwen 44.4 and 46.9m, however this is not evident. Core of really bad competency especially after 44.4m where no pieces are above 10cm. Before that most fragment would be above 5 or 10cm. Fabric still is close to CA, although often hard to pick (especially is matrix dominant). Core orient at 41.5m. Minor oxidation at 44.2m. Orientated measurement at 41.5m, cleavage 185-005 strike, dipping 78 degrees to the west.	40.8 41.5 45.9	CV CV CV	22° 16° 12°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
46.9	**53.2**	**S**				**SHEAR**																
46.9	51.4		SH	sc	a	Variably light and dark greenish-yellow sericite-chlorite rock/schist. Really strong fabric. Very broken ground, mainly after 47.9, major core loss associated with the worst areas (probably 2.1m between 47.9 and 50.5m; loss taken up in assay sample 90318, assay interval marked as 48-48.4m). Occasionally have small wisps of pyrite+/-sulphide-mix material in darker green patches. Fabric close to CA. Dark green sericite-chlorite 'clasts' start to appear after 50.5m e.g. 50.9m.	47.0	CV	8°													
51.4	53.2		BR VC	sc sq	a	Dark green-grey (with patches of greenish yellow), sericite-chlorite +/- silica altered, 'cherty' silica clast bearing volcanoclastic/breccia. The unit is sheared and broken between 51.7 and 52.4m. The clasts are variable in size (mm >4cm) but are larger at the beginning of the unit. Clasts are predominantly the 'cherty' silica types, but there are lesser quantities of pyrite dominant sulphide clasts and sericite squished looking clasts. The matrix may have been sandstone, but is fairly altered, and contains wisps and clots of sericite and wisps of pyrite sub parallel to cleavage. Core is of reasonable competence in last 60cm of unit. Otherwise very bad - only partial recovery between 51.6 and 52.4m (possibly 10-20cm loss; taken up in assay sample 90320).	52.7	CV	11°													
53.2	**67.3**	**HOTS**				**HOST - TRACE SULPHIDES**																
53.2	57.2		RK	qs si	a	Creamy-white, fairly uniform looking silica +/- sericite altered rock. Rare evidence for the presence of clasts (dark green patches). A fabric is marked by tiny white flecks and wisps, but an orientation is difficult to pick. Seems to run about 30 degrees to CA. Numerous thin (<1mm) veinlets of sulphide (sphalerite dominant + black sulphide-mix and pyrite) are present in two major orientations - sub-parallel to CA or at 15-30 degrees to it (most breaks in core are along these orientations). The sulphides are also present as small blebs and wisps, spatially associated with the veinlets. Overall went <1% Zn. Core competency is moderate to good, with most pieces over 10cm. However there is a 30cm loss discrepency, cause unknown (taken up in assay sample 90325). Unit boundaries are fairly rapid, but the nature of which is difficult to say.	56.1 56.6 56.8	VN VN CV	32° 5° 30°													

Hole No: 001B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
57.2	60.9		BR RK	qs sc	a	Dark green, sericite+/-chlorite and silica altered rock/volcanoclastic breccia. Unit has a fairly strong fabric, marked by alternations in ?chlorite content (dark versus mid range greens), and by the vague fabric imparted by the yellow or orange phenocrysts which are ubiquitous throughout. The phenocrysts are most likely after feldspar and are now sericite/clays and possibly carbonate in places (is unit a dacite?). Sporadically entrained within the dark green 'rock' are clasts of extremely variable size (5mm to >10cm). The clasts are again "cherty" silica, and also occur as elongate bands, often paralleling the fabric. The bands can suffer 'competency or tension gash' carbonate veins - at right angle to the long edge of the band. Pyrite masses are commonly present in parts of the matrix, usually in the zones with stronger fabric. Core competency is good.	59.7	CV	18°													
60.9	67.3		BR RK	sc si	a	Similar to previous unit, except the altered ?feldspar 'phenocryts' are more or less absent and the silica clasts and isolated bands are very common. The bands seem less convoluted, but still sit with the fabric. Impossible to say if unit is a sediment (possibly similar to that caught up in earlier breccia zones) or a tectonic breccia. Bands and blobs may merely be the result of boudinage of patchy silica altered fine grained sediments. Unit also contains sporadic occurrences of spotty and blebby sphalerite etc, and as fill in mm scale 'tension' gashes in the silica bands. Pyrite and 'sulphide-mix' may occur as rare clasts. Overall went less than 1%Zn. Competency of unit is mixed - good except in the following intervals, where it is very broken - 61.5-62.6m, 66.2-66.5m.	61.2 63.1 63.2 65.8	CV CV BD CV	14° 20° 24° 17°													
67.3	**70.0**	**S**				**SHEAR**																
67.3	70.0		BR RK	qs	a	Fault/shear. Lithology as previous, broken zone to EOH (last 1m not as broken) 10cm Pug at ~67.6m. EOH 70m.	69.7	CV	5°													

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 002B **Location:** Browns Tunnel 5288N 4929E

Objective: To test the continuity of 'Lens 1' on the 5290N section.

Result: Mineralised where expected, weathering affected zinc grade? 20m at 1.4%Zn 15g/t Ag; best, 1m at 1.4%Pb, 5.2%Zn, 0.21%Cu, 51g/t Ag, 1g/t Au.

Depth	Direct	Dip
0.0	270.0	-70.0
30.0	272.0	-70.0
60.0	272.0	-69.5
60.2	272.0	-69.5

Planned Direction: 270°
Planned Dip: -70°
Planned Depth: 60.0 m
Planned Northing: 5288 m N
Planned Easting: 4929 m E
Planned Collar R.L.: 478 m RL

Drilling Commenced: 1/06/98
Drilling Completed: 3/06/98
Actual Depth: 60.2 m
Surveyed Northing: 5289.50 m N
Surveyed Easting: 4928.70 m E
Surveyed Collar R.L.: 477.70 m RL

Date Logged: 16-Jun-1998
Logged By: Michael Whitbread
Hole Size: HQ
Hole Category: Other
Grouted:

Date Log Verified: 30-Sep-1998
Verified By: Michael Whitbread

Summary Log:
Large shear zone? 0.0-2.0m NC; -5.3m HO (oxidised); -22.6m HOTS (saprolite to 10m; part ox ends ~20m);
-25.3m HODS; -25.6m Fault;-27.7m HODS;-29.9m HOTS; -31.5m HOSM; -34.4m HODS;
-49.7m Fault/shear zone containing breccias and sediments.;
-60.2m (EOH) HO (competent).

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°
0.0	**2.0**	**NC**				**NO CORE**			
0.0	2.0		NC		a	No core recovered.			
2.0	**5.3**	**HO**				**HOST SEQUENCE**			
2.0	5.3		BR	cy	a	More of less completely oxidised material. Consists of zones of clay with remnant oxidised clasts, and zones of silicified medium grained material (sandstone? rhyolite?). This material may be glacials, but looks more like oxidised versions of the unit further downhole. Namely, silicified sediments and breccia, and sericite altered matrix supported breccia. No competency to core. Looks to be ~90cm core loss, with only partial recovery of the remainder.			
				si					
			RK	si					
			SA						
5.3	**11.9**	**HOTS**				**HOST - TRACE SULPHIDES**			

RQD To (m)	RQD %
5.8	0
7.6	83
8.7	18
18.6	87
19.4	12
34.1	87
45.4	12
46.4	90
50.0	8
60.2	94

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
90235	5.3	6.3	1.0	0.1	0.1	0.01	4	0.5	1.7	7
90236	6.3	7.3	1.0	0.1	0.1	0.10	43	0.2	2.1	12
90237	7.3	8.3	1.0	0.1	0.1	0.01	6	0.1	0.6	4
90238	8.3	9.3	1.0	0.1	0.1	0.01	4	0.1	0.6	4
90239	9.3	10.0	0.7	0.1	0.1	0.20	11	0.2	1.6	8
90240	10.0	11.0	1.0	0.1	0.1	0.14	12	0.2	1.8	7
90241	11.0	11.9	0.9	0.1	0.1	0.12	16	0.2	2.6	8
90242	11.9	12.9	1.0	0.2	0.1	0.15	9	0.1	1.9	6
90243	12.9	13.9	1.0	0.1	0.1	0.07	7	0.1	1.7	5
90244	13.9	14.9	1.0	0.2	0.3	0.17	17	0.1	1.6	11
90245	14.9	15.9	1.0	0.1	0.1	0.26	31	0.1	1.3	11
90246	15.9	16.9	1.0	0.9	1.0	0.52	31	0.2	1.8	31
90247	16.9	18.1	1.2	0.5	0.8	0.22	21	0.4	2.3	23
90248	18.1	19.1	1.0	0.1	0.1	0.08	25	0.2	1.4	9
90249	19.1	20.1	1.0	0.3	0.8	0.16	15	0.4	1.9	20
90250	20.1	21.1	1.0	1.6	3.4	0.14	16	0.4	3.3	60
90251	21.1	22.1	1.0	0.7	1.0	0.04	10	0.3	3.3	21
90252	22.1	22.6	0.5	0.5	0.7	0.03	4	0.1	1.9	14
90253	22.6	23.3	0.7	0.7	1.5	0.13	9	0.2	3.4	28
90254	23.3	24.3	1.0	0.7	1.1	0.06	1	0.1	2.8	20
90255	24.3	25.3	1.0	0.3	0.3	0.05	1	0.1	2.4	7
90256	25.3	25.6	0.3	0.9	0.3	0.01	45	0.3	9.2	19

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
5.3	10.0		SA ST	cy si	a	Oxidised material, dominantly saprolitic after silicified fine grained (siltstone, occasional sandstone) sediments. The intensity of weathering decreases after 7m, where the clay content drops off and silicified fragments with uncommon unoxidised portions dominate. The fine sediments are often banded, with the bands usually 1-3cm in thickness, usually running fairly close to the CA. These are also observed in less oxidised fine grained zones further down the hole e.g. 20.9m. The origin of the bands may be sedimentary, however they usually contain or are sub-paralleled by thin (mm scale) pyrite bands, or the oxidised version thereof. The competent pieces are criss-crossed by thin fractures and quartz veins in variable orientations. The fractures and veins commonly contain small (1-10mm wide) cavities. These may be lined with goethite, hematite, open space quartz and a fine black residue - most likely after the sphalerite-pyrite-quartz + the gun-metal sphalerite-chalcopyrite-pyrite mix assemblages seen later in unweathered core. A piece at 7.4m does bear a fragment of sphalerite in the cavity. Unit is weak Hots. The core is not competent, although occasional pieces may reach 30cm. ~20cm core loss 7.9-8.5m. Breaks along banding, fractures and veins. Difficult to tell faulting from breaks just due to weathering. Possible fault ~8.5m (broken ground) and at 9.9m (break with fine mush in it).	7.4 9.0 9.0 9.9	VN JT BD FT	34° 2° 17° 20°		
10.0	11.9		SA ST	si	b	As before except unweathered fragments (medium grey) dominate. Oxidation generally confined to fractures and their immediate wall rocks (nice liesegangs!). Banding of the fine grained material quite visible now. Pyrite bands still present, as well as the cavities (up to 2cm wide e.g. 10.1m). Perhaps meteoric waters are responsible for the removal of sulphides - or perhaps the cavities are early features, incompetely filled by sulphides. Sphalerite blebs rare, depsite the abundance of cavities. Generally competent, except broken zone 11.4-11.8m. Sharp contact with next unit along a quartz vein/fracture. Orientation mark at 10m. Orientated measurements: 10.2m, banding/cleavage ~N/S strike, dip 61 degrees to the west; 10.4m, cleavage/banding ~N/S strike (just NNE/SSW of N/S), dip 76 degrees to the west. Proper magnetic strike measurements not taken due to interference by metal racks in Core Shed.	10.2 10.3 10.4 11.9	BD JT JT CT	22° 49° 36° 73°		
11.9	**22.6**	**HOTS**				**HOST - TRACE SULPHIDES**					

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
90257	25.6	26.6	1.0	1.5	2.9	0.09	36	2.2	2.6	72
90258	26.6	27.2	0.6	0.5	3.6	0.18	25	1.0	3.8	64
90259	27.2	27.7	0.5	0.7	1.2	0.11	31	1.6	6.2	40
90260	27.7	28.7	1.0	0.1	1.5	0.01	1	0.1	1.9	21
90261	28.7	29.9	1.2	0.1	1.2	0.02	12	0.1	3.6	19
90262	29.9	30.7	0.8	0.1	0.4	0.08	23	0.1	6.7	12
90263	30.7	31.5	0.8	0.1	0.2	0.01	16	0.1	6.3	7
90264	31.5	32.6	1.1	0.1	0.5	0.02	12	0.1	2.7	10
90265	32.6	33.6	1.0	0.1	1.6	0.06	1	1.0	2.0	31
90266	33.6	34.4	0.8	0.1	1.5	0.04	13	0.6	2.1	28
90267	34.4	35.4	1.0	1.4	5.2	0.27	51	1.0	5.4	95
90268	35.4	36.5	1.1	0.5	1.8	0.05	12	0.2	3.9	30
90269	36.5	37.4	0.9	0.1	0.3	0.01	5	0.1	7.8	6
90270	37.4	38.0	0.6	0.3	0.1	0.01	12	0.2	2.7	7
90271	38.0	39.0	1.0	0.9	2.2	0.15	25	0.6	4.9	44
90272	39.0	40.0	1.0	0.2	0.8	0.07	4	0.1	1.8	14
90273	40.0	41.0	1.0	0.2	0.6	0.04	8	0.1	2.5	12
90274	41.0	42.0	1.0	0.2	0.6	0.05	8	0.2	3.3	13
90275	42.0	43.0	1.0	0.5	1.9	0.09	13	0.4	3.5	34
90276	43.0	44.0	1.0	0.2	0.7	0.06	10	0.3	3.3	15
90277	44.0	45.0	1.0	0.2	0.4	0.03	7	0.3	3.0	10
90278	45.0	46.0	1.0	0.1	0.1	0.01	1	0.1	1.0	3
90279	46.0	47.0	1.0	0.1	0.1	0.01	1	0.1	0.7	3
90280	47.0	48.0	1.0	0.1	0.1	0.01	1	0.1	0.6	3
90281	48.0	49.0	1.0	0.1	0.1	0.01	1	0.1	0.5	3
90282	49.0	49.7	0.7	0.1	0.1	0.01	1	0.1	1.1	3
90283	49.7	51.2	1.5	0.1	0.2	0.01	1	0.1	1.5	4
		Total Length:	45.9							

Standards

		Pb	Zn	Cu	Ag	Au	Fe	
Reference Values for:	LBM-06						14/03/97	
		2.0	5.0	0.15	70	0.4	5.5	
Variances Allowed:		20%	20%	30%	20%	20%	20%	
90284	Inserted @ 51.2m	1.9	4.8	0.15	64	*0.6*	5.0	N

Weighted Averages

From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
25.3	36.5	11.2	0.5	1.8	0.07	19	0.6	3.9	35
25.6	27.2	1.6	1.1	3.2	0.12	32	1.8	3.0	69
25.6	27.7	2.1	1.0	2.7	0.12	32	1.7	3.8	62
25.6	45.0	19.4	0.4	1.4	0.07	15	0.5	3.7	28
27.7	34.4	6.7	0.1	1.0	0.03	11	0.3	3.5	18
32.6	36.5	3.9	0.5	2.6	0.11	19	0.7	3.4	47
34.4	36.5	2.1	0.9	3.4	0.15	31	0.6	4.6	61
34.4	39.0	4.6	0.7	2.1	0.11	22	0.4	5.0	40

Thin Sections

PTS0001 16.4 m 002B_16.4 sample no. Partially weathered zone, sub economic.

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
11.9	18.1		BR PU SA	se si sc	b	Unit is medium greenish-grey. It consits of relatively unoxidised material containing oxidised zones along fractures and veins. The unit is a sericite-chlorite altered matrix supported breccia OR poorly sorted clast bearing pumice breccia. Clasts consist of angular to sub-rounded silicified sediment of variable size (mm-5cm), and sericite-chlorite altered, slightly compressed ?pumice clasts (mm-5cm showing internal structures). Silica clasts predominate in the first 1-2m and in the last 40cm. Cleavage present, poorly developed, marked by pyrite and sericite wisps, but difficult to measure. Sulphides present are common pyrite wisps and veinlets and occasional-rare clots of sphalerite rimmed by pyrite (in cleavage or fractures) e.g. 16.6m. Cavities rimmed by pyrite, quartz and a 'black' coating (Mn oxide?) are still common (mm-cm widths) and often look to have box works (after sulphides?). These are still mostly related to veining or fracturing.. Core is of reasonable competency, with most pieces over 10cm. Breaks along weathered fractures/veins. Fault? with quartz fragments and weathered pug at 12.5m. Another large weathered fracture at 15.5-15.7m. Mn and iron oxides often on weathered breaks.	12.5 13.7 15.6 16.6	FT CV FT CV	36° 40° 20° 36°		
18.1	19.1		BR PU	si si	a	Silicified rock/breccia, looks to be a silicified version of previous unit, containing small (<4mm) sericite altered clasts and lesser silica clasts. Fractures, weathering etc same as last unit. Core poor-moderate competency, most pieces at or under 10cm.	18.3	JT	25°		
19.1	22.6		BR ST	si si	a	Silicified ?fault breccia and sediments. Minimal weathering. Looks to be a breccia of the silicified fine grained sediments mention earlier in the hole. The fault breccia margin is present at 19.4m, and runs near parallel to CA, which may explain why core comes in and out of silicified breccias throughout the unit. Banded sediments, silicified rock and silicified ?pumice breccias are the lithologies that alternate with this. The clasts are angular to sub-rounded (mm-3cm scale or greater) and sit in a silicified, fine grained matrix. Open space fractures etc are abundant as before (did not measure orientations as there were many), however the amount of sphalerite +/-galena +/- pyrite clots increases down hole. Pyrite wisps and veinlets also common. Sulphide thus approaches disseminated grade near 22.6m. Difficult to pick a cleavage, however sericite wisps often occur around larger silicified clasts. Core, moderate to poorly competent (some pieces under 10cm). Core orientation at 22m.	19.4 20.7	FT SR	6° 55°		
22.6	**25.3**	**HODS**				**HOST - DISSEMINATED SULPHIDES**					
22.6	23.3		BR	se si	b	Transitional between previous silica dominant unit and sericite matrix dominant breccia. Contains abundant silica clasts (mm to >5cm), some of which are banded. Doesn't appear to be much rotation, and clast orientation seems tobe sub-parallel to cleavage (marked by pyrite and sericite). Pyrite dominant sulphide. Sphalerite occurs in occasional small blebs. Core broken to 23m.	22.9 23.2	BD CV	39° 28°		

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
PTS0002		20.4 m	002B_20.4 sample no. Ore grade. Minimal weathering.							
PTS0003		26.4 m	002B_26.4 sample no. Ore grade. Non-weathered.							
PTS0004		35.1 m	002B_35.1 sample no. Associated with a fault zone.							

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
23.3	25.3		BR	se si	a	Return to sericite altered matrix supported breccia. Clasts as before. Cleavage weak-moderate, intense at end of unit. Sulphide content variable HODS-HOTS. Disseminate pyrite dominates, with lesser sphalerite +/- galena spots and veinlets sporadically distributed. Possibly some chalcopyrite amongst the pyrite. Some cavities present in fractures, but only one fracture shows oxidation. Core has moderate competency (some pieces under 10cm). Last 20cm not competent.	24.8 24.9 25.3	JT CV CV	25° 57° 59°													
25.3	**25.6**	**F**				**FAULT**																
25.3	25.6		RK	se	a	Shear/fault. Acual break at 25.5m, contains pug. Cleavage intensity increases towards the break, as does sulphide (pyrite +/- galena) content. Small pits and cavities in sulphides around break. Abrupt change on other side of fault (no cleavage gradation etc).	25.5 25.6	FT JT	50° 33°													
25.6	**27.7**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
25.6	27.7		RK ST	sc si si	a	Dark grey, dark greenish grey, partially silcified sericite pumice? breccia/rock and silicified siltstone. Possibly a bedded sequence, although the margins between siltstone and the sericite altered rock are often brecciated e.g. 27.2m. Up to 26.4m contains abundant cavities, usually containing or lined with a black friable pyrite-galena? mix. Wall rock around cavites is generally barren of sulphide. The more silicified areas contain the greater amounts of cavity. Clots (1-5mm wide) of sphalerite rimmed by pyrite+/- galena are occasionally evident. Pyrite +/- chalcopyrite, bands and blobs present at disseminated grade in last 60cm. Cleavage strong in less silicified zones, absent in silicifed portions. Core of moderate competeny except for 27.5-27.7m and 25.6-26m which are broken. Shear/fault at 27.3m.	27.1 27.3	CV SR	23° 23°													
27.7	**29.9**	**HOTS**				**HOST - TRACE SULPHIDES**																
27.7	29.9		SH	sc	a	Greeny-yellow-gray, sericite-chlorite schist/pumice breccia. Occasionally (esp in first 1m) have (2-3mm) white sericite+/- sulphide (pyrite?) augen/wisps. Pyrite abundant, as wisps in cleavage, however neglible sphalerite noted. Some of the yellowy sericite patches contain small (<1mm) yellow-white spots, perhaps reflecting structures in a relict pumice? Core is competent.	29.8	CV	37°													
29.9	**31.5**	**HOSM**				**HOST - SEMI-MASSIVE SULPHIDES**																

Hole No: 002B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
29.9	31.5		SH	sc	a	Unit as before, except with disseminated to semi-massive sulphides - namely pyrite (both medium and fine grained varieties) +/- chalcopyrite bands and wisps with 2-4mm sphalerite 'clasts/augen' common. The latter are usually rimmed by a grey-black material, presumably the chalcopyrite-galena-sphalerite mix referred to in PASEX reports. The sphalerite occurrences are restricted to the bands of medium grained pyrite, which can cross-cut fine grained pyrite bands (but both types sub-parallel cleavage/bedding). Core is fairly competent. The contact with the following silicified unit sits close to cleavage (perhaps conformable if the 'cleavage' is reflecting bedding?).	30.1 31.2 31.5	CV CV CT	37° 28° 35°													
31.5	**34.4**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
31.5	32.6		RK	cs si	a	White and pale yellow silicified rock. The unsilicified parts look like the sericite-chlorite schist of previous units. The amount of cavities is significant, looking to have come after sphalerite-sulphide mix-pyrite clots (up to 3mm wide) which are still preserved in places. Unable to identify a feature to explain silcification, however numerous thin fractures/veins now exist, many run at a similar angle to cleavage in the previous unit. Coor is of poor-moderate competency.	31.8	VN	25°													
32.6	34.4		SH	sc	a	Return to the sericite-chlorite schist. Sulphide content trace-disseminated. Sphalerite content up, relative to pyrite, which is now only present as disseminated cubes and <mm blebs in cleavage. The sphalerite-mix sulphide-pyrite clots (mm-10mm) are either constrained in cleavage, or in ?fractures/joints/?later cleavage that cross the dominant cleavage. They often have a white halo (silica, white sericite?). Some have been washed out. Core orient at 33.8m. Core is of moderate competency. Orientated measurement at 33.8m (again, magnetic bearing approximate) - Cleavage fabric stikes ~N/S, and dips 78 degrees to the west.	32.7 32.7 33.9 34.1 34.3	JT CV JT CV CV	24° 26° 3° 20° 24°													
34.4	**49.7**	**F**				**FAULT**																
34.4	36.5		BR PY	qs	a	Polymict Breccia consisting of variably matrix and clast supported material. Clasts are: silicified sediment (mm->5cm size), black-sulphide mix clasts (mm-cm), sphalerite-mix-pyrite clot clasts (mm-cm), rarer sericite schist clasts (mm-cm). Generally the matrix is quartz-sericite, but in the 50cm either 35.4m may be semi-massive pyrite. Thus most of the unit is semi-massive sulphide (dominantly pyrite and the balck sulphide-mix); the base metal sulphides may be found outside of the clasts. The clasts are angular to sub-rounded, of extremely variable size. The unit is badly broken, however in larger pieces there appears to be a vague alignment of elongated clasts close to the sericite ?cleavage occasionally visible in the matrix. Core competency is quite bad. Last 60cm of unit has only trace sulphide content.	35.9	CV	24°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
36.5	37.4		BR SA	cy	a	Oxidised polimict breccia. However, there are no obvious sulphide clasts. Some sulphide (sulphide-mix and pyrite) in the matrix in the last 10cm of the unit. Core competency is poor-moderate (some pieces over 10cm). Possible fault/shear position at 37m (crumbled material 15cm wide). Fabric measurememt dodgy.	37.2	CV	21°													
37.4	38.0		SS	se si	b	Grey-black, fairly massive, sericite altered, fine to medium grained sandstone and siltstones. Possibly some silcification. Moderate cleavage/bedding marked by sericite, pyrite wisps and alternations in grain size. Sulphides trace grade, mainly pyrite wisps, sphalerite etc are absent. Competency poor with all pieces under 10cm. Contact with next unit ~45 degress.	37.7 38.0	CV CT	15° 45°													
38.0	45.0		BR VC	se se	b	Grey-black, poorly sorted, sericite altered silt size matrix supported, polymict breccia/volcanoclastic. Clast size varies from mm to greater than 3cm, most are 4mm-2cm in size. Clasts are angular to sub-rounded, with some showing elongation parallel to the dominant fabric (near parallel to CA). Clasts are: Dominantly silicified sandstones and siltstones, rare sericite altered clasts; Sulphide clasts are common, some being pyrite dominant, others similar to the sphalerite etc clots of previous units, or are dominantly the black sulphide-mix and pyrite. Dissolution of some clasts has occurred. Fabric is quite strong and runs very close to the CA. Fine grained pyrite may make up a significant compenent of the matrix. At 41.2-41.6m there is a siltstone (silicified) 'layer' 1-2cm thick which runs 30cm in length. Is this ripped from the wall rock, did it form in place in a fault, or is the whole unit a primary volcanoclastic that has been faulted. Competency is terrible. Most of unit is very broken, but little clay-pug is evident. Zones which are resonably competent are 38-39.8m is moderately commpetent and 41-41.8m. Boundary with next unit is 'faulted' comprising 10cm of fragments under 2cm. Most breaks in core on cleavage, or near perpendicular to CA.	41.4 41.9	CV CV	3° 17°													
45.0	49.7		SS ST	qs qs	b	Grey-black, fairly massive, sericite altered, fine to medium grained sandstone and siltstones. Possibly some silcification. Cleavage difficult to recognize, but pieces break easily along planes, in varying orientations ('joints' measured at 20-30 degrees may reflect cleavage). Sulphides trace grade, mainly pyrite wisps, sphalerite present as uncommon spots and blebs, sometimes in thin fractures.Thin (mm wide) veinlets common in first metre of unit - now appear to be clay, difficult to identify parent. there is one quartz-carbonate veinlet bearing trace galena present at 45.3m. Competency poor with most pieces under 10 and 5cm. Contact with next unit badly broken, and contains pug in last 20cm. Contact runs ~30-40 degrees to CA. Competent zone from 45.3-46.7m.	46.0 47.4 47.7	JT CV JT	21° 27° 60°													
49.7	**60.2**	**HO**				**HOST SEQUENCE**																

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
49.7	60.2		PU VC	sc qs sc	b	EOH at 60.2m. Greenish-yellow and medium gray, sericite+/-chlorite+/-silica altered, clast bearing volcanoclasitc sandstone/pumice breccia. The material is poorly sorted with fragments ranging from sub-mm to 1-2cm. Fragments may be angular to sub-rounded. Most smaller fragments seem to be feldspar (or altered varieties), while the larger clasts are silicified siltstone and sandstone fragments. The rock is almost schistose in places with sericite-chlorite wisps and clots (up to 2cm thick)alternating with more silicified material. The wisps seem to mark a weak cleavage close to CA for most of the unit but possibly ~30-40 degrees to CA in last few metres of core. The sericite-chlorite clots sometimes have internal structure (pumice?), but this may merely be overprinting of feldpar crystals. Unit has occasional 2-3cm thick sericite-chlorite rich bands crossing the core after ~57.3m. Commonly carbonate and quartz-carbonate +/- trace sphalerite veinlets occur, some of which run very close to CA. Core is generally competent. Small shear/fault 'zone' 52.2-52.3m, with clay/pug on the 52.3m surface, and carbonate veining within the zone; yellow 'hue' of unit not as pronounced after this zone (change in carbonate content?). Orientation at 54.5m. Orientation measurement at 54.5m, cleavage fabric strikes ~NNE/SSW and dips 77 degrees to the west.	50.6 52.2 52.3 52.6 54.9 57.8 58.2 58.8	QV SR SR CV VN BD CV BD	52° 18° 27° 14° 4° 46° 34° 42°													

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 003B **Location:** Brown's Tunnel

Objective: To test eastern extension of Lens 1 one 5290N section

Result: No significant mineralisation. HQ core barrel and 3m of HQ rods cut off and abandoned at ~35.7m. Beware Core loss effects on Assays.

Depth	Direct	Dip
0.0	270.0	-62.0
29.5	269.0	-62.7
60.0	267.0	-61.0
86.0	268.0	-61.0

Planned Direction: 270°
Planned Dip: -62°
Planned Depth: 80.0 m
Planned Northing: 5290 m N
Planned Easting: 4958 m E
Planned Collar R.L.: 473 m RL

Drilling Commenced: 4/06/98
Drilling Completed: 9/06/98
Actual Depth: 86.0 m
Surveyed Northing: 5291.70 m N
Surveyed Easting: 4959.90 m E
Surveyed Collar R.L.: 472.30 m RL

Date Logged: 02-Jul-1998
Logged By: Michael Whitbread
Hole Size: HQ/NQ
Hole Category: Other
Grouted:

Date Log Verified: 25-Aug-1998
Verified By: Michael Whitbread

Summary Log:
Ground generally broken, especially around logged faults.
0-2m No core;
-7.2m HO; -16.6m HOTS;
-20.6m F; -24.1m HO (23.7-24.1 F?)
-28.9m HOTS;
-30.5m F; -35m HOTS;
-46.5m F; -48.2m HOTS;
-74.1m FW; -82.9m HOTS -86m(EOH) HO.

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°
0.0	**2.0**	**NC**				**NO CORE**			
0.0	2.0				a	No core			
2.0	**6.1**	**HO**				**HOST SEQUENCE**			
2.0	6.1		BR SA ST	cy cy	a	Weathered, broken, material. Varies between clay zones, weathered siltstone schists, and weathered 'breccias' of 'cherty' fragments (with lesser siltstone fragments as well). First 20cm is a brown silicified sandstone. 'Cherts' most common between 3 and 5.6m. Last part looks to be a weathered version of next unit. Competency very bad - generally only partial recovery, but also have 80cm loss between 3 and 4.7m.			
6.1	**7.2**	**HO**				**HOST SEQUENCE**			
6.1	7.2		RK ST	se se	b	Medium grey, relatively unoxidised, strongly cleaved, fine grained, ?sericite altered, rock/siltstone. Possible fault position at 6.7-6.8m, marked by light grey clay. Competency bad - generally very broken, with larger fragments very soft and friable. Stong fabric at 40 degrees to CA.	6.5	CV	40°
7.2	**16.6**	**HOTS**				**HOST - TRACE SULPHIDES**			

RQD To (m)	RQD %
2.0	NC
8.0	5
9.8	88
11.0	8
16.6	90
20.8	0
29.1	84
30.5	14
35.2	85
46.2	8
86.0	96

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
90340	2.0	2.4	0.4	0.1	0.1	0.01	1	0.1	0.2	3
90341	2.4	3.4	1.0	0.1	0.1	0.01	1	0.1	0.2	3
90342	3.4	4.7	1.3	0.1	0.1	0.01	1	0.1	0.2	3
90343	4.7	5.7	1.0	0.1	0.1	0.01	1	0.1	0.2	3
90344	5.7	6.1	0.4	0.1	0.1	0.01	1	0.1	0.4	3
90345	6.1	7.2	1.1	0.2	0.1	0.01	1	0.1	0.6	3
90346	7.2	8.3	1.1	0.2	0.1	0.01	1	0.1	0.7	3
90347	8.3	9.8	1.5	0.1	0.1	0.01	1	0.1	1.5	3
90348	9.8	11.0	1.2	0.1	0.1	0.01	1	0.1	1.0	3
90349	11.0	12.0	1.0	0.1	0.3	0.01	1	0.1	1.0	6
90350	12.0	13.0	1.0	0.1	0.2	0.01	1	0.1	0.8	4
90351	13.0	14.0	1.0	0.1	0.1	0.01	1	0.1	0.8	3
90352	14.0	15.0	1.0	0.1	0.2	0.01	1	0.1	0.7	4
90353	15.0	16.0	1.0	0.1	0.7	0.01	1	0.1	0.6	11
90354	16.0	16.6	0.6	0.2	1.2	0.01	1	0.1	0.6	18
90355	16.6	17.9	1.3	0.1	0.3	0.01	1	0.1	1.3	6
90356	17.9	19.5	1.6	0.1	0.3	0.01	1	0.1	1.4	6
90357	19.5	20.6	1.1	0.1	0.1	0.01	1	0.1	0.8	3
90358	20.6	21.6	1.0	0.1	0.1	0.01	1	0.1	3.1	3
90359	21.6	22.5	0.9	0.1	0.1	0.01	1	0.1	2.1	3
90360	22.5	23.7	1.2	0.1	0.1	0.01	1	0.1	1.7	3
90361	23.7	24.1	0.4	0.1	0.1	0.01	1	0.1	1.2	3

Hole No: 003B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
7.2	16.6		VC	sc se si	a	Greenish yellow and medium grey, variably sericite+/-chlorite altered, generally sericitic altered-matrix supported, breccia/volcanoclastic breccia. Unit is often partially oxidised, as iron oxide coats along fractures and blebs in surrounding rock. Some of these fractures run about 45 degrees to CA, 'conjugate' to the dominant fabric. Clasts are mainly of the 'cherty'/silica altered fine grained sediment type -some banded, others massive. Clast size from mm to >4cm. Clasts sub-angular to rounded, but elongate, isolated bands of 'chert' are also occasionally present. Clasts smaller in size and less common in last 2m of unit. Fabric is often strong, marked by sericite+/-chlorite wisps and faintly by clast orientation. Fabric wraps around clasts, so locally may not reflect overall fabric orientation. Rarer clasts are pyrite with +/- sulphide mix and very rarely sphalerite. This sulphide assemblage is uncommonly present in strong cleavage zones, around the rims of clasts and in rarely in 'tension' cracks in 'chert' clasts. First 1.2metres of unit stongly sericite altered (carrying only small <5mm size fragments), and is partially oxidised. The last 1m starts to become silicified. Competency generally moderate-good except for these zones: 7.2-8m, 9.5-10.9m, which have most fragments under 5cm and 10cm. Most breaks in unit are along cleavage, which sits around 30 degrees to CA. Quartz veins fragments (with iron oxide staining) present at 12.1m, possibly a small shear zone, parallel to dominant fabric.	8.5 11.4 13.6 13.6 15.2	CV CV JT CV CV	45° 30° 4° 27° 37°		
16.6	**20.6**	**F**				**FAULT**					
16.6	20.6		QZ RK ST VC	 se qs	a	Zone of extensve core loss, and rubbly broken material. Rubble of 3 types: 1- Medium grey siltstone, bearing common thin <1mm sulphide veinlets (pyrite mainly +/- galena +/- sphalerite); 2- Yellow green sericite altered rock, sometimes containing 'cherty' clasts, has a strong fabric (~10-15 degrees to CA); 3 vein quartz fragments. 1 dominates to 19m,after which 2 is predominant. 3 occurs as a 20cm patch somewhere between 19-20.5; hard to say exactly since there is .5m core loss. Competency awful, with 10cm core loss between 17.5-17.8m; 1m loss from 17.8-19m and .5m loss 19-20.5m. Quartz zone (which is rarely seen) probably marks	20.4	CV	10°		
20.6	**24.1**	**HO**				**HOST SEQUENCE**					

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
90362	24.1	24.5	0.4	0.1	0.1	0.02	1	0.1	0.9	3
90363	24.5	25.5	1.0	0.1	0.1	0.01	1	0.1	1.2	3
90364	25.5	26.5	1.0	0.1	0.1	0.01	1	0.1	1.6	3
90365	26.5	27.5	1.0	0.1	0.1	0.01	1	0.1	1.8	3
90366	27.5	28.9	1.4	0.1	0.1	0.01	1	0.1	2.7	3
90367	28.9	30.5	1.6	0.1	0.1	0.01	1	0.1	0.7	3
90368	30.5	31.5	1.0	0.1	0.1	0.01	1	0.1	0.9	3
90369	31.5	32.5	1.0	0.1	0.1	0.01	1	0.1	1.5	3
90370	32.5	33.5	1.0	0.1	0.1	0.01	1	0.1	1.6	3
90371	33.5	34.5	1.0	0.1	0.1	0.01	8	0.1	2.0	4
90372	34.5	35.0	0.5	0.1	0.2	0.01	1	0.1	1.7	4
90373	35.0	36.2	1.2	0.1	0.1	0.01	1	0.1	0.7	3
90374	36.2	38.8	2.6	0.1	0.1	0.01	1	0.1	1.7	3
90375	38.8	39.8	1.0	0.1	0.1	0.01	5	0.1	1.1	4
90376	39.8	40.8	1.0	0.1	0.1	0.02	5	0.1	2.0	4
90377	40.8	41.8	1.0	0.1	0.3	0.01	4	0.1	2.1	6
90378	41.8	42.8	1.0	0.2	0.6	0.01	4	0.1	1.3	10
90379	42.8	43.8	1.0	0.1	0.1	0.03	8	0.1	1.7	4
90380	43.8	44.9	1.1	0.1	0.1	0.01	5	0.1	1.5	4
90381	44.9	45.2	0.3	0.1	0.1	0.01	1	0.1	1.1	3
90382	45.2	46.5	1.3	0.1	0.1	0.01	1	0.1	1.5	3
90383	46.5	47.5	1.0	0.1	0.1	0.01	1	0.1	1.4	3
90384	47.5	48.2	0.7	0.1	0.1	0.01	1	0.1	1.4	3
90385	48.2	49.2	1.0	0.1	0.1	0.01	1	0.1	1.7	3
90386	73.1	74.1	1.0	0.1	0.1	0.01	1	0.1	1.5	3
90387	74.1	75.1	1.0	0.2	0.1	0.01	1	0.1	2.6	3
90388	75.1	76.1	1.0	0.2	0.3	0.01	5	0.1	3.0	7
90389	76.1	77.1	1.0	0.1	0.4	0.01	5	0.1	1.6	8
90390	77.1	78.1	1.0	0.3	0.5	0.01	9	0.2	5.8	11
90391	78.1	79.1	1.0	0.2	0.4	0.01	6	0.1	3.5	8
90392	79.1	80.1	1.0	0.1	0.6	0.01	14	0.2	3.7	13
90393	80.1	81.1	1.0	0.2	0.3	0.05	7	0.1	4.9	8
90394	81.1	82.1	1.0	0.1	0.6	0.01	4	0.1	3.3	10
90395	82.1	82.9	0.8	0.1	0.1	0.01	1	0.1	2.8	3
90396	82.9	83.9	1.0	0.1	0.1	0.01	1	0.1	2.1	3
	Total Length:		58.0							

Standards

Reference Values for:	HBM-02				17/07/98		
	3.4	12.5	0.46	150	1.3	22.7	
Variances Allowed:	20%	20%	30%	20%	20%	20%	
90397 Inserted @ 83.9m	3.7	15.0	0.48	164	1.3	23.3	Y

Hole No: 003B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
20.6	23.7		VC	qs	b	Medium grey or orange grey, densely feldspar phyric, occasionally silicified siltstone clast bearing, moderately silcified/sericitised dacitic mass flow/volcanoclastic. Quartz phenocrysts rare to absent. Feldspar phenocrysts of variable size (mm-5mm), and the uncommon siltstone fragments are 1-2cm in length. Matrix is an indeterminate fine grained material. A fabric is evident, although crystal orientation often only weakly reflects this; may be cleavage or weak bedding. Possibly Fe carbonate alteration present, indicated by the orange post-drilling oxidation hue; some of phenocrysts were carbonate or are now carbonate altered? Occasional thin (<1mm) veinlets of reddy brown clay, or a black material (chlorite?), cut across the core in varying orientations. Core of reasonable competency to 22.5m after which the ground is broken (fragments less than 10 and 5cm, with 0.6m core loss before 23.1m.	21.8 22.4	CV CV	31° 41°													
23.7	24.1		BR ST		b	Possible fault, pug and framents of ?sericite altered siltstone on end face of last unit, 0.2m core loss before 24.1m and broken fragments.	23.7	FT	27°													
24.1	**28.9**	**HOTS**				**HOST - TRACE SULPHIDES**																
24.1	24.5		ST	se	b	Medium to dark grey, possibly weakly sericite altered, siltstone. Marked by strong fabric 5-15 degrees to CA. Breaks along this or ~45 to CA along joint. Unit weak Hots - carries rounded blebs/clasts of sulphide as pyrite, or 'sulphide mix'-sphalerite-chalcopyrite. Bleb size 2mm to 3-4cm. Competency poor, due to breaks along fabric.	24.3	CV	5°													
24.5	28.9		PU ST VC	sc si qs	b	Medium grey or orange grey, densely feldspar phyric, clast bearing, moderately silcified/sericitised dacitic mass flow pumice breccia/volcanoclastic. Quartz phenocrysts rare to absent. Feldspar phenocrysts of variable size (mm-5mm). Black, silicified siltstone/slate fragments are 1->10cm in length, which may be cut by orangey carbonate and white quartz +/- sphalerite etc veinlets. Other wispy, irregular and extensively sericite-chlorite (or can be silica) altered feldspar phyric zones with faint internal lamination may be pumiceous clasts. Also have light grey cherty clasts (sometimes banded and not the black siltstone/slate). In rare case have pyrite wisps and blebs. A fabric is evident close to CA, picked out be clast orientation, sericite wisps, orangey wisps, etc. Fabric, in rare cases followed by thin quartz +/- sulphide-mix+sphalerite e.g. 28.6m. Matrix fine grained, occasionally sand sized. Possibly Fe carbonate alteration present, indicated by the orange post-drilling oxidation hue; some of phenocrysts were carbonate or are now carbonate altered? Feldspar size and abundance greatly decreases after 26.8m. Occasional, thin black +/- sericite veinlets cut across the core ~40-60 degrees. Competency moderate except from 24.7-25.1m which has (0.1m loss) and is broken.	25.4 25.5 27.0 27.3 28.9	CV VN VN CV CV	11° 71° 63° 3° 5°													
28.9	**30.5**	**F**				**FAULT**																

Hole No: 003B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
28.9	30.5		QZ VC	 qs	a	Fault zone, consisting of broken fragments, most 5-10cm in length. Fragments are massive, coarse quartz veins and a version of the previous unit (still clast bearing strongly transposed/sheared) usually cross-cut by the afore mentioned quartz veins (mm-cm's wide). Fragments (e.g. elongate siltstone bands) within the volcanoclastic show kinking around the later quartz veinlets. Dacite volcanoclastic does not show orange oxidation. Quartz veins may carry trace coarse grained red-brown sphalerite, and galena. Veins are coarse quartz crystals, usually elongate vertically to vein walls, or randomly grown into voids if in a massive zone. Competency bad, worst zone before 30m (0.1m core loss).	29.8 30.1	CV CV	10° 7°													
30.5	**35.0**	**HOTS**				**HOST - TRACE SULPHIDES**																
30.5	35.0		ST VC	si se	b	Much like 24.5-28.9m. Medium grey, occasionally orange stained, densely feldspar phyric, clast bearing, moderately sericitised dacitic mass flow breccia/volcanoclastic. Quartz phenocrysts rare to absent. Feldspar phenocrysts of variable size (mm-5mm), set in a finer grained matrix of indeterminate mineralogy - now quartz-sericite altered. Phenocryst size varies between coarse grained to medium grained throughout. Black, silicified siltstone/slate fragments are 1->30cm in length, which may be cut by orangey carbonate and white quartz +/- sphalerite veinlets. Sphalerite may occur as very rare blobs and wisps in the matrix and cleavage as well. Siltstone/slate fragments may have internal lamination/banding. Unit also has cherty type clasts (ie not siltstone/slate). A fabric is evident ~30 degrees to CA, picked out be clast orientation, sericite wisps, orangey wisps, etc. Competency moderate except 33.4-34.5 which is poor to moderate. 0.1 core loss between 30-31.2m most likely in previous fault unit.	31.7 32.6	BE CV	25° 30°													
35.0	**46.5**	**F**				**FAULT**																
35.0	46.5		BR QZ ST	 sc	a	Broken zone, dominantly comprised of broken variably sericite+/-chlorite altered siltstone. Also has two 10cm fault-pug zones (~36.2-36.3m and ~45.1-45.2m), and three zones of quartz+/-chlorite+/-sphalerite+/-galena veining (~36.7-?38.5m?, 43-43.2m and ~46.2-46.4m). The siltstone has a strong fabric at ~30 degrees to CA and is greenish in hue to 39.7m after which it is medium grey. Quartz +/- sphalerite veinlets are common. Siltstone also has occasional cross-cutting or fabric concordant sericite and more rarely sphalerite, pyrite veinlets. Pyrite +/- sphalerite etc may rarely be present as blebs or disseminations in the siltstone. Competency awful, with core loss bad to 38.5m (no recovery 36.9-38.5m), and unmarked core loss in the remainder.	40.6 44.4 44.8 46.4	CV CV CV CV	30° 27° 21° 29°													
46.5	**48.2**	**HOTS**				**HOST - TRACE SULPHIDES**																

Hole No: 003B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
46.5	48.2		VC	qs si	a	Grey, and yellow-brown-grey, heavily silicified, well banded, graded, dominantly fine (to medium grained) volcanoclastic. The banding often appears to be due to alternating graded material. The coarser material is feldspar and lesser quartz crystal rich, but is reasonably well sorted. Only at one spot, 47m, is there an appearance of brecciation, with coarse material wedged unevenly between two finer bands - possibly due to loading. Silicified finer grained bands or 'cherty' intervals, are light grey in colour and may be banded by ?chlorite veinlets/laminations. Coarser bands are yellowy in colour due to more developed sericite (plus silica) alteration of feldspars c.f. light grey silicified finer grained bands. Quartz-carbonate +/- sphalerite veinlets are common, running in various orientations, usally against the banding. This unit may be a fining (Bouma type) unit at the top of the stratigraphically lower mass flow (next unit). Or it may represent the resumption of low energy sedimentation following the mass flow. Competency good. Orientated measurement at 47.5m, bedding, dipping 38-42 degrees to the west at ~10-190 strike.	47.0 47.4 48.0	BD BD BD	27° 15° 37°													
48.2	**74.1**	**FW**				**FOOTWALL SEQUENCE**																
48.2	74.1		PU ST	ql si si	a	NQ from 60.5m. Patchwork black-yellow-grey, or 'dogs breakfast' coloured, densely feldspar phyric, clast bearing, silcified and patchily chlorite altered dacitic mass flow pumice breccia. Quartz phenocrysts rare to absent (thus dacitic composition - as silica may be post deposition). Feldspar phenocrysts of variable size (mm-5mm), and, if not part of a pumice clast, sit in the fine grained, silicified matrix. Unit partly dominated by black (lesser green-black), wispy, irregular and extensively chlorite-silica altered, feldspar phyric patches often with faint internal laminations; these are believed to be pumice clasts. The black patches may be Fe-Mg rich chlorite, which appears to have replaced the matrix, not the phenocrysts. Some of the black patches are chlorite accumulations, not alteration products of pumice. Clasts may be angular to sub-rounded: Dominant among these are dark grey to black, silicified, sometimes banded, siltstone/slate fragments 1->30cm in length. Most other clasts have a variable size range but are less than 10cm in length. Other fragments include: common light grey, often banded, silicified siltstone/chert; rare sericite altered rock; and yellow to pinky-yellow silica +/- ?K-feldspar altered, occasionally banded and/or feldspar phyric clasts. Some of the latter may be pumice clasts. A weak fabric is evident, possibly cleavage or bedding?; is picked out be vague clast or crystal orientation, sericite wisps, elongations of 'pumice' clasts etc. It is difficult to measure, and may be ambiguous in places; but runs ~40-50 degrees to CA. Common, thin (mm-1cm) quartz-carbonate veins cut across the core in varying orientations, rarely carrying sphalerite. Possibly important quartz-carbonate+chlorite veins at 52.5-53.8, running near CA, along or between which there may be some movement.. Competency good. Orientation at 56.5m.	53.2 53.5 57.9 65.4	VN VN CV CV	10° 8° 50° 47°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
74.1	**82.9**	**HOTS**				**HOST - TRACE SULPHIDES**																
74.1	82.9		SL ST	si cl si	b	Medium grey to black, silicified, occasionally chlorite+/-sericite altered, siltstone/shale with lesser fine sandstone and chert. After 78.2m becomes finer grained and black in colour. Variably massive or finely laminated. Possible bedding marked by changes in grain size, some of which run orthogonal to CA, while others sit sub-parallel to laminations (30-40 degrees to CA). The variation may be due to slumping/loading of these contacts, or cross-bedding. Unit also carries trace quantities of sulphide, present either in bands (pyrite mainly), or in thin quartz-carbonate veinlets which are common. A small number of pyrite +/- sphalerite bands (up to 5cm thick) are present up to 78.2m, in the lighter coloured zone of the unit (e.g. at 78m). These bands appear to be parallel to laminations, however most sphalerite present in these zones (and the unit in general) sits in thin carbonate +/- quartz veinlets. The pyrite zones seem to have chlorite band counterparts (which may contain blebby and disseminated pyrite) in the darker, second half of the unit. Pyrite may also be present as small disseminated blebs outside of these zones. Sphalerite content in the unit controlled by the numerous thin (mm) carbonate-quartz veinlets which run in varying orientations: parallel or conjugate to banding and laminations; and to a lesser extent, close to CA. Core competent. Orientation at 77m. Orientated measurement:- 77.9m banding - dip, 74-76 degrees to the East, ~320-140 strike; 76.9m bedding/banding dipping 80 degrees to the East, ~315-135 strike; 82.9m Contact/?shear dipping 80 degrees to the East, ~325-345 strike.	76.9 78.1 78.5 80.3 80.5 82.0	BE BD CV VN BD VN	30° 47° 43° 45° 51° 6°													
82.9	**86.0**	**HO**				**HOST SEQUENCE**																
82.9	86.0		BR VC	si	b	EOH 86m. Yellowy-green-grey, silicified, altered-feldspar phyric rich, 'cherty' clast bearing, matrix dominated, volcanoclastic breccia/mass flow. Feldspar phenocrysts vary from 1-5mm generally. They are also sericite+/-?carbonate altered, taking on a yellowy hue. The phenocrysts are contained within a silty to fine sand sized matrix. Common to occasional cherty clasts (are banded), varying from 5mm->30cm in size. Unit also carries rarer small dark slatey clasts. This unit is similar to 20.6-24.1m. Despite being heavily silcified, assigned HO rather than FW, as it lacks the 'pumice' and large black slate/siltstone clasts/rafts of the 'FW' unit 48.2-73.1m. Carries quartz-carbonate+/-chlorite+/-sphalerite veinlets (similar to previous unit); however sphalerite content is greatly decreased and decreases downhole. Core competent. Orientation at 83. EOH at 86m.	83.8 84.0 85.0	VN CV CV	50° 33° 31°													

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 004B

Location: Brown's Tunnel 5310N

Objective: Test Lens 1 trends on Section 5310N.

Result: LENS 1- 53.8-64.2m, 10.4m at 3.4%Pb, 5.4%Zn, 0.23%Cu, 38g/t Ag, 1.7g/t Au,3.9% Fe $112TMU (includes 56.8-61.2m, 4.4m at $179 TMU).

Depth	Direct	Dip
0.0	90.0	-70.0
31.0	90.0	-68.8
60.0	90.0	-67.5
90.0	89.0	-67.0
100.0	89.0	-67.0

Planned Direction: 90°
Planned Dip: -70°
Planned Depth: 100.0 m
Planned Northing: 5330 m N
Planned Easting: 4900 m E
Planned Collar R.L.: 487 m RL

Drilling Commenced: 10/06/98
Drilling Completed: 12/06/98
Actual Depth: 100.0 m
Surveyed Northing: 5330.20 m N
Surveyed Easting: 4901.80 m E
Surveyed Collar R.L.: 489.60 m RL

Date Logged: 09-Jul-1998
Logged By: Michael Whitbread
Hole Size: HQ/NQ
Hole Category: Other
Grouted:

Date Log Verified: 30-Sep-1998
Verified By: Michael Whitbread

Summary Log:
0-2.1 NC; -14.2 Fluvio Glacials; -43.8 Ho; -44.6 F; -47.4m Ho; -48.8m Hots;-49.3m Ho; -53.8m Hots; -55.6m HODS; -56.8m Hots; -58.7m HOSM; -59.3m HOTS; -61.2m HODS; -68.4m Hots; -72.7m Ho; 73.9 S; -87.6m HOTS; -88.8m HODS; -89.4m HOTS; -100m Ho

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°
0.0	**2.1**	**NC**				**NO CORE**			
0.0	2.1				a	No core.			
2.1	**14.2**	**FG**				**FLUVIO-GLACIALS**			
2.1	13.0		CY GL		a	Glacial material, oxidised, mainly silicified pebbles and cobbles in a clay matrix (where preserved). Yellow clay patch 7.8-7.9m. 9-10m of core loss.			
13.0	14.2		GL		a	Sands and gravels, with one silcified cobble entrained. 40cm core loss associated with this.			
14.2	**19.2**	**HO**				**HOST SEQUENCE**			
14.2	17.0		RK SA ST	cy	a	Weathered rock, most likely after siltstone and sandstones, perhaps volcanoclastic breccia. Unit is pallid, consists mainly of clays and is mottled by goethite. Possibly a vein present - small fragment at 14.6m. Competency very bad. Only occasional fragments over 10cm.	17.0	JT	30°
17.0	19.2		RK SA SS	si	a	As last unit, except silicified and has a darker yellow colour. Iron staining evident, and iron oxides after brittle veining present. Some fragments pitted - after feldspar? Rock possibly after dacite. Competency terrible. Pieces usually pebble sized.	18.9	VN	47°

RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
2.1	NC	90398	14.2	15.7	1.5	0.1	0.1	0.01	1	0.1	2.8	3
21.1	3	90399	15.7	17.0	1.3	0.1	0.1	0.01	1	0.1	1.3	3
22.8	82	90400	17.0	18.5	1.5	0.1	0.1	0.01	1	0.1	0.9	3
24.2	14	90401	18.5	19.2	0.7	0.1	0.1	0.01	1	0.1	1.7	3
25.8	81	90402	19.2	20.7	1.5	0.1	0.1	0.01	1	0.1	4.0	3
27.7	15	90403	20.7	22.2	1.5	0.1	0.1	0.01	1	0.1	0.6	3
28.3	83	90404	22.2	23.7	1.5	0.1	0.1	0.01	1	0.1	1.1	3
29.6	0	90405	23.7	25.2	1.5	0.1	0.1	0.01	1	0.1	0.7	3
30.4	75	90406	25.2	26.7	1.5	0.1	0.1	0.01	1	0.1	0.5	3
37.7	20	90407	26.7	28.2	1.5	0.1	0.1	0.01	1	0.1	0.7	3
38.7	90	90408	28.2	28.5	0.3	0.1	0.1	0.01	1	0.1	0.5	3
39.9	8	90409	28.5	29.5	1.0	0.1	0.1	0.01	1	0.1	0.9	3
42.2	60	90410	29.5	30.2	0.7	0.1	0.1	0.01	1	0.1	0.5	3
43.3	9	90411	30.2	31.7	1.5	0.1	0.1	0.01	1	0.1	0.5	3
44.0	100	90412	31.7	32.7	1.0	0.1	0.1	0.01	1	0.1	0.3	3
45.0	20	90413	32.7	33.7	1.0	0.1	0.1	0.01	1	0.1	0.6	3
50.2	78	90414	33.7	34.7	1.0	0.1	0.1	0.01	1	0.1	0.4	3
55.3	7	90415	34.7	35.7	1.0	0.1	0.1	0.01	1	0.1	0.7	3
56.0	100	90416	35.7	36.7	1.0	0.1	0.1	0.01	1	0.1	0.4	3
56.6	0	90417	36.7	37.7	1.0	0.1	0.1	0.01	1	0.1	0.4	3
57.9	84	90418	37.7	38.7	1.0	0.1	0.1	0.01	1	0.1	0.9	3
59.6	17	90419	38.7	39.7	1.0	0.1	0.1	0.01	6	0.1	0.5	4

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°
19.2	**43.8**	**HO**				**HOST SEQUENCE**			
19.2	28.5		BR PU RK VC	cy cl si	a	Oxidised saprolite after a silcified and patchily clay altered, clast bearing, volcanoclastic breccia/dacitic pumice breccia mass flow/rock. Unit, patchily mottled and streaked by clorite rich zones and reddish clayey zones. Clasts sporadic, usually white, variable in size (cm->10cm) but difficult to identify. Some appear to have evenly distributed altered ?feldspar phenocrysts (possibly dacite clasts?). The chlorite zones often contain the phenocrysts as well, with the form of smaller patches suggesting pumice. A fabric is strongly suggested in some pieces ~close to CA. Joints and weathered quartz veinlets often present (conjugates to), usually ~45 to CA. Competency is moderate, with most fragments above 10 or 5cm, no extensive zones or rubble.	26.1 26.6	VN CV	55° 10°
28.5	30.2		DA VC	si si	a	Yellow-white, oxidised, silica and clay altered, ?feldpsar phyric volcanoclastic sandstone or dacite. Sandstone in appearance, however evenly distributed clay spots and pits look to be after feldspar. Thus could be a dacite. Fairly massive. Competency very bad to 29.6m, after which it is moderate.			
30.2	31.7		BR DA VC	 si	a	Oxidised to moderately oxidised, white and green, variably clast and matrix supported ?dacitic breccia. Fragments are poorly sorted, but less than 5cm in size, and sub-rounded. Matrix is chloritc (greenish), and carries hints of altered feldspar. Looks to be a dacitic breccia (where volcanoclastic or lava ?). Has fabric in places. Some clasts are cherty, or contain quartz phenocrysts. Unit contains common very thin veinlets, oxidised after ?. Unit of poor competence, most fragments under 5cm.	30.3 31.4	JT CV	16° 27°
31.7	33.7		DA RK	 ql qs	a	Oxidised, silica-sericite-?chlorite, banded rock/dacite. Seems to bear oxidised altered ?feldspars phenocrysts, in certain zones. Unit also carries numerous very thin quartz-chlorite veinlets. Banding is faint at best, and in places the unit is massive. Unit of poor to moderate competency, with most fragments over 10 and 5cm.			
33.7	40.2		DA	qs si	a	Moderately oxidised, pale yellow, to greenish grey, variably banded, variably silicified and sericitised+/- chlorite altered dacite. Reason for assigning unit as dacite as for those previous. Iron oxides still coat most fracture surfaces, and some appear to be after sulphide veins e.g. 37.9m (possibly sphalerite). Banding is occasionally visible, and often seems to be the result of variable silicification, although some are visible which are due to grain-size variations e.g. 39.6m. Competency moderate, except for 34.7-37.5m which is quite broken.	37.9 38.1 38.6 39.6	VN VN BD BD	23° 51° 51° 65°

RQD To (m)	RQD %
62.5	89
62.9	0
66.5	91
68.5	30
73.3	86
73.8	0
88.9	90
90.2	7
94.5	86
94.8	0
99.2	95
100.0	0

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
90420	39.7	40.2	0.5	0.1	0.1	0.01	1	0.1	0.5	3
90421	40.2	41.2	1.0	0.1	0.1	0.01	1	0.1	0.9	3
90422	41.2	42.2	1.0	0.1	0.1	0.01	1	0.1	1.8	3
90423	42.2	43.2	1.0	0.1	0.1	0.01	1	0.1	0.9	3
90424	43.2	43.8	0.6	0.1	0.1	0.01	1	0.1	0.4	3
90425	43.8	44.6	0.8	0.1	0.1	0.01	1	0.1	1.2	3
90426	44.6	45.6	1.0	0.1	0.1	0.01	1	0.1	0.7	3
90427	45.6	46.6	1.0	0.1	0.1	0.01	1	0.1	0.6	3
90428	46.6	47.4	0.8	0.1	0.1	0.01	1	0.1	0.8	3
90429	47.4	48.3	0.9	0.2	0.3	0.01	4	0.1	1.3	7
90430	48.3	48.8	0.5	0.5	1.3	0.09	12	0.1	3.3	23
90431	48.8	49.3	0.5	0.1	0.1	0.01	1	0.1	1.3	3
90432	49.3	50.3	1.0	0.3	0.6	0.03	1	0.1	1.7	11
90433	50.3	51.3	1.0	0.2	1.0	0.05	1	0.1	2.3	16
90434	51.3	52.3	1.0	0.1	0.3	0.01	1	0.1	2.1	6
90435	52.3	53.4	1.1	0.1	0.1	0.01	1	0.1	1.1	3
90436	53.4	53.7	0.3	0.1	0.1	0.01	1	0.1	1.3	3
90437	53.7	53.8	0.1	0.5	0.8	0.01	1	0.1	3.4	14
90438	53.8	54.9	1.1	4.1	6.0	0.35	53	2.2	6.7	131
90439	54.9	55.6	0.7	2.5	3.4	0.25	36	1.7	5.9	81
90440	55.6	56.8	1.2	1.2	1.8	0.13	1	0.1	5.2	32
90441	56.8	57.8	1.0	5.5	10.3	0.07	126	1.2	2.1	195
90442	57.8	58.7	0.9	4.4	8.2	0.07	36	1.4	3.3	148
90443	58.7	59.3	0.6	1.9	4.3	0.18	36	10.6	4.8	167
90444	59.3	60.3	1.0	7.5	12.2	0.65	43	1.7	3.3	226
90445	60.3	61.2	0.9	5.9	6.8	0.42	49	1.8	4.6	148
90446	61.2	62.2	1.0	1.3	2.6	0.14	14	1.2	3.1	55
90447	62.2	63.2	1.0	1.3	1.4	0.09	10	0.9	1.7	35
90448	63.2	64.2	1.0	1.4	2.5	0.19	15	0.2	2.4	46
90449	64.2	65.2	1.0	0.5	0.5	0.04	6	0.1	0.9	11
90450	65.2	66.3	1.1	0.7	0.1	0.11	1	0.1	1.5	7
90451	66.3	67.3	1.0	0.8	1.7	0.14	1	0.1	2.4	29
90452	67.3	68.4	1.1	0.1	0.5	0.04	1	0.1	1.9	8
90453	68.4	69.4	1.0	0.1	0.1	0.01	1	0.1	0.5	3
90454	69.4	70.4	1.0	0.1	0.1	0.01	1	0.1	0.5	3
90455	70.4	71.4	1.0	0.1	0.1	0.01	1	0.1	0.8	3
90456	71.4	72.3	0.9	0.1	0.1	0.01	1	0.1	1.0	3
90457	72.3	72.7	0.4	0.1	0.1	0.01	1	0.1	1.2	3
90458	72.7	73.9	1.2	0.9	3.3	0.17	17	0.9	2.3	60
90459	73.9	74.5	0.6	0.5	1.7	0.28	44	0.2	4.8	37
90460	74.5	75.5	1.0	0.6	1.5	0.16	44	0.1	5.9	33
90461	75.5	76.5	1.0	0.3	0.7	0.43	32	0.1	4.6	22
90462	76.5	77.5	1.0	0.3	0.7	0.27	35	0.1	5.5	21
90463	77.5	78.5	1.0	0.4	1.2	0.76	52	0.1	7.3	36
90464	78.5	79.5	1.0	0.3	0.8	0.10	27	0.1	6.6	19
90465	79.5	80.5	1.0	0.3	0.6	0.24	27	0.1	5.8	18
90466	80.5	81.5	1.0	0.3	0.8	0.22	25	0.1	6.6	20

Hole No: 004B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
40.2	43.8		BR DA	ql si	b	Dacite of previous unit, with a clast supported, breccia texture. Fragments thinly separated by grey fine grained silicified +/- chlorite material. In thicker patches the silica-chlorite zones have possible altered feldspar phenocrysts (is this an auto-brecciated lava?). Iron oxides still coating surface, also possibly after sulphides in occasional veins throughout. Possible ?shear at 41.6-42.1m, some iron oxide veins, and some finer brecciation seem to associated with it. Unit has many thin fractures/oxidised veinlets, but is often broken along joints ~25 to CA. Competency moderate, except 42.2-43m which is broken.	41.6 41.9 43.0	SR SR JT	10° 15° 25°		
43.8	**44.6**	**F**				**FAULT**					
43.8	44.6		BR DA	si cl	a	Possiby a fault. Breccia of cherty fragments (rounded and elongate) in what looks to be a finer grained and clorite altered verion of the dacit of previous units. Trace sulphide present as blebs of sulphide mix and pyrite associated with the chert. Clay zone at ~44.4m. Competency poor. Gradational contact with previous unit; broken zone contact with next unit.	44.0 44.0	JT CV	2° 17°		
44.6	**47.4**	**HO**				**HOST SEQUENCE**					
44.6	47.4		BR DA	ql si	a	Continuation of 40.2-43.8m. Little oxidation now. Still has abundant quartz veinlets, many of which are oxidised, some possibly after sulphides. Broken contact with next unit. Core orient at 46m. Orientated measurement at 46.4m, cleavage 72 degrees dip to the east with 340-160 strike.	45.3 46.9	VN VN	61° 30°		
47.4	**48.8**	**HOTS**				**HOST - TRACE SULPHIDES**					
47.4	48.8		BR CH	cl si	a	Green and medium grey, variably chloritic matrix or cherty clast supported, breccia. Matrix consists of green chlorite +/- sericite, with sporadic specks of white, atlered ?feldspar (<1mm). Cherty clasts (5mm->5cm) may be rounded, angular or elongate, and usually sit within the strong fabric (15-20 degrees). Occasional pressure shadows evident on the more rounded clasts. Sulphide trace grade, with disseminated pyrite cubes (fine grained) in the matrix, while small blebs of sulphide-mix-pyrite-sphalerite may be found within clasts, matrix or in pressure shadows. Core moderately competent.	47.7 48.5	CV CV	30° 15°		
48.8	**49.3**	**HO**				**HOST SEQUENCE**					
48.8	49.3		BR DA SA	 qs	a	Oxidised dacite, with incipient 'brecciation' as in earlier unit. Fe oxide fractures etc as before. Sharp contacts with previous unit, interfingered, but sharp contact (vaguely perpendicular to CA) on other side. Peperite? Core modeately competent.	48.8	CT	50°		
49.3	**53.8**	**HOTS**				**HOST - TRACE SULPHIDES**					
49.3	53.4		BR CH	cs	a	Continuation of 47.4-48.8m, less silicified though. Unit becomes pale light green in colour (more sericite vs chlorite?) as unit progresses (last 1.5m). Competency bad between 50.2-52.5 (worst 52.7-51.1m), moderate elsewhere.	51.2 52.6	CV CV	30° 25°		

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
90467	81.5	82.5	1.0	0.2	0.6	0.09	16	0.1	3.7	14
90468	82.5	83.1	0.6	0.2	2.2	0.23	16	0.1	6.5	36
90469	83.1	84.1	1.0	0.1	0.4	0.08	8	0.1	2.7	9
90470	84.1	85.1	1.0	0.1	0.4	0.11	9	0.1	3.4	9
90471	85.1	86.1	1.0	0.1	0.4	0.10	5	0.1	2.5	9
90472	86.1	87.1	1.0	0.1	0.6	0.12	10	0.2	2.9	13
90473	87.1	87.6	0.5	0.1	1.8	0.26	13	0.1	6.8	30
90474	87.6	88.4	0.8	0.1	1.7	0.14	1	0.1	6.3	25
90475	88.4	88.8	0.4	0.1	2.3	0.24	13	0.3	6.7	38
90476	88.8	89.4	0.6	0.1	0.3	0.05	1	0.1	2.2	6
90477	89.4	90.1	0.7	0.1	0.1	0.01	1	0.1	1.8	3
90478	90.1	91.1	1.0	0.1	0.1	0.01	1	0.1	2.0	3
	Total Length:		76.9							

Standards

Reference Values for: HBM-02						17/07/98	
	3.4	12.5	0.46	150	1.3	22.7	
Variances Allowed:	20%	20%	30%	20%	20%	20%	
90479 Inserted @ 91.1m	3.7	13.8	0.48	154	1.4	22.3	Y

Weighted Averages

From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
53.8	61.2	7.4	4.2	6.7	0.27	48	2.1	4.5	139
53.8	64.2	10.4	3.4	5.4	0.23	38	1.7	3.9	112
56.8	61.2	4.4	5.3	8.8	0.29	61	2.8	3.5	179
72.7	73.9	1.2	0.9	3.3	0.17	17	0.9	2.3	60
72.7	83.1	10.4	0.4	1.3	0.27	30	0.2	5.3	29

Thin Sections

PTS0001	48.6 m 004B_48.6 sample number - sub economic.
PTS0002	57.1 m 004B_57.1sample number - ore, carbonate.
PTS0003	57.4 m 004B_57.4 sample number - ore, lesser carbonate.
PTS0005	58.7 m 004B_58.7 sample number - cherty host, gold kick.
PTS0006	58.9 m 004B_58.9 sample number - fault, good gold kick.
PTS0004	59.6 m 004B_59.6 sample number - ore.
PTS0007	61.9 m 004B_61.9 sample number - sub economic

Hole No: **004B**

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
53.4	53.7		BR CH	cy	a	Very clay altered version of previous. Competency poor.	53.6	CV	35°													
53.7	53.8		DA	cs	b	Dark green, chlorite altered dacitic looking chunk, not sure if a clast or not.																
53.8	**55.6**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
53.8	54.9		BR CH	si	a	HODS version of cherty breccia. Sulphides as matrix to the cherty clasts. Pyrite and 'sulphide mix' dominant. Sphalerite subordinate as uncommon blebs surrounded by the black sulphide mix. May go near HOSM, unfortunately there is .3m core loss associated with this. Competency bad.																
54.9	55.6		BR CH	sc	a	As before but more chlorite-sericite in matrix with the sulphides. Strong fabric close to CA in larger fragments. Competency bad, broken fragments.	55.0	CV	18°													
55.6	**56.8**	**HOTS**				**HOST - TRACE SULPHIDES**																
55.6	56.8		BR CH	sc	a	HOTS version of previous. Greater proportion of cloritic and sericitic zones. Far fewer and smaller cherty clasts. Competency poor to moderate with 1/4 the fragments under 5cm.																
56.8	**58.7**	**HOSM**				**HOST - SEMI-MASSIVE SULPHIDES**																
56.8	58.7		BR RK	qs	a	HOSM of fine grained sulphides as: sulphide mix, pyrite and lesser sphalerite rimmed by the former as a matrix in a silica +/- ?carbonate breccia - re inspection has indicated that much of the non-sulphide material is carbonate (or barite?), especially in the first 1m of the unit. Competency poor to moderate. 20cm discrepency before 57.1m, perhpas core loss in friable sulphidic material. Strong fabric (as in previous units).	57.4	CV	13°													
58.7	**59.3**	**HOTS**				**HOST - TRACE SULPHIDES**																
58.7	59.3		BR CH RK	 cs	a	Broken zone; possible 10-20cm core loss - shear or fault? Initial part of unit obviouly cherty breccia, but quickly becomes more chlorite-sericite altered and broken. Visible sulphide far less than previous units (medium to strong HOTS). Some of the sulphide assemblage in fractures in cherty clasts. Strong Au response in assays (10.6g/t), 4.3%Zn too. Fabric strong in chlorite-sericite rich patches.																
59.3	**61.2**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																

Hole No: 004B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
59.3	61.2		CH SS ST	 si si	b	Cased off at 60.50m to NQ. HODS-HOSM of sphalerite-sulphide mix/galena-pyrite-chalcopyrite as blebs, veinlets, bands and patches in a fairly 'undisturbed' banded/?bedded cherty/silicified sediment unit. Bands of sulphide sit close to cherty banding, while veinlets and blebs may have different orientations. Some of the patches look to be in zones running near parallel to CA, may have just been intersected by the drill-hole (this is debatable however). Cracks (<1mm usually) in the chert are also filled by sulphide. Appears to be graded bedding in sediment - appears to face downhole. Slumping and squishing of some of the sedimentary beds/bands looks to have taken place. Possibly cross-bedding or cross-laminations present aswell. Competency good. Voids present sporadically, usually rimmed by, or developed in sulphide masses.	59.3 60.1 60.3	BE BE BE	41° 34° 61°													
61.2	**66.3**	**HOTS**				**HOST - TRACE SULPHIDES**																
61.2	66.3		CH SS ST	 si si	b	Silicified sediments as previous, but with trace grade of the sulphide assemblage. Sulphides in quartz+/-carbonate veins or in greenish sericite+/-chlorite segregations and veins, which often run at a much closer angle to CA than bedding. Sericite etc perhaps following flame structures? Sediments are generally coarser with some coarse grained volcanoclastic sandstones present. Bedding has been disturbed in many cases, but this may be due to slumping. Facing appears to be downhole (by scouring of underlying units by sandstone beds). Bands are fining up. Cross bedding is possibly evident, due to the varying orientation of the beds. Core competent. Core orienation at 65.5m. Orientated measurements at 65m; bedding 64 degrees dip to west, 210-030 strike. Cross-lamination/bedding 30-38 degrees dip to north, with ~285-105 strike.	63.3 64.8 65.0	VN BE BE	29° 66° 55°													
66.3	**68.4**	**HOTS**				**HOST - TRACE SULPHIDES**																
66.3	68.4		BR CH ST	sc si	a	Matrix supported cherty and silcified siltstone/sandstone breccia. Fairly weak Hots. Unit carries sulphide assemblage of previous units as segregations, veinlets and clast fracture fill. Sphalerite still cores galena-chalcopyrite-sulphide mix. Carries some yellowy ?carbonate or ?sphalerite around 67.5m. Strong fabric in unit. Possibly shear contact with previous unit. Diffuse boundary with next. Core of moderate competency.	66.3 67.8	CT CV	31° 28°													
68.4	**72.7**	**HO**				**HOST SEQUENCE**																
68.4	72.3		BR CH SH	 ql sc	a	Dark green, and yellow-green, quartz chlorite and sericite-chlorite altered, occasionally cherty clast bearing, mass flow ?pumice breccia/schist. No sulphides. Carries a very strong fabric (close to CA), and alternation between quartz chlorite and sericite-chlorite bands make it appear schistose. Core fairly competent. Core orientation at 68.5m.	71.0 72.3	CV CT	12° 65°													
72.3	72.7		ST	cs	a	Pale green, sericite-chlorite altered siltstone/rock. Possibly carries very fine grained pyrite. Core competent.	72.7	CT	32°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
72.7	**73.9**	**S**				**SHEAR**																
72.7	73.9		BR RK	ql sc	a	Strongly sericite+/-chlorite altered, sheared out breccia. Unit very soft, but not broken into rubble. First part of unit to 73.5m is light greenish-white in colour, after which the unit darkens to a medium grey, is partially silicified and carries silicifed siltstone clasts. Strong fabric, generally about 40-50 degrees to CA, however some breaks and fabrics run very close to CA. Latter part of unit may carry trace sulphides, mainly pyrite + galena/sulphide-mix. Sharp contacts either side of unit. Unit looks to be sheared out examples of the units either side. Core poorly competent due to softness.	73.5 73.9	CV CT	45° 18°													
73.9	**87.6**	**HOTS**				**HOST - TRACE SULPHIDES**																
73.9	82.5		SS ST	si si	b	Fairly uniform medium grey, faintly thinly laminated/bedded, silicified siltstones and lesser sandstones. Unit carries trace (and in small patches disseminated) sulphide, dominanty as pyrite bands and blebs concordant or discordant with bedding. Some pyrite bands, consisting of fine to medium grained pyrite cubes appears to be diagentic. However there are plenty of cross-cutting veinlets and bands (to 1-2cm thick), which are clearly later. Occasional bands consist of pyrite-chalcopyrite and lesser sphalerite (rimmed by sulphide mix). Unit cut by numerous faint, thin, discontinuous quartz veinlets, along which small offests of banding/bedding may be evident (incipient cleavage?). Unit quite competent. Orientation 74.5m.	75.5 77.5 77.9 77.9 77.9 79.5	BE QV VN VN BD BE	63° 14° 15° 5° 61° 49°													
82.5	83.1		SS	si	b	Small sandstone unit, with possibly disseminated grade suphide as disseminated pyrite and sphalerite (which may be rimmed by chalcopyrite). Unit competent.	83.1	CT	47°													
83.1	87.6		SS ST	si si	b	Continuation of 73.9-82.5m, with slightly darker hue. Orientation at 86.5m. Orientated measurement at 86.3m; bedding/banding 54 degrees dip NW at ~220-040 strike. 87.3m; bedding 54 degrees NW at 220-040 strike; sphalerite veining 68-70 degree dip to east at ~180-000 strike.	86.5	BE	51°													
87.6	**88.8**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
87.6	88.4		PU	si	a	Dark grey and white, silicified and sulphidic, mass flow (pumice breccia). Possibly an altered siltstone or sandstone. Unit consists of pyrite and silicified siltstone/chert blobs/clasts entrained within thin streaks of white silicified rock. Fabric in clast orientation, similar orientaion to bedding in previous unit. Unit has veins etc of sphalerite etc that were in the last unit. Unit went 6%Fe, 1.7%Zn. Unit fines toward next unit (facing downhole?). Core competent.	88.0	BD	67°													
88.4	88.8		SS ST	si si	b	Fining up (as go downhole) version of previous and then thinly laminated sediments, with pyrite banding and veining as previous. Possibly cross-lamination/bedding. Unit competent.	88.7 88.7	BE BE	65° 56°													
88.8	**89.4**	**HOTS**				**HOST - TRACE SULPHIDES**																

Hole No: 004B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
88.8	89.4		BR VC	 si	a	Begins as thinly laminated sediments but quickly takes on a moderately silicified volcanoclastic breccia with small silcified siltstone clasts. Weak Hots - has sphalerite blebs and veinlets as previously. Contains a strong fabric. Difficult to say if a sedimentary breccia or tectonic. Unit is of poor competency in last 40cm, becoming quite broken.	89.2 89.2	JT BD	40° 45°													
89.4	**100.0**	**HO**				**HOST SEQUENCE**																
89.4	90.1		BR DA PU		a	FW? Broken zone of silcified, dacitic, slate and silicified rock clast bearing, mass flow pumice breccia. Assigned dacitic due to densely altered feldspar phyric matrx and fragments which predominate. Slatey rafts can be >10cm in size.																
90.1	97.9		BR PU	 si	a	FW? Competent material of previously described pumice breccia. Up to ~93m many silica clasts and altered ?feldspar phenocrysts have an orangey colour, iron in silica, or iron carbonate? Unit darker medium grey afterwards. 'Pumice' may be dark chlontic, light-green chloritic or siliceous, but usually contain abundant feldspar phenocrysts and occasional internal laminations. Occasionally, quartz-carbonate veinlets occur. No sulphides evident. Faint fabric possibly 20-30 degrees to CA, also faint alignment of clasts at ~40-50 degrees. Large blob of carbonate-quartz at 96.9m. Core competent.	95.0 95.0 95.9	JT CV BD	7° 22° 50°													
97.9	100.0		BR PU	 cs si	a	FW? EOH 100m. Following 20cm of a light green (sericite-chlorite?) densely 2-5mm white crystal (altered ?feldspar) phyric blob, have a very silicified verion of previous unit. Unit quite a light pinky-white colour, possibly a composition change to rhyolite?, however no quartz phenocrysts noted. Looks to be siliceous pumice fragments in a more sericite-chlorite rich matrix/squashed pumice. Possible faint orienation of clasts ~30-40 to CA. Core of poor to moderate competency due to joint running close to CA.	98.8 99.5	BD JT	35° 3°													

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 005B **Location:** Brown's Tunnel 5330N

Objective: Test Lens 1 and Lens 2 extents.

Result: Disappointing results - best is only 0.9m (183-183.9m) - 0.1%Pb, 7.7%Zn, 0.6%Cu, 26g/t Ag, 0.1g/t Au $112 TMU.

Depth	Direct	Dip
0.0	270.0	-85.0
31.0	266.0	-84.1
60.0	264.0	-84.0
90.0	263.0	-83.5
120.0	262.5	-83.2
150.0	264.0	-83.0
180.0	262.5	-83.1
200.0	261.0	-83.0
209.0	261.0	-83.0

Planned Direction: 270°
Planned Dip: -85°
Planned Depth: 200.0 m
Planned Northing: 5330 m N
Planned Easting: 4952 m E
Planned Collar R.L.: 486 m RL

Drilling Commenced: 15/06/98
Drilling Completed: 20/06/98
Actual Depth: 209.0 m
Surveyed Northing: 5329.40 m N
Surveyed Easting: 4951.90 m E
Surveyed Collar R.L.: 486.40 m RL

Date Logged: 13-Jul-1998
Logged By: Michael Whitbread
Hole Size: HQ/NQ
Hole Category: Other
Grouted:

Date Log Verified: 26-Aug-1998
Verified By: Michael Whitbread

Summary Log:

0-3m NC; -33.4m Ho; -53.8m F; -58.7m Hots; -61.9m SR; -69.1m Hots; -71.3m F; -98m FW; -119.7m HOTS; -120.5m Fwts; -173.1m FW; -175.3m Ho; -183m FWTS; -184.9m FWds; -186.2m Fwts; -202.7m FW; -204m FWts; -206.7m FW; -207m Fwts; -209m FW EOH 209m.

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°
0.0	**3.0**	**NC**				**NO CORE**			
0.0	3.0				a	No core.			
3.0	**33.4**	**HO**				**HOST SEQUENCE**			
3.0	5.9		CH SL VC	 si cy	a	Weathered, oxidised material. Zone of broken ground consisting primarily of cherty fragments, mixed with small intervals (e.g. 3.4-4m) of an altered-feldspar phyric volcanoclastic. Occasional silicified black siltstone/slate fragments are present. Some core loss, greater than the 10cm noted, is expected. Competency awful.			
5.9	12.0		SA VC	 cy si	a	Oxidised, yellow-white, volcanoclastic material (as in previous unit). Appears to be clast bearing (1-2cm white, silicified sediments). Around the 9m mark, is quite silicifed and looks dacitic intrusive/lave like. Competency awful, much core loss (~3.3m loss). Some fractures at 45 degrees, too weathered to pick a fabric.	8.8	JT	45°

RQD To (m)	RQD %
21.9	2
24.6	85
27.1	12
32.1	86
53.4	6
59.3	83
61.5	9
69.3	94
71.3	10
77.8	90
78.6	12
81.6	76
82.7	9
112.8	91
114.1	15
142.1	96
142.5	0
209.0	96

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
90480	12.0	14.5	2.5	0.1	0.1	0.01	1	0.1	1.2	3
90481	14.5	16.0	1.5	0.1	0.1	0.01	1	0.1	0.5	3
90482	16.0	17.5	1.5	0.1	0.1	0.01	1	0.1	0.5	3
90483	17.5	19.0	1.5	0.1	0.1	0.01	1	0.1	0.6	3
90484	19.0	20.5	1.5	0.1	0.1	0.01	1	0.1	0.6	3
90485	20.5	21.5	1.0	0.1	0.1	0.01	1	0.1	3.6	3
90486	21.5	23.3	1.8	0.1	0.1	0.01	1	0.1	0.5	3
90487	23.3	24.8	1.5	0.1	0.1	0.01	1	0.1	1.2	3
90488	24.8	26.2	1.4	0.1	0.1	0.01	1	0.1	0.9	3
90489	26.2	27.7	1.5	0.1	0.1	0.01	1	0.1	0.6	3
90490	27.7	29.5	1.8	0.1	0.1	0.01	1	0.1	0.5	3
90491	29.5	31.0	1.5	0.1	0.1	0.01	1	0.1	1.0	3
90492	31.0	32.5	1.5	0.1	0.1	0.01	1	0.1	0.9	3
90493	32.5	32.9	0.4	0.1	0.1	0.01	1	0.1	1.1	3
90494	32.9	33.4	0.5	0.1	0.1	0.01	3	0.4	1.6	6
90495	33.4	34.4	1.0	0.1	0.2	0.01	1	0.1	0.5	4
90496	34.4	35.4	1.0	0.1	0.2	0.01	1	0.1	0.5	4
90497	35.4	35.9	0.5	0.1	0.3	0.01	1	0.1	0.5	6
90498	35.9	36.9	1.0	0.1	0.2	0.01	1	0.1	0.9	4
90499	36.9	37.9	1.0	0.1	0.1	0.01	1	0.1	0.3	3
90500	37.9	38.9	1.0	0.1	0.1	0.01	1	0.1	0.6	3
81501	38.9	39.9	1.0	0.1	0.3	0.01	1	0.1	0.8	6

Hole No: 005B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
12.0	21.5		BR CH SA	cy ht	a	Oxidised, Fe mottled, sheared cherty breccia. Cherty clasts are elongate or sub-rounded, but are the zones which control the mottleing. These are up to 5cm wide, but may be stretched out along a fabric (close to CA). The matriz is sand-silt size, and is usually clay altered (weathering). Competency is awful. Many metres of core loss (~6.6m). Core block error at 22.9m, remarked as 21.9m (error assumed to be in broken material). 22 reassigned as 21m.	16.0 19.0	CV CV	13° 8°		
21.5	23.3		RK SS	cy si	b	Pale creamy-grey, variably silica and clay altered. sandstone/rock. Unit fairly massive. Has numerous small, discontinuous, Fe coated fractures. Possible thin cherty clast or quartz vein at 22.6m. Core of moderate competency. Fairly abrupt boundary with next unit, in terms of colour/alteration, but texture is more gradual.	22.7 23.3	JT CT	40° 65°		
23.3	26.2		CH VC	qs sc	a	Partially oxidised. Variably cleaved/sheared, light grey to greeny-yellow grey, poorly sorted, cherty clast bearing volcanoclastic sandstone. Unit variably sericite+/-chlorite and lesser silica altered. Weathering concentrated along fractures (as in previous unit). Clasts usally <3-5mm in size. Cleavage runs ~30-40 degrees to CA. Unit of poor-moderate competency, with many pieces under 10 and 5cm. Last 2m quite broken (10cm core loss).	23.6 23.6 25.0 25.9	JT CV CV CV	50° 35° 30° 41°		
26.2	29.5		RK SA	cy se	a	Greeny-yellow-grey, moderately oxidised, sericite+/-chlorite altered rock. Unit has a very strong cleavage, marked by white ?sericite flecks. Fractures oxidised (as previous), and often run against cleavage. Competency moderate to good.	28.1 28.2	CV JT	24° 36°		
29.5	32.9		RK	sc	a	Lime green, lightly-barely oxidised, sericite+/-chlorite altered, matrix dominant, chert and pyrite clast bearing rock. Unit like previous, except for pyrite wisps, spots and blebs, and lesser cherty clasts. Clasts <5-10mm in length generally. Cleavage strong, but hard to measure, seems to lie close to CA. Some pyrite wisps seem to mark cleavage, while pyrite blobs are rounded, and may partially overprint/accompany cherty clasts. Strong lineations present on joint faces. Competency moderate except from 32.2 onwards, which becomes broken.	31.5 31.5 31.8	JT CV JT	38° 8° 7°		
32.9	33.4		VC	qs	a	Hardly weathered at all. Well cleaved, 'chert/silicified sediment' clast bearing volcanoclastic sandstone. Sericite altered (weathered?) along joints; looks to be alteration. Clasts (may be elongate) mm-5cm length. Small pyrite blobs and clasts present. Competency awful.	33.2 33.2	JT JT	32° 23°		
33.4	**53.8**	**F**				**FAULT**					
33.4	35.9		BR CH	qs	a	Broken zone of light yellow-green, quartz-sericite altered version of previous unit. Silicified clasts are strung out along the fabric (becomes almost schistose), possibly late quartz veins along this as well as around earlier clasts.	34.9	CV	30°		

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81502	39.9	40.9	1.0	0.1	0.1	0.01	1	0.1	0.8	3
81503	40.9	41.9	1.0	0.1	0.2	0.01	2	0.1	1.0	4
81504	41.9	42.9	1.0	0.1	0.1	0.01	1	0.1	1.2	3
81505	42.9	43.9	1.0	0.1	0.2	0.01	2	0.1	1.3	4
81506	43.9	44.7	0.8	0.1	0.2	0.01	3	0.1	1.4	5
81507	44.7	45.7	1.0	0.1	0.5	0.01	4	0.1	2.5	9
81508	45.7	46.0	0.3	0.1	1.1	0.01	5	0.1	2.4	17
81509	46.0	47.0	1.0	0.2	0.3	0.01	1	0.1	2.0	6
81510	47.0	48.0	1.0	0.1	0.5	0.01	1	0.1	1.3	8
81511	48.0	49.2	1.2	0.1	0.2	0.01	1	0.1	1.0	4
81512	49.2	50.2	1.0	0.1	0.3	0.01	1	0.1	1.3	6
81513	50.2	51.2	1.0	0.1	0.4	0.01	1	0.1	1.0	7
81514	51.2	51.8	0.6	0.1	0.3	0.01	1	0.1	0.7	6
81515	51.8	53.8	2.0	0.1	0.3	0.01	1	0.1	1.7	6
81516	53.8	54.8	1.0	0.2	0.2	0.01	1	0.1	3.8	5
81517	54.8	55.8	1.0	0.1	0.2	0.01	5	0.1	5.2	5
81518	55.8	56.8	1.0	0.1	0.2	0.01	1	0.1	4.8	4
81519	56.8	57.8	1.0	0.6	0.7	0.01	1	0.1	3.8	13
81520	57.8	58.7	0.9	0.1	0.5	0.01	1	0.1	1.8	8
81521	58.7	59.7	1.0	0.2	0.5	0.01	5	0.1	2.8	9
81522	59.7	60.7	1.0	0.2	0.5	0.01	4	0.1	3.2	9
81523	60.7	61.9	1.2	0.2	0.5	0.01	6	0.1	3.1	10
81524	61.9	62.7	0.8	0.1	0.6	0.01	1	0.1	3.7	9
81525	62.7	63.7	1.0	0.1	0.5	0.01	4	0.1	2.2	9
81526	63.7	64.7	1.0	0.1	0.6	0.01	1	0.1	2.9	9
81527	64.7	65.7	1.0	0.2	0.6	0.01	1	0.1	1.6	10
81528	65.7	66.1	0.4	0.2	0.3	0.01	1	0.1	2.6	6
81529	66.1	67.1	1.0	0.1	0.1	0.01	1	0.1	2.5	3
81530	67.1	68.1	1.0	0.2	0.4	0.02	1	0.1	2.5	7
81531	68.1	69.1	1.0	0.1	0.3	0.01	1	0.1	2.3	6
81532	69.1	70.2	1.1	0.1	0.2	0.01	1	0.1	1.9	4
81533	70.2	71.3	1.1	0.1	0.2	0.01	1	0.1	1.5	4
81534	71.3	72.6	1.3	0.1	0.1	0.01	1	0.1	1.5	3
81535	72.6	73.6	1.0	0.1	0.1	0.01	1	0.1	1.2	3
81536	97.0	98.0	1.0	0.1	0.1	0.01	1	0.1	1.3	3
81537	98.0	99.0	1.0	0.1	0.5	0.01	1	0.1	2.8	8
81538	99.0	99.2	0.2	2.4	5.2	0.11	66	0.2	13.4	94
81539	99.2	99.7	0.5	0.5	1.7	0.02	27	0.2	14.9	31
81540	99.7	100.0	0.3	0.1	0.1	0.01	1	0.1	4.4	3
81541	100.0	101.0	1.0	0.1	0.2	0.01	1	0.1	2.2	4
81542	101.0	102.0	1.0	0.1	0.1	0.01	1	0.1	2.3	3
81543	102.0	103.0	1.0	0.1	0.1	0.01	1	0.1	1.7	3
81544	103.0	104.0	1.0	0.1	0.1	0.01	1	0.1	2.0	3
81545	104.0	105.0	1.0	0.1	0.2	0.01	3	0.1	2.5	5
81546	105.0	106.0	1.0	0.1	0.5	0.01	4	0.1	3.0	9
81547	106.0	107.0	1.0	0.1	0.1	0.01	1	0.1	3.6	3
81548	107.0	108.0	1.0	0.1	0.1	0.01	1	0.1	3.2	3

Hole No: 005B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
35.9	49.2		BR CH SH ST	qs qs	a	Broken zone consisting of strongly foliated, medium to dark grey and green-grey, fragments of siltstone, cherty clast breccias, volcanoclastic and quartz-sericite schistose material. Minor wisps or disseminations of pyrite may be associated with these. Zones are: mixed sediments to 39.8m; silicified siltstone/chert to 40.5m; schistose material to 42.1m; dark siltstone to 42.9m; sheared cherty breccia zoning to a schist around 47.2m to 49.2m. Interesting features: 45.7-46m, breccia containing sphalerite blebs and wisps associated with void filling quartz veining: went 1.1%Zn (in breaks in clasts and in the matrix around them). 36.4-36.7m, Joint/fault along cleavage, which has 9cm left lateral displacement, cutting across bedding. Some core loss marked ~.4m, but possibly more due to very broken nature of ground.	36.6 36.6 41.2 45.6 47.8	BE JT CV CV CV	31° 5° 22° 24° 2°		
49.2	51.8		CH SH ST VC	 qs qs	a	Light grey with darker grey patches, more competent (poor to moderate) quartz-sericite schist and sheared cherty bearing volcanoclastic breccia with lesser siltstone and sandstone. Core of poor competency with many pieces over 10cm. Core orientation at 49.5m. Orientated measurement 49.5m - cleavage - dip 80 degrees East, strike 185-005. Sometimes cleavage vertical.	49.5	CV	10°		
51.8	53.8		BR RK ST	 se	a	Broken zone of sheared dark siltstone and light greenish-grey sericite+/-chlorite altered rock, possibly after lithology of previous unit. 1.5m core loss between 52.1 and 53.6m.					
53.8	**58.7**	**HOTS**				**HOST - TRACE SULPHIDES**					
53.8	57.8		BR SH ST	 se	a	Yellow and greenish grey, strongly foliated (schistose) quartz-sericite+/-?carbonate siltstone/rock/breccia. Contains sporadic occurrences of siltstone, relatively un-silicified, as bands/rafts or as rounded clasts with pressure shadows and wrapping cleavage. Siltstone fragments are large near to previous unit, but become more diffuse and small, going through the unit. Towards end of unit, may bear small (<5mm) blobs and wisps of sphalerite, in the cleavage, or abutting clasts (zone went <1%Zn). Competency poor-moderate, with most pieces making 10cm; small (10cm) zones of broken material are present.	55.6	CV	10°		
57.8	58.7		BR	sc si	b	Light yellow cream, spotted with darker greens and black, poorly sorted, weakly to moderately foliated, clast supported polymict breccia. Matrix is vertually non-existent. Clast of varying colours (black to yellow), or varying size (mm-5cm). Some are rounded, some angular, some appear to have suffered compression and smearing. Clasts may be silica, sericite+/-chlorite altered. Mass flow? Small veinlets of sphalerite-pyrite and other fine grained unidentified sulphides occur occasionally interstitial to clasts or in late stage cracks or as cross-cutting veinlets. Disseminated pyrite cubes are present (fine and medium grained). Unit competent	57.8 57.9 58.4	CT CV VN	67° 12° 15°		
58.7	**61.9**	**S**				**SHEAR**					

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81549	108.0	109.0	1.0	0.1	0.3	0.01	3	0.1	3.3	6
81550	109.0	110.0	1.0	0.2	0.7	0.01	5	0.1	2.4	12
81551	110.0	111.0	1.0	0.2	0.7	0.04	9	0.1	1.6	13
81552	111.0	112.0	1.0	0.2	2.4	0.15	15	0.1	1.8	37
81553	112.0	112.8	0.8	0.2	0.4	0.01	1	0.1	3.1	7
81554	112.8	114.0	1.2	0.2	0.6	0.01	3	0.1	3.6	10
81555	114.0	115.0	1.0	0.2	0.3	0.01	1	0.1	3.5	6
81556	115.0	116.0	1.0	0.1	0.1	0.01	1	0.1	3.6	3
81557	116.0	117.0	1.0	0.1	0.4	0.01	1	0.1	3.3	7
81558	117.0	117.7	0.7	0.1	0.3	0.01	1	0.1	2.2	6
81559	117.7	118.7	1.0	0.1	0.2	0.01	1	0.1	1.6	4
81560	118.7	119.7	1.0	0.1	0.4	0.01	1	0.1	1.3	7
81561	119.7	120.5	0.8	0.2	0.4	0.01	1	0.1	1.1	7
81562	120.5	121.5	1.0	0.1	0.1	0.01	1	0.1	1.5	3
81563	172.1	173.1	1.0	0.1	0.1	0.01	1	0.1	1.7	3
81564	173.1	174.1	1.0	0.1	0.1	0.01	1	0.1	1.7	3
81565	174.1	175.3	1.2	0.1	0.1	0.01	1	0.1	2.0	3
81566	175.3	176.3	1.0	0.5	1.5	0.10	10	0.1	3.7	26
81567	176.3	177.3	1.0	0.1	0.2	0.01	1	0.1	3.1	4
81568	177.3	178.3	1.0	0.1	0.2	0.01	9	0.1	2.6	6
81569	178.3	179.3	1.0	0.2	2.0	0.33	23	0.1	5.9	36
81570	179.3	180.3	1.0	0.1	0.2	0.03	11	0.1	2.9	6
81571	180.3	181.3	1.0	0.1	1.8	0.03	9	0.1	3.0	27
81572	181.3	182.2	0.9	0.1	0.3	0.01	4	0.1	3.4	6
81573	182.2	183.0	0.8	0.1	1.9	0.13	4	0.1	5.0	28
81574	183.0	183.9	0.9	0.1	7.7	0.60	26	0.1	11.1	112
81575	183.9	184.3	0.4	0.1	1.4	0.25	10	0.1	8.0	24
81576	184.3	184.9	0.6	0.1	2.6	0.91	41	0.2	9.9	53
81577	184.9	185.1	0.2	0.1	0.4	0.02	5	0.1	2.5	8
81578	185.1	186.2	1.1	0.1	1.9	0.10	7	0.1	5.8	28
81579	186.2	187.2	1.0	0.1	0.1	0.01	1	0.1	1.8	3
81580	187.2	188.5	1.3	0.1	0.1	0.01	1	0.1	1.2	3
81581	188.5	189.5	1.0	0.1	0.1	0.01	1	0.1	3.2	3
81582	189.5	190.5	1.0	0.1	0.1	0.01	3	0.1	2.2	3
81583	190.5	191.5	1.0	0.1	0.3	0.02	5	0.1	2.6	6
81584	191.5	192.5	1.0	0.1	0.4	0.02	1	0.1	1.6	7
81585	192.5	193.5	1.0	0.1	0.1	0.01	1	0.1	0.8	3
81586	193.5	194.5	1.0	0.1	0.1	0.01	1	0.1	1.1	3
81587	194.5	195.1	0.6	0.1	0.1	0.01	1	0.1	2.0	3
81588	195.1	196.1	1.0	0.1	0.1	0.01	1	0.1	1.0	3
81589	196.1	197.1	1.0	0.1	0.3	0.03	6	0.1	1.2	7
81590	197.1	197.8	0.7	0.1	0.1	0.01	1	0.1	1.0	3
81591	197.8	198.0	0.2	0.6	8.5	0.37	76	0.1	9.8	132
81592	198.0	199.0	1.0	0.1	0.1	0.10	1	0.1	1.5	4
81593	199.0	200.0	1.0	0.1	0.1	0.01	1	0.1	1.0	3
81594	200.0	201.0	1.0	0.1	0.7	0.02	10	0.1	1.8	12
81595	201.0	202.0	1.0	0.1	0.1	0.01	1	0.1	0.9	3

Hole No: 005B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
58.7	61.9		BR SH ST	 se si si	a	Shear zone - centred on 60.2, cleavage parallels it. Dark green and dark grey-black, strongly foliated, 'silicified/non-silicified siltstone' clast bearing breccia. Clast size range large (5mm to 10cm). Clasts may be rounded or elongate (rafts/bands). Unit heavily veined by, variably orientated (often 90 degrees to cleavage, but close to CA) yellow carbonate+/- quartz veins which may carry or be associated with sphalerite blebs. Pyrite may be present as small clasts (replacement?). Core competency is bad between 59.4-61.5m (possible shear zone - small clay zone at 60.2m. Otherwise of moderate competency.	59.2 59.2 59.8 60.3 61.8	VN CV CV SR CV	4° 6° 10° 11° 21°		
61.9	**69.1**	**HOTS**				**HOST - TRACE SULPHIDES**					
61.9	65.7		BR	qs	b	Breccia as in 57.8-58.7m. Moderately silicified. More matrix - very fine grained, black. Some chalcopyrite with the sphalerite veinlets and blebs. Pyrite still dominant however. Matrix is occasionally yellow carbonate-quartz. Core orientation 64.5m.	65.1	CV	42°		
65.7	69.1		BR CH SS	sc si	a	Unit is a dark green grey sericite-chlorite and silica altered breccia of silcified siltstone/chert and large sandstone clasts. Similar to previous sheared cherty breccias. Small sphalerite spots and pyrite clots/clasts are uncommon (went <0.5%Zn). Sericite wips and veinlets common. Some banding noted at 66.8m, superimposed on other fabrics? Competency good, but deteriorates towards the end of unit.	66.8 66.8 68.5	BD CV CV	38° 20° 14°		
69.1	**71.3**	**F**				**FAULT**					
69.1	70.2		BR CH	qs	a	Moderately broken fragments of previous unit. Competency poor to bad.	69.9	CV	10°		
70.2	71.3		BR ST		a	Broken zone of altered siltstone, ?sediment, posibly after previous unit. Clay patch in last 10cm of core of this unit. 30cm core loss.					
71.3	**98.0**	**FW**				**FOOTWALL SEQUENCE**					
71.3	72.6		BR DA ST	si bs si	b	Light greeny yellow, silicified, densely altered-feldspar phyric, poorly sorted, dacitic mass flow breccia. Clasts of variable size (5mm to >15cm). Matrix is a mass of feldspar phyric groundmass. Feldspars appear to be altered to yellowy ?carbonate and/or sericite. Black silicified siltstone are present as the largest angular fragments, intraclast to these is a pinky yellow breccia fill mass of silica/?K feldspar/?carbonate. Other clasts are rare cherts, and more common rounded or irregular, silicified rock (most likely after dacitic clasts). Faint greeny, squished masses are also present in the groundmass (pumice?). Competency good. Possible faint fabric picked out be clast elongation. Contact with previous unit sharp.	71.3	CT	31°		

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81596	202.0	202.7	0.7	0.1	0.2	0.01	1	0.1	1.1	4
81597	202.7	204.0	1.3	0.9	3.8	0.18	31	0.1	3.6	62
81598	204.0	205.0	1.0	0.1	0.1	0.02	1	0.1	1.8	3
81599	205.0	206.0	1.0	0.1	0.1	0.01	1	0.1	1.9	3
81600	206.0	206.7	0.7	0.1	0.1	0.01	1	0.1	1.5	3
81601	206.7	207.0	0.3	0.2	8.3	0.16	15	0.1	6.4	114
81602	207.0	208.0	1.0	0.1	0.2	0.01	1	0.1	1.5	4
81603	208.0	209.0	1.0	0.1	0.1	0.01	1	0.1	1.0	3
	Total Length:		123.0							

Standards

		Pb	Zn	Cu	Ag	Au	Fe	
Reference Values for:	HBM-02						17/07/98	
		3.4	12.5	0.46	150	1.3	22.7	
Variances Allowed:		20%	20%	30%	20%	20%	20%	
81604	Inserted @ 209.0m	4.0	16.4	0.53	162	1.4	23.3	N

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
72.6	81.5		PU	qs si	b	Case off to NQ 77.8m. Pinky yellow, often grey, silicified dacitic mass flow pumice breccia. Dacitic by phenocryst composition. Supposed pumice fragments, may be silicified or chlorite-sericite altered, are irregular in shape, may carry internal laminations, and usually contain altered feldspar phenocrysts. Silicified fragments, which are pinky in hue, may be larger than 5cm. Chlorite clots/pseudo-fiamme are usually much smaller. Unit cut by occasional quartz-carbonate veins (<.5cm usually) in varying orientaions. Possibly a faint fabric picked by out by clast orientations ~35-45 degrees to CA. Unit competent.	72.9 76.0 76.0 76.3	CV CV VN VN	35° 44° 58° 27°													
81.5	83.8		BR PU	si	a	Bleached version of previous, associated with a broken zone (possibly a poor expression of a fault). Broken zone between 81.8 and 83.2m. Unit cut by common thin quartz veinlets, which appear conjugate to any perceived fabric.	82.6 82.6	QV CV	45° 44°													
83.8	98.0		DA PU	qs si	a	Return to 72.6-81.5, with a few zones more green in colour (chlorite content increase?), others are grey, lacking the yellowy tinge that dominates the unit. The yellowy zones seem to carry more of a fabric than others. Larger veins are carbonate dominant and often have rounded quartz cores (e.g. 91.1m, 89.6m and 87.1m). Silicification seems to become more intense with depth, as textures become more difficult to discern. Unit heavily quartz-carbonate veined in places e.g. 89.5-92m. Unit competent. Contact with next unit sharp. Core orient at 84m.	90.6 90.6 90.7 93.4 93.4 98.0	QV QV CV CV JT CT	60° 27° 24° 36° 7° 70°													
98.0	**119.7**	**HOTS**				**HOST - TRACE SULPHIDES**																
98.0	99.7		SS ST	si si	a	Medum to light grey in colour. A mish mash of variably heavily silicified and veined siltstone and sandstones. Silicification dies off after 99m. Strong fabric present in first 30cm of unit. Faint banding (bedding?) present throughout, often marked by fine grained disseminated pyrite bands. Small zones are sulphide rich 99-99.2 consisting of sediment heavily infiltrated by disseminated pyrite, and irregular worm-like sphalerite veinlets. In these the sphalerite is bordered by a white material. Core orient at 99m. Small blobs of sphalerite rimmed by a black fine grained material occur uncommonly, associated with the carbonate-quartz veining. Possible ?shear	98.1 98.4 98.5 98.5 99.5	BD BD VN VN CV	51° 54° 45° 10° 47°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
99.7	112.8		SL SS ST	si si se	b	Black to medium grey package of shale, intermixed with siltstone and sandstone beds. Unit fairly heavily veined by yellowy quartz-carbonate veins, which uncommonly carry sphalerite (unit went generally less than 0.5%Zn). Zones of intense veining - 99.7-100.2 and 106-107.6m. Some of the veins are brittle containing angular fragments of the wallrock. Veining is variably orientated either ~30 degrees or about 60-70 to CA, and may run against bedding. Unit coarsens gradually and veining intensity drops as unit progresses. Bedding is observable (can be thinly laminated or thick intervals e.g. 30cm, and the angle to CA increases throughout unit. Bedding may be disrupted by veining. Possible development of a cleavage overprint, and disruption of cherty beds in last 1m of unit. Unit of moderate competency. Sphalerite is present as an accessory in veins, as rare patchy blebs and wisps, pyrite is more common as banding, disseminated cubes, or small blebs unassociated with veining. Core moderately competent. Beds fine up in a downhole direction. Core orientation at 105m and 111m. Orientated measurement; 111m - bedding - mainly horizontal, some at 10 degrees striking ~E-W; - fracture set (weak cleavage?) dip 76 degrees north, strike E-W. Looking at pen mark, think orient was 90 degrees out. So bedding is unchanged (more or less), while the second measurement should be N-S, dipping to the east........... Orientated measurement at 112.2m, cleavage/banding, dip 60-62 degrees west, strike ~N-S.	101.0 101.0 101.0 103.3 103.3 104.0 105.0 107.0 110.6 112.2	VN VN BE VN BE BE BE VN BE CV	19° 61° 20° 19° 20° 40° 57° 10° 89° 30°													
112.8	117.7		SL SS ST	si si si	b	Similar package of sediments to previous. Fairly arbitrary division, mainly by a more ubiquitous silicification, though patches are sericite altered. Heavily veined in first 1.1m, and moderately thereafter. Once again bedding/laminations are close to CA in finer units, and steeps to near 70 degrees in coarser units (due to cross-lamination?, or is cleavage not bedding being reflected in finer zones). Thin quartz-carbonate veinlets appear to mark an incipient cleavage in places. Beds become heavily silicified/cherty in last metre of unit. Core of poor competency to 114m, poor-moderate thereafter. Core orient at 117m. Orientated measurement - 117m, bedding, dip 23 degrees N-W, strike 030(-035)-210(-215).	113.0 113.0 113.1 113.3 115.0 115.5 116.0 116.0 116.8 117.0	CV BD BE VN BD VN CV BD VN BE	30° 44° 90° 14° 34° 10° 24° 46° 27° 72°													
			CH PE RY	 ql		Green and grey, fairly chaotic mix of silicified sediment with lesser isolated patches of light green, quartz phyric, silica-chlorite-sericite altered rhyolitic Peperite contact? or rip up clasts of underlying rhyolite. May get small blebs of sphalerite and galena near end of unit. Core of moderate competency.																
119.7	**120.5**	**FWTS**				**FOOTWALL - TRACE SULPHIDES**																
119.7	120.5		CH PE RY	 sc si	a	As previous unit but silicified sediment bands are now lesser and isolated within the rhyolite. The cherty bands look to be folded. Some thin quartz and carbonate-quartz veining present. Spots and blebs of sphalerite and galena present, sometimes associated with the veining. Core competent.																
120.5	**173.1**	**FW**				**FOOTWALL SEQUENCE**																

Hole No: 005B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
120.5	173.1		RY	cb sc si	a	Light green, occasionally patchy dark green, generally massive, occasionally banded, perhaps slightly sheared, sericite-chlorite and silica altered, quartz with lesser chlorite-altered-feldspar phyric, ryholite. Quartz phenocrysts are generally <1-2mm, may be rounded, resorbed, elongate and wispy. The elongate and wispy forms may be 5mm in length, though usually less than 1mm wide. Quartz phenocrysts are often rimmed or in varying stage of replacement by white carbonate or sericite (my guess is carbonate)? Chlorite spots, possibly after feldspar, are present mainly after 135.7m. This metreage sees the end of the white spots of carbonate that are common up to then. Possibly a change from rhyo-dacite to rhyolite? Banding is sporadically present throughout e.g 130.2m, after 135.7m banding is virtually absent, but a faint orientation of the elongate phenocrysts and chlorite wisps is sporadically noticeable ~40-50 degrees to CA. Unit is veined by quartz, and quartz-carbonate veins throughout, in two main orientations; some close to CA, while others sit ~30-45 degrees, but often opposite to the faint cleavage. Veins, especially the purer quartz variety, show folding, while some of the larger quartz-carbonate veins are brittle e.g. 155.9m. The veins may carry rare blebs of fine grained pyrite +/- galena or sphalerite. Pyrite vein at 133.5. Unit is competent. Core orientation at 123m, 129m, 141m, 149.9m, 155.9m, 162m, 168m. Sharp contact with next unit. Orientated measurement at 149.9m, cleavage approximated by core break - 72-74 degees dip to SE, strike 30(-35)-210(-215).	128.7 130.2 141.6 141.6 143.6 167.5 167.5	VN BD VN CV VN VN CV	3° 62° 25° 42° 9° 35° 54°													
173.1	**175.3**	**HO**				**HOST SEQUENCE**																
173.1	175.3		PU ST	sc si	b	Fairly massive, black, silicified siltstone/shale. Contains a small, sericite-chlorite altered pumiceous mass flow band (dacitic?) 174.5-174.7m. Unit carried occasional 1cm thick, pinky white quartz-carbonate veins. Sharp contact with next unit, but cannot get an angle due to dispruption of the silicified unit. Possible incipient cleavage, marked by thin ?sericite veinlets.	173.9	CV	19°													
175.3	**183.0**	**FWTS**				**FOOTWALL - TRACE SULPHIDES**																
			ST	si si		Dark green, strongly foliated/bedded, chlorite-sericite altered, patchily silicified, silicified siltstone clast bearing, altered-feldspar phyric, dacitic mass flow pumice breccia. Clasts can be from 1-2mm up to 5cm in length. Silicified siltstone clasts occur occasionally. Sphalerite blebs, spots and wisps are common, and sometimes surrounded by a gun metal coloured material. Parts of unit commonly went 1-2%Zn. Pyrite occurs as disseminated cubes throughout, in places comprising much of interclast areas (e.g. 178.4-180m). Less commonly pyrite +/- sphalerite may also have preferentially replaced silicified clasts. Unit has occasional quartz-carbonate veins (1-2cm) running near 90 degrees to CA. Fine sericite wisps may mark a poor cleavage. Mineral or clast/matrix segregations define a strong fabric/banding/bedding ~40-55 degrees to CA. Core is competent.	176.6 177.6 177.6 177.7 180.7	CV JT BD BD VN	10° 55° 44° 40° 88°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
182.2	183.0		PU	cs si	a	Unit as before, but with increasing density of black chlorite? spots. Core competent.	182.5	BD	42°													
183.0	**184.9**	**FWDS**				**FOOTWALL - DISSEMINATED SULPHIDES**																
183.0	184.9		PU SP	cl	a	Possibly FWDS. Black chlorite altered version of previous unit. Unit carries bands of disseminated pyrite and small sphalerite spots and blebs rimmed or accompanied by chalcopyrite, all entrained within a gun-metal/light grey coloured unidentified sulphide (possibly sulphide-mix?). These bands are roughly conformable with the ?mass flow banding, but in places are internally marked by chlorite wisps with a fabric closer to CA. Core competent.	183.8 184.2	CV BD	15° 52°													
184.9	**186.2**	**FWTS**				**FOOTWALL - TRACE SULPHIDES**																
184.9	185.1		PU	si	a	Silicified pumice breccia. Core competent.																
185.1	186.2		PU	cs si	a	Similar to 183-184.9, in mineralogy, except dark chlorite +/- sulphide patches are more distinct clasts separated by sericite-chlorite pseudo-fiamme or silicified patches. Original rock dacitic, most likely. Wisps of sericite and silica mark a fabric close to CA cf banding. Core competent.	185.6 185.6	BD CV	54° 14°													
186.2	**202.7**	**FWTS**				**FOOTWALL - TRACE SULPHIDES**																
186.2	188.5		PU	sc si	a	Light yellowy-green, densely altered-feldpsar phyric, banded, clast bearing, dacitic, ?mass flow pumice breccia. Difficult to say for sure, may be a lava. Has banding and weak cleavage as previous. Has small (3mm-1-2cm) rounded yellowy-white ?clasts, which have include flecks of red ?silica. Have rare angular silica +/-sphalerite clasts. Core competent.	187.6 187.6	BD CV	54° 4°													
188.5	195.1		BR PU VC	si cs	a	Darker green, mixed, ocassionally bedded, probably more chlorite rich, dacitic to rhyo-dacitic, volcanoclastic/mass flow pumice breccia. Unit picked out due to colour change (although some light greeny yellow zones do occur) and because of a relative increase in clast content. Clasts mainly as silica patches (after pumice?), although some of the darker patches appear to be angular clasts (>5cm clast identified). Unit possibly one flow, with large, darker clasts entrained within. The darker zones may carry disseminated pyrite cubes as well. Last 80cm has occasional quartz phenocrysts. Quartz-carbonate veins, sometimes truncated, occasionally present. Core competent.																
195.1	202.7		PU	sc si	a	Return to 186.2-188.5m; less banded, more of a cleavage development (sub-parallel to CA). Contains small zone of FWTS, dark chlorite, gun metal sulphide, pyrite and sphalerite alteration between 197.8-198.0m (went 8.5%Zn 76g/t Ag and 0.37%Cu). Boundaries of this little zone are irregular, but quite sharp (perhaps slumped banding?). Another dark chlorite patch 200.4-200.6m. Dark silicifed 'clasts' and blebs of sphalerite rimmed by a dark fine grained material, uncommonly present. Unit crossed by occasional quartz carbonate veinlets. Core competent.	198.7 199.7	CV CV	15° 4°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
202.7	**204.0**	**FWTS**				**FOOTWALL - TRACE SULPHIDES**																
202.7	204.0		PU SP	cl si	a	Zone similar to 183-184.9m, silcified more than cloritised. Core competent.																
204.0	**206.7**	**FW**				**FOOTWALL SEQUENCE**																
204.0	206.7		PU	sc si	a	Return to 195.1-202.7m.	205.6	VN	33°													
206.7	**207.0**	**FWDS**				**FOOTWALL - DISSEMINATED SULPHIDES**																
206.7	207.0		PU SP	cl	a	Another dark chlorite, sulphide zone. Unit went 8.3%Zn. Core competent.																
207.0	**209.0**	**FW**				**FOOTWALL SEQUENCE**																
207.0	209.0		PU	sc si	a	As before the sulphide-chlorite patch to EOH 209m. Cleavage marked by wisps of quartz or sericite, still close to CA. Core competent.																

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 005B **Location:** Brown's Tunnel 5330N

Objective: Test Lens 1 and Lens 2 extents.

Result: Disappointing results - best is only 0.9m (183-183.9m) - 0.1%Pb, 7.7%Zn, 0.6%Cu, 26g/t Ag, 0.1g/t Au $112 TMU.

Planned Direction: 270°	Drilling Commenced: 15/06/98
Planned Dip: -85°	Drilling Completed: 20/06/98
Planned Depth: 200.0 m	Actual Depth: 209.0 m
Planned Northing: 5330 m N	Surveyed Northing: 5329.40 m N
Planned Easting: 4952 m E	Surveyed Easting: 4951.90 m E
Planned Collar R.L.: 486 m RL	Surveyed Collar R.L.: 486.40 m RL

Date Logged: 13-Jul-1998
Logged By: Michael Whitbread
Hole Size: HQ/NQ
Hole Category: Other
Grouted:

Date Log Verified: 26-Aug-1998
Verified By: Michael Whitbread

Summary Log:
0-3m NC; -33.4m Ho; -53.8m F; -58.7m Hots; -61.9m SR; -69.1m Hots; -71.3m F; -98m FW; -119.7m HOTS; -120.5m Fwts; -173.1m FW; -175.3m Ho; -183m FWTS; -184.9m FWds; -186.2m Fwts; -202.7m FW; -204m FWts; -206.7m FW; -207m Fwts; -209m FW
EOH 209m.

Depth	Direct	Dip	Depth	Direct	Dip	Depth	Direct	Dip	Depth	Direct	Dip
0.0	270.0	-85.0									
31.0	266.0	-84.1									
60.0	264.0	-84.0									
90.0	263.0	-83.5									
120.0	262.5	-83.2									
150.0	264.0	-83.0									
180.0	262.5	-83.1									
200.0	261.0	-83.0									
209.0	261.0	-83.0									

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°
0.0	**3.0**	**NC**				**NO CORE**			
0.0	3.0				a	No core.			
3.0	**33.4**	**HO**				**HOST SEQUENCE**			
3.0	5.9		CH SL VC	 si cy	a	Weathered, oxidised material. Zone of broken ground consisting primarily of cherty fragments, mixed with small intervals (e.g. 3.4-4m) of an altered-feldspar phyric volcanoclastic. Occasional silicified black siltstone/slate fragments are present. Some core loss, greater than the 10cm noted, is expected. Competency awful.			
5.9	12.0		SA VC	 cy si	a	Oxidised, yellow-white, volcanoclastic material (as in previous unit). Appears to be clast bearing (1-2cm white, silicified sediments). Around the 9m mark, is quite silicifed and looks dacitic intrusive/lave like. Competency awful, much core loss (~3.3m loss). Some fractures at 45 degrees, too weathered to pick a fabric.	8.8	JT	45°

RQD To (m)	RQD %
21.9	2
24.6	85
27.1	12
32.1	86
53.4	6
59.3	83
61.5	9
69.3	94
71.3	10
77.8	90
78.6	12
81.6	76
82.7	9
112.8	91
114.1	15
142.1	96
142.5	0
209.0	96

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
90480	12.0	14.5	2.5	0.1	0.1	0.01	1	0.1	1.2	3
90481	14.5	16.0	1.5	0.1	0.1	0.01	1	0.1	0.5	3
90482	16.0	17.5	1.5	0.1	0.1	0.01	1	0.1	0.5	3
90483	17.5	19.0	1.5	0.1	0.1	0.01	1	0.1	0.6	3
90484	19.0	20.5	1.5	0.1	0.1	0.01	1	0.1	0.6	3
90485	20.5	21.5	1.0	0.1	0.1	0.01	1	0.1	3.6	3
90486	21.5	23.3	1.8	0.1	0.1	0.01	1	0.1	0.5	3
90487	23.3	24.8	1.5	0.1	0.1	0.01	1	0.1	1.2	3
90488	24.8	26.2	1.4	0.1	0.1	0.01	1	0.1	0.9	3
90489	26.2	27.7	1.5	0.1	0.1	0.01	1	0.1	0.6	3
90490	27.7	29.5	1.8	0.1	0.1	0.01	1	0.1	0.5	3
90491	29.5	31.0	1.5	0.1	0.1	0.01	1	0.1	1.0	3
90492	31.0	32.5	1.5	0.1	0.1	0.01	1	0.1	0.9	3
90493	32.5	32.9	0.4	0.1	0.1	0.01	1	0.1	1.1	3
90494	32.9	33.4	0.5	0.1	0.1	0.01	3	0.4	1.6	6
90495	33.4	34.4	1.0	0.1	0.2	0.01	1	0.1	0.5	4
90496	34.4	35.4	1.0	0.1	0.2	0.01	1	0.1	0.5	4
90497	35.4	35.9	0.5	0.1	0.3	0.01	1	0.1	0.5	6
90498	35.9	36.9	1.0	0.1	0.2	0.01	1	0.1	0.9	4
90499	36.9	37.9	1.0	0.1	0.1	0.01	1	0.1	0.3	3
90500	37.9	38.9	1.0	0.1	0.1	0.01	1	0.1	0.6	3
81501	38.9	39.9	1.0	0.1	0.3	0.01	1	0.1	0.8	6

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
12.0	21.5		BR CH SA	cy ht	a	Oxidised, Fe mottled, sheared cherty breccia. Cherty clasts are elongate or sub-rounded, but are the zones which control the mottleing. These are up to 5cm wide, but may be stretched out along a fabric (close to CA). The matrix is sand-silt size, and is usually clay altered (weathering). Competency is awful. Many metres of core loss (~6.6m). Core block error at 22.9m, remarked as 21.9m (error assumed to be in broken material). 22 reassigned as 21m.	16.0 19.0	CV CV	13° 8°		
21.5	23.3		RK SS	cy si	b	Pale creamy-grey, variably silica and clay altered, sandstone/rock. Unit fairly massive. Has numerous small, discontinuous, Fe coated fractures. Possible thin cherty clast or quartz vein at 22.6m. Core of moderate competency. Fairly abrupt boundary with next unit, in terms of colour/alteration, but texture is more gradual.	22.7 23.3	JT CT	40° 65°		
23.3	26.2		CH VC	qs sc	a	Partially oxidised. Variably cleaved/sheared, light grey to greeny-yellow grey, poorly sorted, cherty clast bearing volcanoclastic sandstone. Unit variably sericite+/-chlorite and lesser silica altered. Weathering concentrated along fractures (as in previous unit). Clasts usally <3-5mm in size. Cleavage runs ~30-40 degrees to CA. Unit of poor-moderate competency, with many pieces under 10 and 5cm. Last 2m quite broken (10cm core loss).	23.6 23.6 25.0 25.9	JT CV CV CV	50° 35° 30° 41°		
26.2	29.5		RK SA	cy se	a	Greeny-yellow-grey, moderately oxidised, sericite+/-chlorite altered rock. Unit has a very strong cleavage, marked by white ?sericite flecks. Fractures oxidised (as previous), and often run against cleavage. Competency moderate to good.	28.1 28.2	CV JT	24° 36°		
29.5	32.9		RK	sc	a	Lime green, lightly-barely oxidised, sericite+/-chlorite altered, matrix dominant, chert and pyrite clast bearing rock. Unit like previous, except for pyrite wisps, spots and blebs, and lesser cherty clasts. Clasts <5-10mm in length generally. Cleavage strong, but hard to measure, seems to lie close to CA. Some pyrite wisps seem to mark cleavage, while pyrite blobs are rounded, and may partially overprint/accompany cherty clasts. Strong lineations present on joint faces. Competency moderate except from 32.2 onwards, which becomes broken.	31.5 31.5 31.8	JT CV JT	38° 8° 7°		
32.9	33.4		VC	qs	a	Hardly weathered at all. Well cleaved, 'chert/silicified sediment' clast bearing volcanoclastic sandstone. Sericite altered (weathered?) along joints; looks to be alteration. Clasts (may be elongate) mm-5cm length. Small pyrite blobs and clasts present. Competency awful.	33.2 33.2	JT JT	32° 23°		
33.4	**53.8**	**F**				**FAULT**					
33.4	35.9		BR CH	qs	a	Broken zone of light yellow-green, quartz-sericite altered version of previous unit. Silicified clasts are strung out along the fabric (becomes almost schistose), possibly late quartz veins along this as well as around earlier clasts.	34.9	CV	30°		

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81502	39.9	40.9	1.0	0.1	0.1	0.01	1	0.1	0.8	3
81503	40.9	41.9	1.0	0.1	0.2	0.01	2	0.1	1.0	4
81504	41.9	42.9	1.0	0.1	0.1	0.01	1	0.1	1.2	3
81505	42.9	43.9	1.0	0.1	0.2	0.01	2	0.1	1.3	4
81506	43.9	44.7	0.8	0.1	0.2	0.01	3	0.1	1.4	5
81507	44.7	45.7	1.0	0.1	0.5	0.01	4	0.1	2.5	9
81508	45.7	46.0	0.3	0.1	1.1	0.01	5	0.1	2.4	17
81509	46.0	47.0	1.0	0.2	0.3	0.01	1	0.1	2.0	6
81510	47.0	48.0	1.0	0.1	0.5	0.01	1	0.1	1.3	8
81511	48.0	49.2	1.2	0.1	0.2	0.01	1	0.1	1.0	4
81512	49.2	50.2	1.0	0.1	0.3	0.01	1	0.1	1.3	6
81513	50.2	51.2	1.0	0.1	0.4	0.01	1	0.1	1.0	7
81514	51.2	51.8	0.6	0.1	0.3	0.01	1	0.1	0.7	6
81515	51.8	53.8	2.0	0.1	0.3	0.01	1	0.1	1.7	6
81516	53.8	54.8	1.0	0.2	0.2	0.01	1	0.1	3.8	5
81517	54.8	55.8	1.0	0.1	0.2	0.01	5	0.1	5.2	5
81518	55.8	56.8	1.0	0.1	0.2	0.01	1	0.1	4.8	4
81519	56.8	57.8	1.0	0.6	0.7	0.01	1	0.1	3.8	13
81520	57.8	58.7	0.9	0.1	0.5	0.01	1	0.1	1.8	8
81521	58.7	59.7	1.0	0.2	0.5	0.01	5	0.1	2.8	9
81522	59.7	60.7	1.0	0.2	0.5	0.01	4	0.1	3.2	9
81523	60.7	61.9	1.2	0.2	0.5	0.01	6	0.1	3.1	10
81524	61.9	62.7	0.8	0.1	0.6	0.01	1	0.1	3.7	9
81525	62.7	63.7	1.0	0.1	0.5	0.01	4	0.1	2.2	9
81526	63.7	64.7	1.0	0.1	0.6	0.01	1	0.1	2.9	9
81527	64.7	65.7	1.0	0.2	0.6	0.01	1	0.1	1.6	10
81528	65.7	66.1	0.4	0.2	0.3	0.01	1	0.1	2.6	6
81529	66.1	67.1	1.0	0.1	0.1	0.01	1	0.1	2.5	3
81530	67.1	68.1	1.0	0.2	0.4	0.02	1	0.1	2.5	7
81531	68.1	69.1	1.0	0.1	0.3	0.01	1	0.1	2.3	6
81532	69.1	70.2	1.1	0.1	0.2	0.01	1	0.1	1.9	4
81533	70.2	71.3	1.1	0.1	0.2	0.01	1	0.1	1.5	4
81534	71.3	72.6	1.3	0.1	0.1	0.01	1	0.1	1.5	3
81535	72.6	73.6	1.0	0.1	0.1	0.01	1	0.1	1.2	3
81536	97.0	98.0	1.0	0.1	0.1	0.01	1	0.1	1.3	3
81537	98.0	99.0	1.0	0.1	0.5	0.01	1	0.1	2.8	8
81538	99.0	99.2	0.2	2.4	5.2	0.11	66	0.2	13.4	94
81539	99.2	99.7	0.5	0.5	1.7	0.02	27	0.2	14.9	31
81540	99.7	100.0	0.3	0.1	0.1	0.01	1	0.1	4.4	3
81541	100.0	101.0	1.0	0.1	0.2	0.01	1	0.1	2.2	4
81542	101.0	102.0	1.0	0.1	0.1	0.01	1	0.1	2.3	3
81543	102.0	103.0	1.0	0.1	0.1	0.01	1	0.1	1.7	3
81544	103.0	104.0	1.0	0.1	0.1	0.01	1	0.1	2.0	3
81545	104.0	105.0	1.0	0.1	0.2	0.01	3	0.1	2.5	5
81546	105.0	106.0	1.0	0.1	0.5	0.01	4	0.1	3.0	9
81547	106.0	107.0	1.0	0.1	0.1	0.01	1	0.1	3.6	3
81548	107.0	108.0	1.0	0.1	0.1	0.01	1	0.1	3.2	3

Hole No: 005B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
35.9	49.2		BR CH SH ST	qs qs	a	Broken zone consisting of strongly foliated, medium to dark grey and green-grey, fragments of siltstone, cherty clast breccias, volcanoclastic and quartz-sericite schistose material. Minor wisps or disseminations of pyrite may be associated with these. Zones are: mixed sediments to 39.8m; silicified siltstone/chert to 40.5m; schistose material to 42.1m; dark siltstone to 42.9m; sheared cherty breccia zoning to a schist around 47.2m to 49.2m. Interesting features: 45.7-46m, breccia containing sphalerite blebs and wisps associated with void filling quartz veining: went 1.1%Zn (in breaks in clasts and in the matrix around them). 36.4-36.7m, Joint/fault along cleavage, which has 9cm left lateral displacement, cutting across bedding. Some core loss marked ~.4m, but possibly more due to very broken nature of ground.	36.6 36.6 41.2 45.6 47.8	BE JT CV CV CV	31° 5° 22° 24° 2°		
49.2	51.8		CH SH ST VC	 qs qs	a	Light grey with darker grey patches, more competent (poor to moderate) quartz-sericite schist and sheared cherty bearing volcanoclastic breccia with lesser siltstone and sandstone. Core of poor competency with many pieces over 10cm. Core orientation at 49.5m. Orientated measurement 49.5m - cleavage - dip 80 degrees East, strike 185-005. Sometimes cleavage vertical.	49.5	CV	10°		
51.8	53.8		BR RK ST	 se	a	Broken zone of sheared dark siltstone and light greenish-grey sericite+/-chlorite altered rock, possibly after lithology of previous unit. 1.5m core loss between 52.1 and 53.6m.					
53.8	**58.7**	**HOTS**				**HOST - TRACE SULPHIDES**					
53.8	57.8		BR SH ST	 se	a	Yellow and greenish grey, strongly foliated (schistose) quartz-sericite+/-?carbonate siltstone/rock/breccia. Contains sporadic occurrences of siltstone, relatively un-silicified, as bands/rafts or as rounded clasts with pressure shadows and wrapping cleavage. Siltstone fragments are large near to previous unit, but become more diffuse and small, going through the unit. Towards end of unit, may bear small (<5mm) blobs and wisps of sphalerite, in the cleavage, or abutting clasts (zone went <1%Zn). Competency poor-moderate, with most pieces making 10cm; small (10cm) zones of broken material are present.	55.6	CV	10°		
57.8	58.7		BR	sc si	b	Light yellow cream, spotted with darker greens and black, poorly sorted, weakly to moderately foliated, clast supported polymict breccia. Matrix is vertually non-existent. Clast of varying colours (black to yellow), or varying size (mm-5cm). Some are rounded, some angular, some appear to have suffered compression and smearing. Clasts may be silica, sericite+/-chlorite altered. Mass flow? Small veinlets of sphalerite-pyrite and other fine grained unidentified sulphides occur occasionally interstitial to clasts or in late stage cracks or as cross-cutting veinlets. Disseminated pyrite cubes are present (fine and medium grained). Unit competent	57.8 57.9 58.4	CT CV VN	67° 12° 15°		
58.7	**61.9**	**S**				**SHEAR**					

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81549	108.0	109.0	1.0	0.1	0.3	0.01	3	0.1	3.3	6
81550	109.0	110.0	1.0	0.2	0.7	0.01	5	0.1	2.4	12
81551	110.0	111.0	1.0	0.2	0.7	0.04	9	0.1	1.6	13
81552	111.0	112.0	1.0	0.2	2.4	0.15	15	0.1	1.8	37
81553	112.0	112.8	0.8	0.2	0.4	0.01	1	0.1	3.1	7
81554	112.8	114.0	1.2	0.2	0.6	0.01	3	0.1	3.6	10
81555	114.0	115.0	1.0	0.2	0.3	0.01	1	0.1	3.5	6
81556	115.0	116.0	1.0	0.1	0.1	0.01	1	0.1	3.6	3
81557	116.0	117.0	1.0	0.1	0.4	0.01	1	0.1	3.3	7
81558	117.0	117.7	0.7	0.1	0.3	0.01	1	0.1	2.2	6
81559	117.7	118.7	1.0	0.1	0.2	0.01	1	0.1	1.6	4
81560	118.7	119.7	1.0	0.1	0.4	0.01	1	0.1	1.3	7
81561	119.7	120.5	0.8	0.2	0.4	0.01	1	0.1	1.1	7
81562	120.5	121.5	1.0	0.1	0.1	0.01	1	0.1	1.5	3
81563	172.1	173.1	1.0	0.1	0.1	0.01	1	0.1	1.7	3
81564	173.1	174.1	1.0	0.1	0.1	0.01	1	0.1	1.7	3
81565	174.1	175.3	1.2	0.1	0.1	0.01	1	0.1	2.0	3
81566	175.3	176.3	1.0	0.5	1.5	0.10	10	0.1	3.7	26
81567	176.3	177.3	1.0	0.1	0.2	0.01	1	0.1	3.1	4
81568	177.3	178.3	1.0	0.1	0.2	0.01	9	0.1	2.6	6
81569	178.3	179.3	1.0	0.2	2.0	0.33	23	0.1	5.9	36
81570	179.3	180.3	1.0	0.1	0.2	0.03	11	0.1	2.9	6
81571	180.3	181.3	1.0	0.1	1.8	0.03	9	0.1	3.0	27
81572	181.3	182.2	0.9	0.1	0.3	0.01	4	0.1	3.4	6
81573	182.2	183.0	0.8	0.1	1.9	0.13	4	0.1	5.0	28
81574	183.0	183.9	0.9	0.1	7.7	0.60	26	0.1	11.1	112
81575	183.9	184.3	0.4	0.1	1.4	0.25	10	0.1	8.0	24
81576	184.3	184.9	0.6	0.1	2.6	0.91	41	0.2	9.9	53
81577	184.9	185.1	0.2	0.1	0.4	0.02	5	0.1	2.5	8
81578	185.1	186.2	1.1	0.1	1.9	0.10	7	0.1	5.8	28
81579	186.2	187.2	1.0	0.1	0.1	0.01	1	0.1	1.8	3
81580	187.2	188.5	1.3	0.1	0.1	0.01	1	0.1	1.2	3
81581	188.5	189.5	1.0	0.1	0.1	0.01	1	0.1	3.2	3
81582	189.5	190.5	1.0	0.1	0.1	0.01	3	0.1	2.2	3
81583	190.5	191.5	1.0	0.1	0.3	0.02	5	0.1	2.6	6
81584	191.5	192.5	1.0	0.1	0.4	0.02	1	0.1	1.6	7
81585	192.5	193.5	1.0	0.1	0.1	0.01	1	0.1	0.8	3
81586	193.5	194.5	1.0	0.1	0.1	0.01	1	0.1	1.1	3
81587	194.5	195.1	0.6	0.1	0.1	0.01	1	0.1	2.0	3
81588	195.1	196.1	1.0	0.1	0.1	0.01	1	0.1	1.0	3
81589	196.1	197.1	1.0	0.1	0.3	0.03	6	0.1	1.2	7
81590	197.1	197.8	0.7	0.1	0.1	0.01	1	0.1	1.0	3
81591	197.8	198.0	0.2	0.6	8.5	0.37	76	0.1	9.8	132
81592	198.0	199.0	1.0	0.1	0.1	0.10	1	0.1	1.5	4
81593	199.0	200.0	1.0	0.1	0.1	0.01	1	0.1	1.0	3
81594	200.0	201.0	1.0	0.1	0.7	0.02	10	0.1	1.8	12
81595	201.0	202.0	1.0	0.1	0.1	0.01	1	0.1	0.9	3

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
58.7	61.9		BR SH ST	 se si si	a	Shear zone - centred on 60.2, cleavage parallels it. Dark green and dark grey-black, strongly foliated, 'silicified/non-silicified siltstone' clast bearing breccia. Clast size range large (5mm to 10cm). Clasts may be rounded or elongate (rafts/bands). Unit heavily veined by, variably orientated (often 90 degrees to cleavage, but close to CA) yellow carbonate+/-quartz veins which may carry or be associated with sphalerite blebs. Pyrite may be present as small clasts (replacement?). Core competency is bad between 59.4-61.5m (possible shear zone - small clay zone at 60.2m. Otherwise of moderate competency.	59.2 59.2 59.8 60.3 61.8	VN CV CV SR CV	4° 6° 10° 11° 21°		
61.9	**69.1**	**HOTS**				**HOST - TRACE SULPHIDES**					
61.9	65.7		BR	qs	b	Breccia as in 57.8-58.7m. Moderately silicified. More matrix - very fine grained, black. Some chalcopyrite with the sphalerite veinlets and blebs. Pyrite still dominant however. Matrix is occasionally yellow carbonate-quartz. Core orientation 64.5m.	65.1	CV	42°		
65.7	69.1		BR CH SS	sc si	a	Unit is a dark green grey sericite-chlorite and silica altered breccia of silcified siltstone/chert and large sandstone clasts. Similar to previous sheared cherty breccias. Small sphalerite spots and pyrite clots/clasts are uncommon (went <0.5%Zn). Sericite wips and veinlets common. Some banding noted at 66.8m, superimposed on other fabrics? Competency good, but deteriorates towards the end of unit.	66.8 66.8 68.5	BD CV CV	38° 20° 14°		
69.1	**71.3**	**F**				**FAULT**					
69.1	70.2		BR CH	qs	a	Moderately broken fragments of previous unit. Competency poor to bad.	69.9	CV	10°		
70.2	71.3		BR ST		a	Broken zone of altered siltstone, ?sediment, posibly after previous unit. Clay patch in last 10cm of core of this unit. 30cm core loss.					
71.3	**98.0**	**FW**				**FOOTWALL SEQUENCE**					
71.3	72.6		BR DA ST	si bs si	b	Light greeny yellow, silicified, densely altered-feldspar phyric, poorly sorted, dacitic mass flow breccia. Clasts of variable size (5mm to >15cm). Matrix is a mass of feldspar phyric groundmass. Feldspars appear to be altered to yellowy ?carbonate and/or sericite. Black silicified siltstone are present as the largest angular fragments, intraclast to these is a pinky yellow breccia fill mass of silica/?K feldspar/?carbonate. Other clasts are rare cherts, and more common rounded or irregular, silicified rock (most likely after dacitic clasts). Faint greeny, squished masses are also present in the groundmass (pumice?). Competency good. Possible faint fabric picked out be clast elongation. Contact with previous unit sharp.	71.3	CT	31°		

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81596	202.0	202.7	0.7	0.1	0.2	0.01	1	0.1	1.1	4
81597	202.7	204.0	1.3	0.9	3.8	0.18	31	0.1	3.6	62
81598	204.0	205.0	1.0	0.1	0.1	0.02	1	0.1	1.8	3
81599	205.0	206.0	1.0	0.1	0.1	0.01	1	0.1	1.9	3
81600	206.0	206.7	0.7	0.1	0.1	0.01	1	0.1	1.5	3
81601	206.7	207.0	0.3	0.2	8.3	0.16	15	0.1	6.4	114
81602	207.0	208.0	1.0	0.1	0.2	0.01	1	0.1	1.5	4
81603	208.0	209.0	1.0	0.1	0.1	0.01	1	0.1	1.0	3
	Total Length:		123.0							

Standards

		Pb	Zn	Cu	Ag	Au	Fe	
Reference Values for:	HBM-02						17/07/98	
		3.4	12.5	0.46	150	1.3	22.7	
Variances Allowed:		20%	20%	30%	20%	20%	20%	
81604	Inserted @ 209.0m	4.0	***16.4***	0.53	162	1.4	23.3	N

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
72.6	81.5		PU	qs si	b	Case off to NQ 77.8m. Pinky yellow, often grey, silicified dacitic mass flow pumice breccia. Dacitic by phenocryst composition. Supposed pumice fragments, may be silicified or chlorite-sericite altered, are irregular in shape, may carry internal laminations, and usually contain altered feldspar phenocrysts. Silicified fragments, which are pinky in hue, may be larger than 5cm. Chlorite clots/pseudo-fiamme are usually much smaller. Unit cut by occasional quartz-carbonate veins (<.5cm usually) in varying orientaions. Possibly a faint fabric picked by out by clast orientations ~35-45 degrees to CA. Unit competent.	72.9 76.0 76.0 76.3	CV CV VN VN	35° 44° 58° 27°													
81.5	83.8		BR PU	 si	a	Bleached version of previous, associated with a broken zone (possibly a poor expression of a fault). Broken zone between 81.8 and 83.2m. Unit cut by common thin quartz veinlets, which appear conjugate to any perceived fabric.	82.6 82.6	QV CV	45° 44°													
83.8	98.0		DA PU	qs si	a	Return to 72.6-81.5, with a few zones more green in colour (chlorite content increase?), others are grey, lacking the yellowy tinge that dominates the unit. The yellowy zones seem to carry more of a fabric than others. Larger veins are carbonate dominant and often have rounded quartz cores (e.g. 91.1m, 89.6m and 87.1m). Silicification seems to become more intense with depth, as textures become more difficult to discern. Unit heavily quartz-carbonate veined in places e.g. 89.5-92m. Unit competent. Contact with next unit sharp. Core orient at 84m.	90.6 90.6 90.7 93.4 93.4 98.0	QV QV CV CV JT CT	60° 27° 24° 36° 7° 70°													
98.0	**119.7**	**HOTS**				**HOST - TRACE SULPHIDES**																
98.0	99.7		SS ST	si si	a	Medum to light grey in colour. A mish mash of variably heavily silicified and veined siltstone and sandstones. Silicification dies off after 99m. Strong fabric present in first 30cm of unit. Faint banding (bedding?) present throughout, often marked by fine grained disseminated pyrite bands. Small zones are sulphide rich 99-99.2 consisting of sediment heavily infiltrated by disseminated pyrite, and irregular worm-like sphalerite veinlets. In these the sphalerite is bordered by a white material. Core orient at 99m. Small blobs of sphalerite rimmed by a black fine grained material occur uncommonly, associated with the carbonate-quartz veining. Possible ?shear	98.1 98.4 98.5 98.5 99.5	BD BD VN VN CV	51° 54° 45° 10° 47°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
99.7	112.8		SL SS ST	si si se	b	Black to medium grey package of shale, intermixed with siltstone and sandstone beds. Unit fairly heavily veined by yellowy quartz-carbonate veins, which uncommonly carry sphalerite (unit went generally less than 0.5%Zn). Zones of intense veining - 99.7-100.2 and 106-107.6m. Some of the veins are brittle containing angular fragments of the wallrock. Veining is variably orientated either ~30 degrees or about 60-70 to CA, and may run against bedding. Unit coarsens gradually and veining intensity drops as unit progresses. Bedding is observable (can be thinly laminated or thick intervals e.g. 30cm, and the angle to CA increases throughout unit. Bedding may be disrupted by veining. Possible development of a cleavage overprint, and disruption of cherty beds in last 1m of unit. Unit of moderate competency. Sphalerite is present as an accessory in veins, as rare patchy blebs and wisps, pyrite is more common as banding, disseminated cubes, or small blebs unassociated with veining. Core moderately competent. Beds fine up in a downhole direction. Core orientation at 105m and 111m. Orientated measurement; 111m - bedding - mainly horizontal, some at 10 degrees striking ~E-W; - fracture set (weak cleavage?) dip 76 degrees north, strike E-W. Looking at pen mark, think orient was 90 degrees out. So bedding is unchanged (more or less), while the second measurement should be N-S, dipping to the east.......... Orientated measurement at 112.2m, cleavage/banding, dip 60-62 degrees west, strike ~N-S.	101.0 101.0 101.0 103.3 103.3 104.0 105.0 107.0 110.6 112.2	VN VN BE VN BE BE BE VN BE CV	19° 61° 20° 19° 20° 40° 57° 10° 89° 30°													
112.8	117.7		SL SS ST	si si si	b	Similar package of sediments to previous. Fairly arbitrary division, mainly by a more ubiquitous silicification, though patches are sericite altered. Heavily veined in first 1.1m, and moderately thereafter. Once again bedding/laminations are close to CA in finer units, and steeps to near 70 degrees in coarser units (due to cross-lamination?, or is cleavage not bedding being reflected in finer zones). Thin quartz-carbonate veinlets appear to mark an incipient cleavage in places. Beds become heavily silicified/cherty in last metre of unit. Core of poor competency to 114m, poor-moderate thereafter. Core orient at 117m. Orientated measurement - 117m, bedding, dip 23 degrees N-W, strike 030(-035)-210(-215).	113.0 113.0 113.1 113.3 115.0 115.5 116.0 116.0 116.8 117.0	CV BD BE VN BD VN CV BD VN BE	30° 44° 90° 14° 34° 10° 24° 46° 27° 72°													
			CH PE RY	 ql		Green and grey, fairly chaotic mix of silicified sediment with lesser isolated patches of light green, quartz phyric, silica-chlorite-sericite altered rhyolitic.Peperite contact? or rip up clasts of underlying rhyolite. May get small blebs of sphalerite and galena near end of unit. Core of moderate competency.																
119.7	**120.5**	**FWTS**				**FOOTWALL - TRACE SULPHIDES**																
119.7	120.5		CH PE RY	 sc si	a	As previous unit but silicified sediment bands are now lesser and isolated within the rhyolite. The cherty bands look to be folded. Some thin quartz and carbonate-quartz veining present. Spots and blebs of sphalerite and galena present, sometimes associated with the veining. Core competent.																
120.5	**173.1**	**FW**				**FOOTWALL SEQUENCE**																

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
120.5	173.1		RY	cb sc si	a	Light green, occasionally patchy dark green, generally massive, occasionally banded, perhaps slightly sheared, sericite-chlorite and silica altered, quartz with lesser chlorite-altered-feldspar phyric, ryholite. Quartz phenocrysts are generally <1-2mm, may be rounded, resorbed, elongate and wispy. The elongate and wispy forms may be 5mm in length, though usually less than 1mm wide. Quartz phenocrysts are often rimmed or in varying stage of replacement by white carbonate or sericite (my guess is carbonate)? Chlorite spots, possibly after feldspar, are present mainly after 135.7m. This metreage sees the end of the white spots of carbonate that are common up to then. Possibly a change from rhyo-dacite to rhyolite? Banding is sporadically present throughout e.g 130.2m, after 135.7m banding is virtually absent, but a faint orientation of the elongate phenocrysts and chlorite wisps is sporadically noticeable ~40-50 degrees to CA. Unit is veined by quartz, and quartz-carbonate veins throughout, in two main orientations; some close to CA, while others sit ~30-45 degrees, but often opposite to the faint cleavage. Veins, especially the purer quartz variety, show folding, while some of the larger quartz-carbonate veins are brittle e.g. 155.9m. The veins may carry rare blebs of fine grained pyrite +/- galena or sphalerite. Pyrite vein at 133.5. Unit is competent. Core orientation at 123m, 129m, 141m, 149.9m, 155.9m, 162m, 168m. Sharp contact with next unit. Orientated measurement at 149.9m, cleavage approximated by core break - 72-74 degees dip to SE, strike 30(-35)-210(-215).	128.7 130.2 141.6 141.6 143.6 167.5 167.5	VN BD VN CV VN VN CV	3° 62° 25° 42° 9° 35° 54°													
173.1	**175.3**	**HO**				**HOST SEQUENCE**																
173.1	175.3		PU ST	sc si	b	Fairly massive, black, silicified siltstone/shale. Contains a small, sericite-chlorite altered pumiceous mass flow band (dacitic?) 174.5-174.7m. Unit carried occasional 1cm thick, pinky white quartz-carbonate veins. Sharp contact with next unit, but cannot get an angle due to dispruption of the silicified unit. Possible incipient cleavage, marked by thin ?sericite veinlets.	173.9	CV	19°													
175.3	**183.0**	**FWTS**				**FOOTWALL - TRACE SULPHIDES**																
			 ST	si si		Dark green, strongly foliated/bedded, chlorite-sericite altered, patchily silicified, silicified siltstone clast bearing, altered-feldspar phyric, dacitic mass flow pumice breccia. Clasts can be from 1-2mm up to 5cm in length. Silicified siltstone clasts occur occasionally. Sphalerite blebs, spots and wisps are common, and sometimes surrounded by a gun metal coloured material. Parts of unit commonly went 1-2%Zn. Pyrite occurs as disseminated cubes throughout, in places comprising much of interclast areas (e.g. 178.4-180m). Less commonly pyrite +/- sphalerite may also have preferentially replaced silicified clasts. Unit has occasional quartz-carbonate veins (1-2cm) running near 90 degrees to CA. Fine sericite wisps may mark a poor cleavage. Mineral or clast/matrix segregations define a strong fabric/banding/bedding ~40-55 degrees to CA. Core is competent.	176.6 177.6 177.6 177.7 180.7	CV JT BD BD VN	10° 55° 44° 40° 88°													

Hole No: 005B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
182.2	183.0		PU	cs si	a	Unit as before, but with increasing density of black chlorite? spots. Core competent.	182.5	BD	42°													
183.0	**184.9**	**FWDS**				**FOOTWALL - DISSEMINATED SULPHIDES**																
183.0	184.9		PU SP	cl	a	Possibly FWDS. Black chlorite altered version of previous unit. Unit carries bands of disseminated pyrite and small sphalerite spots and blebs rimmed or accompanied by chalcopyrite, all entrained within a gun-metal/light grey coloured unidentified sulphide (possibly sulphide-mix?). These bands are roughly conformable with the ?mass flow banding, but in places are internally marked by chlorite wisps with a fabric closer to CA. Core competent.	183.8 184.2	CV BD	15° 52°													
184.9	**186.2**	**FWTS**				**FOOTWALL - TRACE SULPHIDES**																
184.9	185.1		PU	si	a	Silicified pumice breccia. Core competent.																
185.1	186.2		PU	cs si	a	Similar to 183-184.9, in mineralogy, except dark chlorite +/- sulphide patches are more distinct clasts separated by sericite-chlorite pseudo-fiamme or silicified patches. Original rock dacitic, most likely. Wisps of sericite and silica mark a fabric close to CA cf banding. Core competent.	185.6 185.6	BD CV	54° 14°													
186.2	**202.7**	**FWTS**				**FOOTWALL - TRACE SULPHIDES**																
186.2	188.5		PU	sc si	a	Light yellowy-green, densely altered-feldpsar phyric, banded, clast bearing, dacitic, ?mass flow pumice breccia. Difficult to say for sure, may be a lava. Has banding and weak cleavage as previous. Has small (3mm-1-2cm) rounded yellowy-white ?clasts, which have include flecks of red ?silica. Have rare angular silica +/-sphalerite clasts. Core competent.	187.6 187.6	BD CV	54° 4°													
188.5	195.1		BR PU VC	si cs	a	Darker green, mixed, ocassionally bedded, probably more chlorite rich, dacitic to rhyo-dacitic, volcanoclastic/mass flow pumice breccia. Unit picked out due to colour change (although some light greeny yellow zones do occur) and because of a relative increase in clast content. Clasts mainly as silica patches (after pumice?), although some of the darker patches appear to be angular clasts (>5cm clast identified). Unit possibly one flow, with large, darker clasts entrained within. The darker zones may carry disseminated pyrite cubes as well. Last 80cm has occasional quartz phenocrysts. Quartz-carbonate veins, sometimes truncated, occasionally present. Core competent.																
195.1	202.7		PU	sc si	a	Return to 186.2-188.5m; less banded, more of a cleavage development (sub-parallel to CA). Contains small zone of FWTS, dark chlorite, gun metal sulphide, pyrite and sphalerite alteration between 197.8-198.0m (went 8.5%Zn 76g/t Ag and 0.37%Cu). Boundaries of this little zone are irregular, but quite sharp (perhaps slumped banding?). Another dark chlorite patch 200.4-200.6m. Dark silicifed 'clasts' and blebs of sphalerite rimmed by a dark fine grained material, uncommonly present. Unit crossed by occasional quartz carbonate veinlets. Core competent.	198.7 199.7	CV CV	15° 4°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
202.7	**204.0**	**FWTS**				**FOOTWALL - TRACE SULPHIDES**																
202.7	204.0		PU SP	cl si	a	Zone similar to 183-184.9m, silcified more than cloritised. Core competent.																
204.0	**206.7**	**FW**				**FOOTWALL SEQUENCE**																
204.0	206.7		PU	sc si	a	Return to 195.1-202.7m.	205.6	VN	33°													
206.7	**207.0**	**FWDS**				**FOOTWALL - DISSEMINATED SULPHIDES**																
206.7	207.0		PU SP	cl	a	Another dark chlorite, sulphide zone. Unit went 8.3%Zn. Core competent.																
207.0	**209.0**	**FW**				**FOOTWALL SEQUENCE**																
207.0	209.0		PU	sc si	a	As before the sulphide-chlorite patch to EOH 209m. Cleavage marked by wisps of quartz or sericite, still close to CA. Core competent.																

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 006B **Location:** Brown's Tunnel 5330N

Objective: Test Lens 1 and Lens 2 extents.

Result: Hit Lens 1 (near to 004B though). 46-58.8m (12.8m) 2.3%Pb, 3.6%Zn, 0.19%Cu, 20g/t Ag, 1.7g/t Au, 4.1%Fe - $79TMU. Lens 2, patchy intercepts.

Planned Direction: 270°
Planned Dip: -63°
Planned Depth: 180.0 m
Planned Northing: 5330 m N
Planned Easting: 4952 m E
Planned Collar R.L.: 486 m RL

Drilling Commenced: 22/06/98
Drilling Completed: 25/06/98
Actual Depth: 178.8 m
Surveyed Northing: 5329.40 m N
Surveyed Easting: 4951.40 m E
Surveyed Collar R.L.: 486.50 m RL

Date Logged: 16-Jul-1998
Logged By: Michael Whitbread
Hole Size: HQ/NQ
Hole Category: other
Grouted:

Date Log Verified: 30-Sep-1998
Verified By: Michael Whitbread

Summary Log:
0-2.5m NC; -29.5m Ho; -43m F; -48.2m HOTS; -49.3m HODS; -57.3m HOTS; -63.8m HOTS (58.2-58.8 ~HODS); -75.8m HW; -77.3m Ho; -87.5m HW; -107.7m PR; -110.4m HW; -110.9m HODS; -124.7m variable HOTS; -146.8m Cherty Andesite- Hots; -178.4m Dacite-Andesite becoming more chlorite-sericite-pyrite altered - Hots

Depth	Direct	Dip
0.0	270.0	-63.0
31.0	268.0	-64.0
60.0	266.0	-65.0
90.0	265.5	-64.0
120.0	267.0	-64.0
150.0	268.0	-64.0
178.0	268.0	-63.8
178.8	268.0	-63.8

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°
0.0	**2.5**	**NC**				**NO CORE**			
0.0	2.5		NC		a	No core.			
2.5	**10.0**	**HO**				**HOST SEQUENCE**			
2.5	4.8		BR CH SA		a	Weathered core. Broken fragments of cherty material, occasionally in yellow-white clay (probably after volcanoclastic cherty breccia). Partial recovery of core, 0.4m total loss.			
4.8	10.0		SA SS ST	 cy si	a	Weathered core. Broken zone of white, yellow-white, mix of sandstone and silicified siltstone. Occasional clay patches. Some pieces of core near 10cm (in sandstones). Sandstone pitted, perhaps by weathering of feldspar fragments, and carries small clasts (volcanoclastic?). Possible fabric, marked by oxide (goethite and hematite) banding. End of unit begins to develop mottling. Again partial recovery at best, with at least 1.3m total core loss.	7.9	BD	15°
10.0	**29.5**	**HO**				**HOST SEQUENCE**			

RQD To (m)	RQD %
2.5	NC
12.3	5
13.2	88
19.4	14
20.2	87
27.9	7
29.4	80
42.4	3
47.3	89
53.3	10
55.4	95
57.4	0
64.3	91
65.6	7
89.1	92
90.5	7
101.8	86
102.4	0
177.9	93
178.8	11

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81605	4.8	5.8	1.0	0.1	0.1	0.01	1	0.1	0.6	3
81606	5.8	7.0	1.2	0.1	0.1	0.01	1	0.1	0.8	3
81607	7.0	8.3	1.3	0.1	0.1	0.01	1	0.1	0.3	3
81608	8.3	9.3	1.0	0.1	0.1	0.01	1	0.1	0.6	3
81609	10.0	11.5	1.5	0.1	0.1	0.01	1	0.1	0.6	3
81610	11.5	12.5	1.0	0.1	0.1	0.01	1	0.1	0.9	3
81611	12.5	14.2	1.7	0.1	0.1	0.01	1	0.1	1.0	3
81612	14.2	14.5	0.3	0.1	0.1	0.01	1	0.1	0.8	3
81613	14.5	16.0	1.5	0.1	0.1	0.01	1	0.1	0.6	3
81614	16.0	16.2	0.2	0.1	0.1	0.01	1	0.1	0.4	3
81615	16.2	17.2	1.0	0.1	0.1	0.01	1	0.1	0.5	3
81616	17.2	18.2	1.0	0.1	0.1	0.01	1	0.1	0.3	3
81617	18.2	19.2	1.0	0.1	0.1	0.01	1	0.1	0.5	3
81618	19.2	20.2	1.0	0.1	0.1	0.01	1	0.1	0.5	3
81619	20.2	21.1	0.9	0.1	0.1	0.01	1	0.1	1.0	3
81620	21.1	22.0	0.9	0.1	0.1	0.01	1	0.1	1.1	3
81621	22.0	22.8	0.8	0.1	0.1	0.01	1	0.1	2.0	3
81622	22.8	23.8	1.0	0.1	0.1	0.01	1	0.1	0.8	3
81623	23.8	24.8	1.0	0.1	0.1	0.01	1	0.1	0.6	3
81624	24.8	25.8	1.0	0.1	0.1	0.01	1	0.1	0.6	3
81625	25.8	26.8	1.0	0.1	0.1	0.01	1	0.1	1.1	3
81626	26.8	27.8	1.0	0.1	0.1	0.01	1	0.1	0.6	3

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
10.0	16.0		CH SA VC	 cy si	a	Weathered core. Silicified, iron mottled, patchily clay altered, brown, white or light white-grey, poorly sorted, clast bearing volcanoclastic sandstone. Some patches appear to lack clasts. Clasts are cherty, and usually carry black iron staining. Silicified, dark grey siltstone clasts occasionally present. Iron oxide coats on most fractures. Competency poor to bad for most part, with many pieces near 10cm. Some broken zones. 1.1m indicated core loss, ~1m unmarked core loss.	14.2	BD	34°		
16.0	16.2		VC	ht si	a	Zone of weathered pebbles (mainly volcanoclastic sandstone). May be silicified or iron oxide replaced.					
16.2	21.1		SA SS ST	 cy cy	a	Weathered core. White, clay altered, siltstones and sandstones. No obvious clasts, but occasional suggestions of weathered out phenocrysts. Goethite stains most of the discontinuous fractures. Suggestion of a fabric (possibly bedding), preserved by composition change (clay rich band amongst less clay altered material), and by iron stained fractures (this might be cleavage). Uncommonly have spots (5-10mm) of pyrite, rimmed by oxide most likely after sulphide. Core of varying competence, most poor-moderate, interspersed with small broken patches.	20.2 20.4	BD CV	40° 30°		
21.1	22.0		SA SS	 cy si	a	Weathered core. Broken zone of fragments of dominantly yellow slightly silicified sandstone. Most breaks coated by iron oxide.					
22.0	22.8		SA SS	 si	a	More competent version of sandstone in previous unit. Core of poor competence.					
22.8	29.5		DA SA VC	 si	a	Weathered core. Yellowy-greeny coloured, variably silicified and clay altered, fairly massive looking, sandstone textured rock. Has fairly evenly distributed pits, most likely after feldspar phenocrysts. This unit is probably weathered dacite volcanoclastic or lava. Iron oxides coat most breaks, and fill the thin discontinuous fractures. Some breaks in core are clay filled. Occasional quartz veins present (close or orthogonal to CA). Core of mixed competency, generally broken to poor to 27.7m after which it is poor to moderate.	25.4 28.0 29.0	JT QV QV	14° 12° 74°		
29.5	**43.0**	**F**				**FAULT**					
			DA SA VC	 si		Broken fragments of previous unit. Partial recovery and possibly 15cm core loss.					
31.0	32.7		BR VC	 cy	a	Weathered core. Broken fragments of a darker medium greeny-grey volcanoclastic, possibly clast bearing. Iron oxides present on most fragments. Partial recovery.					
32.7	35.9		BR SA SS	 cy si	a	Weathered core, light yellow white, variably clay altered and silicified, dendritically iron stained, sandstone. Consist predominantly of broken fragments. A lot of breaks seem to be close to CA. 1.7m core loss.					

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81627	27.8	28.8	1.0	0.1	0.1	0.01	1	0.1	0.5	3
81628	28.8	29.5	0.7	0.1	0.1	0.01	1	0.1	0.2	3
81629	29.5	31.0	1.5	0.1	0.1	0.01	1	0.1	1.4	3
81630	31.0	32.7	1.7	0.1	0.1	0.01	1	0.1	2.1	3
81631	32.7	33.7	1.0	0.1	0.1	0.01	1	0.1	1.0	3
81632	33.7	34.7	1.0	0.1	0.1	0.01	1	0.1	1.2	3
81633	34.7	35.9	1.2	0.1	0.1	0.01	1	0.1	0.7	3
81634	35.9	36.3	0.4	0.1	0.1	0.02	1	0.1	1.6	3
81635	36.3	37.8	1.5	0.1	0.1	0.01	1	0.1	0.8	3
81636	37.8	38.2	0.4	0.4	0.3	0.14	18	0.4	6.5	14
81637	38.2	39.2	1.0	0.1	0.1	0.01	1	0.1	1.0	3
81638	39.2	40.2	1.0	0.1	0.1	0.01	1	0.1	0.2	3
81639	40.2	41.2	1.0	0.1	0.1	0.01	1	0.1	0.2	3
81640	41.2	43.0	1.8	0.1	0.1	0.01	1	0.1	0.1	3
81641	43.0	44.0	1.0	2.5	4.8	0.39	15	0.3	4.2	85
81642	44.0	45.0	1.0	1.3	1.6	0.08	6	0.1	2.0	30
81643	45.0	46.0	1.0	1.5	2.0	0.12	10	0.1	2.7	38
81644	46.0	47.2	1.2	2.4	5.2	0.27	13	2.8	1.8	110
81645	47.2	48.2	1.0	1.5	2.2	0.12	14	0.7	4.6	46
81646	48.2	49.3	1.1	7.6	9.6	0.45	48	1.7	8.7	192
81647	49.3	50.9	1.6	0.6	0.7	0.03	11	0.6	5.2	20
81648	50.9	52.4	1.5	2.3	3.0	0.20	19	1.7	2.1	71
81649	52.4	53.3	0.9	2.0	2.9	0.13	23	1.8	3.7	69
81650	53.3	54.4	1.1	3.9	6.7	0.60	21	1.9	2.0	134
81651	54.4	55.1	0.7	0.5	0.5	0.03	28	0.8	11.6	21
81652	55.1	56.5	1.4	0.7	1.4	0.06	15	1.4	1.8	37
81653	56.5	57.3	0.8	0.2	1.2	0.04	10	1.5	1.7	32
81654	57.3	58.2	0.9	1.4	3.0	0.16	17	1.8	1.7	67
81655	58.2	58.8	0.6	6.7	9.0	0.23	43	5.9	9.0	213
81656	58.8	59.5	0.7	0.8	1.8	0.18	16	0.6	4.2	38
81657	59.5	60.2	0.7	0.5	1.2	0.19	13	0.2	3.0	24
81658	60.2	61.2	1.0	0.1	0.4	0.04	8	0.4	1.9	11
81659	61.2	62.2	1.0	0.2	0.5	0.06	6	0.5	1.3	14
81660	62.2	62.8	0.6	0.1	0.4	0.03	4	0.1	1.2	8
81661	62.8	63.8	1.0	0.7	1.1	0.06	6	0.1	1.8	20
81662	63.8	64.2	0.4	0.1	0.1	0.01	1	0.1	1.4	3
81663	64.2	65.3	1.1	0.1	0.1	0.01	1	0.1	1.1	3
81664	65.3	66.0	0.7	0.1	0.1	0.01	1	0.1	1.7	3
81665	66.0	67.0	1.0	0.1	0.1	0.01	1	0.1	2.0	3
81666	67.0	68.0	1.0	0.1	0.1	0.01	1	0.1	1.8	3
81667	68.0	69.0	1.0	0.1	0.1	0.01	1	0.1	1.0	3
81669	75.8	76.8	1.0	0.1	0.4	0.01	1	0.1	1.8	7
81670	76.8	77.3	0.5	0.1	0.3	0.01	1	0.1	2.3	6
81671	77.3	78.3	1.0	0.1	0.1	0.01	1	0.1	2.7	3
81672	109.4	110.4	1.0	0.1	0.2	0.02	1	0.1	0.6	4
81673	110.4	110.9	0.5	1.3	4.2	0.34	31	2.9	7.9	96
81674	110.9	111.9	1.0	0.2	1.2	0.04	7	0.4	2.9	22

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
35.9	36.3		CH VC	 cy	a	Small zone of weathered, semi competent, cherty (and siltstone) clast bearing volcanoclastic sandstone. Poorly sorted, round and sub-angular fragments. Has discontinuous fractures running conjugate 15-20 degrees to CA.	36.1	JT	15°		
36.3	37.8		BR SA SS ST	 si cy	a	Return to broken silcified weathered sandstone. Begins to fine at end of unit to clay altered siltstone. 0.4m core loss.					
37.8	38.2		PY VC		b	Small unoxidised, dark grey, unit of pyrite wisps and blebbed, small-silicifed-clast bearing, volcanoclastic sandstone. Possibly faint banding (bedding?) crossed by faint wispy ?cleavage fabric. Unit ends in 5cm of oxidised cherty material, with thin quartz-pyrite+/-galena veins. Core of poor competence.	38.0 38.0	BD CV	70° 52°		
38.2	43.0		BR SA SS	 cy si	a	Yellow and yellow-white, weathered, broken fragments, variably silicified and clay altered, sandstone/rock. Some banding near beginning of unit. 2.7m core loss. Small clay patch at 39m. Most loss from 39-40m and from 41.5-43m..	39.0	BD	50°		
43.0	**44.0**	**HODS**				**HOST - DISSEMINATED SULPHIDES**					
43.0	44.0		CH PY ST	 si	a	HODS grade sulphide in cherty or silicified fine grained sediments. Pyrite dominant followed by sphalerite, galena and chalcopyrite. Sulphides occur as veins and wisps in the silcified sediments. Open fractures may be lined or partially filled by the sulphides. Sphalerite occurs mainly as blebs or spots within the others, often accompanied by chalcopyrite. Sulphides seem to have followed a fabric ~30 degrees to CA, may also sit in veins near orthogonal to CA.. Core of poor to moderate competency.	43.2	CV	25°		
44.0	**47.2**	**HOTS**				**HOST - TRACE SULPHIDES**					
44.0	47.2		CH ST	 si	a	As before, but HOTS grade sulphide in massive, banded or brecciated cherty sediments. Sulphide vein orientations vary, but lie in two main orientations, near orthogonal to CA or as veinlets and bands ~30 degrees to CA. Occasional fractures run close to CA.Core of poor to moderate competency with many pieces at 5 or 10cm lengths.	45.3	VN	23°		
47.2	**48.2**	**HOTS**				**HOST - TRACE SULPHIDES**					
47.2	48.2		BR CH ST	 sc si sc	a	Broken zone. As before, with fewer sulphides, and more chlorite-sericite alteration, thus green and grey in colour. Some banding evident in sediments. .2m core loss.	47.3	BD	40°		
48.2	**49.3**	**HODS**				**HOST - DISSEMINATED SULPHIDES**					
48.2	49.3		CH PY	sc si	a	Mostly broken zone of HODS (HOSM in places) of sulphide assemblage in cherty sediments (similar to 43-44m - Sulphide-mix/galena increased proportion in this unit). Semi competent after 48.90m. Has some patches with chlorite-sericite alteration as well.	49.0 49.1 49.1	BD VN VN	50° 27° 15°		

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81675	111.9	112.0	0.1	7.5	16.8	0.30	53	0.8	5.4	276
81676	112.0	113.0	1.0	0.4	1.1	0.25	23	0.3	3.0	26
81677	113.0	114.0	1.0	0.2	0.4	0.07	10	0.1	3.4	10
81678	114.0	114.9	0.9	0.2	0.6	0.10	11	0.1	2.9	13
81679	114.9	116.4	1.5	0.3	0.7	0.05	27	0.2	4.9	18
81680	116.4	117.4	1.0	0.4	1.1	0.08	23	0.2	5.1	23
81681	117.4	118.2	0.8	0.1	0.9	0.03	1	0.1	2.2	14
81682	118.2	118.5	0.3	0.1	0.5	0.01	1	0.1	1.4	8
81683	118.5	119.5	1.0	0.3	2.9	0.12	11	0.1	5.1	43
81684	119.5	120.5	1.0	0.3	2.7	0.31	21	0.2	7.3	45
81685	120.5	121.2	0.7	0.1	0.3	0.05	1	0.1	1.3	6
81686	121.2	122.2	1.0	0.1	0.5	0.03	1	0.1	1.4	8
81687	122.2	123.2	1.0	0.1	0.7	0.02	1	0.1	1.8	11
81688	123.2	124.7	1.5	0.2	1.4	0.03	1	0.1	2.0	21
81689	124.7	125.5	0.8	0.1	1.0	0.01	1	0.1	2.3	15
81690	125.5	126.5	1.0	0.1	0.2	0.01	1	0.1	3.6	4
81691	126.5	127.5	1.0	0.1	0.1	0.96	18	0.1	9.9	17
81692	127.5	128.5	1.0	0.1	0.2	0.12	7	0.1	3.1	7
81693	128.5	129.5	1.0	0.1	0.1	0.02	1	0.1	3.2	3
81694	129.5	130.5	1.0	0.1	0.7	0.03	1	0.1	2.0	11
81695	130.5	131.5	1.0	0.1	0.2	0.15	1	0.1	3.1	6
81696	131.5	131.8	0.3	0.1	0.6	0.19	8	0.1	5.7	13
81697	131.8	132.5	0.7	0.1	0.4	0.30	7	0.2	2.6	12
81698	132.5	133.6	1.1	0.1	0.3	0.11	1	0.1	2.0	7
81699	133.6	134.5	0.9	0.1	0.1	0.08	1	0.1	1.7	4
81700	134.5	135.5	1.0	0.1	0.1	0.30	1	0.1	5.3	6
81701	135.5	136.5	1.0	0.1	0.1	0.04	7	0.1	3.2	4
81702	136.5	137.5	1.0	0.1	0.1	0.02	1	0.1	2.2	3
81703	137.5	138.5	1.0	0.1	0.4	0.59	23	0.3	4.0	19
81704	138.5	139.5	1.0	0.2	0.1	0.43	28	0.3	3.4	15
81705	139.5	140.5	1.0	0.1	0.4	0.40	1	0.1	1.7	11
81706	140.5	141.5	1.0	0.1	0.2	0.29	10	0.1	1.9	9
81707	141.5	142.5	1.0	0.1	0.6	0.13	7	0.1	1.9	12
81708	142.5	143.5	1.0	0.1	0.9	0.62	22	0.1	4.6	24
81709	143.5	144.5	1.0	0.1	1.6	0.01	1	0.1	1.2	22
81710	144.5	145.5	1.0	0.1	0.5	0.01	1	0.1	0.5	8
81711	145.5	146.8	1.3	0.1	0.3	0.01	1	0.1	0.4	6
81712	146.8	147.5	0.7	0.1	0.1	0.01	1	0.1	1.4	3
81713	147.5	148.5	1.0	0.1	0.1	0.01	1	0.1	1.3	3
81714	148.5	149.5	1.0	0.1	0.1	0.01	1	0.1	1.9	3
81715	149.5	150.5	1.0	0.1	0.1	0.01	1	0.1	2.2	3
81716	150.5	151.5	1.0	0.1	0.1	0.01	1	0.1	1.9	3
81717	151.5	152.5	1.0	0.1	0.4	0.01	1	0.1	3.2	7
81718	152.5	153.5	1.0	0.1	0.1	0.01	1	0.1	1.5	3
81719	153.5	154.5	1.0	0.1	0.1	0.01	1	0.1	1.6	3
81720	154.5	155.5	1.0	0.1	0.1	0.01	1	0.1	2.1	3
81721	155.5	156.5	1.0	0.1	0.1	0.01	1	0.1	2.2	3

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
49.3	**50.9**	**HOTS**				**HOST - TRACE SULPHIDES**					
49.3	50.9		BR CH VC	 ql	a	Mainly broken zone (esp after 49.8m). Return to greeny-grey silcified unit + HOTS sulphide assemblage. Seems to be hosted in cherty clast bearing sediments. Many breaks close to CA. At least .2m core loss.	49.6	CV	5°		
50.9	**54.4**	**HODS**				**HOST - DISSEMINATED SULPHIDES**					
50.9	53.3		CH ST	 si	a	HODS/Hots (revised post logging from HOTS). Return to grey cherty/silicified sediments + sulphides (as sporadic veins and bands, many may have been washed/weathered out). Broken zone. At least 30cm core loss.					
53.3	54.4		CH SS ST	 si si	a	More competent (moderate) zone of HODS sulphides; assemblage as in previous units ie pyrite-sphalerite-galena-chalcopyrite) in cherty sediments (sandstone and siltstone). Bedding visible. Sulphides as veins and bands, which may run with or against (often conjugate to) bedding. Zone went 3.9%Pb, 6.7%Zn, 0.6%Cu, 1.9g/tAu, and 21g/t Ag - Not expected by logging - Should be HODS according to assays (changed post logging from HOTS)	53.5 53.7	BE VN	42° 39°		
54.4	**57.3**	**HOTS**				**HOST - TRACE SULPHIDES**					
54.4	57.3		SS ST	si si	a	Broken zone of grey and the greenish silicified sediments, with weak HOTS sulphides (less than previous unit). Went ~1% Zn. ~1m of core loss.					
57.3	**58.2**	**HOTS**				**HOST - TRACE SULPHIDES**					
57.3	58.2		SS ST	si si	a	Bedded silicified sandstones and siltstone. Sandstones may be poorly sorted and carry clasts of silcified siltstone. Carries HOTS (sphalerite + sulphide mix-galena mainly) which assayed stronger than visually anticipated. Some fractures are open, and contain void filling quartz crystals, and may be partly filled by sphalerite + sulphide mix/galena. Weird folding of sandstone unit at 57.4m, other beds do not exhibit this folding. Core competent. Core orient at 57.4m. Orientated measurements at 57.5m: Two bedding measurements; one at 30 degrees N dip, strike 110-290, and 20 degrees N dip, strike 130-310; Vein (sulphide bearing) 74 degrees West with strike ~140-320 (to~150-330).	57.5 57.5	VN BE	13° 65°		
58.2	**58.8**	**HODS**				**HOST - DISSEMINATED SULPHIDES**					
58.2	58.8		CH PY SS	 si	a	HODS pyrite-galena/sulphide mix-sphalerite-chalcopyrite as generally thin bands, veinlets and wisps (unit changed post logging from HOTS). Pyrite looks to have replaced an escape or flame sedimentary structure. Sphalerite mainly present as blebs surrounded by gun metal sulphide and may be accompanied by chalcopyrite. Sulphide 'bands' seems closer to CA than bedding (which can be hard to make out).In one spot (58.3-58.4m), bedding seems to have bent around a core of sphalerite-chalcopyrite-galena; this zone may be another fold hinge, as in 57.4m. Core competent.	58.3 58.7	VN BD	11° 33°		

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81722	156.5	157.5	1.0	0.1	0.1	0.01	1	0.1	2.3	3
81723	157.5	158.5	1.0	0.1	0.4	0.02	1	0.1	3.4	7
81724	158.5	159.5	1.0	0.1	0.2	0.03	1	0.1	2.2	4
81725	159.5	160.5	1.0	0.1	0.1	0.03	1	0.1	2.4	3
81726	160.5	161.5	1.0	0.2	0.7	0.03	1	0.1	1.3	11
81727	161.5	162.5	1.0	0.1	0.6	0.02	1	0.1	1.8	10
81728	162.5	163.8	1.3	0.1	0.1	0.01	1	0.1	2.4	3
81729	163.8	164.8	1.0	0.1	3.3	0.10	1	0.1	3.5	45
81730	164.8	165.8	1.0	0.1	4.4	0.06	1	0.1	3.7	59
81731	165.8	166.8	1.0	0.1	4.7	0.15	1	0.1	3.6	64
81732	166.8	167.7	0.9	0.1	7.1	0.17	11	0.1	3.2	97
81733	167.7	168.7	1.0	0.1	2.7	0.12	1	0.1	1.8	38
81734	168.7	169.7	1.0	0.1	2.3	0.09	1	0.1	3.0	32
81735	169.7	170.7	1.0	0.1	0.3	0.02	1	0.1	2.9	6
81736	170.7	171.7	1.0	0.1	0.1	0.89	45	0.1	10.4	21
81737	171.7	172.7	1.0	0.1	0.7	0.14	1	0.1	4.9	12
81738	172.7	173.9	1.2	0.1	0.7	0.04	1	0.1	3.2	11
81739	173.9	174.9	1.0	0.1	2.8	0.57	1	0.1	9.1	44
81740	174.9	175.9	1.0	0.1	0.3	0.34	24	0.1	10.9	13
81741	175.9	176.9	1.0	0.3	0.9	0.06	1	0,1	13.7	15
81742	176.9	177.9	1.0	0.1	0.8	0.18	12	0.1	14.6	16
81743	177.9	178.4	0.5	0.1	0.1	0.01	1	0.1	9.8	3
81744	178.4	178.6	0.2	0.1	0.1	0.01	1	0.1	3.1	3
	Total Length:		135.2							

Standards

	Reference Values for:	HBM-02					17/07/98	
		3.4	12.5	0.46	150	1.3	22.7	
	Variances Allowed:	20%	20%	30%	20%	20%	20%	
81668	Inserted @ 69.0m	3.6	13.9	0.47	160	1.2	21.1	Y

Weighted Averages

From	To	Length	Pb	Zn	Cu	Ag	Au	Fe	TMU
43.0	54.4	11.4	2.5	3.8	0.23	18	1.2	3.7	78
46.0	54.4	8.4	2.8	4.1	0.25	21	1.6	4.0	88
46.0	58.8	12.8	2.3	3.6	0.19	20	1.7	4.1	79
54.4	58.8	4.4	1.5	2.6	0.10	20	2.0	4.3	64
57.3	58.8	1.5	3.5	5.4	0.19	27	3.4	4.6	125
164.8	167.7	2.9	0.1	5.3	0.13	4	0.1	3.5	73

Thin Sections

PTS0001	43.4 m	006B_43.4 - sample number. Ore, oxidation?
PTS0006	47.3 m	006B_47.3 - sample number. Marginal ore.
PTS0002	48.7 m	006B_48.7 - sample number.Rubble, fault zone, possible ore?
PTS0003	49.1 m	006B_49.1 - sample number. Ore, cherty host.
PTS0004	53.8 m	006B_53.8 - sample number. Ore. Lower visual, than assayed.
PTS0005	58.5 m	006B_58.5 - sample number. Ss, St hosted ore.

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
58.8	**62.8**	**HOTS**				**HOST - TRACE SULPHIDES**																
58.8	62.8		CH SS	 si	a	Weak HOTS, in silicified sediments. Sulphides (pyrite-sphalerite-chalcopyrite-galena) as thin wisps veinlets and thin sphalerite cored blebs and thin pyrite bands. Bleached greeny look to unit between 59.4-60.2m. Carbonate as spots and blobs and lesser in fractures/veins. Some fractures are cavitous. One blob which is chlorite-sericite altered looks like a pseudo-fiamme. Bedding visible, but in some spots has a parasitic folded look to it. Banding/fabric at 60.8m runs ~20 degrees to CA, but sphalerite etc veinlets and fractures often run ~ conjugate to this. Trend of bedding at 62m is 30-40m (although an irregular boundary). This whole sequence may be quite folded. Core poor to moderate competency.	60.8	BD	18°													
62.8	**63.8**	**HOTS**				**HOST - TRACE SULPHIDES**																
62.8	63.8		CH PU	 cs	a	Poorly sorted, complex mix of silcified sediment and cloritic pseudo-fiamme and angular blebs and wisps. Pumice breccia? Chloritic patches contain disseminated pyrite cubes (possibly chalcopyrite too); small blebs of sphalerite and galena/sulphide-mix occur at the boundary between silica and chlorite dominant zones (63.4m). Fabric evident in clontic zone orientations (bedding?40-50 degrees to CA), and in last part of unit where chloritic material dominates (cleavage? ~30 degrees to CA). Core moderate competency, last 30cm poor.	63.0 63.5	BD BD	40° 30°													
63.8	**75.8**	**HW**				**HANGINGWALL**																
63.8	64.2		DA PE RY	si ql si	a	Yellowy-orange tinged, large (often >15cm) brecciated blocks/altered zones of silicified rock separated by thin dark cherty +/- chlorite-sericite and pyritic material. Yellowy zones may be rhyodacitic lava, as they have hints of altered feldspar phenocrysts +/- quartz phenocrysts. This unit may be a pepperite. In later parts of the 'Strat' the thin, often folded cherty zones appear, and may merely represent flow-banding.. Core generally competent.	63.8	CT	60°													
64.2	66.0		BR DA		a	Broken zone of previous unit, except blocks/zones are yellowy green in colour, after 65.1m is really broken. Material before that is of poor competence.																
66.0	73.3		CH PE RY	 ql si	a	Continuation of pepperite/banded rhyolitic material. Unit occasionally banded. This may be by alternation between 'clasts' and the darker matrix, or by internal laminations in the clasts themselves (by darker green ?chlorite wisps). Some of the 'matrix' appears to be silicified sediment. Core often marked by hairlike, discontinuous fracture/joint - perhaps weak cleavage - which run against the banding? Core competent.	68.5 69.6 69.8 71.2 72.2	BD JT BD JT BD	45° 30° 42° 24° 69°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
73.3	75.8		CH PU RY SL	 qs si	a	Odd looking rock, appears to be a mix of silcified clast and rhyolitic clast bearing, variably matrix and clast supported, volcanoclastic/mass flow material. Clasts are dominantly cherty quartz, although some silicifed shale is present. Unit is much more 'matrix' rich than previous units, with the matrix being a dark grey colour. The 'pumice' are a yellowy brown colour, and may be internally banded by brown streaks. In general silicification is mild. There is a zone of banded rock from 74.4-74.8m which carries quartz clasts/phenocrysts (5mm). It may be a thinly bedded/banded volcanoclastic or a rhyolitic lava. Unit becomes darker and more of a silicic breccia in last 80-90cm of core, which appears to fine towards the end of unit. Sericite veinlets mark a fabric in last metre of core. One clast/blob is composed of pyrite-sphalerite-galena. Core competent.	74.1 74.5 75.2 75.6	BD BD VN VN	50° 50° 24° 18°													
75.8	**77.3**	**HO**				**HOST SEQUENCE**																
75.8	77.3		CH ST	 sc	b	NQ from 76.5m. Possibly HO? Sediment package. Begins with a 10cm interval of silicified siltstone/tuff, followed by thick sericite-chlorite altered fine grained material (up to 30cm), interbanded with slightly brecciated cherty intervals (5-10cm thick). Boundaries are complex, unit may actually be a very coarse breccia. Small vein of sphalerite+/-galena at 76m. A fabric is visible in the softer parts of the unit, however, it is difficult to measure. Core competent.																
77.3	**87.5**	**HW**				**HANGINGWALL**																
77.3	81.9		DA PE RY ST	 si	b	Pepperite of dark green dacite with medium to dark grey siltstone. Unit is moderately silicified. Dacite becomes rhyodacitic and lighter in colour, and also more sediment poor after 79.6. Some banding is present throughout, within both igneous and sedimentary zones, although not always coherent in orientation. Unit competent. Core orient at 80.5m	81.4 81.5	BD BD	62° 33°													
81.9	84.2		CH PU	 sc	b	Mix of feldspar phyric (dacitic), sericite-chlorite altered material with cherty sediments. However, this unit has a volcanoclastic look to it. May be a pumiceous mass flow.Cherty bands are very long and thin in some instances, and small and rounded in others. Banding, both in small and large clast orientations runs 10-30 degrees to CA; sericite wispy veinlets also run in this orientation. Core competent.	82.4 83.3 83.3	BD VN BD	12° 18° 24°													
84.2	87.5		CH PU		a	This unit has a similar texture to the last (except for much smaller clast size), but is has an orangey hue, especially the altered feldspars, which are bright orange in colour (carbonate alteration?). Unit is banded by alternating yellow-green and dark green patches, both of which contain the altered-feldspar phenocrysts. Possibly a volcanoclastic again, due to the angular and sub rounded fragments of silicified sediment. Unit is competent, but becomes less so in the last metre. Orange hue decreases throughout unit as well.	86.4 87.1	BD BD	4° 22°													
87.5	**107.7**	**PR**				**PINNACLES RHYOLITE**																

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
87.5	100.7		RY	si	b	Lightly weathered, bleached light grey to yellowy-cream coloured, silicified (or silicia rich matrix), quartz phyric, occasionally altered-feldspar phyric, massive, occasionally banded, brecciated in places, rhyolite - Pinnacles Rhyolite. Unit blotched by occasional darker green blotches or matrix (in the case of slightly brecciated zones e.g. 101.7m). These darker zones are sericite-chlorite altered, and relatively soft. Unit crossed by common quartz+/-carbonate veins (1-3mm). These may be in varying orientations, but show signs of oxidation. Iron oxides on most breaks and fractures. Unit of poor to moderate competency, appears to have been quite brittle. First 3m of poor to bad competency, worst zone is broken 89.1-89.7 (40cm loss). Unit is strongly fractured by thin, sometimes curved cracks (possily perlitic?). Core orient at 95.1m. Orientated measurement at 95.4m - fracture/vein dip 82 degrees N, strike 110-290 (to 115-295).	95.1 95.1 96.1 99.1 100.5	QV JT QV BD BD	64° 58° 12° 45° 49°													
100.7	102.8		PU RY	sc si	b	Possibly a pumiceous rhyolitic lava, seems to grade over 10cm from previous unit. Lithology as previous unit, but with numerous green, sericite-chlorite, altered feldspar and quartz phyric clots/patches/pseudo fiamme. Veining almost absent. Unit of poor-moderate competency, with the last 80cm of unit poor due to common joint breaks (pieces 5cm length). Core orient at 101.5m. Orientated measurement at 101.5m: Banding/?cleavage of dacitic-andesitic 'pumice', 80-84 degrees dip East, strike ~190-010.	102.3 102.6	JT BD	62° 53°													
102.8	107.0		RY	si	b	Banded ryholitic lava - Pinnacles Rhyolite. Altered feldspar phenocrysts are orange in colour. Lava becomes brecciated towards end of unit. Orangey hue disappears after 105.9m. Unit takes on greeny colour thereafter. Core competent.	104.0 105.7	BD BD	60° 50°													
107.0	107.7		BR RK RY	si	b	Jumbled mess of greeny rhyolitic-dacitic clasts, bloby and irregular fragments, intermixed with a silica rich, fine grained material. Possibly a blocky lava, with convoluted silica flow bands, or perhaps a volcanoclastic, now cemented by silica. Core competent. Boundary with next unit abrupt. Core orient at 107.5m.																
107.7	**110.4**	**HW**				**HANGINGWALL**																
107.7	109.4		HY VC	si si	b	Hyaloclastite - volcanoclastic? Moderately silicified, graded sequence of fining up (fining up hole), rhyolitic-dacitic pumice or lava, and cherty clast bearing, volcanoclastic mass flow. Matrix grades from sandstone at base to siltstone at the top. Clasts are green, and irregular in shape. Unit cut by thin sericitic veinlets. Bedding in the siltstone/sandstone parts seems to be much steeper to CA than the clast fabric in the coarser parts of units. Unit looks to be multiple flows, about 1m thick (picked by fine siltstone/mud units which would cap an individual flow). Possibly last unit should be in this strat unit as well. Core competent. Orientated measurement 107.7m, bedding dips at 42-44 degrees to the East with ~170-350 strike. Banding (108.1m) in pumice dips 74-80 degrees to the East, with a strike of ~135-315.	107.7 107.8 108.0	BE BE VN	55° 64° 37°													

Hole No: 006B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
109.4	110.4		HY PE RY	si sc	b	Large blocks (bombs? 10-20cm common) of rhyolite (less green than previous unit) in a silcified fine grained matrix. Might be the basal part of a large hyaloclastite flow (i.e. previous unit), but could be a peppertite. Gradational contact with previous unit. Contact over 10cm with next unit. Some rhyolitic clasts have green altered-?feldspars and have suffered minor sericite-chlorite alteration. Trace blebs of sphalerite and galena may be found in the matrix. Core competent.	110.0	BD	51°													
110.4	**110.9**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
110.4	110.9		BR CH PY		b	Cherty sediments containing HODS grade veins of pyrite-sphalerite-sulphide-mix/galena-chalcopyrite. Veining has a vague orientation ~ 30 degrees to CA. Pyrite also as fine grained replacement masses of the matrix and cherty fragments. Unit probably a cherty breccia, with the matrix favoured by incoming sulphides. Core competent.																
110.9	**114.9**	**HOTS**				**HOST - TRACE SULPHIDES**																
110.9	114.9		CH	cs si	b	Hots version of previous, with sulphides mainly present as blebs, occasionallly as veins. Small HOSM patch (10cm) at 111.9-112m. Unit also carries isolated chlorite+/-pyrite blebs and clots. These appear to be alteration rather than clasts. They vary in size from mm to 5cm in width. They may have preferentially replaced matrix, as there is limited evidence of brecciation. Core competent.	112.0	BD	43°													
114.9	**116.4**	**HOTS**				**HOST - TRACE SULPHIDES**																
114.9	116.4		SS ST	si si	b	Banded/bedded silicified sediments (siltstone and sandstone). Lacks the clots of sericite-chlorite of previous unit. Sulphides really only as pyrite bands, paralleling the bedding, rare sphalerite etc blobs occur. Core competent.	115.5 115.5	BE BE	40° 35°													
116.4	**124.7**	**HOTS**				**HOST - TRACE SULPHIDES**																
116.4	118.2		RK ST	cs si	a	Chlorite-sericite altered patches and bands (the latter dominate), with lesser intervals of silicified sediments. Altered bands have a fairly consistent orientation, and white flecks within these zones parallel the band edges. Alteration may have replaced an igneous rock which was pepperitic with the sediment. Sulphide mainly as fine grained pyrite bands and replacements. Wisps and veinlets of sphalerite-sulphide-mix etc occur occasionally. Core competent. Orientated measurement of cleavage/banding at 116.5m, dip 82 degrees N, strike 120-300. Other measurements of cleavage/banding, dip 78-80 N, with strike 130-310.	116.5 117.5	BD BD	34° 30°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
118.2	121.2		CH RK	 sc	a	Sediment poor version of previous, with strong HOTS (possibly HODS between 119.5-120.5m) mineralisation of pyrite-sulphide mix-sphalerite-chalcopyrite as bands, blebs and wisps. Green altered zones contain abundant white flecks, apparently marking a cleavage. Core competent. Orientated measurement at 119.5m; Cherty banding/?cleavage, 78-80 degrees dip to the East, strike ~N/S (~185-005) - lineations on face strike 090. Measurement at 119.9m; sulphide banding /cleavage dipping 78-80 degrees East, striking ~N/S (170(-185)-350(-005) range). Pyrite band dipping 78 degrees N, 030-210 strike.	119.0 120.8	BD CV	40° 45°													
121.2	124.7		CH DA RK	 se sc	a	Complex mix of cherty material, green chlorite-sericite altered zones and brecciated fragments of a phenocryst poor felsic ?lava. Green zones carry what look to be altered-feldspar phenocrysts (altered dacitic pumice?). The brecciated 'lava' fragments are a lighter yellow-green in colour, and small dark green chlorite specks contained within may be after plagiocalse or amphibole phenocrysts (andesitic lava?). Unit sporadically mineralised by sphalerite+/-black sulphide blebs. Quartz-carbonate veins common, run near orthogonal to CA, and may carry sphalerite spots. Core orient at 123.7m.	124.0	BD	40°													
124.7	**146.8**	**HOTS**				**HOST - TRACE SULPHIDES**																
124.7	146.8		AN CH	 cs	a	Variably creamy white (relatively unaltered), medium green (chlorite-sericite altered), altered-amphibole phyric, possibly silicic flow-banded or chert bearing, andesite. Altered amphibole phenocrysts may be up to a few mm long. Andesite also carries occasional cm size rounded blobs - clasts or alteration patches?. Unit occassionally banded, and sporadically has convolutely folded and/or brecciated cherty fragments. Green altered zones may be cm to metres in length. Altered zones are dark in colour, may carry white flecks (and a fabric) and are usually associated with the cherty bearing areas of the unit. The alteration is chlorite-sericite-pyrite (may have sericite wispy veinlets). Unit sporadically mineralised by common quartz-carbonate+/-sphalerite+sulphide mix+/-galena veins, quartz-pyrite-chalcopyrite veins, and patchy blebs and lesser bands (which may accomapany cherty bands) of pyrite-sulphide mix-sphalerite-chalcopyrite. Pyrite may be coarse grained or fine grained, with the former occasionally overprinting the latter. Unit occasionally went ~1%Zn. Some quartz-carbonate veins are brittle. Unit competent.	127.5 128.3 128.6 144.8 146.4 146.4	BD BD VN CV CV QV	56° 60° 14° 35° 34° 30°													
146.8	**163.8**	**HOTS**				**HOST - TRACE SULPHIDES**																

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
146.8	163.8		AN CH DA	sc sc	a	Mildly sericite-chlorite altered Dacite-Andesite with similar textures to previous unit. Far more cherty fragments. Colour is an apple green, or light green throughout. Altered phenocrysts are white within a green matrix- feldspar vs amphiole?- (as against green against cream in last unit). Some phenocrysts are rounded, and are rimmed by white material. Small zones have dark green alteration of phenocrysts. Unit mildly sericite altered throughout. In some zones unit has a mm scale nodular/granular appearance e.g. 155.1m. Unit more weakly mineralised (similar style and mineralogy as previous unit) than last unit. Quartz+/-carbonate veins and veinlets common (occasionally brittle). Near end of unit, dark green clorite alteration increases. Very thin sericite or quartz veinlets may mark a weak cleavage. Unit competent. Core orient at 161.5m.	154.4 158.3 160.7	CV CV BD	11° 30° 39°													
163.8	**167.7**	**HOTS**				**HOST - TRACE SULPHIDES**																
163.8	167.7		BR RK	 cs	a	Chlorite-sericite lesser pyrite altered Bright (fluro) green rock breccia/alteration, set in .5-1cm wide dark chlorite altered bands. In places unit appears to be a breccia, in others a psychedelic tie-dyed shirt. Light green patches are commonly present. Unit mineralised by common sphalerite-sulphide mix/galena+/-quartz+/-pyrite veinlets and irregular wisps. 166.8-167.7m went 7.1% Zn (Hods). Stringy sericite-cherty masses may accompany the mineralisation. Cleavage present, marked by thin sericite veinlets and by white flecks present within the matrix (best seen 165.5-166.5m) Core is competent, of moderate competency in last 1m of unit.	166.0 166.1 166.2	BD VN CV	36° 30° 29°													
167.7	**170.7**	**HOTS**				**HOST - TRACE SULPHIDES**																
167.7	170.7		RK	cs ql si	a	Light creamy-white, speckled black, silicified rock. Unit has a diseased look due to a white carbonate alteration, which rims any fragments/silica grains etc within the unit. Relatively unaltered parts suggest a rhyolite/dacite +/-cherty fragment protolith. Dark chlorite alteration becomes more prevalent as disitnct bands in the last 1.5m of unit. Also have dark silica-chlorite? alteration selvages entering the protolith from fractures and sulphide bearing veins (assemblage as previous). Unit competent.	169.6	BD	40°													
170.7	**178.4**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
170.7	173.9		RK	cs si	a	Rock becoming increasingly, but patchily, black chlorite-sericite-pyrite altered. Possibly a sandstone protolith, in first part, cherty bearing/material protolith after 172.6m. Darker chlorite zones well cleaved, and carries irregular quartz-carbonate-pyrite-chalcopyrite+/-sphalerite veinlets and wisps. 170.7-171.7m assayed at 0.89%Cu, 45g/tAg and 10.4% Fe. Overall strat changed from HOTS to HODS due to high pyrite content. Unit competent.	171.4	CV	40°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
173.9	178.4		BR RK	si cs	a	Heavily black chlorite-sericite-pyrite altered rock. Carries sporadic sphalerite-sulphide mix-chalcopyrite blebs and wisps (sitting in cleavage mainly) rimmed by a white mineral. Quartz-chalcopyrite-pyrite veinlets occasionally present (up to 1cm in width). Pyrite as bands in cleavage too. Protolith may have been a breccia, due to selective replacement by dark chlorite or angualr 'clasts' at 176.6m. Unit competent. Core orient at 176.5m.	175.9 176.6	CV BD	33° 37°													
178.4	**178.6**	**F**				**FAULT**																
178.4	178.6		RK	qs	a	Small zone of broken material - fragments are silica and sericite+/-chlorite altered.																
178.6	**178.8**	**HO**				**HOST SEQUENCE**																
178.6	178.8		CH VC	 si	b	Looks to be an angular cherty and silicified siltstone/sandstone clast bearing volcanoclastic. EOH 178.8m.	178.7	BD	49°													

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 007B **Location:** Brown's Tunnel 5370N
Objective: Test extent of Lens 1
Result: Disappointing result - 70.2-81m at 1.3%Zn, 0.3g/t Au, 0.26%Cu,22g/t Ag ($29 TMU). 101-102m - 4.6g/t Au, 1.9%Zn, 1.5%Pb ($79TMU).

Depth	Direct	Dip
0.0	270.0	-56.0
33.0	270.0	-55.8
62.2	269.0	-53.8
92.2	270.0	-53.0
120.0	269.5	-51.7
120.1	269.5	-51.7

Planned Direction: 270°
Planned Dip: -56°
Planned Depth: 120.0 m
Planned Northing: 5368 m N
Planned Easting: 4994 m E
Planned Collar R.L.: 489 m RL

Drilling Commenced: 26/06/98
Drilling Completed: 29/06/98
Actual Depth: 120.1 m
Surveyed Northing: 5366.50 m N
Surveyed Easting: 4996.90 m E
Surveyed Collar R.L.: 489.70 m RL

Date Logged: 21-Jul-1998
Logged By: Michael Whitbread
Hole Size: HQ/NQ
Hole Category: other
Grouted: No

Date Log Verified: 28-Aug-1998
Verified By: Michael Whitbread

Summary Log:
0-1m NC; -8.0m Ho, 36.5m F; -46.5m FW; -63.7m Ho; -70.2m HOTS; -70.5m Hosm; -78.8m HOTS; -79.7m Hosm; -81m HODS; -115.6 Hots; -120.1 PR.

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°
0.0	**1.0**	**NC**				**NO CORE**			
0.0	1.0		NC		a	No core.			
1.0	**8.0**	**HO**				**HOST SEQUENCE**			
1.0	8.0		RK SA VC	cy si	a	Weathered, pale green grey coloured, partly clay altered, mildly silicified, sandstone textured rock. Carries occasional silicified 'clasts' (mm-cm scale). Most likely a volcanoclastic sandstone. Quartz vein fragments at 6.5m. Competency very bad, 0.6m core loss to 2m, 0.7m from 4.3-5.3m, 1.2m loss 5.3-6.5m and 1.2m loss 6.5-8m.	3.0	JT	20°
8.0	**36.5**	**F**				**FAULT**			
8.0	15.7		CY RK	cy si	a	Main zone of fault? Weathered unit. Broken zone of extensive core loss, with abundant clay and quartz fragments to 11m, after which clay content drops but quartz continues (10 percent of fragments). Other fragments are yellow clay *altered rock (looks to be after previous unit), and mottled* green rock (from next unit). Core loss: 2.6m loss to 11m, 4.2m further loss to end of unit.			

RQD To (m)	RQD %
1.0	NC
17.2	6
18.3	90
36.5	10
42.2	77
44.0	0
46.3	91
47.0	14
60.5	86
61.6	9
62.9	84
64.4	6
65.3	100
67.1	5
86.6	90
88.1	6
115.9	87
116.8	11
118.6	72
119.5	0
120.1	83

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81745	60.1	61.1	1.0	0.1	0.1	0.01	1	0.1	1.6	3
81746	61.1	62.1	1.0	0.1	0.3	0.01	1	0.1	2.0	6
81747	62.1	63.1	1.0	0.1	0.1	0.01	1	0.1	1.8	3
81748	63.1	63.7	0.6	0.1	0.1	0.01	1	0.1	1.7	3
81749	63.7	65.2	1.5	0.1	0.3	0.03	1	0.1	1.8	6
81750	65.2	66.2	1.0	0.2	1.4	0.08	1	0.1	1.5	21
81751	66.2	66.9	0.7	0.3	2.1	0.07	11	0.1	3.8	32
81752	66.9	67.3	0.4	0.1	0.1	0.01	1	0.1	1.6	3
81753	67.3	68.2	0.9	0.1	0.1	0.01	1	0.1	2.1	3
81754	68.2	69.2	1.0	0.1	0.1	0.01	1	0.1	3.0	3
81755	69.2	70.2	1.0	0.1	0.4	0.05	1	0.1	2.9	7
81756	70.2	70.5	0.3	1.1	6.2	5.63	124	2.5	18.3	194
81757	70.5	71.5	1.0	0.2	0.3	0.14	27	0.4	2.1	15
81758	71.5	72.5	1.0	0.2	0.5	0.04	10	0.3	1.0	12
81759	72.5	73.5	1.0	0.3	0.6	0.08	13	0.2	1.5	14
81760	73.5	74.5	1.0	0.3	0.7	0.05	13	0.2	1.6	15
81761	74.5	75.7	1.2	0.2	0.8	0.05	8	0.2	1.5	15
81762	75.7	76.7	1.0	0.6	2.8	0.19	17	0.5	2.4	49
81763	76.7	77.7	1.0	0.5	1.8	0.20	14	0.1	3.1	31
81764	77.7	78.8	1.1	0.4	1.3	0.12	14	0.2	5.9	24
81765	78.8	79.7	0.9	0.5	0.7	0.05	53	0.4	18.4	25
81766	79.7	81.0	1.3	0.2	2.3	0.17	24	0.2	4.4	39

Hole No: 007B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
15.7	18.5		PU SA VC	 cy si	a	Weathered unit. White, mottled with green-black, variably silicified and clay altered, poorly sorted, very coarse and angular volcanoclastic breccia. Some mottles appear to be pseudo-fiamme, and a few have internal structure, possibly after pumice? Uncommon altered-'feldspars' are noted. Unit possibly mass flow pumice breccia, *of dacitic affinity. Quartz* vein fragments present to 17.2m. Unit of poor to bad competency, with most pieces around 5cm. Core loss 0.9m to 17.2m.	18.1	BD	26°		
18.5	27.6		DA SA VC	 cy si	a	More weathered and broken version of previous unit. Abundant core loss - 3.8m loss to 26 metres.					
27.6	34.7		BR RY VC	 cy si	a	Weathered unit. Change in composition to a more silica rich unit. Dog's breakfast texture, dark groundmass, with generally creamy, light coloured clasts. Presence of occasional quartz phenocrysts indicates rhyolitic, to rhyodacitic composition. Angular clasts may be 10cm in size. Still have occasional pseudo-fiamme (pumice?), but clasts are dominant comprised of a fine grained silica rich matrix, carrying occasional phenocrysts of quartz +/- feldspar. Vague banding/?bedding, by parallel clast orientation occasionally noted. May be a brecciated pumiceous lava, or a mass flow pumice breccia. Unit occasionally cut by quartz veins (barren) a few cm thick. Some quartz vein fragments around 29m. Unit of poor to bad competence. Occasional fragments are over 10cm. 0.4m core loss 28-29m.	33.4 33.7	BD QV	40° 60°		
34.7	36.5		DA	cy sc	b	Mildly weathered, green, altered feldspar phyric, dacite. Some phenocrysts (orthoclase?) altered to a pinky red clay. Small 10cm interval of previous unit, incorporated near end of this unit. Cleavage fabric noted, marked by sericite wisps. Competency bad. Possibly 10-20cm core loss 36.1-36.4m.	35.6	CV	40°		
36.5	**42.8**	**FW**				**FOOTWALL SEQUENCE**					
36.5	42.8		BR DA RY VC	 se se si	b	Continuation of silicified rhyolitic-dacitic ?pumiceous breccia. Dog's breakfast texture of dark groundmass, with creamy, white, green or pinky red clasts. Weathering light, mainly confined to fractures. Unit contains many hair fractures/sericite veinlets, perhaps defining a vague fabric *~25-30 degrees to CA. Also close to CA (0-10 degrees), are* thicker fractures and quartz veins. Unit may carry black shale clasts. After 42.3, unit becomes more sericite altered, and possibly more dacitic in composition (becoming pale green in colour). Boundary with next unit is transitional. Core of moderate to good competency throughout. Small broken zones 36.8-37m, and 38.3-38.6m. Core orient at 39.5m.	37.7 39.6	VN CV	10° 26°		
42.8	**46.5**	**FW**				**FOOTWALL SEQUENCE**					

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81767	81.0	82.0	1.0	0.1	0.3	0.04	1	0.1	1.5	6
81768	82.0	83.2	1.2	0.1	1.3	0.17	1	0.1	2.0	20
81769	83.2	84.2	1.0	0.3	0.7	0.04	30	0.4	9.6	20
81770	84.2	85.2	1.0	0.1	0.2	0.01	14	0.2	5.2	7
81771	85.2	86.2	1.0	0.1	0.1	0.01	1	0.1	2.2	3
81772	86.2	86.7	0.5	0.1	0.1	0.01	1	0.1	2.6	3
81773	86.7	87.7	1.0	0.1	0.1	0.01	1	0.1	1.7	3
81774	87.7	88.7	1.0	0.1	0.3	0.01	1	0.1	2.2	6
81775	88.7	89.7	1.0	0.1	0.3	0.01	1	0.1	2.3	6
81776	89.7	90.7	1.0	0.1	0.1	0.01	1	0.1	1.6	3
81777	90.7	91.4	0.7	0.1	0.1	0.01	1	0.1	1.3	3
81778	91.4	92.2	0.8	0.1	0.1	0.01	1	0.1	1.9	3
81779	92.2	93.2	1.0	0.1	0.1	0.01	1	0.1	2.8	3
81780	93.2	94.2	1.0	0.1	0.1	0.01	1	0.1	1.7	3
81781	94.2	95.2	1.0	0.1	0.1	0.01	1	0.1	0.8	3
81782	95.2	96.2	1.0	0.1	0.1	0.01	1	0.1	1.4	3
81783	96.2	97.2	1.0	0.1	0.1	0.01	1	0.1	1.1	3
81784	97.2	98.2	1.0	0.1	0.1	0.01	1	0.0	0.9	2
81785	98.2	99.2	1.0	0.1	0.1	0.01	1	0.1	1.6	3
81786	99.2	100.2	1.0	0.5	0.8	0.05	1	0.1	2.7	15
81787	100.2	101.0	0.8	0.1	0.6	0.05	1	0.1	1.9	10
81788	101.0	102.0	1.0	1.5	1.9	0.17	26	4.6	4.2	79
81789	102.0	103.0	1.0	0.3	0.5	0.05	7	0.3	2.4	12
81790	103.0	104.0	1.0	0.2	0.4	0.02	6	0.1	1.7	8
81791	104.0	104.8	0.8	0.3	0.6	0.06	7	0.1	1.6	12
81792	*104.8*	*105.8*	*1.0*	*0.4*	*1.1*	*0.14*	*7*	*0.1*	*1.0*	*20*
81793	105.8	106.8	1.0	0.5	0.8	0.10	8	0.1	1.0	16
81794	106.8	107.3	0.5	0.2	0.4	0.04	1	0.1	1.4	8
81795	107.3	108.2	0.9	0.1	0.1	0.01	1	0.1	1.6	3
81796	108.2	109.2	1.0	0.1	0.1	0.01	1	0.1	1.3	3
81797	109.2	110.2	1.0	0.1	0.1	0.01	1	0.1	1.0	3
81798	110.2	111.2	1.0	0.2	0.3	0.03	1	0.1	1.7	6
81799	111.2	112.2	1.0	0.1	0.2	0.02	1	0.1	1.5	4
81800	112.2	113.2	1.0	0.1	0.1	0.01	1	0.1	1.3	3
81801	113.2	114.2	1.0	0.1	0.1	0.01	1	0.1	1.7	3
81802	114.2	115.6	1.4	0.1	0.2	0.01	1	0.1	2.3	4
81803	115.6	116.2	0.6	0.1	0.1	0.01	1	0.1	1.3	3
81804	116.2	117.2	1.0	0.1	0.1	0.01	1	0.1	0.4	3
	Total Length:		57.1							

Standards

				Pb	Zn	Cu	Ag	Au	Fe	
Reference Values for:	HBM-02							17/07/98		
				3.4	12.5	0.46	150	1.3	22.7	
Variances Allowed:				20%	20%	30%	20%	20%	20%	
81805	Inserted @ 117.2m			3.5	13.8	*0.16*	155	*0.7*	21.0	N

Weighted Averages

From	To	Length	Pb	Zn	Cu	Ag	Au	Fe	TMU
70.2	81.0	10.8	0.4	1.3	0.26	22	0.3	4.4	29

Hole No: 007B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
42.8	46.5		SH VC	se si	a	Light pale greeny-brown, sericite and lesser silica altered, clast bearing, fine grained matrix, volcanoclastic/schist. Unit is strongly banded by sericite altered intervals of squashed clasts interspersed with fine grain silicified material;looks schistose, fabric may be a cleavage superimposed onto initial bedding. Clasts generally less than 1cm, may be squashed of have pressure shadows, or be relatively undeformed. Rare black silicified siltstone present as clasts. Unit consists of broken fragments to 43.8m, and is broken after 46.1m; of moderate competency in between.	44.1 46.1	BD BD	57° 57°													
46.5	**52.9**	**HO**				**HOST SEQUENCE**																
46.5	48.0		ST	se si	b	Medium to light grey, patchily sericite altered, mildly silicified siltstone. Unit has abundant hair like fractures, along which sericite alteration has taken place (and possibly silicification as well). One set of cracks sits ~58 degrees to CA. Patches *furthest from the fractures are light grey, patches adjacent to* the cracks are dark grey. Some cracks have been filled by brittle quartz veining. Unit competent except for first 10cm, which is broken. Irregular boundary with next unit. Possibly 30cm core loss in first broken zone.	47.0 47.7 47.8	QV QV JT	60° 12° 58°													
48.0	49.5		VC	se	a	Light green sericite+/-chlorite and mildly silica altered, silcified siltstone clast bearing, volcanoclastic/rock. Unit has a strong fabric, marked by sericite wisps and veinlets. Unit cut by occasional quartz veinlets (<1cm). Unit competent.	48.3 49.5	CV CT	40° 55°													
49.5	52.9		SL		b	Black shale unit, with small sericite or quartz cracks/wisps and larger carbonate+/-quartz veins. Contains small bands and inclusions of poorly sorted sandstone material. Cracks/wisps sit 20-40 degrees to CA. Unit of moderate competency.	51.5 51.9 52.9	BE VN CT	85° 7° 63°													
52.9	**61.1**	**HO**				**HOST SEQUENCE**																
52.9	61.1		SH VC	sc	a	NQ from 55.40m. Stongly sericite-chlorite altered, light green, altered-feldspar-phyric-clast bearing, schistose rock/volcanoclastic. Probably after a dacitic derived volcanoclastic (dacitic - indicated by feldspar). Strong fabric present, possibly bedding rather than a cleavage. Mild silicification sporadically present. May carry uncommon, shale clasts. Clast 1-2cm or smaller in size generally. Unit competent except for 55-55.2m and 60.6-61.1m.	54.3 55.9 59.7	CV CV CV	47° 56° 40°													
61.1	**63.7**	**HO**				**HOST SEQUENCE**																
61.1	63.7		BR CH ST VC	sc	a	Yellow and dark greeny-grey, variably sericite+/-chlorite altered (as wisps - marking a cleavage), poorly sorted, cherty clast bearing, patchily silicified volcanoclastic breccia with a siltstone matrix, interspersed with silty intervals. Clast size can vary from mm to >3cm. Unit of poor competency (moderate in parts). Worst zone- 63.1-63.5m, which is broken. Core orient at 62.2m. Orientated measurement - 61.9m, sericite "cleavage" - 82-86 degrees dip East, striking ~020-.200 (to 030-210).	61.1 62.6	CT CV	51° 40°													

Hole No: 007B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
63.7	**70.2**	**HOTS**				**HOST - TRACE SULPHIDES**																
63.7	66.2		RK	si	a	Steaked white and dark grey, strongly silica altered, banded, cherty rock. Carries small blebs and wisps of sphalerite/-sulphide mix-galena+/-pyrite. Sulphide wisps sit sub-parallel to banding. Pyrite also present as disseminated fine grained cubes. Unit has numerous thin fractures, which are often cavitous after quartz veins +/-sulphide, which may still patchily fill them. Thin, discontinuous tension gash like quartz-carbonate veins sit conjugate to the banding. Unit of moderate to poor competency, mainly due to breaks close to CA.	64.0 65.0	JT BD	10° 38°													
66.2	67.3		CH VC	cs	b	Dark greeny grey, chlorite-sericite altered fine grained volcanoclastic siltstone and sandstone with cherty bands and clasts. Unit has common wisps and blebs of fine grained pyrite, and uncommonly of sphalerite. May be a shear present at 66.7m. Unit well banded/cleaved. Terminates in a 10cm zone of ?sericite-carbonate alteration.	66.7 67.3	CV CT	57° 37°													
67.3	70.2		RK	sc si	a	Green-grey, silica-sericite+/-chlorite altered rock. Might be a sandstone due to numerous small serticitic flecks and spots throughout. Unit heavily veined by sericite and quartz-carbonate wisps and veinlets, however these do not define a clear fabric. The wisps seem to favour a number of orientations (~orthogonal, ~15-20 degrees and sub-parallel to CA). Some quartz veins show brecciation of the host e.g. 69.3m. Remnant banding visible in spots, but indicates that folding is present. Unit of moderate competency.	69.3 69.5	VN VN	45° 16°													
70.2	**70.5**	**HOSM**				**HOST - SEMI-MASSIVE SULPHIDES**																
70.2	70.5		PY ST	si	b	Bands of pyrite-chalcopyrite and quartz-carbonate in a silicified siltstone. Look to be multiple veins, or one large stockworky vein. Unit poor to moderately competent. Unit assayed ~6% Zn: sphalerite not noted during logging however.																
70.5	**78.8**	**HOTS**				**HOST - TRACE SULPHIDES**																
70.5	75.7		ST	si	b	Fairly bland looking medium grey, variably massive to thinly banded/bedded, silicified siltstone and fine grained sandstone.. Unit has common very thin fractures, after or filled with quartz +/-sphalerite-galena-chalcopyrite veins. Pyrite bands are occasionally present sub-parallel to bedding. Thin quartz-carbonate + sulphide veins are sporadically present (<1-2cm in width). Unit competent. Core orient at 74.2m. Orientated measurement - 74.2m, cherty banding dip 46-48 degrees North, strike ~E-W. Fracture/Joint - dip 74-76 degrees South, strike ~E-W.	73.7 74.2 74.2 75.1 75.1	BD BD JT VN VN	34° 25° 22° 70° 30°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
75.7	78.8		BR CH ST	si si	b	Medium grey silicified sediments. Mainly brecciated, banded chert and sandstone. Cherty fragments may be mm to 10cm in size. Evidence that brecciation may be due to folding e.g. cherty fragment has a hinge displayed in its internal banding, however, this does not match the surrounding fabric, which sits ~50 degrees to core axis. Cherty fragment banding is often rotated away from this trend. Unit mineralised by blobs and veins of sphalerite-galena-chalcopyrite and by disseminations of pyrite, with sulphides (esp disseminated pyrite) more prevalent in the coarse sand sized breccias-volcanoclastics, than in more massive silicified intervals. Sulphides often seem to sub-parallel the banding in the breccia zones. The more massive intervals are interspersed (on approximately a 10cm scale) with the cherty breccia intervals, the fine grained matrix of which may be sericite/-chlorite altered. The contact between the massive and breccia unit can be quite a high angle to CA e.g. 80 degrees. Unit competent.	77.4 77.8 78.4	CT BD BD	80° 50° 40°													
78.8	**79.7**	**HOSM**				**HOST - SEMI-MASSIVE SULPHIDES**																
78.8	79.7		BR CH PY	si	a	HOSM to HODS of very fine grained pyrite replacment of a cherty breccia/volcanoclastic. Some pyrite masses as renal forms, within the cherty breccia/sedimentary bands. Unit competent.	78.9	BD	39°													
79.7	**81.0**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
79.7	81.0		CH SS	 si	b	HODS to HOSM of medium to fine grained disseminated pyrite cubes and masses/splotches of sphalerite-sulphide-mix-chalcopyrite in a silicified sandstone containing thin cherty interbeds. Sphalerite masses are often elongate parallel to the dominant banding/?cleavage (varies between 35-50 degrees). Unit occasionally cut by thin quartz-carbonate +/- sulphide veinlets. Unit competent. Core orient at 80.2m. Orientated measurement 80.2-80.3m, vein + sulphide fracture zone, dip 80 degrees South, strike 065-245. Others, dip 86 degrees South, strike 060(-070)-240(-250).	79.7	BD	37°													
81.0	**115.6**	**HOTS**				**HOST - TRACE SULPHIDES**																
81.0	83.2		SS	si	b	Interval of medium grey, fairly massive silicified sandstone, with patches of blebby or veinlets of sphalerite-chalcopyrite and disseminated medium to fine grained pyrite. 5cm blebby occurrence of sphalerite-chalcopyrite is in a small brecciated interval at 82.3m. Thin quartz+/-carbonate veins common (varying orientations, may rarely carry sphalerite-chalcopyrite). Unit competent.	82.3	VN	30°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
83.2	86.7		ST VC	si sc	b	Dark greeny grey, mildly sericite-chlorite altered, poorly sorted, volcanoclastic breccia of ?dacitic composition. Numerous pseudo-fiamme present, indicate a fabric (bedding?cleavage?) in some places. These paler green sericite altered patches often have yellow-white altered-?feldspar phenocrysts (<1mm usually), which are also found in the surrounding groundmass. Unit interbanded with silicified siltstone intervals in first 50cm, after which it contains many clasts thereof (mm to >5cm). Unit has suffered extensive fine grained pyrite replacement in the first half of the unit (possibly HODS). Unit competent. Core orient at 86.00m. Orientated measurement 85.2m banding of pseudo-fiamme, dip 78 degrees East, strike ~N-S. Some others: 72 dip east, ~190-010 trend.	83.4 85.2	BE BD	51° 60°													
86.7	91.4		SH ST	 si	b	Fairly uniform and bland, medium grey siltstone, shale and lesser sandstone. Unit becomes finer grained and darker towards the end of unit. Criss-crossed by numerous thin, quartz-carbonate veinlets, which rarely carry sphalerite blebs, many veinlets are sub-parallel ~30 degrees to CA. Large solitary, pseudo fiamme in last 20cm of unit, also small band of next unit at 90.5m Unit quite broken to 88m, mainly along the veinlets. Competent thereafter.	89.2 89.5 89.6	VN BE BE	30° 60° 75°													
91.4	99.2		CH VC	 se si	b	Unit of volcanoclastics similar to 83.2-86.7m. Sericite+/-chlorite altered, occasionally weakly silicified. Contains numerous psudeo-fiamme often defining a fabric, and also bears numerous disseminated orangey or white ?carbonate spots/altered feldpsar. Cherty inteval 94.5-95.2m. Contains sporadic bands replaced by fine grained pyrite. Occasional carbonate-quartz veinlets present, with or conjugate to banding. Core competent. core orient at 92.2m, and 98.2m.	92.9 95.1 98.2	BD BD BD	30° 47° 45°													
99.2	101.0		BR CH	sc	a	Cherty breccia in a fine grained sericite-chlorite altered matrix/siltstone. Banding of chert preserved in places, jumbled in others. Some rotation of clasts (which can be up to 5-10cm in size) evident by corellation of internal banding within the clasts. Possible fabric preserved by sericite matrix, but orientation distorted around clasts. Unit cut by thin (1-2mm usually) veinlets of quartz and/or carbonate, which may or may not accompany sphalerite. Some cavities are present along these veins (timing unknown). Blebs of sphalerite+sulphide mix and chalcopyrite also present. Core of moderate to poor competency, with many pieces under 10cm.	99.5 99.6	BD VN	29° 32°													
101.0	104.8		BR CH	sc si	a	Dark grey to dark greeny grey, silcified and occasionally sericite-chlorite altered cherty breccia. Breccia clasts are often rounded and 1-2cm in size, larger, internally banded, and more angualr varieties do occur. Matrix sporadically replaced by chlorite-sericite. Banding (?bedding/?cleavage) preserved by clast orientation and alternation with sericite-chlorite altered matrix. Sphalerite-chalcopyrite etc spots and veinlets become more common in the last 40cm, but may be rarely found throughout. Core of moderate competency.	103.0	BD	25°													

Hole No: 007B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
104.8	107.3		BR CH		b	Light grey, fractured and slightly brecciated cherty sediments with small interval of patchily sericite altered coarser bands (which may carry bands of chert fragments). Unit contains common wisps and thin veinlets of sphalerite (rimmed by a darker material - sulphide-mix)+chalcopyrite+/-galena. Core competent. Core orientation at 107.2m. Orientated measurement at 105.4m, cracks (sulphide bearing), strike ~010-190, dip 84-90 degrees East (can be slightly to the West too). Cherty banding - dip 66 degrees North, strike ~E-W, some strike slightly ~ENE-WSW of this.	105.9 105.9 106.8	VN VN BD	51° 23° 20°													
107.3	115.6		ST VC	si sc	b	Mix of coarse grained volcanoclastic (with small cherty fragements) and silicified siltstones. The coarser bands tend to be more sericite-chlorite altered, while the finer sediments are silicified. Small cherty bands often show brecciation into surrounding coarse grained volcanoclastics. Negligible sulphide, only some disseminated pyrite present in the more sericite altered zones. Banding close to CA in first part of unit, steepens out in last half. Unit competent. Core orient at 113.2m. Orientated measurement at 107.4m of cherty (clast) banding and sericite veinlets - dip 78 degrees West, strike ~N/S to 170-350.	108.8 111.4 114.1	BD BD BD	15° 42° 35°													
115.6	**120.1**	**PR**				**PINNACLES RHYOLITE**																
115.6	116.2		BR CH RK	qs	a	Transitional to rhyolite, consists of fine grained material, fairly heavily quartz-carbonate +/-sphalerite veined, which contains common cherty clasts. Matrix lightly sericite altered, and seems to be mildly silicified in places. Unit most likely an altered version of the coarse grained volcanoclastics of the previous unit. Core of poor competence.	115.8	VN	55°													
116.2	120.1		RY	si	b	EOH 120.1m. Creamy-yellow tan coloured, quartz phyric rhyolite. Appears to be pumiceous (and possibly rhyo-dacitic) after 119.2m. Unit has many 1-2cm quartz+/-carbonate veins, which appear to be barren now. Unit contains abundant thin sub-parallel quartz veinlets, which often sit ~45 degrees to CA, in opposing orientations to larger quartz veins - fabric? Mild weathering has taken place along veins and fractures, with iron oxides coating these features, possibly after sulphides in some of the veins. Unit of moderate to poor competency, with many pieces 5-10cm long. Small 10cm broken zone at 119.1m.	116.7 116.7	VN VN	37° 45°													

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 008B

Location: Brown's Tunnel 5370N

Objective: Test Lens 1 Extent

Result: Large mineralised zone, av. 3.2%Zn in 17m. Contains 130-132m 8.6%Zn, 0.25%Cu ($123TMU), and 124.3-127m 5,2%Zn, 0.34%Cu ($79TMU).

Depth	Direct	Dip
0.0	270.0	-55.0
36.0	267.0	-56.0
60.0	268.0	-56.0
90.0	268.0	-56.0
120.0	269.0	-55.3
150.0	268.0	-54.0
180.0	268.0	-52.6
197.5	268.0	-52.6

Planned Direction: 270°
Planned Dip: -55°
Planned Depth: 190.0 m
Planned Northing: 5370 m N
Planned Easting: 5038 m E
Planned Collar R.L.: 499 m RL

Drilling Commenced: 1/07/98
Drilling Completed: 7/07/98
Actual Depth: 197.5 m
Surveyed Northing: 5369.20 m N
Surveyed Easting: 5034.70 m E
Surveyed Collar R.L.: 499.30 m RL

Date Logged: 22-Jul-1998
Logged By: Michael Whitbread
Hole Size: HQ
Hole Category: other
Grouted:
Date Log Verified: 28-Aug-1998
Verified By: Michael Whitbread

Summary Log:
0-4m NC; -32.8m Ho?; -49.3m F; -63.9m FW; -66m F; -98m FW; -114.2m Ho; -130.6m HOTS;
-130.9m HOSM; -138.6m HODS; -145m HOTS;
-148.4m Hots; 151.1m F; -157.4m Ho; -167.4m PR; -172.7m Ho; -188.2m PR; -189.8m Hots;
-190.1m HOMS; -196.5m Hots; -197.5m

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°
0.0	**4.0**	**NC**				**NO CORE**			
0.0	4.0		NC		a	No core.			
4.0	**32.8**	**HO**				**HOST SEQUENCE**			
4.0	6.5		RK	cy si	a	Weathered core. Consists of brown clays coating heavily silicified rock. Rock has pits after 1-10mm clasts and/or phenocrysts. Broken fragments. Zone with 2m core loss.			
6.5	10.5		BR CH SA	cy	a	Weathered unit. Friable material, consisting of heavily clay altered cherty breccia. Matrix, which is what has gone to clay, is dominant.. Possible shear at 9.0m, containing clasts (1-2cm) of fine grained pyrite in a zone 3cm wide. Competency dreadful, with 3.2m of core loss. Difficult to say if this lies within a fault zone, or is broken due to weathering.	9.0	SR	52°
10.5	12.6		SH	si	a	Broken zone of black silcified shale/siltstone fragments. Competency bad, with 1.5m core loss to 12.5 metres.			
12.6	20.1		SA VC	cy si	a	Weathered core. Broken zone of variably clay and silica altered, patchily green-black mottled, small silica clast bearing volcanoclastic sandstone. Black zones contain white, mm size, phenocryst-like inclusions - possibly pumice or lava clasts. Unit also has occasional thin green-black streaks-bands (sit ~65 degrees to CA). Silcified zone before 15.5m. Unit most likely a more highly weathered version of next unit. Possibly within a fault zone. Potentially 3.4m core loss.	13.7	BD	65°

RQD To (m)	RQD %
4.0	NC
30.2	5
31.5	69
38.1	19
38.4	100
49.3	14
51.5	68
51.8	0
64.0	91
66.0	10
76.8	87
77.4	0
102.7	90
104.5	5
108.0	85
108.4	0
148.0	93
151.0	16
174.0	94
174.7	0
197.5	95

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81806	8.5	9.5	1.0	0.1	0.1	0.01	1	0.1	0.7	3
81807	32.8	33.8	1.0	0.1	0.1	0.01	1	0.1	1.1	3
81808	33.8	34.7	0.9	0.1	0.1	0.01	1	0.1	1.2	3
81809	34.7	35.7	1.0	0.1	0.1	0.01	1	0.1	1.2	3
81810	35.7	36.7	1.0	0.1	0.1	0.01	1	0.1	1.2	3
81811	36.7	37.7	1.0	0.1	0.1	0.01	1	0.1	1.2	3
81812	37.7	39.1	1.4	0.1	0.1	0.01	1	0.1	1.4	3
81813	39.1	40.0	0.9	0.1	0.1	0.01	1	0.1	1.0	3
81814	40.0	41.0	1.0	0.1	0.1	0.01	1	0.1	1.1	3
81815	41.0	42.0	1.0	0.1	0.1	0.01	1	0.1	1.1	3
81816	42.0	43.0	1.0	0.1	0.1	0.01	1	0.1	0.8	3
81817	43.0	44.0	1.0	0.1	0.1	0.01	1	0.1	0.4	3
81818	44.0	47.0	3.0	0.1	0.1	0.01	1	0.1	0.2	3
81819	47.0	48.3	1.3	0.1	0.1	0.01	1	0.1	0.2	3
81820	48.3	49.3	1.0	0.1	0.1	0.01	1	0.1	0.7	3
81821	49.3	50.2	0.9	0.1	0.1	0.01	1	0.1	1.3	3
81822	50.2	51.5	1.3	0.1	0.1	0.01	1	0.1	1.9	3
81823	51.5	51.7	0.2	0.1	0.1	0.10	1	0.1	0.9	4
81824	62.6	63.9	1.3	0.1	0.1	0.01	1	0.1	2.7	3
81825	63.9	65.0	1.1	0.1	0.1	0.01	1	0.1	0.5	3
81826	65.0	66.0	1.0	0.1	0.1	0.01	1	0.1	0.4	3
81827	66.0	66.5	0.5	0.1	0.1	0.01	1	0.1	4.3	3

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
20.1	21.8		PU VC	cl cy si	a	Weathered core. White with green pseudo-fiamme and green-black mottles, white clast bearing, variably clay and silica altered pumice breccia, volcanoclastic. Less weathered version of previous unit. Less broken too, with most pieces 5-10cm in length. Fiamme (dark chlorite altered) contain cream, or orange-brown altered-phenocrysts (?feldspar); these are sporadically distributed in the matrix too. Pseudo-fiamme up to 5cm in length, variably flattened, and occasional define a foliation(larger versions sit at a much higher angle to CA than smaller fiamme - rotation into a cleavage?). Thin green-black streaks may be an extremely flattened variety. White clasts (5mm-2cm in size) are angular to sub-rounded, and may be clay or silica altered. Core of poor to moderate competency. Possibly 30cm core loss.	21.2 21.7	BD BD	30° 37°		
21.8	28.9		DA PU VC	cy si	a	Moderately weathered core Broken zone (fault zone?), of generally yellow-green, lesser creamy-white mottled with black, variably clay and lesser silica altered, altered-feldspar phyric, pumice bearing, volcanoclastics (possibly lavas). Zones of creamy white material are silicified, whereas the green zones are more fledspar phyric and clay altered. Unit probably a mix of dacite and rhyodacite (more silica rich) derived material. A number of thin quartz +/- chlorite veins are present, and run close to CA (some breaks are along these). Unit broken, especially to 24.4m (1.1m loss). 1.2m loss in the remainder of the unit.	25.0	VN	17°		
28.9	32.8		DA PU VC	cl si	b	Lightly weathered core. Medium grey, mottled with dark green pseudo-fiamme, spotted with altered-feldspar phenocrysts, dacitic pumiceous volcanoclastic/?lava. Pseudo-fiamme vaguely define a foliation ~ 70 degrees to CA. Altered feldspar phenocrysts occur throughout but are concentrated within the pumiceous clasts. Unit lightly to moderately silicified. Thin quartz and chlorite veinlets are common, and run close to CA. Unit of moderate competency, except for a small broken zone 29.9-31.2m (10cm core loss).	30.9 30.9 30.9	VN VN BD	10° 5° 70°		
32.8	**49.3**	**F**				**FAULT**					
32.8	34.7		DA PU VC	cl si	b	Fairly broken version of previous unit. Some sticks reach 10cm; most are fragments <5cm.					

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81828	113.0	114.2	1.2	0.1	0.1	0.01	1	0.1	1.4	3
81829	114.2	115.6	1.4	0.4	1.1	0.06	12	0.1	3.4	20
81830	115.6	116.0	0.4	0.8	1.1	0.22	31	0.2	6.3	28
81831	116.0	117.0	1.0	0.4	0.9	0.09	27	0.1	4.4	20
81832	117.0	118.0	1.0	0.3	0.4	0.08	34	0.1	4.3	15
81833	118.0	119.0	1.0	0.4	2.0	0.26	30	0.1	4.2	37
81834	119.0	120.0	1.0	0.3	1.5	0.45	35	0.1	5.7	33
81835	120.0	121.0	1.0	0.4	2.7	0.72	54	0.2	8.6	56
81836	121.0	122.0	1.0	0.3	2.3	0.44	35	0.1	4.0	43
81837	122.0	123.0	1.0	0.2	1.0	0.27	21	0.1	4.4	22
81838	123.0	124.3	1.3	0.2	1.5	0.15	14	0.1	2.9	25
81839	124.3	124.5	0.2	0.6	11.5	0.56	47	0.2	6.3	168
81840	124.5	125.0	0.5	0.6	2.3	0.11	14	0.1	3.1	37
81841	125.0	126.0	1.0	0.5	4.5	0.34	20	0.1	3.8	69
81842	126.0	127.0	1.0	0.2	6.2	0.42	23	0.1	4.5	91
81843	127.0	128.0	1.0	0.2	2.5	0.19	14	0.1	2.9	39
81844	128.0	129.0	1.0	0.1	2.0	0.06	5	0.1	2.6	29
81845	129.0	130.0	1.0	0.2	1.3	0.05	12	0.1	3.4	21
81846	130.0	130.6	0.6	0.1	3.6	0.12	13	0.1	2.4	52
81847	130.6	130.9	0.3	0.9	38.3	0.45	143	0.4	9.3	534
81848	130.9	131.9	1.0	0.1	2.3	0.23	16	0.1	2.8	37
81849	131.9	132.0	0.1	0.2	12.2	0.58	30	0.2	4.5	173
81850	132.0	132.6	0.6	0.1	0.8	0.04	9	0.1	2.9	14
81851	132.6	133.1	0.5	0.2	4.9	0.50	35	0.2	4.5	78
81852	133.1	134.0	0.9	0.1	2.2	0.19	18	0.1	3.0	35
81853	134.0	135.0	1.0	0.1	0.7	0.06	12	0.1	2.5	13
81854	135.0	136.0	1.0	0.2	1.0	0.05	14	0.1	2.2	18
81855	136.0	137.0	1.0	0.2	3.5	0.18	18	0.1	2.6	52
81856	137.0	138.0	1.0	0.3	2.0	0.08	6	0.1	2.1	30
81857	138.0	138.6	0.6	0.2	2.6	0.15	6	0.1	1.8	38
81858	138.6	139.6	1.0	0.2	1.0	0.08	5	0.1	1.5	17
81859	139.6	140.7	1.1	0.1	0.5	0.06	1	0.1	1.5	9
81860	140.7	141.7	1.0	0.3	2.5	0.08	4	0.1	2.5	36
81861	141.7	142.3	0.6	0.2	0.8	0.02	1	0.1	1.6	13
81862	142.3	143.3	1.0	0.2	0.9	0.01	3	0.1	2.5	14
81863	143.3	144.0	0.7	0.2	0.9	0.03	4	0.1	2.9	15
81864	144.0	145.0	1.0	0.2	1.5	0.04	4	0.1	3.8	22
81865	145.0	146.3	1.3	0.1	0.2	0.01	1	0.1	1.0	4
81866	146.3	147.3	1.0	0.1	0.1	0.01	1	0.1	1.4	3
81867	147.3	148.4	1.1	0.1	0.1	0.01	1	0.1	1.0	3
81868	148.4	149.0	0.6	0.1	0.3	0.01	1	0.1	1.9	6
81869	149.0	150.0	1.0	0.1	1.0	0.01	1	0.1	3.2	15
81870	150.0	151.1	1.1	0.1	0.6	0.01	1	0.1	2.4	9
81871	151.1	152.1	1.0	0.1	0.1	0.01	1	0.1	1.1	3
81872	152.1	153.1	1.0	0.1	0.1	0.01	1	0.1	1.5	3
81873	153.1	154.1	1.0	0.1	0.1	0.01	1	0.1	1.4	3
81874	154.1	155.4	1.3	0.1	0.1	0.01	1	0.1	1.5	3

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
34.7	39.1		BR RK VC	 si	b	Broken zone. Light grey or creamy white, mottled with angular black fragments, silicified volcanoclastic breccia. Angular black fragments vary from mm to 5cm in size, some look pumice like (more wispy and irregular form/boundaries, internal structure, phenocrysts etc). Many are rimmed by thin white haloes (?silica, quite hard), and thus the matrix in denser patches is often white. No obvious foliation in fragments though. White silicified clasts are subordinately present. White altered-phenocrysts occur, but are generally visible only within black zones. Towards end of unit, have gradual return of green pseudo-fiamme (but occur rarely throughout). As in 28.9-32.8m, have thin chlorite veins close to CA, less so quartz veinlets. Some patches (often associated with chlorite veins), are sericite-chlorite altered. Core pieces generally less than 5cm length. Occasional sticks over 10cm. Quartz fragments in last 30cm. Possibly unmarked core loss, at the least there is partial recovery of core.	38.2	VN	8°		
39.1	44.0		DA PU VC	 sc	a	Return to 28.9-32.8m. Unit becoming increasingly washed out by sericite-chlorite alteration towards the end of unit (fault focus?). Quartz-chlorite veins common, close to CA, but not a uniform orientation; many breaks are along these (sericite-chlorite alteration is often most intense adjacent to these, and grades away with distance). Possible decrease in banding (pumice) angle with CA towarde end of unit. Core of poor competency, with broken material intermixed with core over 10cm. Worst zone 40-41m.	40.3 41.2 42.3	VN BD BD	20° 65° 40°		
44.0	49.3		BR RY	 sc si	a	Broken zone of greenish patchily sericite-chlorite altered, pinky rhyolitic fragments, with common small intervals of quartz vein fragments. A number of small clay zones present - ~46.6-46.8m, ~47.6-47.65m. Difficult to give accurate positions due to core loss - 0.8m to 46.8m, 0.90m loss to 46.8-48.30, further 0.2m loss to 49.3m. Quartz fragments common to ~47m. 'Rhyolitic' fragments commonly quartz veined (up to 3cm in width), sitting at a high angle to CA.					
49.3	**63.9**	**FW**				**FOOTWALL SEQUENCE**					
49.3	50.2		DA RY	 sc	a	More competent version of last unit i.e. patcily sericite-chlorite altered rhyolitic rock. Intervals look to be dacite of earlier unit. Rhyolitic due to high silica content, rather than phenocrysts content. Possibly silicified dacite, or interbedded rhyolite and dacite? Unit cut by numerous quartz+/-carbonate(clay altered?)+/-chlorite veins. Carbonate has been washed out in places, leaving cavities in the veins. Veins may be up to 5cm in width, or mm in size.	49.6	QV	74°		

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81875	155.4	156.8	1.4	0.1	0.4	0.04	1	0.1	2.8	7
81876	156.8	157.4	0.6	0.2	0.4	0.01	1	0.1	3.6	7
81877	157.4	158.4	1.0	0.1	0.1	0.01	1	0.1	0.7	3
81879	188.2	189.5	1.3	0.1	0.2	0.01	1	0.1	2.3	4
81880	189.5	189.8	0.3	0.1	1.9	0.06	14	0.4	3.1	32
81881	189.8	190.1	0.3	0.1	9.6	0.98	64	0.4	22.4	151
81882	190.1	191.1	1.0	0.1	0.1	0.06	1	0.1	1.6	4
81883	191.1	191.8	0.7	0.1	0.2	0.02	1	0.1	2.3	4
81884	191.8	192.0	0.2	0.1	0.8	0.25	1	0.1	7.0	15
81885	192.0	193.0	1.0	0.1	0.1	0.01	1	0.1	1.8	3
81886	193.0	194.0	1.0	0.1	0.1	0.01	1	0.1	1.6	3
	Total Length:		75.0							

Standards

Reference Values for:	HBM-02					17/07/98	
	3.4	12.5	0.46	150	1.3	22.7	
Variances Allowed:	20%	20%	30%	20%	20%	20%	
81878 Inserted @ 158.4m	3.6	14.1	0.47	164	1.2	22.4	Y

Weighted Averages

From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
120.0	130.9	10.9	0.3	3.8	0.28	25	0.1	4.1	59
120.0	133.1	13.1	0.3	3.7	0.28	24	0.1	4.0	57
120.0	137.0	17.0	0.2	3.2	0.24	22	0.1	3.7	51
124.3	127.0	2.7	0.4	5.2	0.34	22	0.1	4.1	79
130.0	132.0	2.0	0.2	8.6	0.25	35	0.2	3.7	123
130.0	133.1	3.1	0.2	6.5	0.25	30	0.1	3.7	94

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
50.2	62.6		BR PU RY	sc si	b	Variably pink-red, or mottled pink and black, silica rich (most likely silicified), patchily dark chlorite altered, occasionally banded, rhyolitic-rhyo-dacitic breccia. Pinky-red intervals seem to be fairly coherent, can be phenocryst poor or rich, and may be lavas. Darker intevals (the more brecciated zones) contain darker material, usually phenocryst bearing, often as a matrix to angular pinky (rhyolitic) fragments, but occasionally present are chlorite altered pseudo-fiamme (pumice?). 1-3mm phenocrysts are common throughout, and appear to be quartz (due to hardness), though they look suspiciously like pseudomorphed-feldspars. Habit of most is rectilinear - feldspar lathlike); some sub-rounded, obviously quartz phenocrysts do exist. Quartz-carbonate and carbonate veins and veinlets very common, and occur in a number of orientations (dominant trends: thin veinlets 20-30 degrees to CA, with conjugates present as well; thicker ones (>1mm)~45 degress or greater, to CA; and rarer ones close to CA.). Rough zoning of pink versus dark zones - 50.2-51.7m Pink, -~58 dark, -~61m pink, -62.6 dark. Unit may be sericite-chlorite altered in and adjacent to broken zones e.g. 51.5-51.7m. Unit of good to moderate competency, with a small poor patch at 51.5-51.7m. Many breaks along vein orientations. Core orients at 51.5m, 59m.	56.5 58.6 58.7 60.8	BD VN VN VN	60° 25° 45° 7°													
62.6	63.9		RK	se	a	Yellowy-brown coloured, fairly destructive sericite+/-chlorite alteration of rock (most likely like previous unit). Alteration appears fairly massive, but in places dense sericite wisps are visible (~50-70 degrees to CA). Alteration most likely due to proximity to fault of next unit. Competency good - decreases towards end of unit. Quartz veins at 63m, contain blebs of black galena-sulphide mix+/-sphalerite.	63.0 63.0 63.6	VN VN VN	57° 11° 65°													
63.9	**66.0**	**F**				**FAULT**																
63.9	66.0		RK	sc	a	Broken zone of sericite-chlorite altered rock, most likely after rhyolitic breccias of surrounding units. Quartz vein (and fragments) are common.																
66.0	**98.0**	**FW**				**FOOTWALL SEQUENCE**																
66.0	66.5		BR RY	se	a	As in 62.6-63.9m. Sericite altered rhyo-dacitic breccia. Yellow-brown sericite veinlets and wisps intense. No obvious preferred direction. Core competent.																
66.5	75.0		RY	si	b	Return to rhyolite-rhyodacite unit similar to those prior to the preceding fault. Alternating intervals of light creamy or pinky areas with more dominant dark-green to black zones. Fairly even distribution of phenocrysts with less obvious brecciation here. Both zones carry phenocrysts of quartz and silicified ?feldspar laths. Minor chlorite-sericite (green colour, fairly white streak) alteration is evident around occasional thin ?chlorite+/-quartz veins e.g. 67m. Carbonate-quartz veins and veinlets very common. Core of moderate to good competency.	67.0 71.3 72.5 72.5	VN VN VN VN	22° 37° 40° 25°													
75.0	77.2		RK	si	a	Black, fine grained, silicified version of previous unit. Contains brittle, faint, silica veins. Quartz-carbonate veins still abundant. Rare chlorite veins also about. Abrupt boundary with next unit. Core competent.	76.5 76.5	VN VN	25° 45°													

Hole No: 008B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
108.5	111.3		BR ST VC	 si sc	a	As in last unit, but with more scattered alteration, with a more obvious fabric, and a lack of the orangey colouring. Clasts again have curvaceous ends, suggesting that the fabric is a transposition layering. Strange convolution of fabric around aggregates of clasts 108.6-109m, looks fold-like or deflection of fabric around the aggregates. Small clay bearing joint at 109.6m. Core of moderate competency.	109.1 109.6 109.6 110.3	CV JT CV CV	37° 40° 51° 45°													
111.3	**114.2**	**HO**				**HOST SEQUENCE**																
111.3	114.2		RK RY VC	si si	a	Yellow-brown, silicified, moderately altered-?feldspar phyric, silica clast bearing volcanoclastic/rock. Has occasional green squashed pseudo-fiamme (which also carry the 'phenocrysts'). Silica clasts up to 5cm in size, but sporadic in occurrence. Possible a rhyolitic mass flow breccia. Carries common, but thin quartz-carbonate veinlets - usually running 20-25 degrees to CA. Also has common thin sericite wisps that mark a fabric ~55-60 degrees to CA. Core competent. Core orient at 113m. Orientated measurement at 113.6m - cleavage/fabric dips 76 degrees East, strike 200-020. Vein dips 68-70 degrees North at 120-110.	111.8 113.5 113.5 113.7	VN CV CV VN	16° 60° 55° 26°													
114.2	**130.6**	**HOTS**				**HOST - TRACE SULPHIDES**																
114.2	115.6		ST	sc si	b	Medium grey and green, silicified/cherty siltstone altered by bands of chlorite-sericite-pyrite alteration. Bands may contain wisps of sericite running about 50 degrees to core axis. Minor reddy-brown sphalerite - rimmed by sulphide mix/galena - blebs (1-3mm wide) and discontinuous wisps may be associated with the chlorite-sericite bands, but also occur as isolated veinlets +/-quartz-carbonate. Pyrite banding becomes more important towards end of unit. Unit is competent apart from contact with previous unit, in which there may be 30cm core loss (10cm broken zone visible now).	114.5 115.3	VN BD	50° 47°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
115.6	130.6		ST	si	b	Medium grey unit of fairly massive, rarely obviously bedded, silicified siltstone with lesser fine grained sandstone. Unit cut be common bands of fine to medium grained pyrite which may be accompanied or dominated by medium brown coloured sphalerite blebs rimmed by balck sulphide-mix or galena. In some instance chalcopyrite wisps and blebs may accompany the sphalerite. The above sulphides may also be present as isolated wisps, veinlets and blebs, or as accessories in carbonate quartz veinlets. Sulphide bands are usually 1-2cm wide, with wisps and veins 2-5mm in width. 5-8cm band of sphalerite-pyrite-chalcopyrite at around 124.3-124.4m. Sulphide banding may be following initial bedding of unit, and obscures bedding as a result. Many thin sulphide and carbonate-quartz veinlets, and hairline cracks run accross banding/bedding (sort of conjugate) - might be critical direction of mineralisation, which is then ponding along bedding?. Core competent. Core orient at 118.9m. Orientated measurement at 118.9-119.1m; pyrite banding (not very planar) ~dip 87 degrees East, ~190-010 strike. Others 80 degrees West at ~210-030. Thin carbonate+/-sulphide veins (parallel), dip ~58 degrees North, ~080-260 strike. 119.3-119.5 - carbonate-quartz-sulphide vein - dip 66 degrees West, strike ~140-320. Vein (fabric?) dip 86 degrees North, strike 130-310. 119.1-199.3m - bendy pyrite-sphalerite band, dip ~68 degrees West, strike ~N-S (bottom anastomosing part of vein is subvertical). Carbonate veinlet dip 59 degrees North, strike ~100-280.	118.5 118.8 119.4 120.6 122.2 122.3 124.1 124.2 125.4 127.8	VN BD JT BD BD BE BD BE JT VN	15° 34° 35° 45° 20° 16° 29° 34° 57° 17°													
130.6	**130.9**	**HOSM**				**HOST - SEMI-MASSIVE SULPHIDES**																
130.6	130.9		SP		a	Small zone of banded semi-massive light brown sphalerite-with a dark sulphide, fine grained pyrite, lesser chalcopyrite and galena. Core competent.	130.8	BD	29°													
130.9	**138.6**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
130.9	138.6		ST	si	b	As in 115.6-130.6m - overall HODS to HOTS. Sphalerite increasingly red-brown in colour. Small HODS-HOSM veins 131.9-132m, 132.6-133.1m - Sampled separately. Core competent. Core orient 134m. Orientated measurements, cherty bedding -dip 28-30 degrees West, strike ~045-225. Pyrite (diagenetic) banding - dip 20 degrees West, strike ~045-225. 132.8m - Carbonate and sulphide veinlets dip ~42 degrees West ~125-305. 132.9m - sphalerite-pyrite veins etc dip 84 degrees South, strike ~110-290. 133.7m - Quartz-sphalerite-chalcopyrite vein, dip 50 degrees West, strike ~140-320.	133.8 133.8 135.0 136.0	BD VN VN BE	35° 30° 25° 36°													
138.6	**145.0**	**HOTS**				**HOST - TRACE SULPHIDES**																
138.6	140.7		ST	si	a	Light grey, silicified siltstone, crossed by intense, brittle quartz+/-carbonate+spotty red sphalerite (+/-chalcopyrite+/-pyrite) veining. Vague veining trend at ~30 degrees to CA. Core competent.	140.4	VN	30°													

Hole No: 008B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
140.7	145.0		SL ST	si qs sc	a	Dark grey to black, variably sericite-chlorite-pyrite altered, strongly banded/bedded shale, siltstone and minor sandstone. Sericite-chlorite alteration is present as occasional bands, but seems to follow/be confined by the surrounding sedimentary banding. Includes interval of material like last unit from 141.7-142.3m. Banding in unit looks to be sedimentary, some bands are pyrite rich (can be massive), or contain disseminated pyrite cubes (fine to medium grained). Banding close to CA near beginning of unit, but varies considerably - 143.6m evidence of folded nature of this unit of sediments. Bedding often disrupted by veining. Unit has abundant quartz-carbonate+/-sulphides as in last unit. Core of good to moderate competency, apparrently 10cm core loss between 141.8-143m.	141.5 143.3 143.6 143.7 143.8	BD VN BD BD VN	18° 60° 16° 85° 30°													
145.0	**148.4**	**HOTS**				**HOST - TRACE SULPHIDES**																
145.0	148.4		VC	sc si	a	Medium grey, and striped grey and yellow-green, unit of silicified volcanoclastic siltstone and sandstone containing sericite-chlorite wisps and pseudo-fiamme like features.The sericite-chlorite wisps and 'pseudo-fiamme' are usually <= 1cm in width. Difficult to say if these are purely an alteration product, or whether are altered squashed 'pumice' and reflect bedding (most likely as they are parallel to elongate silica clasts). 146.3-147.3m may be a separate very coarse volcanoclastic flow including occasional sub-angular 3-4cm silica rock clasts within it. Sediments are poorly sorted, containing numerous lithic clasts 1-10mm in size. Unit carries uncommon thin quartz-carbonate +/-sphalerite veinlets. Core of moderate competency, but parts farily easily along the fabric.	145.7 146.1 147.0	BD BD BD	55° 40° 55°													
148.4	**151.1**	**F**				**FAULT**																
148.4	151.1		SL VC	si si	a	Broken zone of shale and volcanoclastic from units either side. ~?5cm finely broken and clay rich zone at beginning of unit. Last 50cm of unit very broken. Fragments may be angular, or discs. Volcanoclastic from last unit finishes ~149m. Then have black shale, follwed by green volcanoclastic in last ~60cm of unit. Volcanoclastics tend to be mildly silicified, or more so than the shale. Shale banded by very thin coarser, light grey bands (may carry fine grained pyrite). Unit carries common ~5mm wide carbonate-quartz +/-sphalerite veinlets, some of which show folding - small cracks and carbonate-quartz wisps axial planar to the folded veins.	149.5 149.5 149.5 149.5 150.0	CV VN VN BD VN	30° 19° 10° 71° 4°													
151.1	**155.4**	**HO**				**HOST SEQUENCE**																

Hole No: 008B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
151.1	155.4		PU VC	sc si	b	Creamy coloured, silicified rock, spotted/measled with abundant dark green and light green pseudo-fiamme. After 152m, dificult to identify a fabric, pseudo-fiamme have complex, convoluted shapes and margins - possible fabric 45-60 degrees . Pseudo-fiamme are sericite-chlorite altered, and contain 1-2mm sized white flecks/altered lath-like or rounded phenocrysts (?feldspar), some of which might be quartz. Occasional barren quartz veinlets (1mm), usually against the vague banding. Core is competent.	151.6 153.3	BD VN	47° 45°													
155.4	**157.4**	**HO**				**HOST SEQUENCE**																
155.4	157.4		SL SS ST	si	b	Medium grey, in places black, graded, bedded unit of volcanoclastic, very coarse to shale sized sediments. Last 50cm of unit is shale, which is lightly silicified and patchily sericite-chlorite altered but contains spoardic 3-4cm silicified sandstone and siltstone clasts - some of which have internal banding, at odds with the apparrent bedding in this unit. Remainder of unit is medium grey in colour. Appears to fine up, up-hole. The basal sections of poorly sorted, very coarse, volcanoclastics contain various angular variably silicified siltstones/cherts up to 2-3cm in length. Coarser parts also contain disseminated pyrite cubes. Including shale, probably three distinct flows here. Core competent. Shale unit, may be the fine top from base of next unit (transitional boundary).	155.6 156.6	BE BE	45° 47°													
157.4	**167.4**	**PR**				**PINNACLES RHYOLITE**																
157.4	162.1		BR PU RY	sc si	b	Pale-creamy coloured, occasionally mixed with light grey, sometimes ?pepperitic or brecciated, other times massive and occasionally banded, quartz phyric rhyolite/rhyolite breccia. Massive interval from 158.8-161.6m, can be banded and also bear chlorite altered ?feldspar laths. 'Pepperitic' intervals may in fact be pumice breccia volcanoclastic intervals. Vague fabric preserved by clasts in these intevals. Medium green, phenocryst bearing, chlorite altered clots/pseudo-fiamme also present throughout (mainly in the breccia interval). Clast size varies from 0.5cm to 5-10cm. Carbonate-quartz veinlets and wisps strong intensity throughout,often running against banding. Some sphalerite spotting and thin wisps at base	158.6 161.2 161.2	BD VN BD	38° 43° 40°													
162.1	167.4		PE RY VC	sc si	b	Similarly textured rock to before, but more green in colour, phenocrysts are comprised of feldspar laths and quartz and have intervals of siltstone and volcanoclastic sandstone. Looks more of a complexly mixed pepperite (rhyolite and siltstones and sandstones) in this unit. Pepperitic intervals contain two main types of clast - greenish chlorite-sericite altered and creamy-pink silicified clasts. More massive and banded intervals may have alternating bands of these types. Occasional carbonate-quartz veinlets present. Sediment intervals may be 10-20cm thick, two of these (first 20cm of unit, and 165.0-166.1) bear no rhyolite clasts, while the others do. Banding in massive areas is often near orthogonal to CA. Around 165m have a thin band of sediment running close to CA. Unit competent.	162.2 163.9	BE BD	39° 84°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
167.4	**172.7**	**HO**				**HOST SEQUENCE**																
167.4	172.7		PU ST VC	sc si si	a	Volcanoclastic pumice breccia of dark grey silicified siltstone (as fragments and occasionally as massive intervals), pinky rhyolite fragments in a matrix of light and dark green, feldspar +/- quartz phyric chlorite-sericite altered material. Some light green bands look to be squashed pseudo-fiamme (which define a fabric). Silicified clasts may be rounded or angular, and are poorly sorted (.5-5cm). Two intervals of siltstone/sandstone 20cm near base of unit, and 168.2-168.4m. Core competent, minor breaks near 170m. Core orient at 170m. Orientated measurement at 170m - pseudo-fiamme and joints dip 72 degrees East ~030-210.	167.4 170.3 172.2	CT BD BD	39° 41° 44°													
172.7	**188.2**	**PR**				**PINNACLES RHYOLITE**																
172.7	174.7		BR RY	sc si	b	Clast supported breccia of creamy coloured rhyolite, with chlorite-sericite altered, apparently phenocryst bearing fined grained material as matrix (pseudo-fiamme?). Competency is moderate to poor, especially in last 60cm of unit. Breaks along ~25 degrees to CA.	174.5	JT	24°													
174.7	179.9		RY	si	b	Fairly massive, occasionally incipiently brecciated quartz phyric, chlorite-altered-?feldspar phyric, rhyolite. Unit crossed by fairly strong carbonate-quartz+/-?sericite+/- rare pyrite, veins and veinlets (1-5mm generally), in two main orientations - near orthogonal to CA, and ~20 degrees to CA. Core competent.	176.6 178.0	VN VN	66° 18°													
179.9	188.2		BR RY	sc si	b	Darker green-grey coloured, generally more brecciated (amongst more massive intervals), rhyolite/rhyolite breccia. Becomes more altered-?feldspar phenocryst rich in the last 3m of the unit. Brecciated parts are generally clast supported, with the matrix a black or dark-green fine grained material; breccia may be a distinct band within more massive material. Uncommon patches of chlorite-sericite-pyrite alteration present e.g. 185m. Also have occasional chlorite-sericite altered bands (possibly along microfractures) e.g. 182.5m. Unit has an orangey-pinky hue in last 3m. 15cm carbonate-quartz vein at 183.1. Intensity of veining decreases towards the end of unit. Core competent except 184.8-185m and 183.1-183.2m. Possible 20cm discrepency between 180.3-182m. Core orients at 182m and 188m.	180.2 182.1 182.4	BD VN BD	55° 55° 40°													
188.2	**189.8**	**HOTS**				**HOST - TRACE SULPHIDES**																

Hole No: 008B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
188.2	189.8		BR CH RK VC	 sc si	b	Volcanoclastic breccia? Medium to light grey fine grained matrix, containing abundant chlorite-sericite altered angular and elongate rock fragments. Fragments preserve a fabric (30-40 degrees to CA). Contact with previous unit sharp. Contact with next unit pretty sharp. Contains more cherty material in latter half of unit, and ends in a 20cm cherty, sort of brecciated, interval. This cherty interval contains some chlorite-sericite replacement, and some fine grained pyrite replacement (separate position form chlorite-sericite). Also within the cherty zone: within thin cracks in the cherty fragments of this zone have rare sphalerite+/-black sulphide mix-chalcopyrite etc; may also find the black sulphide rimming rare silica clasts. Unit contains uncommon, irregular carbonate+/-quartz veins and veinlets. Also have some white carbonate replacing/rimming occasional silica clasts. Unit competent. Orientated measurement at 188.5m, pseudo-fiamme-fabric, dip 83 degrees West, strike ~N-S.	188.2 188.7	CT BD	57° 38°													
189.8	**190.1**	**HOMS**				**HOST - MASSIVE SULPHIDES**																
189.8	190.1		CH PY RK	 cl	a	HOMS-HOSM of banded, fine to medium grained pyrite, with subordinate chalcopyrite, and rare sphalerite+/-sulphide mix. Also present in this band is a band black chlorite containing disseminated pyrite cubes, and the occasional cherty fragment with sphalerite sitting in any internal cracks. Fairly sharp contacts - might be a mini shear or something. Orientated measurements - 189.9m, sulphide banding dip 81 degrees West, strike ~N-S. 190m Joint, dips 82 degrees West, strike ~160-340.	190.0 190.1	BD CT	23° 21°													
190.1	**196.5**	**HOTS**				**HOST - TRACE SULPHIDES**																
190.1	196.5		BR CH RK VC	 sc si	b	Continuation of volcanoclastic breccia similar to 188.2-189.8m; with occasional cherty bands. Also has a HODS pyrite-chlorite-chalcopyrite rich interval 191.8-192m. Virtually no sulphide elsewhere. Distinctive carbonate rimming/replacement of chlorite-sericite altered clasts in the 80cm prior to the sulphide band. Have occasional wisps and veinlets of carbonate+/-chlorite+/-pyrite. In the last 2m unit becomes lighter in colour, and start to carry larger chlorite-sericite altered clasts (2-10cm) which carry altered-phenocrysts (possibly related to next unit). Core competent.	191.9 192.0 193.9 195.0	BD CT BD BD	10° 30° 35° 37°													
196.5	**197.5**	**PR**				**PINNACLES RHYOLITE**																
196.5	197.5		BR RY	 ql si	b	EOH 197.5m. Brecciated (in parts), and oddly banded rhyolite as in earlier unit. Breccia is clast supported, and matrix is a light grey silicified matrix. Bands (1-5mm in width) are alternations of dark chlorite-silica altered rhyolite, with pinky coloured rhyolite, and occur within individual clasts. Some smaller clasts are light greeny coloured sericite-chlorite altered, and some may be banded with darker green bands. However the bands don't seem to correlate across the clasts. In the larger inteval - clast bands run close to CA. Unit cut by occasional 0.5-1cm carbonate veins running ~ 90 degrees to CA. Core competent. Core orient at 197m.																

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 009B **Location:** Southern Trenches

Objective: Mother Lode underneath STRC5.

Result: Shallow lens dip - separation<planned. 28.6-33.4m@23.9%Pb, 28.6%Zn, 2.83%Cu, 127g/t Ag, 12.6g/t Au, 3.8%Fe ($658TMU). 28-33.4m is $593TMU

Depth	Direct	Dip
0.0	258.0	-72.0
30.0	258.0	-71.8
70.0	259.0	-71.0
73.0	259.0	-71.0

Planned Direction: 258°
Planned Dip: -72°
Planned Depth: 70.0 m
Planned Northing: 4408 m N
Planned Easting: 4653 m E
Planned Collar R.L.: 422 m RL

Drilling Commenced: 8/07/98
Drilling Completed: 10/07/98
Actual Depth: 73.0 m
Surveyed Northing: 4409.00 m N
Surveyed Easting: 4652.00 m E
Surveyed Collar R.L.: 421.80 m RL

Date Logged: 28-Jul-1998
Logged By: Michael Whitbread
Hole Size: HQ
Hole Category: other
Grouted:

Date Log Verified: 25-Sep-1998
Verified By: Michael Whitbread

Summary Log:
0-3m NC; -10.3m Hots; -12m Ho; -23.1m Hots; -24.3m F;
-28.6m HOTS; -33.4m HOMS;
-33.6 Hots; -44.6m Hots; -46m F; -64.7 Hots; -67.4m F; -73m HO.
EOH 73m.

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°
0.0	**3.0**	**NC**				**NO CORE**			
0.0	3.0		NC		a	No core.			
3.0	**10.3**	**HOTS**				**HOST - TRACE SULPHIDES**			

RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
3.0	NC	81887	3.0	4.0	1.0	0.1	0.1	0.01	1	0.1	2.1	3
3.4	100	81888	4.0	5.0	1.0	0.1	0.2	0.01	1	0.1	1.3	4
4.1	28	81889	5.0	6.0	1.0	0.1	0.5	0.01	1	0.1	4.5	8
4.6	100	81890	6.0	7.0	1.0	0.1	0.3	0.01	1	0.1	2.3	6
12.0	4	81891	7.0	8.0	1.0	0.1	0.3	0.01	1	0.1	1.4	6
13.0	100	81892	8.0	8.9	0.9	0.1	0.2	0.01	1	0.1	0.7	4
13.4	0	81893	8.9	9.7	0.8	0.1	0.2	0.01	1	0.1	3.1	4
15.2	94	81894	9.7	10.3	0.6	0.1	0.1	0.01	1	0.1	1.0	3
15.4	0	81895	10.3	11.1	0.8	0.1	0.2	0.01	1	0.1	0.7	4
17.5	81	81896	11.1	12.0	0.9	0.1	0.2	0.01	1	0.1	0.5	4
19.7	0	81897	12.0	13.0	1.0	0.1	0.6	0.03	1	0.1	0.6	10
23.1	85	81898	13.0	14.0	1.0	0.1	0.5	0.07	1	0.1	0.6	9
24.8	5	81899	14.0	15.0	1.0	0.2	1.4	0.08	1	0.1	1.1	21
31.5	91	81900	15.0	16.0	1.0	0.1	0.4	0.02	1	0.1	0.8	7
32.5	0	81901	16.0	17.0	1.0	0.1	0.1	0.02	1	0.1	0.9	3
40.0	91	81902	17.0	18.0	1.0	0.1	0.1	0.02	1	0.1	0.8	3
42.7	7	81903	18.0	19.0	1.0	0.1	0.2	0.01	1	0.1	0.8	4
44.6	100	81904	19.0	20.0	1.0	0.1	0.6	0.03	1	0.1	1.0	10
46.5	5	81905	20.0	21.2	1.2	0.1	0.3	0.02	1	0.1	1.0	6
47.4	89	81906	21.2	22.2	1.0	0.1	0.1	0.01	1	0.1	0.7	3
49.2	5	81907	22.2	23.1	0.9	0.1	0.1	0.03	1	0.1	0.9	3
51.9	85	81908	23.1	23.5	0.4	0.1	0.2	0.01	1	0.1	0.8	4

Hole No: 009B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°
3.0	10.3		RK	cl si	a	Dark grey, black and occasionally light grey, white carbonate spotted and variably dark chlorite altered rock. Some weathering along fractures and breaks - mainly as iron oxide staining. Less chlorite altered intervals (mainly 6.4-~8.9) are moderately silica altered, probably after sandstone of some kind. Carbonate spots vary from mm to 4cm across, with the larger spots possibly being pseudomorphs after clasts. Spots as dissemintations or as clotted aggregates. Many of the spots are partially or apparently completely weathered out, producing a pitted surface. Associated (usually included within) the spots are blebs of sphalerite (light brown)-black sulphide mix. The latter often rims sphalerite. The spots seem to lack sphalerite etc when in lightly altered zones. A fabric is marked by anastomosing wisps of sericite (referred to as a cleavage in the structures entry). In more strongly altered pieces the fabric is not obvious. Core is generally very broken (darker, chlorite altered pieces generally), though some pieces up to 30cm (usually light coloured pieces) occur. Broken zone mainly 5.5-9.5m, has fragments 5 to 1cm in size. Joint near parallel to CA around 8.4m. 20cm core loss marked between 7 and 7.7m, possilby more unmarked loss throughout unit.	4.0 8.3 8.3 9.6	CV JT CV CV	37° 3° 34° 50°
10.3	**12.0**	**HO**				**HOST SEQUENCE**			
10.3	12.0		CH RK SS ST	 cy cy cy	a	Brown and pale greenish-yellow, alternating intervals of clay altered sandstone and siltstone, with cherty silica altered rock. Some chert present as clasts. Cherty intervals:- 10cm at beginning of unit and 10cm at 11m. Some parts not completely gone to clay, merely moderately sericite altered. Green chlorite often on breaks. Last 70cm are most likely an altered version of the next unit, and contains 1-3mm spots of chlorite (perhaps sulphide but difficult to say). Unit fairly broken, most fragments under 10cm, many under 5cm.	10.5 11.9	BD CV	68° 60°
12.0	**23.1**	**HOTS**				**HOST - TRACE SULPHIDES**			
12.0	18.0		BR CH RK	si sc	a	Green and light white-grey, variably sericite-chlorite altered, silicified rock/cherty breccia. Unit looks like it was silicified prior to sericite-chlorite alteration, since cherty areas appear to be fragmented by the later alteration; but sericite-chlorite dominant zones often have isolated rounded clasts of chert. This could be due to the sericite-chlorite preferentially replacing a fine grained material. Rock possibly a cherty volcanoclastic breccia, as seen in Brown's Tunnel core. Sericite-chlorite alteration generally present as distinct zones often adjacent to joints. Weak banding/fabric present in unit, more visible in sericite-chlorite zones (30-40 degrees to CA). Unit also contains blebs of sphalerite+/-galena+/-chalcopyrite+/-pyrite and sulphide mix, usually associated with cherty zones and clasts and the fractures within them. Some Clasts look to have been partially replaced by a white 'carbonate' which may include tiny spots of the previously mentioned sulphides. Unit generally competent, may contain small 10cm zones of broken material every m or so. After 17.5m quite broken.	14.7 14.9 17.0	JT CV JT	18° 36° 11°

RQD To (m)	RQD %
53.2	7
55.5	91
57.0	6
62.5	93
63.8	7
64.8	100
67.8	3
73.0	94

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81909	23.5	24.3	0.8	0.2	0.3	0.03	1	0.1	0.6	6
81910	24.3	25.3	1.0	0.6	1.1	0.07	11	0.2	2.5	22
81911	25.3	26.3	1.0	0.7	1.6	0.04	7	0.1	2.5	27
81912	26.3	27.0	0.7	0.6	2.2	0.08	8	0.1	2.2	35
81913	27.0	28.0	1.0	0.5	1.7	0.10	1	0.1	0.7	27
81914	28.0	28.6	0.6	0.3	5.5	0.29	11	0.2	1.1	80
81915	28.6	29.6	1.0	20.6	28.2	4.21	137	1.6	5.7	557
81916	29.6	30.6	1.0	25.4	26.9	3.43	86	1.5	4.3	546
81917	30.6	31.6	1.0	27.1	33.6	2.30	129	3.7	2.9	655
81918	31.6	32.6	1.0	26.7	29.0	2.65	146	20.5	3.2	748
81919	32.6	33.4	0.8	18.3	24.2	1.14	138	43.2	2.3	824
81921	33.4	33.6	0.3	0.7	1.2	0.18	8	0.1	2.3	23
81922	33.6	35.2	1.6	0.3	0.5	0.01	1	0.1	2.9	9
81923	35.2	36.5	1.3	0.3	0.8	0.02	1	0.1	3.7	13
81924	36.5	37.5	1.0	0.4	1.0	0.04	1	0.1	3.0	17
81925	37.5	38.5	1.0	0.6	1.2	0.06	1	0.1	3.1	20
81926	38.5	39.5	1.0	0.3	1.2	0.03	1	0.1	2.8	18
81927	39.5	40.5	1.0	0.1	0.3	0.01	1	0.1	1.7	6
81928	40.5	41.5	1.0	0.2	0.8	0.04	1	0.1	3.9	13
81929	41.5	43.0	1.5	0.2	1.7	0.04	1	0.1	2.4	25
81930	43.0	44.6	1.6	0.5	4.5	0.08	1	0.1	2.8	63
81931	44.6	46.0	1.4	0.3	0.3	0.01	1	0.1	0.7	7
81932	46.0	47.0	1.0	0.1	0.1	0.01	1	0.1	0.7	3
81933	47.0	48.0	1.0	0.1	0.1	0.01	1	0.1	0.4	3
81934	48.0	49.0	1.0	0.1	0.1	0.01	1	0.1	0.7	3
81935	49.0	50.1	1.1	0.1	0.1	0.01	1	0.1	0.5	3
81936	50.1	50.2	0.1	0.1	0.7	0.06	1	0.1	1.3	11
81937	50.2	51.2	1.0	0.1	0.7	0.02	1	0.1	0.9	11
81938	51.2	52.3	1.1	0.1	0.2	0.01	1	0.1	0.4	4
81939	52.3	53.2	0.9	0.1	0.1	0.01	1	0.1	0.4	3
81940	53.2	54.2	1.0	0.1	0.1	0.01	1	0.1	0.6	3
81941	54.2	55.2	1.0	0.1	0.1	0.01	1	0.1	0.2	3
81942	55.2	56.2	1.0	0.1	0.1	0.01	1	0.1	0.5	3
81943	56.2	57.2	1.0	0.1	0.2	0.03	1	0.1	1.2	4
81944	57.2	58.2	1.0	0.1	0.1	0.01	1	0.1	1.7	3
81945	58.2	59.2	1.0	0.1	0.1	0.01	1	0.1	1.7	3
81946	59.2	60.2	1.0	0.1	1.1	0.03	1	0.1	1.4	16
81947	60.2	61.2	1.0	0.1	0.1	0.02	1	0.1	1.3	3
81948	61.2	62.2	1.0	0.1	0.1	0.01	1	0.1	1.3	3
81949	62.2	63.2	1.0	0.1	0.1	0.01	1	0.1	0.6	3
81950	63.2	64.7	1.5	0.1	0.1	0.01	1	0.1	0.8	3
81951	64.7	65.7	1.0	0.1	0.1	0.01	1	0.1	1.0	3
81952	65.7	66.7	1.0	0.1	0.1	0.01	1	0.1	1.2	3
81953	66.7	67.4	0.7	0.1	0.1	0.01	1	0.1	1.4	3
81954	67.4	68.5	1.1	0.1	0.1	0.01	1	0.1	0.9	3
81955	68.5	70.0	1.5	0.1	0.1	0.01	1	0.1	1.3	3
81956	70.0	71.5	1.5	0.1	0.1	0.01	1	0.1	1.0	3

Hole No: 009B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
18.0	21.2		CH RK	cs	a	Medium and light green, sericite-chlorite altered rock, with occasional stretched out cherty clasts. Unit most likely a more completely altered version of previous. Also have trace galena+/-sulphide mix, in cracks, and veinlets, and as disseminated mm spots; often in cherty rich zones e.g. 19.7m. Rarer clasts are fine grained pyrite (replacement or original?). Fabric present once again, marked by sericite wisps and vague banding; cleavage?. Sulphide bearing veinlets may run with or 'conjugate' to the fabric. Unit quite broken to 19.7m. After which it is moderately competent. Orientated measurements at 21.1m - Banding, 68 degrees East. 155-335 strike. Others at 68-78E, strike ~160(170)-340(350). Fracture (cavity) - dips 50 degrees South, strike ~050-230.	18.4 19.6 19.6 20.1 21.2	JT VN CV CV CT	3° 35° 38° 41° 49°		
21.2	23.1		RK SH	sc si	a	Light grey and greenish grey, banded, almost a sericite-chlorite and silica schist. Consists of cherty bands (or at least stretched fragments) interspersed with sericite-chlorite bands. Unit has common thin sphalerite etc +/- chlorite veinlets and sphalerite etc spots and blebs. These are generally associated with the more silica rich portions, where thin yellowy carbonate wisps are also noted. Veinlets are discontinuous, but usually sit at a reasonably steep angle to CA. Green chlorite often on breaks. Core of moderate competency. Core orientation at 22m. Orientated measurement at 21.3m. dominant veins/fracture trend, dip 79 degrees South, strike ~060-240. Vein dip 46 degrees North, strike ~045-050. Measurement at 22.3m - banding, dips 84-88 degrees East strike ~010-190. Chlorite-pyrite wispy vein, dip 34 degrees East, ~350-170.	22.1 23.0	CV CV	30° 28°		
23.1	**24.3**	**F**				**FAULT**					
23.1	23.5		RK	sc	a	Broken zone of sericite-chlorite altered rock and puggy clay.					
23.5	24.3		RK	sc si	a	Broken zone, with some 5-0cm fragments, but no puggy clay. Fragments are silica banded sericite-chlorite altered rock, and also bear white carbonate blebs, usually associated with the quartz (possibly veining rather than cherty bands). Dark green chlorite coats many of the breaks along the fabric.	23.9	CV	35°		
24.3	**28.6**	**HOTS**				**HOST - TRACE SULPHIDES**					

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81957	71.5	73.0	1.5	0.1	0.1	0.01	1	0.1	1.4	3
	Total Length:		70.0							

Standards

Reference Values for:	HBM-02					17/07/98		
	3.4	12.5	0.46	150	1.3	22.7		
Variances Allowed:	20%	20%	30%	20%	20%	20%		
81920 Inserted @ 33.4m	3.8	14.9	0.49	165	1.2	22.9	Y	

Weighted Averages

From	To	Length	Pb	Zn	Cu	Ag	Au	Fe	TMU
28.0	33.4	5.4	21.3	26.0	2.55	114	11.2	3.5	593
28.6	33.4	4.8	23.9	28.6	2.83	127	12.6	3.8	658

Hole No: **009B**

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
24.3	27.0		SL ST	sc sc	b	Dark matte greeny-grey, sericite-chlorite-pyrite altered thinly bedded/banded siltstone/shale. First 20cm is cherty. Bands, where distinguishable in unit, are 4-10mm in size (some areas are more finely laminated, or appear massive). Some fine grained disseminated pyrite bands seem conformable with surrounding laminations. Banding often disrupted (usually <1cm, occasionally greater) by cross cutting sulphide veinlets and thin fractures; also shows some disruptions that are more major faults/folding or are the result of soft-sediment deformation. Most banding runs close to CA. Sulphide veinlets (usually 1-2mm) consist of sphalerite+/-galena+sulphide mix?+dark grey ?silica, and run in a branch-like 'fracture pattern' with some arms running at a high angle to CA, while others brach off at around 40 degrees. Pyrite bands present, but mostly seem to sit close to sedimentary banding (diagenetic?). Core of moderate competency - minor broken zone in first 50cm of unit.	25.5 25.5 25.5 25.5	BD VN VN VN	10° 29° 40° 69°													
27.0	28.6		CH ST	 si	a	White and light grey, heavily silicified, banded/laminated cherty rock/siltstone. Unit is veined by thin sphalerite (yellow-brown to reddy-brown)-galena-sulphide mix-quartz+/-chalcopyrite. Veins sit in two main 'conjugate' orientations - both ~35 degrees to CA. Banding sits fairly close 30 too, and some sulphide veins are following the laminations. Core competent. Some silicified fragments sitting after 38.5m Core Block, most likely have fallen down the hole. At end of unit, quickly grades into massive sulphides of next unit.	27.0 27.5 27.7	CT VN BD	79° 35° 26°													
28.6	**33.4**	**HOMS**				**HOST - MASSIVE SULPHIDES**																
28.6	33.4		CP GA SP		a	Thinly laminated/banded, massive sulphide comprised of galena, sphalerite and chalcopyrite-pyrite. Appears to have replaced silicified rock of last unit (preserved in patches, one with a sericite-chlorite band ~60 degrees to CA). Sphalerite medium brown to light brown in colour. Some unidentified black bands may be the sulphide mix of chalcopyrite and galena disease of sphalerite. Bands 1mm or so in size. Banding orientation varies considerably throughout, but it is difficult to pick exactly where the changes occur (usually in a disrupted zone where identification of banding is difficult). At 30m, disruption/truncation seems to be along a thin mm vein/shear/?joint running ~48 degrees to CA. 33-33.2m is an interval of silicified rock- no noticeable banding in this interval which surrounding sulphides might be mimicing, however at 32.8, there is an elongate cherty clast parallel to the sulphide banding. Thus unit may be following the laminations like those found in the previous unit (which were disrupted as well). Core of good copetency, moderate to poor between 31.5 and 32.5m.	30.0 30.1 31.1 31.1 32.6 33.3	JT BD JT BD BD BD	48° 16° 5° 53° 30° 70°													
33.4	**33.6**	**HOTS**				**HOST - TRACE SULPHIDES**																

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
33.4	33.6		RK VC	sc	a	Green, sericite-chlorite altered rock/volcanoclastic, on the margin of the HOMS of previous unit. Small cherty interval marks boundary with previous unit. Small (2mm) clay veinlet at 33.5m, breaks in core more orthogonal to CA than indicated by the fabric. Unit has small white and grey silicic clasts and crystal fragments, most likely volcanoclastic. Also has rare spots of sphalerite etc at base of unit. Unit of poor competency. Abrupt contact with next unit ~along cleavage.	33.4 33.5 33.5	CT CV VN	70° 61° 60°													
33.6	**35.2**	**HOTS**				**HOST - TRACE SULPHIDES**																
33.6	35.2		BR VC	cb sc	a	Unit is an extensively carbonate altered volcanoclastic breccia. Light creamy white carbonate spots can coalesce to be semi-massive, but seem to sit within bands as fairly dense spots and blobs in most places. Carbonate spots show sign of having replaced some of the clasts and crystal fragments. Matrix is a dark clorite altered fine grained rock. Unit poorly sorted, with sizes of fragments ranging from <1mm to 1cm in size. Some clasts are silicic, while others appear to have been feldspar laths. Uncommonly have .5cm clorite altered bands, without spotting. Rare small blebs and veinlets of medium brown sphalerite present. Core of moderate to poor competency.	33.7 34.6	BD VN	60° 25°													
35.2	**43.0**	**HOTS**				**HOST - TRACE SULPHIDES**																
35.2	43.0		BR CH VC	sc	b	Continuation of poorly sorted, silicic/cherty clast bearing, volcanoclastic breccia - without the extensive carbonate alteration of the previous unit. Carbonate still present as common, sometimes replacive blobs, spots etc which decrease in abundance as the unit progresses. Clast size from mm to >3-4cm, with some bands strecting across the core - bands or long clasts?. Some light pinky silicic clasts present; also may find that carbonate has altered non silicic clasts and fragments (e.g. feldspars). Uncommonly have pyrite clasts, and have occasional spots and small clasts of sphalerite etc, often associated with carbonate. Unit generally a light yellow-greeny striped dark green grey with light to medium grey cherty fragments. Thus most of unit sericite-chlorite altered. Fabric present (marked by sericite wisps mainly), with which the more elongate clasts seem to be aligned. Core of moderate-poor competency, with last 2m of poor competency, containing clay patches (small 10cm zone at 41m), and common broken patches (with stronger dark-green chlorite alteration) amongst zones of 5-10cm core pieces (quite broken 42.4-42.7m - fault?). Core orient at 41.5m. Orientated measurement - sericite-wisps and banding dip 56-58 degrees West, strike ~150-330.	37.0 40.4 42.8	CV CV CV	60° 35° 56°													
43.0	**44.6**	**HOTS**				**HOST - TRACE SULPHIDES**																

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
43.0	44.6		RK	si	a	Light cream with patchy medium grey, silicified rock. Has faint greenish bands which are mildly sericite-chlorite altered. Has strong HOTS of quartz-sphalerite(dark brown)+/-galena+/-pyrite, rimmed by the black sulphide-mix veinlets which run sub-parallel to the banding (some discontinuous wisps run conjugate too). Also have spots and blebs of sphalerite etc throughout. Some disseminated pyrite cubes and fine grained pyrite bands at 44.3-44.5m. Core of good to moderate competency.	43.3 43.6 43.8 44.5 44.5	BD VN VN VN BD	40° 40° 46° 36° 41°													
44.6	**46.0**	**F**				**FAULT**																
44.6	46.0		RK	sc si	a	Broken zone of fragments similar to previous unit, however are significantly more sericite-chlorite altered. Last half of unit begins to show small chlorite-sericite pseudo-fiamme, most likely fractured version of next unit. Many fractures have a thin paste of fine grained ?galena (gun metal coloured, could be the sulphide mix) coating them. Fracture orientation, either close to CA or sometimes at a high angle. Quartz veining strong in last half of unit. Silica rich fragments appear pitted - some clasts appear to have weathered out. Some spots and blebs of sphalerite etc also present; hard to pick out their preferred orientation. Disseminated pyrite associated with sericite-chlorite wisps, veinlets and zones.	44.9 45.1	VN CV	12° 55°													
46.0	**53.2**	**HOTS**				**HOST - TRACE SULPHIDES**																
46.0	53.2		PU RK	cl si	a	Dull light brown coloured, moderately silicified rock, with common, but spaced, thin dark green chlorite pseudo-fiamme (1-20mm wide). Rock possibly a pumice breccia. Have a small zone of chlorite-sericite alteration present at 50.2m. Browny-yellow carbonate wisps are common (blobs and spots not uncommon too), some run with the dominant fabric (pseudo-fiamme defined - cleavage? or primary bedding? - called cleavage in structures entry), some run far closer to CA. Unit also carries common thin veinlets and wisps of gun metal sulphide, and spots and blebs of the same +/-sphalerite+/-chalcopyrite, which are sometimes associated with quartz veining. Blebs generally run with the pseudo-fiamme fabric. The veinlets often run close to CA, and some fractures develop along these (and are thus coated in the gun-metal sulphide - possibly galena or chalcopyrite-galena disease of sphalerite). Unit of variable competency, with long sticks interspersed by quite broken zones. Some broken patches are 47.5-48m, and the last metre of the unit.	48.7 48.7 50.8 51.8	JT CV CV VN	14° 50° 52° 6°													
53.2	**64.7**	**HOTS**				**HOST - TRACE SULPHIDES**																

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
53.2	64.7		PU RK	cl cb si	a	As in last unit but: pseduo-fiamme are a lighter, brighter green; carbonate blebs and spots and wisps very strong to ~61m (generally conformable with the pseudo-fiamme fabric - marked cleavage in structures entry) becoming common discrete veins thereafter; much scarcer veinlets and blebs of sulphide , especially after first few metres; possbly cherty clasts in first few metres of unit. Carbonate looks to have replaced earlier fragments - some carbonate looks feldspar lath-like, or suspiciously rounded/clast like. Carbonate also pitted, sometimes by sub-parallel streaks which run against the fabric. 5cm carbonate vein with brecciated silicic fragments at 64.6m Cherty fragments are present in the first few metres of the unit; difficult to say if disrupted veining, or clasts. Most of the sulphide blebs are associated with the quartz bands and 'clasts'. Core generally competent with small intervals of rubble often adjacent to core blocks e.g. 56.5-56.7m, possibly rubble which has fallen from higher up. 10-20cm core loss 56.5-58.2m. Core orient at 56.5m. Orientated measurements 56.5m: chlorite vein, dip 6-8 degrees West, strike ~165-345; Banding/cleavage ~vertical, striking NNW-SSE (very vague in orientated piece available).	54.9 59.4 63.5 64.6	CV CV CV VN	42° 39° 47° 54°													
64.7	**67.4**	**F**				**FAULT**																
64.7	67.4		PU RK	cl si	a	Fairly broken zone of material similar to last unit. Most pieces 5-10cm in length, separated by patches of finer material. Carbonate spotting heavy in places. Most breaks close to CA. Fractures coated by dark chlorite. Occasional quartz-carbonate+/-sphalerite veins present.	66.1	JT	4°													
67.4	**68.5**	**HO**				**HOST SEQUENCE**																
67.4	68.5		PU RK	cl si	b	As in unit preceding fault, except fiamme are rarer, and carbonate fairly absent as well. Core competent.																
68.5	**73.0**	**HO**				**HOST SEQUENCE**																
68.5	73.0		PU RK	cl cb si	a	EOH 73m. Silic rock with chlorite altered pseudo-fiamme and heavy yellow-white carbonate (+/-quartz) veining (up to 3cm wide, most quite thin) and carbonate spotting - generally with the fabric. Some of the veins are brittle. Fabric marked as cleavage, but could be primary bedding. Core competent.	70.1 71.0 71.1	CV VN CV	55° 55° 62°													

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 010B **Location:** Southern Trenches

Objective: Extend ore from STRC5 and 009B slightly North and Up-dip.

Result: Success. 29-32.9 m 6.4%Pb, 9.2%Zn, 0.98%Cu, 32g/t Ag, 1.1g/t Au, 9.7%Fe, $178TMU. Despite triple tube, large % core loss in this zone.

Depth	Direct	Dip	Depth	Direct	Dip	Depth	Direct	Dip	Depth	Direct	Dip
0.0	276.0	-50.0									
35.0	275.0	-48.2									
60.0	274.5	-47.1									
94.0	275.0	-46.0									
120.0	274.0	-46.0									
120.2	274.0	-46.0									

Planned Direction: 280°
Planned Dip: -50°
Planned Depth: 70.0 m
Planned Northing: 4408 m N
Planned Easting: 4653 m E
Planned Collar R.L.: 422 m RL

Drilling Commenced: 10/07/98
Drilling Completed: 15/07/98
Actual Depth: 120.2 m
Surveyed Northing: 4409.40 m N
Surveyed Easting: 4651.10 m E
Surveyed Collar R.L.: 421.80 m RL

Date Logged: 29-Jul-1998
Logged By: Michael Whitbread
Hole Size: HQ
Hole Category: Other
Grouted:

Date Log Verified: 25-Sep-1998
Verified By: Michael Whitbread

Summary Log:
Hole ~5 degrees Az off plan.
0-4m NC; -15.9m Hots; -21.2m F; -23.9m Hots; -24.8m Ho;
-29m F; -31.9 HOSM (F); -32.9m HODS (F); -35.2m Hots (F?);
-57.9m Hots; -73m Ho; -91.8m Hots;
-107m Ho;
-116.7m ROSEBERY FAULT
-120.2m Ho.EOH 120.2m.

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°
0.0	**4.0**	**NC**				**NO CORE**			
0.0	4.0		NC		a	No core.			
4.0	**12.7**	**HOTS**				**HOST - TRACE SULPHIDES**			
4.0	8.0		RK	cs cy si	a	Lightly weathered, medium to dark grey, patchily silicified and generally moderately chlorite-sericite altered rock. Contains numerous white clayey spots, and flecks. These may be carbonate (now weathered) after former phenocrysts or laths and many are partially to completely weathered, leaving a pitted surface. Intensity of spotting varies. After about 6.3m unit crossed by common sericite wisps and veinlets ~62 degrees to CA (though can be close to CA in places). Some uncommon sulphide remnants remain - as isolated spots and blebs (often associated with carbonate), or as veinlets/fractures. Veinlets can run close to CA, near orthogonal to CA, or close to the sericitic wisp orientation. Sulphide present as dark fine grained mass - possibly galena or chalcopyrite-galena disease of sphalerite. Commonly breaks are along the joints/fractures close to CA. Competency is poor to bad. 6-8m is reasonable, prior to that is fairly rubbly and broken. 0.1m core loss to 5m.	6.5 7.1	CV CV	62° 59°

RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
4.0	NC	81958	4.0	5.0	1.0	0.1	0.1	0.01	1	0.1	0.9	3
5.6	18	81959	5.0	6.0	1.0	0.1	0.1	0.01	1	0.1	0.9	3
8.0	83	81960	6.0	7.0	1.0	0.1	0.1	0.01	1	0.1	0.5	3
20.3	21	81961	7.0	8.0	1.0	0.1	0.1	0.01	1	0.1	0.6	3
24.8	71	81962	8.0	9.0	1.0	0.1	0.1	0.01	1	0.1	0.4	3
26.7	0	81963	9.0	10.0	1.0	0.1	0.1	0.01	1	0.1	0.6	3
27.4	100	81964	10.0	11.0	1.0	0.1	0.4	0.01	1	0.1	0.2	7
33.7	14	81965	11.0	12.7	1.7	0.3	0.6	0.03	1	0.1	0.4	11
34.3	83	81966	12.7	14.0	1.3	0.1	0.2	0.10	1	0.1	0.6	5
36.0	17	81967	14.0	15.0	1.0	0.1	0.3	0.03	1	0.1	0.8	6
41.7	80	81968	15.0	15.9	0.9	0.1	0.1	0.03	1	0.1	1.3	3
42.0	0	81969	15.9	16.7	0.8	0.1	0.1	0.01	1	0.1	0.7	3
45.8	76	81970	16.7	17.6	0.9	0.2	0.3	0.01	1	0.1	0.7	6
46.8	10	81971	17.6	18.7	1.1	0.7	0.8	0.03	1	0.1	1.8	15
48.6	77	81972	18.7	20.4	1.7	0.9	1.1	0.06	10	0.2	1.3	23
49.0	0	81973	20.4	21.2	0.8	0.6	2.2	0.06	7	0.1	1.9	34
49.3	100	81974	21.2	21.9	0.7	0.4	1.3	0.04	4	0.1	1.4	21
51.2	15	81975	21.9	22.9	1.0	0.1	1.3	0.08	4	0.1	1.0	20
52.1	88	81976	22.9	23.9	1.0	0.1	0.3	0.03	1	0.1	1.3	6
57.7	25	81977	23.9	24.8	0.9	0.2	0.7	0.03	1	0.1	1.9	11
60.5	71	81978	24.8	26.7	1.9	0.2	1.5	0.02	1	0.1	2.4	22
64.1	25	81979	26.7	27.4	0.7	0.5	3.6	0.15	5	0.2	6.4	54

Hole No: 010B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description
8.0	12.7		CH RK	cb se si	a	Lightly weathered - bleached. Light dull yellow-green and medium grey unit. Similar to previous unit except more strongly sericite wisped/cleaved, also with stronger whitish ?carbonate spotting-alteration. Carbonate spotty aggregates/blobs can be 3cm wide - possibly replacement of a former clast. Sulphide content up - veinlets occur, but spots and blebs are common, often associated-with/rimmed-by the alleged carbonate (some spots partially or completely weathered). Sulphide assemblage is sphalerite (dark brown) rimmed by dark fine grained material+/-pyrite+/-chalcopyrite. Cherty fragments become obvious in last 1m or so of unit - is unit an altered cherty volcanoclastic breccia? Unit fairly broken throughout - fault? Core orient at 8m. Unmarked core loss throughout esp 9.5-11m and 11-14m (maybe 1m in total). Samples from 10-11m and 12.7-14m assumed to take up the loss (81964 and 81966). Orientated measurement - ~8m, Fracture/cleavage (near to CA) dip 66-68 degrees north, strike ~E-W. Fracture (core break) dip 40 degrees North, strike ~E-W. Wispy cleavage (near orthogonal to CA), sub-horizontal. Mineralised Fracture dip 68 degrees East, strike ~190-010.
12.7	**15.9**	**HOTS**				**HOST - TRACE SULPHIDES**
12.7	15.9		BR CH RK	sc	a	Light pale greenish-grey coloured rock. Looks to be a more completely altered version of previous unit - has small whitish patches (up 3cm across) of silica and carbonate +/-sulphides (assemblage as before) in the first few metres of the unit. Contains occasional silica 'clasts' up to a few cm in size within the sericite-chlorite matrix. The matrix is occasionally flecked by white sericite, marking a fabric. Fabric marked elsewhere by sericite wisps and veinlets and vague alignment of silicic clasts. Rare pyrite clasts/spots are present. Thin (1-2mm) Quartz+/- "-sphalerite+sulphide-mix+/-pyrite+/-chalcopyrite" veins and blebs common. Many of these veinlets sit close to CA. Core of moderate to poor competency. Most pieces 5-10cm in length. Core orient at 14m. Orientated measurements at 14m. Weak break/fracture/?cleavage dip 78-80 degrees East, 160-340 strike. Veining (close to CA) dip 56-58 degrees South, ~080-260 strike.
15.9	**18.7**	**F**				**FAULT**
15.9	18.7		BR CH RK	sc	a	Broken version of previous unit, poorer in silica intervals. 0.5m loss to 17.9m and 0.2m loss to 18.7m
18.7	**21.2**	**F**				**FAULT**

@ Depth	Feature	LCA Deg°
9.8	CV	71°
9.9	CV	65°
14.4	CV	55°
14.9	VN	7°
14.9	JT	11°
15.5	CV	59°

RQD To (m)	RQD %
90.2	90
91.5	38
93.0	73
93.7	42
97.5	71
99.0	6
100.3	69
103.1	17
104.9	66
118.2	7
120.2	85

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
81980	27.4	29.0	1.6	0.1	1.0	0.03	1	0.1	2.0	15
81981	29.0	31.0	2.0	5.7	8.9	0.96	34	1.2	14.4	172
81982	31.0	31.9	0.9	9.9	10.2	1.40	37	0.8	6.2	212
81983	31.9	32.9	0.9	4.3	8.9	0.59	24	1.0	3.1	157
81984	32.9	34.3	1.4	0.3	1.6	0.06	7	0.1	0.9	25
81985	34.3	35.2	0.9	1.2	0.1	0.01	5	1.2	0.5	19
81986	35.2	36.0	0.8	0.5	0.4	0.01	1	0.1	0.5	9
81987	36.0	37.0	1.0	0.1	0.3	0.01	1	0.1	0.7	6
81988	37.0	38.0	1.0	0.1	0.6	0.01	1	0.1	0.9	9
81989	38.0	39.0	1.0	0.1	0.3	0.01	1	0.1	0.8	6
81990	39.0	40.0	1.0	0.2	1.1	0.03	1	0.1	0.9	17
81991	40.0	41.0	1.0	0.1	0.6	0.01	1	0.1	0.8	9
81992	41.0	42.0	1.0	0.2	0.3	0.02	1	0.1	0.5	6
81993	42.0	43.0	1.0	0.1	0.1	0.02	1	0.1	0.3	3
81994	43.0	44.0	1.0	0.1	0.4	0.03	1	0.1	0.4	7
81995	44.0	45.0	1.0	0.1	0.1	0.02	1	0.1	0.3	3
81996	45.0	46.0	1.0	0.1	0.1	0.01	1	0.1	0.3	3
81997	46.0	47.0	1.0	0.1	0.1	0.01	1	0.1	0.3	3
81998	47.0	48.0	1.0	0.1	0.1	0.01	1	0.1	0.3	3
81999	48.0	49.0	1.0	0.1	0.1	0.01	1	0.1	0.3	3
82000	49.0	50.0	1.0	0.1	0.1	0.01	1	0.1	0.3	3
97001	50.0	51.0	1.0	0.1	0.1	0.01	1	0.1	0.4	3
97002	51.0	52.0	1.0	0.1	0.1	0.01	1	0.1	0.3	3
97003	52.0	53.0	1.0	0.1	0.1	0.01	1	0.1	0.3	3
97004	53.0	54.0	1.0	0.1	0.1	0.01	1	0.1	0.3	3
97005	54.0	55.0	1.0	0.1	0.1	0.01	1	0.1	0.3	3
97006	55.0	56.0	1.0	0.1	0.1	0.01	1	0.1	0.2	3
97007	56.0	57.0	1.0	0.2	0.1	0.01	1	0.1	0.3	3
97008	57.0	57.9	0.9	0.2	0.5	0.02	1	0.1	0.7	9
97009	57.9	59.0	1.1	0.1	0.1	0.01	1	0.1	0.4	3
97010	59.0	60.0	1.0	0.1	0.1	0.01	1	0.1	0.5	3
97011	60.0	61.0	1.0	0.1	0.1	0.01	1	0.1	0.5	3
97012	61.0	61.8	0.8	0.1	0.1	0.01	1	0.1	0.3	3
97013	61.8	62.8	1.0	0.1	0.1	0.01	1	0.1	0.4	3
97014	62.8	64.0	1.2	0.1	0.1	0.01	1	0.1	0.6	3
97015	64.0	65.0	1.0	0.1	0.1	0.01	1	0.1	0.9	3
97017	65.0	66.0	1.0	0.1	0.2	0.02	1	0.1	1.0	4
97018	66.0	67.0	1.0	0.1	0.1	0.01	1	0.1	0.8	3
97019	67.0	68.0	1.0	0.1	0.1	0.01	1	0.1	0.7	3
97020	68.0	69.0	1.0	0.1	0.1	0.01	1	0.1	1.5	3
97021	69.0	70.0	1.0	0.1	0.1	0.02	1	0.1	1.0	3
97022	70.0	71.0	1.0	0.1	0.1	0.01	1	0.1	1.8	3
97023	71.0	72.0	1.0	0.1	0.1	0.01	1	0.1	1.3	3
97024	72.0	73.0	1.0	0.1	0.1	0.01	1	0.1	1.2	3
97025	73.0	74.0	1.0	0.1	0.1	0.01	1	0.1	1.5	3
97026	74.0	75.0	1.0	0.1	0.1	0.01	1	0.1	0.9	3
97027	75.0	76.0	1.0	0.1	0.1	0.01	1	0.1	0.9	3

Hole No: 010B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
18.7	21.2		BR ST	sc si	a	Broken zone of medium grey, occasionally dull-green-grey, moderately silicified fine sandstone and siltstone/chert, with sporadic greeny sericite-chlorite bands and patches of alteration. Some of the latter altered patches can appear to be breccias of chert material; still difficult to say if sericite-chlorite alteration is generating the texture, or has merely replaced the fine grained matrix of an existing cherty-breccia. Cherty zones contain numerous thin quartz wisps. Spots, blebs and wisps of sphalerite common, with medium brown sphalerite more dominant and visible than previously - otherwise assemblage as before. Veins generally ~close to CA or near orthogonal to it. Unmarked core loss (10cm or so in each zone is likely). Competency begins to improve after 20.4m.	19.6 19.8 20.6 20.9	BD VN VN JT	55° 80° 26° 4°		
21.2	**23.9**	**HOTS**				**HOST - TRACE SULPHIDES**					
21.2	21.9		ST	sc si	a	Less broken version of previous unit.	21.3	VN	27°		
21.9	23.9		ST	qb si	b	Light grey, silicified sandstone-siltstone/rock as previous, but without the bands and zones of soft greeny sericite-chlorite alteration. This unit is splotched with creamy light yellow patches and bands of ?silica-?carbonate, which are possibly clasts. These have irregular, but often sub-rounded boundaries. Some are more cherty grey and are partially replaced by fine grained pyrite. Green chlorite swirls become common in last 80cm of unit, and creamy patches die out. Unit carries occasional blebs of sphalerite+sulphide mix, much less than previous lithology. Unit has strong hair thin quartz wisps throughout. These criss-cross, and it is difficult to pick a fabric. Unit competent.	22.0	BD	47°		
23.9	**24.8**	**HO**				**HOST SEQUENCE**					
23.9	24.8		CH RK	cs si	a	Dull yellowy-green, strongly chlorite-sericite altered rock, contain occasionally rounded silica clasts (3mm-3cm). Last 15-20cm is silicified (similar to previous units). Rare sulphide spots in silica rich part (pyrite, rare sphalerite and sulphide-mix). Unit has strong banding/fabric (dark verus lighter bands, and vague clast orientation). Core of moderate competency.	24.1 24.7	BD JT	70° 8°		
24.8	**29.0**	**F**				**FAULT**					
24.8	26.7		RK	sc si	a	Broken cherty bearing and banded material, similar to previous unit. 0.6m loss to 25.8, 0.7 further loss to 26.7m. Some stronger sericite alteration (with ?carbonate) present (light yellow-green fragments). Some pyrite and other fine grained dark sulphides present on breaks. Also some Dark chlorite altered fragments in last 20cm or so, and dark-green chlorite found on some breaks.					

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
97028	76.0	77.0	1.0	0.1	0.2	0.03	1	0.1	1.1	4
97029	77.0	78.0	1.0	0.1	0.1	0.03	1	0.1	1.1	3
97030	78.0	79.5	1.5	0.1	0.1	0.03	1	0.1	1.0	3
97031	79.5	80.5	1.0	0.1	0.1	0.01	1	0.1	3.6	3
97032	80.5	81.9	1.4	0.1	0.1	0.15	1	0.1	4.3	5
97033	81.9	83.0	1.1	0.1	0.1	0.01	1	0.1	2.5	3
97034	83.0	83.7	0.7	0.1	0.1	0.01	1	0.1	2.4	3
97035	83.7	85.0	1.3	0.1	0.1	0.01	1	0.1	3.6	3
97036	85.0	86.0	1.0	0.1	0.1	0.01	1	0.1	4.1	3
97037	86.0	87.0	1.0	0.1	0.1	0.01	1	0.1	5.0	3
97038	87.0	88.0	1.0	0.1	0.1	0.01	1	0.1	4.6	3
97039	88.0	89.0	1.0	0.1	0.1	0.01	1	0.1	5.2	3
97040	89.0	90.0	1.0	0.1	0.1	0.01	1	0.1	4.1	3
97041	90.0	91.0	1.0	0.1	0.1	0.01	1	0.1	3.4	3
97042	91.0	91.8	0.8	0.1	0.1	0.01	1	0.1	2.2	3
97043	91.8	92.8	1.0	0.1	0.1	0.01	1	0.1	1.2	3
97044	92.8	93.6	0.8	0.1	0.1	0.01	1	0.1	1.4	3
97045	93.6	93.8	0.2	0.1	0.1	0.01	1	0.1	1.4	3
97046	93.8	95.0	1.2	0.2	0.1	0.01	1	0.1	2.0	3
97047	95.0	96.6	1.6	0.2	0.3	0.01	1	0.1	2.1	6
97048	96.6	97.5	0.9	0.1	0.4	0.01	1	0.1	3.6	7
97049	97.5	98.5	1.0	0.2	0.8	0.01	1	0.1	3.4	13
97050	98.5	99.5	1.0	0.2	0.8	0.01	1	0.1	4.4	13
97051	99.5	100.5	1.0	0.1	0.6	0.01	1	0.1	3.5	9
97052	100.5	101.9	1.4	0.1	0.7	0.01	1	0.1	3.3	11
97053	101.9	103.0	1.1	0.1	0.2	0.01	1	0.1	2.2	4
97054	103.0	104.0	1.0	0.1	0.1	0.01	1	0.1	1.3	3
97055	104.0	104.9	0.9	0.1	0.1	0.01	1	0.1	1.4	3
97056	104.9	106.0	1.1	0.1	0.1	0.01	1	0.1	1.3	3
97057	106.0	107.0	1.0	0.1	0.1	0.01	1	0.1	1.4	3
97058	107.6	108.8	1.2	0.1	0.1	0.01	1	0.1	1.5	3
97059	108.8	110.0	1.2	0.2	0.2	0.01	1	0.1	3.7	5
97060	110.0	111.1	1.1	0.2	1.1	0.05	6	0.1	3.9	18
97061	111.1	112.8	1.7	0.1	0.1	0.01	1	0.1	3.4	3
97062	112.8	114.2	1.4	0.1	0.1	0.01	1	0.1	3.7	3
97063	114.2	115.0	0.8	0.1	0.1	0.01	1	0.1	4.1	3
97064	115.0	116.7	1.7	0.1	0.1	0.01	1	0.1	4.5	3
97065	116.7	117.6	0.9	0.1	0.1	0.01	1	0.1	4.2	3
97066	117.6	118.6	1.0	0.1	0.1	0.01	1	0.1	3.0	3
97067	118.6	120.2	1.6	0.1	0.1	0.01	1	0.1	2.9	3
		Total Length:	115.6							

Standards

	Pb	Zn	Cu	Ag	Au	Fe	
Reference Values for: HBM-02					17/07/98		
	3.4	12.5	0.46	150	1.3	22.7	
Variances Allowed:	20%	20%	30%	20%	20%	20%	
97016 Inserted @ 65.0m	3.8	14.9	0.49	160	1.5	22.8	Y

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
26.7	27.4		RK	sb	a	Competent zone of light yellowy coloured rock, stongly sericite-?carbonate altered. Contain bands (up to 1cm) of fine to medium grained pyrite,and a couple of quartz-sphalerite-sulphide mix-pyrite veins - one lacks quartz and seems to contain chlorite. Unit also has small dark spots, which may be fine grained sulphide or unaltered host. Some fractures and cavities present - after sulphide veining most likely. Unit competent.	26.8 26.9 26.9 27.3 27.3	JT JT VN VN VN	5° 44° 29° 23° 47°		
27.4	29.0		CH RK	 sc	a	Zone of broken fragments, mainly of cherty/silicic clasts bearing sericite-chlorite altered rock. Occasional minor fine grained pyrite blebs, and rare sphalerite spots. 1m core loss before 29m, possibly lost some of the mineralisation of the next unit.					
29.0	**31.9**	**HOSM**				**HOST - SEMI-MASSIVE SULPHIDES**					
29.0	31.9		BR CH GA PY	sc	a	Broken zone of semi massive to massive sulphides, most likely after a cherty breccia. Sulphides are pyrite dominant to ~30.7m, after which galena/sulphide mix with lesser sphalerite becomes important. Assemblage is: fine to medium grained pyrite, followed by a fine grained black sulphide mass, medium grained galena and sphalerite with lesser chalcopyrite. Sulphides mainly as bands and blobs, usually in the matrix around, or fractures within, the silicic clasts (1-3cm in size). Sphalerite usually occurs as 2-5mm blebs within galena and/or the black sulphide mix. Chalcopyrite usually present on the peripheries of sphalerite-galena etc masses, but is also present as brighter yellow coloured tinges in pyrite masses. After 31.3m, it is difficult to identify cherty clasts, but the sulphides seem to be as veins-bands, accompanied/bordered by chlorite-sericite. Pyrite also present as uncommon 1-2cm clasts (or has replaced them). Streaks of sericite are occasionally present throughout. Some evidence of quartz veining inside some of these sulphide veins. Unit fairly strongly banded (?cleavage) ~50 degrees to CA. Unit contains numerous pits and cavities (1-3mm wide, 1-2cm long, some up to 1cm wide and 2-3cm long, 2-3cm deep), most likely after sulphide (probably sphalerite), and are usually rimmed by black sulphide mix or pyrite. There is extensive core loss in this zone, despite triple tubing, the driller thinks that there weren't cavities, merely that the material was washing away during drilling. Some pieces 5-10cm in length, however there 1m core loss 29-30.2m; 0.3m core loss to 31.3m. Possibly 10-20cm loss to 31.8m. 81981 is believed to have taken up 1-1.3m core loss.	30.4 30.9 31.6	BD BD VN	50° 53° 66°		
31.9	**32.9**	**HODS**				**HOST - DISSEMINATED SULPHIDES**					

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
Weighted Averages										
	29.0	32.9	3.9	6.4	9.2	0.98	32	1.1	9.7	178

Hole No: 010B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
31.9	32.9		CH RK	sc si	a	Essentially HODS version of previous. Silic intervals and cherty fragments commonly present. Where not mineralised, matrix is speckled sericite+/-?chlorite altered. Hair like quartz veinlets are present within one of the sericite zones which contains a folded or breccia type quartz+sphalerite-mix-pyrite vein (.5-2cm). Once again, sulphides present, either in the matrix, or as discrete bands/veins, often accompanied by sericite-chlorite. Unit is quite broken. Plenty of rubble in this and the last unit around the core blocks, beware contamination from uphole. Possible 10cm or so core loss.	32.5 32.8	BD JT	47° 35°													
32.9	**35.2**	**HOTS**				**HOST - TRACE SULPHIDES**																
32.9	35.2		RK	se si	a	Dull-greenish grey, essentially a broken zone of silicic rock, pervasively altered by sericite. Worst breaks from 34.2-35.2m (70cm core loss). Sericite mainly visible as strong wisps, (marking a fabric). Some zones are still quite silicified esp 34.3-~35.2 (70cm core loss in this zone). Some small, thin (2-3mm) blebs and discontinuous veinlets of sphalerite-mix etc, which may or may not be accompanied by quartz. These may run ~ with the fabric, against it, or close to CA. Slight oxidation on some joint surfaces.	33.7	CV	54°													
35.2	**57.9**	**HOTS**				**HOST - TRACE SULPHIDES**																
35.2	42.0		BR RK	sc si	a	Dull greenish-light grey, varibly sericite-chlorite altered, patchily silicified, silicified clast and chloritic wisp bearing, breccia/rock. Silic clasts vary from rounded to sub angular and elongate, may be 5mm to 3-4cm in size - some have white carbonate within them (disrupted quartz-carbonate veining?). One is folded, or the hinge of a fold (or possibly a folded vein). Silica clasts become less identifiable after 38-39m, and discontinuous thin (2-5mm wide) elongate chlorite blebs and wisps appear. Looks to be more of an incipient brecciation and alteration of silicified rock (as against the matrix supported nature earlier on). Unit contains common blebs and wisps of sphalerite-mix, plus specks of pyrite+/-chalcopyrite. These are often associated with the silicified intevals/clasts and are variably orientated (pretty much the same orientations as in last unit). Some appear to have been partially washed out. Sericite (and lesser sericite-chlorite) mark a fabric, with some strong banding of these present at 38-38.3m. Core orient at 38m. Generally competent, small broken zone 35.5-35.7 (possibly from up hole), and minor breaks around 39 and 40m. Occasional joints run close to CA, slight oxidation present on these. Orientated measurements 37.8m - fracture (thin - close to CA), dip 52-54 degrees North, strike ~80-260. 38m - banding (sericite-chlorite)dip 42-44 degrees North, strike 100-280. Faint fractures and breaks - dip 78-80 degrees East, strike 160-340.	36.3 38.0 38.0 40.7	JT CV CV BD	4° 42° 50° 55°													

Hole No: 010B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
42.0	57.9		BR PU	cb se si cl	a	Similar to last half of last unit - silicified rock/breccia, with common chlorite pseudo-fiamme (pumice? or alteration?) and carbonate spots. Breccia fairly clast supported. Some sericite alteration interspersed with the silica fragments (angular, 3-10cmm in size, elongate 3-4cm long 3-10mm wide) and pseudo-fiamme. Carbonate very common, as blobs and spots associated with the quartz fragments, and as fracture fill within silicic clasts. Surface of core is extensively pitted, could be after sericite, carbonate, chlorite, weathered out silicic fragments, who knows. Also have thin fractures (usually within silicic intervals) washed/weathered out, most likely after carbonate fill. Sulphides rare, with some pyrite lining cavities, or some black fine grained sulphide on joint surfaces. Very weak oxidation on rare surfaces. Fabric difficult to pick in most places - long pseudo fiamme, elongate silicic fragments and sericite wisps define it best - cleavage or bedding? Core of moderate to poor competency - fairly broken interval 48.3-51.2m (first and last 20cm are worst). 30cm loss to 48.6 and 10cm loss to 49.8m. Many breaks along joints close to CA.	45.5 50.0 51.0 53.6 57.8	CV JT JT JT CV	50° 25° 12° 17° 55°													
57.9	**73.0**	**HO**				**HOST SEQUENCE**																
57.9	61.8		RK	cl si	a	More massive (cf brecciated last unit), dull-greenish light grey, silicified rock with occasional chlorite wisps/pseudo fiamme. Some disseminated 1-2mm yellow carbonate spots (and pits after these), but not as intense as last unit. Occasional sericite wisps present. Brittle yellow-brown (oxidised?) carbonate vein (1-2cm wide) at 58.5m. Uncommon thin quartz veins present. Possibly a weak fabric marked by occasional sericite wisps and chlorite wisps. Unit fairly broken after 60.6m. Possibly 40cm core loss after 61.4 (ie 61.4-62.8 - 40cm core loss). Core orient at 59m. Orientated measurement at 59m - 'Pumice' banding, dip 84 degrees East, strike 190-010. Quartz vein, dip 38-40 degrees North, ~060(070)-240(250) strike. Other ?quartz wisps near vertical, ~E-W strike. Mineralised sub-horizontal break - ~~25 degrees west, 120(140)-300(320).	58.5 59.4 60.2 60.3 61.6	VN CV JT CV CV	70° 58° 19° 47° 48°													
61.8	73.0		PU RK	cl cb	a	Dull grey, with vibrant medium green thin pseudo-fiamme (1-6mm wide), silicified, and patchily sericite altered rock/pumice breccia. Pseudo-fiammed very common, and brighter in colour than in previous units; usually elongate and thin. Fabric defined by them and sericite wisps. Unit also carries carbonate spots (1mm max diameter, generally), blebs and veinlets (1-2mm wide, often as quartz-carbonate), mostly sitting with the fabric. Carbonate also present as fracture fill in silic bands/clasts. Carbonate orangey brown to ~68.6m, yellow-white thereafter. Unit more obviously brecciated after 68.5m, where intense carbonate development is present. One galena bleb noted 69.4m, with carbonate-quartz veining. Core quite broken to ~64m (possible fault zone when combined with broken part of last unit). No clay or pug, fragments from 1-2cm up to 20cm in length. Core competent therafter. Some pitting and cavity development in quartz-carbonate vein rich areas. Core orient 65m. Orientated measurement at 64.6m - 'Pumice' banding and breaks, dip 78-80 degrees East, strike ~N-S. Other one at 86-88 East, strike 190-010.	66.0 71.2	BD BD	48° 60°													

Hole No: 010B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
73.0	**79.5**	**HOTS**				**HOST - TRACE SULPHIDES**																
73.0	79.5		PU RK	cs cb si	a	As in last unit, but chlorite pseudo-fiamme are less common. Thin and pale, chlorite-sericite zones are present between silicic 'clasts' but do not appear 'fiamme' like, and often are not strongly visible. Sericite-chlorite wisps occasionally present. Silic clast size 2mm-3cm in size, and may have irregular, elongate or rounded shapes. Carbonate spotting etc uncommon in first couple of metres, reasonably strong thereafter (white colouration). 2-10mm carbonate veins become more prominent in the latter zone as well. Uncommon blebs and spots of galena, black sulphide-mix and pyrite present in carbonate bearing silica intervals. Reasonably sparse disseminated pyrite cubes also present, mainly in more chlorite rich zones. Occasional joints present ~15-20 degrees to Ca, one at 76.2 has lineations down it - can't get consistent slip direction on it. Core competent. Contact with next unit a little broken.	76.2 77.4 79.2	JT BD VN	20° 66° 70°													
79.5	**91.8**	**HOTS**				**HOST - TRACE SULPHIDES**																
79.5	81.9		BR RK	cl si	a	Dark grey-black, weird looking silica chlorite altered rock/breccia (?pumice breccia). Looks to be a breccia, as can see vague ghosts of clasts and small ?crystal fragments (mm-3cm). Ghosts are lightly silicified and are of a slightly lighter hue than the dark-grey-black matrix, which is generally chlorite altered - ghosting may merely be a silica alteration effect. Difficult to pick a fabric, possibly about 70 degrees to CA. Unit heavily veined by yellow-white carbonate +/- quartz veins (mm to 1cm wide). These run either close to CA or near orthogonal to it. Uncommonly have fine grained disseminated pyrite and chalcopyrite; rare small pyrite clasts noted aswell. Core competent- minor breaks at contact with last unit. Core orient at 80m.	80.3 80.5	VN VN	6° 75°													
81.9	83.7		BR RK	cs si	a	Light coloured version of previous unit. Pinky cream coloured in last 70cm. At 82.1, have obvious breccia fabric, some rounded clasts (2cm) noted. Matrix here lighter greeny coloured (chlorite). Also have some 10cm bands between 82-83m which are quite sericite altered. Core competent.	82.1 82.6 82.7 83.5	BD VN BD VN	69° 76° 67° 12°													
83.7	91.8		BR RK	cs si	a	As in 79.5-81.9m. Some carbonate present esp 86-87m. Possibly after feldspar laths/crystals (Feldspar phyric pumice?). Carbonate-quartz veins, often show brittle textures. Around 86.1m, unit speckled with small black chlorite spots, and when coupled with sericite and carbonate wisps, form a fabric. Core competent. Core orient 86m. Orientated measurement 85.7m 1cm vein - dip 66 degrees North, strike ~110-290. Chlorite cleavage zone, dip 80 degrees East, strike ~205-025. Sericite wispy cleavage dip 70 degrees East, ~N-S strike. At 86m - cleavage and vein, 78 degrees East, strike 170-350. Carbonate vein dip 22 degrees west, ~160-340 strike. 89.5, carbonate-quartz vein ~40 degrees West, strike 140-150.	86.0 86.2 86.3 86.4 88.8 89.0 91.6 91.8	BD CV CV BD CV VN BD CT	55° 61° 45° 73° 60° 47° 75° 65°													
91.8	**93.8**	**HO**				**HOST SEQUENCE**																

Hole No: 010B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
91.8	93.6		BR RK	sc si	a	Light pinky and orangey-brown coloured silicified rock (possibly Rhyolite), with chlorite-sericite alteration. Silica parts look to be incipiently brecciated, separated by chlorite-sericite wisps etc (which are a darker green-black hue). As before, brecciation might be primary, or the result of alteration. Thin quartz carbonate veinlets common, becoming dominantly yellow carbonate in last 40cm. Vague fabric indicated by clasts and alteration. Core competent. Funny "cappucino fault pug" present at 92.4m (possibly drilling mud, gypsum or something), ground around it is pristine in competence. Core orient at 92m.	91.9 92.3 92.4 92.8 93.6	VN VN FT BD BD	22° 61° 80° 69° 58°													
93.6	93.8		RK SL	sc si	a	Possible fault. Small broken zone - fragments from units either side. Possibly 10cm core loss here.																
93.8	**103.0**	**HO**				**HOST SEQUENCE**																
93.8	96.6		BR SL VC	si sc	a	Variably black and medium to light grey, patchily silicified or silica clast bearing black shale. Looks to be a breccia of brown grey silica fragments (vary from 2-10mm clasts to 'clast supported' bands 10-20cm wide), in a dark shale matrix (usually soft). These silica zones may be rhyolitic lava fragments. Lesser sericite-chlorite alteration present in the matrix of the silica rich zones as well. Could be blobby-poddy silica alteration. However, some of the silica clast bands contain poorly sorted clast sizes and look to be coarse volcanoclastics mixed with shale. Shale dominant intervals have dominantly smaller clasts (5-10mm, few larger), but also contain occasional thin sandstone lenses and pyrite blobs. Small sphalerite wisps can be found in cracks in silicic clasts. Fabric present, especially visible in shale intervals. Some quartz-carbonate+/-chlorite+/-galena+/-sphalerite veining (5mm to 2cm) and carbonate spotting present. Core of moderate competency. Some breaks along joint close to CA.	95.4 95.6	JT BD	14° 60°													
96.6	103.0		BR SL SS	sc si	a	Black unit of shale supported breccia containing altered sandstone lamellae/lenses and clasts. Like last unit except lacking thick brown-grey silica bands. 'Clasts' are light grey, green-grey in colour and consist of silica and/or chlorite-sericite +/-carbonate; some are completely (white) carbonate altered. Sphalerite, galena etc may also be found within or completely replacing these. Clasts may be small rounded quartz fragments, to larger (2-3cm wide) isolated rounded, but elongate, blobs to bands. Sub angular 4-5cm clasts are noted near end of unit. Larger ones look like altered sandstone blobs and bands. Some appear to be disrupted quartz+/-carbonate+/-sulphide veining. Thin, continuous quartz-carbonate veins are commonly found throughout, becoming carbonate dominant towards end of unit. 10cm quartz-carbonate-chlorite vein 102.75-102.9m, contains angular shale fragments. Fabric present, marked by bands and elongate clasts and tiny ?sericite wisps. Unit of moderate competency at beginning, but becomes increasingly broken as unit progresses, often along joints close to CA.	96.6 99.3 99.5 100.1	JT BD BD BD	4° 57° 61° 51°													

Hole No: 010B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
103.0	**104.9**	**HO**				**HOST SEQUENCE**																
103.0	104.9		BR RK RY	cb sc si	a	Creamy brown, to pale greeny-grey, variably massive to brecciated silicic rock/rhyolite. Rhyolite due to rounded quartz phyric nature of fairly massive unit at 103.4m. Where brecciated, generally clast supported, occasionally matrix supported. Matrix is shaley material from previous unit at 103.1 and 103.5, but after these 5cm zones the matrix is generally sericite-chlorite altered material (perhaps after the fine matrix of an auto-brecciated rhyolite). Unit is semi-massive (dull-cream) carbonate altered 103.5-104m. Patchy replacive carbonate +/-quartz alteration present elsewhere as well. Occasional veinlets of dull carbonate-?sericite present throughout. Thin quartz veinlets in more massive parts of rhyolite. Banding present, more obvious in altered matrix rich intervals. Core moderate to poor competency (pieces 5-10cm or greater usually).	104.7	BD	58°													
104.9	**107.0**	**HO**				**HOST SEQUENCE**																
104.9	107.0		BR RK RY	cb sc si	a	As before but more broken (rubbly). Slightly more competent 106.3-106.9m. Possibly beginning of Rosebery fault.																
107.0	**116.7**	**F**				**FAULT**																
107.0	107.6		NC		a	No Core. Happy Rosebery fault!																
107.6	108.8		CY		a	Light grey clay pug. 1m of core loss. Party mode Rosebery fault.																
108.8	110.0		CY SL		a	Fragments of shale and pug. 0.7m loss. Riotous, drunken mode Rosebery fault.																
110.0	111.1		CY		a	Baby poo looking clay, sands and beuatiful slop and filth. 0.8m loss marked and loss attributed to this zone, but slop is spread over 1.3m of tray; thus diifcult to quantify loss. Rosbery fault the next morning!																
111.1	114.2		BR SL	si cy	a	Broken zone of shale carrying pale silicic clasts (as in units prior to the fault). Patch of brecciated silica+/-carbonate alterated fragments at 113-113.3m. Occasional patches quite clay altered. 0.7m loss to 113m; 0.3m loss to 114.2m.	113.6 113.6	CV CV	54° 47°													
114.2	116.7		SL	cy	a	As in last unit, but of poor to bad competency (i.e. competency is improving). Some thin sandstone bands present (2mm wide). 3cm carbonate-quartz vein at 116m. 0.6m loss to 116m; 0.1m loss to 116.6m. Possibly folding in unit.	114.5 116.4 116.5	BD BD VN	20° 55° 65°													
116.7	**120.2**	**HO**				**HOST SEQUENCE**																

Hole No: 010B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
116.7	120.2		SL		b	EOH 120.2m. Continuation of shale unit (fairly soft could be sericite altered, or just soft to begin with), carries occasional sandstone laminations and bands. Carbonate-quartz veins (0.5-3cm) and veinlets are common (generally run ~ with banding. Poor to moderate competency; improving ground. 10cm loss to 117.5m; 10cm loss to 119m. Possibly a cleavage at a closer angle to CA than sandstone banding; marked by thin wisps of sericite?	116.8 116.8 119.1	CV BD BE	38° 60° 50°													

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 011B **Location:** Brown's Tunnel 5290N Line

Objective: Verify BT2 Lens 1 intersection, and check size of pod.

Result: Pod sheared out. 24.4-26.3m 5.5%Pb, 9.6%Zn, 1.97%Cu, 41g/tAg, 1.4g/tAu, 5.5%Fe, $194TMU. 24.4-25m Fault pug. -26.3m silicified sediment.

Depth	Direct	Dip
0.0	92.0	-57.0
32.0	93.0	-56.8
45.0	93.0	-57.2

Planned Direction: 90°	Drilling Commenced: 22/09/98
Planned Dip: -57°	Drilling Completed: 26/09/98
Planned Depth: 45.0 m	Actual Depth: 45.0 m
Planned Northing: 5288 m N	Surveyed Northing: 5288.27 m N
Planned Easting: 4889 m E	Surveyed Easting: 4889.47 m E
Planned Collar R.L.: 477 m RL	Surveyed Collar R.L.: 476.42 m RL

Date Logged: 30-Sep-1998
Logged By: Michael Whitbread
Hole Size: HQ
Hole Category: other
Grouted:

Date Log Verified: 26-Nov-1998
Verified By: Michael Whitbread

Summary Log:
0-2.7m NC; -5.5m Ho; -6.0m NC; -21.3m Ho;
-25m F;
-26.3m Hosm;-32.8m Hods;-33m S;
-43.7m Hots;
-45m F. EOH

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°
0.0	**2.7**	**NC**				**NO CORE**			
0.0	2.7		NC		a	No core.			
2.7	**5.5**	**HO**				**HOST SEQUENCE**			
2.7	5.5		SA SS	cy	a	Highly weathered and oxidised core. Unit is white, to yellow white and brown in colour. Saprolite of medium to coarse grained sandstone, now fairly altered to clay minerals. Very minor quartz veinng. Iron staining common. Unit of poor competence, present as broken fragments generally under 10 and 5cm in length.	2.8	JT	32°
5.5	**6.0**	**NC**				**NO CORE**			
5.5	6.0		NC		a	No core. Perhaps like next unit, except completely washed away.			
6.0	**6.5**	**HO**				**HOST SEQUENCE**			
6.0	6.5		RK		a	Loose sand, consisting mainly of rounded quartz and ?feldspathic fragments. At least 20cm core loss.			
6.5	**11.5**	**HO**				**HOST SEQUENCE**			

RQD To (m)	RQD %
2.7	NC
15.4	79
20.8	27
21.3	100
22.2	0
28.7	86
29.3	33
32.7	76
33.0	0
34.6	75
35.0	0
37.2	72
38.7	20
39.0	100
40.9	5
42.1	83
45.0	24

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
97122	19.1	19.3	0.2	0.1	0.1	0.01	1	0.1	0.8	3
97123	19.3	20.3	1.0	0.1	0.1	0.01	1	0.1	0.7	3
97124	20.3	21.3	1.0	0.1	0.1	0.01	3	0.1	0.8	3
97125	21.3	21.8	0.5	0.2	0.1	0.38	117	0.4	9.4	31
97126	21.8	22.6	0.8	7.3	5.1	0.48	52	0.4	5.5	122
97127	22.6	23.6	1.0	0.2	0.2	0.45	3	0.1	2.0	10
97128	23.6	24.4	0.8	0.5	0.5	0.98	5	0.2	2.4	23
97129	24.4	25.0	0.6	5.5	9.3	3.52	87	2.6	10.3	223
97130	25.0	26.3	1.3	5.5	9.7	1.25	29	0.8	3.3	180
97131	26.3	27.3	1.0	0.8	1.9	0.28	14	0.1	1.6	35
97132	27.3	28.3	1.0	0.3	1.3	0.12	7	0.1	2.1	22
97133	28.3	29.5	1.2	1.0	1.0	0.11	8	0.1	1.8	22
97135	29.5	30.5	1.0	0.2	1.0	0.05	5	0.1	1.6	16
97136	30.5	31.5	1.0	0.2	0.8	0.04	1	0.1	1.5	13
97137	31.5	32.8	1.3	0.3	1.7	0.09	3	0.1	1.8	26
97138	32.8	33.0	0.2	0.2	0.4	0.02	3	0.1	3.9	8
97139	33.0	34.0	1.0	0.1	0.1	0.01	8	0.1	1.7	4
97140	34.0	35.0	1.0	0.1	0.1	0.01	1	0.1	1.3	3
97141	35.0	36.2	1.2	0.1	0.2	0.02	2	0.1	1.4	5
97142	36.2	37.2	1.0	0.1	0.4	0.01	2	0.1	1.1	7
97143	37.2	38.2	1.0	0.1	1.6	0.04	13	0.1	1.6	25
97144	38.2	39.2	1.0	0.1	0.5	0.03	3	0.1	1.3	9

Hole No: 011B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
6.5	11.5		SA SS	cy	a	Highly oxidised, white to yellow brown, medium grained sandstone/rock. Unit fairly altered to clay minerals. Very dodgy evidence (questionable quartz phenocrysts) for some pieces to be weathered rhyolite. Unit of poor competence (most pieces at or under 10cm). Some very broken zones e.g. 10-10.7m, the first 40cm of the unit (clay rich - possibly after siltstone etc). Iron staining present occasionally on breaks in core. Patchy silicification begins in last 20cm of unit, increases towards end of unit. Boundary with next unit gradational over 15cm. Some weak banding (sometimes grainsize, other times alteration; after ??) present on some pieces.	6.9 8.2 9.6	JT JT BD	40° 18° 27°		
11.5	**21.3**	**HO**				**HOST SEQUENCE**					
11.5	21.3		RK	cy si	a	Oxidised, variably pink, white and yellow brown coloured, silicified rock. Subtle grain size variations may indicate a siltstone-sandstone protolith, but these variations may also be caused by the silicification process. Unit carries numerous liesegang patterns, and contains numerous thin fractures. These fractures (generally less 0.5mm wide) are usually coloured by goethite, and can be cavitous. The orientations are varied, but may sit close to CA, 45 degrees to it, or near parallel to the joint/shears mentioned below. In rare cases some iron oxides in these fractures appear to be after sulphides; some also contain fine grained black sulphide masses. Quartz veins are sporadic in occurrence and thin where present. Occasionally have small joints/fractures/?shears (0.5-2cm in width) present which are clay rich, and have similar orientations e.g. 16m, 16.5m, 19.9m, 20.6m. Small brecciated zone (silica fragments) 19.1-19.3m - this zone is quite broken. Unit generally of moderate competency with lesser zones of poor competence. Some core loss: 20cm 19.2-20m.	12.7 16.5 19.9 20.6	JT JT JT JT	° 23° 28° 25°		
21.3	**21.8**	**F**				**FAULT**					
21.3	21.8		CY SA		a	Clay rich, but partially oxidised mess. Contact with previous unit is reasonbly sharp in terms of texture, but silicification does persists for a few cm's - roughly 40-45 degrees in orientation to CA (approximate though). Unit contains common fine to medium grained pyrite crystals in non oxidised patches - these zones may be comprised of fine grained sulphide. Unit looks to be a clay fault pug. 20cm core loss to 21.5m.					
21.8	**25.0**	**F**				**FAULT**					
21.8	22.6		CY MD		a	Soft, dark grey, sulphide bearing plasticine like mud and sand size particles as a fault pug (or mudstone?). Pyrite crystals abundant (<1mm size), some evidence of galena crystals as well. Scattered chips of oxidised rock throughout. Occasional sulphide chips (some pyrite masses, others indeterminate) impregnated into the pug. Competency bad due to softness, but core recovered fairly well.					

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
97145	39.2	40.9	1.7	0.2	0.4	0.11	6	0.2	2.9	10
97146	40.9	41.9	1.0	0.1	0.3	0.05	10	0.1	2.5	8
97147	41.9	42.9	1.0	0.3	0.7	0.07	3	0.2	2.9	14
97148	42.9	43.7	0.8	0.3	0.8	0.08	18	0.4	4.2	19
97149	43.7	45.0	1.3	0.1	0.1	0.01	1	0.1	0.7	3
	Total Length:		25.9							

Standards

		Pb	Zn	Cu	Ag	Au	Fe	
Reference Values for:	LBM-07						21/08/98	
		2.0	6.3	0.17	51	0.4	9.4	
Variances Allowed:		20%	20%	30%	20%	20%	20%	
97134	Inserted @ 29.5m	2.1	6.0	0.18	42	0.4	8.9	Y

Weighted Averages

From	To	Length	Pb	Zn	Cu	Ag	Au	Fe	TMU
21.3	32.8	11.5	1.7	2.7	0.55	20	0.4	3.0	57
21.8	26.3	4.5	3.8	5.1	1.19	28	0.7	4.2	110
23.6	26.3	2.7	4.0	6.9	1.67	30	1.0	4.6	143
24.4	26.3	1.9	5.5	9.6	1.97	41	1.4	5.5	194

TMU Parameters

Date of Parameters:	21/07/98	**Aust-US Exch. Rate:**	0.7000
Pb Metal Price (US$/t):	$525	**Pb Recovery (%):**	68.40%
Zn Metal Price (US$/t):	$1,200	**Zn Recovery (%):**	75.50%
Cu Metal Price (US$/t):	$1,750	**Cu Recovery (%):**	45.40%
Ag Metal Price (US$/oz):	$6	**Ag Recovery (%):**	70.00%
Au Metal Price (US$/oz):	$300	**Au Recovery (%):**	63.70%

Hole No: 011B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
22.6	24.4		CY MD		a	Light grey version of previous - lacking the preponderance of sulphide crystals. Some disseminated fine grained pyrite crystals about, occasional grey sulphide chips (1-2mm across - some pyrite masses, others indeterminate) impregnated into the pug. Greater proportion of sand size particles than compared with previous unit. Competency as in last unit.																
24.4	25.0		RK		a	Loose sand and mud fill, consisting of fragments of quartz, carbonate?, sulphides (pyrite, dark indeterminate and galena), and undifferentiated oxidised lithics. Maximum particle size 2mm. Overall only 50% of core recovered.																
25.0	**26.3**	**HOSM**				**HOST - SEMI-MASSIVE SULPHIDES**																
25.0	26.3		RK SS	si si	a	Medium grey, silicified rock/sandstone/siltstone containing semi-massive sulphide as blebs, veins and stringers. May go 8-10% Zn. Sulphides are dominated by medium to light brown sphalerite, dark fine grained presumably sphalerite, chalcopyrite and pyrite (sometimes mixed) and galena. Sulphides are usually fine grained, but may be coarse in larger veins The light brown sphalerite occurs as patches and round spots from 1 to 8mm in size, larger patches occur within sulphide veins. One vein at 25.4m shows internal banding parallel to vein walls. Core of poor to moderate competence. 25.1-25.3m is broken. Sulphide veins and veinlets in 3 main orientations 25 degrees, 40 and near orthogonal.	25.4 25.4	VN VN	40° 25°													
26.3	**29.5**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
26.3	29.5		RK	si	a	HODS version of previous - light grey coloured. Unit may go 4-5%Zn. Lacks the larger veins of previous unit. Sulphides as thin wisps and hairlike veinlets, and as tiny blebs - some of the latter appear to follow a fabric. Veinlet and blebs and wisp orientations vary, but around 27.7m some wisps follow a fabric which appears to be a tension fabric conjugate to the banding in the host rock (this banding is defined by finer grained cherty bands (- looks suspiciously like the cherty breccia banding further downhole). Larger veinlets may carry small quantities of coarser grained sphalerite etc with chlorite, but also have bleached margins (silica and/or sericite alteration). Core of moderate to good competency.	27.0 27.8	BD BD	30° 45°													
29.5	**32.8**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
29.5	32.8		RK	qs si	a	Light yellow-green-white version of previous unit. Perhaps some sericite alteration as is softer than previous unit. Some evidence of fabric development indicated by white flecks and elsewhere by 'banding' - difficult to say if cleavage or banding. Sulphides still as thin veinlets, spots, wisps and blebs. Some larger veinlets (5-10mm wide) sporadically present, containing brown coarser sphalerite. Core of moderate to good competency. Core orient at 31.5m. Orientated measurement, 31.6m, sulphide vein - dip 72 degrees north, strike 260-80.	29.6 31.6	BD CV	26° 45°													

Hole No: 011B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
32.8	**33.0**	**S**				**SHEAR**																
32.8	33.0		RK	si	a	Small zone of broken core, most likely after a small puggy shear. Host is cherty sediment.	32.9	SR	20°													
33.0	**36.2**	**HOTS**				**HOST - TRACE SULPHIDES**																
33.0	36.2		BR CH	sc	a	Cherty breccia, within a green sericite-chlorite+/-silica altered sandstone/siltstone matrix. Cherty fragments mainly as elongate bands 1-3cm thick which may extend wider than the core width. Chert is unevenly distributed throughout the unit. Disseminated fine grained pyrite thoughout. Rare sphalerite, dark fine grained sulphide/galena associated with cherty clasts towards end of unit. Fabric defined by clast orienation. Some cherty clasts have internal lamination sub-parallel to the clast orientations. Fabric strengthens near end of unit (cleavage?). Core of moderate to poor competency. Possibly some core loss (20cm) between 33 and 34m.	33.1 35.8	BD BD	48° 35°													
36.2	**39.2**	**HOTS**				**HOST - TRACE SULPHIDES**																
36.2	39.2		BR SH	 sc	a	Yucky yellow-green coloured, sericite-chlorite schist. Contains occasional rounded and sub-angular clasts from 2mm to 3cm in size. These are sometimes siltstone, but are generally sulphidic. The sulphides are small (1mm) dark brown rounded sphalerite cores, surrounded by black fine grained sulphide, pyrite. Some more vein-like occurences of these sulphides occur on the margins of remnant silicified sediment clasts. Overall unit may go 1-2%Zn. Core is of moderate competency to 37.3m, after which competency is poor. Breaks in core seem to be at a higher angle to CA than cleavage.	37.2 37.2	JT CV	50° 35°													
39.2	**40.9**	**HOTS**				**HOST - TRACE SULPHIDES**																
39.2	40.9		CH SS	 cs	b	Zone of dull green-grey, chlorite-sericite sandstone, with cherty patches. Rare minor blebs of pyrite and fine grained black sulphide. Very broken zone around ~39.7-40m, possibly some core loss (indeterminate due to core block error). Competency poor to bad in remainder.																
40.9	41.9		BR	cc cs	a	Carbonate-chlorite-sericite altered coarse to very coarse cherty breccia. Alteration fairly intense, some clasts completely replaced, one large silicified clast remains. Larger clasts (1-3cm) are quite rounded. Smaller pieces - which dominate - (1-5mm) are more angular. Core of moderate competency. Fabric still present in places - replaced over by carbonate.	41.0	BD	45°													
41.9	**43.7**	**HOTS**				**HOST - TRACE SULPHIDES**																

Hole No: 011B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
41.9	43.7		BR CH	sc	b	Cherty breccia, with cherty intervals up to 10cm wide, separated by moderate to heavily sericite-chlorite, occasionally pyrite altered siltstone/rock. Cherty fragments become very small towards end of unit (1-5mm). Some cracks (partially to completely cavitous) contains galena, and fine grained dark sulphide. Uncommon thin bands of sphalerite and dark fine grained sulphide present, sub parallel to the fabric defined by alteration in the intervals between cherty zones. Grade not expected to reach 1%Zn. Possible small fault zone ~43.1-43.4m. Core otherwise of moderate competency.	42.5	CV	42°													
43.7	**45.0**	**F**				**FAULT**																
43.7	45.0		SS ST	se se	b	Broken zone of weak to moderately sericite altered sandstone and siltstone. EOH 45m.																

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 012B **Location:** Brown's Tunnel 5290N

Objective: Confirm upper limits of Lens 1 on this section.

Result: Patchy juicy bits. Best 35.3-37.1m@1.6%Pb, 12.1%Zn, 0.94%Cu, 168g/tAg, 0.5g/tAu, 6.1%Fe, $209TMU. Others 1.6m@$165, 1.7m@$204m.

Depth	Direct	Dip	Depth	Direct	Dip	Depth	Direct	Dip	Depth	Direct	Dip
0.0	92.0	-37.0									
30.0	94.0	-38.2									
53.0	94.5	-39.0									
53.2	94.5	-39.0									

Planned Direction: 90°
Planned Dip: -37°
Planned Depth: 52.0 m
Planned Northing: 5288 m N
Planned Easting: 4889 m E
Planned Collar R.L.: 476 m RL

Drilling Commenced: 28/09/98
Drilling Completed: 1/09/98
Actual Depth: 53.2 m
Surveyed Northing: 5288.25 m N
Surveyed Easting: 4890.37 m E
Surveyed Collar R.L.: 476.44 m RL

Date Logged: 06-Oct-1998
Logged By: Michael Whitbread
Hole Size: HQ
Hole Category: Other
Grouted:

Date Log Verified: 26-Nov-1998
Verified By: Michael Whitbread

Summary Log:
0-5m NC; -16.7m Ho; -18.2m F; -20.4m Ho; -22.5m F; -22.8m Ho; -23.5m Hods; -24m Hots; -24.7m Hods;-25.1m Hosm; -25.5 Hods; 32.5m Hots; -33.1m HOMS; -34.1m Hods; -34.5m Ho; -35.3m Hosm; -35.6 Homs; -36.5m Hots; 37.1m Hosm; -38.1m Hots; -41.7m Ho; -42m Hosm; -44.5m Hots; -50.5m F; -51m HOMS; -53.3m Hots

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°
0.0	**5.0**	**NC**				**NO CORE**			
0.0	5.0		NC	.	a	No core.			
5.0	**16.7**	**HO**				**HOST SEQUENCE**			
5.0	15.5		SA SS	cy	a	Highly bleached, weathered, clay altered ?sandstone. Some yellow staining present, and goethite is present on many joint/broken surfaces. Competency variable, but generally poor to broken. Core loss common, 70cm loss to 5.5-7m; 10cm loss to 8.20m, 20cm to 8m, 40cm 9.50-11m, 50cm loss to 12m, 40cm loss to 12.9m, 10cm 14.2-15m.			
15.5	16.7		BR CH SA	 cy	a	Highly weathered unit, which looks to be have been a cherty breccia (pieces cm to mm scale). Matrix is now clay. Looks puggy but may be due solely to oxidation. Competency terrible (as core is now quite crumbly). 10cm loss to 15.7m. 50cm loss to 16.7m.			
16.7	**18.2**	**F**				**FAULT**			
16.7	17.3		RK		a	Loose, yellow, fine to medium grained sand. Particles look to be a mix of quartz and goethitic particles.			
17.3	18.2		NC		a	No core, assumed to be like previous unit, but unrecoverable.			
18.2	**19.7**	**HO**				**HOST SEQUENCE**			

RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
23.5	7	97150	22.8	23.5	0.7	0.3	0.1	1.00	162	0.2	8.2	45
23.8	100	97151	23.5	24.0	0.5	0.1	0.1	0.57	17	0.1	2.9	12
27.7	7	97152	24.0	24.7	0.7	0.9	2.3	0.60	22	0.3	7.0	48
29.6	78	97153	24.7	25.1	0.4	5.6	7.0	0.34	21	0.4	9.5	130
30.7	18	97154	25.1	25.5	0.4	0.6	1.2	0.11	9	0.3	3.8	24
32.6	78	97155	25.5	26.5	1.0	0.1	0.1	0.01	2	0.1	2.3	3
33.0	25	97156	26.5	27.4	0.9	0.2	0.2	0.01	3	0.1	2.2	5
33.5	100	97157	27.4	27.6	0.2	0.2	0.7	0.02	8	0.1	4.9	13
34.0	40	97158	27.6	28.6	1.0	0.1	0.1	0.01	1	0.1	1.3	3
38.9	79	97159	28.6	29.6	1.0	0.3	0.4	0.03	1	0.1	1.7	8
39.6	0	97160	29.6	30.6	1.0	0.2	1.2	0.09	9	0.3	3.2	22
42.4	85	97161	30.6	31.6	1.0	0.2	0.5	0.02	16	0.2	4.6	12
44.9	16	97162	31.6	32.5	0.9	0.5	0.8	0.02	12	0.2	2.1	17
45.3	100	97163	32.5	33.1	0.6	0.2	22.4	3.06	44	0.3	14.7	336
51.7	4	97164	33.1	34.1	1.0	1.8	3.5	0.20	22	0.2	3.4	62
52.8	63	97165	34.1	34.5	0.4	0.1	0.1	0.01	4	0.1	2.5	4
53.2	0	97166	34.5	35.3	0.8	0.4	0.1	0.02	21	0.5	21.1	12
		97167	35.3	35.6	0.3	7.0	36.4	1.47	593	1.4	2.6	641
		97168	35.6	36.5	0.9	0.4	6.8	0.75	95	0.3	6.0	118
		97169	36.5	37.1	0.6	0.7	7.8	0.97	64	0.3	8.0	130
		97170	37.1	38.1	1.0	0.3	1.3	0.06	12	0.1	2.6	22
		97171	38.1	38.9	0.8	0.1	0.4	0.01	14	0.1	1.9	9

Hole No: 012B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %
18.2	19.7		GO	cy	a	Yellowy brown honeycomb of goethite (and hematite?), most likely a gossan after semi-massive, banded sulphides (perhaps similar to the pyrite rich seen later in the hole). Material has a very low SG due to cavitous structure. 60cm core loss in this zone - possibly attributable to the last unit.	19.7	BD	59°		
19.7	**20.4**	**HO**				**HOST SEQUENCE**					
19.7	20.4		NC		a	No core.					
20.4	**22.5**	**F**				**FAULT**					
20.4	21.7		NC RK	 cy	a	Clayey pug with quartz vein fragments (to 2cm in width). Only 5-10cm recovery for this interval.					
21.7	22.5		CH SA SS		a	Broken zone of highly oxidised, yellow-brown and white, version of massive cherty sediments -dominantly sandstone. Some evidence of weathered thin sulphide veinlets and crack fill. In zone near previous unit are small pieces of quartz veining.	22.4 22.4	VN VN	54° 13°		
22.5	**22.8**	**HO**				**HOST SEQUENCE**					
22.5	22.8		CH SA SS		a	As in previous unit but competent.					
22.8	**23.5**	**HODS**				**HOST - DISSEMINATED SULPHIDES**					
22.8	23.5		CH PY SA		a	Broken zone of oxidised cherty sandstone like previous unit with patches of solid fine to medium grained pyrite and fine grained black undifferentiated sulphide. Unit may be sulphide pug/fill in a fault, one pyrite blob looks to be a clast (cataclastite?). Possible error in core block at ~22.7m (incorrectly named 24m) -may have carried through to this unit- 30cm core loss is assigned to this unit if previous block is 22.7m.					
23.5	**24.0**	**HOTS**				**HOST - TRACE SULPHIDES**					
23.5	24.0		CH		b	Blue grey cherty rock/sandstone/siltstone with small wisps and veinlets of fine grained black sulphide (+/-pyrite and rarely quartz), and fine grained pyrite following cracks, and in rarer cases e.g. pyrite bands, following the cherty banding itself. The cracks and veinlets may sit close to CA, conjugate to cherty banding, or sub-parallel to it. Broken zone in last 15-20cm of unit obscures boundary with next unit. Sharp boundary with previous unit. Competency poor.	23.6	BD	54°		
24.0	**24.7**	**HODS**				**HOST - DISSEMINATED SULPHIDES**					

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
97172	38.9	39.5	0.6	0.1	0.2	0.01	10	0.1	2.8	6
97173	39.5	39.7	0.2	0.1	0.1	0.01	3	0.1	1.3	3
97174	39.7	40.7	1.0	0.1	0.1	0.01	2	0.1	1.4	3
97175	40.7	41.7	1.0	0.1	0.1	0.01	3	0.1	1.7	3
97176	41.7	42.0	0.3	0.1	0.1	0.01	9	0.2	14.6	5
97177	42.0	43.0	1.0	0.1	0.1	0.01	2	0.2	2.0	4
97178	43.0	44.0	1.0	1.0	1.6	0.05	11	0.2	3.4	30
97179	44.0	45.5	1.5	0.3	0.3	0.02	8	0.3	3.3	10
97180	45.5	46.6	1.1	0.3	0.5	0.02	4	0.1	1.9	10
97181	46.6	48.0	1.4	1.1	3.4	0.03	12	0.4	3.7	56
97182	48.0	49.0	1.0	0.1	0.1	0.02	1	0.1	1.4	3
97183	49.0	50.5	1.5	0.1	0.1	0.07	1	0.1	0.3	4
97184	50.5	51.0	0.5	1.9	21.8	0.20	71	1.7	13.7	322
97186	51.0	52.2	1.2	0.3	1.0	0.48	19	15.0	1.4	155
97187	52.2	53.2	1.0	0.1	0.2	0.05	7	0.9	1.6	13
	Total Length:		30.4							

Standards

Reference Values for: HBM-02 17/07/98

	Pb	Zn	Cu	Ag	Au	Fe	
	3.4	12.5	0.46	150	1.3	22.7	
Variances Allowed:	20%	20%	30%	20%	20%	20%	
97185 Inserted @ 51.0m	3.6	14.4	0.48	141	1.3	21.6	Y

Weighted Averages

From	To	Length	Pb	Zn	Cu	Ag	Au	Fe	TMU
32.5	34.1	1.6	1.2	10.6	1.27	30	0.2	7.6	165
35.3	37.1	1.8	1.6	12.1	0.94	168	0.5	6.1	209
50.5	52.2	1.7	0.8	7.1	0.40	34	11.1	5.0	204

TMU Parameters

Date of Parameters: 21/07/98 **Aust-US Exch. Rate:** 0.7000

Pb Metal Price (US$/t): $525 **Pb Recovery (%):** 68.40%
Zn Metal Price (US$/t): $1,200 **Zn Recovery (%):** 75.50%
Cu Metal Price (US$/t): $1,750 **Cu Recovery (%):** 45.40%
Ag Metal Price (US$/oz): $6 **Ag Recovery (%):** 70.00%

Hole No: 012B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
24.0	24.7		BR CH	cl py	a	Cherty breccia with sulphidic and chloritic matrix - generally matrix supported, though some clasts cross the core. Sulphides dominated by disseminated fine to medium grained pyrite cubes and lesser patches, blebs and veinlets of fine grained black sulphide (undifferentiated) and galena; rarely have 5-10mm clots of pale-brown sphalerite. Difficult to perceive a persistent dominant fabric. Core is of poor competency.																
24.7	**25.1**	**HOSM**				**HOST - SEMI-MASSIVE SULPHIDES**																
24.7	25.1		SH	cs py	a	Semi massive sulphides consisting of disseminated or thinly banded pyrite, with lesser fine grained black sulphide and galena, with lesser reddy brown sphalerite augen; possibly some chalcopyrite component mixed with the pyrite. The groundmass is chlorite+/-sericite. Unit is strongly cleaved, and most bands, augen etc sit in this fabric. Some cross-cutting veinlets of galena-fine grained sulphide exist. Core of moderate to poor competency (pieces 5-10cm in length).	24.8	CV	44°													
25.1	**25.5**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
25.1	25.5		BR CH	cs py	a	Broken zone - Continuation of green and grey cherty breccia with a chlorite+/-sericite and disseminated pyrite altered matrix. Unit picked out due to clayey pug in last 5cm of unit. Shear? Contact is next to a thicker cherty interval, thus the pug may be only very localised.	25.4 25.5	CV CT	46° 71°													
25.5	**27.4**	**HOTS**				**HOST - TRACE SULPHIDES**																
25.5	27.4		BR CH	cs	a	Continuation of cherty breccia. Small clayey zone at 25.7m and possible pug at 26.8m. Cherty clasts can be large (5-10cm) and the chlorite-sericite+/-pyrite altered matrix intervals are correspondingly sized (and soft). Pyrite content much decreased, but fabric still quite strong. Core of poor competency (some sticks above 5cm). Contact with next unit shows a very strong fabric. Core orient at 27m. Orientated measurement at 26.98m - Banding/cleavage dip 70 degrees NW strike ~215-35.	27.0	CV	52°													
27.4	27.6		BR CH	sc	a	Cherty breccia with HODS pyrite-fine grained sulphide and sphalerite (similar to previous units). Cleavage fabric as in previous. Core as pieces 2-5cm long.																
27.6	**29.6**	**HOTS**				**HOST - TRACE SULPHIDES**																

Hole No: 012B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
27.6	29.6		BR RK SS	sc se	a	Unit begins as very strongly sheared, sericite altered chert bearing rock (light yellow cream coloured - first 15cm). This rapidly changes to sericite+/-chlorite altered sandstone/rock (greeny-grey colour), which only faintly carries the fabric. This carries occasional thin veinlets of medium brown sphalerite blobs rimmed by fine grained black sulphide and pyrite, which may be carried in, or accompanied by quartz. Isolated spots of this assemblage also occur. Silica content seems to be higher in these mineralised zones. At 29.1m unit changes to a complex breccia of cherty and clay altered 'lithic' fragments (5mm-2cm in diameter). This is not included in the next unit due to clay fragments, and more rounded nature of the clasts (possibly detrital?). Small spots of sphalerite etc and larger pyrite cubes are found in this latter zone aswell. Competency good.	27.7	CV	47°													
29.6	**32.5**	**HOTS**				**HOST - TRACE SULPHIDES**																
29.6	32.5		BR CH	sc	a	Cherty breccia as in previous units, varying from matrix to clast (>10cm) supported. Sulphide mainly as occasional pyrite blebs in the sericite+/-chlorite altered matrix. Some thin (<1cm) pyrite bands/clasts are occasionally present. Rare spots of sphalerite etc may found (usually <5mm). Competency variable (matrix dominant parts are less competent) - overall moderate to poor. Small broken zone 31.5-31.6m. Minor carbonate? (white <1cm diameter) spotting at the beginning of the broken zone).	31.7	CV	44°													
32.5	**33.1**	**HOMS**				**HOST - MASSIVE SULPHIDES**																
32.5	33.1		PY RK SP		a	HOMS of beautiful medium brown sphalerite as misshappenly interconnected spots and blobs, often rimmed by a very thin fine grained black sulphide margin, sitting within pyrite-chalcopyrite and fine grained black sulphide. Last 10cm is black and may be comprised of fine grained sulphide finely mixed with chlorite? Difficult to ascertain the sulphide content of this zone. Carries disseminated pyrite (mix of medium coarse grained and finer grained crystals) and sphalerite spots. Remnant quartz veining present sporadically as reasonably well formed crystals within the sphalerite rich part of this unit - but often accompanied by the fine grained black sulphide. A fabric is only fainlty visible in the black latter portion of this unit. Core of moderate to poor competency. Core orient at 33m.	33.0	CV	44°													
33.1	**34.1**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
33.1	34.1		BR CH	cs py	a	Return to cherty breccia (matrix dominant), but clasts are becoming smaller and more patchy, although still large in places. Matrix is chlorite-?sericite altered with disseminated grade pyrite cubes, and lesser sphalerite spots (<5mm) present. Galena also present but mainly in and around a larger banded cherty clast at 33.5m. Last 10cm of unit quite broken - possibly a shear/fault. Core competent otherwise. Fabric as in previous units.	33.3	CV	45°													

Hole No: 012B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
34.1	**34.5**	**HO**				**HOST SEQUENCE**																
34.1	34.5		DA VR	 se	a	Dark grey volcanic rock (perhaps dacite), with yellow-green sericite alteration patches/pseudo fiamme. Unit carries white often lath-like carbonate or clay altered phenocrysts up to a few mm in length. These may be found in or out of the 'alteration' patches which have a vague pseudo fiamme character. Some of the 'phenocysts' are equant to sub rounded - perhaps clasts? 'Fiamme' define a fabric (termed cleavage in structures). Core of moderate competency. Broken and mushy contact with previous unit - minor component of this lithology incorporated into end of last unit.	34.3	CV	60°													
34.5	**35.3**	**HOSM**				**HOST - SEMI-MASSIVE SULPHIDES**																
34.5	35.3		RK	py se	a	Hods-Hosm of disseminated pyrite cubes as an alteration of rock possibly like that of last unit. Cubes fine to medium grained - larger ones surround minor pits and cavities. Difficult to pick a fabric. Minor joint/shear at 35.2m. Core of poor competence, as all sticks under 10cm and quite crumbly.	35.2	JT	32°													
35.3	**35.6**	**HOMS**				**HOST - MASSIVE SULPHIDES**																
35.3	35.6		GA SP		a	Massive sulphide - as fine grained black undifferentiated sulphide (black streak), with lesser bands (some faint, others veinlike) and aggregates of spotty medium to light brown sphalerite. Some galena also present around minor pits and cavities, and may comprise much of the fine grained black sulphide. Rarer chalcopyrite is associated with some of the more veinlike sphalerite bands. Core of moderate competency. Protolith probably a cherty rock.	35.5	BD	40°													
35.6	**36.5**	**HOTS**				**HOST - TRACE SULPHIDES**																
35.6	36.5		CH		b	Medium grey, Banded cherty sediments with trace to disseminated sulphide as sphalerite (+/-fine grained black sulphide) spots and fine grained black spots, with lesser bands of sphalerite and one semi massive pyrite band (follows cherty banding). Unit may run 2% Zn, difficult to estimate. Cherty banding is convoluted in places - folding? Core of moderate competence. Core orient at 36m. Orientated measurement of cherty banding - near vertical, 170-180 strike. Sulphide vein ('conjugate' to cherty banding), sub horizontal to 20 degrees W, strike ~N-S.	36.2	BD	46°													
36.5	**37.1**	**HOSM**				**HOST - SEMI-MASSIVE SULPHIDES**																
36.5	37.1		BR CH	py se	a	Matrix supporteed (just) breccia of rounded cherty fragment (3mm-1cm diameter) in a matrix of predominantly pyrite and sericite with lesser sphalerite and fine grained black sulphide. Unit crumbly and a little cavitous, but of moderate competency.																
37.1	**38.1**	**HOTS**				**HOST - TRACE SULPHIDES**																

Hole No: 012B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
37.1	38.1		CH	se	b	Cherty unit with persistent thin streaks of sericite alteration throughout - unit is cherty breccia (in a sericite+/-chlorite schisty looking matrix) in the first 10cm or so. Most of unit carries disseminated sulphide spots (many now pitted) of pyrite, galena, and fine grained black sulphide. Fabric defined by sericite wisps and by sulphide spot trends. Fairly abrupt contact with next unit. Core of moderate to poor competency.	37.5	CV	51°													
38.1	**38.9**	**HO**				**HOST SEQUENCE**																
38.1	38.9		SH	sc	a	Yellow-green, sericite+/-chlorite (and perhaps a minor silica component) schist. Stong fabic marked - perhaps sheared out version of previous unit. Core competent.	38.7	CV	63°													
38.9	**39.5**	**HO**				**HOST SEQUENCE**																
38.9	39.5		SS ST		b	Unit of medium grey, partially silicified, banded siltstone/sandstone. Unit quite broken, and when combined with first part of next strat might be a fault. Unit carries very minor disseminated pyrite cubes. Abrupt contact with previous unit. Banding varies rapidly in orientation.																
39.5	**41.7**	**HO**				**HOST SEQUENCE**																
39.5	39.7		PU RK	se	a	Broken zone of medium grey-green rock with yellow-green sericite alteration splotches/dodgy pseudo-fiamme. Unit carries ?clay altered fragments/?phenocrysts 1-2mm in size - some are lath like, others are sub-rounded. Sericite splotches can be from 1-20mm wide, and are elongate (fiamme like) and also carry the fragments.. Rock possibly a pumice bearing lava or mass flow - perhaps dacitic in composition.																
39.7	41.7		BR CH VC	se	a	Unit begins as in previous, but quickly grades into a orangey hued unit of similar texture, but with 1-2cm rounded, or wormlike cherty clasts. Perhaps it is some sort of mass flow?, or merely an altered cherty breccia. Cherty clasts do not carry the clay fragments - these are quite concentrated and found in the sericite matrix. Core competent. Open space, thin (2-3mm) Quartz + sphalerite +chalcopyrite+galena vein present at 41.3. Unit grades abruptly (1-2cm) into next.	40.1	CV	46°													
41.7	**42.0**	**HOSM**				**HOST - SEMI-MASSIVE SULPHIDES**																
41.7	42.0		RK VC	py se	a	Previous unit with semi-massive fine grained pyrite alteration. Core competent.																
42.0	**45.5**	**HOTS**				**HOST - TRACE SULPHIDES**																

Hole No: 012B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
42.0	45.5		BR CH	sc	b	Cherty bearing breccia, possibly a mass-flow volcanoclastic as in unit before previous but with the orange hue. Cherty clasts become increasingly large throughout and eventually are bands crossing the core width, separated by chlorite-sericite altered rock with flecks/fragments/?phenocrysts (less distinguishable than previously). Fabric quite stong in the non cherty portions. After 44.1m unit quite broken - possibly within a fault. Clayey ?pug (5cm) present at 45.4m. But within the broken pieces are sticks 10-20cm in width. Unit carries uncommon sphalerite-fine grained black sulphide-galena-pyrite patches up to 3cm wide but irregular in outline e.g. 44m. Overall unit will go <<1% Zn however.	44.0 44.7	CV CV	55° 60°													
45.5	**50.5**	**F**				**FAULT**																
45.5	48.0		SS	cs	b	Broken zone of greeny coloured, weakly to moderately chlorite-sericite altered sandstone. Rare fragments may carry cherty clasts. Also may carry rare sulphide bands (fine grained black sulphide, galena, pyrite and sphalerite). Overall grade negligible though.																
48.0	50.5		RK	ql qs	a	Broken zone of beigey yellow coloured silica-sericite-chlorite altered rock. 60cm core loss (minimum) within this and last unit. Unit has common thin quartz-chlorite veinlets (varying orientations).																
50.5	**51.0**	**HOMS**				**HOST - MASSIVE SULPHIDES**																
50.5	51.0		GA PY		a	Massive sulphide as banded pyrite + galena with lesser sphalerite +/- chalcopyrite. Sphalerite as medium brown spots and blebs usually associated with/rimmed by fine grained black sulphide. Unit of moderate competence in the middle but the margins are quite broken. Sulphides appear to have replaced banded chert.	50.7	BD	70°													
51.0	**53.2**	**HOTS**				**HOST - TRACE SULPHIDES**																
51.0	53.2		CH		b	Cherty banded sediments with patchy blebs veinlets and bands of sulphide. Dull fine grained pyrite bands/blebs are dominant, with occasional patches of fine grained black sulphide and sphalerite +/-chalcopyrite etc present. Overall unit may go 1%Zn. Cherty unit is pitted by thin cracks (varying orientations) which are often lined with sulphides (black fine grained). Banding varies in orientation from 0 to 60 degrees to CA. Quartz veinlets and lesser veins with cavities are common and may be accompanied by the sulphides mention previously. Core generally of moderate competency. Beginning of unit a little broken. EOH 53.2m.																

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 013B **Location:** Brown's Tunnel 5370N

Objective: Test alternate northern extent of lens 1.

Result: No significant mineralisation. May have drilled down a shallow fault, esp to 20.6m - mainly sand!

Depth	Direct	Dip
0.0	270.0	-37.0
30.0	267.0	-36.8
60.0	267.0	-37.6
100.0	267.0	-38.2

Planned Direction: 270°
Planned Dip: -37°
Planned Depth: 100.0 m
Planned Northing: 5367 m N
Planned Easting: 4997 m E
Planned Collar R.L.: 490 m RL

Drilling Commenced: 5/10/98
Drilling Completed: 11/10/98
Actual Depth: 100.0 m
Surveyed Northing: 5366.19 m N
Surveyed Easting: 4995.52 m E
Surveyed Collar R.L.: 488.49 m RL

Date Logged: 16-Oct-1998
Logged By: Michael Whitbread
Hole Size: HQ
Hole Category: other
Grouted:

Date Log Verified: 26-Nov-1998
Verified By: Michael Whitbread

Summary Log:
0-2m NC; -7.5m FW; -20.6m F; -39.7m FW; -41.6m F; -84.7m Ho; -93m F; -100m HW EOH.

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°
0.0	**2.0**	**NC**				**NO CORE**			
0.0	2.0		NC		a	No core			
2.0	**7.5**	**FW**				**FOOTWALL SEQUENCE**			
2.0	7.5		CH PU SA VR	 si si	a	Tan coloured, oxidised, highly silicified, cherts and ?pumice breccias. Some elements look like host, however some of the more brecciated portions look like dacitic pumice breccia i.e. FW. Unit generally broken (most pieces under 10 and 5cm). Consists of alternating cherty and porphyritic lava and pumice breccia. Cherty fragments dominate, but some are obviously the result of alteration of pumice breccia. Breccia fragments often appear to be porphyritic after ?feldspar, and may be up to 2-3cm long. Small zone of greenish rock 2.4-2.6 which looks porphyritic, but the crystals are quite concentrated - perhaps volcaniclastic? No obvious fabric to the breccias, where fragments may be blocky, or fiamme like. Competency and recovery decrease with depth - 3.5-5.1m has 70cm core loss, while 6.1-7.5 has 1.2m loss. Fragments also more silicic near end of unit.			
7.5	**20.6**	**F**				**FAULT**			
7.5	9.0		NC		a	No core.			

RQD To (m)	RQD %
2.0	NC
30.1	4
33.1	73
35.3	9
36.0	85
41.7	15
44.2	84
49.2	10
50.7	80
56.7	21
70.4	91
71.1	14
85.1	90
91.0	16
91.6	100
92.3	0
95.4	90
96.0	0
98.4	91
100.0	31

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
97188	89.1	90.1	1.0	0.1	0.1	0.01	1	0.1	0.2	3
97189	90.1	90.4	0.3	0.1	0.1	0.01	1	0.1	0.7	3
97190	90.4	90.7	0.3	0.1	0.1	0.02	1	0.1	1.1	3
97191	90.7	91.6	0.9	0.1	0.1	0.01	1	0.1	1.4	3
97192	91.6	92.2	0.6	0.2	0.5	0.04	5	0.1	1.9	10
97194	92.2	93.0	0.8	0.1	0.1	0.01	1	0.1	1.5	3
97195	93.0	94.0	1.0	0.1	0.1	0.01	1	0.1	0.2	3
		Total Length:	4.9							

	Pb	Zn	Cu	Ag	Au	Fe	
Reference Values for: LBM-07 21/08/98	2.0	6.3	0.17	51	0.4	9.4	
Variances Allowed:	20%	20%	30%	20%	20%	20%	
97193 Inserted @ 92.2m	2.0	5.5	0.17	45	0.4	8.3	Y

TMU Parameters

Date of Parameters:	21/07/98	**Aust-US Exch. Rate:**	0.7000
Pb Metal Price (US$/t):	$525	**Pb Recovery (%):**	68.40%
Zn Metal Price (US$/t):	$1,200	**Zn Recovery (%):**	75.50%
Cu Metal Price (US$/t):	$1,750	**Cu Recovery (%):**	45.40%
Ag Metal Price (US$/oz):	$6	**Ag Recovery (%):**	70.00%
Au Metal Price (US$/oz):	$300	**Au Recovery (%):**	63.70%

Hole No: 013B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
9.0	13.1		RK		a	Loose quartz and lithic sand; medium to coarse grained. Fault may include from 6.1m due to broken nature of that part of previous unit. Difficult to ascertain how much core has been lost. Triple tubing seems to have recovered 75% of core/sand.																
13.1	13.5		CH PU SA VR	 si	a	Extremely oxidised, and quite broken, silicified pumice breccia - white with some goethitic stains and small patches of green. Small patches of chlorite bearing fragments/?pseudo-flamme are noted. Fragments no greater than 2cm.																
13.5	15.9		RK		a	More sand.																
15.9	16.7		CH PU SA VR	 cy cy	a	As in 13.1-13.5 - more goethitic content (yellow staining) and far less silica alteration.																
16.7	18.0		RK		a	More sand. Is more fine grained now.																
18.0	19.7		CH PU SA VR	 cy	a	As in 15.9-16.7m. Quite broken, possibly only 80% recovery.																
19.7	20.6		RK		a	More sand. Still nice looking beach sand (for Tasmania!).																
20.6	**28.2**	**FW**				**FOOTWALL SEQUENCE**																
20.6	26.3		PU SA	cl si cy	a	Oxidised, yellowish hued, and generally quite broken (some fragments up to 5 and 10cm), partially silicified pumice breccia. Seems to consist of pumice mixed with lithics. Fragments are usually angular, with some silicic clasts being elongate; the softer intervals may have complex boundaries due to wispy interfingering. Silicified clast intervals sit within/alternating with softer (sometimes greenish) chlorite altered zones (pseudo-flamme?). The unit is poorly sorted, with fragments varying from mm to 5cm. Small fragments, mainly found within chlorite richer zones, might actually be altered feldspar pheoncrysts; in less oxidised parts the concentration of these looks too dense to be lava - volcanoclastic maybe? Goethite stains common on broken surfaces. Core quite porous - easily soaking up water sprayed on it.																
26.3	28.2		PU RY SA SL	ql si cy	a	As before, but black silty/shale clasts are common, and some large (5-10cm) clasts of rhyolite/rhyodacite noted. Therefore, unit termed a rhyolitic pumice breccia. Competency improving, though still poor, with many fragments above 5cm. Fabric vague as banding of clasts warps around larger fragments.	26.3	BD	75°													
28.2	**35.9**	**FW**				**FOOTWALL SEQUENCE**																

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
28.2	35.9		SA VR	se si	a	Light yellow-green-brown coloured, oxidised, sericite and silica altered rock - I believe that this unit may in fact be a flow banded lava (rhyolite?), as it looks similar to volcanic rocks further down the hole. Grains comprising unit look to be sand sized, however the overall look is almost schistose with occasional bands and small elongate "augen" of silica within a ?sericite altered groundmass - in some instances this appears to contain pseudo-fiamme. Unit has a fabric defined by the sericite wisps, and alignment of silica bands. Surface of rock looks pitted - after what I don't know? After 34.5m, unit contains rare cherty fragments and elongate rafts (are these merely unoxidised remnants?). Pitting becomes more larger in size and more rounded - some are still partially filled with porous looking structures of clay and silica. Unit possibly a pumice bearing tuff? Core of variable but generally moderate competency except 33-34.4m which is broken. Yellow hue drops off in last metre or so of unit.	29.4 35.3	BD BD	60° 62°													
35.9	**39.7**	**FW**				**FOOTWALL SEQUENCE**																
35.9	39.7		VR	cc qs	a	Possibly a less oxidised version of last unit. Greeny-grey and light greeny brown coloured rock. Looks like pits of previous unit were chlorite or carbonate rounded spots (1-2mm generally, in size). Silica content seems much higher in this unit - silica-sericite(-chlorite)-schist. Carbonate distribution erratic, with some as small spots (similar to the chlorite spotting), while it may also appear in wispy aggregates. Vague fabric present as in previous unit ('schistose' banding). Unit most likely a pumice bearing tuff. Core of moderate competency - some oxidation along fractures.	36.2 39.3	BD BD	65° 65°													
39.7	**41.6**	**F**				**FAULT**																
39.7	41.6		VR	cl qs	a	Broken zone of rock as in previous unit. Rare pieces above 5cm. Most fragments 1-3cm in size.																
41.6	**44.1**	**HO**				**HOST SEQUENCE**																
41.6	44.1		SA SS	se si	b	Partially oxidised, brown and medium grey, fine to medium grained sandstone (possibly a phenocryst poor rhyolite lava when compared with units further down the hole. Unit boundary with previous unit is quite altered (silica and ?chlorite-sericite) and cavitous. Also have a 10cm band of finely laminated sericite alteration 10cm from base of unit. Remainder of unit fairly uniform. Thin (1-3mm) quartz veins are common, and are quite cavitous, usually lined with small quartz crystals - In rare instances these veins contain peacock coloured tiny fragments of sulphide. These veins are often accompanied by increased silicification of the wall rock. Veins generally have consistent orientations (mirrored by occasional sericite wisps), although these occasionally sit conjugate to thin brown ?sericite veinlets 1-2mm wide. Core competent - minor 10cm broken zones (possibly due to zealous drillers) e.g. 41.9-42m, 43.6-43.8m, which can have increased sericite alteration associated with them.	43.5 43.9 43.9	VN VN VN	52° 25° 52°													

Hole No: 013B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
44.1	**46.0**	**HO**				**HOST SEQUENCE**																
44.1	46.0		SL SS	cs sc	b	Generally fairly broken interval of occasionally silicified, partially chlorite altered black shale, with minor intervals of greeny sandstone and medium grey siltstone. Sometimes have small rafts of shale with the 'sandstone'. Thin wisps of sericite alteration are present, and uncommonly have sericite-chlorite alteration. Minor quartz veining present (1-5mm) which may be uncommonly accompanied by sphalerite and pyrite. Possibly cleavage/fabric in this unit - marked by sericite wisps and veinlets, breaks in core, and by alternations between altered and unaltered shale. Competency very poor.	44.5 45.5	CV CV	55° 50°													
46.0	**47.6**	**HO**				**HOST SEQUENCE**																
46.0	47.6		RK	se si	a	Heavily sericite altered, greenish-yellow rock. Contains occasional pods and intervals of silicified, and carbonate spotted rock - possibly rhyolitic lava. One instance (7cm) of poorly sorted slate clasts (up to 3cm and rounded) within an altered matrix. Strong fabric - marked by sericite alteration. Unit most likely a lava containing occasional lithic clasts. Boundaries either side are sharp. Competency poor.	46.3	CV	65°													
47.6	**49.4**	**HO**				**HOST SEQUENCE**																
47.6	49.4		SL	cs	a	Moderate to poorly competent slate unit similar to 44.1-46m. Some banding which may be bedding - looks to be sub-parallel to the alteration fabric.	48.6	BD	55°													
49.4	**49.7**	**HO**				**HOST SEQUENCE**																
49.4	49.7		RK RY	se si	a	Pinky coloured silicified and lesser sericite altered rock - looks like an altered Pinnacles Rhyolite. Core competent.																
49.7	**50.2**	**HO**				**HOST SEQUENCE**																
49.7	50.2		SL	cs	b	Return to slate. Quite broken before 49.9m - core competent thereafter. Bands of greenish chlorite+/-sericite alteration (mm-2cm thick) present. Bedding noted, but wavers in orientation around the general trend of the alteration bands. Sharp contact with units either side.	50.0	BD	37°													
50.2	**50.5**	**HO**				**HOST SEQUENCE**																
50.2	50.5		LV RK	sc	a	As in 49.4-49.7m. Grades into next unit as ?chlorite content of strong sericite alteration increases. Core competent.																
50.5	**59.8**	**HO**				**HOST SEQUENCE**																

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
50.5	56.9		BR RD	 cs	b	Pale green hued, minor to moderately chlorite (far lesser sericite) altered, silicified, fine grained, occasionally banded, occasionally brecciated, quartz phenocryst poor ?rhyo-dacite/rock. Some evidence for rhyolitic nature by rare quartz phencorysts. Numerous spots (0.5-1mm; now chlorite) are present - possibly after feldspar? Bands are 1-5mm thick in general. Matrix to brecciated fragments is milky white quartz/silica. Unit contains common thin quartz +/- chlorite veinlets, and chlorite blebs - many of which appear to have become cavitous. Most veining runs either 90 or near 0 to CA. Core of variable competence - poor to 54.2 - of moderate competency thereafter.	53.2 56.0	BD BD	45° 40°													
56.9	58.0		RY	cc	b	Slightly carbonate altered, silica rich, rock/rhyolite?Unit has brown hue, and subtle to non-existent banding. Looks to be more silica rich when compared with units either side. Has a cellular texture, with cells separated by very thin intervals of chlorite (obvious in first 10cm of unit - questionable later), but is also heavily speckled by very fine grained yellow-white specks (possibly carbonate?). Colour may be due to slight oxidation of carbonate? Grades into next unit. Core competent.																
58.0	59.8		RD SA	ql	b	Thinly banded version of 50.5-56.9m - bands are alternating silica, and greenish chlorite richer intervals. Bands 1-5mm wide, semi-continuous, although minor boudinaging of silica bands is apparent. Oxidation present as yellow and brown geothite on some fractures and the occasional thin quartz vein. Unit becomes increasingly lighter yellow in colour - and more oxidised - towards the end of the unit. Core competent.	58.4	BD	44°													
59.8	**60.8**	**HO**				**HOST SEQUENCE**																
59.8	60.8		RD RK SA	 cy	a	Light-yellow-brown, moderately oxidised version of previous unit. Core of moderate to good competency.																
60.8	**61.6**	**HO**				**HOST SEQUENCE**																
60.8	61.6		PU RD SA	si	b	Moderately oxidised - pale lime green coloured, pumice breccia (see next unit). Oxidation decreases towards end of	61.1	CV	70°													
61.6	**65.0**	**HO**				**HOST SEQUENCE**																
61.6	65.0		PU RD VC	ql	b	Light green-grey, speckled with dark green-black fragments, ?rhyo-dacitic 'pumice breccia'/volcanoclastic/mass flow. The unit consists of dark, chlorite+/-silica altered angular or irregular fragments (1mm-3cm in diameter), set in a fine grained silica matrix (sometimes pink, sometimes lime-green). In both the matrix and 'pumice', are common white lath-like phenocrysts, most likely after feldspar. Rarer quartz crystals, (also <2mm in size) are noted. Unit variably matrix and clast supported. Matrix becomes pinker and unit becomes more silica rich after about 63m. Difficult to pick a consistent fabric. Core competent.																

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
65.0	**66.8**	**HO**				**HOST SEQUENCE**																
65.0	66.8		BR RY VC	se	b	Partly banded and partly brecciated, grey to light green-grey, quartz phenocryst poor rhyolite/ryholitic breccia. Looks to be incipiently brecciated accross banding in the first 40cm of unit. Difficult to know if banded intervals are merley 'bomb' size clasts. Some rotation of these 'clasts' is evident by the internal banding orientations. Occasional instances of dark clorite 'pumice' like those in preceding units noted. Occasional patches of sericite+/-chlorite alteration present (in zones 1-10cm wide). These more altered zones are usually coincident with dark chlorite pumice richer areas. Core of moderate to good competency.																
66.8	**72.5**	**HO**				**HOST SEQUENCE**																
66.8	72.5		RY	cs	b	Light pale green-grey, fine grained, sparsely quartz phyric, rhyolite. Unit is faintly banded. Brecciated rhyolite 'clasts' of previous unit very similar in appearance to this unit. Weak chlorite-?sericite alteration bands noted throughout as dark green, or pale green-yellow discoloured bands (1-10cm in width). These 'alteration' bands seem to sit sub-parallel to the '?flow' banding found throughout. Light green-yellow interval from 69.7-70.2m (larger alteration band?), contains a 'stock-worky' thin quartz-chlorite(dark) vein (1-5mm). Minor quartz+/-chlorite veinlets present throughout unit. Veinlets mainly run close to CA, or orthogonal to it. Occasionally have small intervals of carbonate or chlorite spotting - possibly after phenocrysts. Unit competent. Phenocryst poor intervals might be mistaken for silicified sandstone. Core orient at 67.4m.	67.2 69.0	BD BD	64° 60°													
72.5	**74.5**	**HO**				**HOST SEQUENCE**																
72.5	74.5		RY SA	ql se	a	Perhaps a slightly oxidised version of previous unit. Unit light beige in colour, and has common chlorite-quartz+/-pyrite veinlets (1-5mm in width), running in varying orientations - mainly close to CA or conjugate to banding. Some quartz dominated veinlets run close to CA, and are quite cavitous. Core of moderate to poor competency, due to breaks along the veins close to CA. Small broken zone at 72.9-73m.	73.2 73.9 73.9	VN VN BD	5° 43° 43°													
74.5	**79.1**	**HO**				**HOST SEQUENCE**																

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
74.5	79.1		BR PE RY	sc se	a	Unit begins as a peperite of the rhyolitic material similar to that in last unit, with a rounded cherty clast bearing, strongly foliated, sericite-chlorite altered siltstone and sandstone. Sediment units sporadically contain intervals of rhyolite, or rhyolitic pumice breccia, which may be incipiently brecciated, and may have complex boundaries. These intervals become less common after 77m. It is possible that these intervals may merely be clasts within the sediments. Cherty clasts (occur in clusters, sporadically distributed) vary from 2mm-5cm across, and in some places look to be disrupted intervals of chert (intense cleavage development may have caused this). Sediment has small intervals of more intense, green, sericite-?chlorite alteration. Some of these look pseudo-fiamme like. Some evidence of bedding parallel to cleavage. Core competent, despite breaking fairly easily along cleavage.	78.4 78.5	CV BD	60° 60°													
79.1	**84.7**	**HO**				**HOST SEQUENCE**																
79.1	84.7		BR PU RD VC	 se	b	Light beige coloured ?rhyo-dacitic breccia. Unit consists of mm to cm sized, irregular, brown-yellow, altered ?feldspar phyric, pseudo-fiamme contained within a light grey, fine grained, semi-transluscent silicic matrix. A minority of fragments are quite angular and silicic. Phenocrysts look to be clay and/or carbonate altered feldspar laths (1-2mm in size), which are fairly evenly distributed throughout both the matrix and 'pumice'. Pumice tend to be far softer than matrix - interpreted as due to sericite alteration. Some faint banding of pumice breccia evident throughout, by clast elongations and sub-parallel orientation. Little evidence for quartz phenocrysts. Core competent. Core orient at 79.5m.	84.5	BD	58°													
84.7	**93.0**	**F**				**FAULT**																
84.7	90.1		BR PU RD	ql se	a	Pretty much a broken and more ?sericite altered version of previous unit. Unit occasionally crossd by dark green chlorite-quartz veins (1-5mm in width). Some appear to be cavitous after chlorite. Core of bad competency with occasional sticks of core up to 20cm amongst pieces 1-2cm in size. 20cm core loss between 85.5-88.2m.	88.7	BD	47°													
90.1	90.4		BR CH	sc	b	Cherty unit, slightly brecciated, in a sericite-chlorite altered matrix. Core pitted, but of moderate competency.																
90.4	90.7		CH ST	 si	b	Extremely broken zone of dark grey siltstone and cherty fragments.																
90.7	91.6		BR CH ST	sc	b	Moderately competent unit of siltstone and chert. First 20cm of unit quite soft ?sericite+/-chlorite+minor pyrite altered. There appears to be small (5mm) fragments within this first interval. Competency drops of in last 10cm of unit.																
91.6	92.2		BR CH QZ	sc	a	Quartz+/-chlorite veined interval- with occasional galena, sphalerite, pyrite and chalcopyrite as accessories. Host is a greenish sericite-chlorite+/-pyrite altered cherty breccia. Quartz veining crosses cherty clasts as well. Quartz veining fairly massive to 91.8m. Difficult to pick an orientation for the veining, looks to be 60 degrees or so. Core fairly broken.	92.1	VN	60°													

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
92.2	93.0		BR CH	sc	a	Greeny-grey cherty breccia with fairly intense sericite-chlorite+/-pyrite alteration of the matrix. Pyrite masses tend to favour sites adjacent to the cherty clasts. In intervals that are matrix supported, a strong fabric is evident. Cherty clasts are poorly sorted (3mm-7cm). Core of poor to moderate competency.	92.8	CV	65°													
93.0	**100.0**	**HW**				**HANGINGWALL**																
93.0	100.0		BR PU RD VC	 sc si	a	Unit similar to 79.1-84.7m - pseudo-fiamme/pumicey looking things in a silicic matrix. The clasts are greener than previously (more chlorite altered?), though some pinky silicic fragments are present. These silicic fragments dominate the clast fraction after 97.2m (and are quartz phyric to boot - rhyolite). Unit could be a pumice bearing brecciated lava, or a mass flow volcaniclastic. Clast sizes are extremely variable, and the unit varies between matrix and clast supported. Core orient at 94.5m. Unit of moderate competency. EOH 100m.																

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 014B **Location:** Southern Trenches

Objective: Test down dip extension of 009B intercept.

Result: No significant intercept. Fruitcake! Best is 30cm @ 3%Pb, 7.4% Zn at 18.6-18.9m.

Depth	Direct	Dip
0.0	90.0	-89.0
30.0	94.5	-88.5
60.0	100.0	-89.0
66.7	100.0	-89.0

Planned Direction: 90°
Planned Dip: -89°
Planned Depth: 100.0 m
Planned Northing: 4409 m N
Planned Easting: 4656 m E
Planned Collar R.L.: 422 m RL

Drilling Commenced: 12/10/98
Drilling Completed: 16/10/98
Actual Depth: 66.7 m
Surveyed Northing: 4411.15 m N
Surveyed Easting: 4657.82 m E
Surveyed Collar R.L.: 422.07 m RL

Date Logged: 26-Oct-1998
Logged By: Michael Whitbread
Hole Size: HQ
Hole Category: other
Grouted:

Date Log Verified: 26-Nov-1998
Verified By: Michael Whitbread

Summary Log:
0-3m NC; -5.6m FW; -6.5m F; -7m FW; -18.6m F; -19m Hods; -25.9m Ho; -30.9m Hots; -46.5m Fwts; -49.9m Ho; -54.4m F; -58.5m Ho; -58.9m F; -60.1m Hods; -63.4m Hots; -63.5m F; -66.7m Hots EOH.

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°
0.0	**3.0**	**NC**				**NO CORE**			
0.0	3.0		NC		a	No core.			
3.0	**5.6**	**FWTS**				**FOOTWALL - TRACE SULPHIDES**			
3.0	5.6		BR CH RK	si qb	a	Light to medium grey, slightly brecciated looking, silicified rock/chert. Unit has suffered minor oxidation along fractures and broken surfaces. Unit consists of lighter coloured silicified cherty fragments (1-2cm to >5cm), separated by a darker, fine grained silicified matrix. Unit could be described as matrix supported. The lighter coloured fragments sometimes verge on being vein quartz and may be merely alteration artefacts rather the clasts. Unit contains numerous small pits most likely after either the white ?carbonate spots (generally 1-3mm in diameter) or after larger masses of now green-brown clayey material (possibly after chlorite-sericite). These carbonate spots are more numerous in preservation than the latter are fairly evenly spread throughout. Sphalerite+/-galena+/-fine grained black sulphide spots and blebs (1-5mm wide) occur sporadically throughout (and may have occupied some of the pits). Clay alteration between clasts increases towards the end of unit, and the 'clast' size decreases. Difficult to identify a consistent fabric. Unit is of poor competence, with occasional sticks exceeding 10cm.			

RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
3.0	NC	97196	3.0	4.0	1.0	0.1	0.1	0.01	1	0.1	0.2	3
4.5	20	97197	4.0	5.0	1.0	0.1	0.8	0.01	1	0.1	0.3	12
4.7	100	97198	5.0	5.6	0.6	0.4	2.1	0.05	4	0.1	0.6	31
6.3	25	97199	5.6	6.5	0.9	0.1	0.3	0.01	1	0.1	0.5	6
9.5	96	97200	6.5	7.0	0.5	0.1	0.5	0.01	1	0.1	0.5	8
14.0	6	97201	7.0	8.5	1.5	0.1	0.1	0.01	1	0.1	0.3	3
14.6	100	97202	15.3	16.9	1.6	0.1	0.2	0.01	1	0.1	1.7	4
25.8	13	97203	16.9	18.6	1.7	0.1	0.4	0.01	1	0.1	0.4	7
29.6	81	97204	18.6	18.9	0.3	3.0	7.4	0.02	22	0.1	1.3	116
31.0	14	97206	18.9	19.0	0.1	0.5	1.7	0.02	5	0.1	0.5	27
32.4	78	97207	19.0	20.2	1.2	0.1	0.1	0.01	1	0.1	0.2	3
33.4	40	97208	24.8	25.9	1.1	0.1	0.2	0.01	1	0.1	1.4	4
36.8	84	97209	25.9	26.9	1.0	0.1	0.1	0.03	1	0.1	1.0	3
43.9	16	97210	26.9	27.9	1.0	0.1	0.2	0.01	1	0.1	0.6	4
44.4	100	97211	27.9	28.9	1.0	0.1	0.2	0.01	1	0.1	0.8	4
46.8	22	97212	28.9	29.9	1.0	0.1	0.2	0.01	1	0.1	0.4	4
47.4	100	97213	29.9	30.9	1.0	0.1	0.1	0.01	1	0.1	0.3	3
54.6	16	97214	30.9	31.9	1.0	0.2	0.2	0.02	2	0.1	0.6	5
58.5	87	97215	31.9	32.6	0.7	0.1	0.2	0.02	3	0.1	0.5	5
58.9	0	97216	32.6	33.5	0.9	0.3	0.3	0.04	9	0.1	1.4	8
59.7	87	97217	33.5	34.5	1.0	0.2	0.1	0.01	3	0.1	1.2	4
61.8	14	97218	34.5	35.5	1.0	0.2	0.1	0.02	3	0.1	1.0	4

Hole No: 014B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°
5.6	**6.5**	**F**				**FAULT**			
5.6	6.5		BR CH	cy qb	a	Broken zone of material as in previous unit. Most breaks along core axis. Unit darker coloured due to higher clay content. Puggy clay present in last 20cm of unit, containing small silicified/cherty clasts (fabric in this appears to be along core axis). 30-40cm of unmarked core loss assigned to this unit. At best there is only partial (50%) recovery.			
6.5	**7.0**	**FW**				**FOOTWALL SEQUENCE**			
6.5	7.0		RK	si	a	As in 3-5.6m. However carbonate spotting is far less common. Sphalerite+etc blebs and wisps up to 2cm across are common. Dull greenish-brown colour and slightly softer nature of the 'matrix' indicates some slightly weathered ?chlorite-sericite alteration. The degree of brecciation and the intensity of this alteration increases towards end of unit (however it also becomes more weathered and pitted as well). Core competent.	6.6	JT	15°
7.0	**18.6**	**F**				**FAULT**			
7.0	9.4		BR CY	si	a	Dull green-brown clayey pug with cherty fragments. Matrix proportion and clast size grade (up and down respectively) from last unit in the 15cm or so of preserved core. 1.3m loss to 8.5m. A further 90cm loss attributed to 9.4m.			
9.4	12.3		CH RK	qb se	a	Broken zone of cherty unit (as in previous units), with carbonate spotting, and variable sericite alteration. Core loss marked - 0.4 to 10m and 0.6 to 10.9m.			
12.3	12.8		CY RK		a	Core block errors in this vicinity, not to mention unmarked core loss. So boundary is an educated guess. 40cm core loss assigned to this unit. Loose sand fill of brown clay and cherty fragments (particle size mm to 1cm diameter.			
12.8	13.9		RK	qb ql	a	Broken zone of cherty, carbonate spotted rock. Very dark green, but hard (silica-clorite altered) from ~13m to 13.5m. Cherty rubble again to 13.9m.			
13.9	14.7		RK	qb se	a	Competent patch of silicified, carbonate spotted rock. Minor sericite altered wisps and bands. Sericite alteration intense in			
14.7	16.9		SH	cl si	a	Broken zone of dark green, chloritic-silica schist. Strong fabric close to CA for the more preserved fragments. Some carbonate spots noted, and possible breccia fragments. 50cm core loss assigned to this zone (core block errors make it difficult to accurately indicate where the core loss originated). Often find rounded silica fragments after core blocks - believe these to be rubble from further up the hole.	15.4	CV	5°
16.9	18.6		RK	qs sc	a	Broken zone of pale yellow-green silicified, and sericite+/- chlorite altered rock. Looks to be after a 'host' like cherty breccia and sandstone, as against the inferred siliceous pumice breccias of earlier in the hole. Minimal carbonate spotting. Rare flecks of fine grained black sulphide, pyrite increasing towards end of unit. Some cherty breccia type banding towards end of unit.	18.5	BD	20°

RQD To (m)	RQD %
63.3	86
63.7	0
66.3	76
66.7	0

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
97219	35.5	36.5	1.0	0.1	0.1	0.02	1	0.1	1.7	3
97220	36.5	37.5	1.0	0.2	0.1	0.01	1	0.1	0.9	3
97221	37.5	38.5	1.0	0.1	0.1	0.01	2	0.1	0.7	3
97222	43.5	44.5	1.0	0.1	0.1	0.01	2	0.1	0.6	3
97223	44.5	45.5	1.0	0.4	0.1	0.01	5	0.1	0.8	5
97224	45.5	46.5	1.0	0.5	0.1	0.02	6	0.1	1.4	6
97225	46.5	47.8	1.3	0.2	0.1	0.01	1	0.1	0.6	3
97226	47.8	48.7	0.9	0.2	0.2	0.01	3	0.1	0.6	5
97227	56.9	58.5	1.6	0.1	0.1	0.01	1	0.1	1.3	3
97228	58.5	58.9	0.4	0.1	0.3	0.02	3	0.1	1.6	6
97229	58.9	60.1	1.2	0.1	1.2	0.16	5	0.1	1.9	20
97230	60.1	61.0	0.9	0.1	0.4	0.03	1	0.1	1.2	7
97231	61.0	62.0	1.0	0.3	1.7	0.08	2	0.1	2.3	26
97232	62.0	63.4	1.4	0.1	0.9	0.04	1	0.1	1.5	14
97233	63.4	63.5	0.1	0.1	0.2	0.01	1	0.1	1.2	4
97234	63.5	64.5	1.0	0.1	0.8	0.01	1	0.1	3.3	12
97235	64.5	65.4	0.9	0.1	0.6	0.01	1	0.1	3.7	9
97236	65.4	65.9	0.5	0.2	1.0	0.02	1	0.1	1.4	15
97237	65.9	66.7	0.8	0.1	0.1	0.01	1	0.1	0.6	3
	Total Length:		39.1							

Standards

		Pb	Zn	Cu	Ag	Au	Fe	
Reference Values for:	LBM-07						21/08/98	
		2.0	6.3	0.17	51	0.4	9.4	
Variances Allowed:		20%	20%	30%	20%	20%	20%	
97205	Inserted @ 18.9m	2.0	5.5	0.17	45	0.5	7.9	Y

TMU Parameters

Date of Parameters:	21/07/98	**Aust-US Exch. Rate:**	0.7000
Pb Metal Price (US$/t):	$525	**Pb Recovery (%):**	68.40%
Zn Metal Price (US$/t):	$1,200	**Zn Recovery (%):**	75.50%
Cu Metal Price (US$/t):	$1,750	**Cu Recovery (%):**	45.40%
Ag Metal Price (US$/oz):	$6	**Ag Recovery (%):**	70.00%
Au Metal Price (US$/oz):	$300	**Au Recovery (%):**	63.70%

Hole No: 014B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
18.6	**19.0**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
18.6	19.0		CY RK	 sc si	a	Shear related? HOTS-HODS of quartz-galena-fine grained black sulphide-sphalerite-pyrite veining in a chlorite-sericite-silica altered rock (possibly after cherty breccia). Veins are only 5-10mm wide, but are sub-parallel. Unit of poor competence - but not completely broken. Unit ends in 10cm of very sericite altered rock, with minor pug.	18.8 18.8	VN BD	25° 25°													
19.0	**24.0**	**HO**				**HOST SEQUENCE**																
19.0	24.0		BR CH RK	qs sb	a	Unit of very altered (sericite+/-chlorite) variably silicified, moderately carbonate spotted rock. Could be after cherty breccia or the silicieous pumice breccias of earlier in the hole. At beginning of unit are small elongate clasts of chert, but it quickly becomes difficult to identify distinct clasts. Sericite alteration increases in strength throughout, and becomes most intense from 22.5 to 23.2m, where the rock is crossed by intese yellow sericite-wisps (orangey carbonate spots present too). Sericite alteration rapidly decreases after this interval. On many of the broken surfaces are patches of broken chlorite, and rarely very small clumps of fine grained black sulphide or galena. Fabrics (defined by wisps of sericite or chlorite or elongations in clasts or carbonate spots) generally run ~20-30 degrees to CA.	20.5 22.7	CV CV	17° 30°													
24.0	**25.9**	**HO**				**HOST SEQUENCE**																
24.0	25.9		 RK	 co si	a	Dark greeny grey, patchily chlorite altered, carbonate spotted (1-3mm in size, as in the earlier parts of the hole), silicified rock. Occasional sericite wisps present. Numerous pits present, most likely after carbonate. Broken zones at beginning and end of unit. Remainder of core of poor to moderate competency.																
25.9	**30.9**	**HOTS**				**HOST - TRACE SULPHIDES**																

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
25.9	30.9		BR CH RK	qs sb	a	Browny-green grey, occasionally yellowy, variably sericite altered, occasionally brecciated, silica rock/chert. Sericite alteration most visible as orangey yellow thin wisps, clumps of which occur sporadically throughout. Greenish chlorite-sericite alteration is less commonly developed, though sericite alteration of the matrix in cherty breccia intervals is common. Chlorite wisps and veinlets sporadically present throughout - (often closer to CA than the sericite wisps). Unit could be FW or Ho - the less brecciated intervals look more like FW. Brecciated intervals consist of rounded to sub-angular clasts of cherty rock 0.5-3cm in diameter, in a generally matrix supported mode. Unit has occasional wisps and spots of carbonate (the latter showing minor preference to the silica clasts). Surface of core pitted - some after carbonate, most probably after the small blebs, wisps and veinlets of sphalerite and attendant fine grained sulphide-galena-pyrite. The sulphides are really only commonly present between 28.7-29.4m and are accompanied by, and sometimes carried within 1-5mm quartz+/-chlorite+/-sulphide veins. A dominant fabric is difficult to pick -sometimes sericite wisps conflict themselves - most run ~35-45, while others run ~20. Core generally competent - small broken zones 30.2-30.5m and the last 10cm of unit.	26.0 26.9 28.2 28.2 28.4	VN VN VN VN QV	30° 25° 20° 42° 35°													
30.9	**37.5**	**FWTS**				**FOOTWALL - TRACE SULPHIDES**																
30.9	32.6		PU RK	qs	a	Similarly altered but more FW looking unit (when compared with the previous unit). Unit is a lighter grey; seems to possess a shinier lustre than the previous unit. Silica clasts/fragments, can be quite distinct and rounded, or appear to be aggregates of a number of small clasts. Unit is clast supported. Clast size varies from 1cm to greater than 5cm. Some minor sulphide spots etc as in previous unit. Strong sericite wisping close to CA - varies around clasts though. Core competent.	31.8 32.5	CV CV	12° 8°													
32.6	37.5		PU RK	ql sb	a	Dark greeny-grey, fairly heavily carbonate altered, brecciated siliceous unit. Appears to be mainly clast supported, but the boundaries of some silica 'clasts' can be difficult to see. Matrix is chlorite+/-sericite altered, with a few sericite wisps present. Unit visually dominated by large, or aggregate yellow carbonate spots. These seem to favour the the more pure silica clasts, sometimes present as fill in crystal edges or tension gashes, or as more rounded spots and aggregates. The carbonate is also found wthin some sericite and chlorite-sericite wisps. Unit carries very small, occasional spots of sphalerite etc (as in the last few units), which are spatially related to carbonate alteration, but are not necessarily bounded by or adjacent to the spots themselves. Impossible to pick a fabric in clast rich intervals - the sericite wisps in these areas run between 20 and 40 degrees to CA, but can run against the preceived fabric present in matrix rich intervals (which run 30 degrees). Core is competent.	35.9 36.5	CV CV	28° 30°													
37.5	**46.5**	**FWTS**				**FOOTWALL - TRACE SULPHIDES**																

Hole No: 014B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
37.5	43.5		DA RK	qs	a	Light greeny-grey, fairly massive looking, intensely ?carbonate spotted/altered feldspar phyric, sericite+/-silica altered rock. Flecks and spots of white soft sericite or carbonate are 1-2mm in size - look like alteration after ?feldspar. Some chlorite wisps (near orthogonal to CA) and small chlorite alteration blebs and spots occur sporadically. Unit then is most likely of dacitic affinities. A joint/s is/are present at CA for most of the unit. Difficult to determine a fabric in the unit. Core of variable competency. Unit quite broken in first 20cm and after ~39M. Moderate competency elsewhere.	39.0	JT	2°													
43.5	46.5		RK	si	a	Similar to last unit, except darker green in colour, and more densely packed spots/altered phenocrysts. However, most spots do not appear to be pseudomorphs after feldspar (rounded, diffuse not angular boundaries), especially around a mildy mineralised joint which runs close to CA for most of unit. This may be 1-5mm thick and can carry galena and fine grained black sulphide. Small blebs of sphalerite etc occur occasionally, separate from this joint. Some blebs occur within or adjacent to quartz veinlets. Last 10cm of core broken.	45.5	JT	2°													
46.5	**47.8**	**HO**				**HOST SEQUENCE**																
46.5	47.8		RK	si	a	Silicified rock (possibly after sandstone) with only scarce quantities of the 'spots' of the previous unit. Minor carbonate and chlorite wisps. Very minor galena mineralisation along some breaks in core. Core competent.	47.0	JT	25°													
47.8	**49.9**	**HO**				**HOST SEQUENCE**																
47.8	49.9		RK	sc si	a	More sericite-chlorite altered version of previous; also more broken. Joints common, and are generally black chlorite coated. Small breccia of silicified rock at 48.6m contained within one of these chlorite joints. Faint fabric at 35 to CA. Some chlorite 'joints' run conjugate to this. Unit becomes more broken and altered towards next unit. Possibly could be included in the 'fault' strat of next unit.	48.0 48.6	CV JT	35° 45°													
49.9	**54.4**	**F**				**FAULT**																
			RK	sc																		
51.3	54.4		RK	cl qb	a	Broken rock, which is variably chlorite-sericite altered (dark green) and intensely silica-carbonate altered. Carbonate as spots, veins and wisps. Carbonate and silica alteration dominates with only minor intervals of dark chlorite+/-sericite alteration (although patches and wisps of chlorite-sericite alteration may be found intermixed with the other). Evidence of a breccia of silicic clasts in latter parts of unit.	54.2	CV	27°													
54.4	**56.9**	**HO**				**HOST SEQUENCE**																

Hole No: 014B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
54.4	56.9		RK	qb si	a	White, with yellow-white carbonate spots, extremely silicified rock. Spots are 1-3mm in size, fairly evenly distributed, carbonate - some appear to mildy oxidised (or mixed with sericite). Unit has common 1-5mm wide, browny carbonate-quartz veins. These generally run 25 degrees to CA, though other orientations occur. No fabric readily discernible. Rare thin chlorite wispy veinlets run near perpendicular to CA. Unit very competent. Seems to grade into next unit. Boundary with last unit is broken, but silicification does seem to increase within 10cm of the boundary.	56.8	VN	25°													
56.9	**58.5**	**HQ**				**HOST SEQUENCE**																
56.9	58.5		RK	co qb	a	Silic rock, as in last unit but with intense carbonate spotting. Chlorite alteration also increases towards end of unit. Carbonate+chlorite blebs vein, at least 2cm thick on margin of core, runs close to CA. Core of moderate competency.	58.3	VN	6°													
58.5	**58.9**	**F**				**FAULT**																
58.5	58.9		RK	co	a	Small broken zone of chlorite-carbonate altered rock fragments, most likely similar to last unit.																
58.9	**60.1**	**HODS**				**HOST - DISSEMINATED SULPHIDES**																
58.9	60.1		RK ST	ql	a	Medium grey, with a green hue, sericite-chlorite and silica altered siltstone/chert. Unit carries weak HODS-HOTS grade sphalerite–fine grained black sulphide-galena-pyrite-chalcopyrite blebs and wisps. Sphalerite as medium brown masses - unit may go 1-2%Zn. These may be rimmed by quartz-carbonate as thin veinlets, or may occur with very thin chlorite wisps. The veinlets exist in a number of orientations - 2 are conjugate and ~15-20 to CA, while other, but less numerous mineralised veins run near orthogonal to CA. Disseminated fine grained pyrite also present. Core of moderate competency - tends to split along the wispy veinlets orientations.	59.9	CV	17°													
60.1	**62.0**	**HOTS**				**HOST - TRACE SULPHIDES**																
60.1	62.0		RK ST	cl	a	As in last unit except more chlorite+/-?sericite altered (thus dark green-grey coloured). Sulphides as much more fine grained and smaller wisps and blebs, generally occurring without any obvious quartz-carbonate veining. Fairly abrupt boundary with next unit. Core of poor to moderate competency.	60.6	CV	20°													
62.0	**63.4**	**HOTS**				**HOST - TRACE SULPHIDES**																

[redacted]

Hole No: 014B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
62.0	63.4		RK	cl qb	a	Pinky red silicified rock, with abundant carbonate spots. Suffers more or less complete chlorite+minor wispy sericite alteration as the unit progresses. Ends up looking like last unit, except for small 'windows' of silicified, spotted material. Mineralised by small brown sphalerite-fine grained black sulphide/galena blebs and small wisps - May go 1%Zn. Cleavage hard to pick out - silica rich portions tend to obscure it. Core competent - minor rubble at 63.3 - but may be from further up hole.	63.1	CV	18°													
63.4	**63.5**	**F**				**FAULT**																
63.4	63.5		RK		a	Loose sand fill- with very fine grained fragments of black coloured, black streaked ?magnetite-?hematite or destroyed drill steel. Remainder is quartz and other lithics. Possible that this material is from further uphole.																
63.5	**66.7**	**HOTS**				**HOST - TRACE SULPHIDES**																
63.5	66.7		RK	cb cs qb	a	Looks to be a continuation of the very chlorite+/-sericite altered end member of 62-63.4m, with intervals of intense carbonate alteration. Difficult to tell if the occasional carbonate spotted silica fragments are clasts, or remnants due the chlorite alteration. The carbonate intervals looks to be intense agregates of spotting, perhaps accompanied by sericite. Difficult to tell if the carbonate intervals (10-20cm wide in places) are after silica rich portions or not. Minor blebs and fine grained spots of mineralisation (assemblage as previous) seems to favour the carbonate (and silica) richer intervals, although they do occur elsewhere to a lesser extent. Overall grade <1%Zn. Carbonate drops off after 65.8m, and the unit starts to look quite schistose (quartz-chlorite-sericite schist). Dominant fabric is hard to pick earlier in unit, due to conjugate sericite wisps, but one orientation chosen due to vague carbonate 'interval/clast' orientations being sub-parallel to most breaks in core and one set of sericite wisping. Core of good to moderate competency. EOH 66.7m.	63.5 64.5 64.7 66.2	CV VN CV CV	30° 22° 28° 35°													

PASMINCO ROSEBERY

A.C.N. 004 074 962

Hole No: 015B **Location:** Southern Trenches

Objective: Along strike from 009B mineralisation.

Result: No significant mineralisation. Fruuuuiiiiiiiittttttcaaaake!!! I've killed it!

Depth	Direct	Dip
0.0	216.0	-53.5
20.0	213.0	-53.3
48.0	214.5	-53.0
70.0	214.0	-53.5

Planned Direction: 216°
Planned Dip: -54°
Planned Depth: 100.0 m
Planned Northing: 4410 m N
Planned Easting: 4652 m E
Planned Collar R.L.: 422 m RL

Drilling Commenced: 17/10/98
Drilling Completed: 19/10/98
Actual Depth: 70.0 m
Surveyed Northing: 4409.35 m N
Surveyed Easting: 4653.38 m E
Surveyed Collar R.L.: 421.83 m RL

Date Logged: 28-Oct-1998
Logged By: Michael Whitbread
Hole Size: HQ
Hole Category: other
Grouted:

Date Log Verified: 26-Nov-1998
Verified By: Michael Whitbread

Summary Log:
0-3m NC; -8.6m Hots; -10.7m F; -17.1m Hots; -17.2m F; -17.5m Ho, -24.1m Hots; -27.8m F; -33.9m Hots; -34.8m F; -35.9m Hots; -36.8m F; -51.7m Hots; -57.9m F; -69.9m Hots; -70m F EOH.

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°
0.0	**3.0**	**NC**				**NO CORE**			
0.0	3.0		NC		a	No core.			
3.0	**8.6**	**HOTS**				**HOST - TRACE SULPHIDES**			
3.0	8.6		RK	cb cl si	a	Dark green to medium grey, slightly oxidised and clay altered, variably chlorite and silica altered, heavily carbonate/clay spotted, rock. Spots are 1-8mm in diameter, and contain white carbonate/clay. Some have been weathered out leaving a pitted surface. Uncommonly have medium brown sphalerite +/- fine grained black sulphide or pyrite, contained within or associated with the spotting. Chlorite alteration can be massive, or as abundant distinct clots of chlorite 1cm in diameter. Fabric present, most obvious in chlorite rich intervals. Core of moderate to poor competency, but decreases in competency (and increases in browny fracture coatings - weathering), after 7.3m.	3.3 5.3 7.6	CV CV CV	45° 35° 25°
8.6	**10.7**	**F**				**FAULT**			

RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
3.0	NC	97238	3.0	4.5	1.5	0.1	0.1	0.01	1	0.1	2.3	3
4.9	0	97239	4.5	5.5	1.0	0.1	0.1	0.01	1	0.1	1.5	3
5.3	100	97240	5.5	6.5	1.0	0.1	0.1	0.01	1	0.1	1.4	3
5.7	0	97241	6.5	7.5	1.0	0.1	0.1	0.01	1	0.1	2.3	3
6.8	54	97242	7.5	8.6	1.1	0.1	0.1	0.01	1	0.1	2.6	3
10.9	19	97243	8.6	9.4	0.8	0.1	0.3	0.01	1	0.1	1.8	6
11.6	85	97244	9.4	10.7	1.3	0.1	0.2	0.01	1	0.1	0.7	4
12.1	20	97245	10.7	12.0	1.3	0.1	0.7	0.01	1	0.1	2.0	11
13.9	83	97246	12.0	13.0	1.0	0.1	0.8	0.01	1	0.1	1.2	12
16.1	3	97247	13.0	13.9	0.9	0.1	1.9	0.16	4	0.1	1.3	29
18.1	70	97248	13.9	14.2	0.3	0.2	1.2	0.01	4	0.1	0.6	18
18.7	0	97249	14.2	16.0	1.8	0.1	0.2	0.01	1	0.1	0.6	4
19.6	100	97250	16.0	17.1	1.1	0.1	1.0	0.03	1	0.1	1.2	15
22.1	12	97251	17.1	17.2	0.1	0.1	0.3	0.01	1	0.1	1.0	6
23.7	68	97252	17.2	17.5	0.3	0.1	0.2	0.01	1	0.1	0.8	4
25.5	27	97253	17.5	18.5	1.0	0.1	0.4	0.02	1	0.1	1.3	7
26.0	80	97254	18.5	19.5	1.0	0.1	0.1	0.01	1	0.1	1.4	3
27.9	10	97255	19.5	20.6	1.1	0.1	0.1	0.01	2	0.1	0.7	3
29.5	75	97256	20.6	21.6	1.0	0.1	0.1	0.01	1	0.1	0.6	3
32.5	13	97257	21.6	22.6	1.0	0.1	0.2	0.02	2	0.1	0.6	5
33.8	84	97258	22.6	23.7	1.1	0.2	0.3	0.03	3	0.1	1.0	7
34.0	0	97259	23.7	24.1	0.4	0.4	0.9	0.11	13	0.1	0.8	18

Hole No: 015B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°
8.6	10.7		BR CH ST	se cl se	a	Broken zone with mixed components, most with a dull-browny hue to them due to mild weathering. Some are cherty breccias, other components are sericite or chlorite altered sandstone/siltstone. Distinct lack of carbonate spots or pitting c.f. last unit. Impossible to pick a believable fabric. 5cm pug at ~8.9m, and at ~9.7m.			
10.7	**13.9**	**HOTS**				**HOST - TRACE SULPHIDES**			
10.7	13.9		CH RK	 cs si	a	Dark green and light grey coloured, variably chlorite+/-sericite and silica altered rock similar to 3-8.6m - but with only minor carbonate/chlorite spotting. The spotting that is present is also much smaller 1-3mm. Unit quite quartz-carbonate flooded/veined in last 20cm of unit. Some blebs and wisps of sulphide (as previous) associated with this veining. Rare occurrences elsewhere in unit. <<1%Zn in unit. Fabric noted. Unit of moderate to good competency.	12.4	CV	45°
13.9	**14.2**	**HOTS**				**HOST - TRACE SULPHIDES**			
13.9	14.2		SH	sc	a	Sericite-chlorite schist, with thin minor blebs of fine grained sulphide and sphalerite. Strong fabric. Abrupt boundaries with units either side. Core of poor competency.	14.0	CV	49°
14.2	**17.1**	**HOTS**				**HOST - TRACE SULPHIDES**			
14.2	16.0		RK	cs ql	a	Pale green silica and chlorite-sericite altered rock. Most likely after siltstone. Chlorite dominant to ~15m after which silica dominates. Small blebs of sphalerite etc present in occasional, thin quartz veins. Some clay 'clasts'/spots (3-10mm) in the chlorite dominant portion. Core of moderate to poor competency. Particularly poor around 15.7m.	14.9	CV	50°
16.0	17.1		CH		a	Grey, cherty rock, with small wisps and zones of chlorite, sericite alteration. Carries common blebs and wisps of sphalerite etc usually hosted within thin quartz veins - sulphides occur mainly in the moderately silica flooded/veined first 30cm of unit. Overall unit probably won't make 1%Zn. Unit fairly competent.	16.3 16.5	VN JT	35° 30°
17.1	**17.2**	**F**				**FAULT**			
17.1	17.2		CY		a	Small puggy zone. Contains clay and lithic fragments from surrounding units. Boundary with next unit has 67degree angle to CA.	17.2	FT	67°
17.2	**17.5**	**HO**				**HOST SEQUENCE**			
17.2	17.5		CH RK		a	Unit as in that before the puggy fault. Trace quantity of sulphides.			
17.5	**24.1**	**HOTS**				**HOST - TRACE SULPHIDES**			

RQD To (m)	RQD %
35.7	82
36.8	9
37.4	100
38.6	0
39.6	100
41.1	33
42.8	82
44.5	11
45.7	100
47.3	18
53.6	82
57.7	24
58.3	83
59.4	9
61.3	52
63.7	8
67.4	83
68.7	15
70.0	84

Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
97260	24.1	25.5	1.4	0.3	0.4	0.05	7	0.1	0.8	9
97261	25.5	26.6	1.1	0.1	1.0	0.18	2	0.1	1.5	17
97262	26.6	27.8	1.2	0.3	0.2	0.01	1	0.1	0.8	5
97263	27.8	29.0	1.2	0.2	0.1	0.01	4	0.1	0.7	4
97264	29.0	30.3	1.3	0.1	0.1	0.01	3	0.1	0.5	3
97265	30.3	31.6	1.3	1.9	1.8	0.24	52	0.4	1.2	48
97266	31.6	32.2	0.6	0.4	1.3	0.06	8	0.1	1.2	22
97267	32.2	33.9	1.7	0.3	2.0	0.05	8	0.1	3.0	30
97268	33.9	34.8	0.9	1.6	2.8	0.03	18	0.1	3.2	49
97269	34.8	35.9	1.1	0.1	0.3	0.01	5	0.1	1.0	6
97270	35.9	36.8	0.9	0.2	0.4	0.01	1	0.1	0.9	7
97271	36.8	38.0	1.2	0.1	0.1	0.01	1	0.1	1.8	3
97272	38.0	39.4	1.4	0.4	0.3	0.01	16	0.1	0.5	10
97273	39.4	40.4	1.0	0.4	0.2	0.01	5	0.1	0.6	7
97274	60.8	61.8	1.0	0.1	0.1	0.03	2	0.1	0.3	3
97275	61.8	62.8	1.0	0.3	1.0	0.09	2	0.1	0.5	17
97276	62.8	63.8	1.0	0.1	0.1	0.02	1	0.1	0.6	3
97277	63.8	64.8	1.0	0.1	0.6	0.08	1	0.1	1.5	10
97278	64.8	65.8	1.0	0.1	0.1	0.03	2	0.1	1.1	3
97279	65.8	66.8	1.0	0.1	0.1	0.03	2	0.1	0.7	3
'97280	66.8	68.0	1.2	0.1	0.1	0.03	1	0.1	0.7	3
97281	68.0	69.0	1.0	0.2	0.4	0.04	1	0.1	0.8	8
97282	69.0	69.9	0.9	0.1	0.2	0.02	1	0.1	0.6	4
97283	69.9	70.0	0.1	0.1	0.5	0.03	2	0.1	1.8	9
		Total Length:	46.6							

Standards

	Pb	Zn	Cu	Ag	Au	Fe	
Reference Values for: LBM-07						21/08/98	
	2.0	6.3	0.17	51	0.4	9.4	
Variances Allowed:	20%	20%	30%	20%	20%	20%	
97284 Inserted @ 70.0m	2.0	5.9	0.18	46	0.4	8.2	Y

TMU Parameters

Pb Metal Price (US$/t):	$525	**Pb Recovery (%):**	68.40%
Zn Metal Price (US$/t):	$1,200	**Zn Recovery (%):**	75.50%
Cu Metal Price (US$/t):	$1,750	**Cu Recovery (%):**	45.40%
Ag Metal Price (US$/oz):	$6	**Ag Recovery (%):**	70.00%
Au Metal Price (US$/oz):	$300	**Au Recovery (%):**	63.70%

Hole No: 015B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
17.5	24.1		BR RK	 ql	a	Pale green and grey, faintly banded, possibly silica clast bearing, variably chlorite-sericite altered silica rock/volcanoclastic breccia. Contains occasional quartz veins +/-sulphide (sphalerite etc as previously). Unit still would not go 1%Zn. Most parts have a slightly banded/zoned look to them due to alternations between light grey silica rich domains/'clasts', and the greenish silica-chlorite intervening zones- possibly due to solely to alteration, but may reflect protolith texture (siliceous pumice breccia?). "Clast' size can vary from 5mm, to one at 22.7m which is 10cm. Occasional intervals look more like cherty sediment than altered pumice breccia. Some minor orangey carbonate-?sericite alteration present sporadically throughout as wisps, or as small spots and aggregates. Yellowy carbonate sometimes accompanies the quartz veins. Noticeable fabrics are the banding, and veining and carbonate-sericite wisps, which tend to run with it anyway. Competency is mixed, poor between 20-22m, but generally moderate elsewhere. The more chlorite rich intervals tend to be less competent.	19.1 22.0	BD BD	35° 47°													
24.1	**27.8**	**F**				**FAULT**																
24.1	27.8		CH RK	 ql	a	Broken version of previous unit dominated by chlorite more than silica, with two main patches of cherty intervals carrying quartz+/-sphalerite etc veins. These occur at 28.6-25.8m and 26.1-26.6m, and are slightly more competent (pieces 5-10cm in length). The cherty intervals would struggle to go 1%Zn, and overall the grade is far worse.																
27.8	**30.3**	**HOTS**				**HOST - TRACE SULPHIDES**																
27.8	30.3		 SH	 ql	a	More competent version (c.f. last unit) of the silica chlorite rock of previous units. Looks almost schistose, with quite discrete segregation of silica and silica-chlorite bands (1-15mm wide), and a lack of the 'clast' like texture of previous units. Still carry occasional blebs of sulphide -associated with quartz veining. Occasional joints (can be conjugate to banding) have small galena growths, or films of chlorite and fine grained black sulphide on them. Banding in more chlorite rich intervals becomes a strong cleavage. Overall grade still	28.0 28.0 28.6	CV JT BD	35° 30° 35°													
30.3	**32.2**	**HOTS**				**HOST - TRACE SULPHIDES**																
30.3	32.2		CH		b	Medium grey cherty sediments. Small wisps and patches of sericite-chlorite alteration present - rarely as a matrix to localised cherty breccia. Unit carries minor blebs and veinlets of medium brown sphalerite-galena-pyrite etc not contained with any recognisable quartz veining (c.f. previous units). Unit suffers increasing sericite-chlorite alteration and bad competency after 31.6m. 30cm loss from 31.7-32m. No really obvious fabric, except for sub-parallel mineralised veinlets of sulphide. Difficult to put an accurate boundary between this unit and the next. Boundary chosen at chlorite shear/fault.	30.6 30.7 32.2	JT VN SR	7° 25° 60°													
32.2	**33.9**	**HOTS**				**HOST - TRACE SULPHIDES**																

Hole No: 015B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
32.2	33.9		CH RK	cs cl	a	Weird looking mixed lithology/altered unit. Unit dominated by intervals of medium grey cherty sediment with abundant chloritic clots alternating with extremely chlorite altered rock; while from 32.4-32.7 we have, contained within a dark green chloritic matrix, aggregate clasts of deformed quartz-carbonate clasts separated by a light green chlorite-sericite matrix. These clasts are often cored by, or contain sphalerite-galena blebs and spots. This zone is most likely a screwed up quartz-carbonate vein contained within an annealed chloritic shear (sheared due to competency of surrounding cherty sediment). At 33.45 we have a carbonate vein containing thin blebs and veinlets of fine grained black sulphide (black streak). Sulphides are present, but uncommon outside the two zones mentioned. Chlorite rich zones carry a strong fabric, but this varies depending on the presence of silicified material. Unit will not make 1%Zn. Unit of moderate competency except in the first 5cm which is broken.	33.0 33.4	CV CV	20° 40°													
33.9	**34.8**	**F**				**FAULT**																
33.9	34.8		RK	cl cs	a	Begins with a broken zone of chloritic rock, carrying minor occurrences of galena, generally within thin, erratic quartz veinlets. Rubble of this material to ~34.2m; then two 10cm sticks of yellowy green sericite-chlorite-?carbonate, strongly foliated rock (fabric close to CA); then 10cm of very small broken chlorite-sericite chips; followed by 30-40cm of unmarked core loss to the next unit.	34.3	CV	8°													
34.8	**35.9**	**HOTS**				**HOST - TRACE SULPHIDES**																
34.8	35.9		BR CH RK	cs si	a	Light grey silicified sandstone/siltstone/rock/chert. Some evidence of original grainsize variations/bedding preserved in colour and transluscency changes. Unit brecciated by green chlorite-sericite matrix in first 20cm of unit (looks like normal chert breccia; still can't tell if the breccia is an artefact of alteration or alteration of a primary texture. Brecciated interval carries minor galena and fine grained black sulphide as in previous units. The extremely fine grained thin silica after 35.4 carries very thin worm-like wisps of galena etc with 1mm sized blebs of brown sphalerite entrained within. Sporadic chlorite wisps sub-parallel to banding occur; many of the sulphide wisps sub-parallel the banding aswell. Contact with next unit is sharp, but shows brecciation of marginal 2-3mm sized cherty fragments away from this unit. Core competent.	35.0 35.4 35.6 35.9	BD BD BD CT	38° 47° 45° 35°													
35.9	**36.8**	**F**				**FAULT**																
35.9	36.8		RK	sc	a	Broken zone of yellowy-green sericite-chlorite altered rock. Strongly foliated. Rare small blebs of galena and fine grained black sulphide can be found sitting within the fabric.	36.6	CV	43°													
36.8	**39.4**	**HOTS**				**HOST - TRACE SULPHIDES**																

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int.	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
36.8	39.4		RK	sc si	a	Greeny-yellow coloured, sericite-chlorite altered, silcified rock/volcanoclastic. Strong fabric in sericite-chlorite dominated areas. Siliceous patches often carry orangey carbonate spots and veinlets (can be quite concentrated). Textute of unit looks slightly schistose/banded with sericite-chlorite finely intermixed with siliceous lamellae. Possibly a more altered version of the next unit, the boundary with which is gradational. Greenish alteration certainly decreases and the relevant silica content increases towards the next unit. Very trace quantites of sulphide blebs (assemblage as previous). Core of moderate to good competency.	37.3 38.7	CV BD	43° 48°													
39.4	**51.7**	**HOTS**				**HOST - TRACE SULPHIDES**																
39.4	51.7		PU RK	cb si	a	Light to medium greenish-tinged, grey, cherty rock/pumice breccia with fairly intense carbonate spotting and rimming, and abundant chlorite clots and pseudo fiamme of varying size and shape. Fiamme vary from 3mm to 2cm in width, and are usually elongate in a preferred banding orientation. Rare angular lithic fragments of the same cherty rock can be found within the unit. Carbonate as thin yellow white to orange coloured veinlets, spots and thin (<1mm) rims around the margins of some pseudo-fiamme etc. Some rounded pitting present throughout unit, probably after the carbonate. Occasional carbonate veins (<1-2cm wide) brecciate the host rock.Very minor disseminated pyrite accompanying some chlorite rich patches, and very rare galena in similar positions. Carbonate orange prior to ~44m, and after ~49.5m. Core generally competent. Broken zones (fragments generally 2-5cm in size), possible fault? ~42.8m to 43.9m, and ~45.8-46.5m.	42.0 44.5 49.9	BD BD BD	40° 47° 49°													
51.7	**57.9**	**F**				**FAULT**																
51.7	57.9		PU RK	si	a	Broken version of previous unit. Lots of unmarked core loss. Chlorite pseudo-fiamme size and occurrence gradually decreasing throughout unit, although wispy, indistinct chlorite-sericite alteration is present. Carbonate alteration also majorly decreased. Some occasional, isolated, thin blebs of galena and brown sphalerite, or pyrite and fine grained black sulphide. Banding looks like a cleavage in places, with thin carbonate wisps and chlorite-sericite wisps running sub-parallel. At least 1.5m core loss to 53.9m, ~20cm loss 55-56m, with partial recovery dominating throughout. Some occurences of broken material falling in after runs - makes estimating core block accuracy very difficult.	57.0	BD	40°													
57.9	**60.8**	**HOTS**				**HOST - TRACE SULPHIDES**																
57.9	60.8		PU RK	si	a	More competent version of previous unit. Some small broken zones sporadically throughout, amongst competent core. Chlorite pseudo-fiamme only present as thin 1-5mm wide and elongate blebs, still forming a fabric. Very thin orangey ?sericite-carbonate veinlets commonly present.	60.6	BD	50°													
60.8	**69.9**	**HOTS**				**HOST - TRACE SULPHIDES**																

Hole No: 015B

From (m)	To (m)	Strat Code	Desc Code	Alt Code	Alt Int	Description	@ Depth	Feature	LCA Deg°	RQD To (m)	RQD %	Sample No	From (m)	To (m)	Length (m)	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
60.8	69.9		RK SS	sc si	b	Greenish hued grey, silica rich rock/sandstone, containing minor sericite-chlorite wispy alteration througout. Unit contains common blebs of galena-sphalerite-pyrite and fine grained black sulphide, often contained with thin quartz-carbonate veins, or areas of stronger, but subtle, silica flooding. Still, probably make 1%Zn. Only rarely does unit have small (<1cm long) chlorite 'pseudo-fiamme'. Thin orangey carbonate-?sericite veinlets still present and fairly common. Unit begins to carry more chlorite pseudo-fiamme in last 1m of core. Difficult to pick a fabric as quartz veins can run in conjugate senses, and carbonate veinlets have varying orientations. The quartz veins do often lie parallel to chlorite blebs. Core of poor competency to 63.5 (possible part of a fault zone); competent thereafter. Core orientation at 68m. Orientated measurement of the vague banding - ~N-S stike, ~60 degrees dip east.	62.1 62.5 62.6 65.1 66.7 66.7 68.0	JT BD JT BD BD JT BD	50° 35° 40° 44° 52° 30° 50°													
69.9	**70.0**	**F**				**FAULT**																
69.9	70.0		CY RK	qs	a	10cm of broken fragments (silica, and silica-sericite-chlorite) and clayey bits. EOH at 70m though, so difficult to indicate if this zone is important.	69.9	CT	21°													

556186

BURNS PEAK EL 44/88

JOINT VENTURE ANNUAL REPORT

NOVEMBER 1997 - 31ST DECEMBER 1998

APPENDIX 3

PETROLOGICAL REPORTS

BROWNS TUNNEL ORE CHARACTERISATION STUDY

PASMINCO
ROSEBERY
MINE

Attn: H.W. Fander
Central Mineralogical Services
8 Bradshaw Avenue
Crafers SA 5152

Mr Fander,

As well as faxing this letter to you, I have included a copy of it with the core samples, which are hopefully winging their way to you now. All but one of the pieces are quarter core cuts, unfortunately not rectangular stubs - the large core saws we possess tend to make a meal of most of the samples when finer cuts are made. Some of the more brittle samples might, at your discretion, require impregnation or some other preservation technique prior to thin section preparation.

On each sample, the general areas of interest (in terms of section work) are marked with permanent pen with arrows pointing in towards the section area. No marks are present on samples of sufficiently small size. Many of the pieces have been cut with one of the faces near perpendicular to the dominant fabric.

Pasminco would like you to provide a general petrographic description of the samples in terms of opaques, gangue, and possible metallurgical implications of grain relationships, size, oxidation effects etc. Any thoughts on genesis etc, which spring to mind are certainly welcome! Pasminco intends to use your results to aid in ore characterisation and metallurgy testing which will be carried out immediately upon receipt of your work. Included below is a list of the samples, with other notes of interest. If you would like any other information, do not hesitate to call me on 03 64732287.

<u>Samples - 19 in total.</u>

001B_38.5m - surrounding zones are oxidised. Ore grade.
002B_16.4m - from a partially weathered zone, sub-economic.
002B_20.4m - Ore grade. Minimal weathering.
002B_26.4m - Ore grade. Non-weathered.
002B_35.1m - Ore grade. Associated with a fault zone.

004B_48.6m - sub-economic. In cherty breccia host.
004B_57.1m - Ore grade. ?Carbonate hosted.
004B_57.4m - As before, lesser ?carbonate content.
004B_59.6m - Ore grade.
004B_58.7m - Cherty host - notable gold kick in assay containing this and the next sample.
004B_58.9m - Adjacent to a fault zone. Strong fabric- is gold present in this material and/or the former sample?
004B_61.9m - Sub-economic.

006B_38.2m - partial oxidation in this part of hole. Weak mineralisation.

006B_43.4m - Ore grade. Any incipient oxidation?
006B_48.7m - Rubble from a fault zone. Mineralised, possible ore.
006B_49.1m - Cherty host, ore.
006B_53.8m - Ore. Visual estimate (pre-cutting of core) lower than actual assay result.
006B_58.5m - Silicified sandstone and siltstone hosted ore.
006B_47.3m - Marginal ore.

In addition to these samples, I have managed to obtain 4 further samples (already prepared into Polished slides and one normal thin section) from older holes in the area.

The samples are:
77908 - PTS and block - Ore sample with sphalerite spots/porphyroblasts rimmed by a fine grained dark material. Possible close to the weathering oxidation boundary.
77909 - PTS - stockwork vein containing sphalerite spots, in a silicified volcanic?
77911 - PTS - stockwork vein containing sphalerite spots, in a cherty sediments.
77915 - TS - not of interest in an ore sense, contains curious orange alteration. What is that, and does it have any relation to mineralisation? Low priority sample.

Regards,

Michael Whitbread
Mine Geologist
Pasminco Rosebery Mine
Rosebery TAS 7470
BH (03) 64732287
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Central Mineralogical Services

8 Bradshaw Avenue, Crafers, S.A. 5152
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CMS

23 September 1998

Mr M.Whitbread
Pasminco Mining Rosebery
PO Box 21
ROSEBERY Tas. 7470

REPORT CMS 98/8/9

YOUR REFERENCE:	Letter M. Whitbread
DATE RECEIVED:	24 August 1998
SAMPLE NO'S:	As per report
SUBMITTED BY:	M. Whitbread
WORK REQUESTED:	Mineragraphy, petrography

HWFander

H.W. Fander, M.Sc.

REPORT CMS 98/8/9

ROSEBERY DRILL CORE INTERSECTIONS

Nineteen drill core samples and four prepared sections were received for mineragraphic and petrographic examination. Polished thin sections were prepared (by Pontifex & Associates) as requested and were examined in transmitted and reflected light; the results are given in the attached sheets.

The **host rocks** range from chemical sediments (cherts) to felsic lavas, and include fine clastic rocks, pyroclastic types and mixed clastic-pyroclastic types of doubtful interpretation. Two baritic rocks also occur. The interpretation of the volcanic rocks is hampered by devitrification and argillic-sericitic alteration and silicification. The sulphide mineralisation is accompanied by quartz and muscovite (apparently the variety phengite).

The **sulphide assemblage** is simple, comprising sphalerite, galena, chalcopyrite and pyrite, with occasional tetrahedrite, rare arsenopyrite and sporadic covellite. There is evidence of a second, late-stage phase of galena in one or two samples; it is metallurgically important because it has been deposited as thin rims on sphalerite.

Sphalerite patches invariably have dark, opaque rims due to myriads of ultrafine chalcopyrite inclusions; small sphalerite grains may be completely opaque, with no clear cores at all. This type of sphalerite will naturally have abnormally high Fe and Cu contents.

In general, the sulphide textures and grainsizes are simple and coarse, and should not present undue metallurgical problems. However, liberation of some of the very fine sulphides in gangue may be inefficient and lead to lower recoveries; this is probably the case for many ore-grade intersections consisting mainly of gangue (ie host rock), where, for instance, sulphides are deposited between fine mica flakes. This situation exists also around margins of larger sulphide patches, where there are fine intergrowths with mica flakes.

No gold was seen in the two relevant intersections. The nature of the gold would require a separately specialised investigation.

REPORT CMS 98/8/9

PHOTOMICROGRAPHS

Photo No.	Sample No.	Magnification	Subject Description
1	001B 38.5m	50x	Pale sphalerite with black opaque rims due to inclusions.
2	001B 38.5m	670x	Part of the opaque rim, showing chalcopyrite inclusions.
3	001B 38.5m	270x	Fine galena and sphalerite in gangue - typical of the fine galena and sphalerite in gangue in many intersections in this suite.
4	002B16.4m	135x	Development of covellite rimming and veining chalcopyrite.
5	002B 26.4m	135x	Ragged sphalerite contrasting with solid sphalerite.
6	002B 35.1m	135x	Typical galena/chalcopyrite intergrowths in sphalerite.
7	006B 38.2m	135x	Sphalerite patches with fine secondary galena rims and enclosing an arsenopyrite crystal (a)
8	006B 47.3m	135x	Galena rims on chalcopyrite.

SAMPLE NO: **001B/38.5m** **Page: 1**

General Description: Massive host rock with lenses and veins of sulphides; conspicuous sphalerite.

Host Rock: May be termed a **soft-sediment breccia** (pseudoconglomerate), probably formed by slumping. It consists of subparallel lenses and streaks of shale, carbonaceous shale (-graphitic schist), indurated siltstones, altered fine felsic tuff, and fragments of altered, devitrified obsidian and pumice. The whole rock has a strong preferred orientation due to deformation prior to lithification. Quartz patches and veins, and muscovite, are associated with mineralisation.

Sulphides: These are sphalerite, galena, chalcopyrite and pyrite. **Sphalerite** occurs as veins up to 5mm wide, as patches up to 2mm, and as grains down to 10μ in gangue; it has black opaque rims 20μ - 200μ wide, full of submicroscopic chalcopyrite inclusions, and pale centres. It is simply intergrown with galena. **Galena** forms small grains (<10μ - 100μ) in gangue, and patches up to 800μ, also as inclusions in pyrite. **Chalcopyrite** is generally intergrown with galena on a 50μ - 200μ scale, and occurs as 5μ - 200μ inclusions in sphalerite; there are also coarser intergrowths with galena where chalcopyrite forms masses and veins up to 2mm wide. Pyrite is very minor, as small, dispersed crystals.

Comments: Fine sulphides in gangue are common and may be difficult to liberate.

SAMPLE NO: **002B/16.4m**

General Description: Massive host rock with minor sulphides and scattered small grains, patches and lenses.

Host Rock: A silicified, mineralised **soft-sediment breccia**. It consists of parallel lenses of shale (now ultrafine sericite and quartz) which is carbonaceous and pyritic. Occasional fragments of altered obsidian are incorporated. The rock has preferred fabric due to pre-consolidation shearing. Extensive silicification has taken place, and there are radiating aggregates of muscovite (var. phengite) associated with the mineralisation.

Sulphides: These are sphalerite, chalcopyrite, minor galena and pyrite, and a trace of covellite (indicating supergene enrichment). **Sphalerite** forms patches up to 3-4mm, with dark rims and pale centres and also occurs as irregular 5μ - 200μ grains in gangue. **Chalcopyrite** forms masses up to 600μ x 3mm, rimmed and veined by fine **covellite** and with rare tetrahedrite inclusions; also as small (10μ - 200μ) grains in gangue. **Galena** is mostly very fine, as 5μ - 50μ grains in gangue and with pyrite, with a few patches up to 150μ. **Pyrite** occurs as small, well-formed crystals throughout.

Comments: Fine sulphides in gangue may be difficult to liberate.

SAMPLE NO: **002B/20.4m** **Page: 3**

General Description: Massive host rock with scattered sulphides, as small grains and as larger pods up to 10x25mm.

Host Rock: A silicified and sercitised **porphyritic felsic lava** containing fragments of altered fine vitric tuff.

Most phenocrysts were originally feldspar; occasional quartz phenocrysts occur. The groundmass is ultrafine quartz and sericite, probably representing altered, flow-banded glass. The rock may have had a dacitic to rhyolitic composition. The sulphides are accompanied by quartz and muscovite.

Sulphides: These are sphalerite, chalcopyrite, pyrite, galena, and a trace of covellite; there are composite sulphide patches up to 5x10mm consisting chiefly of black-rimmed **sphalerite** containing inclusions of the other sulphides. Sphalerite also forms irregular grains 5μ - 200μ in gangue. **Chalcopyrite** occurs as discontinuous veinlets up to 500μ wide, as <5μ - 200μ grains in gangue. **Covellite** veinlets (5-30μ wide) cut chalcopyrite and sphalerite and form films in gangue. **Galena** rarely occurs as patches up to 500μ; it is usually much finer (10μ - 100μ) in gangue, pyrite and sphalerite. **Pyrite** ranges from small framboids to larger individual crystals and compact aggregates throughout.

Comments: -

General Description: Massive host rock with abundant sulphides throughout accompanied by fine-grained muscovite.

Host Rock: Very fine-grained, weakly carbonaceous shale grading into siltstone. Now composed chiefly of ultrafine sericite, with fine quartz in the silty portions. Weakly sheared.

The sulphide grains and patches are rimmed with muscovite flakes.

Sulphides: These are sphalerite, galena, pyrite and chalcopyrite (in decreasing order). **Sphalerite** forms irregular masses up to 4x10mm, associated with the other sulphides, but chiefly occurs as very ragged patches 30μ - 500μ intergrown with gangue. **Galena** occurs as patches up to 1mm, and as interlocking intergrowths with sphalerite (50μ - 200μ scale) and with chalcopyrite; also as 5μ - 50μ inclusions in pyrite. **Chalcopyrite** is generally intergrown with galena; it also occurs as submicroscopic inclusions in large numbers, forming dark rims in sphalerite. **Pyrite** occurs as scattered crystals - longer ones contain small galena inclusions. Some sphalerite is full of submicroscopic inclusions throughout and is thus opaque.

Comments: Sphalerite liberation from gangue could be problematical.

SAMPLE NO: **002B/35.1m**

General Description: Massive, mineralised host rock, with sulphide patches up to 30mm across. The rock is thoroughly sericitised but still recognisable.

Host Rock: This is a completely altered **rhyolitic lava breccia**. There are small phenocrysts of quartz and of sericitised feldspar, in a fine-grained sericitc groundmass with minor quartz. Incorporated fragments of lava are indicated by subtle textural differences. There is a general flow orientation of the fabric. The sulphides are associated with quartz and muscovite.

Sulphides: These are sphalerite, galena, pyrite and chalcopyrite. There are composite sulphide patches up to 25mm across consisting mainly of a matrix of **sphalerite** (with the usual black, opaque rims) with inclusions and interlocking intergrowths of galena and chalcopyrite, from <10μ to 500μ or more. Sphalerite also occurs as ragged grains and patches, 5μ to 400μ, in gangue. **Galena** occurs as irregular patches up to 1-2mm in sphalerite and also as much smaller inclusions (down to 5μ); also intergrown with chalcopyrite (50μ - 200μ scale). **Chalcopyrite** is closely associated with sphalerite, and galena as interlocking grains. **Pyrite** is mainly in gangue and contains <20μ galena inclusions.

Comments: Fine-grained sulphides in gangue.

SAMPLE NO: **004B/48.6m**

General Description: Massive schistose rock with disseminated minor sulphide mineralisation.

Host Rock: This is a sheared, altered **lithic tuff** or tuff-lava; there is some uncertainty due to shearing and sericitisation. It consists of lenses and fragments of altered porphyritic felsic lava and fine tuff in a schistose matrix of altered tuff or glassy felsic lava. The sulphides, fine-grained, with associated quartz. A few sulphide lenses are up to 3-4mm long.

Sulphides: These are sphalerite, pyrite, galena and chalcopyrite. **Sphalerite** forms thin parallel lenses up to 1-2mm long, with black, opaque rims (up to 200μ wide), intergrown along margins with galena and chalcopyrite; it also occurs as 5μ - 100μ irregular grains throughout the rock. **Galena** is seen as lenses up to 700μ long, and as composite patches intergrown with **chalcopyrite** on a 50μ to 400μ scale. Both galena and chalcopyrite also occur as 10μ - 200μ inclusions in sphalerite; the submicroscopic inclusions responsible for the black, opaque rims in sphalerite are believed to be chalcopyrite. Small **pyrite** crystals are scattered through the rock.

Comments: -

SAMPLE NO: 004B/57.1m **Page: 7**

General Description: Mineralised vein material, with abundant dispersed sulphides in barite.

Host Rock: Consists entirely of barite, as platy crystals with parallel orientation and as interstitial microgranular material. Shows some strain-extinction.

Sulphides: The dominant sulphide is sphalerite, with subordinate galena, minor pyrite, a trace of tetrahedrite, and rare chalcopyrite. **Sphalerite** is abundant as grains and as shapeless, irregular masses, ranging from 10μ to 1mm or more and mostly >100μ, with occasional aggregates up to 5mm. It forms simple intergrowths with **galena**, which occurs as shapeless patches 50μ to 1mm (some is in the 5μ - 50μ range). **Tetrahedrite** is almost completely restricted to galena, as inclusions up to 100μ. **Pyrite** is present throughout, as well-formed crystals 5μ - 100μ in gangue and in sphalerite.

Comments: High-grade, amenable ore (especially because of the barite matrix) with low-Fe sphalerite.

SAMPLE NO: **004B/57.4m**

General Description: Barite-quartz rock with dispersed sulphides; sheared, with preferred orientation.

Host Rock: Consists chiefly of subparallel plates of barite, with interstitial, partly replacive microgranular quartz. Minor parallel shearing and granulation was followed by the deposition of the quartz and sulphides.

Sulphides: These are sphalerite, galena and pyrite, with dominant **sphalerite** as streaks and lenses up to 40mm (or more) long and as 5μ - 200μ grains throughout the gangue. It forms simple, often coarse intergrowths with **galena** on a 50μ - 500μ scale; galena also forms continuous bodies up to 40mm long with inclusions of sphalerite and pyrite (30μ - 300μ). Galena is commonly seen as <5μ - 30μ inclusions in **pyrite** crystals which are scattered throughout the sulphides and the gangue. The quartz areas tend to be crowded with 1μ - 30μ sphalerite grains.

Comments: Generally very amenable because of the simple, coarse sulphide textures, but some problems associated with fine sphalerite and galena in gangue and pyrite.

SAMPLE NO: **004B/58.7m**

General Description: Fine-grained, weakly-mineralised siliceous rock.

Host Rock: This is a weakly sheared and patchily recrystallised **chert**. It consists mainly of ultrafine featureless chert with occasional small pellets or concretions, and haphazard coarser, clear quartz patches and veins with associated fine sulphides. Sericitic shear zones cut the rock and contain fine sulphides.

Sulphides: Minor sulphides, occurring mainly in crosscutting veinlets and comprising sphalerite, galena and chalcopyrite; pyrite is scattered through the rock as framboids and small crystals. **Sphalerite** is mostly black, opaque due to myriads of submicroscopic inclusions and occurs as discontinuous veins and lenses up to 500μ wide and as 10μ to 100μ irregular grains. **Galena** forms thin (<100μ) veinlets and also 10μ - 300μ patches; some is intergrown with chalcopyrite, in veins. **Chalcopyrite** patches up to 300μ occur sporadically.

No gold was seen; it may be associated with pyritic shears.

Comments: -

SAMPLE NO: **004B/58.9m** **Page: 10**

General Description: Volcanic host rock with dispersed sulphides and sulphides in veinlets. Host rock is extensively argillised.

Host Rock: Apparently there are two rock types, with a brecciated contact; alteration (and sulphide deposition) has obscured/obliterated details. The major rock is a **rhyolitic lava** with small quartz phenocrysts in a fine, flow-banded sericitic groundmass. It has an irregular contact with a fine, altered **?vitric tuff** which is brecciated along the contact.

Sulphides: **Pyrite** is abundant, as concretions and as clusters of small crystals. **Sphalerite** occurs as veinlets up to 500µ wide, usually with associated, included or intergrown **galena**, **chalcopyrite**, rare tetrahedrite; it also forms irregular patches up to 1.2mm across.

Much of the pyrite is very fine-grained (1µ - 20µ) and pervades the rock; it may be the source of any anomalous gold values.

Comments: -

SAMPLE NO: **0048/59.6m**

General Description: Fine-grained siliceous host rock with sulphide veins.

Host Rock: This fine-grained featureless rock is regarded as a **chert**. It consists of very fine quartz devoid of any characteristic or distinctive textures, with patches and veinlets of recrystallised quartz. The sulphide veins are accompanied by quartz and minor sericite.

Sulphides: Veins and patches of individual and composite sulphides; mainly sphalerite, with chalcopyrite, galena, tetrahedrite, pyrite. **Sphalerite**, with black opaque rims, as veins up to 3mm wide, and as irregular grains/patches in the 20μ to 300μ range. **Chalcopyrite** forms veins up to 1mm wide, associated and intergrown with galena and sphalerite. **Galena** occurs as large, shapeless masses, thin veinlets (<100μ wide) and as <30μ inclusions in pyrite. **Tetrahedrite** veinlets up to 200μ wide cut the other sulphides. **Pyrite** occurs mainly as contorted layers of framboids, also as larger crystals; the framboids are thought to be primary.

Comments: Good, coarse sulphides with simple textures.

SAMPLE NO: **0048/61.9m** **Page: 12**

General Description: Fine-grained siliceous rock with a few sulphide veinlets.

Host Rock: This appears to be a **chert**, in the absence of evidence indicating a different origin. It consists of fine-grained quartz, banded in places due to slight differences in grainsize and opacity. There are small pelletal textures, and some evidence of soft-sediment deformation/brecciation. The rock is cut by quartz-sulphide veins.

Sulphides: These occur chiefly in subparallel veins 20μ to 2mm wide, dominantly composed of sphalerite (with opaque rims) with associated galena and chalcopyrite. **Sphalerite** also forms irregular patches up to 2mm, and smaller grains (10μ - 200μ) in gangue. **Galena** patches up to 1mm are simply intergrown with sphalerite and chalcopyrite, sometimes as <20μ rims (on chalcopyrite); also as 10μ - 50μ grains in gangue. **Chalcopyrite** forms patches up to 500μ in sphalerite, and 10μ - 50μ grains in gangue. **Pyrite** crystals are scattered through the rock but are not abundant.

Comments: Although subeconomic, this material should be amenable and could be blended.

General Description: Fine-grained, strongly pyritised rock with minor amounts of other sulphides.

Host Rock: A fine-grained fragmental rock, believed to be an altered **tuff** or **tuff-lava**; interpretation is hampered by alteration and extensive pyrite impregnation. It consists of parallel wisps of altered ?glass, fragments of quartz, small lenses and grains of altered fine tuff, and longer streaks of altered glass and sericite flakes. There are occasional larger lithic fragments.

Sulphides: Chiefly pyrite, as myriads of small grains and larger porous patches throughout; minor sphalerite and galena, traces of chalcopyrite and arsenopyrite. **Sphalerite** mostly as 5μ - 100μ grains, occasional patches up to 500μ; almost all has 1μ - 10μ galena rims. **Galena** rarely as 100μ - 500μ patches, mostly as fine rims on sphalerite - believed to be late-stage, supergene galena. **Arsenopyrite** as scattered, large, corroded crystals up to 500μ, sometimes intergrown with marcasite. There is a trace of **chalcopyrite**, rimmed with covellite and ultrafine (secondary) galena.

Comments: Fine galena rims on sphalerite are likely to cause major flotation problems.

SAMPLE NO: **006B/43.4m**

General Description: Mineralised, fine-grained siliceous rock with sulphide veins.

Host Rock: Now composed of small polygonal quartz grains and interstitial sericite, with virtually no diagnostic features. Interpreted on a textural basis as an altered felsite of probable rhyolitic composition, but this is quite speculative. Sulphide patches and veins accompanied by quartz and sericite.

Sulphides: These are sphalerite, pyrite, galena and chalcopyrite. **Sphalerite** occurs as veins up to 2mm wide, coarsely-intergrown with chalcopyrite and galena, and as irregular grains and patches 10μ - 200μ scattered through the rock. **Galena** is intergrown with, and forms <50μ rims on, chalcopyrite; some pyrite is also thinly (<10μ) rimmed with galena. **Chalcopyrite** patches up to 600μ are intergrown with galena and associated with sphalerite. **Pyrite** is abundant as small grains and as large aggregates finely laced with sphalerite veinlets and minor fine galena. A small trace of tetrahedrite occurs in galena.

Comments: Galena rims on other sulphides are a problem. Pyrite with ultrafine sphalerite and galena poses liberation problems.

General Description: Fine-grained siliceous rock with weak sulphide mineralisation in concordant and discordant zones/veins.

Host Rock: Mainly a very fine-grained, featureless, uniform sediment composed of sericite and quartz; a siltstone/mudstone or possibly a fine tuff (ash). There are thin parallel layers of coarser material, with quartz splinters and crystals in a schistose sericite matrix - possibly intercalations of altered crystal tuff; these contain more pyrite (more permeable). Sulphide-quartz veins and replacive patches.

Sulphides: Sphalerite, chalcopyrite and galena occur mainly in disrupted quartz veins; also as fine intergrowths with pyrite. **Sphalerite** patches up to 1mm are scattered through the rock, and 10μ - 50μ intergrowths with pyrite occur. **Galena** often forms <20μ rims on pyrite and is present as 1μ - 10μ inclusions in many pyrite crystals; it also rims, and is intergrown with, chalcopyrite on a 10μ - 200μ scale. **Chalcopyrite**, as irregular 50μ to 400μ patches, is almost always associated with galena, within sphalerite; 10μ - 50μ galena rims are common.

Comments: -

SAMPLE NO: **006B/48.7m**

General Description: Semi-massive sulphides, with abundant sphalerite; chiefly pyrite, with interstitial sericite and more substantial lenses and bands of argillic sediment.

Host Rock: Very little host rock is present in this section. It seems to be an argillite, consisting of featureless, ultrafine sericite.

Sulphides: These are sphalerite, galena and pyrite, with a trace of chalcopyrite; they occur as composite lenses, and as very small grains finely intergrown with gangue (micas). **Sphalerite** occurs as subparallel lenses up to 10mm long, with black, opaque rims, generally intergrown with galena on a 50μ - 500μ scale, and with sparse 10μ - 100μ galena and chalcopyrite inclusions. **Galena** forms irregular, shapeless grains and patches 20μ - 600μ, and interlocking intergrowths with sphalerite, and occurs as 1μ - 50μ inclusions in pyrite. Both sulphides are abundant as irregular grains, 1μ - 100μ, in gangue. Pyrite is seen as small crystals throughout and as larger aggregates up to 1mm often full of galena inclusions.

Comments: Contrasting coarse and very fine sulphides, with some problems relating to liberation of very fine sulphides from gangue.

General Description: Fine-grained siliceous rock with abundant sulphides, massive in places.

Host Rock: Fine-grained **chert**, mostly recrystallised and impregnated with sulphides. Less-altered portions appear to be a finely-banded pyritic chert. Fine wisps of sericite occur, and there are scattered barite crystals associated with the sulphides.

Sulphides: These are sphalerite, galena, pyrite and minor chalcopyrite, with sphalerite and galena forming large expanses up to 10-15mm. **Sphalerite**, with black, opaque rims, has clear (ie inclusion-free) areas up to 1-2mm, and is simply intergrown with coarse galena; it also occurs as 100μ - 500μ patches intergrown with pyrite. **Galena**, in addition to forming uninterrupted patches of 1-5mm, also occurs as networks of veins, with pyrite, in the 5μ - 200μ range; also as 1μ - 50μ inclusions in pyrite. **Chalcopyrite** is mainly associated with and often thinly rimmed by galena, as patches 50μ - 300μ. **Pyrite** is abundant, as well-formed crystals mostly 20μ - 200μ but up to 500μ; also as spongy masses with ultrafine galena inclusions.

Comments: Mostly coarse, amenable sulphides.

SAMPLE NO: **006B/53.8m**

General Description: Fine-grained, mineralised siliceous rock, with quartz-sulphide veins.

Host Rock: An impure, argillaceous **chert**, composed chiefly of ultrafine quartz with small sericite flakes. Recrystallised patches of much coarser quartz with associated fine sulphides. Larger masses of coarse sulphides with clear quartz and thin bands of sericite.

Sulphides: These occur in veins, and in lenses up to 15mm in length, and comprise sphalerite, galena, conspicuous chalcopyrite, minor pyrite and a trace of tetrahedrite. **Sphalerite** forms larger expanses, with clear areas 100µ - 1mm common; there are simple, coarse intergrowths with galena, as well as with chalcopyrite, and pyrite inclusions. **Galena** forms veins 20µ - 200µ wide; also rims on chalcopyrite, and larger areas up to 1mm, as well as 1µ - 50µ inclusions in pyrite. **Chalcopyrite**, as irregular grains/patches 30µ - 300µ, is usually associated with galena and sphalerite but also occurs as small (mostly <100µ) grains in gangue. Larger **pyrite** crystals commonly contain galena. **Tetrahedrite** occurs as <100µ grains in galena.

Comments: An amenable ore.

SAMPLE NO: **006B/58.5m**

General Description: Well-mineralised fine-grained siliceous rock with dispersed sulphide patches throughout.

Host Rock: Extensively recrystallised **chert** with argillic (sericitic) layers and lenses. Original rock was ultrafine quartz but most is now coarse mosaic quartz associated with sulphide patches. No evidence of clastic features.

Sulphides: These are sphalerite, galena and pyrite. **Sphalerite** forms lenses and pods up to 6mm or more across, with the usual black rims and fine ragged edges (perimeters) finely intergrown with gangue; clear areas 200µ to 1-2mm are common. Smaller grains (<5µ - 100µ) are intergrown with gangue. **Galena** forms irregular grains/patches 10µ - 200µ in gangue, and up to 1mm in gangue and sphalerite. **Pyrite** occurs as well-formed crystals throughout.

Comments: -

GENERAL DESCRIPTION: Semi-massive sulphides and dispersed sulphides in gangue. Mainly sphalerite and pyrite, with chalcopyrite, galena and a trace of **covellite**.

DETAILS OF SULPHIDES:

a) **Sphalerite:** Lenses and veinlike bodies up to 4-5mm wide; margins intergrown with mica. Contains few very small sulphide inclusions, but larger patches of chalcopyrite and galena. Also 5μ - 100μ grains in gangue.

b) **Galena:** As very irregular grains (2μ - 50μ) and patches up to 400μ full of gangue (mica) and fine pyrite inclusions. Also as grains 20μ - 100μ along edges of sphalerite bodies.

c) **Pyrite:** Small, well-formed crystals 20μ - 200μ throughout the gangue and in sphalerite. Also as small framboids scattered through the gangue.

d) **Chalcopyrite:** As fine (2μ - 100μ) grains in gangue. As 10μ - 1mm irregular patches in sphalerite. Forms intergrowths with galena on a 20μ - 100μ scale.

e) **Others:** Rare tetrahedrite in chalcopyrite. Covellite as small patches partly replacing chalcopyrite, indicating incipient supergene enrichment.

f) **Gangue:** Sulphides fringed with muscovite (var. phengite) flakes. Areas of ultrafine sericite. Minor quartz. No lithic material. Small aggregates of fine rutile crystals.

g) **Comments:** Good sphalerite and some coarse chalcopyrite, but galena may be difficult to liberate.

SAMPLE NO. 77909

GENERAL DESCRIPTION: Disseminated sulphides as small grains and larger patches in gangue.

DETAILS OF SULPHIDES:

a) **Sphalerite:** Larger patches have clear, pale centres, and black opaque borders due to numerous ultrafine (mostly <1μ) chalcopyrite inclusions. Masses up to 5-10mm across, and 5μ - 100μ grains in gangue. Interlocking intergrowths with galena on a 20μ - 200μ scale.

b) **Galena:** Very irregular patches 100μ - 1mm+ in sphalerite. 5μ - 50μ grains in gangue. As <50μ rims on chalcopyrite. As 2μ - 50μ inclusions in pyrite. Intergrowths with chalcopyrite. <20μ rims on sphalerite.

c) **Pyrite:** As scattered crystals 20μ - 200μ embedded in other sulphides. Often with <50μ galena inclusions, rarely with sphalerite inclusions. A few crystals up to 500μ.

d) **Chalcopyrite:** As shapeless patches 50μ - 500μ, often associated and intergrown with galena. Also as ultrafine to submicroscopic inclusions in sphalerite, in larger numbers causing opacity.

e) **Others:** None detected.

f) **Gangue:** Fine-grained quartz and ultrafine sericite, with relict textures suggesting that original rock was a fine vitric tuff. Vein quartz is associated with the sulphides.

g) **Comments:** Because of ultrafine chalcopyrite inclusions, the sphalerite will have a higher Fe content.

GENERAL DESCRIPTION: Veins and disseminated patches of sulphides in host rock. Sphalerite, chalcopyrite, galena and pyrite, all associated.

DETAILS OF SULPHIDES:

a) Sphalerite: In discontinuous veins and in patches up to 2-3mm; interlocking intergrowths with galena, especially around margins. Dark, opaque borders (50μ - 100μ wide) due to ultrafine chalcopyrite inclusions.

b) Galena: As 5μ - 100μ grains in gangue. Patches up to 1mm, with irregular outlines, intergrown with chalcopyrite and with embedded pyrite crystals. Inclusions mostly <20μ in pyrite.

c) Pyrite: Scattered small crystals in the other sulphides and in gangue. Some contains galena inclusions. A few framboids.

d) Chalcopyrite: Relatively common, as 20μ - 300μ patches in gangue, and occasional larger masses up to 1-2mm, generally intergrown with galena on a 20μ - 200μ scale.

e) Others: None detected.

f) Gangue: Fine-grained cherty quartz, with parallel sericite flakes; an indurated impure chert. Many random quartz veins with sulphides, and parallel quartz veinlets.

g) Comments: Should be an amenable ore, though Fe values in sphalerite may be higher than normal.

77915 (thin section) **Page: 23**

This is an altered **porphyritic obsidian** of felsic composition; it is thought to have been a lava.

There are scattered phenocrysts of completely silicified feldspar with subparallel orientation, in a quartz-sericite groundmass showing relict glassy and perlitic textures. A band of finer-grained lava breccia of different composition (more feldspathic, less siliceous) is incorporated and conforms with the general flow fabric.

Accessory amounts of leucoxenised magnetite are scattered through the rock. There are patches of introduced siderite, and of quartz with sphalerite and pyrite (the sphalerite has black, opaque rims - **cp 77908-11**). Quartz veins traverse the rock.

99-4262A

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BURNS PEAK EL 44/88

JOINT VENTURE ANNUAL REPORT

NOVEMBER 1997 - 31ST DECEMBER 1998

APPENDIX 4

PRELIMINARY PARTIAL DIGEST SOIL GEOCHEMICAL SURVEY "SOUTHERN TRENCHES" AREA ROSEBERY DISTRICT, TASMANIA

99-4262A (APPx 4 of 99-4262)

558218

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Geology and Computing

PRELIMINARY ORIENTATION
PARTIAL DIGEST
SOIL GEOCHEMISTRY SURVEY
"SOUTHERN TRENCHES" AREA
ROSEBERY DISTRICT, TASMANIA

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For **Pasminco Exploration**
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1. SUMMARY.

A single line of total and partial digest soil geochemistry was completed over buried mineralisation at Pasminco's "Southern Trenches" prospect north-west of Tullah on the Tasmanian West Coast.

Partial digests over this mineralisation have been successful in generating anomalous features. Although not strong these anomalies are of greater contrast than those derived by conventional techniques.

Additional work in profiling, re-sampling, electrical testing (SP) and extension of the original survey is recommended.

2. INTRODUCTION.

The purpose of conducting an orientation partial digest survey was to determine if buried mineralization could be detected using simple soil geochemical techniques. Base metal dispersion could in such a case manifest itself as a low contrast or subtle feature using total digest techniques or as a high contrast feature using partial digest techniques.

A preliminary programme of reconnaissance soil geochemistry was conducted along one line over glacial sediment covered base metal mineralisation on line 4400N at the "Southern Trenches " prospect just west of Boco Siding.

The regional geology is dominated by felsic volcanics and volcaniclastics of the Cambrian Central Volcanic Sequence in western Tasmania. Permian glacials and fluvio-glacials form as isolated cover in variable thicknesses to 40m. There remains a possibility that fluvio-glacial cover infills areas of recessive weathering preferentially localised over silica-sericite-pyrite alteration. Identification of glacially derived cover can be difficult and may be confused with colluvium.

Glacial sediments in proximity to the trench are approximately 3 metres thick over the buried mineralised sequence and thin to 20cms, 15 m uphill to the east.

Mineralisation within the district forms as massive poly-metallic Cu_Pb-Zn sulphides with significant accessory Ba, Ag and Au within variable silica-sericite-pyrite-chlorite alteration. At the Southern Trenches prospect, mineralisation occurs as massive sulphides up to 5 metres wide.

The soil profile is typified by a top 5cm (approx.) layer of organic mat (A0?) underlain by 20cms of unstructured grey sandy loam (A-B) containing variable but often high levels of organic material which is subsequently underlain by a C horizon dominated by kaolinitic saprolite fragments within a fine silty matrix. Organic material is derived in situ from decaying plant roots and by accumulation of litter from leaves and bark. The dominance of organic material within some portions of the upper profile typify this soil as an 'Organosol' (Isbell, 1996). Soil pH's are all less than 5.

The regional topography is characterized by steep mountainous topography, narrow hills and valleys with flat or undulating floors.

3. SAMPLING PROCEDURE.

Samples for MMI-type analysis were collected within the variably organic sandy loam layer below the organic root mat zone from 5 to 25 cms below surface and sieved through a coarse -5mm sieve to remove excessive over size material. Some soil was wet and sampled unsieved all material was loaded into plastic press seal bags. Soil samples would be air dried at the laboratory and then sieved to -20# prior to digestion. A portion of the sample was retained within chip trays for future reference. Hand augering to approximately 30cms for a C horizon sample was also completed.

Sampling was nominally at 10 metre spacings outside the alteration zone, 5 metre spacings within the alteration zone and at 2 metre spacings above the buried massive sulphide zone. The nature of typical MMI type dispersion is for metal ions to rise directly above the source with only minor lateral dispersion. Sample spacing is therefore designed to cover the plan projection of the targeted system.

Total digests were carried out using AMDEL method IC3E for elements Ca, Co, Cu, Fe, Mg, Mn, Ni, Pb, S, Zn, Ag, As, Bi, Cd, Mo, Sb, and Tl. Au was determined by Method FA3 and Ba by XRF1. Partial digests were carried out using method code IC8M for elements Ag, As, Au, Ba , Bi, Cd, Co, Cu, Mo, Ni, Pb, Pd, Pt, Sb, Tl, and Zn. Three 'Deepleachs" were selected. All soil pH's measured were below 5. The soils are clearly strongly acid and the most prominent surface absorption sites will occupied by hydrogen ions. Remaining sites bind minor base metal ion cations and hydrated cations. The characteristics of the partial digests is briefly described.

- Deepleach 18. A very weak ion-exchange salt designed to exchange the most weakly bound base-metal ions. Resultant background could be close to the detection limit for some elements. This is an exceptionally weak extractant. This reagent has been used successfully in other areas of western Tasmania to for general MMI type base metal exploration.
- Deepleach 34. A strong ion exchange salt with a different cation/anion mix to Deepleach 18. It also has complexing agent for ionic precious metals.
- Deepleach 35. A general purpose non specific chelating/complexing agent for base metals and Ba with an added complexing agent for precious metals. The solution is weakly buffered with a mild acid. It has performance characteristics which are similar to WAMTECH's MMI solution A but unlike solution A will complex precious metals also.

4. QUALITY CONTROL.

Standards particular to Pasminco were included in the batch (166809A, 166814A, 166830A, 166835A, 166849A, 166852A).

No duplicates were included although this will be required during routine analysis.

A specific partial digest standard will need to be created before routine samples are submitted. The standard should be created from soils which have been demonstrated to be clearly MMI anomalous. As additional batches are submitted a database of expected values and variances for the standard will be created. This will enable normalisation of data should any variances attributable to laboratory temperature or procedure be encountered.

5. RESULTS.

Raw assay results appear in the Appendix.

Several of the following diagrams will refer to the anomaly to background ratio. In partial digest analysis the absolute quantity of metal extracted is not always important. The relative proportion of metal above the background typically defines the anomaly over mineralisation. The background value would typically be determined by taking the mean or median value for a given population. In this case the population appears at first pass to contain a large number of potentially anomalous values suggesting a lower value than median may be more realistic. The 25th percentile for each element was therefore selected as the background value.

Aggregated anomaly to background ratios for the three partial digests, C horizon samples and total digest are shown on figures 1 to 5. The partial digest analyses generate a variety of contrasting responses. The generally elevated values from Easting 4628 to 4634 directly over buried mineralisation for Deepleach 18 and the levels of precious metals in Deepleach 35 is encouraging. However the overall aggregated responses are not great. The total and C horizon results are generally more subdued.

The zinc-alone anomaly to background ratio plot (figure 6) shows a clear feature over the zone of buried mineralisation for all "Deepleach" solutions. Additional unexplained features occur toward the ends of the line at 4600E and 4690E. These may need to be followed up. The presence of minor pathfinder elements such as thallium (figure 7) in association with zinc is encouraging and may enable multi-element screening of features. The level of zinc extracted does not vary considerably with each partial digest (figure 8). The differences may even be attributable to laboratory batch effects or temperature.

The anomaly to background ratio for aggregated elements Cu, Pb, Zn does not offer any clearer discrimination at this stage (figure 9).

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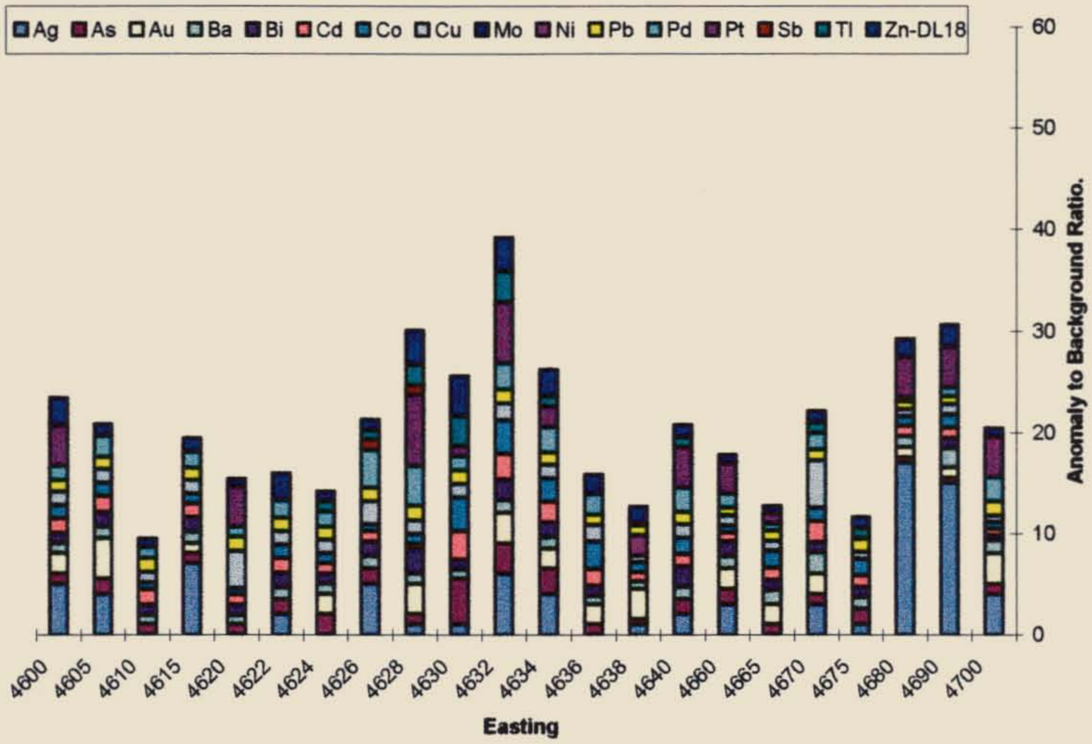

Fig.1. Aggregated Anomaly to Background Ratios: Deepleach 18.

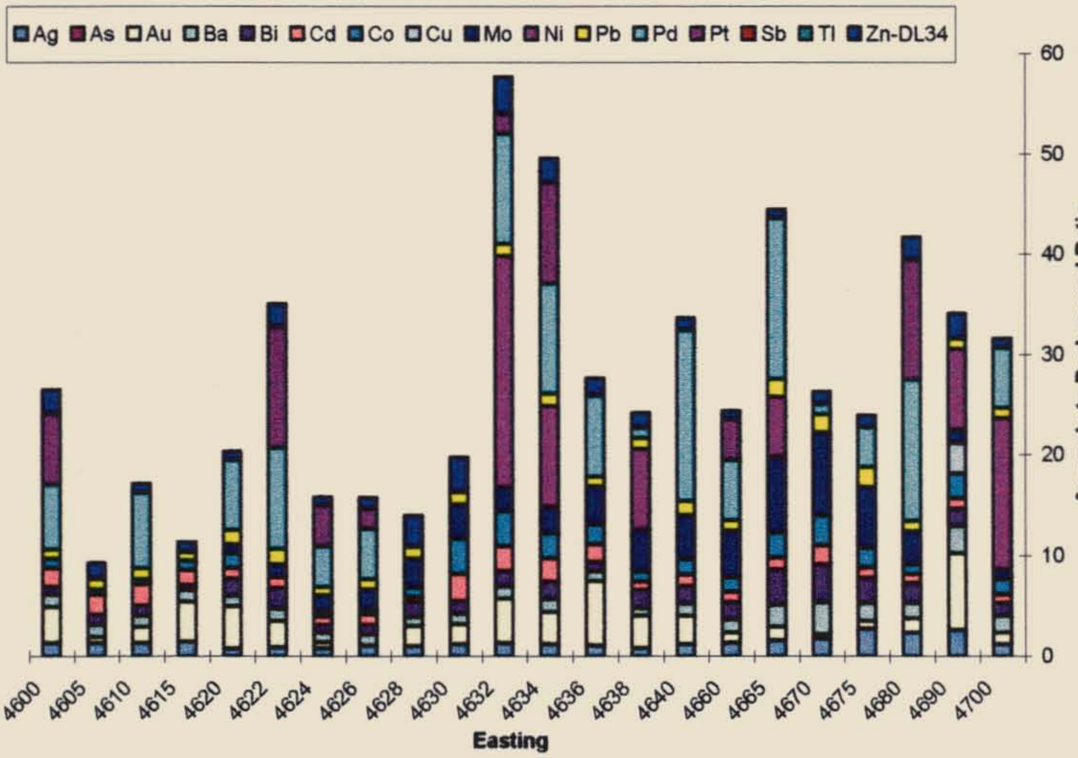

Fig. 2. Aggregated Anomaly to Background Ratios. Deepleach 34.

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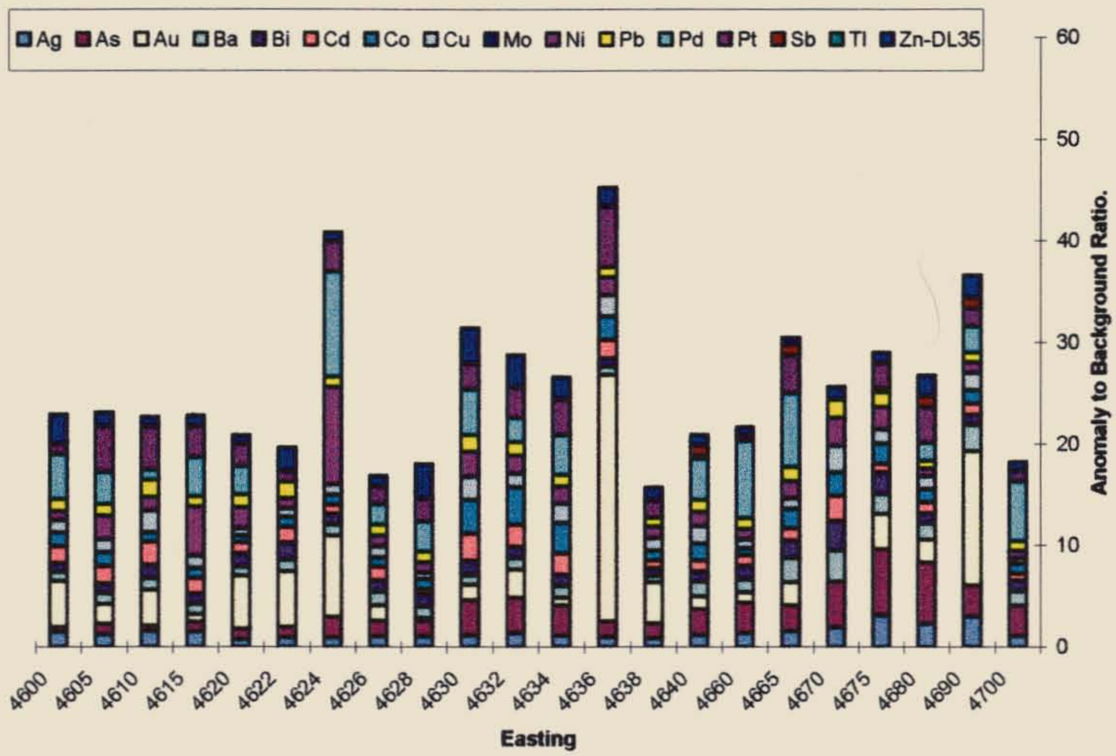

Fig. 3. Aggregated Anomaly to Background Ratios: Deepleach 35

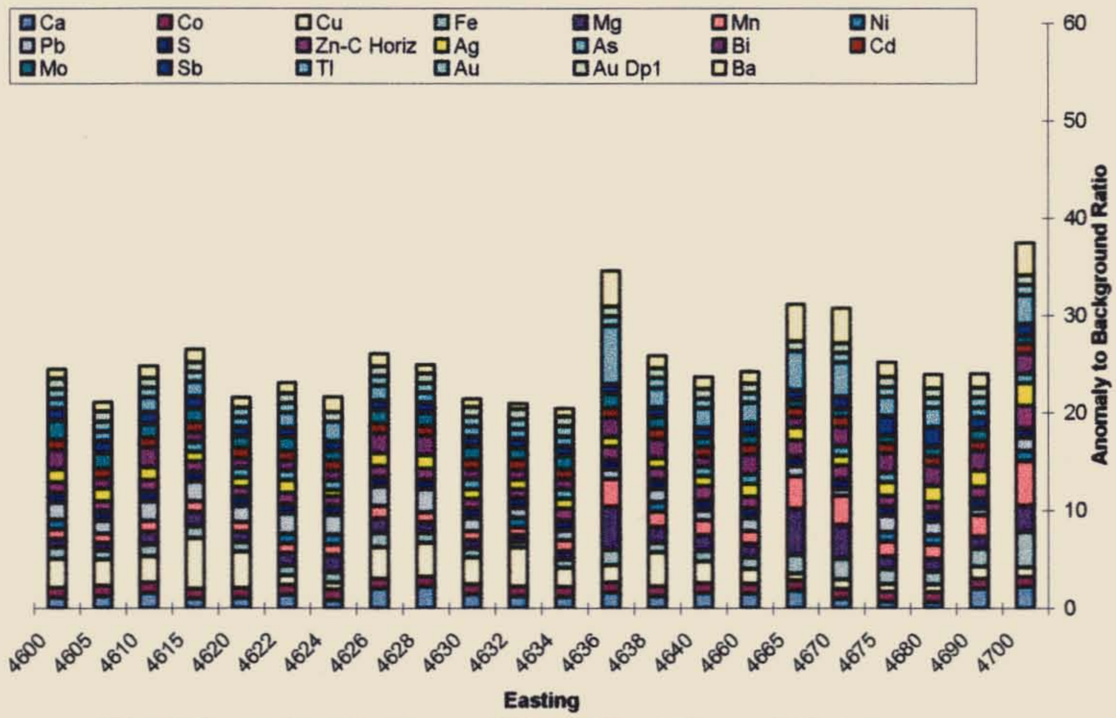

Fig. 4. Anomaly to Background Ratio. Total Digest: C Horizon

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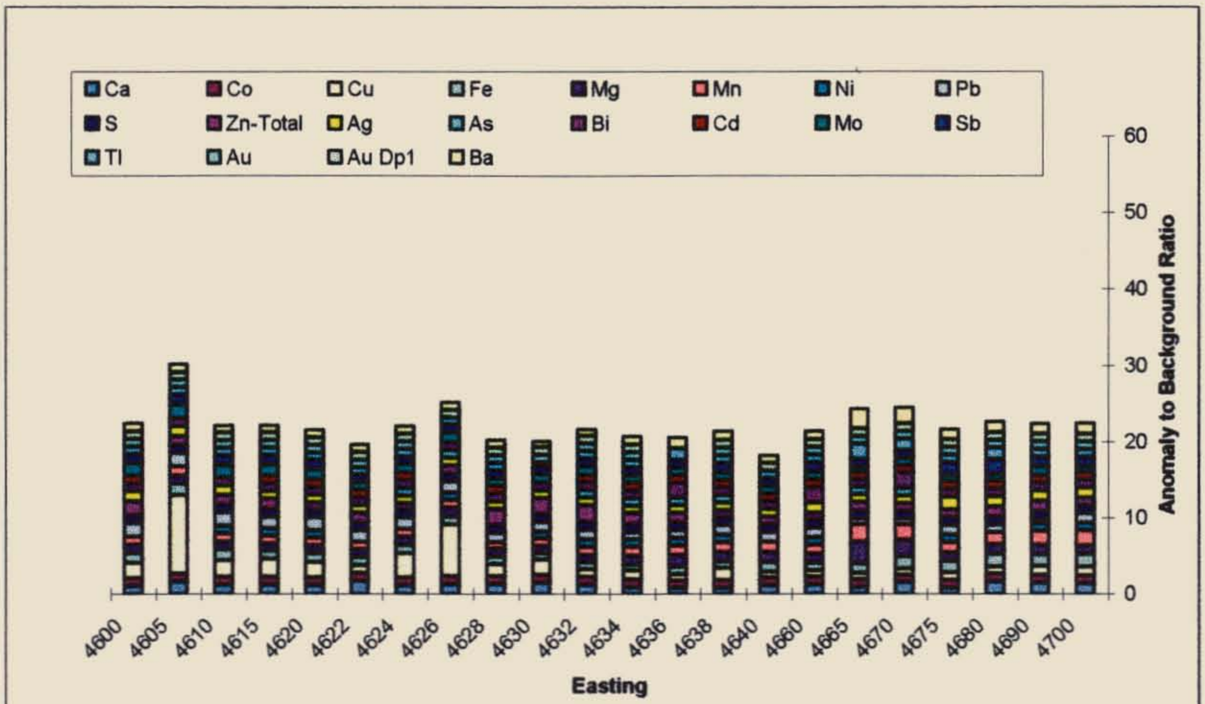

Fig. 5. Aggregated Anomaly to Background Ratio. Total Digest

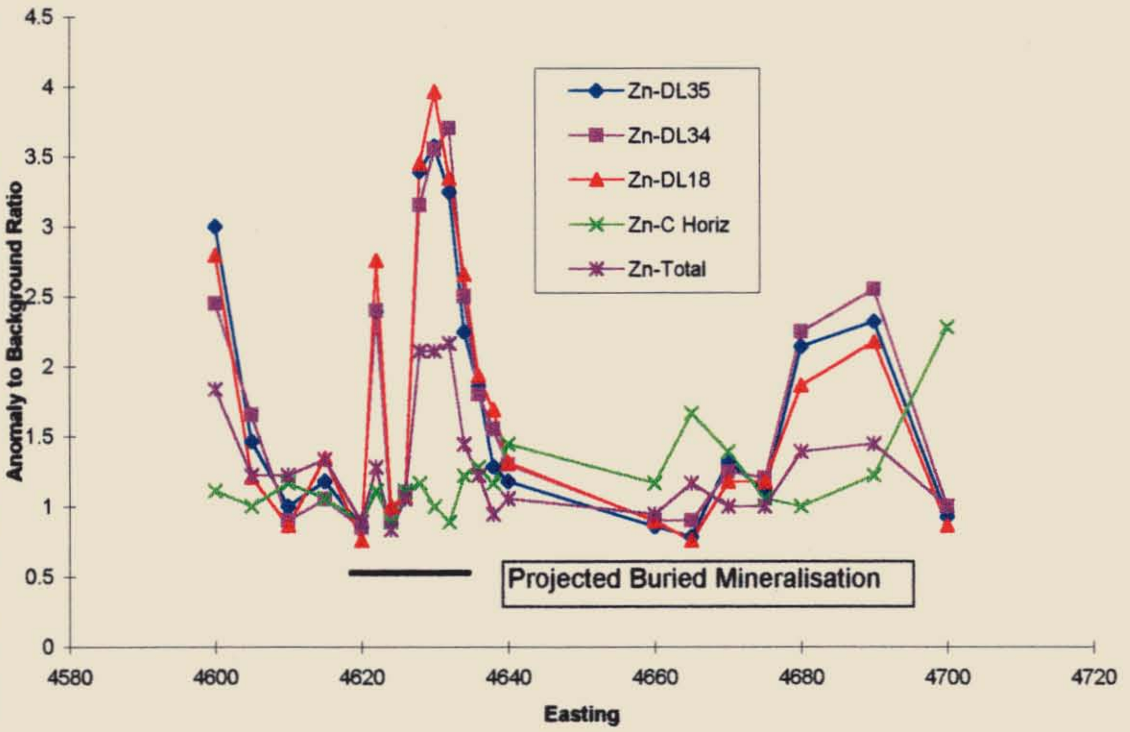

Fig.6. Anomaly to Background Ratio. Zinc

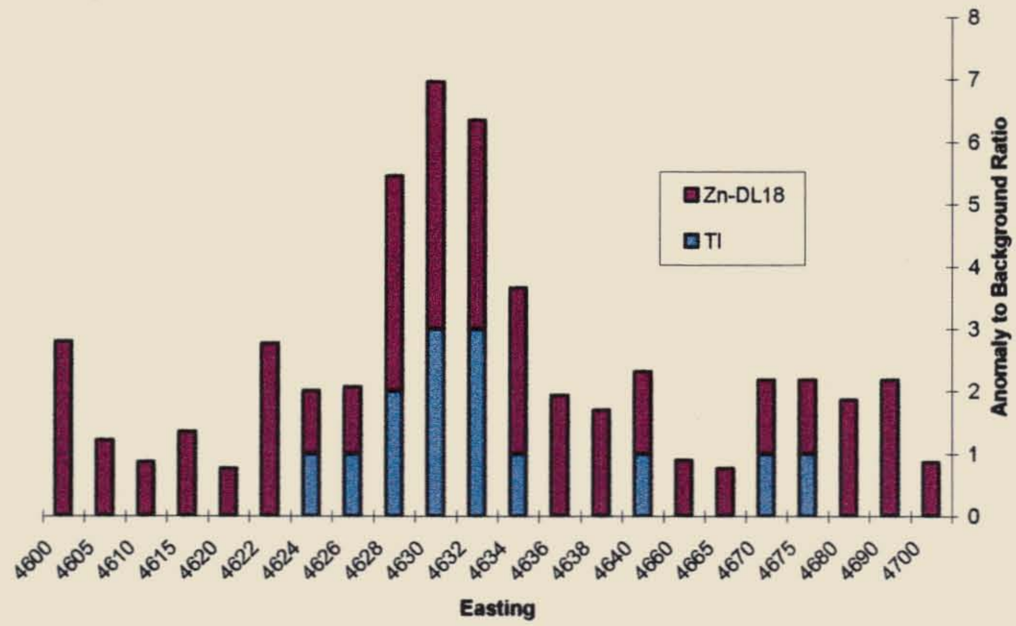

Fig.7. Anomaly to Background Ratio: Zn and Thallium. Deepleach 18.

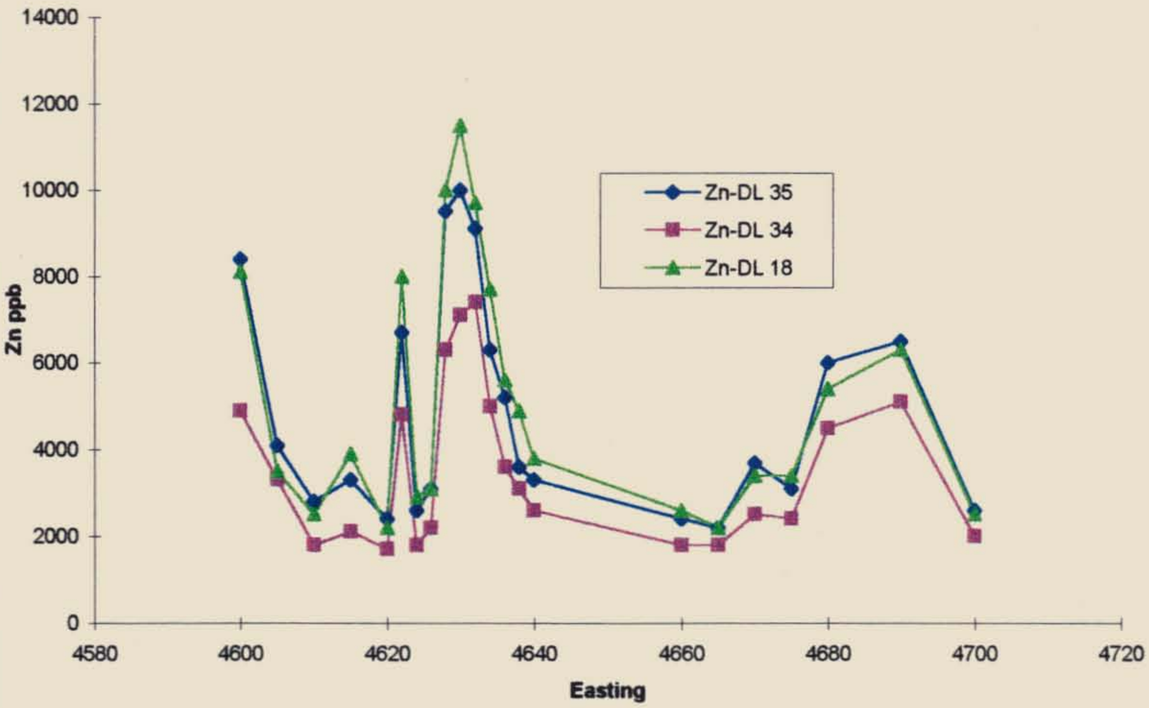

Fig. 8. Levels of Zn ppb extracted for individual 'Deepleachs'.

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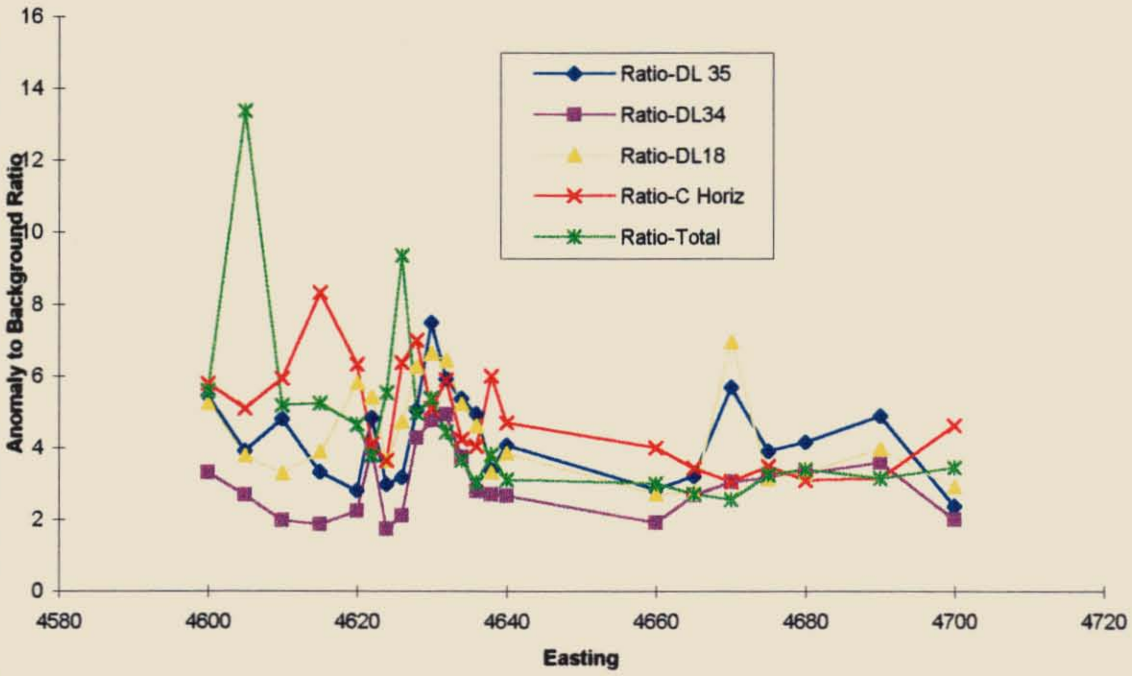

Fig.9. Anomaly to Background Ratio. fn(Cu,Pb,Zn)

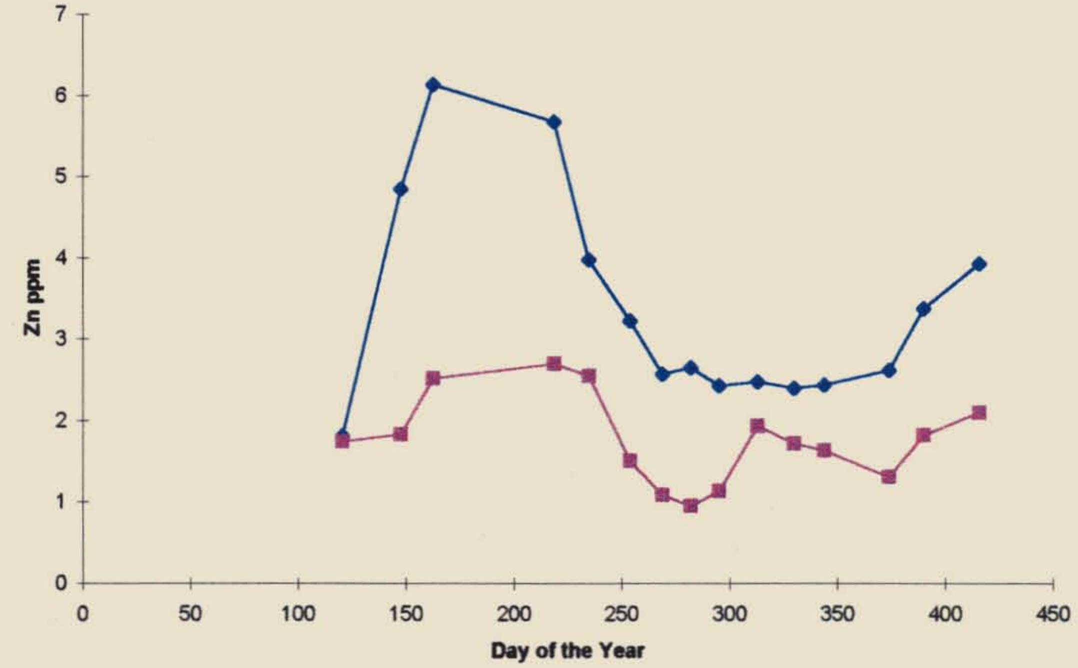

Fig. 10. Same location (2) sampling versus time of the year. (Day 1 =Jan 1st). Zn ppm

6. RECOMMENDATION.

All three partial digests appear to generate positive responses over buried mineralisation in contrast to conventional analysis. Additional work is clearly justified.

I recommend:-

- establishing a shallow pit at 4632 easting and sampling a profile at 5 cm increments from surface through to saprolite. The profile should be photographed and described in general terms. Samples should be air dried and sieved into -20# +80# and -80# fractions if practical and analysed by all three 'Deepleachs' or by Deepleach 35 at the absolute minimum. Unsieved samples should also be submitted.
- additional lines over mineralisation along strike should also be sampled in a similar manner provided the sub-surface geology is well understood.
- a self-potential survey be conducted over line 4400N to indicate the presence of a natural electrical field in the ground. The elevated zinc response towards the end of line 4400N at 4600E and 4690E may be attributable to a distorted electrochemical migration of ions laterally. A self potential survey will detect this field. Strictly speaking it is not necessary to have a high level of oxidation to generate a self potential field. All that is required is that the conductive body (massive sulphides) lie within a medium which has an oxidation potential gradient. The top of water table may have this gradient. The peak value should lie between the 'rabbit-ear' peaks. The peaks at the ends of the line would require additional geological follow-up in the absence of an self potential field.
- The lines should be re-sampled at the same location and in an identical manner to the original survey on line 4400N. The MMI type metal ions in the soil are very weakly bound and are therefore subject to removal by bacterial /botanical activity. There is some evidence (for this type of soil at least) that these features can be slightly depleted during summer or enriched during winter. Sampling in mid-winter is suggested.

7. REFERENCES.

Isbell R.F. 1996. The Australian Soil Classification. CSIRO Publishing.

538232

PRELIMINARY ORIENTATION
PARTIAL DIGEST
SOIL GEOCHEMISTRY SURVEY
"SOUTHERN TRENCHES" AREA
ROSEBERY DISTRICT, TASMANIA

APPENDIX 1.

Raw Data, Field Notes

May 1998

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	Pasminco : Orientation Partial Digest Soil Geochemistry, Southern Trenches. Tasmania																						
2		8AD0902C		Deepleach 35																			
3	Easting	Sample Nc	Ag	As	Au	Ba	Bi	Cd	Co	Cu	Mo	Ni	Pb	Pd	Pt	Sb	Tl	Zn-DL 35					
4	4700	166801	9	6	-0	613	4.8	8	3	32	-1	7	2000	0.47	0.04	-1	-1	2600					
5	4690	166802	25	6	0.53	1200	4.5	12	4	108	-1	10	1900	0.21	0.07	1	-1	6500					
6	4680	166803	19	12	0.09	724	4.6	12	4	81	-1	7	1600	0.14	0.14	1	-1	6000					
7	4675	166804	26	13	0.14	872	9.9	9	6	89	-1	20	3000	0.03	0.1	-1	-1	3100					
8	4670	166805	16	9	-0	1400	13	27	7	170	-1	25	3700	-0.01	-0.01	-1	-1	3700					
9	4665	166806	13	5	0.09	1100	7.7	13	6	65	-1	15	3000	0.58	0.15	1	-1	2200					
10	4660	166807	11	6	0.04	572	6.4	11	2	58	-1	9	2300	0.61	0.02	-1	-1	2400					
11	4640	166808	9.65	5	0.05	670	4.6	12	5	110	-1	13	2500	0.32	0.01	1	-1	3300					
12	4638	166809	6.75	3	0.16	296	3.5	8	3	80	-1	10	1800	-0.01	0.07	-1	-1	3600					
13	4636	166810	8.15	3	0.97	370	3.8	20	7	135	-1	16	2100	-0.01	0.24	-1	-1	5200					
14	4634	166811	8.95	6	0.03	517	5	23	9	125	-1	15	2500	0.31	0.14	-1	-1	6300					
15	4632	166812	11	7	0.11	532	5	24	11	87	-1	16	2800	0.19	0.12	-1	-1	9100					
16	4630	166813	8.95	7	0.06	423	6.7	29	10	149	-1	22	3400	0.36	0.1	-1	-1	10000					
17	4628	166814	8.45	3	0.01	535	5.7	5	3	40	-1	9	2200	0.24	0.09	-1	-1	9500					
18	4626	166815	8.75	3	0.06	600	5.3	14	3	66	-1	10	2200	0.16	0.07	-1	-1	3100					
19	4624	166816	7.7	4	0.32	487	4.8	10	3	65	-1	86	2200	0.83	0.12	-1	-1	2600					
20	4622	166817	7.55	2	0.22	512	7.6	17	3	54	-1	9	3400	-0.01	0.04	-1	-1	6700					
21	4620	166818	5.9	2	0.21	389	6	12	2	46	-1	19	2600	0.22	0.09	-1	-1	2400					
22	4615	166819	12	2	0.03	460	4.4	17	3	77	-1	44	2000	0.31	0.12	-1	-1	3300					
23	4610	166820	13	1	0.14	527	5.8	25	3	138	-1	12	3500	0.08	0.17	-1	-1	2800					
24	4605	166821	10	2	0.08	487	4.2	19	4	84	-1	21	2400	0.25	0.18	-1	-1	4100					
25	4600	166822	12	1	0.18	411	4.1	18	4	78	-1	8	2600	0.35	0.04	-1	-1	8400					
26																							
27		166814A	119	11	0.26	1300	2.9	63	3100	64000	42000	856	1900	-0.01	0.19	6	-1	7300					
28		166809A	10	9	28	2000	0.4	6	97	1300	2700	472	137	-0.01	0.15	6	-1	2000					
29		SCHEME	IC8M	IC8	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M					
30		DL	0.05	1	0.01	1	0.1	1	1	1	1	1	1	0.01	0.01	1	1	1					
31		UNITS	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB					
32																							
33																							
34		8AD0902A		Deepleach 34																			
35	Easting	Sample Nc	Ag	As	Au	Ba	Bi	Cd	Co	Cu	Mo	Ni	Pb	Pd	Pt	Sb	Tl	Zn-DL 34					
36	4700	166801	9.7	-1	0.06	1300	0.5	6	3	-1	8	15	260	0.12	-0.01	-1	-1	2000					
37	4690	166802	22	-1	0.38	2100	0.7	7	5	3	11	8	270	-0.01	-0.01	-1	-1	5100					
38	4680	166803	20	-1	0.07	1200	0.8	6	2	-1	26	-1	268	0.28	0.12	-1	-1	4500					
39	4675	166804	23	-1	0.04	1400	1	7	4	-1	48	-1	511	0.08	-0.01	-1	-1	2400					

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
40	4670	166805	15	-1	0.02	2500	1.5	13	6	-1	66	-1	468	0.02	-0.01	-1	-1	2500					
41	4665	166806	13	-1	0.07	1700	1.4	8	5	-1	60	6	463	0.32	-0.01	-1	-1	1800					
42	4660	166807	11	-1	0.05	1000	0.7	7	3	-1	37	-1	261	0.12	0.04	-1	-1	1800					
43	4640	166808	10	-1	0.14	952	0.7	8	3	-1	35	-1	355	0.34	-0.01	-1	-1	2600					
44	4638	166809	6.7	-1	0.16	609	0.7	6	2	-1	33	8	295	0.02	-0.01	-1	-1	3100					
45	4636	166810	8.65	-1	0.32	742	0.4	12	4	-1	30	-1	255	0.16	-0.01	-1	-1	3600					
46	4634	166811	10	-1	0.16	992	0.7	16	5	-1	21	10	317	0.22	0.1	-1	-1	5000					
47	4632	166812	11	-1	0.22	985	0.6	17	7	-1	19	23	317	0.22	0.02	-1	-1	7400					
48	4630	166813	10	-1	0.1	783	0.5	19	7	-1	27	-1	316	-0.01	-0.01	-1	-1	7100					
49	4628	166814	8.15	-1	0.1	723	0.6	3	2	-1	23	-1	288	-0.01	-0.01	-1	-1	6300					
50	4626	166815	9.1	-1	-0	814	0.4	7	1	-1	16	-1	260	0.1	0.02	-1	-1	2200					
51	4624	166816	6.6	-1	0.03	736	0.3	6	1	-1	13	-1	216	0.08	0.04	-1	-1	1800					
52	4622	166817	7.3	-1	0.13	968	0.8	8	-1	-1	10	-1	407	0.2	0.12	-1	-1	4800					
53	4620	166818	6.35	-1	0.21	778	0.7	7	3	-1	7	-1	361	0.14	-0.01	-1	-1	1700					
54	4615	166819	12	-1	0.2	910	0.2	10	2	-1	-1	-1	210	-0.01	-0.01	-1	-1	2100					
55	4610	166820	11	-1	0.08	869	0.4	15	1	-1	-1	-1	278	0.15	-0.01	-1	-1	1800					
56	4605	166821	11	-1	0.03	946	0.4	14	1	-1	-1	-1	266	-0.01	-0.01	-1	-1	3300					
57	4600	166822	11	-1	0.18	939	0.3	13	2	-1	-1	-1	221	0.13	0.07	-1	-1	4900					
58																							
59		166814A	112	-1	0.54	1700	0.2	52	11	351	44000	17	2	-0.01	-0.01	-1	-1	9					
60		166809A	8.35	-1	-0	4700	-0.1	4	40	622	1300	228	2	0.05	-0.01	-1	-1	295					
61		SCHEME	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M					
62		DL	0.05	1	0.01	1	0.1	1	1	1	1	1	1	0.01	0.01	1	1	1					
63		UNITS	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB					
64																							
65	8AD0902B																						
66	Deepleach 18																						
67	Easting	Sample No	Ag	As	Au	Ba	Bi	Cd	Co	Cu	Mo	Ni	Pb	Pd	Pt	Sb	Tl	Zn-DL 18					
68	4700	166801	0.2	2	0.03	1400	0.1	6	2	2	-1	-1	90	0.41	0.04	-1	-1	2500					
69	4690	166802	0.75	1	0.01	2100	0.2	9	4	3	-1	-1	52	0.15	0.04	-1	-1	6300					
70	4680	166803	0.85	1	0.01	1200	-0.1	9	3	2	-1	-1	50	0.06	0.04	-1	-1	5400					
71	4675	166804	0.05	3	-0	1300	0.2	10	5	2	-1	-1	85	0.01	-0.01	-1	1	3400					
72	4670	166805	0.15	2	0.02	2300	0.2	19	4	14	-1	-1	72	0.28	-0.01	-1	1	3400					
73	4665	166806	-0.05	2	0.02	1500	0.2	11	5	3	-1	-1	64	0.12	0.01	-1	-1	2200					
74	4660	166807	0.15	3	0.02	1300	0.3	8	2	3	-1	-1	53	0.23	0.03	-1	-1	2600					
75	4640	166808	0.1	3	-0	1300	0.4	11	5	4	-1	-1	79	0.4	0.04	-1	1	3800					
76	4638	166809	0.05	1	0.03	799	-0.1	8	3	2	-1	2	62	0.04	-0.01	-1	-1	4900					
77	4636	166810	-0.05	2	0.02	893	0.2	15	8	5	-1	-1	66	0.35	-0.01	-1	-1	5600					
78	4634	166811	0.2	5	0.02	1200	0.3	18	7	4	-1	-1	81	0.43	0.02	-1	1	7700					

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
79	4632	166812	0.3	6	0.03	1400	0.4	23	10	5	-1	-1	93	0.44	0.06	-1	3	9700					
80	4630	166813	0.05	9	-0	997	0.2	25	10	4	-1	-1	87	0.24	0.01	-1	3	11500					
81	4628	166814	0.05	2	0.03	1100	0.5	4	3	4	-1	-1	96	0.66	0.07	1	2	10000					
82	4626	166815	0.25	3	-0	1300	0.3	9	2	7	-1	-1	86	0.63	-0.01	1	1	3100					
83	4624	166816	-0.05	4	0.02	1100	0.2	9	3	4	-1	-1	85	0.26	-0.01	-1	1	2900					
84	4622	166817	0.1	3	-0	1200	0.3	13	4	4	-1	-1	85	0.29	-0.01	-1	-1	8000					
85	4620	166818	-0.05	2	-0	1000	0.2	9	2	11	-1	-1	90	0.17	0.04	-1	-1	2200					
86	4615	166819	0.35	2	0.01	1200	0.3	12	3	4	-1	-1	79	0.27	-0.01	-1	-1	3900					
87	4610	166820	-0.05	2	-0	967	0.2	14	2	3	-1	-1	92	0.19	-0.01	-1	-1	2500					
88	4605	166821	0.2	3	0.04	1200	0.3	14	4	4	-1	-1	81	0.35	-0.01	-1	-1	3500					
89	4600	166822	0.25	2	0.02	1100	0.2	13	4	4	-1	-1	73	0.24	0.04	-1	-1	8100					
90		166814A	0.15	10	0.84	322	0.1	33	3	37	40000	10	5	-0.01	0.04	5	-1	27					
91		166809A	-0.05	9	10	509	0.1	1	44	24	872	159	-1	-0.01	-0.01	-1	-1	741					
92		SCHEME	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M	IC8M					
93		DL	0.05	1	0.01	1	0.1	1	1	1	1	1	1	0.01	0.01	1	1	1					
94		UNITS	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB					
95				DL35																			
96	Easting	Sample No	Ag	As	Au	Ba	Bi	Cd	Co	Cu	Mo	Ni	Pb	Pd	Pt	Sb	Tl	Zn-C	Ratio-C				
97		166814A	119	11	0.26	1300	2.9	63	3100	64000	42000	856	1900	-0.01	0.19	6	-1	7300					
98		166809A	10	9	28	2000	0.4	6	97	1300	2700	472	137	-0.01	0.15	6	-1	2000					
99				DL34																			
100	Easting	150419	Ag	As	Au	Ba	Bi	Cd	Co	Cu	Mo	Ni	Pb	Pd	Pt	Sb	Tl	Zn-A	Ratio-A				
101		166814A	112	-1	0.54	1700	0.2	52	11	351	44000	17	2	-0.01	-0.01	-1	-1	9					
102		166809A	8.35	-1	-0	4700	-0.1	4	40	622	1300	228	2	0.05	-0.01	-1	-1	295					
103				DL18																			
104		Sample No	Ag	As	Au	Ba	Bi	Cd	Co	Cu	Mo	Ni	Pb	Pd	Pt	Sb	Tl	Zn-B	Ratio-B				
105		166814A	0.15	10	0.84	322	0.1	33	3	37	40000	10	5	-0.01	0.04	5	-1	27					
106		166809A	-0.05	9	10	509	0.1	1	44	24	872	159	-1	-0.01	-0.01	-1	-1	741					
107																							
108																							
109		8AD0903		Total Digest C Horizon Soil																			
110	Easting	Sample No	Ca	Co	Cu	Fe	Mg	Mn	Ni	Pb	S	Zn	Ag	As	Bi	Cd	Mo	Sb	Tl	Au	Au Dp1	Ba	
111	4700	166823	600	-2	4	7300	3050	230	-2	20	-500	41	0.7	-0.5	0.2	-0.1	0.4	2.5	0.6	-1	-9000	440	
112	4690	166824	550	-2	5	3650	1450	110	2	10	-500	22	0.5	2.5	0.2	-0.1	0.6	2.5	0.2	-1	-9000	190	
113	4680	166825	165	-2	3	2750	1450	75	-2	20	-500	18	0.5	1.5	0.2	-0.1	0.5	4	0.4	-1	-9000	190	
114	4675	166826	190	-2	3	3050	1500	75	-2	25	-500	19	0.4	-0.5	0.2	-0.1	0.4	4	0.4	-1	-9000	200	
115	4670	166827	260	-2	4	4150	4000	150	2	10	-500	25	0.3	-0.5	0.2	-0.1	0.4	2.5	0.7	-1	-9000	470	
116	4665	166828	490	-2	3	3850	5450	165	2	15	-500	30	0.4	2.5	0.1	-0.1	0.4	2	0.8	1	-9000	500	
117	4660	166829	410	-2	6	2350	1600	65	2	20	-500	21	0.4	-0.5	0.2	-0.1	0.5	2.5	0.4	-1	-9000	165	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
118	4640	166830	420	-2	9	2050	1950	75	2	15	-500	26	0.3	-0.5	0.1	-0.1	0.5	2	0.4	-1	-9000	160	
119	4638	166831	330	-2	14	1900	1900	75	-2	20	-500	21	0.3	2.5	0.2	-0.1	0.6	2	0.4	-1	-9000	175	
120	4636	166832	440	-2	7	3200	5100	140	3	15	-500	23	0.3	1	0.2	-0.1	0.7	2	1.2	-1	-9000	480	
121	4634	166833	310	-2	8	1600	1050	55	2	15	-500	22	0.3	-0.5	0.1	-0.1	0.7	2	0.2	-1	-9000	110	
122	4632	166834	330	-2	16	1200	750	40	-2	15	-500	16	0.3	1	0.1	-0.1	0.6	2	0.2	-1	-9000	85	
123	4630	166835	390	-2	11	1800	1000	45	2	20	-500	18	0.3	-0.5	0.1	-0.1	0.7	2	0.2	-1	-9000	115	
124	4628	166836	600	-2	14	2050	1250	50	7	35	-500	21	0.4	1	0.2	-0.1	0.7	2	0.2	-1	-9000	120	
125	4626	166837	550	-2	13	2800	1800	60	6	30	-500	20	0.4	1	0.2	-0.1	0.7	2	0.3	-1	-9000	170	
126	4624	166838	230	-2	3	2150	2000	55	-2	30	-500	16	0.2	-0.5	0.1	-0.1	0.5	2	0.4	2	-9000	200	
127	4622	166839	360	-2	4	2000	1500	50	-2	30	-500	20	0.4	-0.5	0.1	-0.1	0.7	2	0.3	-1	-9000	145	
128	4620	166840	280	-2	15	2000	1150	50	2	25	-500	16	0.3	-0.5	0.1	-0.1	0.6	2	0.2	-1	-1	130	
129	4615	166841	250	-2	21	2250	1750	55	3	30	-500	19	0.3	-0.5	0.1	-0.1	0.7	2.5	0.3	-1	-9000	180	
130	4610	166842	430	-2	11	2400	1500	55	4	30	-500	21	0.4	1.5	0.2	-0.1	0.7	2.5	0.3	-1	-9000	160	
131	4605	166843	340	-2	11	1800	900	45	2	20	-500	18	0.4	1.5	0.1	-0.1	0.8	2.5	0.2	-1	-9000	130	
132	4600	166844	290	-2	12	2300	1000	50	-2	25	-500	20	0.4	1.5	0.2	-0.1	1	2.5	0.2	-1	-9000	135	
133																							
134		Total Digest -20# Soil																					
135	Easting	Sample No	Ca	Co	Cu	Fe	Mg	Mn	Ni	Pb	S	Zn	Ag	As	Bi	Cd	Mo	Sb	Tl	Au	Au Dp1	Ba	
136	4700	166845	420	-2	6	3150	1150	90	-2	25	-500	18	0.4	0.5	0.1	-0.1	0.5	2.5	0.2	-1	-9000	145	
137	4690	166846	450	-2	6	2850	1250	85	-2	10	-500	26	0.4	2	0.1	-0.1	0.7	2.5	0.2	-1	-9000	135	
138	4680	166847	500	-2	5	3100	1300	70	3	20	-500	25	0.4	0.5	0.1	-0.1	0.5	4	0.3	-1	-9000	150	
139	4675	166848	250	-2	5	2800	1150	60	-2	25	-500	18	0.5	1	0.1	-0.1	0.5	3.5	0.2	-1	-9000	135	
140	4670	166849	470	-2	4	3050	2200	90	2	15	-500	18	0.3	-0.5	0.2	-0.1	0.6	2	0.3	-1	-9000	210	
141	4665	166850	270	-2	4	2450	2900	100	2	15	-500	21	0.3	-0.5	0.1	-0.1	0.4	2	0.4	-1	-9000	260	
142	4660	166851	380	-2	4	1900	1200	55	-2	25	-500	17	0.4	2	0.2	-0.1	0.6	2.5	0.2	-1	-9000	110	
143	4640	166852	340	-2	4	2450	1300	60	2	25	-500	19	0.3	1.5	0.1	-0.1	0.6	2	0.2	1	-9000	100	
144	4638	166853	250	-2	8	1600	1250	55	-2	25	-500	17	0.3	-0.5	0.1	-0.1	0.6	2.5	0.2	-1	-9000	120	
145	4636	166854	230	-2	4	1950	1450	60	-2	20	-500	22	0.3	-0.5	0.2	-0.1	0.6	2	0.3	2	7	140	
146	4634	166855	270	-2	6	1400	1200	50	-2	20	-500	26	0.3	-0.5	0.1	-0.1	0.6	2	0.2	-1	-9000	110	
147	4632	166856	380	-2	5	1800	900	50	-2	25	-500	39	0.3	-0.5	0.1	-0.1	0.7	2	0.2	-1	-9000	80	
148	4630	166857	450	-2	10	1750	850	45	-2	25	-500	38	0.3	2.5	0.1	0.1	0.7	2	0.1	-1	-9000	75	
149	4628	166858	410	-2	8	1850	1000	40	2	25	-500	38	0.3	1	0.1	-0.1	0.6	2	0.2	-1	-9000	100	
150	4626	166859	400	-2	34	1950	1150	45	-2	30	-500	19	0.3	-0.5	0.1	0.1	0.8	2	0.2	1	-9000	100	
151	4624	166860	350	-2	16	2100	1100	45	2	30	-500	15	0.3	-0.5	0.1	-0.1	0.7	2	0.2	-1	-9000	100	
152	4622	166861	550	-2	5	1950	1050	45	2	30	-500	23	0.3	1	0.1	-0.1	0.6	2	0.2	-1	-9000	95	
153	4620	166862	350	-2	10	2250	1000	45	-2	35	-500	16	0.3	1	0.1	-0.1	0.8	2.5	0.2	-1	-9000	100	
154	4615	166863	370	-2	12	1950	1000	45	-2	30	-500	24	0.3	1	0.1	-0.1	0.9	2.5	0.2	-1	-9000	90	
155	4610	166864	380	-2	11	2600	1050	50	-2	35	-500	22	0.4	2	0.1	0.1	1	2.5	0.2	-1	-9000	90	
156	4605	166865	500	-2	52	2850	1000	55	2	35	-500	22	0.4	0.5	0.1	0.2	1.1	2.5	0.2	-1	-9000	105	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
157	4600	166866	320	-2	10	2450	1100	50	2	35	-500	33	0.4	1	0.1	-0.1	1	2.5	0.2	-1	-9000	105	
158																							
159		166830A	3100	53	440	257000	5450	750	470	210	-500	650	0.8	105	11	1	390	13.5	1	54	-9000	420	
160		166852A	3050	50	440	250000	5400	750	470	210	-500	650	0.8	110	10.5	1.3	450	15.5	0.9	63	-9000	410	
161		166835A	650	6	31	25800	3950	55	16	20	-500	30	0.3	1000	0.7	0.2	4.7	140	1.2	1540	-9000	550	
162		166849A	1150	5	32	26300	4050	60	14	25	-500	31	0.2	1300	1	0.2	4.1	200	1.1	1640	-9000	470	
163		SCHEME	IC3E	IC3E	IC3E	IC3E	IC3E	IC3E	IC3E	IC3E	IC3E	IC3E	IC3M	IC3M	IC3M	IC3M	IC3M	IC3M	IC3M	FA3	FA3	XRF1	
164		DL	10	2	2	100	10	5	2	5	500	2	0.1	0.5	0.1	0.1	0.1	0.5	0.1	1	1	10	
165		UNITS	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPB	PPB	PPM	
166																							
167																							
168																							
169																							

	B	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS
1	Orientation	Response Ratios			25%tile																		
2	8AD0902C	8.45	2	0.04	460	4.5	11	3	65	-1	9	2100	0.08	0.04	-1	-1	2800						
3	Sample No	Ag	**As**	Au	Ba	Bi	**Cd**	**Co**	**Cu**	Mo	Ni	**Pb**	Pd	Pt	Sb	**Tl**	**Zn-DL**	Ratio	Ratio-DL 35				
4	166801	1.065	3	-0.25	1.333	1.07	0.73	1	0.492	-1	0.78	0.95	5.88	1	-1	-1	0.929	2.37	7.101				
5	166802	2.959	3	13.25	2.609	1	1.09	1.333	1.662	-1	1.11	0.9	2.63	1.75	1	-1	2.321	4.89	10.31				
6	166803	2.249	6	2.25	1.574	1.02	1.09	1.333	1.246	-1	0.78	0.76	1.75	3.5	1	-1	2.143	4.15	12.58				
7	166804	3.077	6.5	3.5	1.896	2.2	0.82	2	1.369	-1	2.22	1.43	0.38	2.5	-1	-1	1.107	3.9	13.22				
8	166805	1.893	4.5	-0.25	3.043	2.89	2.45	2.333	2.615	-1	2.78	1.76	-0.1	-0.25	-1	-1	1.321	5.7	14.99				
9	166806	1.538	2.5	2.25	2.391	1.71	1.18	2	1	-1	1.67	1.43	7.25	3.75	1	-1	0.786	3.21	8.896				
10	166807	1.302	3	1	1.243	1.42	1	0.667	0.892	-1	1	1.1	7.63	0.5	-1	-1	0.857	2.84	7.511				
11	166808	1.142	2.5	1.25	1.457	1.02	1.09	1.667	1.692	-1	1.44	1.19	4	0.25	1	-1	1.179	4.06	9.319				
12	166809	0.799	1.5	4	0.643	0.78	0.73	1	1.231	-1	1.11	0.86	-0.1	1.75	-1	-1	1.286	3.37	6.601				
13	166810	0.964	1.5	24.25	0.804	0.84	1.82	2.333	2.077	-1	1.78	1	-0.1	6	-1	-1	1.857	4.93	10.59				
14	166811	1.059	3	0.75	1.124	1.11	2.09	3	1.923	-1	1.67	1.19	3.88	3.5	-1	-1	2.25	5.36	13.45				
15	166812	1.302	3.5	2.75	1.157	1.11	2.18	3.667	1.338	-1	1.78	1.33	2.38	3	-1	-1	3.25	5.92	15.27				
16	166813	1.059	3.5	1.5	0.92	1.49	2.64	3.333	2.292	-1	2.44	1.62	4.5	2.5	-1	-1	3.571	7.48	16.95				
17	166814	1	1.5	0.25	1.163	1.27	0.45	1	0.615	-1	1	1.05	3	2.25	-1	-1	3.393	5.06	8.01				
18	166815	1.036	1.5	1.5	1.304	1.18	1.27	1	1.015	-1	1.11	1.05	2	1.75	-1	-1	1.107	3.17	6.943				
19	166816	0.911	2	8	1.059	1.07	0.91	1	1	-1	9.56	1.05	10.4	3	-1	-1	0.929	2.98	6.885				
20	166817	0.893	1	5.5	1.113	1.69	1.55	1	0.831	-1	1	1.62	-0.1	1	-1	-1	2.393	4.84	8.388				
21	166818	0.698	1	5.25	0.846	1.33	1.09	0.667	0.708	-1	2.11	1.24	2.75	2.25	-1	-1	0.857	2.8	5.561				
22	166819	1.42	1	0.75	1	0.98	1.55	1	1.185	-1	4.89	0.95	3.88	3	-1	-1	1.179	3.32	6.861				
23	166820	1.538	0.5	3.5	1.146	1.29	2.27	1	2.123	-1	1.33	1.67	1	4.25	-1	-1	1	4.79	8.562				
24	166821	1.183	1	2	1.059	0.93	1.73	1.333	1.292	-1	2.33	1.14	3.13	4.5	-1	-1	1.464	3.9	7.96				
25	166822	1.42	0.5	4.5	0.893	0.91	1.64	1.333	1.2	-1	0.89	1.24	4.38	1	-1	-1	3	5.44	8.908				
26																							
27	166814A																						
28	166809A																						
29	SCHEME																						
30	DL																						
31	UNITS																						
32																							
33		Response Ratios			25%tile																		
34	8AD0902A	8.65	-1	0.05	783	0.4	7	2	-1	8	-1	260	0.02	-0.01	-1	-1	2000						
35	Sample No	Ag	**As**	Au	Ba	Bi	**Cd**	**Co**	**Cu**	Mo	Ni	**Pb**	Pd	Pt	Sb	**Tl**	**Zn-DL**	Ratio	Ratio-DL34				
36	166801	1.121	-1	1.2	1.66	1.25	0.86	1.5	-1	1	15	1	6	-1	-1	-1	1	2	2.357				
37	166802	2.543	-1	7.6	2.682	1.75	1	2.5	3	1.4	8	1.04	-0.5	-1	-1	-1	2.55	3.59	9.088				
38	166803	2.312	-1	1.4	1.533	2	0.86	1	-1	3.3	-1	1.03	14	12	-1	-1	2.25	3.28	3.138				
39	166804	2.659	-1	0.8	1.788	2.5	1	2	-1	6	-1	1.97	4	-1	-1	-1	1.2	3.17	4.165				

	B	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS
40	166805	1.734	-1	0.4	3.193	3.75	1.86	3	-1	8.3	-1	1.8	1	-1	-1	-1	1.25	3.05	5.907				
41	166806	1.503	-1	1.4	2.171	3.5	1.14	2.5	-1	7.5	6	1.78	16	-1	-1	-1	0.9	2.68	4.324				
42	166807	1.272	-1	1	1.277	1.75	1	1.5	-1	4.6	-1	1	6	4	-1	-1	0.9	1.9	2.404				
43	166808	1.156	-1	2.8	1.216	1.75	1.14	1.5	-1	4.4	-1	1.37	17	-1	-1	-1	1.3	2.67	3.308				
44	166809	0.775	-1	3.2	0.778	1.75	0.86	1	-1	4.1	8	1.13	1	-1	-1	-1	1.55	2.68	2.542				
45	166810	1	-1	6.4	0.948	1	1.71	2	-1	3.8	-1	0.98	8	-1	-1	-1	1.8	2.78	4.495				
46	166811	1.156	-1	3.2	1.267	1.75	2.29	2.5	-1	2.6	10	1.22	11	10	-1	-1	2.5	3.72	6.505				
47	166812	1.272	-1	4.4	1.258	1.5	2.43	3.5	-1	2.4	23	1.22	11	2	-1	-1	3.7	4.92	8.848				
48	166813	1.156	-1	2	1	1.25	2.71	3.5	-1	3.4	-1	1.22	-0.5	-1	-1	-1	3.55	4.77	8.98				
49	166814	0.942	-1	2	0.923	1.5	0.43	1	-1	2.9	-1	1.11	-0.5	-1	-1	-1	3.15	4.26	3.686				
50	166815	1.052	-1	-0.2	1.04	1	1	0.5	-1	2	-1	1	5	2	-1	-1	1.1	2.1	1.6				
51	166816	0.763	-1	0.6	0.94	0.75	0.86	0.5	-1	1.6	-1	0.83	4	4	-1	-1	0.9	1.73	1.088				
52	166817	0.844	-1	2.6	1.236	2	1.14	-0.5	-1	1.3	-1	1.57	10	12	-1	-1	2.4	3.97	2.608				
53	166818	0.734	-1	4.2	0.994	1.75	1	1.5	-1	0.9	-1	1.39	7	-1	-1	-1	0.85	2.24	2.738				
54	166819	1.387	-1	4	1.162	0.5	1.43	1	-1	-0	-1	0.81	-0.5	-1	-1	-1	1.05	1.86	2.286				
55	166820	1.272	-1	1.6	1.11	1	2.14	0.5	-1	-0	-1	1.07	7.5	-1	-1	-1	0.9	1.97	2.612				
56	166821	1.272	-1	0.6	1.208	1	2	0.5	-1	-0	-1	1.02	-0.5	-1	-1	-1	1.65	2.67	3.173				
57	166822	1.272	-1	3.6	1.199	0.75	1.86	1	-1	-0	-1	0.85	6.5	7	-1	-1	2.45	3.3	4.157				
58																							
59	166814A																						
60	166809A																						
61	SCHEME																						
62	DL																						
63	UNITS																						
64																							
65		Response Ratios			25%tile																		
66	18	0.05	2	-0.01	1100	0.2	9	3	3	-1	-1	66	0.17	-0.01	-1	-1	2900						
67	Sample Nc	Ag	**As**	Au	Ba	Bi	**Cd**	**Co**	**Cu**	Mo	Ni	**Pb**	Pd	Pt	Sb	Tl	**Zn-DL**	Ratio	Ratio-DL18				
68	166801	4	1	3	1.273	0.5	0.67	0.667	0.667	-1	-1	1.36	2.41	4	-1	-1	0.862	2.89	5.226				
69	166802	15	0.5	1	1.909	1	1	1.333	1	-1	-1	0.79	0.88	4	-1	-1	2.172	3.96	6.794				
70	166803	17	0.5	1	1.091	-0.5	1	1	0.667	-1	-1	0.76	0.35	4	-1	-1	1.862	3.29	5.786				
71	166804	1	1.5	-1	1.182	1	1.11	1.667	0.667	-1	-1	1.29	0.06	-1	-1	1	1.172	3.13	7.405				
72	166805	3	1	2	2.091	1	2.11	1.333	4.667	-1	-1	1.09	1.65	-1	-1	1	1.172	6.93	11.37				
73	166806	-1	1	2	1.364	1	1.22	1.667	1	-1	-1	0.97	0.71	1	-1	-1	0.759	2.73	6.617				
74	166807	3	1.5	2	1.182	1.5	0.89	0.667	1	-1	-1	0.8	1.35	3	-1	-1	0.897	2.7	5.755				
75	166808	2	1.5	-1	1.182	2	1.22	1.667	1.333	-1	-1	1.2	2.35	4	-1	1	1.31	3.84	8.23				
76	166809	1	0.5	3	0.726	-0.5	0.89	1	0.667	-1	2	0.94	0.24	-1	-1	-1	1.69	3.3	5.685				
77	166810	-1	1	2	0.812	1	1.67	2.667	1.667	-1	-1	1	2.06	-1	-1	-1	1.931	4.6	9.931				
78	166811	4	2.5	2	1.091	1.5	2	2.333	1.333	-1	-1	1.23	2.53	2	-1	1	2.655	5.22	12.05				

	B	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS
79	166812	6	3	3	1.273	2	2.56	3.333	1.667	-1	-1	1.41	2.59	6	-1	3	3.345	6.42	15.31				
80	166813	1	4.5	-1	0.906	1	2.78	3.333	1.333	-1	-1	1.32	1.41	1	-1	3	3.966	6.62	17.23				
81	166814	1	1	3	1	2.5	0.44	1	1.333	-1	-1	1.45	3.88	7	1	2	3.448	6.24	8.681				
82	166815	5	1.5	-1	1.182	1.5	1	0.667	2.333	-1	-1	1.3	3.71	-1	1	1	1.069	4.71	7.872				
83	166816	-1	2	2	1	1	1	1	1.333	-1	-1	1.29	1.53	-1	-1	1	1	3.62	7.621				
84	166817	2	1.5	-1	1.091	1.5	1.44	1.333	1.333	-1	-1	1.29	1.71	-1	-1	-1	2.759	5.38	9.658				
85	166818	-1	1	-1	0.909	1	1	0.667	3.667	-1	-1	1.36	1	4	-1	-1	0.759	5.79	8.456				
86	166819	7	1	1	1.091	1.5	1.33	1	1.333	-1	-1	1.2	1.59	-1	-1	-1	1.345	3.88	7.208				
87	166820	-1	1	-1	0.879	1	1.56	0.667	1	-1	-1	1.39	1.12	-1	-1	-1	0.862	3.26	6.478				
88	166821	4	1.5	4	1.091	1.5	1.56	1.333	1.333	-1	-1	1.23	2.06	-1	-1	-1	1.207	3.77	8.156				
89	166822	5	1	2	1	1	1.44	1.333	1.333	-1	-1	1.11	1.41	4	-1	-1	2.793	5.23	9.01				
90	166814A																						
91	166809A																						
92	SCHEME																						
93	DL																						
94	UNITS																						
95																							
96	Sample Nc																						
97	166814A																						
98	166809A																						
99																							
100	150419																						
101	166814A																						
102	166809A																						
103																							
104	Sample Nc																						
105	166814A																						
106	166809A																						
107																							
108			25%tile																				
109	8AD0903		280	-2	4	2000	1150	50	-2	15	-500	18	0.3	-0.5	0.1	-0.1	0.5	2	0.2	-1	-9000	130	
110	Sample Nc	Sample	Ca	**Co**	**Cu**	Fe	Mg	Mn	Ni	**Pb**	S	**Zn-C**	Ag	As	Bi	**Cd**	Mo	Sb	Tl	Au	Au Dp1	Ba	Ratio-C Hc
111	166823		2.14	1	1	3.65	2.65	4.6	1	1.3	1	2.28	2.33	1	2	1	0.8	1.25	3	1	1	3.385	4.611111
112	166824		1.96	1	1.25	1.83	1.26	2.2	-1	0.7	1	1.22	1.67	-5	2	1	1.2	1.25	1	1	1	1.462	3.138889
113	166825		0.59	1	0.75	1.38	1.26	1.5	1	1.3	1	1	1.67	-3	2	1	1	2	2	1	1	1.462	3.083333
114	166826		0.68	1	0.75	1.53	1.3	1.5	1	1.7	1	1.06	1.33	1	2	1	0.8	2	2	1	1	1.538	3.472222
115	166827		0.93	1	1	2.08	3.48	3	-1	0.7	1	1.39	1	1	2	1	0.8	1.25	3.5	1	1	3.615	3.055556
116	166828		1.75	1	0.75	1.93	4.74	3.3	-1	1	1	1.67	1.33	-5	1	1	0.8	1	4	-1	1	3.846	3.416667
117	166829		1.46	1	1.5	1.18	1.39	1.3	-1	1.3	1	1.17	1.33	1	2	1	1	1.25	2	1	1	1.269	4

	B	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS
118	166830		1.5	1	2.25	1.03	1.7	1.5	-1	1	1	1.44	1	1	1	1	1	1	2	1	1	1.231	4.694444
119	166831		1.18	1	3.5	0.95	1.65	1.5	1	1.3	1	1.17	1	-5	2	1	1.2	1	2	1	1	1.346	6
120	166832		1.57	1	1.75	1.6	4.43	2.8	-1.5	1	1	1.28	1	-2	2	1	1.4	1	6	1	1	3.692	4.027778
121	166833		1.11	1	2	0.8	0.91	1.1	-1	1	1	1.22	1	1	1	1	1.4	1	1	1	1	0.846	4.222222
122	166834		1.18	1	4	0.6	0.65	0.8	1	1	1	0.89	1	-2	1	1	1.2	1	1	1	1	0.654	5.888889
123	166835		1.39	1	2.75	0.9	0.87	0.9	-1	1.3	1	1	1	1	1	1	1.4	1	1	1	1	0.885	5.083333
124	166836		2.14	1	3.5	1.03	1.09	1	-3.5	2.3	1	1.17	1.33	-2	2	1	1.4	1	1	1	1	0.923	7
125	166837		1.96	1	3.25	1.4	1.57	1.2	-3	2	1	1.11	1.33	-2	2	1	1.4	1	1.5	1	1	1.308	6.361111
126	166838		0.82	1	0.75	1.08	1.74	1.1	1	2	1	0.89	0.67	1	1	1	1	1	2	-2	1	1.538	3.638889
127	166839		1.29	1	1	1	1.3	1	1	2	1	1.11	1.33	1	1	1	1.4	1	1.5	1	1	1.115	4.111111
128	166840		1	1	3.75	1	1	1	-1	1.7	1	0.89	1	1	1	1	1.2	1	1	1	1E-04	1	6.305556
129	166841		0.89	1	5.25	1.13	1.52	1.1	-1.5	2	1	1.06	1	1	1	1	1.4	1.25	1.5	1	1	1.385	8.305556
130	166842		1.54	1	2.75	1.2	1.3	1.1	-2	2	1	1.17	1.33	-3	2	1	1.4	1.25	1.5	1	1	1.231	5.916667
131	166843		1.21	1	2.75	0.9	0.78	0.9	-1	1.3	1	1	1.33	-3	1	1	1.6	1.25	1	1	1	1	5.083333
132	166844		1.04	1	3	1.15	0.87	1	1	1.7	1	1.11	1.33	-3	2	1	2	1.25	1	1	1	1.038	5.777778
133			25%tile																				
134	Total Diges		320	-2	5	1900	1000	45	-2	20	-500	18	0.3	-0.5	0.1	-0.1	0.6	2	0.2	-1	-9000	100	
135	Sample No	Sample	Ca	**Co**	**Cu**	Fe	Mg	Mn	Ni	**Pb**	S	**Zn-T**	Ag	As	Bi	**Cd**	Mo	Sb	Tl	Au	Au Dp1	Ba	Ratio-Total
136	166845		1.31	1	1.2	1.66	1.15	2	1	1.3	1	1	1.33	-1	1	1	0.833	1.25	1	1	1	1.45	3.45
137	166846		1.41	1	1.2	1.5	1.25	1.889	1	0.5	1	1.44	1.33	-4	1	1	1.167	1.25	1	1	1	1.35	3.144444
138	166847		1.56	1	1	1.63	1.3	1.556	-1.5	1	1	1.39	1.33	-1	1	1	0.833	2	1.5	1	1	1.5	3.388889
139	166848		0.78	1	1	1.47	1.15	1.333	1	1.3	1	1	1.67	-2	1	1	0.833	1.75	1	1	1	1.35	3.25
140	166849		1.47	1	0.8	1.61	2.2	2	-1	0.8	1	1	1	1	2	1	1	1	1.5	1	1	2.1	2.55
141	166850		0.84	1	0.8	1.29	2.9	2.222	-1	0.8	1	1.17	1	1	1	1	0.667	1	2	1	1	2.6	2.716667
142	166851		1.19	1	0.8	1	1.2	1.222	1	1.3	1	0.94	1.33	-4	2	1	1	1.25	1	1	1	1.1	2.994444
143	166852		1.06	1	0.8	1.29	1.3	1.333	-1	1.3	1	1.06	1	-3	1	1	1	1	1	-1	1	1	3.105556
144	166853		0.78	1	1.6	0.84	1.25	1.222	1	1.3	1	0.94	1	1	1	1	1	1.25	1	1	1	1.2	3.794444
145	166854		0.72	1	0.8	1.03	1.45	1.333	1	1	1	1.22	1	1	2	1	1	1	1.5	-2	-8E-04	1.4	3.022222
146	166855		0.84	1	1.2	0.74	1.2	1.111	1	1	1	1.44	1	1	1	1	1	1	1	1	1	1.1	3.644444
147	166856		1.19	1	1	0.95	0.9	1.111	1	1.3	1	2.17	1	1	1	1	1.167	1	1	1	1	0.8	4.416667
148	166857		1.41	1	2	0.92	0.85	1	1	1.3	1	2.11	1	-5	1	-1	1.167	1	0.5	1	1	0.75	5.361111
149	166858		1.28	1	1.6	0.97	1	0.889	-1	1.3	1	2.11	1	-2	1	1	1	1	1	1	1	1	4.961111
150	166859		1.25	1	6.8	1.03	1.15	1	1	1.5	1	1.06	1	1	1	-1	1.333	1	1	-1	1	1	9.355556
151	166860		1.09	1	3.2	1.11	1.1	1	-1	1.5	1	0.83	1	1	1	1	1.167	1	1	1	1	1	5.533333
152	166861		1.72	1	1	1.03	1.05	1	-1	1.5	1	1.28	1	-2	1	1	1	1	1	1	1	0.95	3.777778
153	166862		1.09	1	2	1.18	1	1	1	1.8	1	0.89	1	-2	1	1	1.333	1.25	1	1	1	1	4.638889
154	166863		1.16	1	2.4	1.03	1	1	1	1.5	1	1.33	1	-2	1	1	1.5	1.25	1	1	1	0.9	5.233333
155	166864		1.19	1	2.2	1.37	1.05	1.111	1	1.8	1	1.22	1.33	-4	1	-1	1.667	1.25	1	1	1	0.9	5.172222
156	166865		1.56	1	10.4	1.5	1	1.222	-1	1.8	1	1.22	1.33	-1	1	-2	1.833	1.25	1	1	1	1.05	13.37222

	B	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS
157	166866		1	1	2	1.29	1.1	1.111	-1	1.8	1	1.83	1.33	-2	1	1	1.667	1.25	1	1	1	1.05	5.583333
158																							
159	166830A		9.69	-26.5	88	135	5.45	16.67	-235	11	1	36.1	2.67	-210	110	-10	650	6.75	5	-54	1	4.2	134.6111
160	166852A		9.53	-25	88	132	5.4	16.67	-235	11	1	36.1	2.67	-220	105	-13	750	7.75	4.5	-63	1	4.1	134.6111
161	166835A		2.03	-3	6.2	13.6	3.95	1.222	-8	1	1	1.67	1	-2000	7	-2	7.833	70	6	-1540	1	5.5	8.866667
162	166849A		3.59	-2.5	6.4	13.8	4.05	1.333	-7	1.3	1	1.72	0.67	-2600	10	-2	6.833	100	5.5	-1640	1	4.7	9.372222
163	SCHEME																						
164	DL																						
165	UNITS																						
166																							
167																							
168																							
169																							

Correlation Matrix Total Digest

	Ca	*Co*	*Cu*	*Fe*	*Mg*	*Mn*	*Ni*	*Pb*	*S*	*Zn*	*Ag*	*As*	*Bi*	*Cd*	*Mo*	*Sb*	*Tl*	*Au*	*Au Dp1*	*Ba*
Ca	1																			
Co	#DIV/0!	1																		
Cu	0.2832	#DIV/0!	1																	
Fe	0.3496	#DIV/0!	0.07665	1																
Mg	-0.218	#DIV/0!	-0.2502	0.2795	1															
Mn	0.0202	#DIV/0!	-0.2738	0.6562	0.7614	1														
Ni	0.3602	#DIV/0!	0.1045	0.338	0.34	0.1592	1													
Pb	0.0725	#DIV/0!	0.49646	-0.1539	-0.592	-0.703	-0.006	1												
S	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1											
Zn	0.1906	#DIV/0!	-0.0963	-0.2888	-0.293	-0.278	0.0413	-0.0421	#DIV/0!	1										
Ag	0.0532	#DIV/0!	0.07322	0.6149	-0.163	0.22	-0.0829	0.0692	#DIV/0!	-0.1333	1									
As	0.3314	#DIV/0!	-0.1112	0.1462	-0.406	-0.176	-0.1422	0.1825	#DIV/0!	0.2141	0.4018	1								
Bi	-0.077	#DIV/0!	-0.2293	0.0142	0.3252	0.2275	-0.0682	-0.3222	#DIV/0!	-0.2477	-0.0522	-0.114	1							
Cd	0.3355	#DIV/0!	0.79493	0.0619	-0.25	-0.25	-0.0791	0.4258	#DIV/0!	0.0925	0.1171	0.2087	-0.1832	1						
Mo	0.1988	#DIV/0!	0.65653	-0.0053	-0.474	-0.485	-0.0628	0.6941	#DIV/0!	0.149	0.0994	0.2463	-0.1944	0.6159	1					
Sb	0.0732	#DIV/0!	-0.0509	0.5228	-0.14	0.138	0.0242	0.0183	#DIV/0!	-0.1658	0.739	0.2162	-0.1553	-0.0785	-0.072	1				
Tl	-0.198	#DIV/0!	-0.2181	0.3303	0.8683	0.6557	0.3998	-0.4915	#DIV/0!	-0.2746	-0.0872	-0.523	0.3351	-0.324	-0.4233	0.0855	1			
Au	-0.299	#DIV/0!	0.0756	-0.1444	0.0603	-0.067	-0.103	-0.0675	#DIV/0!	-0.1722	-0.2754	-0.216	0.3306	0.07105	-0.0643	-0.28	0.1666	1		
Au Dp1	-0.369	#DIV/0!	-0.1259	-0.1425	0.0969	0.0176	-0.1807	-0.1769	#DIV/0!	-0.0444	-0.1548	-0.249	0.5492	-0.1006	-0.1067	-0.157	0.3105	0.7142	1	
Ba	-0.155	#DIV/0!	-0.2561	0.4653	0.9471	0.8709	0.3117	-0.645	#DIV/0!	-0.32	0.0448	-0.396	0.3091	-0.2943	-0.5384	0.0796	0.8706	-0.033	0.1	1

Correlation Matrix C Horizon

	Ca	Co	Cu	Fe	Mg	Mn	Ni	Pb	S	Zn	Ag	As	Bi	Cd	Mo	Sb	Tl	Au	Au Dp1	Ba
Ca	1																			
Co	#DIV/0!	1																		
Cu	0.0168	#DIV/0!	1																	
Fe	0.4028	#DIV/0!	-0.4872	1																
Mg	0.2363	#DIV/0!	-0.4196	0.5654	1															
Mn	0.3923	#DIV/0!	-0.5108	0.9268	0.781	1														
Ni	0.5259	#DIV/0!	0.3546	-0.1125	0.1061	-0.0981	1													
Pb	-0.0063	#DIV/0!	0.3366	-0.2467	-0.372	-0.4672	0.1705	1												
S	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1											
Zn	0.5586	#DIV/0!	-0.3763	0.8562	0.5793	0.8835	-0.02	-0.3124	#DIV/0!	1										
Ag	0.4658	#DIV/0!	-0.3316	0.7164	0.0412	0.5322	-0.121	-0.0353	#DIV/0!	0.6207	1									
As	0.276	#DIV/0!	0.072	-0.0223	0.14	0.0715	0.073	-0.1683	#DIV/0!	-0.0113	0.2109	1								
Bi	0.2451	#DIV/0!	-0.2063	0.4342	0.151	0.3247	0.0804	0.0119	#DIV/0!	0.2378	0.4774	0.3203	1							
Cd	-2E-16	#DIV/0!	6E-17	-1E-16	7E-17	3E-16	-1E-16	0	#DIV/0!	0	5E-16	4E-17	-9E-16	1						
Mo	0.0293	#DIV/0!	0.5603	-0.5046	-0.443	-0.5633	0.215	0.3397	#DIV/0!	-0.4245	-0.1668	0.23	-0.0675	-4E-16	1					
Sb	-0.4583	#DIV/0!	-0.3576	0.2175	-0.136	0.0611	-0.346	-0.0026	#DIV/0!	-0.067	0.4115	0.0097	0.4239	-2E-16	-0.284	1				
Tl	0.1224	#DIV/0!	-0.4383	0.5091	0.9357	0.7183	0.0029	-0.3647	#DIV/0!	0.488	0.022	0.0607	0.2506	-4E-16	-0.405	-0.014	1			
Au	-0.098	#DIV/0!	-0.3637	0.0413	0.3478	0.1204	-0.177	0.1069	#DIV/0!	0.0058	-0.2846	0.0424	-0.339	-4E-17	-0.313	-0.198	0.2223	1		
Au Dp1	-0.1638	#DIV/0!	0.2603	-0.116	-0.14	-0.1394	0.0702	0.1067	#DIV/0!	-0.2233	-0.1574	-0.2024	-0.239	3E-16	-0.013	-0.14	-0.168	-0.068	1	
Ba	0.2208	#DIV/0!	-0.4962	0.7552	0.954	0.9025	-5E-04	-0.4107	#DIV/0!	0.6878	0.2355	0.0782	0.2579	-8E-17	-0.505	0.0152	0.9002	0.2648	-0.14	1

Correlation Matrix Deepleach 18

	Ag	*As*	*Au*	*Ba*	*Bi*	*Cd*	*Co*	*Cu*	*Mo*	*Ni*	*Pb*	*Pd*	*Pt*	*Sb*	*Tl*	*Zn-DL 18*
Ag	1															
As	-0.223	1														
Au	0.097	-0.1616	1													
Ba	0.4103	-0.1622	0.0974	1												
Bi	-0.252	0.3338	-0.0427	0.1089	1											
Cd	-0.076	0.7226	-0.0753	0.0925	0.155	1										
Co	-0.072	0.7192	0.0437	-0.031	0.2144	0.80637	1									
Cu	-0.187	0.0033	-0.1257	0.3905	0.1815	0.27599	-0.0285	1								
Mo	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1							
Ni	-0.116	-0.227	0.2417	-0.299	-0.527	-0.1803	-0.1218	-0.1897	#DIV/0!	1						
Pb	-0.503	0.4287	-0.1999	-0.275	0.5105	0.18888	0.1128	0.1878	#DIV/0!	-0.246	1					
Pd	-0.107	0.2356	0.1787	-0.002	0.6996	0.03091	0.0895	0.2053	#DIV/0!	-0.32	0.5188	1				
Pt	0.3373	0.0157	0.2078	0.1004	0.2507	-0.1639	0.0815	-0.0881	#DIV/0!	-0.21	0.0205	0.27086	1			
Sb	-0.031	-0.0642	-0.035	-0.061	0.4033	-0.354	-0.2434	0.1171	#DIV/0!	-0.069	0.3178	0.69149	0.1742	1		
Tl	-0.148	0.7465	-0.0849	0.0749	0.4606	0.48689	0.5878	0.1834	#DIV/0!	-0.167	0.5034	0.44587	0.2202	0.33712	1	
Zn-DL 18	0.1688	0.5332	0.0761	-0.136	0.2607	0.47404	0.6469	-0.1362	#DIV/0!	-0.019	0.1765	0.28217	0.386	0.16026	0.5416	1

Correlation Matrix Deepleach 34

	Ag	*As*	*Au*	*Ba*	*Bi*	*Cd*	*Co*	*Cu*	*Mo*	*Ni*	*Pb*	*Pd*	*Pt*	*Sb*	*Tl*	*Zn-DL 34*
Ag	1															
As	#DIV/0!	1														
Au	0.0644	#DIV/0!	1													
Ba	0.6696	#DIV/0!	-0.0011	1												
Bi	0.394	#DIV/0!	-0.2081	0.72065	1											
Cd	-0.059	#DIV/0!	0.1234	-0.0161	-0.126	1										
Co	0.3185	#DIV/0!	0.2726	0.44463	0.4067	0.47326	1									
Cu	0.5037	#DIV/0!	0.5784	0.48272	0.0344	-0.1423	0.2039	1								
Mo	0.2963	#DIV/0!	-0.2519	0.50232	0.8352	-0.109	0.5096	-0.1302	1							
Ni	0.0094	#DIV/0!	0.2862	0.13837	0.0694	0.18413	0.4661	0.189	-0.018	1						
Pb	0.3156	#DIV/0!	-0.2225	0.50637	0.8572	-0.0072	0.3342	-0.112	0.7025	-0.011	1					
Pd	-0.025	#DIV/0!	-0.0068	-0.0337	0.2713	-0.0088	0.0227	-0.2663	0.2151	0.1857	0.2512	1				
Pt	0.0022	#DIV/0!	-0.0826	-0.1296	-0.025	0.00699	-0.308	-0.1382	-0.168	-0.029	-0.1121	0.4187	1			
Sb	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1		
Tl	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	
Zn-DL 34	0.0504	#DIV/0!	0.3674	-0.102	-0.112	0.40499	0.375	0.1922	-0.117	0.3289	-0.0917	-0.086	0.27	#DIV/0!	#DIV/0!	1

Correlation Matrix Deepleach 35

	Ag	*As*	*Au*	*Ba*	*Bi*	*Cd*	*Co*	*Cu*	*Mo*	*Ni*	*Pb*	*Pd*	*Pt*	*Sb*	*Tl*	*Zn-DL 35*
Ag	1															
As	0.6573	1														
Au	0.0623	-0.177	1													
Ba	0.6911	0.5321	-0.095	1												
Bi	0.3554	0.4721	-0.284	0.6557	1											
Cd	-0.064	-0.034	0.0176	0.0286	0.2389	1										
Co	0.1004	0.4195	0.0452	0.1465	0.2119	0.65172	1									
Cu	0.2505	0.2268	0.21	0.2878	0.2956	0.76252	0.6025	1								
Mo	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1							
Ni	-0.121	-0.061	0.096	-0.0738	0.0187	0.01201	-0.031	0.0189	#DIV/0!	1						
Pb	0.0327	0.0435	-0.217	0.2656	0.7234	0.62683	0.384	0.4495	#DIV/0!	-0.021	1					
Pd	-0.212	-0.081	-0.209	-0.0592	-0.205	-0.2463	-0.129	-0.366	#DIV/0!	0.4906	-0.1911	1				
Pt	-0.042	-0.131	0.4655	-0.2959	-0.361	0.21558	0.2334	0.1637	#DIV/0!	0.1679	-0.1437	-0.07	1			
Sb	0.4425	0.3077	0.0682	0.5157	-0.097	-0.2463	-0.004	0.0387	#DIV/0!	-0.198	-0.2308	0.1242	-0.027	1		
Tl	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1	
Zn-DL 35	-0.012	0.0434	0.0547	-0.1724	-0.139	0.32742	0.5027	0.1695	#DIV/0!	-0.243	0.0961	-0.188	0.03636	-0.068	######	1

A. FIELD NOTES

Field notes from visits to Lakeside and Southern Trenches Prospects on Thursday 12 March and Friday 13 March 1998 in the presence of Barry Murphy, Owen Parfrey, Craig Archer and Aaron Clayton.

(i). Lakeside Prospect (Tullah area):-

1st site. (Excavated).

- Au-As in po rich veins set within silica-sericite-pyrite alteration.
- covered extensively by Permian glacials and recent colluvium up to 40m in thickness.
- low undulating hilly topography.
- 30cm to 40cm brown grey sandy loam soils, unstructured internally.
- soil pH < 5.

2nd site. (50m from 1st. Also excavated)

- dark brown, organic loam 20 to 40cms.
- top 20cms intensely covered with matted roots from grasses, small shrubs.
- sample at base of matted zone to maximise presence/abundance of fines.

(ii). Southern Trenches Prospect (Boco area):-

- sheared silica-sericite -pyrite alteration zone hosting massive Zn-Pb-Cu sulphides (5 metres wide).
- top 5 cms of organic mat. (A0)
- unstructured 20cms of grey fine sandy loam (A) containing high levels of organic material.
- c horizon dominated by weathered kaolinitic frags (breccia texture) within fine silty matrix.
- soil pH < 5.
- southern part of prospect has variable thickness of glacial cover.
- excessive thickness (3m thick) of glacials developed directly over alteration zone. (recessive palaeo weathering trough infill with glacials?). 20 cms thickness 15m uphill to east.
- glacials may in part be colluvium containing locally derived weathered si-py-ser rock.
- some risk that glacials/colluvium may contain sulphide frags (not ideal site).

Orientation sampling strategy for this site.

- sample at 2 metre spacings above massive sulphide zone.
- sample at 5 metre spacings above alteration zone.
- sample at 10 metre spacing above host rocks outside alteration zone.
- total traverse length about 100 metres.
- sample below organic root mat to 25cms for MMI samples.
- hand auger further down to 30cms for conventional (total digest) C horizon soil.
- try 3 Deepleach digests on MMI soil. Also do total digest on MMI soil sample.
- retain untreated soil sample for record within chip trays.
- Section line is 4400N. Line samples at eastings 4700, 4690, 4680, 4675, 4670, 4665, 4660 (peg above road), 4640, 4638, 4636, 4634, 4632, 4630, 4628, 4626, 4624, 4622, 4620, 4615, 4610, 4605, 4600 (bottom track).

(iii). Lakeside South Prospect Area. (Powerline track).-

- No complete profile exposed.
- Thick organic surface layer of matted black organic debris.
- Sample collected at 20 cms contains no siliciclastic component. Virtually 100% organic.
- pH <5.
- valley floor, flat topography.
- underlying rocks probably glacials or colluvium/alluvium derived from glacials.

(iv). Stirling Valley. East Stitt Grid.

1st site.

- steep hill slopes.
- top 20cms dominated by light brown organic (50 - 95%) soil (leaf litter) plus very minor orange clay.
- go as deep to 20cms as possible.
- pH <5.

2nd site.

- steep slopes.
- pH<5.
- 30 cms all brown organic (95%) soil derived from leaf litter.

3rd site.

- undulating rises on valley floor at base of range.
- Brown organic (90%) fines within matted organic roots.
- pH<5.

Historical MMI data inspected.

Hercules traverses.

- Northern line. Positive MMI and conventional responses. Contamination of site by mining activities highly likely. Outcropping sulphides nearby.
- Outcropping lode area gives best results in coarse fraction.
- Southern line. Fine fraction gives superior total Pb.
- all fractions give good total Zn. Lack of Pb:Zn correlation unexplained.
- no anomalies with Regoleach.
- Au in finer fraction.
- Likelihood of contamination and lack of sub-surface geological control on southern line indicates limited value in data.

Orientation lines should always be over drilled areas where sub-surface geology is well understood. Consider using Rosebery Mine section tested by MERIWA research several years ago.

5502511

BURNS PEAK EL 44/88

JOINT VENTURE ANNUAL REPORT

NOVEMBER 1997 - 31ST DECEMBER 1998

APPENDIX 5

NORTH KERSHAW-CHESTER AREA

MMI SOIL SAMPLING ANALYTICAL RESULTS

PASMINCO ROSEBERY MINE
BURNS PEAK EL 44/88
JOINT VENTURE ANNUAL REPORT
1st NOVEMBER 1997 TO 31ST DECEMBER 1998
APPENDIX 5
NORTH KERSHAW SOIL SAMPLING DETAILS

Prospect:	North Kershaw/Chester
Tenement Name:	Burns Peak
Tenement Number:	EL44/88
Sample Type:	Soil
Sub Sample Type:	MMI
Sample Dates	21-28th Octohber1998
Grid:	Local
Local Grid Name:	North Kershaw
Reference Method:	Taped
Reference Accuracy:	100%
UTM Zone	55
UTM Datum	AGD66
Data Set	Burns Peak
Laboratory	AMDEL
Lab Job Number	8AD2917

Sample Number	Local East	Local North	Ag ppm IC8/40	As ppm IC8/40	Au ppm IC8/40	Bi ppm IC8/40	Cd ppm IC8/40	Ba ppm IC8/40	Co ppm IC8/40	Cu ppm IC8/40	Mo ppm IC8/40	Ni ppm IC8/40	Pb ppm IC8/40	Pt ppm IC8/40	Pd ppm IC8/40	Sb ppm IC8/40	Tl ppm IC8/40	Zn ppm IC8/40	SDS	Colour	Soil Profile	Slope Angle	Sample Depth	Organic Content %
304001	7750	81900	0.00095	0.047	0.00105	0.024	0.006	0.773	0.057	0.112	0.009	0.02	0.094	<0.00001	0.00159	<0.001	<0.001	0.962	3701	Light brown	B	14	0.2	20
304002	8250	82100	0.0014	0.007	0.00082	0.014	0.007	0.608	0.013	0.525	<0.001	0.042	0.854	0.0004	0.00022	<0.001	<0.001	1.1	3701	Dark brown	B	5	0.2	30
304003	8225	82100	0.0021	0.027	0.00083	0.029	0.006	1.2	0.048	0.641	0.036	0.045	1	0.00053	0.00083	<0.001	<0.001	1.3	3701	Brown	B	8	0.2	30
304004	8200	82100	3.1	0.108	0.00239	0.042	0.02	1.5	0.189	3.3	<0.001	0.214	3.6	0.00015	0.00085	0.039	<0.001	15	3701	Dark brown	B	9	0.2	35
304005	7700	82100	0.0016	0.036	0.0004	<0.0001	0.012	0.195	0.014	0.586	<0.001	0.087	1.2	0.00007	<0.00001	<0.001	<0.001	1.8	3701	Dark brown	B	7	0.2	40
304006	7675	82100	0.0042	0.032	0.00052	<0.0001	0.013	1.1	0.014	0.287	0.004	0.036	0.752	0.0002	0.00014	<0.001	<0.001	1.1	3701	Light brown	B	5	0.2	40
304007	7650	82100	0.0013	0.004	0.00065	<0.0001	0.003	0.856	0.008	0.137	0.005	0.032	0.476	0.00063	0.00036	<0.001	<0.001	0.354	3701	Brown	B	8	0.2	30
304008	7600	82100	<0.00005	0.004	0.00107	<0.0001	0.005	0.185	0.004	0.093	<0.001	0.028	0.219	0.0002	<0.00001	<0.001	<0.001	0.303	3701	Light grey	B	15	0.2	20
304009	7500	82100	<0.00005	0.004	0.0011	<0.0001	0.002	0.528	0.003	0.079	<0.001	0.026	0.178	0.00019	0.00043	<0.001	<0.001	0.308	3701	Light grey	B	6	0.2	20
304010	7475	82100	0.00015	<0.001	0.00056	<0.0001	0.003	1.2	0.005	0.139	<0.001	0.125	0.199	0.0001	<0.00001	<0.001	<0.001	0.479	3701	Grey/brown	B	4	0.2	30
304011	7900	82100	<0.00005	0.105	0.00017	0.053	0.007	1.1	0.081	0.175	0.023	0.055	0.588	0.0004	0.00069	<0.001	<0.001	0.929	3701	Orange	B	5	0.2	30
304012	7875	82100	<0.00005	0.19	0.00013	0.034	0.012	2	0.034	0.279	0.025	0.075	0.928	0.00018	0.00037	0.004	<0.001	0.776	3701	Orange	B	31	0.2	30
304013	7850	82100	<0.00005	0.023	0.00051	<0.0001	0.005	0.904	0.011	0.149	0.026	0.023	0.517	0.00002	0.00021	<0.001	<0.001	0.583	3701	Dark brown	B	9	0.2	35
304014	7825	82100	<0.00005	0.006	0.00063	<0.0001	0.001	0.861	0.007	0.133	0.006	0.017	0.438	0.00018	0.00049	<0.001	<0.001	0.239	3701	Light brown	B	2	0.2	20
304015	7800	82100	<0.00005	0.022	0.00014	<0.0001	0.013	0.574	0.013	0.579	<0.001	0.079	1.1	<0.00001	<0.00001	<0.001	<0.001	2.8	3701	Dark brown	B	18	0.2	
304016	7575	82100	<0.00005	0.029	0.00001	<0.0001	0.006	0.023	0.01	0.741	<0.001	0.057	0.606	<0.00001	<0.00001	<0.001	<0.001	3.2	3701	Dark brown	B	6	0.2	35
304017	7450	82100	<0.00005	0.036	0.00008	<0.0001	0.019	0.006	0.015	0.756	<0.001	0.079	0.763	0.00025	<0.00001	<0.001	<0.001	3.5	3701	Dark brown	B	7	0.2	40
304018	7425	82100	<0.00005	<0.001	0.00082	<0.0001	0.004	0.388	0.003	0.113	<0.001	0.025	0.459	0.00008	0.00019	<0.001	<0.001	0.387	3701	Off-white	B	15	0.2	10
304019	7875	81900	<0.00005	0.014	0.00072	<0.0001	0.008	0.272	0.017	0.218	<0.001	0.041	0.609	<0.00001	<0.00001	<0.001	<0.001	1.2	3701	Light grey	B	12	0.2	20
304020	7525	81900	<0.00005	0.01	0.00109	<0.0001	0.008	0.505	0.004	0.159	0.002	0.043	0.423	<0.00001	<0.00001	<0.001	<0.001	0.693	3701	Brown	B	18	0.2	30
304021	7500	81900	<0.00005	0.007	0.00039	<0.0001	0.006	1.1	0.006	0.423	0.002	0.047	0.234	0.00019	<0.00001	<0.001	<0.001	0.54	3701	Dark brown	B	15	0.2	35
304022	7475	81900	<0.00005	0.005	0.0007	<0.0001	0.005	0.726	0.004	0.286	<0.001	0.046	0.478	0.00002	<0.00001	<0.001	<0.001	0.483	3701	Grey/brown	B	8	0.2	30
304023	7450	81900	<0.00005	0.004	0.00039	<0.0001	0.002	0.921	0.003	0.14	0.001	0.054	0.282	0.00005	0.00027	<0.001	<0.001	0.724	3701	Off-white	B	8	0.2	15
304024	6950	81900	0.0005	0.339	0.00077	<0.0001	0.009	1.1	0.005	0.618	0.022	0.147	1.4	<0.00001	0.00208	0.017	<0.001	0.972	3701	Off-white	B	20	0.2	30
304025	7800	81900	<0.00005	0.038	<0.00001	<0.0001	0.008	0.8	0.014	0.122	<0.001	0.065	0.759	0.00011	<0.00001	<0.001	<0.001	1.1	3701	Dark brown	B	18	0.2	35
304026	7775	81900	<0.00005	0.109	0.00023	<0.0001	0.028	3.9	0.045	0.268	<0.001	0.085	1.4	0.0004	<0.00001	<0.001	<0.001	2.9	3701	Dark brown	B	15	0.2	30
304027	7400	82100	<0.00005	<0.001	0.00015	<0.0001	0.009	0.622	0.003	0.474	<0.001	0.042	0.578	<0.00001	0.00084	<0.001	<0.001	0.391	3701	Off-white	B	12	0.2	10
304028	7350	82100	<0.00005	0.015	<0.00001	<0.0001	0.005	0.007	0.011	0.631	<0.001	0.09	0.677	0.00033	<0.00001	<0.001	<0.001	1.5	3701	Dark brown	B	7	0.2	25
304029	7625	81900	0.018	0.068	0.00068	0.0028	0.011	1.4	0.013	0.437	0.021	0.048	0.986	0.00025	0.00058	0.001	<0.001	2	3701	Brown	B	28	0.2	30
304030	7600	81900	0.0045	0.032	0.00036	0.003	0.008	1.1	0.004	0.309	0.013	0.03	0.956	0.00039	0.00039	<0.001	<0.001	0.726	3701	Light brown	B	15	0.2	30
304031	8075	82100	0.0014	0.084	0.00065	0.0094	0.006	2	0.028	0.215	0.016	<0.001	0.57	0.00048	0.0015	0.002	<0.001	0.894	3701	Brown	B	22	0.2	
304032	8050	82100	0.0006	0.12	0.00145	0.011	0.007	1.1	0.01	0.113	0.039	0.004	0.656	<0.00001	0.00195	0.009	<0.001	0.405	3701	Orange	B	7	0.2	15
304033	7625	82100	0.0021	0.009	0.00041	0.0008	0.006	0.074	0.005	0.147	0.01	0.011	0.452	0.0003	0.0004	<0.001	<0.001	0.626	3701	Light grey	B	12	0.2	25
304034	8100	81900	0.00055	0.013	0.00018	0.0003	0.004	0.399	0.004	0.104	0.003	0.025	0.305	0.00021	<0.00001	<0.001	<0.001	0.537	3701	Dark brown	B	12	0.2	30
304035	7950	81900	0.00065	0.018	0.00038	0.0016	0.012	0.541	0.013	0.145	0.005	0.018	1	0.00011	0.00068	<0.001	<0.001	2	3701	Light grey	B	3	0.2	20
304036	7925	81900	<0.00005	0.024	<0.00001	<0.0001	0.008	0.369	0.009	0.146	<0.001	0.007	0.712	0.00021	<0.00001	<0.001	<0.001	0.882	3701	Dark brown	B	16	0.2	35
304037	7900	81900	0.0006	0.08	0.00034	0.0003	0.006	0.356	0.006	0.232	0.008	0.091	0.529	0.00005	0.00003	<0.001	<0.001	1.2	3701	Dark brown	B	3	0.2	35
304038	7350	81900	0.00085	0.017	0.0003	0.0023	0.003	0.72	0.006	0.198	0.005	<0.001	0.278	0.00019	0.00075	<0.001	<0.001	0.194	3701	Brown	B	7	0.2	40
304039	7025	81900	0.0018	0.027	0.00052	0.0049	0.003	0.894	0.003	0.116	0.007	<0.001	0.356	0.00077	0.00374	0.002	<0.001	0.585	3701	Light brown	B	7	0.2	25
304040	7000	81900	0.0019	0.032	0.00053	0.0024	<0.001	0.54	0.002	0.094	0.005	<0.001	0.469	0.00007	0.00136	0.001	<0.001	0.135	3701	Light brown	B	11	0.2	20
304041	6975	81900	0.011	5.9	0.0006	0.021	0.012	0.986	0.007	0.306	0.093	0.024	12	0.00035	0.00785	0.087	0.001	0.842	3701	Light brown	B	12	0.2	30
304042	6750	81900	0.0055	0.358	0.00017	0.02	0.013	2.8	0.546	1.4	0.016	0.783	2.4	0.00014	0.00093	0.011	0.002	4	3701	Brown	B	30	0.2	30
304043	6725	81900	0.0049	0.262	0.00011	0.018	0.007	2.8	0.127	0.909	0.026	0.418	1.9	0.00014	0.00077	0.022	<0.001	1.3	3701	Brown	B	47	0.2	40
304044	8075	81900	0.0039	0.29	0.00033	0.011	0.01	1.9	0.015	0.179	0.041	<0.001	0.951	0.00045	0.0069	0.011	<0.001	0.75	3701	Orange	B	18	0.2	15
304045	8050	81900	0.00025	0.049	<0.00001	0.0011	0.006	0.287	0.023	0.509	<0.001	0.053	0.559	0.00029	<0.00001	<0.001	<0.001	2	3701	Dark brown	B	15	0.2	35
304046	7325	81900	0.00045	0.033	0.00024	0.0015	0.013	0.884	0.011	0.216	0.003	<0.001	0.634	0.00028	0.00018	<0.001	<0.001	2.5	3701	Brown	B	5	0.2	35
304047	7300	81900	0.0007	0.014	0.00062	0.0006	0.004	0.497	0.003	0.098	0.002	<0.001	0.482	0.0002	<0.00001	<0.001	<0.001	0.448	3701	Off-white	B	7	0.2	15
304048	7275	81900	<0.00005	0.017	<0.00001	<0.0001	<0.001	1.4	0.01	0.141	<0.001	0.005	0.235	0.00003	<0.00001	<0.001	<0.001	0.189	3701	Dark brown	B	5	0.2	40
304049	7250	81900	0.00025	0.032	<0.00001	0.0011	0.003	1	0.009	0.782	0.003	0.035	0.626	0.00016	0.00002	<0.001	<0.001	0.514	3701	Brown	B	3	0.2	30
304050	7225	81900	0.00035	0.025	0.00018	0.0012	0.006	0.741	0.005	0.058	<0.001	<0.001	0.557	0.00047	0.00084	<0.001	<0.001	0.764	3701	Brown	B	5	0.2	25
304051	7200	81900	0.0001	0.013	0.00013	0.0014	0.005	0.63	0.003	0.038	<0.001	<0.001	0.378	0.00005	0.00047	<0.001	<0.001	0.188	3701	Grey	B	4	0.2	30
304052	7175	81900	0.0003	0.016	<0.00001	0.0008	0.009	0.46	0.013	0.292	<0.001	0.019	0.419	0.0002	0.00038	<0.001	<0.001	1.4	3701	Brown	B	1	0.2	35

Sample Number	Local East	Local North	Ag ppm IC8/40	As ppm IC8/40	Au ppm IC8/40	Bi ppm IC8/40	Cd ppm IC8/40	Ba ppm IC8/40	Co ppm IC8/40	Cu ppm IC8/40	Mo ppm IC8/40	Ni ppm IC8/40	Pb ppm IC8/40	Pt ppm IC8/40	Pd ppm IC8/40	Sb ppm IC8/40	Tl ppm IC8/40	Zn ppm IC8/40	SDS	Colour	Soil Profile	Slope Angle	Sample Depth	Organic Content %
304054	8175	82100	0.0001	0.015	0.00096	<0.0001	0.011	0.124	0.01	0.304	<0.001	<0.001	0.554	0.00008	<0.00001	<0.001	<0.001	1.7	3701	Grey/brown	B	5	0.2	30
304055	7550	82100	0.00025	0.008	0.00055	0.0007	0.001	0.798	0.004	0.151	0.003	0.022	0.398	0.00025	0.00061	<0.001	<0.001	0.336	3701	Light brown	B	5	0.2	30
304056	6700	81900	0.002	0.279	0.00018	0.021	0.015	3	1.7	0.621	0.016	0.441	2.1	<0.00001	0.00069	0.013	<0.001	1.3	3701	Brown	B	37	0.2	30
304057	8200	81900	0.0011	0.131	<0.00001	0.045	0.012	2.1	0.037	0.277	0.012	0.075	0.334	0.00047	0.00163	0.005	<0.001	1.2	3701	Light brown	B	35	0.2	20
304058	8175	81900	0.0006	0.046	<0.00001	<0.0001	0.002	0.398	0.016	0.184	<0.001	0.048	0.276	0.00008	0.00018	0.001	<0.001	0.1	3701	Dark brown	B	3	0.2	35
304059	8025	81900	0.0004	0.02	0.00027	0.0059	0.01	2.3	0.016	0.193	<0.001	0.019	0.629	0.00025	0.00034	0.002	<0.001	5.9	3701	Dark brown	B	5	0.2	35
304060	8000	81900	0.00085	0.133	<0.00001	0.032	0.007	1.7	0.012	0.204	0.033	0.057	0.682	0.00055	0.00137	0.006	<0.001	0.397	3701	Orange	B	11	0.2	30
304061	7975	81900	0.00085	0.026	<0.00001	<0.0001	0.019	0.234	0.018	0.498	<0.001	0.058	0.922	0.00014	<0.00001	<0.001	<0.001	2.9	3701	Dark brown	B	21	0.2	30
304062	7725	81900	0.0038	0.073	<0.00001	0.026	0.015	2.4	0.028	0.217	0.01	0.046	0.912	0.00019	0.0005	0.002	<0.001	1.3	3701	Brown	B	13	0.2	20
304064	7700	81900	0.0008	0.023	0.00039	<0.0001	0.004	1.1	0.008	0.114	0.003	0.025	0.717	0.00011	0.00026	<0.001	<0.001	0.274	3701	Light brown	B	2	0.2	20
304065	7675	81900	0.0009	0.035	0.00012	0.0001	0.004	1.4	0.015	0.149	0.003	<0.001	0.837	0.00053	0.00029	<0.001	<0.001	1.2	3701	Brown	B	13	0.2	30
304066	7650	81900	0.0007	0.023	0.00001	<0.0001	0.006	1.2	0.007	0.247	0.005	0.017	0.699	0.00013	0.00035	<0.001	<0.001	0.887	3701	Light brown	B	23	0.2	25
304067	7425	81900	0.001	0.035	<0.00001	<0.0001	0.005	1.2	0.014	0.11	0.005	0.022	0.521	0.00023	0.00119	0.001	<0.001	3.9	3701	Light grey	B	2	0.2	35
304068	7400	81900	0.00085	0.021	0.00008	<0.0001	0.004	0.795	0.005	0.083	0.002	0.024	0.335	0.00029	<0.00001	<0.001	<0.001	0.326	3701	Brown	B	7	0.2	20
304069	7375	81900	0.00085	0.029	<0.00001	<0.0001	0.008	0.708	0.005	0.15	<0.001	<0.001	0.43	0.00028	0.00026	<0.001	<0.001	0.297	3701	Light grey	B	2	0.2	35
304070	7150	81900	0.0022	0.037	<0.00001	<0.0001	0.012	0.851	0.017	0.194	<0.001	<0.001	0.363	0.00039	0.00069	0.001	<0.001	0.803	3701	Brown	B	11	0.2	25
304071	7125	81900	0.0003	0.026	<0.00001	<0.0001	0.006	0.672	0.004	0.04	<0.001	0.004	0.521	0.00044	0.00058	<0.001	<0.001	0.535	3701	Light brown	B	3	0.2	25
304072	7100	81900	0.0005	0.022	0.00011	<0.0001	0.01	0.564	0.007	0.104	<0.001	0.016	0.446	0.00016	0.0005	0.002	<0.001	1.8	3701	Light brown	B	15	0.2	25
304073	7075	81900	0.0019	0.018	0.00042	<0.0001	0.006	0.814	0.003	0.306	<0.001	<0.001	0.456	0.00038	0.00039	<0.001	<0.001	0.493	3701	Off-white	B	12	0.2	20
304074	7050	81900	0.0014	0.035	<0.00001	<0.0001	0.015	0.741	0.006	0.228	0.002	0.003	0.461	0.00045	0.0011	0.001	<0.001	0.621	3701	Light grey	B	9	0.2	20
304075	6875	81900	0.0062	0.241	<0.00001	<0.0001	0.005	1.5	0.018	0.27	0.018	0.019	0.399	0.00029	0.00085	0.015	<0.001	0.537	3701	Orange	B	16	0.2	10
304076	6850	81900	0.02	1.4	0.00006	0.023	0.007	1.2	0.036	0.727	0.181	0.081	0.785	0.0007	0.00318	0.122	<0.001	0.771	3701	Orange	B	30	0.2	35
304077	8125	82100	0.0036	0.09	0.00134	0.006	0.014	3.2	0.071	0.424	0.02	<0.001	1.2	0.00035	0.00305	0.003	<0.001	1.3	3701	Brown	B	30	0.2	25
304078	8100	82100	0.0029	0.106	<0.00001	0.0076	0.017	3.1	0.104	0.387	0.018	0.002	0.874	0.00047	0.00241	0.004	<0.001	1.9	3701	Brown	B	30	0.2	30
304079	7525	82100	0.0013	0.019	0.00031	<0.0001	0.007	0.674	0.004	0.26	0.004	<0.001	0.501	0.00019	0.00036	<0.001	<0.001	13.5	3701	Light grey	B	3	0.2	35
304080	8150	81900	0.0004	0.042	<0.00001	<0.0001	0.009	1.8	0.014	0.157	0.005	<0.001	0.521	0.00041	0.00064	<0.001	<0.001	4.2	3701	Brown	B	8	0.2	20
304081	8125	81900	0.00045	0.028	<0.00001	<0.0001	0.004	0.386	0.007	0.095	<0.001	0.003	0.282	0.00028	0.00008	<0.001	<0.001	0.485	3701	Dark brown	B	15	0.2	25
304082	7575	81900	0.0009	0.013	<0.00001	<0.0001	0.004	0.132	0.005	0.112	0.003	<0.001	0.312	0.00046	0.0003	<0.001	<0.001	0.98	3701	Light grey	B	3	0.2	20
304083	7550	81900	0.0013	0.023	0.00008	<0.0001	0.003	0.673	0.004	0.224	0.003	<0.001	0.337	0.00019	0.0001	<0.001	<0.001	0.276	3701	Light grey	B	28	0.2	30
304084	7775	82100	0.0011	0.011	0.0002	<0.0001	0.012	0.281	0.005	0.222	0.005	<0.001	0.309	0.00035	0.00027	<0.001	<0.001	0.826	3701	Light grey	B	24	0.2	20
304085	7750	82100	0.00095	0.011	0.00029	0.001	0.001	0.365	0.003	0.15	0.002	<0.001	0.011	0.00008	0.00019	<0.001	<0.001	0.914	3701	Light grey	B	33	0.2	10
304086	7725	82100	0.00065	0.018	0.00011	0.0004	0.003	0.01	0.009	0.376	<0.001	0.017	0.094	<0.00001	0.00021	<0.001	<0.001	1.6	3701	Dark brown	B	32	0.2	40
304087	7850	81900	0.0007	0.012	0.00032	0.0009	0.005	0.226	0.004	0.29	<0.001	0.013	0.149	<0.00001	0.00018	<0.001	<0.001	0.835	3701	Dark brown	B	3	0.2	35
304088	7825	81900	<0.00005	0.067	<0.00001	0.0012	0.006	0.106	0.029	0.122	<0.001	<0.001	0.413	0.00034	0.00023	<0.001	<0.001	3.8	3701	Dark brown	B	22	0.2	30
304089	6925	81900	0.0057	1.7	0.00004	0.024	0.009	1.7	0.007	0.484	0.105	<0.001	0.869	0.00019	0.0019	0.156	<0.001	1	3701	Orange	B	33	0.2	15
304090	6900	81900	0.018	2.4	0.00031	0.016	0.013	3.3	0.103	0.542	0.113	0.099	2.2	0.00019	0.00327	0.103	0.004	2.1	3701	Orange	B	29	0.2	10
304091	8025	82100	0.0013	0.038	0.00048	0.0027	0.004	1.7	0.012	0.15	0.005	<0.001	0.828	<0.00001	0.00099	0.003	<0.001	0.444	3701	Brown	B	3	0.2	30
304092	8000	82100	0.00045	0.039	0.00001	0.0018	0.013	3.5	0.046	0.163	<0.001	<0.001	0.715	<0.00001	0.00013	0.002	<0.001	21.5	3701	Brown	B	2	0.2	35
304093	7975	82100	0.0002	0.074	<0.00001	0.0022	0.006	6.5	0.153	0.143	0.005	0.038	1	<0.00001	0.00056	0.005	<0.001	3	3701	Dark brown	B	3	0.2	35
304094	7950	82100	0.0015	0.009	<0.00001	0.0008	0.002	5.9	0.018	0.206	0.011	0.082	0.629	<0.00001	0.00055	0.005	<0.001	14.5	3701	Brown	B	27	0.2	30
304095	7925	82100	0.001	0.14	<0.00001	0.018	0.008	1.2	0.033	0.945	0.029	0.108	0.547	0.00008	0.00176	0.006	<0.001	0.445	3701	Orange	B	23	0.2	20
304096	6825	81900	0.012	2.8	0.00076	0.014	0.005	1.9	0.021	0.516	0.087	0.022	0.836	0.00023	0.00335	0.109	0.002	1.6	3701	Orange	B	43	0.2	30
304097	6800	81900	0.0069	1.1	0.00004	0.016	0.01	4.8	0.281	1.1	0.028	0.408	1.7	<0.00001	0.00143	0.055	0.002	3.1	3701	Orange	B	45	0.2	30
304098	8775	81900	0.0073	0.578	0.00013	0.022	0.007	5.2	0.663	1	0.025	0.75	3.5	0.00005	0.00059	0.028	0.001	1.6	3701	Brown	B	40	0.2	30
304099	8150	82100	0.0038	0.151	<0.00001	0.0077	0.017	3.3	0.064	1.5	0.001	0.146	2.1	<0.00001	0.00058	0.005	<0.001	2	3701	Dark brown	B	11	0.2	40
304100	7375	82100	0.00085	0.025	0.0003	0.0011	0.003	0.801	0.005	0.163	<0.001	<0.001	0.78	0.00003	0.00035	<0.001	<0.001	0.543	3701	Brown	B	7	0.2	25
304101	7200	82100	0.0011	0.023	0.00017	0.0002	0.007	0.218	0.002	0.229	0.001	<0.001	0.339	<0.00001	<0.00001	<0.001	<0.001	0.213	3701	Grey	B	4	0.2	20
304102	7225	82100	0.0016	0.016	0.00011	0.0004	0.007	0.645	0.004	0.387	<0.001	<0.001	0.473	0.00003	0.00022	<0.001	<0.001	1.1	3701	Brown	B	5	0.2	35
304103	7300	82100	0.0009	0.014	0.00032	0.0009	0.008	0.456	0.004	0.108	<0.001	<0.001	0.244	<0.00001	0.00095	<0.001	<0.001	1.5	3701	Off-white	B	5	0.2	15
304104	7425	82700	0.0018	0.019	0.00013	0.0008	0.001	0.909	0.004	0.126	<0.001	<0.001	0.178	<0.00001	0.00181	<0.001	<0.001	0.468	3701	Light brown	B	25	0.2	35
304105	7500	82700	0.00075	0.013	0.00009	0.0003	0.002	0.476	0.003	0.067	<0.001	<0.001	0.121	<0.00001	0.0012	<0.001	<0.001	1.6	3701	Grey	B	3	0.2	30
304106	7475	82700	0.0009	0.014	0.00054	0.0002	0.005	1.4	0.007	0.185	0.001	<0.001	0.319	0.0002	0.00057	<0.001	<0.001	0.626	3701	Brown	B	2	0.2	50
304107	7450	82700	0.0011	0.014	0.00004	0.0011	0.002	0.658	0.003	0.158	<0.001	<0.001	0.238	0.00048	0.00138	<0.001	<0.001	0.498	3701	Light brown	B	10	0.2	30
304108	7550	82700	0.0006	0.013	<0.00001	<0.0001	0.004	0.421	0.002	0.072	<0.001	<0.001	0.129	<0.00001	0.00017	<0.001	<0.001	0.226	3701	Grey	B	11	0.2	20
304109	7325	82100	0.0011	0.022	<0.00001	0.0009	0.004	0.859	0.005	0.785	<0.001	<0.001	0.28	<0.00001	0.00078	<0.001	<0.001	0.547	3701	Dark brown	B	8	0.2	35

Sample Number	Local East	Local North	Ag ppm IC8/40	As ppm IC8/40	Au ppm IC8/40	Bi ppm IC8/40	Cd ppm IC8/40	Ba ppm IC8/40	Co ppm IC8/40	Cu ppm IC8/40	Mo ppm IC8/40	Ni ppm IC8/40	Pb ppm IC8/40	Pt ppm IC8/40	Pd ppm IC8/40	Sb ppm IC8/40	Tl ppm IC8/40	Zn ppm IC8/40	SDS	Colour	Soil Profile	Slope Angle	Sample Depth	Organic Content %
304110	7275	82100	0.0015	0.014	0.00023	0.0005	0.011	0.588	0.009	0.281	0.001	0.019	0.348	0.00036	0.0003	0.001	<0.001	0.841	3701	Off-white	B	17	0.2	25
304111	7250	82100	0.0024	0.026	0.00006	0.0007	0.006	0.605	0.007	0.411	<0.001	0.003	0.487	0.00009	<0.00001	<0.001	<0.001	0.491	3701	Light brown	B	15	0.2	35
304112	7625	82700	0.00065	0.013	<0.00001	0.0007	0.001	0.686	0.008	0.308	<0.001	<0.001	0.356	0.00004	0.00019	<0.001	<0.001	0.247	3701	Grey	B	14	0.2	25
304113	7525	82700	0.0011	0.015	<0.00001	0.0006	0.004	1.4	0.005	0.198	0.002	<0.001	0.176	0.00017	0.00004	<0.001	<0.001	0.693	3701	Brown	B	5	0.2	35
304114	7400	82700	0.0018	0.017	<0.00001	0.0013	0.006	2.8	0.004	0.386	0.013	0.045	0.343	0.00028	0.00186	<0.001	<0.001	0.641	3701	Grey	B	25	0.2	40
304115	7175	82100	0.0016	0.018	0.00005	0.0007	0.005	0.34	0.004	0.532	0.001	<0.001	0.449	0.00028	0.00045	<0.001	<0.001	0.381	3701	Dark brown	B	6	0.2	30
304116	7100	82100	0.0041	0.018	<0.00001	0.0022	0.022	1.6	0.007	0.332	<0.001	0.04	1.2	0.0002	0.00024	0.002	<0.001	1.3	3701	Grey	B	9	0.2	30
304117	6925	82100	0.0061	0.953	<0.00001	0.015	0.011	2.4	0.222	0.195	0.062	0.147	3.5	0.00042	0.00401	0.041	0.003	1.6	3701	Orange	B	27	0.2	25
304118	6875	82100	0.0049	1	0.00004	0.016	0.011	3	0.085	0.136	0.041	0.288	3.3	0.00038	0.00183	0.037	0.002	0.541	3701	Orange	B	31	0.2	20
304119	6800	82100	0.0014	0.318	<0.00001	0.013	0.007	3.8	0.172	0.594	0.018	0.257	1.6	0.00017	0.00067	0.011	<0.001	0.903	3701	Orange	B	12	0.2	20
304120	7150	82100	0.0018	0.028	<0.00001	0.0009	0.006	1.5	0.004	0.263	<0.001	<0.001	1.2	0.00007	0.00038	<0.001	<0.001	1	3701	Dark brown	B	11	0.2	35
304121	7125	82100	0.0018	0.027	<0.00001	0.0006	0.007	0.629	0.004	0.175	<0.001	<0.001	0.652	0.00024	0.00055	<0.001	<0.001	1.5	3701	Off-white	B	12	0.2	25
304122	6850	82100	0.0055	1.3	<0.00001	0.013	0.029	2.3	0.231	0.856	0.043	0.477	1.5	0.0004	0.00221	0.063	0.003	2.5	3701	Brown	B	4	0.2	15
304123	6750	82100	0.0012	0.288	<0.00001	0.017	0.011	2.8	0.314	0.7	0.012	0.382	2.5	0.00016	0.00094	0.01	0.002	1.5	3701	Orange	B	41	0.2	30
304124	6725	82100	0.0023	0.356	0.00017	0.011	0.014	6.3	1.9	1.5	0.02	0.93	2.6	0.00031	0.0026	0.02	0.003	6.3	3701	Orange	B	43	0.2	30
304125	7875	82700	0.0011	0.047	<0.00001	0.0034	0.006	1.5	0.053	0.42	0.007	<0.001	0.926	0.00052	0.00082	0.001	0.002	4.3	3701	Brown	B	22	0.2	35
304126	7075	82100	0.00075	0.088	<0.00001	0.011	0.009	1.2	0.007	0.094	0.025	<0.001	0.515	0.00037	0.00342	0.012	0.001	0.68	3701	Orange	B	7	0.2	10
304127	7025	82100	0.032	0.2	<0.00001	0.001	0.009	1.1	0.005	0.402	0.009	0.04	1.5	0.00005	0.00064	0.003	0.001	1.4	3701	Dark brown	B	9	0.2	35
304128	6975	82100	0.0029	0.045	<0.00001	0.0013	0.004	0.579	0.004	0.32	0.006	<0.001	1	0.00042	0.00046	0.002	<0.001	1.5	3701	Dark brown	B	26	0.2	35
304129	6950	82100	0.0041	0.23	0.00016	0.006	0.004	0.599	0.004	0.247	0.031	<0.001	3.1	0.00044	0.00128	0.008	0.001	0.257	3701	Brown	B	7	0.2	30
304130	7050	82100	0.0046	1.6	0.00185	0.034	0.005	1.7	0.005	0.207	0.121	<0.001	1.8	0.00063	0.00517	0.094	<0.001	0.595	3701	Orange	B	4	0.2	15
304131	7000	82100	0.0018	0.039	<0.00001	0.0022	0.004	0.676	0.002	0.184	0.01	<0.001	0.741	0.00022	0.00079	0.003	<0.001	1.9	3701	Light grey	B	25	0.2	30
304132	6825	82100	0.0023	0.826	<0.00001	0.014	0.004	2.3	0.042	0.393	0.026	0.092	1.2	0.0002	0.0014	0.025	0.001	0.881	3701	Orange	B	16	0.2	25
304133	7825	82700	0.00065	0.017	<0.00001	0.0008	0.003	0.615	0.003	0.082	0.003	<0.001	0.545	0.00019	0.00072	<0.001	<0.001	0.206	3701	Brown	B	7	0.2	35
304134	7800	82700	0.00045	0.016	<0.00001	0.0008	0.003	0.816	0.004	0.049	<0.001	<0.001	0.23	0.00035	0.00092	<0.001	<0.001	0.193	3701	Grey/brown	B	5	0.2	25
304135	7725	82700	0.0004	0.012	<0.00001	0.0005	0.006	0.257	0.008	0.088	0.003	<0.001	0.081	0.00044	0.00098	<0.001	<0.001	0.309	3701	Grey	B	3	0.2	25
304136	7675	82700	0.00055	0.018	0.00014	0.0002	0.005	0.597	0.013	0.085	0.001	<0.001	0.094	0.00031	0.00044	0.001	<0.001	0.326	3701	Brown	B	2	0.2	30
304137	7600	82700	0.00095	0.015	<0.00001	0.0012	0.004	0.695	0.004	0.103	0.003	<0.001	0.113	0.00047	0.00217	0.001	<0.001	0.86	3701	Grey	B	5	0.2	40
304138	7575	82700	0.0005	0.009	<0.00001	0.0006	0.004	0.692	0.003	0.07	<0.001	<0.001	0.143	0.00035	0.00054	<0.001	<0.001	4.1	3701	Brown	B	5	0.2	20
304139	6775	82100	0.0022	0.184	<0.00001	0.0072	0.006	1.6	0.066	0.618	0.009	0.131	0.607	0.00027	0.00126	0.007	<0.001	0.81	3701	Orange	B	39	0.2	25
304140	6900	82100	0.0016	1.4	<0.00001	0.012	0.005	3.5	0.262	0.092	0.017	0.261	2.8	0.00028	0.00345	0.042	0.004	1	3701	Orange	B	35	0.2	20
304141	7850	82700	0.0003	0.174	0.00025	0.101	0.004	1.4	0.015	0.088	0.016	0.017	0.967	0.00013	0.00066	0.003	<0.001	0.131	3701	Brown	B	14	0.2	30
304142	7775	82700	0.00065	0.054	0.00017	0.029	0.013	1.4	0.013	0.157	0.017	0.027	0.821	0.00005	0.00127	0.005	<0.001	0.332	3701	Brown	B	3	0.2	35
304143	7750	82700	<0.00005	0.003	0.00034	<0.0001	0.003	0.33	0.003	0.155	0.003	0.014	0.256	<0.00001	0.00039	<0.001	<0.001	0.224	3701	Grey	B	4	0.2	25
304144	7700	82700	0.0017	0.05	0.00028	0.019	0.005	0.674	0.012	0.105	0.022	0.021	0.245	0.00005	0.00324	0.012	<0.001	1.7	3701	Grey	B	1	0.2	30
304145	7650	82700	<0.00005	0.025	<0.00001	<0.0001	0.004	1	0.007	0.183	<0.001	0.02	0.553	<0.00001	<0.00001	<0.001	<0.001	0.221	3701	Brown	B	16	0.2	45
304146	7250	82700	0.0006	0.32	0.00006	<0.0001	0.013	4.3	0.648	0.444	0.027	0.184	0.505	0.00012	0.00391	0.014	<0.001	6.4	3701	Blue	B	1	0.2	5
304147	6975	82700	<0.00005	0.549	0.00015	0.052	0.007	2.4	0.028	0.004	0.029	0.113	2.2	0.00002	0.00104	0.012	<0.001	0.336	3701	Orange	B	40	0.2	20
304148	8050	82500	0.00015	0.016	0.00035	<0.0001	0.006	1.2	0.008	0.334	0.01	0.052	0.97	0.0001	0.00003	<0.001	<0.001	0.407	3701	Grey	B	9	0.2	45
304149	8025	82500	0.0007	0.018	<0.00001	<0.0001	0.016	2.4	0.021	0.281	0.005	0.064	0.897	<0.00001	<0.00001	<0.001	<0.001	1.4	3701	Brown	B	10	0.2	50
304150	8000	82500	0.0007	0.39	0.00005	0.013	0.005	2.4	0.205	0.017	0.018	0.06	1.5	<0.00001	0.00066	0.004	<0.001	0.4	3701	Light brown	B	3	0.2	20
304151	7950	82500	0.0031	0.111	<0.00001	0.017	0.012	2.7	0.022	0.168	0.015	0.064	1.1	0.00003	0.00049	<0.001	<0.001	0.386	3701	Brown	B	5	0.2	15
304152	7925	82500	0.014	0.284	0.0006	0.028	0.03	4.4	0.582	1.7	0.016	0.233	2.6	<0.00001	0.00048	0.003	<0.001	4.5	3701	Brown	B	16	0.2	5
304153	7900	82500	0.0038	0.348	0.00013	0.015	0.017	3.6	0.462	0.093	0.022	0.116	1.6	0.00003	0.00036	0.004	<0.001	0.992	3701	Orange	B	18	0.2	25
304154	7175	82700	<0.00005	0.014	0.00005	<0.0001	0.004	0.822	0.007	0.098	0.007	0.04	1.3	<0.00001	0.00027	<0.001	<0.001	0.321	3701	Grey	B	1	0.2	20
304155	7625	82500	<0.00005	0.116	<0.00001	0.0093	0.003	1.8	0.032	<0.001	0.012	0.075	1.3	<0.00001	0.00064	<0.001	<0.001	0.026	3701	Orange	B	20	0.2	20
304156	7500	82500	0.001	0.005	0.00039	<0.0001	0.008	0.655	0.005	0.736	0.007	0.049	4.7	<0.00001	<0.00001	<0.001	<0.001	0.7	3701	Grey	B	21	0.2	25
304157	7375	82700	0.0004	<0.001	0.00004	<0.0001	0.009	2	0.007	0.203	0.008	0.045	1.3	<0.00001	0.00054	<0.001	<0.001	0.602	3701	Grey	B	19	0.2	25
304158	7350	82700	0.0016	0.045	<0.00001	<0.0001	0.006	2.8	0.01	0.143	0.011	0.048	0.567	0.00001	0.00046	<0.001	<0.001	0.669	3701	Light brown	B	7	0.2	35
304159	7300	82700	<0.00005	0.026	<0.00001	<0.0001	0.006	1.2	0.016	0.153	0.006	0.07	0.415	<0.00001	0.00034	<0.001	<0.001	0.484	3701	Light brown	B	2	0.2	35
304160	7275	82700	0.0021	0.007	<0.00001	<0.0001	0.004	0.715	0.023	0.682	0.006	0.077	0.262	<0.00001	0.0006	<0.001	<0.001	1.8	3701	Grey	B	4	0.2	10
304161	7225	82700	<0.00005	0.027	<0.00001	<0.0001	0.003	1.9	0.007	0.148	0.005	0.067	0.423	<0.00001	0.00055	<0.001	<0.001	0.296	3701	Brown	B	2	0.2	10
304162	7150	82700	0.00025	0.004	0.00048	<0.0001	0.002	0.427	0.003	0.056	0.003	0.056	0.372	<0.00001	0.00033	<0.001	<0.001	0.239	3701	Grey	B	3	0.2	10
304163	7125	82700	<0.00005	<0.001	0.00035	<0.0001	0.002	0.596	0.002	0.051	0.005	0.049	0.305	<0.00001	<0.00001	<0.001	<0.001	0.227	3701	Grey	B	4	0.2	15
304164	7000	82700	0.00065	0.018	<0.00001	<0.0001	0.008	0.72	0.008	0.338	0.01	0.088	0.538	0.00005	0.00042	<0.001	<0.001	0.372	3701	Brown	B	34	0.2	20

Sample Number	Local East	Local North	Ag ppm *IC8/40*	As ppm *IC8/40*	Au ppm *IC8/40*	Bi ppm *IC8/40*	Cd ppm *IC8/40*	Ba ppm *IC8/40*	Co ppm *IC8/40*	Cu ppm *IC8/40*	Mo ppm *IC8/40*	Ni ppm *IC8/40*	Pb ppm *IC8/40*	Pt ppm *IC8/40*	Pd ppm *IC8/40*	Sb ppm *IC8/40*	Tl ppm *IC8/40*	Zn ppm *IC8/40*	SDS	Colour	Soil Profile	Slope Angle	Sample Depth	Organic Content %
304165	7200	82700	<0.00005	0.227	<0.00001	<0.0001	0.006	3.1	0.096	0.166	0.009	0.075	0.949	<0.00001	0.00217	0.003	<0.001	0.363	3701	Orange	B	1	0.2	10
304167	7075	82700	<0.00005	0.072	<0.00001	<0.0001	0.003	3.1	0.046	0.102	0.008	0.05	0.629	<0.00001	0.00005	<0.001	<0.001	0.36	3701	Grey	B	5	0.2	15
304168	7050	82700	<0.00005	0.002	<0.00001	<0.0001	0.006	0.235	0.004	0.05	0.007	0.045	0.419	<0.00001	0.00006	<0.001	<0.001	0.298	3701	Grey	B	2	0.2	20
304169	7975	82500	0.0041	0.135	0.005	0.0069	0.008	0.632	0.01	0.196	0.005	0.028	0.344	<0.00001	0.0007	0.001	<0.001	0.313	3701	Grey	B	2	0.2	20
304170	7775	82500	0.0012	0.005	0.00024	0.0006	<0.001	0.408	0.004	0.597	<0.001	0.037	0.387	0.00018	0.0004	<0.001	<0.001	0.123	3701	Light brown	B	17	0.2	5
304171	7750	82500	0.0022	0.088	<0.00001	0.0053	0.008	1.1	0.01	0.402	0.005	0.018	0.554	0.00002	0.00021	0.004	<0.001	1.5	3701	Orange	B	6	0.2	25
304172	7725	82500	0.0011	0.024	0.00006	0.0021	0.002	0.471	0.008	0.217	<0.001	0.014	0.365	0.00016	0.00053	0.002	<0.001	0.374	3701	Light grey	B	8	0.2	30
304173	7700	82500	0.0008	0.02	0.00011	0.0006	0.008	1.3	0.004	0.162	<0.001	0.016	0.396	<0.00001	0.00023	<0.001	<0.001	0.876	3701	Brown	B	3	0.2	35
304174	7675	82500	0.0007	0.012	<0.00001	<0.0001	0.002	0.446	0.002	0.084	<0.001	0.006	0.228	0.00032	0.00044	<0.001	<0.001	0.396	3701	Light grey	B	18	0.2	20
304175	7025	82700	0.002	0.008	0.00026	<0.0001	0.002	0.252	0.003	0.084	<0.001	0.007	0.128	<0.00001	0.00023	<0.001	<0.001	0.323	3701	Grey	B	11	0.2	25
304176	7875	82500	0.0042	0.284	0.0004	0.024	0.009	2.9	0.132	0.108	0.015	0.054	1.5	0.00019	0.00089	0.008	0.001	0.303	3701	Brown	B	23	0.2	20
304177	7850	82500	0.002	0.245	0.00021	0.02	0.007	2.6	0.053	0.472	0.008	0.08	2.2	<0.00001	0.00055	0.004	<0.001	1.1	3701	Brown	B	31	0.2	20
304178	7600	82500	0.0003	0.12	<0.00001	0.0079	0.007	1.2	0.019	0.354	0.008	0.029	1.1	0.0001	0.00041	0.002	<0.001	0.39	3701	Light brown	B	5	0.2	20
304179	7325	82700	0.0009	0.011	0.00016	0.0003	0.001	0.901	0.003	0.074	<0.001	0.005	0.432	<0.00001	0.0002	<0.001	<0.001	0.718	3701	Light brown	B	10	0.2	25
304180	7100	82700	0.0011	0.005	0.00012	<0.0001	<0.001	0.247	0.002	0.069	<0.001	<0.001	0.163	0.00006	0.00038	<0.001	<0.001	0.623	3701	Grey	B	4	0.2	15
304181	8100	82500	0.0012	0.167	0.00007	0.025	0.006	1.8	0.039	0.718	0.024	0.084	0.523	0.00017	0.00101	0.003	<0.001	1.2	3701	Brown	B	11	0.2	15
304182	8075	82500	0.0011	0.089	<0.00001	0.0047	0.004	1.5	0.029	0.582	0.002	0.027	0.824	0.00005	0.00051	<0.001	<0.001	0.353	3701	Brown	B	11	0.2	20
304183	7475	82500	0.0023	0.025	0.00011	0.001	0.006	0.616	0.006	0.459	<0.001	0.026	1.3	0.00013	0.00027	<0.001	<0.001	0.368	3701	Grey	B	27	0.2	30
304184	7450	82500	0.0014	0.015	0.00018	0.0002	0.01	0.911	0.009	0.324	<0.001	0.025	0.922	0.00008	0.00025	<0.001	<0.001	1.1	3701	Brown	B	16	0.2	25
304185	7825	82500	0.0021	0.023	0.0001	0.0016	0.008	0.857	0.016	0.28	<0.001	0.005	1.2	0.0002	0.00084	0.003	<0.001	1.3	3701	Grey	B	2	0.2	35
304186	7800	82500	<0.00005	0.075	<0.00001	0.0074	0.01	0.833	0.016	<0.001	0.003	0.024	1	0.00004	0.00039	0.002	<0.001	0.18	3701	Orange	B	5	0.2	30
304187	7575	82500	0.0009	0.015	0.00022	0.0009	0.005	0.274	0.01	0.129	<0.001	0.018	0.446	0.00001	0.00036	<0.001	<0.001	0.236	3701	Light grey	B	8	0.2	20
304188	7550	82500	0.00075	0.005	<0.00001	<0.0001	0.003	0.184	0.008	0.464	0.002	0.03	0.314	<0.00001	0.00036	<0.001	<0.001	1.1	3701	Grey	B	17	0.2	15
304189	7525	82500	0.0016	0.011	0.00026	<0.0001	0.006	0.63	0.004	0.223	<0.001	0.018	0.926	<0.00001	0.00003	<0.001	<0.001	0.397	3701	Brown	B	24	0.2	
304190	7650	82500	0.0011	0.014	0.00007	<0.0001	0.011	2.5	0.008	0.352	<0.001	0.028	1.1	0.00013	0.0002	<0.001	<0.001	1.4	3701	Dark brown	B	11	0.2	40
304191	7425	82500	0.0018	0.025	0.00008	0.0002	0.018	1.8	0.012	0.48	<0.001	0.047	1.1	<0.00001	0.00018	<0.001	<0.001	2.4	3701	Brown	B	26	0.2	30
304192	7400	82500	0.0011	0.018	<0.00001	0.0005	0.008	1.1	0.005	0.388	<0.001	0.037	0.872	0.00003	0.00043	<0.001	<0.001	0.627	3701	Grey/brown	B	27	0.2	30
304193	7375	82500	0.00095	0.025	0.00013	0.0003	0.004	1.2	0.003	0.189	<0.001	0.029	0.541	0.00009	0.00074	0.002	<0.001	0.517	3701	Grey	B	23	0.2	30
304194	7350	82500	0.0015	0.014	<0.00001	<0.0001	0.011	1.3	0.003	0.117	<0.001	0.02	0.643	<0.00001	0.00014	<0.001	<0.001	0.664	3701	Brown	B	4	0.2	20
304195	7325	82500	0.0014	0.009	<0.00001	<0.0001	0.008	1.3	0.003	0.122	<0.001	0.016	0.765	0.00012	0.00027	0.006	<0.001	0.528	3701	Dark brown	B	11	0.2	15
304197	7300	82500	0.02	0.028	0.00004	0.0075	0.018	1.9	0.004	0.081	<0.001	0.031	0.397	0.00009	<0.00001	<0.001	<0.001	0.752	3701	Brown	B	18	0.2	20
304199	7275	82500	0.009	0.016	0.00004	<0.0001	0.006	0.742	0.005	0.133	<0.001	0.042	0.069	0.0002	<0.00001	<0.001	<0.001	0.761	3701	Brown	B	23	0.2	35
304200	7250	82500	0.0036	0.035	0.00013	0.018	0.01	0.814	0.004	0.186	0.016	0.017	0.196	<0.00001	0.00051	0.004	<0.001	0.395	3701	Grey	B	22	0.2	10
304201	7175	82500	0.0038	0.098	0.00018	0.05	0.016	4	0.051	0.161	0.008	0.103	1	0.00003	0.00066	0.006	<0.001	1.3	3701	Light brown	B	26	0.2	20
304202	7050	82500	0.0036	0.117	<0.00001	0.015	0.238	0.737	0.272	1.6	0.013	1	0.594	0.00012	0.00052	0.004	<0.001	10	3701	Dark brown	B	17	0.2	25
304203	7000	82500	0.0044	0.394	0.00004	0.044	0.029	9.3	0.198	0.386	0.009	1.1	3.2	0.00016	0.00023	0.008	<0.001	0.55	3701	Brown	B	0	0.2	25
304204	378100	82300	0.00065	0.077	<0.00001	0.016	0.004	5.4	0.119	0.137	<0.001	0.126	0.687	0.00019	0.00149	<0.001	<0.001	0.541	3701	Brown	B	15	0.2	15
304205	378050	82300	<0.00005	0.121	<0.00001	0.019	0.008	3.7	0.01	<0.001	0.013	0.085	1.1	<0.00001	0.00079	0.004	<0.001	0.058	3701	Brown	B	25	0.2	20
304206	378000	82300	0.0006	0.176	0.00003	0.0073	0.007	1.4	0.009	<0.001	0.013	0.026	0.847	0.00004	0.00031	0.002	<0.001	0.256	3701	Orange	B	2	0.2	15
304207	377950	82300	0.00045	0.024	0.00007	<0.0001	0.01	2.1	0.009	0.262	<0.001	0.021	1.2	0.00004	<0.00001	<0.001	<0.001	1	3701	Brown	B	27	0.2	40
304208	377775	82300	0.00035	0.014	0.0001	<0.0001	0.002	0.165	0.017	0.162	<0.001	0.075	0.385	<0.00001	<0.00001	<0.001	<0.001	0.574	3701	Dark brown	B	5	0.2	20
304209	377750	82300	0.0017	0.02	0.00018	<0.0001	0.003	2.4	0.021	0.384	<0.001	0.049	0.241	0.00004	<0.00001	<0.001	<0.001	0.848	3701	Brown	B	16	0.2	30
304210	377675	82300	0.013	0.076	<0.00001	0.0042	0.03	3.4	0.391	0.819	0.024	0.103	1.8	<0.00001	0.00056	0.008	<0.001	2.3	3701	Brown	B	5	0.2	10
304211	377625	82300	0.0025	0.119	0.00006	0.012	0.006	1.7	0.012	0.394	0.012	0.041	1.3	0.00018	0.00005	0.004	<0.001	0.836	3701	Brown	B	5	0.2	40
304212	377575	82300	0.002	0.179	0.00007	0.0085	0.008	2.6	0.092	0.052	0.014	0.061	4	0.00012	0.00034	0.008	<0.001	1.1	3701	Brown	B	9	0.2	20
304213	377500	82300	0.0069	0.165	0.00011	0.012	0.036	13.5	0.218	0.346	0.015	0.208	3.9	0.00017	0.00236	0.008	<0.001	1.9	3701	Brown	B	2	0.2	20
304214	377450	82300	0.0025	0.129	0.00013	<0.0001	0.006	2	0.034	0.316	0.008	0.059	1.5	0.00008	0.0005	0.004	<0.001	1	3701	Brown	B	19	0.2	30
304215	377425	82300	0.0047	0.117	<0.00001	<0.0001	0.009	5.1	0.119	0.263	0.016	0.073	2.1	0.00008	0.00057	0.004	<0.001	0.758	3701	Fawn	B	20	0.2	20
304216	377375	82300	0.011	0.333	0.00013	0.0023	0.062	4.6	0.441	2.3	0.024	0.285	3	0.00033	0.00077	0.012	<0.001	3.7	3701	Brown	B	8	0.2	10
304217	377325	82300	0.0074	0.22	0.00014	0.0053	0.015	2.7	0.231	0.788	0.027	0.061	3.6	0.00005	0.00036	0.01	<0.001	0.885	3701	Brown	B	5	0.2	10
304218	377225	82300	0.0074	0.136	0.00019	<0.0001	0.015	1.4	0.042	0.437	0.031	0.05	1.1	0.0001	0.00075	0.017	<0.001	1.5	3701	Brown	B	10	0.2	15
304219	377175	82300	0.0038	0.009	0.00021	<0.0001	0.006	2.1	0.005	0.231	<0.001	0.019	0.409	0.00028	0.00008	<0.001	<0.001	0.651	3701	Brown	B	3	0.2	20
304220	377050	82300	0.00085	0.439	0.0001	0.0028	0.003	2.2	0.014	0.105	0.015	0.066	0.825	0.00018	0.00083	0.01	<0.001	0.031	3701	Brown	B	25	0.2	20
304221	377025	82300	0.0009	0.185	<0.00001	<0.0001	0.008	1.1	0.01	0.015	0.007	0.038	2	<0.00001	0.00095	0.008	<0.001	0.317	3701	Grey	B	15	0.2	30
304222	376925	82300	0.0005	1.4	<0.00001	0.019	<0.001	3.8	0.044	<0.001	0.028	0.05	2	0.00002	0.00046	0.037	<0.001	<0.001	3701	Light brown	B	4	0.2	20

Sample Number	Local East	Local North	Ag ppm *IC8/40*	As ppm *IC8/40*	Au ppm *IC8/40*	Bi ppm *IC8/40*	Cd ppm *IC8/40*	Ba ppm *IC8/40*	Co ppm *IC8/40*	Cu ppm *IC8/40*	Mo ppm *IC8/40*	Ni ppm *IC8/40*	Pb ppm *IC8/40*	Pt ppm *IC8/40*	Pd ppm *IC8/40*	Sb ppm *IC8/40*	Tl ppm *IC8/40*	Zn ppm *IC8/40*	SDS	Colour	Soil Profile	Slope Angle	Sample Depth	Organic Content %
304223	7075	82500	0.0063	2.3	0.00027	0.0055	0.081	4.4	0.988	1.2	0.037	0.678	8	0.00017	0.00135	0.034	0.001	16.5	3701	Brown	B	19	0.2	10
304224	7025	82500	0.0038	0.331	<0.00001	0.0055	0.024	4.3	2.5	1.8	0.014	0.486	4.4	0.00026	0.00023	0.014	<0.001	1.5	3701	Brown	B	15	0.2	15
304225	6975	82500	0.0014	0.203	<0.00001	0.0075	0.009	2.2	0.092	0.52	0.003	0.181	0.761	<0.00001	0.00016	0.007	<0.001	0.794	3701	Brown	B	36	0.2	25
304226	377850	82300	0.00055	0.001	<0.00001	0.0002	0.004	0.204	0.005	0.016	<0.001	0.007	0.382	<0.00001	0.00004	<0.001	<0.001	0.274	3701	Grey	B	30	0.2	15
304227	377800	82300	0.002	0.008	0.0001	0.0007	0.013	0.457	0.007	0.155	<0.001	0.027	0.548	<0.00001	0.00016	<0.001	<0.001	0.385	3701	Grey	B	12	0.2	20
304228	377725	82300	0.0011	0.125	<0.00001	0.0088	0.003	1.8	0.035	0.087	<0.001	0.046	1.3	0.00009	<0.00001	0.005	<0.001	0.595	3701	Brown	B	20	0.2	10
304229	377650	82300	0.0023	0.004	<0.00001	0.0008	0.01	1.5	0.005	0.214	0.003	0.012	0.587	<0.00001	0.00002	<0.001	<0.001	0.342	3701	Grey	B	15	0.2	15
304230	377600	82300	0.007	0.257	0.00021	0.02	0.023	3.8	0.369	0.134	0.026	0.077	17.5	<0.00001	0.00074	0.013	<0.001	2	3701	Brown	B	5	0.2	10
304231	377550	82300	0.0096	0.231	0.00006	0.015	0.031	6.8	0.246	2	0.019	0.143	12	0.00007	0.00114	0.015	<0.001	4	3701	Brown	B	4	0.2	20
304232	377400	82300	0.0043	0.266	0.00032	0.0095	0.023	3.2	0.078	0.341	0.012	0.143	2.9	0.00022	0.00117	0.005	<0.001	1.3	3701	Brown	B	14	0.2	15
304233	377275	82300	0.0058	0.124	0.0001	0.0068	0.015	2.8	0.078	0.627	0.029	0.056	3.8	0.00013	0.00024	0.008	<0.001	1.6	3701	Light brown	B	12	0.2	15
304234	377250	82300	0.019	0.329	0.00028	0.018	0.017	1.8	0.159	2	0.064	0.029	6.4	0.0001	0.00079	0.063	0.002	0.774	3701	Brown	B	4	0.2	10
304235	377200	82300	0.0061	0.071	0.00023	0.0054	0.011	1.6	0.008	0.383	0.013	0.025	1.7	0.00012	0.00039	0.004	<0.001	0.332	3701	Light brown	B	5	0.2	
304236	377150	82300	0.0057	0.071	0.00004	0.0077	0.007	1.2	0.023	0.249	0.046	0.01	0.662	<0.00001	0.00018	0.006	<0.001	0.265	3701	Light brown	B	6	0.2	20
304237	377000	82300	0.002	0.007	0.00004	0.0007	0.011	1.6	0.004	0.154	<0.001	0.04	0.778	<0.00001	<0.00001	<0.001	<0.001	0.856	3701	Grey	B	12	0.2	30
304238	376975	82300	0.0003	0.229	<0.00001	0.0079	0.004	1.8	0.013	<0.001	0.005	0.024	0.756	0.00008	0.00169	0.007	<0.001	0.031	3701	Brown	B	7	0.2	10
304239	376950	82300	0.0013	0.041	<0.00001	0.0005	0.006	0.765	0.006	0.269	<0.001	0.077	1	0.00005	<0.00001	0.001	<0.001	0.801	3701	Brown	B	4	0.2	30
304240	377100	82300	0.00045	0.44	0.00016	0.011	0.006	1.5	0.008	<0.001	0.005	0.064	1.4	0.00005	0.00047	0.012	<0.001	0.002	3701	Brown	B	17	0.2	15
304241	377475	82300	0.0015	0.149	<0.00001	0.008	0.028	7.6	0.121	0.356	0.003	0.162	2.8	0.00004	0.00014	0.007	<0.001	1.8	3701	Light brown	B	22	0.2	20
304242	7225	82500	0.0012	0.123	0.00001	0.0059	0.009	1.3	0.016	0.328	<0.001	0.103	1.9	0.00011	0.00012	0.007	<0.001	1.3	3701	Brown	B	38	0.2	25
304243	7200	82500	0.0005	0.141	0.00009	0.013	0.001	3.2	0.056	<0.001	<0.001	0.044	1.8	<0.00001	0.0007	0.01	<0.001	<0.001	3701	Light brown	B	31	0.2	15
304244	7125	82500	0.0018	0.255	0.00002	0.0027	0.024	1.7	0.012	0.458	<0.001	0.192	1.4	0.00001	0.00051	0.006	<0.001	2.6	3701	Brown	B	46	0.2	45
304245	7100	82500	0.0033	2.2	<0.00001	0.014	0.033	3.4	0.79	0.289	0.037	0.236	6.2	0.00007	0.00051	0.034	0.007	2.7	3701	Light brown	B	42	0.2	15
304246	6950	82500	0.00015	0.376	0.00006	0.015	0.008	3.6	0.324	<0.001	0.009	0.144	3.2	0.00009	0.0003	0.012	0.003	0.239	3701	Brown	B	32	0.2	5
304247	377925	82300	0.00005	0.114	0.00006	0.012	0.005	3.3	0.067	<0.001	0.01	0.064	1.7	0.00011	0.00046	0.003	0.002	0.13	3701	Brown	B	14	0.2	40
304248	377875	82300	0.0011	0.009	0.00008	0.0003	0.005	0.395	0.003	0.114	<0.001	0.036	0.919	0.00002	<0.00001	<0.001	0.001	0.31	3701	Grey	B	33	0.2	20
304249	377825	82300	0.0019	0.002	0.00012	0.0003	0.003	0.307	0.002	0.069	<0.001	0.007	0.43	<0.00001	0.00021	<0.001	<0.001	0.103	3701	Grey	B	33	0.2	20
304250	377700	82300	0.0012	0.006	0.00017	0.0003	0.004	0.577	0.014	0.375	<0.001	0.022	0.352	<0.00001	0.00018	<0.001	<0.001	0.33	3701	Grey	B	14	0.2	20
304251	377525	82300	0.0006	0.152	0.00001	0.0046	0.014	4.5	0.11	0.819	<0.001	0.297	1.3	<0.00001	0.0003	0.003	<0.001	2	3701	Brown	B	2	0.2	50
304252	377300	82300	0.0079	0.281	0.00015	0.0087	0.015	3	0.897	1.7	0.022	0.093	3.1	0.00013	0.00036	0.014	<0.001	1.3	3701	Light brown	B	5	0.2	20
304253	377125	82300	0.0056	2.9	0.00019	0.018	0.006	1.2	0.03	0.388	0.044	0.024	2.2	<0.00001	0.00037	0.062	<0.001	0.261	3701	Brown	B	25	0.2	5
304254	7150	82500	0.0029	0.057	<0.00001	0.0033	0.009	1.8	0.019	0.122	0.001	0.058	1	<0.00001	<0.00001	0.002	<0.001	1.8	3701	Grey	B	25	0.2	30
304255	378075	82300	0.00045	0.076	0.00006	0.0047	0.011	2.4	0.016	0.169	0.001	0.063	0.863	0.00024	<0.00001	0.003	<0.001	0.669	3701	Dark brown	B	24	0.2	20
304256	378025	82300	0.0007	0.114	<0.00001	0.012	0.01	2.6	0.02	0.076	0.012	0.029	0.678	<0.00001	0.00004	0.004	<0.001	0.209	3701	Fawn	B	12	0.2	10
304257	377975	82300	0.00085	0.019	0.00002	0.0008	0.008	1.6	0.009	0.057	<0.001	0.008	0.452	<0.00001	<0.00001	<0.001	<0.001	0.588	3701	Light brown	B	25	0.2	30
304258	377900	82300	0.00045	0.012	<0.00001	0.0006	0.003	0.746	0.01	0.047	<0.001	<0.001	0.279	0.00005	<0.00001	<0.001	<0.001	0.169	3701	Grey	B	24	0.2	5
304260	377350	82300	0.0061	0.441	<0.00001	0.0073	0.025	1.8	0.448	0.592	0.02	0.053	2.6	0.00001	0.0006	0.009	<0.001	0.891	3701	Brown	B	16	0.2	15
304261	377075	82300	0.0004	0.391	<0.00001	0.014	0.008	6.2	0.017	<0.001	0.006	0.109	3	<0.00001	0.00087	0.01	<0.001	0.034	3701	Brown	B	30	0.2	25
304262	376900	82300	<0.00005	0.471	<0.00001	0.0083	0.003	2	0.015	<0.001	0.018	0.088	1.6	<0.00001	0.00129	0.017	<0.001	0.132	3701	Orange	B	24	0.2	10
304263	376875	82300	0.0004	0.248	0.00027	0.0042	0.007	1.8	1.1	0.019	0.01	1.2	1.2	<0.00001	0.00052	0.005	<0.001	2.5	3701	Orange	B	33	0.2	5
304264	376850	82300	<0.00005	0.218	0.00028	0.011	0.01	10	0.717	0.017	0.006	1.1	4.4	<0.00001	0.00036	0.006	<0.001	0.414	3701	Brown	B	35	0.2	10
304265	376825	82300	0.0008	0.273	<0.00001	0.01	0.036	7.2	2	2.3	0.006	1.4	5	<0.00001	0.00034	0.011	<0.001	0.876	3701	Brown	B	48	0.2	30
304266	376800	82300	0.001	0.208	<0.00001	0.0085	0.036	7.1	4	5.4	0.004	3	5.7	<0.00001	0.00075	0.014	<0.001	3.2	3701	Brown	B	50	0.2	35
			0.00005	***0.001***	***0.00001***	***0.0001***	***0.001***	***0.001***	***0.001***	***0.001***	***0.001***	***0.001***	***0.001***	***0.00001***	***0.00001***	***0.001***	***0.001***	***0.001***						

Sample Number	Local East	Local North	Sampled By	Comments
304001	7750	81900	PC/ CA/ HH	Open bush; tall scrub
304002	8250	82100	PC/ CA/ HH	START OF LINE; Tall open scrub; Sample taken 3m west of peg; peg on road.
304003	8225	82100	PC/ CA/ HH	Swampy ground; tall open scrub
304004	8200	82100	PC/ CA/ HH	Tall open scrub
304005	7700	82100	PC/ CA/ HH	Dense bush
304006	7675	82100	PC/ CA/ HH	Swampy ground; dense bush
304007	7650	82100	PC/ CA/ HH	Dense bush
304008	7600	82100	PC/ CA/ HH	Tall open scrub
304009	7500	82100	PC/ CA/ HH	Thick horizontal; dense bush
304010	7475	82100	PC/ CA/ HH	Dense bush
304011	7900	82100	PC/ CA/ HH	Tall open scrub
304012	7875	82100	PC/ CA/ HH	Tall open scrub
304013	7850	82100	PC/ CA/ HH	Tall open scrub
304014	7825	82100	PC/ CA/ HH	Tall open scrub
304015	7800	82100	PC/ CA/ HH	Tall open scrub
304016	7575	82100	PC/ CA/ HH	Tall open scrub
304017	7450	82100	PC/ CA/ HH	Dense bush
304018	7425	82100	PC/ CA/ HH	Open bush
304019	7875	81900	PC/ CA/ HH	Open tall bush
304020	7525	81900	PC/ CA/ HH	Tall open scrub
304021	7500	81900	PC/ CA/ HH	Open bush
304022	7475	81900	PC/ CA/ HH	Tall open scrub
304023	7450	81900	PC/ CA/ HH	Tall open scrub
304024	6950	81900	PC/ CA/ HH	Tall open scrub
304025	7800	81900	PC/ CA/ HH	Tall open scrub
304026	7775	81900	PC/ CA/ HH	Tall scrub
304027	7400	82100	PC/ CA/ HH	Tall open scrub
304028	7350	82100	PC/ CA/ HH	Open scrub
304029	7625	81900	PC/ CA/ HH	Open tall bush
304030	7600	81900	PC/ CA/ HH	Thick open scrub
304031	8075	82100	PC/ CA/ HH	Tall open scrub
304032	8050	82100	PC/ CA/ HH	Tall dense scrub
304033	7625	82100	PC/ CA/ HH	Dense bush
304034	8100	81900	PC/ CA/ HH	Dense bush
304035	7950	81900	PC/ CA/ HH	Open tall bush
304036	7925	81900	PC/ CA/ HH	Open tall bush
304037	7900	81900	PC/ CA/ HH	Open tall bush
304038	7350	81900	PC/ CA/ HH	Thick open scrub
304039	7025	81900	PC/ CA/ HH	Tall open scrub
304040	7000	81900	PC/ CA/ HH	Dense bush
304041	6975	81900	PC/ CA/ HH	Dense bush
304042	6750	81900	PC/ CA/ HH	Dense bush
304043	6725	81900	PC/ CA/ HH	Open tall bush
304044	8075	81900	PC/ CA/ HH	Open thick bush
304045	8050	81900	PC/ CA/ HH	Tall dense bush
304046	7325	81900	PC/ CA/ HH	Thick open scrub
304047	7300	81900	PC/ CA/ HH	Tall open scrub
304048	7275	81900	PC/ CA/ HH	Tall open scrub
304049	7250	81900	PC/ CA/ HH	Tall open scrub
304050	7225	81900	PC/ CA/ HH	Tall open scrub
304051	7200	81900	PC/ CA/ HH	Tall open scrub
304052	7175	81900	PC/ CA/ HH	Tall open scrub

Sample Number	Local East	Local North	Sampled By	Comments
304054	8175	82100	PC/ CA/ HH	Tall open scrub
304055	7550	82100	PC/ CA/ HH	Thick horizontal; dense bush
304056	6700	81900	PC/ CA/ HH	Open bush
304057	8200	81900	PC/ CA/ HH	Open dense bush on side of road
304058	8175	81900	PC/ CA/ HH	Tall dense bush
304059	8025	81900	PC/ CA/ HH	Tall dense bush
304060	8000	81900	PC/ CA/ HH	Tall dense bush
304061	7975	81900	PC/ CA/ HH	Tall dense bush
304062	7725	81900	PC/ CA/ HH	Open bush; thick horizontal
304064	7700	81900	PC/ CA/ HH	Open tall bush
304065	7675	81900	PC/ CA/ HH	Sample taken 1m west of creek; Open tall bush
304066	7650	81900	PC/ CA/ HH	Open bush
304067	7425	81900	PC/ CA/ HH	Thick scrub; thick horizontal
304068	7400	81900	PC/ CA/ HH	Thick short scrub
304069	7375	81900	PC/ CA/ HH	Thick scrub
304070	7150	81900	PC/ CA/ HH	Tall open scrub
304071	7125	81900	PC/ CA/ HH	Tall open scrub
304072	7100	81900	PC/ CA/ HH	Tall open scrub
304073	7075	81900	PC/ CA/ HH	Tall open scrub
304074	7050	81900	PC/ CA/ HH	Tall open scrub
304075	6875	81900	PC/ CA/ HH	Tall open scrub
304076	6850	81900	PC/ CA/ HH	Tall open scrub
304077	8125	82100	PC/ CA/ HH	Tall open scrub
304078	8100	82100	PC/ CA/ HH	1m north of sample is small flowing creek; Tall open scrub
304079	7525	82100	PC/ CA/ HH	Open dense scrub
304080	8150	81900	PC/ CA/ HH	Open bush
304081	8125	81900	PC/ CA/ HH	Open dense bush
304082	7575	81900	PC/ CA/ HH	Tall open scrub
304083	7550	81900	PC/ CA/ HH	Tall open scrub
304084	7775	82100	PC/ CA/ HH	Tall open scrub
304085	7750	82100	PC/ CA/ HH	Tall open scrub
304086	7725	82100	PC/ CA/ HH	Dense scrub
304087	7850	81900	PC/ CA/ HH	Open tall bush
304088	7825	81900	PC/ CA/ HH	Open short scrub
304089	6925	81900	PC/ CA/ HH	Tall open scrub
304090	6900	81900	PC/ CA/ HH	Tall open scrub
304091	8025	82100	PC/ CA/ HH	Dense bush
304092	8000	82100	PC/ CA/ HH	Thick button grass; Thick short scrub
304093	7975	82100	PC/ CA/ HH	Tall open scrub
304094	7950	82100	PC/ CA/ HH	Tall open scrub
304095	7925	82100	PC/ CA/ HH	Open scrub; thick horizontal
304096	6825	81900	PC/ CA/ HH	Tall open scrub
304097	6800	81900	PC/ CA/ HH	Tall open scrub
304098	6775	81900	PC/ CA/ HH	Dense bush
304099	8150	82100	PC/ CA/ HH	Tall open scrub
304100	7375	82100	PC/ CA/ HH	Open scrub
304101	7200	82100	PC/ CA/ HH	Tall open scrub
304102	7225	82100	PC/ CA/ HH	Tall open scrub
304103	7300	82100	PC/ CA/ HH	Tall open scrub
304104	7425	82700	AC/HH	Mild scrub
304105	7500	82700	AC/HH	Cross over track 10m from 7500E peg; Mild scrub
304106	7475	82700	AC/HH	Mild bush
304107	7450	82700	AC/HH	Mild scrub
304108	7550	82700	AC/HH	Mild scrub
304109	7325	82100	PC/ CA/ HH	Tall open scrub

Sample Number	Local East	Local North	Sampled By	Comments
304110	7275	82100	PC/ CA/ HH	Dense bush
304111	7250	82100	PC/ CA/ HH	Tall open scrub
304112	7625	82700	AC/HH	Mild bush; Heaps of cutty grass; Fine rock in sample
304113	7525	82700	AC/HH	Mild scrub
304114	7400	82700	AC/HH	Mild scrub
304115	7175	82100	PC/ CA/ HH	Tall open scrub
304116	7100	82100	PC/ CA/ HH	Tall open scrub
304117	6925	82100	PC/ CA/ HH	Tall open scrub
304118	6875	82100	PC/ CA/ HH	Tall open scrub
304119	6800	82100	PC/ CA/ HH	Tall open scrub
304120	7150	82100	PC/ CA/ HH	Tall open scrub
304121	7125	82100	PC/ CA/ HH	Tall open scrub
304122	6850	82100	PC/ CA/ HH	Tall open scrub
304123	6750	82100	PC/ CA/ HH	Tall open scrub
304124	6725	82100	PC/ CA/ HH	Tall open scrub
304125	7875	82700	AC/HH	Start of line 7875E; Dense scrub
304126	7075	82100	PC/ CA/ HH	Tall open scrub
304127	7025	82100	PC/ CA/ HH	Tall open scrub
304128	6975	82100	PC/ CA/ HH	Tall open scrub
304129	6950	82100	PC/ CA/ HH	Tall open scrub
304130	7050	82100	PC/ CA/ HH	Tall open scrub
304131	7000	82100	PC/ CA/ HH	Tall open scrub
304132	6825	82100	PC/ CA/ HH	Tall open scrub
304133	7825	82700	AC/HH	Dense scrub
304134	7800	82700	AC/HH	Mild-dense bush
304135	7725	82700	AC/HH	Thick scrub
304136	7675	82700	AC/HH	Light horizontal; Dense bush
304137	7600	82700	AC/HH	Thick scrub
304138	7575	82700	AC/HH	Dense bush
304139	6775	82100	PC/ CA/ HH	Tall open scrub
304140	6900	82100	PC/ CA/ HH	Tall open scrub
304141	7850	82700	AC/HH	Thick scrub; Mild horizontal
304142	7775	82700	AC/HH	Thick scrub
304143	7750	82700	AC/HH	Thick scrub; Light horizontal
304144	7700	82700	AC/HH	Mild bush
304145	7650	82700	AC/HH	Mild scrub
304146	7250	82700	AC/HH	Mild scrub
304147	6975	82700	AC/HH	End of line; 10m east of Marian Oak River; Fairly open bush
304148	8050	82500	AC/HH	Myrtle forest
304149	8025	82500	AC/HH	Medium density myrtle scrub
304150	8000	82500	AC/HH	Sampled edge of creek; medium density myrtle forest
304151	7950	82500	AC/HH	Medium density myrtle scrub
304152	7925	82500	AC/HH	Medium density forest
304153	7900	82500	AC/HH	Open myrtle forest
304154	7175	82700	AC/HH	Dense scrub
304155	7625	82500	AC/HH	Thick myrtle and eucalypt forest
304156	7500	82500	AC/HH	Rocky sample; Open celery-top and myrtle scrub
304157	7375	82700	AC/HH	Mild bush; light horizontal
304158	7350	82700	AC/HH	Fairly open scrub
304159	7300	82700	AC/HH	Fairly open scrub
304160	7275	82700	AC/HH	Thick scrub; Fairly dense horizontal forest
304161	7225	82700	AC/HH	Mild scrub
304162	7150	82700	AC/HH	Thick scrub; Light horizontal
304163	7125	82700	AC/HH	Fairly open bush; young vegetation
304164	7000	82700	AC/HH	Mild scrub

Sample Number	Local East	Local North	Sampled By	Comments
304165	7200	82700	AC/HH	Dense scrub
304167	7075	82700	AC/HH	Small creek running 0.5m north of 7075E peg; Dense bush
304168	7050	82700	AC/HH	Thick scrub; Mild horizontal
304169	7975	82500	AC/HH	Open myrtle forest
304170	7775	82500	AC/HH	Sampled edge of small stream; Open myrtle forest
304171	7750	82500	AC/HH	Open rainforest
304172	7725	82500	AC/HH	Open forest
304173	7700	82500	AC/HH	Patchy laurel and celery-top scrub
304174	7675	82500	AC/HH	Thick horizontal
304175	7025	82700	AC/HH	Mild scrub
304176	7875	82500	AC/HH	Open myrtle forest
304177	7850	82500	AC/HH	Open myrtle forest
304178	7600	82500	AC/HH	Thick horizontal
304179	7325	82700	AC/HH	Thick bush
304180	7100	82700	AC/HH	Thick young vegetation
304181	8100	82500	AC/HH	Start of sampling on road edge; Open myrtle forest
304182	8075	82500	AC/HH	Open myrtle forest
304183	7475	82500	AC/HH	Cross over track 5m before this peg; Medium density myrtle forest
304184	7450	82500	AC/HH	Myrtle and horizontal forest
304185	7825	82500	AC/HH	Medium density forest
304186	7800	82500	AC/HH	Light horizontal underlaying myrtle forest
304187	7575	82500	AC/HH	Open myrtle forest
304188	7550	82500	AC/HH	Open celery-top and myrtle forest
304189	7525	82500	AC/HH	Medium density myrtle and laurel scrub
304190	7650	82500	AC/HH	Medium horizontal
304191	7425	82500	AC/HH	Thick horizontal
304192	7400	82500	AC/HH	Thick myrtle, eucalypt and tea tree forest
304193	7375	82500	AC/HH	Medium density eucalypt and tea tree forest
304194	7350	82500	AC/HH	Open eucalypt, tea tree and celery-top forest
304195	7325	82500	AC/HH	Open eucalypt and tea tree forest
304197	7300	82500	AC/HH	Open eucalypt and tea tree forest
304199	7275	82500	AC/HH	Open eucalypt and tea tree forest
304200	7250	82500	AC/HH	Medium density eucalypt and tea tree forest and celery-top pine
304201	7175	82500	AC/HH	Medium density eucalypt and sassafras
304202	7050	82500	AC/HH	Man ferns; Dense sassafras and myrtle forest
304203	7000	82500	AC/HH	Working off line around cliff. Open sassafras and myrtle forest.
304204	378100	82300	AC/HH/JB	Start of line; Sampled edge of road; James Beresford started today.
304205	378050	82300	AC/HH/JB	Open myrtle, blackwood and celery-top forest.
304206	378000	82300	AC/HH/JB	Open myrtle, leatherwood and sassafras forest.
304207	377950	82300	AC/HH/JB	Open myrtle and sassafras forest.
304208	377775	82300	AC/HH/JB	Medium density eucalypt, blackwood and celery-top forest.
304209	377750	82300	AC/HH/JB	Open celery-top and eucalypt forest.
304210	377675	82300	AC/HH/JB	Open eucalypt, myrtle, celery-top and sassafras forest.
304211	377625	82300	AC/HH/JB	Open sassafras and myrtle forest.
304212	377575	82300	AC/HH/JB	Medium density eucalypt, sassafras and myrtle forest
304213	377500	82300	AC/HH/JB	Dense myrtle forest.
304214	377450	82300	AC/HH/JB	Open myrtle and sassafras forest.
304215	377425	82300	AC/HH/JB	Open myrtle, eucalypt, sassafras and manfern forest
304216	377375	82300	AC/HH/JB	Open myrtle, sassafras and manfern forest.
304217	377325	82300	AC/HH/JB	Medium density rainforest
304218	377225	82300	AC/HH/JB	Still following river; Medium density rainforest
304219	377175	82300	AC/HH/JB	Veering away from river; Open rainforest
304220	377050	82300	AC/HH/JB	Open eucalypt and myrtle forest
304221	377025	82300	AC/HH/JB	Open leatherwood, eucalypt and myrtle forest
304222	376925	82300	AC/HH/JB	Open eucalypt forest

Sample Number	Local East	Local North	Sampled By	Comments
304223	7075	82500	AC/HH	Dense sassafras and myrtle forest
304224	7025	82500	AC/HH	Open sassafras and myrtle forest.
304225	6975	82500	AC/HH	Open myrtle and sassafras forest.
304226	377850	82300	AC/HH/JB	Dense myrtle and horizontal forest.
304227	377800	82300	AC/HH/JB	Open eucalypt, celery-top, sassafras and myrtle forest.
304228	377725	82300	AC/HH/JB	Open eucalypt, myrtle, celery-top and sassafras forest.
304229	377650	82300	AC/HH/JB	Open gum, myrtle, celery-top and sassafras forest.
304230	377600	82300	AC/HH/JB	Open sassafras and myrtle forest.
304231	377550	82300	AC/HH/JB	Open eucalypt, myrtle and sassafras forest.
304232	377400	82300	AC/HH/JB	Medium density sassafras, myrtle and manfern forest
304233	377275	82300	AC/HH/JB	Still following edge of river; Open rainforest
304234	377250	82300	AC/HH/JB	Medium density rainforest
304235	377200	82300	AC/HH/JB	Open rainforest
304236	377150	82300	AC/HH/JB	Open rainforest
304237	377000	82300	AC/HH/JB	Open rainforest
304238	376975	82300	AC/HH/JB	Open eucalypt forest
304239	376950	82300	AC/HH/JB	Open eucalypt forest
304240	377100	82300	AC/HH/JB	Medium density rainforest
304241	377475	82300	AC/HH/JB	Open myrtle and sassafras forest.
304242	7225	82500	AC/HH	Dense eucalypt, celery-top, sassafras and lanceolata
304243	7200	82500	AC/HH	Medium density eucalypt, celery-top and sassafras
304244	7125	82500	AC/HH	Open myrtle, celery-top and sassafras forest. Very steep.
304245	7100	82500	AC/HH	Open sassafras and myrtle forest. Waterfall on left of track
304246	6950	82500	AC/HH	Last sample on the edge of the MarionOak River; End of line; Open myrtle and sassafras forest.
304247	377925	82300	AC/HH/JB	Medium density myrtle and sassafras with underlaying horizontal.
304248	377875	82300	AC/HH/JB	Dense myrtle and horizontal forest.
304249	377825	82300	AC/HH/JB	Open myrtle forest
304250	377700	82300	AC/HH/JB	Open sassafras, myrtle and eucalypt forest
304251	377525	82300	AC/HH/JB	Medium density myrtle and sassafras forest
304252	377300	82300	AC/HH/JB	Open myrtle, sassafras and manfern forest
304253	377125	82300	AC/HH/JB	Medium density rainforest
304254	7150	82500	AC/HH	Medium density eucalypt, myrtle and sassafras
304255	378075	82300	AC/HH/JB	Open blackwood and celery-top forest.
304256	378025	82300	AC/HH/JB	Open myrtle and sassafras forest.
304257	377975	82300	AC/HH/JB	Open sassafras and myrtle forest.
304258	377900	82300	AC/HH/JB	Sample edge of small northward-flowing stream. Medium density myrtle.
304260	377350	82300	AC/HH/JB	Sampled edge of river; Medium density rainforest
304261	377075	82300	AC/HH/JB	Open rainforest
304262	376900	82300	AC/HH/JB	Open eucalypt forest
304263	376875	82300	AC/HH/JB	Dense blackwood, eucalypt and myrtle
304264	376850	82300	AC/HH/JB	Medium density myrtle forest
304265	376825	82300	AC/HH/JB	Open myrtle and manfern forest
304266	376800	82300	AC/HH/JB	Sampled 5m from Marionoak River bank; Medium density rainforest

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APPENDIX 6

GEOTERREX IP SURVEY REPORT FOR

THE MT KERSHAW-CHESTER MINE AREA

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A LOGISTICS REPORT FOR THE INDUCED POLARISATION SURVEY CONDUCTED IN THE MT. KERSHAW - CHESTER MINE AREA, TASMANIA FOR PASMINCO EXPLORATION

GEOTERREX-DIGHEM PROJECT NUMBER 4-620

October, 1998

Geoterrex-Dighem Pty. Ltd.

7-9 George Place

Artarmon, NSW, 2064

Sydney, Australia

Executive Summary

An induced polarisation (IP) survey was performed by Geoterrex-Dighem Pty. Ltd. Australia for Pasminco Exploration over the Mt. Kershaw-Chester Mine area located in the western part of Tasmania.

The survey was conducted between 27^{th} September and 18^{th} October 1998.

The goal of the geophysical survey was to outline anomalous areas for possible follow up drilling and geological mapping.

A coverage of about 13 km of IP survey was completed during the survey along 7 lines.

All lines were surveyed in time domain, using 50 m dipole-dipole configuration with 0.125 Hz frequency.

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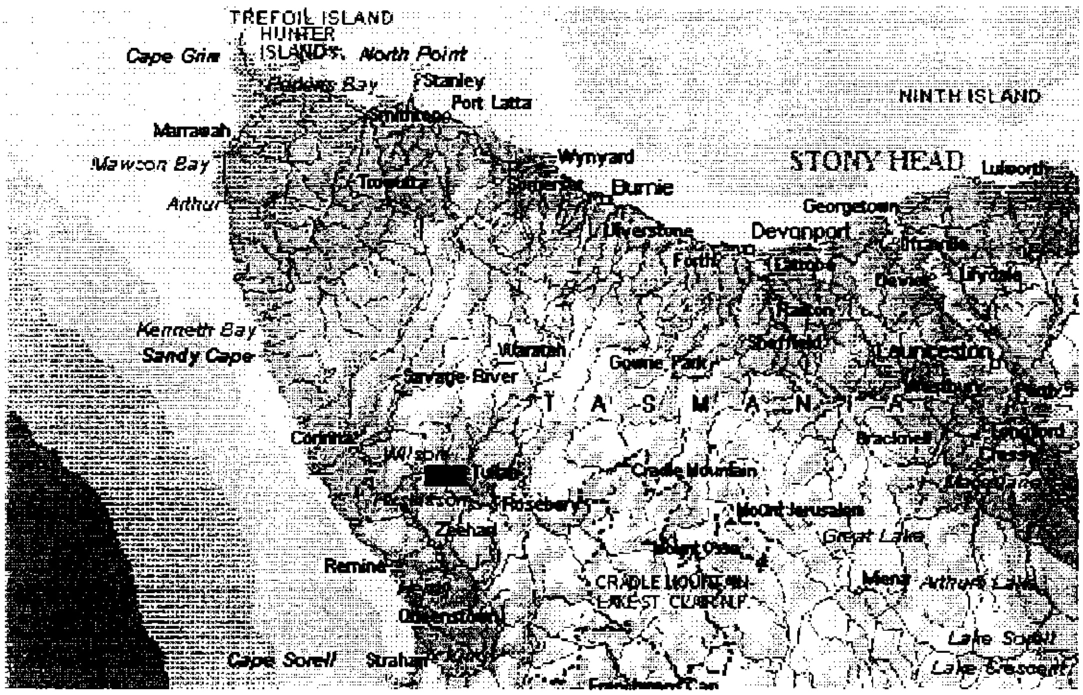
List of Tables

1. Introduction

This report describes survey parameters, data collection procedures and presentation formats, of an induced polarisation survey carried out for Pasminco Exploration by Geoterrex-Dighem Pty. Ltd. Australia. This survey was conducted between 27th September and 18th October, 1998.

1.1 Survey location

The survey encompassed 7 lines located in Rosebery area in the proximity of the old Chester mine. The survey area is located in western Tasmania, approximately 120 km south of Burnie. The survey location is shown in Figure 1.1.



Survey area

Figure 1.1 Location map.

1.2 Survey equipment and personnel

Geoterrex-Dighem Pty. Ltd. supplied equipment and personnel listed in Table 1. The field crew comprised two geophysicists, one acting as a crew chief, one geophysical technician and one worker supplied by Pasminco.

Table 1 Equipment and personnel supplied by Geoterrex-Dighem for survey

IP Transmitter	HUNTEC LOPO M-4
IP Receiver	IRIS ELREC 6
IP Generator	Battery pack
IP Survey equipment	wire, reels, receiver electrodes, hand-held radios
Safety equipment	as outlined in the Geoterrex-Dighem Pty. Ltd. Safety Policy
Processing	computer, software and printer necessary for in-field processing
Miscellaneous	office supplies, etc,.
Crew	Sylvester Werczynski (Geophysicist, Crew chief) Roger Miller (Geophysicist) Keith Clinton (Geophysical technician)

2. Survey method

Generalised theory of the induced polarisation prospecting method is briefly reviewed. Configurations of electrode arrays used during the survey are also briefly discussed.

2.1 General theory

Induced polarisation is a separation of charge as a result of an applied electric field. It is measured in the earth by passing current through a volume of earth and measuring the polarisation effects resulting from this current. For the time-domain method used throughout this survey, a steady current is passed through the earth for several seconds, then suddenly interrupted. The polarisation voltages build up during the passage of the current, then decay slowly after cessation of the current. The rate of decay is measured when the transmitted current is interrupted.

Polarisation is established whenever a current is caused to flow across an interface between ionic and electronic conduction modes. Current flow in most rocks will be by ionic conduction through the electrolyte in capillaries of the rock, although certain rock-forming minerals display a degree of electronic conduction. Electronic conductors include almost all of the metallic sulphides, native metals, graphite, and some arsenides and oxides. Some clays and serpentinites also exhibit polarisation effects due to membrane polarisation. However, it is generally not possible to distinguish between induced polarisation responses due to metallic and non-metallic sources, nor even to distinguish between the different types within each group.

The major advantage of the IP method is in the detection of disseminated sulphides. Electromagnetic methods, also used to detect sulphide ores, do not respond well to disseminated ore. It is for this reason that the technique has been widely used in the search for gold mineralisation.

2.2 The dipole-dipole electrode configuration

The dipole-dipole electrode configuration is illustrated in Figure 2.1. Typically, seven or nine equally-spaced collinear current electrodes are dug into the ground. IP measurements are then taken with a mobile potential (or measuring) dipole with a length equal to the spacing, *a*, between two adjacent current electrodes.

By convention, dipole-dipole data for apparent resistivity, chargeability and standard-error-of-the-mean (SEM) are plotted in pseudosection format (Sumner, 1976; Bishop and Tyne, 1993). These data are discussed in detail in sections 2.4, 2.5 and 2.6 of this report. Pseudosections display the variation of data with distance along the survey line and depth below the survey line. They are termed pseudosections because of the indirect relationship between representation of the earth geoelectric section and the true subsurface geological structures. The plotting method is illustrated in Figure 2.2.

Of all IP electrode arrays, the dipole-dipole configuration provides the strongest anomalies and best depth discrimination to a buried polarisable target.

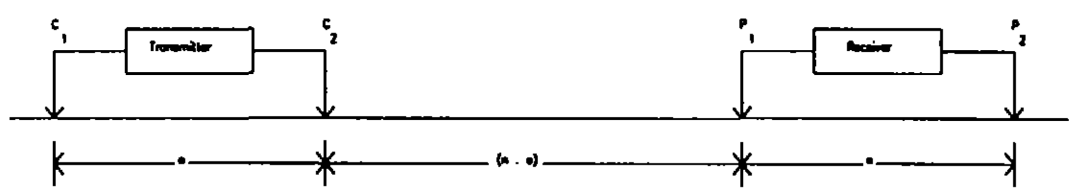


Figure 2.1 Dipole-dipole IP/resistivity array.

In Figure 2.1, C_1 and C_2 are current electrodes, P_1 and P_2 are potential electrodes, *a* is the dipole length or spacing, and *n* is an integer (n = 1, 2, 3, 4 ...).

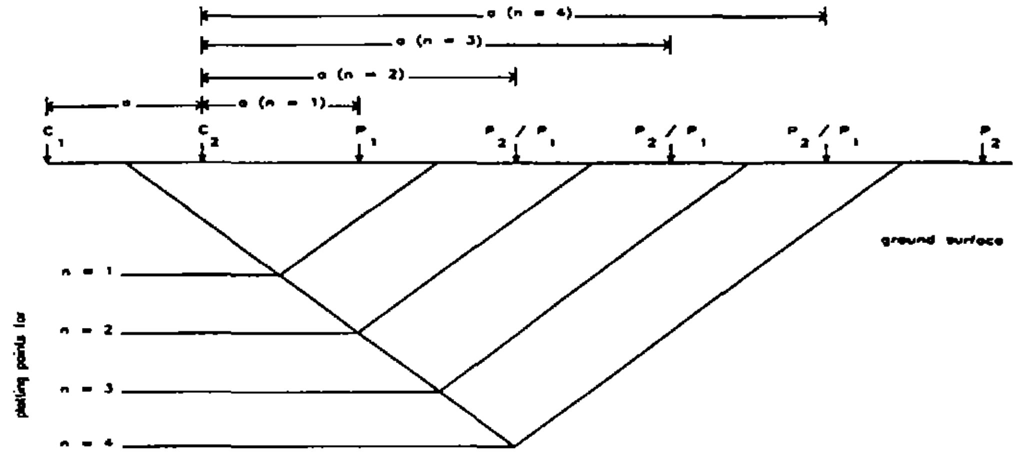


Figure 2.2 Halloff plotting of measurements on pseudosections (after Bishop and Tyne, 1993).

2.3 Apparent resistivity

Apparent resistivity is defined as earth resistance times a constant factor related to the array geometry. Apparent resistivity was calculated from field data using the equation:

$$\rho_a = \frac{KV}{I}$$

where ρ_a = apparent resistivity (Ωm);

V = potential difference between potential electrodes (V);

I = transmitted current (amps); and

K = dimensionless constant dependant upon the geometry of the electrode positions.

For any surfical linear array with current electrodes C_1 and C_2, and potential electrodes P_1 and P_2, where C_1P_1 is the distance between C_1 and P_1, the dimensionless constant, K, is defined by equation:

$$K = \frac{2\pi}{\left(\frac{1}{C_1 P_1}\right) - \left(\frac{1}{C_1 P_2}\right) - \left(\frac{1}{C_2 P_1}\right) + \left(\frac{1}{C_2 P_2}\right)}$$

For the case of a dipole-dipole array, with separation of a, the equation reduces to:

$$K_n = a\pi n(n + 1)(n + 2)$$

where K_n is the constant for a reading taken with a spacing of n. The dipole-dipole array was illustrated in Figure 2.1.

2.4 Chargeability

Chargeability is a measure of how well the earth below the survey holds an applied charge. The IRIS ELREC 6 receiver used for the survey allows logarithmic and arithmetic sampling modes for chargeability measurements. The programmable mode offers 10 fully independent IP windows which the operator can define by himself according to the way he wants to sample the IP decay curve.
In each IP window the value of the partial apparent chargeability (Mi) is computed and at the end of the measurement, the average values of partial apparent chargeabilities (Mi) are computed. The weighted average value (M) of these average partial apparent chargeabilities is also computed.

$$M = \frac{\sum_{i=1}^{nip} T_{Mi_{Mi}}}{\sum_{i=1}^{nip} T_{Mi}}$$

Where:

nip	is the number of IP windows (up to 10)
T_Mi	are the width of the IP windows (in ms)
Mi	are the average values of the partial apparent chargeabilities (in mV/V)
M	is the weighted average value of the average partial apparent chargeabilities (in mV/V)
M_DLY	is the time delay before measurement of M (in ms)

These concepts are illustrated in Figure 2.3.

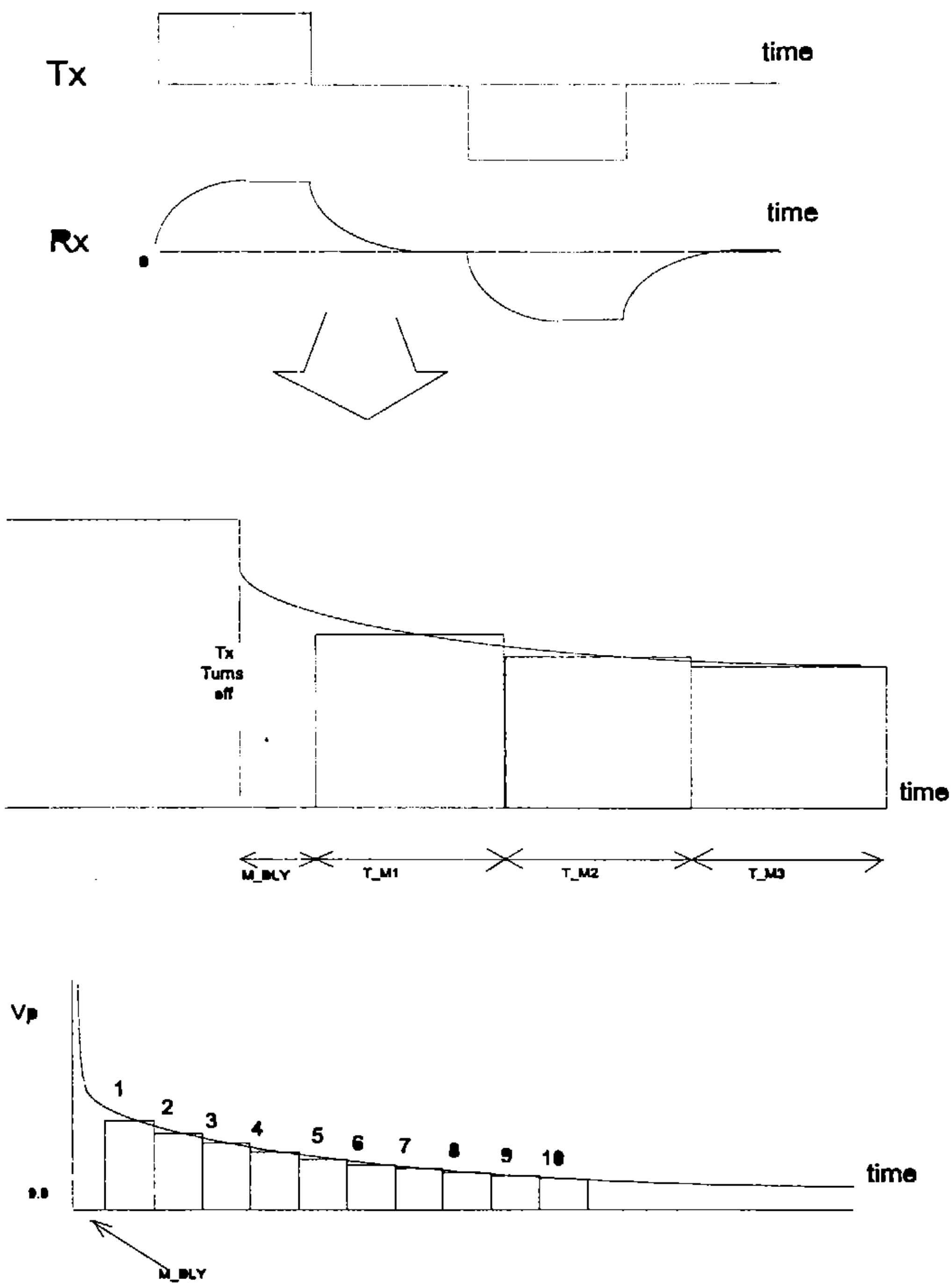


Figure 2.3 The arithmetic sampling mode with 10 preset windows.

2.5 Standard error of the mean

The standard error of the mean (SEM) is defined as the standard deviation divided by the square root of the number of cycles or pulses used to obtain the data. Algebraically, the SEM is defined:

$$SEM = \frac{\sqrt{\frac{\sum_{j=1}^{n} X_j^2}{n} - \left(\frac{\sum_{j=1}^{n} X_j}{n}\right)^2}}{\sqrt{n}}$$

where $n =$ number of cycles (pulses) acquired; and

$j =$ jth cycle (pulse).

X_j is defined according to the mode of operation of the receiver. For example

$$X_j = \frac{Window\ integral_j}{Vp_j}$$

SEM is presented in different units for different methods. For example

$$SEM\,[TDIP] = SEM\ x\ 1000\ x\ \frac{0.116875}{frequency}$$

In summary, the SEM is a measure of the variation in the data, normalised according to the number of data collected. Its presentation with data gives an indication as to the confidence of those data. Data having high SEMs should be interpreted more rigorously than data with low SEMs.

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3. Survey description

3.1 Survey progress

Survey production details are described in Table 2. Of the 21 days required for the survey, nearly 2 days were charged at standby rates, and 6 days were required to mobilise and demobilise the crew.

Table 2 Daily survey progress

DATE	PRODUCTION	DETAILS
27.09.98	Mobilisation	Roger drives from Sydney to Melbourne.
28.09.98	Mobilisation	Vehicle loaded on ferry to Tasmania.
29.09.98	Mobilisation	Sylvester and Keith left Sydney by air and met Roger in Devonport. Drive to Rosebery.
30.09.98	10 hr production	Safety meeting. Prepared setup at Mt. Kershaw-Chester grid. Read line 81500N (377950E-377300E).
1.10.98	3 hr production 7 hr standby	Started readings on line 81500N, but had to stop due to rain.
2.10.98	10 hr production	Read line 81500N (377300E-376450E).
3.10.98	10 hr production	Read line 81300N (376450E-376950E). Wind and showers.
4.10.98	10 hr production	Read line 81300N (376950E-378150E). Showers.
5.10.98	10 hr production	Read line 81100N (377550E-378400E).
6.10.98	3 hr production 7 hr standby	Rain in the morning. Started reading on line 81100N, but had to stop because of heavy rain all day.
7.10.98	8 hr production 2 hr standby	Rain in the morning. Removed wire from line 81100N because the river flooded the western valley. Setup and read on line 80900N (377600E-378450E).
8.10.98	10 hr production	Read line 80700N (377300E-378200E).
9.10.98	10 hr production	Read line 80500N (378200E-377150E).
10.10.98	10 hr production	Read line 80500N (377150E-376450E).
11.10.98	10 hr production	Read line 80700N (376450E-377300E)..
12.10.98	10.5 hr production	Read line 80900N (377600E-376450E).
13.10.98	10.5 hr production	Rain all night and morning. River crossing the line. Read line 81100N (376500E-377550E).
14.10.98	6.5 hr production 3.5 hr breakdown	Drizzle all morning. Read line 80300N (378200E-377800E). Transmitter got wet and blew up all fuses. Went back to Rosebery to buy new set of fuses.

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DATE	PRODUCTION	DETAILS
15.10.98	11 hr production	Rain all night. Read line 80300N (377800E-376550E). End of survey.
16.10.98	demobilisation	Packed up equipment and left Rosebery to Burnie. Sylvester and Keith flew back to Sydney.
17.10.98	demobilisation	Vehicle left Burnie to Victoria by ferry.
18.10.98	demobilisation	Vehicle arrived in Sydney.

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3.2 Data acquired

All IP data were recorded on an ELREC 6 receiver. Measured primary voltage, chargeability and apparent resistivity (derived by IRIS firmware) data were recorded in Field notebooks as primary quality control procedures. Data were transferred from the ELREC 6 to computer at the conclusion of each day's work. In-field data processing was completed as necessary. Final quality control was undertaken at the Sydney office of Geoterrex-Dighem Pty. Ltd.

3.3 Survey procedures

The time-domain IP survey described in this logistics report was conducted using equipment described in Table 1. Current was transmitted using a portable Huntec LOPO M-4 transmitter powered by a 36V battery pack. Current was transmitted at a frequency of 0.125 Hz. Current electrodes were carefully prepared using metal stakes to ensure electrical continuity between electrode and the ground. Non-polarisable porous pots were used for potential electrodes. Like the current electrodes, these were carefully prepared using a copper sulphate solution to ensure electrical continuity between electrode and ground. To further reduce noise levels, the receiver case was grounded at each station.

For the dipole-dipole survey an *a* spacing of 50 m was used. Measurements were made for all current and dipole separations, n = 1 to 4.

3.4 Survey statistics

The dipole-dipole survey was completed along the 7 lines of varying length with a coverage about 13 km. The coverage is summarised in Table 3.

Table 3. Mt. Kershaw-Chester grid

LINE	START	END	COVERAGE (m)
80300N	76500E	78225E	1725
80500N	76400E	78225E	1825
80700N	76400E	78225E	1825
80900N	76400E	78475E	2075
81100N	76450E	78425E	1975
81300N	76400E	78175E	1775
81500N	76400E	77975E	1575
		Total:	12775

3.5 Survey data presentation

In general, survey data were processed using the GEOSOFT suite of programmes. Apparent resistivity, chargeability and SEM data were reduced, gridded then contoured for final presentation. Contours were then coloured. Data were posted on the pseudosections dipole-dipole data.

With regard to colouring of data images, usual conventions were followed. From the visible-light spectrum, blacks and blues correspond to regions where the contoured quantity is low, while yellows and reds correspond to regions where the contoured quantity is high. Greens are mid range values.

In order that aesthetics of apparent resistivity data are improved, the above colour scheme was reversed for these data. Thus, yellows, reds and whites indicate regions of successively higher conductivity; blacks indicate regions of high resistivity.

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4. References

Bishop, J. R. and Tyne, E. D. (1993), 'IP and EM Workshop', Course notes.

Dolan, W. M. and McLaughlin, G. H. (1967), 'Considerations concerning measurement standards and design of IP equipment, parts 1 and 2', *in* 'Proceedings of the Symposium on Induced Electrical Polarisation, University of California.

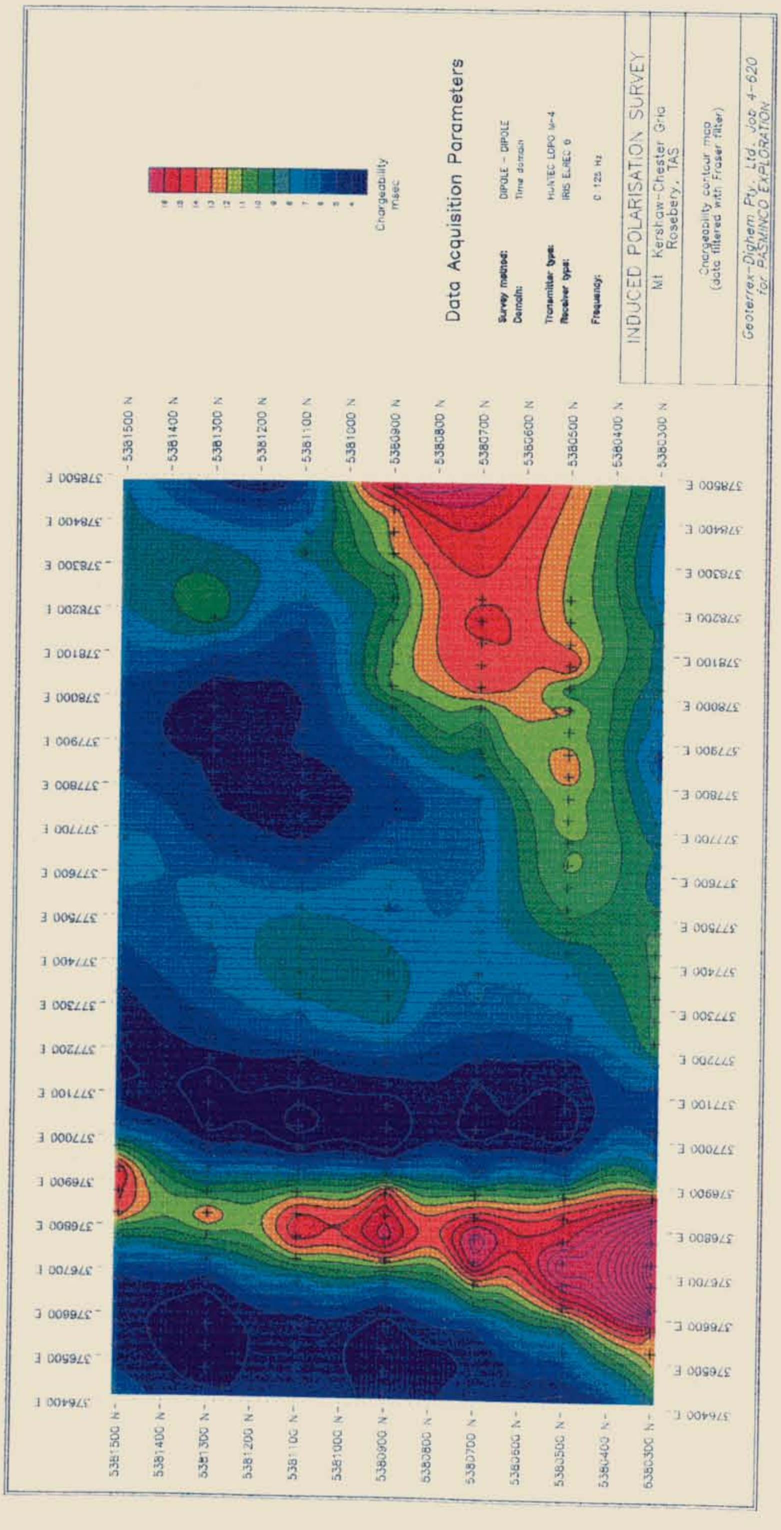
Emerson, D. W. (ed.) (1980), 'The geophysics of the Elura orebody', Australian Society of Exploration Geophysicists.

IRIS Instruments (1994), 'ELREC 6 operating manual, Revised 9.4'

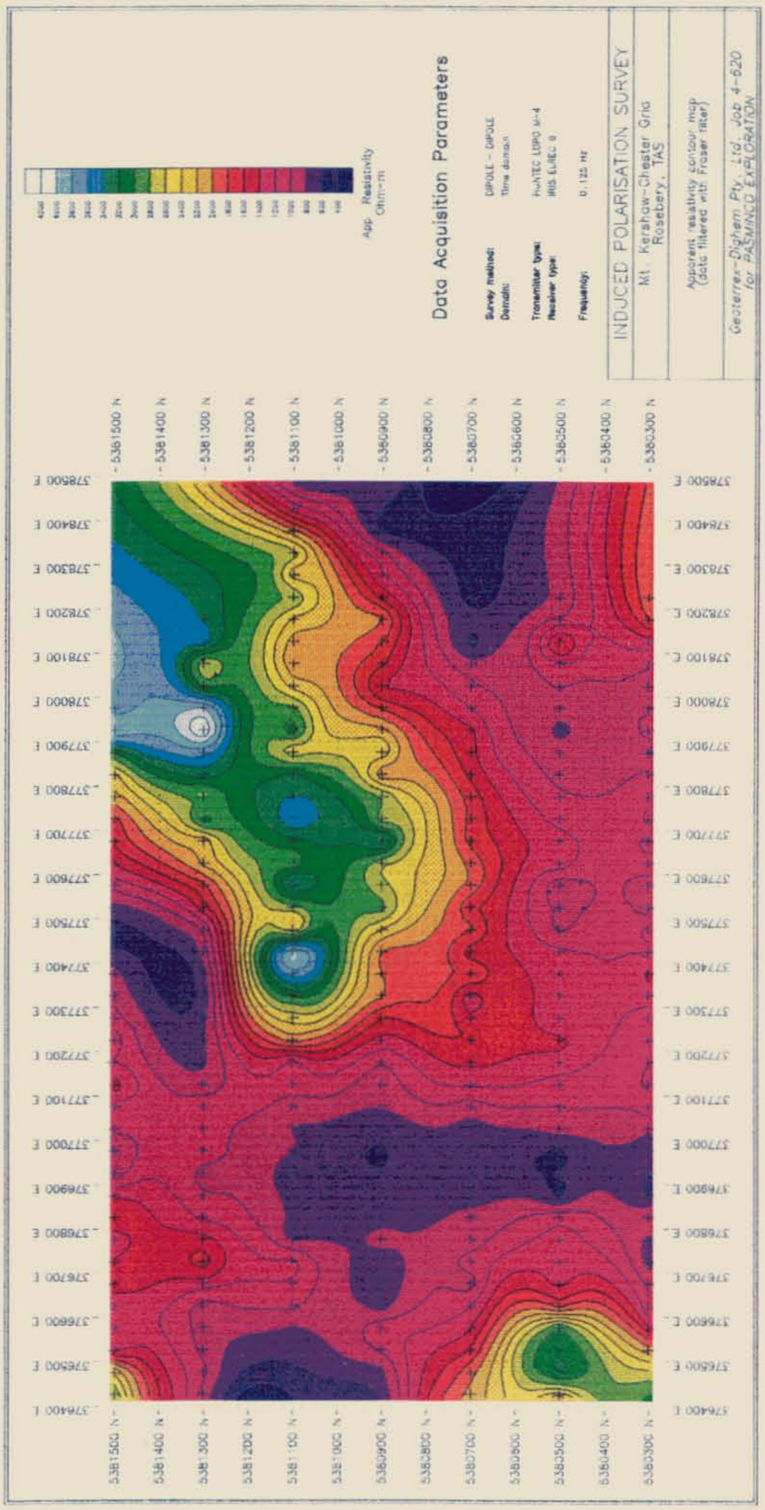
Sumner, J. S. (1976), 'Principles of induced polarisation for geophysical exploration', Elsevier Publishing, Amsterdam, 277pp.

CONTOUR MAPS

MT KERSHAW-CHESTER GRID



Chargeability contour map (filtered).



Apparent resistivity contour map (filtered).

Appendices

A Equipment specifications

A 1 ELREC 6 multichannel receiver

Information contained in this Appendix was compiled using the IRIS ELREC 6 Instruction Manual.

Table A 1.1 ELREC 6 - General information

Item	Range/Value	Notes
Description	Multiple-channel digital electromagnetic receiver	
Frequency range	to 0.5 Hz	
Number of channels	6 input channels	
Survey capabilities	resistivity, IP time and frequency domain	
Software languages	C, 80x86-assembly	
Power source	12 V rechargeable battery	40-100 hours in operation at 20 °C
Operating temperature range	-40°C to +70°C	to -40°C with optimal LCD heater
Operating humidity range	0 to 100%	operable in direct rain
Noise rejection	50 to 60 Hz power line rejection	
Memory capacity	2505 measurements	
Chargeability resolution	0.1 mV/V	

A 2 HUNTEC LOPO M-4 IP transmitter

Table A 2.1 LOPO M-4 Output

Item	Value	Notes
Maximum current	1.5 A DC	
Maximum voltage	1800 Volts DC	
Load range	zero to infinity ohms in five ranges	
Max Load power	in excess of 160 watts at 75% efficiency	Range 1: 100ohms-230ohms Range 2: 230ohms-520ohms Range 3: 520ohms-1200ohms Range 4: 1200ohms-2700ohms Range 5: 2700ohms-6100ohms
Load current	continuously adjustable max/min current 15:1	when the transmitter is operated at half of its available output current it will hold this current constant to within 1% while the load resistance changes by ±100%, or when the input voltage changes by ±20% of its original value
Turn on time	less than 10^{-3} sec	
Turn off time	less than 10^{-3} sec	
Cycle time	2, 4, 8, 16 sec	
Duty ratio	1:1, 1.28:1, 1.67:1, 2.2:1	
Timing accuracy	± 0.01%	

Table A 2.2 LOPO M-4 Input

Item	Value
Voltages	24 and 36 Volts DC
Maximum current	12 Amperes @ 36V 2 Amperes @ 24V
Batteries	six GC-680-1 lead acid Gel/Cel, 8 Ah

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P.W. Edwards
F.C. Murphy
M. Whitbread

January 1999

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APPENDIX 2

RESOURCE CALCULATIONS

BROWNS TUNNEL AND SOUTHERN TRENCHES

PASMINCO ROSEBERY MINE
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APPENDIX 2
RESOURCE CALCULATIONS

BROWNS TUNNEL RESOURCE - NO MINING PARAMETERS APPLIED

The following sections were used to generate the geological inferred resource based on sections 5290N, 5330N, 5370N.

- Only the near surface intercepts were included in the resource. These roughly correspond to "Lens 1" of Mike Quayle 1996.
- Mineralisation boundaries were interpreted on section using $20TMU, $40 TMU and $60 TMU cut off grades. Lithological and structural controls were used to define the shapes. TMUs are calculated values of the ore based on Pasminco's 1998/99 financial year plan prices, recoveries and $US:$Aus exchange rates as shown on the drill logs.
- No minimum mining width restrictions were applied to the blocks.
- The shapes were digitised using guide and saved as string files.
- These string files were snapped to drillholes so that only those assays relevant to a string would carry any weight in the string weighted averages.
- The snapped string files were then made planar and assigned influence values of +/-20m.
- A sectional resource was then generated by importing the planar snapped string files into Rescalc (Datamine). This only generated tonnes and grade for the individual blocks and a total for each section. Densities are calculated from metal grades using the standard Pasminco formula.
- The output text files from Rescalc were imported into Excel and tonne weighted averages were used to generate: a total resource ($20 TMU and above); $40-$60 and above TMU resource; and >$60 resource. Resources were generated for each section and compared with the Rescalc totals to ensure accuracy. Where Fe assays were missing, an arbitrary Fe value (approximately average of the other Fe values in the block) was inserted. This did not affect the TMU values.

The calculations are shown broken down by block and drill intercept in Tables 1-3, by for $20-40 TMU blocks, 40-60 TMU blocks and > $60 TMU blocks, by blocks only on Tables 4-6 and as a summary above the 3 cut-off grades on Table 7. Shapes are shown on the relevant plans in this appendix.

BROWNS TUNNEL RESOURCE - 3 METRE MINIMUM MINING WIDTH APPLIED

Resource estimates were calculated for $40, $50 and $60 TMU cut-offs with a 3m minimum horizontal mining width applied using the mineralised outlines defined in the previous section.

Drill intersections used are shown on Table 8 and the resource estimates by section shown on Table 9. Blocks defined are shown on the relevant plans included in the appendix.

SOUTHERN TRENCHES

A similar methodology was followed for Southern Trenches except that only one section, 4405N, was used and a +/-10m envelope was used, not +/-20m.

Details are contained in the attached Tables 10-14 and blocks shown on the relevant plans in this appendix.

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RESOURCE CALCULATIONS

TABLE ONE: BROWNS TUNNEL RESOURCE CALCULATIONS BY INTERVAL AND BLOCK, LINE 5290N

BLOCK	BHID	FROM	TO	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	AVTMU $	CALCTMU $	INFL m	AREA sq m	VOL cu m	SG	TONNES
290L1	001B	35.4	36.7	0.4	1.6	0.13	1	0.1	3.1	25.29	0.17	-	-	-	2.92	-
SUBTOT		-	-	0.4	1.6	0.13	1	0.1	3.1	25.29	0.17	40	5.76	230.44	2.92	672.16
290L10	002B	35.4	36.5	0.5	1.8	0.05	12	0.2	3.9	30.31	1.28	-	-	-	2.94	-
SUBTOT		-	-	0.5	1.8	0.05	12	0.2	3.9	30.31	1.28	40	3.33	133.17	2.94	392.17
290L11	002B	32.6	34.4	0.1	1.56	0.05	6.33	0.82	2.04	29.56	0.76	-	-	-	2.88	-
SUBTOT		-	-	0.1	1.56	0.05	6.33	0.82	2.04	29.56	0.76	40	4.1	163.93	2.88	472.01
290L12	002B	27.7	28.8	0.1	1.47	0.01	2	0.1	2.05	20.93	0.26	-	-	-	2.88	-
SUBTOT		-	-	0.1	1.47	0.01	2	0.1	2.05	20.93	0.26	40	6.86	274.37	2.88	789.74
290L13	BT2	9.3	17.4	0.44	0.65	0.18	16.01	0.42	0	19.27	1.67	-	-	-	2.82	-
290L13	002B	19.1	20.1	0.3	0.8	0.18	15	0.4	1.9	19.87	1.56	-	-	-	2.87	-
290L13	002B	21.1	21.3	0.7	1	0.04	10	0.3	3.3	21.39	1.07	-	-	-	2.92	-
290L13	002B	21.8	22.1	0.7	1	0.04	10	0.3	3.3	21.39	1.07	-	-	-	2.92	-
290L13	002B	22.6	24.3	0.7	1.26	0.09	4.29	0.14	3.05	22.97	0.5	-	-	-	2.92	-
SUBTOT		-	-	0.48	0.77	0.16	13.89	0.37	0.77	19.97	1.45	40	73.12	2924.7	2.84	8312.7
290L14	002B	15.9	18.1	0.68	0.89	0.36	25.55	0.31	2.07	26.3	2.62	-	-	-	2.88	-
SUBTOT		-	-	0.68	0.89	0.36	25.55	0.31	2.07	26.3	2.62	40	2.8	112.01	2.88	323.16
290L15	002B	42	43	0.5	1.9	0.09	13	0.4	3.5	33.99	1.4	-	-	-	2.93	-
SUBTOT		-	-	0.5	1.9	0.09	13	0.4	3.5	33.99	1.4	40	0.58	23.28	2.93	68.32
290L16	012B	43	44	1	1.6	0.05	11	0.2	3.4	30.11	1.19	-	-	-	2.94	-
SUBTOT		-	-	1	1.6	0.05	11	0.2	3.4	30.11	1.19	40	1.8	71.92	2.94	211.33
290L17	EAF4	41	42.3	0.55	1.53	0.06	7.54	0.29	0	27.16	0.84	-	-	-	2.83	-
SUBTOT		-	-	0.55	1.53	0.06	7.54	0.29	0	27.16	0.84	40	3.07	122.74	2.83	347.6
290L18	EAF3	32	33	0.43	1	0.32	21	0.33	0	25.39	2.16	-	-	-	2.82	-
290L18	EAF4	32.9	34.4	0.17	0.68	0.24	8	0.11	0	14.68	0.84	-	-	-	2.81	-
SUBTOT		-	-	0.28	0.81	0.27	13.2	0.2	0	18.96	1.37	40	11.4	455.87	2.82	1284.57
290L19	012B	37.6	38.1	0.3	1.3	0.06	12	0.1	2.6	22.05	1.25	-	-	-	2.9	-
SUBTOT		-	-	0.3	1.3	0.06	12	0.1	2.6	22.05	1.25	40	0.52	20.76	2.9	60.12
290L2	BT2	33.7	35	2.33	4.67	0.65	24	0.37	0	89.9	2.65	-	-	-	2.92	-
290L2	011B	26.3	29.5	0.72	1.38	0.17	9.56	0.1	1.83	25.94	1.03	-	-	-	2.88	-
SUBTOT		-	-	1.18	2.38	0.31	13.73	0.18	1.3	44.42	1.5	40	5.54	221.66	2.89	641.44
290L3	BT2	25.9	28.9	0.91	2.42	0.07	4.47	0.06	0	38.16	0.55	-	-	-	2.85	-
290L3	012B	25.1	25.5	0.6	1.2	0.11	9	0.3	3.8	24.08	0.98	-	-	-	2.94	-
SUBTOT		-	-	0.88	2.28	0.07	5	0.09	0.45	36.5	0.6	40	7.84	313.43	2.86	896.72
290L4	EAF3	82	83	0.65	1.04	0.14	7	0.17	0	21.17	0.77	-	-	-	2.83	-
SUBTOT		-	-	0.65	1.04	0.14	7	0.17	0	21.17	0.77	40	1.28	51.23	2.83	144.88
290L5	001B	50.5	51.4	0.3	1	0.03	19	0.2	4.9	19.94	1.94	-	-	-	2.96	-
SUBTOT		-	-	0.3	1	0.03	19	0.2	4.9	19.94	1.94	40	1.49	59.62	2.96	176.39
290L6	011B	31.5	32.8	0.3	1.7	0.09	3	0.1	1.8	25.97	0.37	-	-	-	2.88	-
SUBTOT		-	-	0.3	1.7	0.09	3	0.1	1.8	25.97	0.37	40	3.34	133.67	2.88	384.8
290L7	BT2	22.7	24.3	1.2	1.3	0.03	3	0.07	0	24.41	0.38	-	-	-	2.84	-
SUBTOT		-	-	1.2	1.3	0.03	3	0.07	0	24.41	0.38	40	1.9	75.97	2.84	215.95
290L8	011B	37.2	38.2	0.1	1.6	0.04	13	0.1	1.6	24.85	1.35	-	-	-	2.87	-
SUBTOT		-	-	0.1	1.6	0.04	13	0.1	1.6	24.85	1.35	40	1.95	78	2.87	223.65
290L9	012B	29.6	30.6	0.2	1.2	0.09	9	0.3	3.2	21.8	0.97	-	-	-	2.91	-

BLOCK	BHID	FROM	TO	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	AVTMU $	CALCTMU $	INFL m	AREA sq m	VOL cu m	SG	TONNES
SUBTOT		-	-	0.2	1.2	0.09	9	0.3	3.2	21.8	0.97	40	2.83	113.19	2.91	329.34
290M1	001B	36.7	37.9	1.6	2.5	0.22	9	0.1	2.3	45.53	1.03	-	-	-	2.93	-
SUBTOT		-	-	1.6	2.5	0.22	9	0.1	2.3	45.53	1.03	40	5.29	211.47	2.93	620.2
290M2	001B	38.9	39.9	1.2	2.8	0.52	24	0.1	2.4	53.42	2.52	-	-	-	2.93	-
SUBTOT		-	-	1.2	2.8	0.52	24	0.1	2.4	53.42	2.52	40	3.61	144.51	2.93	423.73
290M3	012B	22.8	23.5	0.3	0.1	1	162	0.2	8.2	44.58	16.09	-	-	-	3.05	-
290M3	012B	24	24.7	0.9	2.3	0.6	22	0.3	7	47.72	2.32	-	-	-	3.06	-
SUBTOT		-	-	0.6	1.2	0.8	92	0.25	7.6	46.15	9.21	40	6.6	263.84	3.05	805.87
290M4	BT2	21.4	22.7	1.37	2.42	0.09	5	0.05	0	40.64	0.62	-	-	-	2.86	-
SUBTOT		-	-	1.37	2.42	0.09	5	0.05	0	40.64	0.62	40	1.64	65.49	2.86	187.35
290M5	002B	38	39	0.9	2.2	0.15	25	0.6	4.9	44.48	2.63	-	-	-	2.99	-
SUBTOT		-	-	0.9	2.2	0.15	25	0.6	4.9	44.48	2.63	40	1.82	72.73	2.99	217.44
290M6	002B	27.2	27.7	0.7	1.2	0.11	31	1.6	6.2	39.9	3.29	-	-	-	3.01	-
SUBTOT		-	-	0.7	1.2	0.11	31	1.6	6.2	39.9	3.29	40	1.99	79.62	3.01	239.68
290M7	012B	46.6	48	1.1	3.4	0.03	12	0.4	3.7	55.62	1.37	-	-	-	2.97	-
SUBTOT		-	-	1.1	3.4	0.03	12	0.4	3.7	55.62	1.37	40	5.08	203.06	2.97	604.07
290M8	EAF3	33	35.7	0.67	2.37	0.54	19	0.42	0	47.29	2.03	-	-	-	2.85	-
SUBTOT		-	-	0.67	2.37	0.54	19	0.42	0	47.29	2.03	40	21.95	878.03	2.85	2499.86
290U1	BT2	28.9	33.7	4.86	9.87	0.71	37.85	0.27	0	169.91	4.25	-	-	-	3.05	-
290U1	BT2	35	44.5	6.73	10.01	0.86	46.6	0.65	0	187.65	5.22	-	-	-	3.09	-
290U1	001B	37.9	38.9	2.9	4.3	0.38	14	0.1	1.9	78.2	1.63	-	-	-	2.98	-
290U1	011B	24.4	26.3	5.5	9.57	1.97	41	1.37	5.51	193.71	4.72	-	-	-	3.25	-
290U1	012B	24.7	25.1	5.6	7	0.34	21	0.4	9.5	130.41	2.52	-	-	-	3.34	-
SUBTOT		-	-	5.84	9.53	0.9	41.18	0.59	0.92	175.94	4.63	40	78.95	3157.94	3.09	9772.73
290U2	002B	34.4	35.4	1.4	5.2	0.27	51	1	5.4	95.34	5.36	-	-	-	3.06	-
290U2	012B	32.5	34.1	1.2	10.59	1.27	30.25	0.24	7.64	165.06	3.42	-	-	-	3.22	-
SUBTOT		-	-	1.28	8.52	0.89	38.23	0.53	6.78	138.25	4.16	40	21.16	846.41	3.16	2672.63
290U3	002B	25.6	27.2	1.12	3.16	0.12	31.87	1.75	3.05	69.1	3.46	-	-	-	2.95	-
290U3	012B	35.3	37.6	1.32	9.73	0.75	133.83	0.4	5.34	168.34	13.64	-	-	-	3.13	-
SUBTOT		-	-	1.24	7.03	0.49	92	0.95	4.4	127.63	9.46	40	13.29	531.55	3.05	1623.54
290U4	EAF4	50.9	52.3	9.34	25.47	0.68	264.89	1.22	0	442.88	27.42	-	-	-	3.43	-
SUBTOT		-	-	9.34	25.47	0.68	264.89	1.22	0	442.88	27.42	40	4.25	169.99	3.43	582.52
290U5	EAF4	43.3	44.9	4.55	7.97	1.44	60.67	0.6	0	158.87	6.49	-	-	-	3.01	-
SUBTOT		-	-	4.55	7.97	1.44	60.67	0.6	0	158.87	6.49	40	5.16	206.27	3.01	621.61
290U6	EAF3	35.7	38.5	8.55	13.56	1.49	90.64	14.14	0	376.35	11.09	-	-	-	3.2	-
290U6	EAF4	34.4	39.7	0.92	1.84	0.48	26.57	4.19	0	75.42	3.14	-	-	-	2.85	-
290U6	012B	50.8	52.5	0.45	3.31	0.37	23	10.95	2.88	149.47	3.49	-	-	-	2.94	-
SUBTOT		-	-	3.02	5.44	0.75	44.26	8.2	0.5	174.25	5.47	40	28.72	1148.95	2.95	3394.56
290U7	002B	20.1	21.1	1.6	3.4	0.14	16	0.4	3.3	60.14	1.78	-	-	-	2.97	-
SUBTOT		-	-	1.6	3.4	0.14	16	0.4	3.3	60.14	1.78	40	1.2	48	2.97	142.78
TOTAL		-	-	**2.33**	**4.88**	**0.51**	**33.19**	**1.1**	**1.69**	**96.47**	**3.63**		**340.19**	**13607.79**	**2.97**	**40355.63**

TABLE 2: BROWNS TUNNEL RESOURCE CALCULATIONS BY INTERVAL AND BLOCK, LINE 5330N

BLOCK	BHID	FROM	TO	COMPS	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	AVTMU $	CALCTMU $	INFL m	AREA sq m	VOL cu m	SG	TONNES
330L1	006B	62.8	63.8	10	0.7	1.1	0.06	6	0.1	1.8	20.45	0.66	-	-	-	2.88	-
SUBTOT		-	-	10	0.7	1.1	0.06	6	0.1	1.8	20.45	0.66	40	3.15	125.64	2.88	362.34
330L2	EAF6	60.6	61.6	10	0.41	1.9	0.13	16	0.01	0	31.06	1.66	-	-	-	2.83	-
330L2	EAF6	70.2	70.3	1	0.69	1.25	0.25	14	0.07	0	25.65	1.46	-	-	-	2.83	-
330L2	004B	55.6	56.8	12	1.2	1.8	0.13	1	0.1	5.2	31.98	0.21	-	-	-	3	-
330L2	004B	73.9	76.5	46	0.41	1.11	0.39	41.17	0.11	5.69	29.21	4.14	-	-	-	2.99	-
330L2	004B	80.5	81.5	10	0.3	0.8	0.22	25	0.1	6.6	19.69	2.52	-	-	-	3.01	-
330L2	004B	82.5	83.1	6	0.2	2.2	0.23	16	0.1	6.5	35.62	1.67	-	-	-	3.02	-
330L2	004B	87.1	88.8	17	0.1	1.67	0.2	7.35	0.15	6.54	29.57	0.81	-	-	-	3.02	-
330L2	006B	44	46	20	1.4	1.8	0.1	8	0.1	2.35	33.91	0.9	-	-	-	2.92	-
330L2	006B	49.3	50.9	16	0.6	0.7	0.03	11	0.6	5.2	19.69	1.19	-	-	-	2.97	-
330L2	006B	54.4	57.3	29	0.51	1.13	0.05	16.76	1.28	4.14	31.99	1.84	-	-	-	2.94	-
SUBTOT		-	-	167	0.58	1.35	0.19	20.2	0.36	4.73	29.34	2.1	40	234.24	9369.7	2.97	27786.72
330M1	004B	63.2	64.2	10	1.4	2.5	0.19	15	0.2	2.4	46.1	1.63	-	-	-	2.93	-
SUBTOT		-	-	10	1.4	2.5	0.19	15	0.2	2.4	46.1	1.63	40	1.16	46.41	2.93	136.04
330M2	004B	61.2	62.2	10	1.3	2.6	0.14	14	1.2	3.1	54.92	1.63	-	-	-	2.95	-
SUBTOT		-	-	10	1.3	2.6	0.14	14	1.2	3.1	54.92	1.63	40	2.2	88.15	2.95	260.1
330M3	EAF6	67.4	69.4	20	1.24	2.32	0.17	12.5	0.11	0	41.56	1.36	-	-	-	2.86	-
SUBTOT		-	-	20	1.24	2.32	0.17	12.5	0.11	0	41.56	1.36	40	17.16	686.25	2.86	1960.78
330M4	004B	72.7	73.9	12	0.9	3.3	0.17	17	0.9	2.3	60.16	1.91	-	-	-	2.93	-
SUBTOT		-	-	12	0.9	3.3	0.17	17	0.9	2.3	60.16	1.91	40	2.18	87.27	2.93	255.53
330M5	EAF6	62.4	63.4	10	0.39	2.82	0.15	17	0.09	0	44.03	1.79	-	-	-	2.85	-
330M5	006B	47.2	48.2	10	1.5	2.2	0.12	14	0.7	4.6	46.15	1.57	-	-	-	2.99	-
SUBTOT		-	-	20	0.95	2.51	0.14	15.5	0.4	2.3	45.09	1.68	40	12.44	497.62	2.92	1452.14
330M6	EAF6	54.6	55.6	10	0.36	2.68	0.13	17	0.19	0	42.64	1.6	-	-	-	2.84	-
SUBTOT		-	-	10	0.36	2.68	0.13	17	0.19	0	42.64	1.6	40	13.12	524.61	2.84	1491.5
330M7	EAF6	51.6	52.6	10	0.12	3.38	0.17	18	1.11	0	59.18	2	-	-	-	2.85	-
SUBTOT		-	-	10	0.12	3.38	0.17	18	1.11	0	59.18	2	40	8.34	333.66	2.85	950.01
330M8	EAF6	48.6	49.6	10	0.7	2.61	0.02	15	0.13	0	41.37	1.6	-	-	-	2.85	-
SUBTOT		-	-	10	0.7	2.61	0.02	15	0.13	0	41.37	1.6	40	7.48	299.25	2.85	852.55
330U1	004B	53.8	55.6	18	3.46	4.99	0.31	46.39	2.01	6.39	111.75	5.06	-	-	-	3.14	-
330U1	004B	56.8	61.2	44	5.32	8.77	0.29	60.7	2.76	3.5	179	6.72	-	-	-	3.15	-
SUBTOT		-	-	62	4.79	7.67	0.29	56.55	2.54	4.34	159.48	6.24	40	15.4	615.94	3.15	1939.83
330U2	006B	57.3	58.8	15	3.52	5.4	0.19	27.4	3.44	4.62	125.12	3.33	-	-	-	3.09	-
SUBTOT		-	-	15	3.52	5.4	0.19	27.4	3.44	4.62	125.12	3.33	40	4.99	199.46	3.09	616.55
330U3	EAF6	65.4	67.4	20	3.5	4.3	0.38	16	0.23	0	82.87	1.86	-	-	-	2.93	-
330U3	006B	50.9	54.4	35	2.73	4.14	0.31	20.66	1.79	2.48	90.37	2.44	-	-	-	2.99	-
SUBTOT		-	-	55	3.01	4.2	0.34	18.96	1.22	1.58	87.64	2.23	40	33.38	1335.26	2.97	3962.03
330U4	EAF6	61.6	62.4	8	1.01	8.97	0.69	25	0.55	0	138.36	2.86	-	-	-	2.94	-
330U4	006B	46	47.2	12	2.4	5.2	0.27	13	2.8	1.8	109.55	1.81	-	-	-	2.97	-
SUBTOT		-	-	20	1.84	6.71	0.44	17.8	1.9	1.08	121.08	2.23	40	11.3	451.85	2.96	1338.24
330U5	EAF6	55.6	59.6	40	4.46	14.52	0.9	138.25	0.49	0	249.7	14.34	-	-	-	3.11	-
SUBTOT		-	-	40	4.46	14.52	0.9	138.25	0.49	0	249.7	14.34	40	41.06	1642.55	3.11	5103.69
330U6	EAF6	52.6	54.6	20	1.01	4.38	0.23	34	0.64	0	76.18	3.6	-	-	-	2.88	-
SUBTOT		-	-	20	1.01	4.38	0.23	34	0.64	0	76.18	3.6	40	23.43	937.22	2.88	2696.63
330U7	EAF6	49.6	50.6	10	0.12	5.01	0.12	17	0.33	0	72.67	1.88	-	-	-	2.87	-
SUBTOT		-	-	10	0.12	5.01	0.12	17	0.33	0	72.67	1.88	40	9.12	364.72	2.87	1046.15
330U8	006B	48.2	49.3	11	7.6	9.6	0.45	48	1.7	8.7	191.75	5.46	-	-	-	3.42	-
SUBTOT		-	-	11	7.6	9.6	0.45	48	1.7	8.7	191.75	5.46	40	4.31	172.33	3.42	589.57
330U9	006B	43	44	10	2.5	4.8	0.39	15	0.3	4.2	84.66	1.75	-	-	-	3.04	-
SUBTOT		-	-	10	2.5	4.8	0.39	15	0.3	4.2	84.66	1.75	40	2.28	91.09	3.04	277.33
TOTAL		-	-	522	1.48	3.76	0.27	32.95	0.62	3.06	70.63	3.49	760	446.73	17869.17	2.97	53079.92

TABLE 3: BROWNS TUNNEL RESOURCE CALCULATIONS BY INTERVAL AND BLOCK, LINE 5370N

BLOCK	BHID	FROM	TO	COMPS	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	AVTMU $	CALCTMU $	INFL m	AREA sq m	VOL cu m	SG	TONNES
370L1	007B	104.8	105.8	10	0.4	1.1	0.14	7	0.1	1	19.99	0.75	-	-	-	2.85	-
SUBTOT		-	-	10	0.4	1.1	0.14	7	0.1	1	19.99	0.75	40	2.06	82.37	2.85	234.83
370L2	EAF8	79	81	20	0.26	1.41	0.07	5	0.36	0	24.47	0.58	-	-	-	2.82	-
370L2	EAF8	83	88	50	0.33	1.6	0.09	6	0.29	0	27.02	0.68	-	-	-	2.83	-
SUBTOT		-	-	70	0.31	1.55	0.08	5.71	0.31	0	26.29	0.66	40	85.01	3400.52	2.83	9614.7
370L3	007B	82	84.2	22	0.19	1.03	0.11	14.18	0.24	5.45	20.12	1.47	-	-	-	2.97	-
SUBTOT		-	-	22	0.19	1.03	0.11	14.18	0.24	5.45	20.12	1.47	40	9.01	360.33	2.97	1071.41
370L4	007B	76.7	81	43	0.38	1.59	0.14	25.19	0.22	7.41	30.54	2.58	-	-	-	3.05	-
SUBTOT		-	-	43	0.38	1.59	0.14	25.19	0.22	7.41	30.54	2.58	40	29.55	1182.14	3.05	3601.21
370L5	EAF10	103	104	10	0.48	1.52	0.19	16	0.18	0	28.74	1.67	-	-	-	2.83	-
370L5	EAF10	111	112	10	0.09	1.46	0.94	23	0.12	0	35.12	2.36	-	-	-	2.82	-
370L5	007B	65.2	66.9	17	0.24	1.69	0.08	5.12	0.1	2.45	25.73	0.58	-	-	-	2.9	-
370L5	008B	114.2	117	28	0.46	1.03	0.09	20.07	0.11	4.17	21.27	2.05	-	-	-	2.94	-
370L5	008B	118	120	20	0.35	1.75	0.36	32.5	0.1	4.95	35.1	3.3	-	-	-	2.97	-
370L5	008B	122	124.3	23	0.2	1.28	0.2	17.04	0.1	3.55	23.81	1.75	-	-	-	2.92	-
370L5	008B	127	130	30	0.17	1.93	0.1	10.33	0.1	2.97	29.72	1.1	-	-	-	2.91	-
370L5	008B	130.9	131.9	10	0.1	2.3	0.23	16	0.1	2.8	36.6	1.67	-	-	-	2.91	-
370L5	008B	137	138.6	16	0.26	2.22	0.11	6	0.1	1.99	33.29	0.68	-	-	-	2.89	-
SUBTOT		-	-	164	0.27	1.64	0.21	16.14	0.11	2.98	28.73	1.67	40	262.34	10493.55	2.91	30548.85
370L6	008B	124.5	125	5	0.6	2.3	0.11	14	0.1	3.1	37.45	1.49	-	-	-	2.93	-
SUBTOT		-	-	5	0.6	2.3	0.11	14	0.1	3.1	37.45	1.49	40	1.13	45.36	2.93	132.95
370L7	008B	133.1	134	9	0.1	2.2	0.19	18	0.1	3	35.2	1.87	-	-	-	2.92	-
SUBTOT		-	-	9	0.1	2.2	0.19	18	0.1	3	35.2	1.87	40	11.02	440.98	2.92	1285.78
370M1	EAF10	140	141	10	0.87	3.38	0.17	8	0.11	0	52.52	0.94	-	-	-	2.86	-
SUBTOT		-	-	10	0.87	3.38	0.17	8	0.11	0	52.52	0.94	40	8.88	355.12	2.86	1016.74
370M2	EAF8	81	83	20	0.29	3.07	0.21	9.5	0.11	0	46.31	1.06	-	-	-	2.85	-
SUBTOT		-	-	20	0.29	3.07	0.21	9.5	0.11	0	46.31	1.06	40	17.25	690.09	2.85	1964.76
370M3	007B	75.7	76.7	10	0.6	2.8	0.19	17	0.5	2.4	48.87	1.84	-	-	-	2.92	-
SUBTOT		-	-	10	0.6	2.8	0.19	17	0.5	2.4	48.87	1.84	40	2.81	112.42	2.92	328.01
370M4	EAF10	109	111	20	0.12	3.03	0.34	33.5	0.58	0	54.8	3.48	-	-	-	2.84	-
370M4	008B	136	137	10	0.2	3.5	0.18	18	0.1	2.6	52.43	1.91	-	-	-	2.92	-
SUBTOT		-	-	30	0.15	3.19	0.29	28.33	0.42	0.87	54.01	2.96	40	37.65	1505.83	2.87	4321.57
370M5	EAF10	105	106	10	0.8	2.71	0.18	26	0.21	0	47.66	2.71	-	-	-	2.85	-
370M5	008B	130	130.6	6	0.1	3.6	0.12	13.01	0.1	2.4	51.67	1.41	-	-	-	2.92	-
SUBTOT		-	-	16	0.54	3.04	0.16	21.13	0.17	0.9	49.16	2.22	40	28.99	1159.54	2.88	3335.68
370M6	008B	120	122	20	0.35	2.5	0.58	44.5	0.15	6.3	49.92	4.52	-	-	-	3.03	-
SUBTOT		-	-	20	0.35	2.5	0.58	44.5	0.15	6.3	49.92	4.52	40	29.88	1195.18	3.03	3616.6

BLOCK	BHID	FROM	TO	COMPS	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	AVTMU $	CALCTMU $	INFL m	AREA sq m	VOL cu m	SG	TONNES
370U1	EAF10	137	140	30	0.08	8.61	0.51	4.33	0.14	0	119.64	0.73	-	-	-	2.92	-
370U1	007B	101	102	10	1.5	1.9	0.17	26	4.6	4.2	79.19	3.14	-	-	-	2.98	-
SUBTOT		-	-	40	0.44	6.93	0.43	9.75	1.26	1.05	109.52	1.33	40	27.57	1102.76	2.93	3233.59
370U2	EAF10	112	116	40	0.39	10.55	1.54	50	0.37	0	168.13	5.37	-	-	-	2.96	-
370U2	007B	70.2	70.5	3	1.1	6.2	5.63	123.99	2.5	18.3	193.65	12.91	-	-	-	3.58	-
SUBTOT		-	-	43	0.44	10.25	1.82	55.16	0.52	1.28	169.91	5.89	40	44.96	1798.26	2.99	5379.05
370U3	EAF10	106	109	30	0.36	5.7	0.54	26	0.21	0	88.13	2.8	-	-	-	2.88	-
370U3	008B	130.6	130.9	3	0.9	38.3	0.45	142.98	0.4	9.3	534.17	15.4	-	-	-	3.82	-
370U3	008B	132.6	133.1	5	0.2	4.9	0.5	35	0.2	4.5	78.06	3.65	-	-	-	3	-
SUBTOT		-	-	38	0.38	8.17	0.53	36.42	0.23	1.33	122.02	3.9	40	69.06	2762.43	2.96	8167.55
370U4	008B	131.9	132	1	0.2	12.2	0.58	29.99	0.2	4.5	172.52	3.39	-	-	-	3.11	-
SUBTOT		-	-	1	0.2	12.2	0.58	29.99	0.2	4.5	172.52	3.39	40	0.1	4.08	3.11	12.71
370U5	EAF10	102	103	10	2.08	3.68	0.15	31	0.66	0	71.31	3.31	-	-	-	2.89	-
370U5	008B	125	127	20	0.35	5.35	0.38	21.5	0.1	4.15	80.03	2.32	-	-	-	3	-
SUBTOT		-	-	30	0.93	4.79	0.3	24.67	0.29	2.77	77.12	2.65	40	36.44	1457.67	2.96	4320.09
370U6	EAF10	98	101	30	5.96	26.36	2.16	175	2.39	0	448.18	18.61	-	-	-	3.35	-
SUBTOT		-	-	30	5.96	26.36	2.16	175	2.39	0	448.18	18.61	40	33.64	1345.67	3.35	4509.03
TOTAL		-	-	611	0.65	4.64	0.45	29.86	0.36	2.21	77.01	3.17	760	737.36	29494.3	2.94	86695.12

TABLE 4: BROWNS TUNNEL RESOURCE CALCULATIONS: SUBTOTALS BY BLOCK AND SECTION FOR $20-$40 TMU BLOCKS

BLOCK		Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	AVTMU $	CALCTMU $	INFL m	AREA sq m	VOL cu m	SG	TONNES
5290N														
290L1	SUBTOT	0.4	1.6	0.13	1	0.1	3.1	25.29	0.17	40	5.76	230.44	2.92	672.16
290L10	SUBTOT	0.5	1.8	0.05	12	0.2	3.9	30.31	1.28	40	3.33	133.17	2.94	392.17
290L11	SUBTOT	0.1	1.56	0.05	6.33	0.82	2.04	29.56	0.76	40	4.1	163.93	2.88	472.01
290L12	SUBTOT	0.1	1.47	0.01	2	0.1	2.05	20.93	0.26	40	6.86	274.37	2.88	789.74
290L13	SUBTOT	0.48	0.77	0.16	13.89	0.37	0.77	19.97	1.45	40	73.12	2924.7	2.84	8312.7
290L14	SUBTOT	0.68	0.89	0.36	25.55	0.31	2.07	26.3	2.62	40	2.8	112.01	2.88	323.16
290L15	SUBTOT	0.5	1.9	0.09	13	0.4	3.5	33.99	1.4	40	0.58	23.28	2.93	68.32
290L16	SUBTOT	1	1.6	0.05	11	0.2	3.4	30.11	1.19	40	1.8	71.92	2.94	211.33
290L17	SUBTOT	0.55	1.53	0.06	7.54	0.29	0	27.16	0.84	40	3.07	122.74	2.83	347.6
290L18	SUBTOT	0.28	0.81	0.27	13.2	0.2	0	18.96	1.37	40	11.4	455.87	2.82	1284.57
290L19	SUBTOT	0.3	1.3	0.06	12	0.1	2.6	22.05	1.25	40	0.52	20.76	2.9	60.12
290L2	SUBTOT	1.18	2.38	0.31	13.73	0.18	1.3	44.42	1.5	40	5.54	221.66	2.89	641.44
290L3	SUBTOT	0.88	2.28	0.07	5	0.09	0.45	36.5	0.6	40	7.84	313.43	2.86	896.72
290L4	SUBTOT	0.65	1.04	0.14	7	0.17	0	21.17	0.77	40	1.28	51.23	2.83	144.88
290L5	SUBTOT	0.3	1	0.03	19	0.2	4.9	19.94	1.94	40	1.49	59.62	2.96	176.39
290L6	SUBTOT	0.3	1.7	0.09	3	0.1	1.8	25.97	0.37	40	3.34	133.67	2.88	384.8
290L7	SUBTOT	1.2	1.3	0.03	3	0.07	0	24.41	0.38	40	1.9	75.97	2.84	215.95
290L8	SUBTOT	0.1	1.6	0.04	13	0.1	1.6	24.85	1.35	40	1.95	78	2.87	223.65
290L9	SUBTOT	0.2	1.2	0.09	9	0.3	3.2	21.8	0.97	40	2.83	113.19	2.91	329.34
Section Total		**0.49**	**1.13**	**0.15**	**11.44**	**0.29**	**1.17**	**23.56**	**2.86**		**139.51**	**5579.96**	**2.86**	**15947.05**
5330N														
330L1	SUBTOT	0.7	1.1	0.06	6	0.1	1.8	20.45	0.66	40	3.15	125.84	2.88	362.34
330L2	SUBTOT	0.58	1.35	0.19	20.2	0.36	4.73	29.34	2.1	40	234.24	9369.7	2.97	27786.72
Section Total		**0.58**	**1.35**	**0.19**	**20.02**	**0.36**	**4.69**	**29.48**	**2.97**		**237.39**	**9495.54**	**2.97**	**28149.06**
5370N														
370L1	SUBTOT	0.4	1.1	0.14	7	0.1	1	19.99	0.75	40	2.06	82.37	2.85	234.83
370L2	SUBTOT	0.31	1.55	0.08	5.71	0.31	0	26.29	0.66	40	85.01	3400.52	2.83	9614.7
370L3	SUBTOT	0.19	1.03	0.11	14.18	0.24	5.45	20.12	1.47	40	9.01	360.33	2.97	1071.41
370L4	SUBTOT	0.38	1.59	0.14	25.19	0.22	7.41	30.54	2.58	40	29.55	1182.14	3.05	3601.21
370L5	SUBTOT	0.27	1.64	0.21	16.14	0.11	2.98	28.73	1.67	40	262.34	10493.55	2.91	30548.85
370L6	SUBTOT	0.6	2.3	0.11	14	0.1	3.1	37.45	1.49	40	1.13	45.36	2.93	132.95
370L7	SUBTOT	0.1	2.2	0.19	18	0.1	3	35.2	1.87	40	11.02	440.98	2.92	1285.78
Section Total		**0.28**	**1.62**	**0.17**	**14.64**	**0.16**	**2.75**	**28.57**	**2.91**		**400.12**	**16005.25**	**2.91**	**46489.73**
Grand Total		**0.41**	**1.46**	**0.17**	**15.75**	**0.25**	**3.08**	**27.97**	**2.92**		**777.02**	**31080.75**	**2.92**	**90585.84**

TABLE 6: BROWNS TUNNEL RESOURCE CALCULATIONS: SUBTOTALS BY BLOCK AND SECTION FOR \$40-\$60 TMU BLOCKS

BLOCK		Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	AVTMU $	CALCTMU $	INFL m	AREA sq m	VOL cu m	SG	TONNES
5290N														
290M1	SUBTOT	1.6	2.5	0.22	9	0.1	2.3	45.53	1.03	40	5.29	211.47	2.93	620.2
290M2	SUBTOT	1.2	2.8	0.52	24	0.1	2.4	53.42	2.52	40	3.61	144.51	2.93	423.73
290M3	SUBTOT	0.6	1.2	0.8	92	0.25	7.6	46.15	9.21	40	6.6	263.84	3.05	805.87
290M4	SUBTOT	1.37	2.42	0.09	5	0.05	4	40.64	0.62	40	1.64	65.49	2.86	187.35
290M5	SUBTOT	0.9	2.2	0.15	25	0.6	4.9	44.48	2.63	40	1.82	72.73	2.99	217.44
290M6	SUBTOT	0.7	1.2	0.11	31	1.6	6.2	39.9	3.29	40	1.99	79.62	3.01	239.68
290M7	SUBTOT	1.1	3.4	0.03	12	0.4	3.7	55.62	1.37	40	5.08	203.06	2.97	604.07
290M8	SUBTOT	0.67	2.37	0.54	19	0.42	4	47.29	2.03	40	21.95	878.03	2.85	2499.86
Section Total		**0.88**	**2.30**	**0.44**	**28.30**	**0.38**	**4.31**	**48.01**			**47.98**	**1918.75**	**2.92**	**5598.20**
5330N														
330M1	SUBTOT	1.4	2.5	0.19	15	0.2	2.4	46.1	1.63	40	1.16	46.41	2.93	136.04
330M2	SUBTOT	1.3	2.6	0.14	14	1.2	3.1	54.92	1.63	40	2.2	88.15	2.95	260.1
330M3	SUBTOT	1.24	2.32	0.17	12.5	0.11	2	41.56	1.36	40	17.16	686.25	2.86	1960.78
330M4	SUBTOT	0.9	3.3	0.17	17	0.9	2.3	60.16	1.91	40	2.18	87.27	2.93	255.53
330M5	SUBTOT	0.95	2.51	0.14	15.5	0.4	2.3	45.09	1.68	40	12.44	497.62	2.92	1452.14
330M6	SUBTOT	0.36	2.68	0.13	17	0.19	2	42.64	1.8	40	13.12	524.61	2.84	1491.5
330M7	SUBTOT	0.12	3.38	0.17	18	1.11	2	59.18	2	40	8.34	333.66	2.85	950.01
330M8	SUBTOT	0.7	2.61	0.02	15	0.13	2	41.37	1.6	40	7.48	299.25	2.85	852.55
Section Total		**0.79**	**2.65**	**0.14**	**15.26**	**0.38**	**2.12**	**46.15**			**64.08**	**2563.22**	**2.87**	**7358.65**
5370N														
370M1	SUBTOT	0.87	3.38	0.17	8	0.11	1	52.52	0.94	40	8.88	355.12	2.86	1016.74
370M2	SUBTOT	0.29	3.07	0.21	9.5	0.11	1	46.31	1.06	40	17.25	690.09	2.85	1964.76
370M3	SUBTOT	0.6	2.8	0.19	17	0.5	2.4	48.87	1.84	40	2.81	112.42	2.92	328.01
370M4	SUBTOT	0.15	3.19	0.29	28.33	0.42	0.87	54.01	2.96	40	37.65	1505.83	2.87	4321.57
370M5	SUBTOT	0.54	3.04	0.16	21.13	0.17	0.9	49.16	2.22	40	28.99	1159.54	2.88	3335.68
370M6	SUBTOT	0.35	2.5	0.58	44.5	0.15	6.3	49.92	4.52	40	29.88	1195.18	3.03	3616.6
Section Total		**0.37**	**2.97**	**0.31**	**26.48**	**0.23**	**2.28**	**50.97**			**125.46**	**5018.18**	**2.91**	**14583.36**
Grand Total		**0.52**	**2.54**	**0.24**	**22.13**	**0.27**	**2.29**	**44.77**			**237.52**	**9500.15**	**2.90**	**27540.21**

TABLE 6: BROWNS TUNNEL RESOURCE CALCULATIONS: SUBTOTALS BY BLOCK AND SECTION FOR >$60 TMU BLOCKS

BLOCK		Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	AVTMU $	CALCTMU $	INFL m	AREA sq m	VOL cu m	SG	TONNES
5290N														
290U1	SUBTOT	5.84	9.53	0.9	41.18	0.59	0.92	175.94	4.63	40	78.95	3157.94	3.09	9772.73
290U2	SUBTOT	1.28	8.52	0.89	38.23	0.53	6.78	138.25	4.16	40	21.16	846.41	3.16	2672.63
290U3	SUBTOT	1.24	7.03	0.49	92	0.95	4.4	127.63	9.46	40	13.29	531.55	3.05	1623.54
290U4	SUBTOT	9.34	25.47	0.68	264.89	1.22	4	442.88	27.42	40	4.25	169.99	3.43	582.52
290U5	SUBTOT	4.55	7.97	1.44	60.67	0.6	4	158.87	6.49	40	5.16	206.27	3.01	621.61
290U6	SUBTOT	3.02	5.44	0.75	44.26	8.2	0.5	174.25	5.47	40	28.72	1148.95	2.95	3394.56
290U7	SUBTOT	1.6	3.4	0.14	16	0.4	3.3	60.14	1.78	40	1.2	48	2.97	142.78
Section Total		**4.32**	**8.83**	**0.84**	**53.08**	**2.00**	**2.19**	**173.63**			**152.7**	**6109.11**	**3.08**	**18810.37**
5330N														
330U1	SUBTOT	4.79	7.67	0.29	56.55	2.54	4.34	159.48	6.24	40	15.4	615.94	3.15	1939.83
330U2	SUBTOT	3.52	5.4	0.19	27.4	3.44	4.62	125.12	3.33	40	4.99	199.46	3.09	616.55
330U3	SUBTOT	3.01	4.2	0.34	18.96	1.22	1.58	87.64	2.23	40	33.38	1335.26	2.97	3962.03
330U4	SUBTOT	1.84	6.71	0.44	17.8	1.9	1.08	121.08	2.23	40	11.3	451.85	2.96	1338.24
330U5	SUBTOT	4.46	14.52	0.9	138.25	0.49	4	249.7	14.34	40	41.06	1642.55	3.11	5103.69
330U6	SUBTOT	1.01	4.38	0.23	34	0.64	4	76.18	3.6	40	23.43	937.22	2.88	2698.83
330U7	SUBTOT	0.12	5.01	0.12	17	0.33	4	72.67	1.88	40	9.12	364.72	2.87	1046.15
330U8	SUBTOT	7.6	9.6	0.45	48	1.7	8.7	191.75	5.46	40	4.31	172.33	3.42	589.57
330U9	SUBTOT	2.5	4.8	0.39	15	0.3	4.2	84.66	1.75	40	2.28	91.09	3.04	277.33
Section Total		**3.22**	**8.08**	**0.47**	**61.07**	**1.14**	**3.45**	**148.11**			**145.3**	**5810.42**	**3.03**	**17572.22**
5370N														
370U1	SUBTOT	0.44	6.93	0.43	9.75	1.26	1.05	109.52	1.33	40	27.57	1102.76	2.93	3233.59
370U2	SUBTOT	0.44	10.25	1.82	55.16	0.52	1.28	169.91	5.89	40	44.96	1798.26	2.99	5379.05
370U3	SUBTOT	0.38	8.17	0.53	36.42	0.23	1.33	122.02	3.9	40	69.06	2762.43	2.96	8167.55
370U4	SUBTOT	0.2	12.2	0.58	29.99	0.2	4.5	172.52	3.39	40	0.1	4.08	3.11	12.71
370U5	SUBTOT	0.93	4.79	0.3	24.67	0.29	2.77	77.12	2.65	40	36.44	1457.67	2.96	4320.09
370U6	SUBTOT	5.96	26.36	2.16	175	2.39	4	448.18	18.61	40	33.64	1345.67	3.35	4509.03
Section Total		**1.47**	**11.08**	**1.04**	**59.39**	**0.81**	**2.00**	**181.15**			**211.8**	**8470.87**		**25622.02**
Grand Total		**2.83**	**9.55**	**0.82**	**57.95**	**1.27**	**2.47**	**169.51**			**509.8**	**20390.4**		**62004.61**

TABLE 7: BROWNS TUNNEL RESOURCE, TONNES ABOVE THE VARIOUS CUTOFFS

	Tonnes	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $	SG
20 TMU BLOCKS	90,586	0.4	1.4	0.2	16	0.2	3.08	28	2.92
40 TMU BLOCKS	27,540	0.5	2.5	0.2	22	0.3	2.29	45	2.90
60 TMU BLOCKS	62,005	2.8	9.5	0.8	58	1.3	2.47	170	3.05
Total @ $20 TMU cutoff	**180,131**	**1.3**	**4.4**	**0.4**	**31**	**0.6**	**2.75**	**79**	**2.96**
Total @ $40 TMU Cutoff	**89,545**	**2.1**	**7.4**	**0.6**	**47**	**1.0**	**2.41**	**131**	**3.00**
Total @ $60 TMU Cutoff	**62,005**	**2.8**	**9.5**	**0.8**	**58**	**1.3**	**2.47**	**170**	**3.05**

TABLE 8: 1998 BROWNS TUNNEL RESOURCE - 3M MINIMUM MINING WIDTH

CUT-OFF = $40 TMU

BLOCK	DRILLHOLE	X-SECTION AREA	LENGTH	SG	TONNES	Pb %	Zn %	Cu %	Ag g/t	Au g/t	TMU $/t
290B1	BT2,011B	73.94	40	3.13	9257	5	8.4	0.83	37	0.53	155.45
290B2	012B	34.59	40	3.2	4428	1.6	12.1	0.94	168	0.5	211.76
290B3	EAF3/4.012 B	44.63	40	3.03	5409	2.4	4.9	0.66	38	6.1	143.99
330B1M	004B	28.50	40	3.1	3534	3.9	6.2	0.25	44	2	128.99
330B2M	006B	80.93	40	3.01	9744	2.2	3.4	0.19	19	1.4	73.34
330B3M	EAF6	158.34	40	3.05	19317	2	6.2	0.39	49	0.4	107.74
330B3L1	EAF6	11.63	40	2.97	1382	1.2	2.3	0.17	13	0.1	41.20
330B3L2	EAF6	26.58	40	2.97	3157	0.9	2.6	0.05	13	0.2	43.05
370B1	EAF10	21.90	40	3.02	2646	0.3	7.3	0.43	5	0.1	102.71
370B2	EAF10	265.95	40	3.07	32659	1.4	8.6	0.92	54	0.7	145.31
370B3	008B	102.91	40	2.97	12226	0.3	4.6	0.23	21	0.1	68.54
	TOTAL/AV	850		3.1	103757	1.9	6.8	0.6	45	0.90	120.04

CUT-OFF $50 TMU

BLOCK	DRILLHOLE	X-SECTION AREA	LENGTH	SG	TONNES	Pb %	Zn %	Cu %	Ag g/t	Au g/t	TMU $/t
290B1	BT2,011B	73.94	40	3.13	9257	5	8.4	0.83	37	0.53	155.45
290B2	012B	34.59	40	3.2	4428	1.6	12.1	0.94	168	0.5	211.76
290B3	EAF3/4, 012B	44.63	40	3.03	5409	2.4	4.9	0.66	38	6.1	143.99
330B1M	004B	28.50	40	3.1	3534	3.9	6.2	0.25	44	2	128.99
330B2M	006B	80.93	40	3.01	9744	2.2	3.4	0.19	19	1.4	73.34
330B3M	EAF6	158.34	40	3.05	19317	2	6.2	0.39	49	0.4	107.74
370B1	EAF10	21.90	40	3.02	2646	0.3	7.3	0.43	5	0.1	102.71
370B2	EAF10	265.95	40	3.07	32659	1.4	8.6	0.92	54	0.7	145.31
370B3	008B	102.91	40	2.97	12226	0.3	4.6	0.23	21	0.1	68.54
	TOTAL/AV	811.685		3.1	99218.7	1.9	6.9	0.6	46	0.94	123.59

CUT-OFF $60 TMU

BLOCK	DRILLHOLE	X-SECTION AREA	LENGTH	SG	TONNES	Pb %	Zn %	Cu %	Ag g/t	Au g/t	TMU $/t
290B1	BT2,011B	73.94	40	3.13	9257	5	8.4	0.83	37	0.53	155.45
290B2	012B	34.59	40	3.2	4428	1.6	12.1	0.94	168	0.5	211.76
290B3	EAF3/4, 012B	44.63	40	3.03	5409	2.4	4.9	0.66	38	6.1	143.99
330B1	004B	25.10	40	3.12	3132	4.2	6.7	0.27	48	2.1	138.87
330B2	006B,EAF6	94.92	40	3.02	11467	2.4	4	0.27	19	1.07	80.14
330B3	EAF6	68.66	40	3.13	8596	2.9	9.9	0.6	91	0.5	171.47
370B1	EAF10	21.90	40	3.02	2646	0.3	7.3	0.43	5	0.1	102.71
370B2	EAF10	265.95	40	3.07	32659	1.4	8.6	0.92	54	0.7	145.31
370B3	008B	102.91	40	2.97	12226	0.3	4.6	0.23	21	0.1	68.54
	TOTAL/AV	732.5925		3.1	89817.97	2.0	7.4	0.7	50	0.98	131.81

ALL RESOURCES CLASSED AS INFERRED

TABLE 9: Browns Tunnel Drill Intersections

DRILLHOLE	From m	to m	width m	Est. T.W	Pb %	Zn %	$40 TMU cutoff Cu %	Ag g/t	Au g/t	Fe %	TMU $
001B	36.7	39.9	3.2		1.9	3.2	0.36	15	0.01	2.2	55
002B	25.6	27.7	2.1		1	2.7	0.12	32	1.7	3.8	62
004B	53.8	64.2	10.4		3.4	5.4	0.23	38	1.7	3.9	112
005B	183	184.9	1.9		0.1	4.8	0.62	27	0.1	10.1	75
006B	43	58.8	15.8		2.2	3.4	0.19	19	1.4	3.9	74
006B	110.4	112	1.6		1	3.1	0.15	17	1.2	4.6	61
006B	118.5	120.5	2		0.3	2.8	0.22	16	0.2	6.2	44
006B	163.8	167.7	3.9		0.1	4.8	0.12	3	0.1	3.5	66
008B	124.3	133.1	8.8		0.3	4.6	0.23	21	0.1	3.6	68
011B	24.4	26.3	1.9		5.5	9.6	1.97	41	1.4	5.5	194
012B	24	25.1	1.1		2.6	4	0.51	22	0.3	7.9	78
012B	32.5	37.1	4.6		1.6	12.1	0.94	168	0.5	6.1	209
012B	50.5	52.2	1.7		0.8	7.1	0.4	34	11.1	5	204
	50.5	53.2	2.7		0.5	4.6	0.27	24	7.3	3.8	133
EAF3	33	38.5	5.5		4.7	8.1	1.02	55	7.4		215
EAF4	34.4	39.7	5.3		0.9	1.8	0.48	27	4.2		75
EAF4	43.3	44.9	1.6		4.7	8.2	1.46	62	0.6		162
EAF4	50.9	52.3	1.4		9.4	25.8	0.69	267	1.2		448
EAF6	48.6	69.4	20.8		1.8	5.3	0.32	40	0.3		91
	48.6	51.6	3		0.9	2.6	0.05	13	0.2		43
	67.4	69.4	2		1.2	2.3	0.17	13	0.1		42
EAF8	80.8	82.8	2		0.3	3.1	0.21	10	0.1		46
EAF9	162	173.1	11.1		8	18.9	0.81	93	4.7		353
EAF9	182.8	201.3	18.5		0.1	5.3	0.51	26	0.1		80
EAF10	98	116	18		1.4	8.6	0.92	54	0.7		145
EAF10											
EAF10											
EAF10	137	141	4		0.3	7.3	0.43	5	0.1		103
BT2	29.4	44.5	15.1		5.9	9.8	0.82	43	0.5		179
BT3	132.2	136	3.8		3.3	6.5	0.12	27	2.8		132
BT4	103	106.3	3.3		3.1	4.7	0.11	52	0.5		92

DRILLHOLE	From m	to m	width m	Est. T.W	Pb %	Zn %	Cu %	$50 TMU cut-off Ag g/t	Au g/t	Fe %	TMU $
001B	37.9	39.9	2		2	3.5	0.45	19	0.1	2.1	66
002B	25.6	27.2	1.6		1.1	3.2	0.12	32	1.8	3	69
004B	53.8	62.2	8.4		3.9	6.2	0.25	44	2	4.3	129
005B	183	183.9	0.9		0.1	7.7	0.6	26	0.1	11.1	112
006B	43	58.8	15.8		2.2	3.4	0.19	19	1.4	3.9	74
	54.4	58.8	4.4		1.5	2.6	0.1	20	2	4.3	64
	54.4	58.8	4.4		1.3	2.3	0.12	19	1.6	4.1	56
006B											
006B											
006B	164.8	167.7	2.9		0.1	5.3	0.13	4	0.1	3.5	73
008B	124.3	132	7.7		0.3	4.8	0.22	21	0.1	3.6	71
011B	24.4	26.3	1.9		5.5	9.6	1.97	41	1.4	5.5	194
012B	24.4	29.5	5.1		2.5	4.4	0.84	21	0.6	3.2	88
012B	32.5	37.1	4.6		1.6	12.1	0.94	168	0.5	6.1	209
012B	50.5	52.2	1.7		0.8	7.1	0.4	34	11.1	5	204
EAF3	35.7	38.5	2.8		8.5	13.6	0.149	91	14.1		376
EAF4	34.4	39.7	5.3		0.9	1.8	0.48	27	4.2		75
EAF4	43.3	44.9	1.6		4.7	8.2	1.46	62	0.6		162
EAF4	50.9	52.3	1.4		9.4	25.8	0.69	267	1.2		448
EAF6	51.6	67.4	15.8		2	6.2	0.39	49	0.4		107
EAF8											
EAF9	162	173.1	11.1		8	18.9	0.81	93	4.7		353
EAF9	182.8	200.3	17.5		0.1	5.4	0.53	28	0.1		82
EAF10	98	101	3		6	26.4	2.16	175	2.4		448
EAF10	106	116	10		0.3	6.7	0.94	37	0.3		108
EAF10	98	116	18		1.4	8.6	0.92	54	0.7		145
EAF10	137	141	4		0.3	7.3	0.43	5	0.1		103
BT2	29.4	44.5	15.1		5.9	9.8	0.82	43	0.5		179
BT3	132.2	136	3.8		3.3	6.5	0.12	27	2.8		132
BT4	103	106.3	3.3		3.1	4.7	0.11	52	0.5		92

DRILLHOLE	From m	to m	width m	Est. T.W	Pb %	Zn %	$60 TMU cut-off Cu %	Ag g/t	Au g/t	Fe %	TMU $
001B	37.9	38.9	1		2.9	4.3	0.38	14	0.1	1.9	74
002B	25.6	27.2	1.6		1.1	3.2	0.12	32	1.8	3	69
004B	53.8	61.2	7.4		4.2	6.7	0.27	48	2.1	4.5	139
005B	183	183.9	0.9		0.1	7.7	0.6	26	0.1	11.1	112
006B	46	58.8	12.8		2.3	3.6	0.19	20	1.7	4.1	79
	46	60.2	14.2		2.2	3.4	0.19	20	1.6	4	75
	46	54.4	8.4		2.8	4.1	0.25	21	1.6	4	88
006B											
006B											
006B	164.8	167.7	2.9		0.1	5.3	0.13	4	0.1	3.5	73
008B	130.6	132	1.4		0.3	10.7	0.3	44	0.2	4.3	153
011B	24.4	26.3	1.9		5.5	9.6	1.97	41	1.4	5.5	194
012B											
012B	32.5	37.1	4.6		1.6	12.1	0.94	168	0.5	6.1	209
012B	50.5	52.2	1.7		0.8	7.1	0.4	34	11.1	5	204
EAF3	35.7	38.5	2.8		8.5	13.6	0.149	91	14.1		376
EAF4	34.4	39.7	5.3		0.9	1.8	0.48	27	4.2		75
EAF4	43.3	44.9	1.6		4.7	8.2	1.46	62	0.6		162
EAF4	50.9	52.3	1.4		9.4	25.8	0.69	267	1.2		448
EAF6	52.6	59.6	7		2.9	9.9	0.6	91	0.5		171
	61.6	67.4	5.8		1.8	3.9	0.29	16	0.3		68
EAF8											
EAF9	162	173.1	11.1		8	18.9	0.81	93	4.7		353
EAF9	183.8	198.3	14.5		0.1	5.7	0.58	31	0.1		88
EAF10	98	101	3		6	26.4	2.16	175	2.4		448
EAF10	106	116	10		0.3	6.7	0.94	37	0.3		108
EAF10	98	116	18		1.4	8.6	0.92	54	0.7		145
EAF10	137	140	3		0.1	8.6	0.51	4	0.1		120
BT2	29.4	44.5	15.1		5.9	9.8	0.82	43	0.5		179
BT3	133.5	134.4	0.9		11	19.6	0.27	51	7.8		390
BT4	103	104.6	1.6		5	7.4	0.17	26	0.4		131

TABLE 10: SOUTHERN TRENCHES RESOURCE CALCULATIONS BY INTERVAL AND BLOCK

BLOCK	BHID	FROM	TO	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	AVTMU $	CALCTMU $	INFL. m	AREA sq m	VOLUME cu m	SG	TONNES
st405L1	STRC5	34	35	0.73	1.6	0.07	7	0.17	0	28.04	0.78	-	-	-	2.84	-
st405L1	009B	33.4	33.6	0.7	1.2	0.18	8	0.1	2.3	23.46	0.87	-	-	-	2.9	-
st405L1	010B	32.9	34.3	0.3	1.6	0.06	7	0.1	0.9	25.04	0.76	-	-	-	2.85	-
SUBTOT		-	-	0.5	1.57	0.07	7.08	0.13	0.66	26.07	0.78	20	21.43	428.59	2.85	1221.31
st405L2	STRC5	22	25	0.53	1.38	0.06	7	0.08	0	23.29	0.76	-	-	-	2.83	-
st405L2	STRC5	26	27	0.78	1.82	0.08	4	0.07	0	29.75	0.48	-	-	-	2.84	-
st405L2	009B	24.3	28	0.6	1.61	0.07	6.65	0.13	1.96	26.96	0.74	-	-	-	2.89	-
st405L2	010B	18.7	22.9	0.57	1.39	0.06	7	0.14	1.36	24.08	0.77	-	-	-	2.87	-
st405L2	010B	24.8	26.7	0.2	1.5	0.02	1	0.1	2.4	21.72	0.16	-	-	-	2.89	-
st405L2	015B	27.9	29	0.2	0.1	0.01	4	0.1	0.7	4.02	0.42	-	-	-	2.83	-
SUBTOT		-	-	0.51	1.39	0.06	5.72	0.11	1.23	23.24	0.64	20	99.53	1990.69	2.86	5699.46
st405m1	STRC5	33	34	1.5	2.39	0.05	11	0.47	0	45.29	1.26	-	-	-	2.86	-
SUBTOT		-	-	1.5	2.39	0.05	11	0.47	0	45.29	1.26	20	3.43	68.63	2.86	196.5
st405m2	010B	26.7	27.4	0.5	3.6	0.15	5	0.2	6.4	53.5	0.65	-	-	-	3.05	-
SUBTOT		-	-	0.5	3.6	0.15	5	0.2	6.4	53.5	0.65	20	4.96	99.13	3.05	302.05
st405U1	STRC5	27	33	16.21	23.57	1.3	82.33	19.31	0	586.92	11.32	-	-	-	3.61	-
st405U1	009B	28	33.4	21.23	25.99	2.53	113.89	11.48	3.44	594.93	13.93	-	-	-	4.04	-
st405U1	010B	29	32.9	6.38	9.22	0.98	32.29	1.05	9.65	178.08	3.81	-	-	-	3.42	-
SUBTOT		-	-	15.47	20.77	1.65	80.72	11.89	3.68	485.53	10.33	20	127	2539.94	3.7	9386.66
TOTAL		-	-	8.88	12.28	0.95	47.76	6.7	2.63	282.45	6.07	100	256.35	5126.98	3.28	16805.98

TABLE 11: SOUTHERN TRENCHES RESOURCE CALCULATIONS: TOTALS BY BLOCK AND TMU CUTOFF

	BLOCK	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	AVTMU $	CALCTMU $	INFL	AREA sq m	VOL cu m	SG	TONNES
BY BLOCK														
st405L1	SUBTOT	0.5	1.57	0.07	7.08	0.13	0.66	26.07	0.78	20	21.43	428.59	2.85	1221.31
st405L2	SUBTOT	0.51	1.39	0.06	5.72	0.11	1.23	23.24	0.64	20	99.53	1990.69	2.86	5699.46
st405m1	SUBTOT	1.5	2.39	0.05	11	0.47	4	45.29	1.26	20	3.43	68.63	2.86	196.5
st405m2	SUBTOT	0.5	3.6	0.15	5	0.2	6.4	53.5	0.65	20	4.96	99.13	3.05	302.05
st405U1	SUBTOT	15.47	20.77	1.65	80.72	11.89	3.68	485.53	10.33	20	127	2539.94	3.7	9386.66
BY TMU CUTOFF														
20 TMU blocks		0.51	1.42	0.06	5.96	0.11	1.13	23.84			120.96	2419.28	2.86	6920.77
40 TMU blocks		0.89	3.12	0.11	7.36	0.31	5.45	50.34			8.39	167.76	2.98	498.55
60TMU block		15.47	20.77	1.65	80.72	11.89	3.68	485.53			127	2539.94	3.7	9386.66

TABLE 12: SOUTHERN TRENCHES, TONNES ABOVE THE VARIOUS CUTOFFS

	Tonnes	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	AVTMU $	SG
20 TMU BLOCKS	6,921	0.5	1.4	0.1	6	0.1	1.1	24	2.86
40 TMU BLOCKS	499	0.9	3.1	0.1	7	0.3	5.5	50	2.98
60 TMU BLOCKS	9,387	15.5	20.8	1.7	81	11.9	3.7	486	3.70
Total @ $20 TMU Cutoff	**16,806**	**8.9**	**12.3**	**1.0**	**48**	**6.7**	**2.7**	**282**	**3.33**
Total @ $40 TMU Cutoff	**9,885**	**14.7**	**19.9**	**1.6**	**77**	**11.3**	**3.8**	**464**	**3.66**
Total @$60 TMU Cutoff	**9,387**	**15.5**	**20.8**	**1.7**	**81**	**11.9**	**3.7**	**486**	**3.70**

TABLE 13: SOUTHERN TRENCHES RESOURCE - 3M MINIMUM MINING WIDTH

CUT-OFF = $40 TMU

BLOCK	DRILLHOLE	X-SECTION AREA	LENGTH	SG	TONNES	Pb %	Zn %	Cu %	Ag g/t	Au g/t	TMU $/t
405ST1	010B	28.40	20	3.42	1943	6.4	9.2	0.98	32	1.1	178.74
405ST1LK	010B	0.60	20	2.97	36	1.5	2.4	0.05	11	0.5	45.80
405ST2	STRC5	33.80	20	3.64	2461	14.1	20.5	1.12	72	16.6	509.74
405ST2L	STRC5	4.60	20	2.97	273	1.5	2.4	0.05	11	0.5	45.80
405ST3	009B	60.75	20	4.25	5164	23.9	28.6	2.83	127	12.6	659.57
405ST3L	009B	0.80	20	2.97	48	1.5	2.4	0.05	11	0.5	45.80
	TOTAL/AV	128		3.80	9876	17.3	21.9	2.0	91	10.96	508.46

CUT-OFF $50 TMU AND $60 TMU

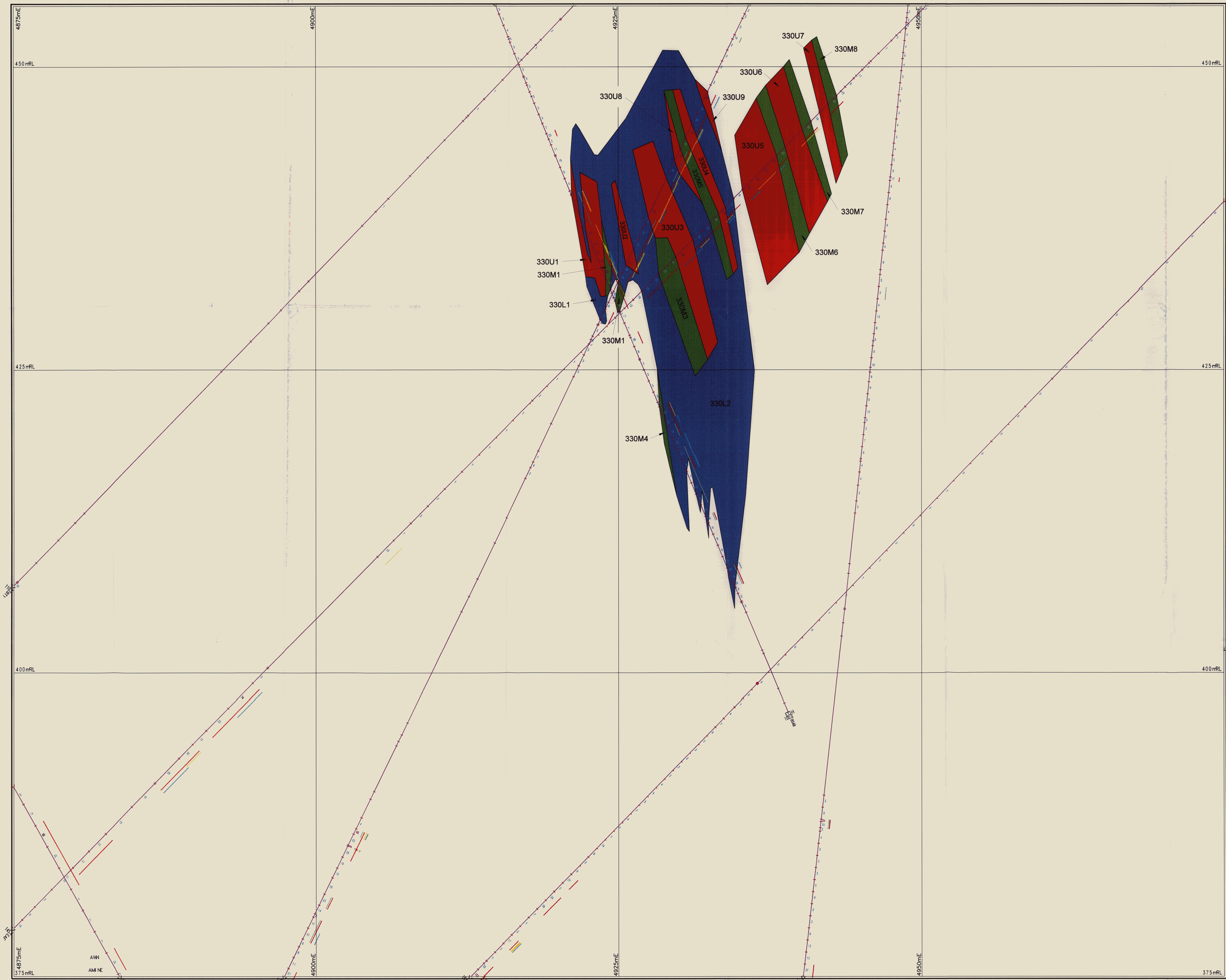
BLOCK	DRILLHOLE	X-SECTION AREA	LENGTH	SG	TONNES	Pb %	Zn %	Cu %	Ag g/t	Au g/t	TMU $/t
405ST1	010B	28.40	20	3.42	1943	6.4	9.2	0.98	32	1.1	178.74
405ST2	STRC5	33.80	20	3.79	2562	16.2	23.6	1.3	82	19.3	588.28
405ST3	009B	60.75	20	4.25	5164	23.9	28.6	2.83	127	12.6	659.57
	TOTAL/AV	122.95		3.96	9668.35	18.3	23.4	2.1	96	12.06	544.07

ALL RESOURCES CLASSED AS INFERRED

TABLE 14: SOUTHERN TRENCHES DRILL INTERSECTIONS

	$40 TMU cutoff										$50 and $60 TMU cut-off									
DRILLHOLE	From m	to m	width m	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $	From m	to m	width m	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	TMU $
010B	29	32.9	3.9	6.4	9.2	0.98	32	1.1	9.7	178	29	32.9	3.9	6.4	9.2	0.98	32	1.1	9.7	178
STRC5	27	34	7	14.1	20.5	1.12	72	16.6		510	27	33	6	16.2	23.6	1.3	82	19.3		587
009B	28	33.4	5.4	23.9	28.6	2.83	127	12.6	3.8	658	28	33.4	5.4	23.9	28.6	2.83	127	12.6	3.8	658


4850mE
4875mE
4900mE
4925mE
475mRL
450mRL
425mRL
400mRL
290M4
290L7
290L13
290M3
290L14
290L9
290U7
290L3
290L19
290L2
290M7
290M8
290U1
290L6
290U2
290LU3
290LM6
290L16
290L18
290M5
290L12
290L8
290L11
290U6
290L17
290L1
290L10
290L15
290U5
290M1
290M2
290U4
290L5
290L9
LEGEND
CALCULATION MODEL = TMU DOLLARS
TMU > 80
TMU 65-80
TMU40-65
TMU 00-40
Lith above Alteration
HOLE VERIFIED AND GROUTED
HOLE VERIFIED (Not grouted - Unkn wn)
HOLE NOT VERIFIED
Right Solid Dashed Small Bar
ZN % >10 6-10 1-6
FE % >15 10-15 5-10
AUg/t >3.0 1.5-3.0 0.5-1.5
CU % >1 0.25-0.5
5 cm
Ore block >60 TMU
Ore block >40 <60 TMU
Ore block >20 <40TMU
99-4262
J/V ANNUAL REPORT - EL 44/88
BURNS PEAK - PASMINCO R'BERY
EDWARDS, MURPHY, WHITBREAD
Vol 3 of 3
2 0 2 4 6 8 Metres
SCALE 1:100
558309
PASMINCO MINING - ROSEBERY
BROWNS TUNNEL
CROSS SECTION AT 5290N
INFERRED GEOLOGICAL
RESOURCE
Influence (20N, 20S)
DATE 5 JAN 99
DRAWN
DWG No 1
DATAMINE
DESIGNED
CHECKED
APPROVED



LEGEND

CALCULATION MODEL = TMU DOLLARS
TMU > 80
TMU 65-80
TMU40-65
TMU 00-40

Lith above Alteration

HOLE VERIFIED AND GROUTED
HOLE VERIFIED (Not grouted - Unknown)
HOLE NOT VERIFIED

Right	Solid	Dashed	Small Bar
ZN %	>10	6-10	1-6
FE %	>15	10-15	5-10
AUg/t	>3.0	1.5-3.0	0.5-1.5
CU %	>1		0.25-0.5

Ore block >60 TMU
Ore block >40 <60 TMU
Ore block >20 <40TMU

99-4262
J/V ANNUAL REPORT - EL 44/88
BURNS PEAK – PASMINCO R'BERY
EDWARDS, MURPHY, WHITBREAD
VOL 3 of 3

5 cm

2 0 2 4 6 8 Metres

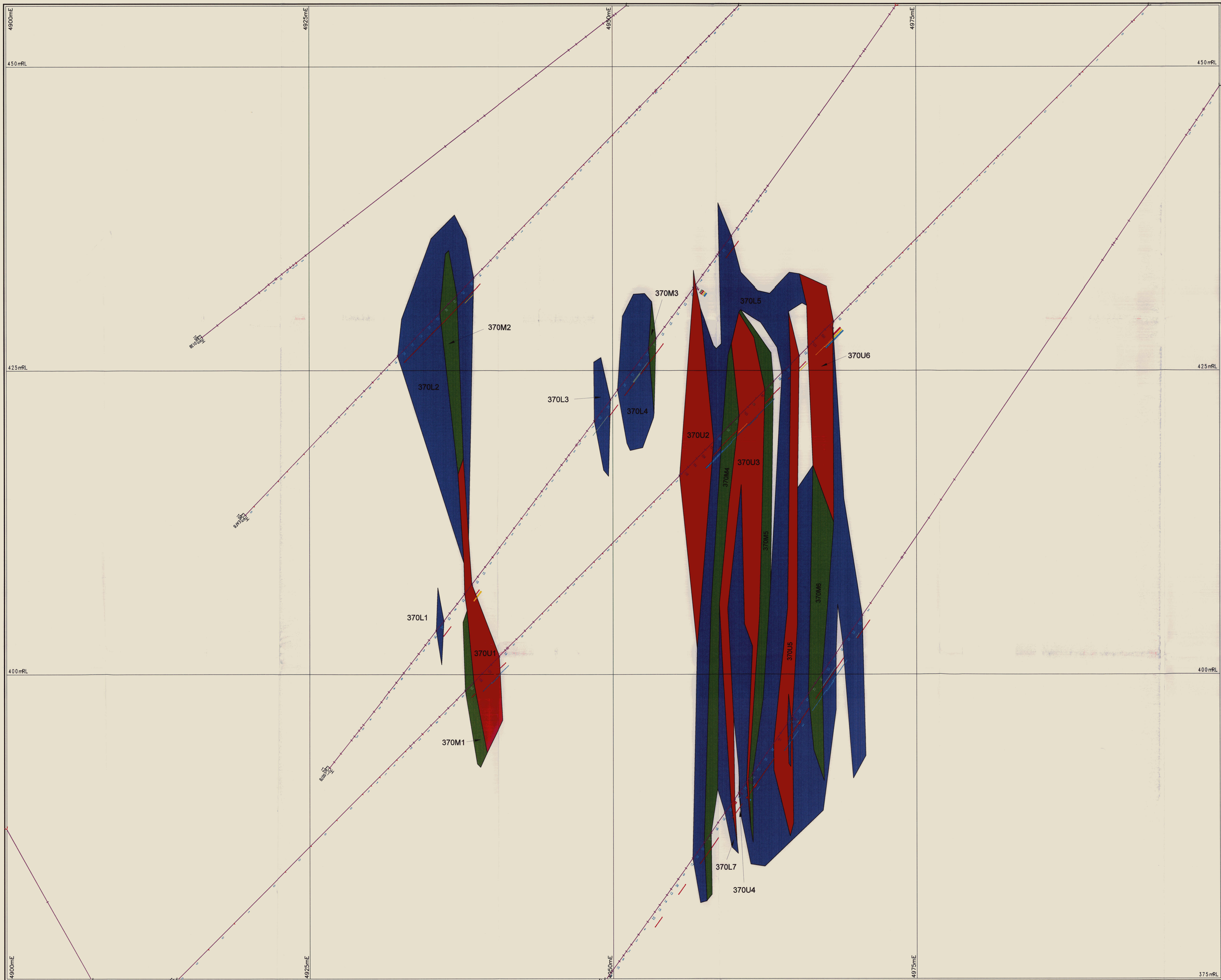
SCALE 1:100

558310

PASMINCO MINING - ROSEBERY

BROWNS TUNNEL
CROSS SECTION AT 5330N
INFERRED GEOLOGICAL RESOURCE
Influence (20N, 20S)

DATE	5 JAN 99	DRAWN		DESIGNED	
				CHECKED	
DWG No	2	DATAMINE		APPROVED	



LEGEND

CALCULATION MODEL = TMU DOLLARS
TMU > 80
TMU 65-80
TMU40-65
TMU 00-40

Lith above Alteration

HOLE VERIFIED AND GROUTED
HOLE VERIFIED (Not grouted - Unkn wn)
HOLE NOT VERIFIED

Right	Solid	Dashed	Small Bar
ZN %	>10	6-10	1-6
FE %	>15	10-15	5-10
AUg/t	>3.0	1.5-3.0	0.5-1.5
CU %	>1		0.25-0.5

Ore block >60 TMU
Ore block >40 <60 TMU
Ore block >20 <40TMU

99-4262
J/V ANNUAL REPORT - EL 44/88
BURNS PEAK – PASMINCO R'BERY
EDWARDS, MURPHY, WHITBREAD
Vol 3 of 3

5 cm

2 0 2 4 6 8 Metres

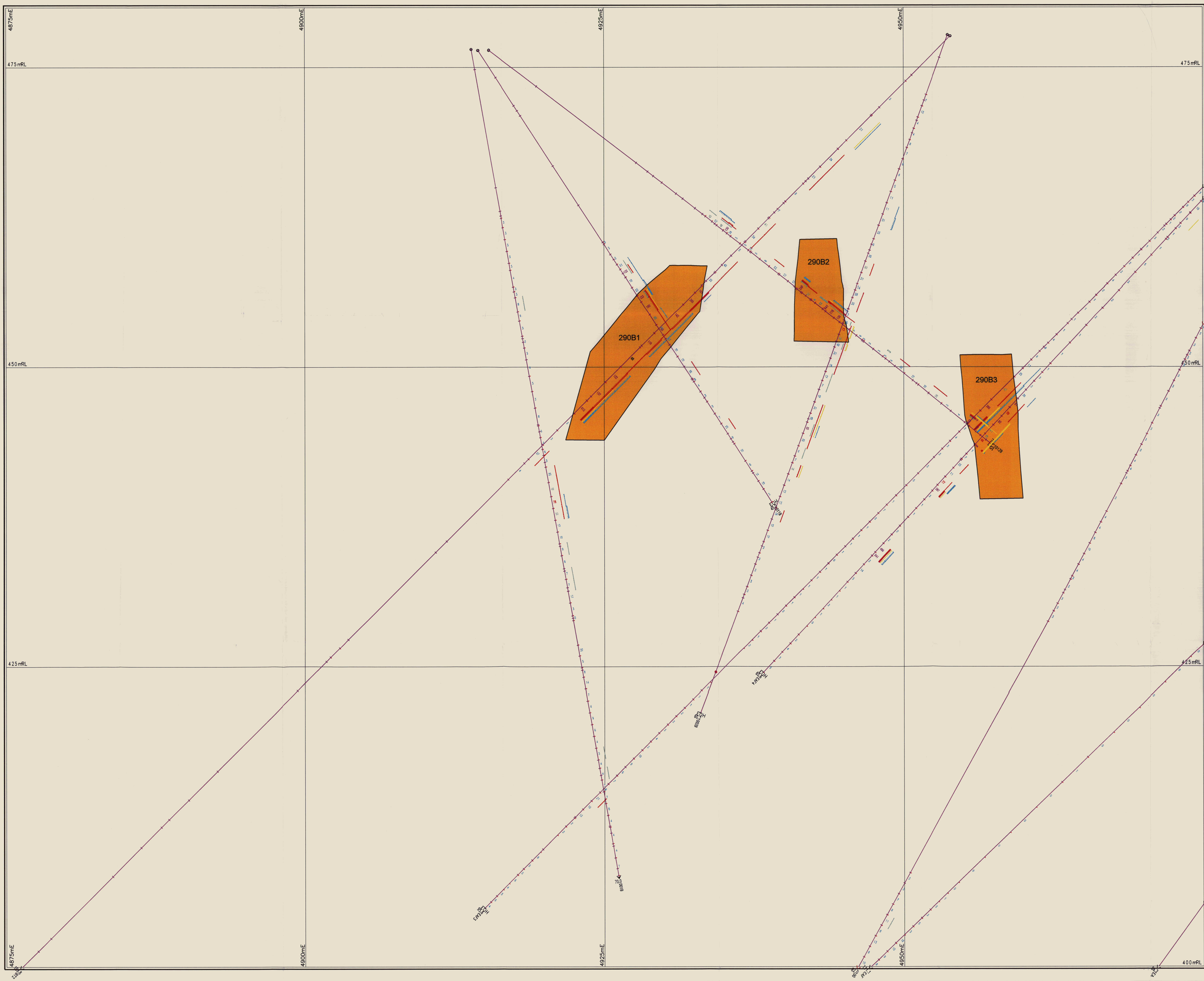
SCALE 1:100

558311

PASMINCO MINING - ROSEBERY

BROWNS TUNNEL
CROSS SECTION AT 5370N
INFERRED GEOLOGICAL RESOURCE
Influence (20N, 20S)

DATE	5 JAN 99	DRAWN		DESIGNED	
DWG No	3	DATAMINE		CHECKED	
				APPROVED	



LEGEND

CALCULATION MODEL = TMU DOLLARS
TMU > 80
TMU 65-80
TMU40-65
TMU 00-40

Lith above Alteration

HOLE VERIFIED AND GROUTED
HOLE VERIFIED (Not grouted - Unknown)
HOLE NOT VERIFIED

Right	Solid	Dashed	Small Bar
ZN %	>10	6-10	1-6
FE %	>15	10-15	5-10
AUg/t	>3.0	1.5-3.0	0.5-1.5
CU %	>1		0.25-0.5

5 cm

>60 TMU ore blocks
(Ore blocks for >40 and >50 are identical)

99-4262

J/V ANNUAL REPORT - EL 44/88
BURNS PEAK – PASMINCO R'BERY
EDWARDS, MURPHY, WHITBREAD
VOL 3 of 3

2 0 2 4 6 8 Metres

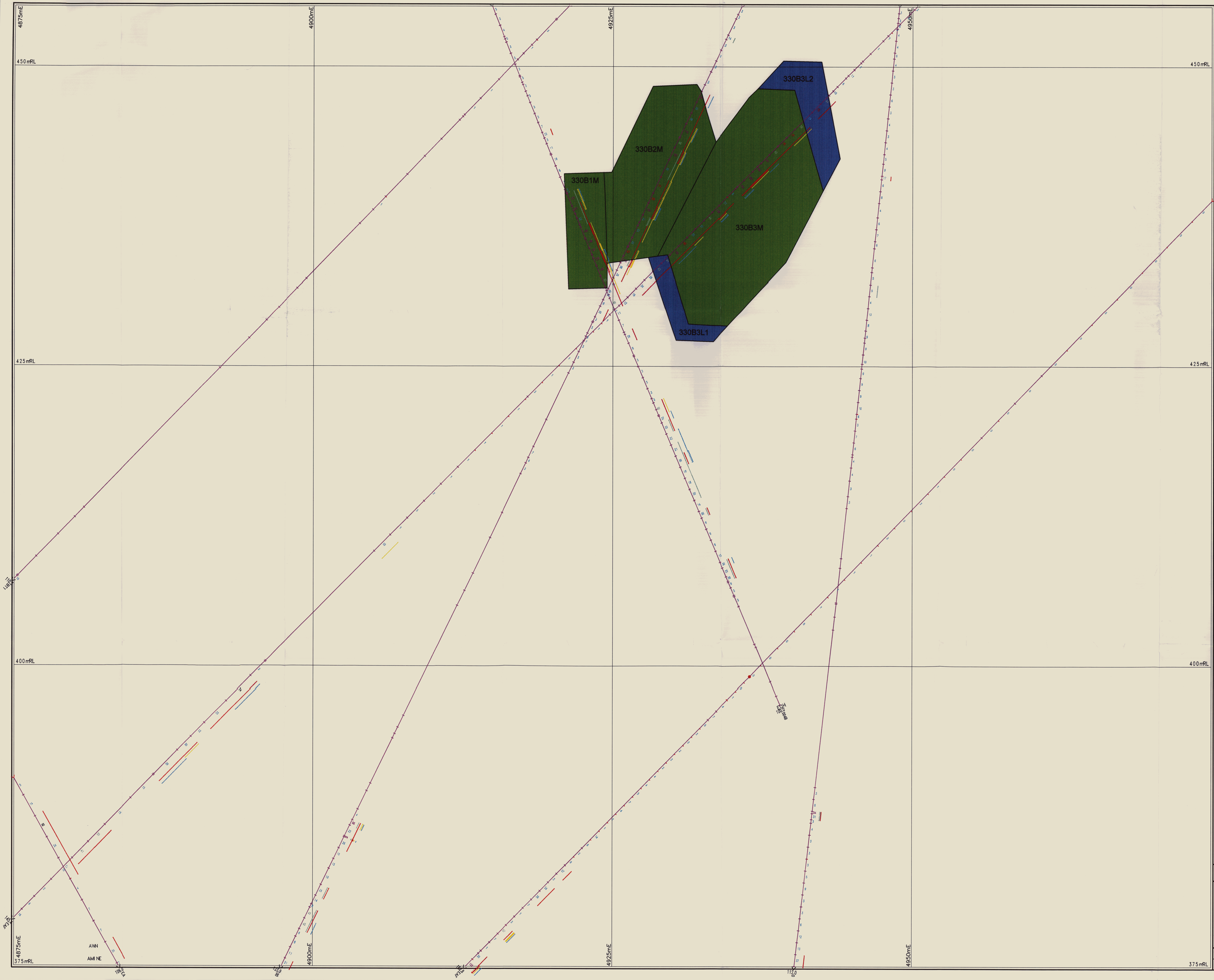
SCALE 1:100

556312

PASMINCO MINING - ROSEBERY

BROWNS TUNNEL
CROSS SECTION AT 5290N
INFERRED GEOLOGICAL RESOURCE
3m MINIMUM HORIZONTAL WIDTH
Influence (20N, 20S)

DATE	5 JAN 99	DRAWN		DESIGNED	
DWG No	4	DATAMINE		CHECKED	
				APPROVED	



LEGEND

CALCULATION MODEL = TMU DOLLARS
TMU > 80
TMU 65-80
TMU40-65
TMU 00-40

Lith above Alteration

HOLE VERIFIED AND GROUTED
HOLE VERIFIED (Not grouted - Unknown)
HOLE NOT VERIFIED

Right	Solid	Dashed	Small Bar
ZN %	>10	6-10	1-6
FE %	>15	10-15	5-10
AUg/t	>3.0	1.5-3.0	0.5-1.5
CU %	>1		0.25-0.5

99-4262

J/V ANNUAL REPORT - EL 44/88
BURNS PEAK – PASMINCO R'BERY
EDWARDS, MURPHY, WHITBREAD
Vol 3of 3

40 <50 TMU ore blocks

>50 TMU ore blocks

5 cm

2 0 2 4 6 8 Metres

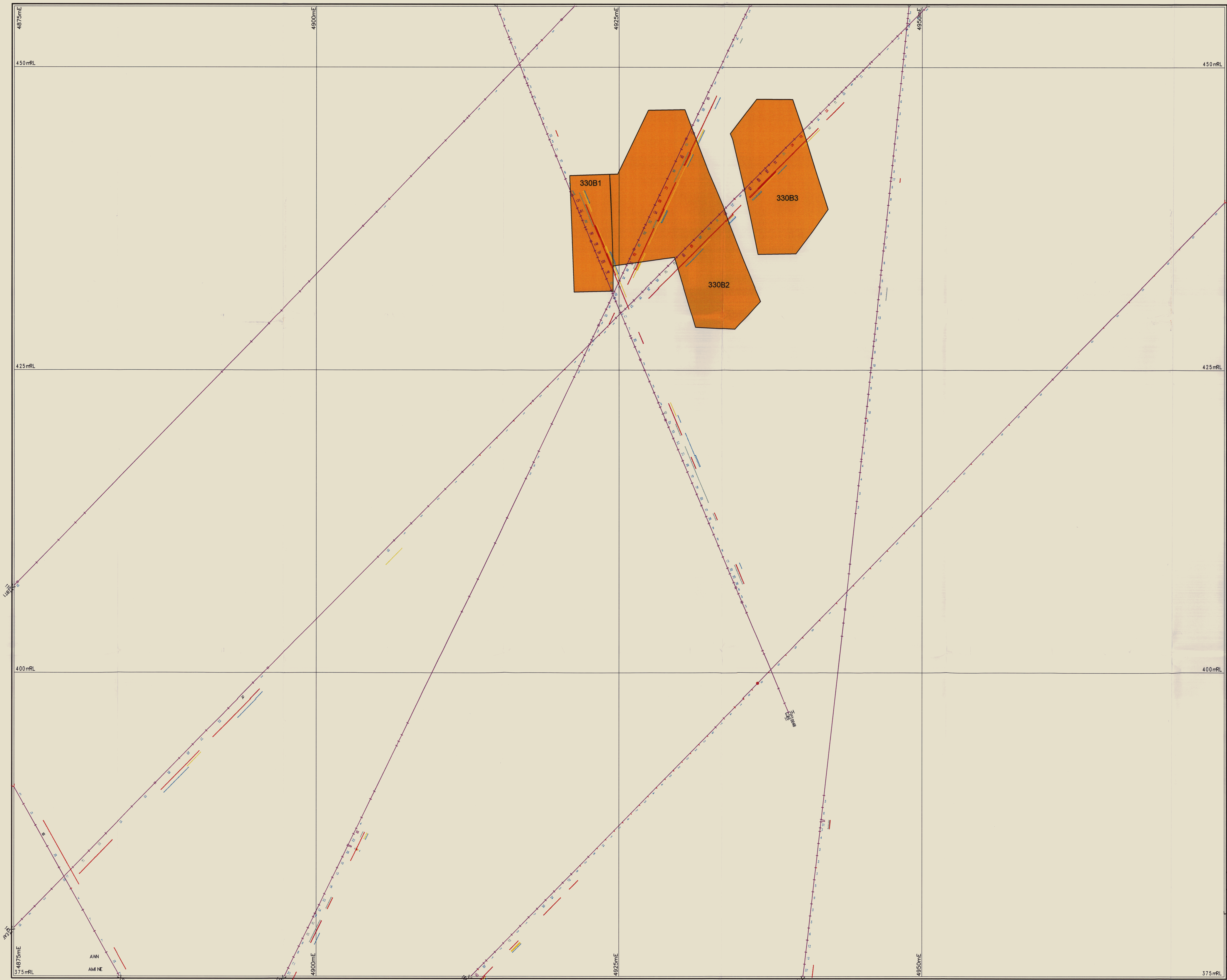
SCALE 1:100

558213

PASMINCO MINING - ROSEBERY

BROWNS TUNNEL
CROSS SECTION AT 5330N
INFERRED GEOLOGICAL RESOURCE
3m MINIMUM HORIZONTAL WIDTH
40 - 50 TMU
Influence (20N, 20S)

DATE	5 JAN 99	DRAWN		DESIGNED	
DWG No	5	DATAMINE		CHECKED	
				APPROVED	



LEGEND

CALCULATION MODEL = TMU DOLLARS
TMU > 80
TMU 65-80
TMU40-65
TMU 00-40

Lith above Alteration

HOLE VERIFIED AND GROUTED
HOLE VERIFIED (Not grouted - Unknown)
HOLE NOT VERIFIED

Right	Solid	Dashed	Small Bar
ZN %	>10	6-10	1-6
FE %	>15	10-15	5-10
AUg/t	>3.0	1.5-3.0	0.5-1.5
CU %	>1		0.25-0.5

5 cm

>60 TMU ore blocks

99-4262

J/V ANNUAL REPORT - EL 44/88
BURNS PEAK – PASMINCO R'BERY
EDWARDS, MURPHY, WHITBREAD
Vol 3 of 3

2 0 2 4 6 8 Metres

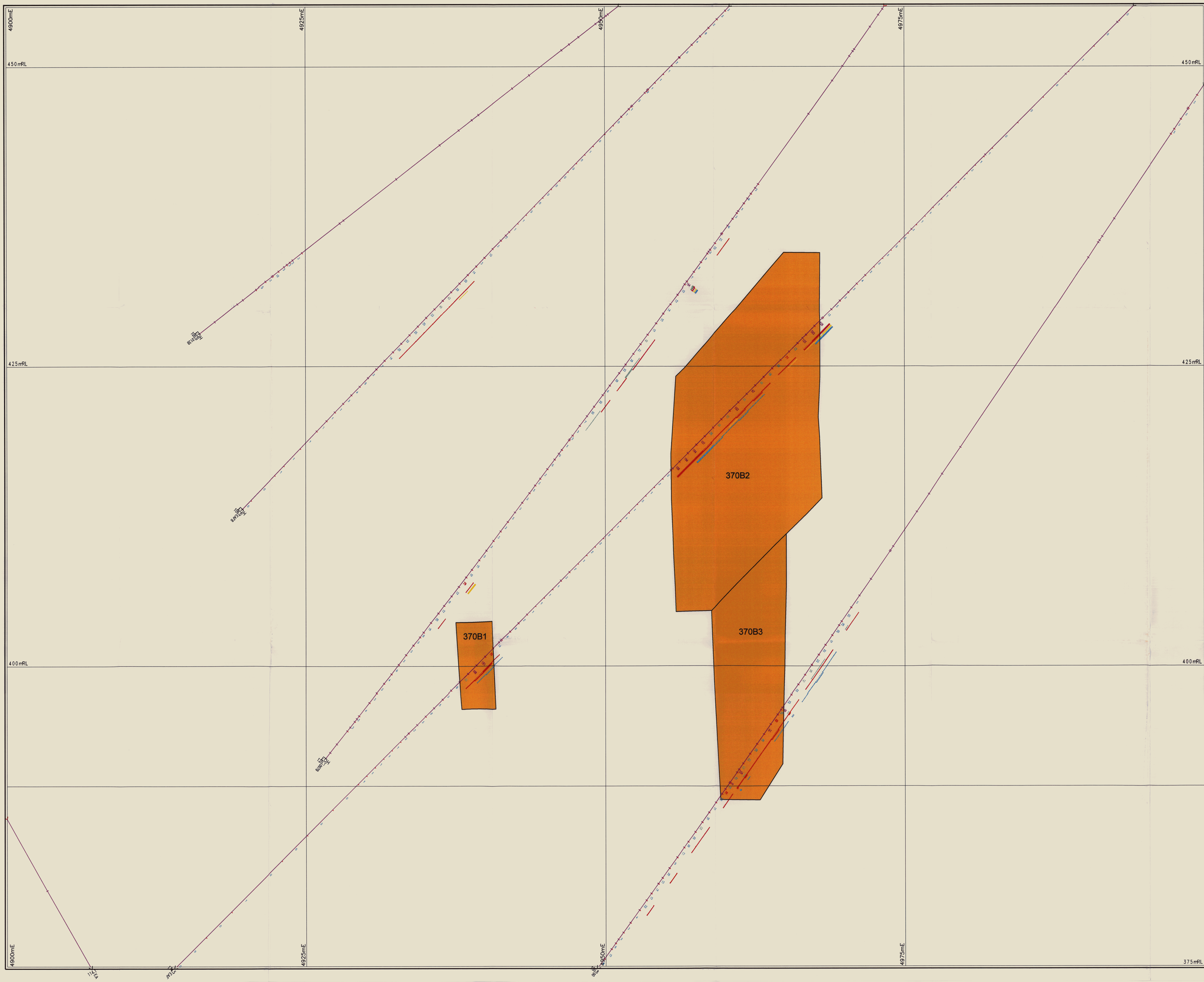
SCALE 1:100

556314

PASMINCO MINING - ROSEBERY

BROWNS TUNNEL
CROSS SECTION AT 5330N
INFERRED GEOLOGICAL RESOURCE
3m MINIMUM HORIZONTAL WIDTH
60 TMU
Influence (20N, 20S)

DATE	5 JAN 99	DRAWN		DESIGNED	
DWG No	6	DATAMINE		CHECKED	
				APPROVED	



LEGEND

CALCULATION MODEL = TMU DOLLARS

TMU > 80
TMU 65-80
TMU40-65
TMU 00-40

Lith above Alteration

HOLE VERIFIED AND GROUTED
HOLE VERIFIED (Not grouted - Unknown)
HOLE NOT VERIFIED

Right	Solid	Dashed	Small Bar
ZN %	>10	6-10	1-6
FE %	>15	10-15	5-10
AUg/t	>3.0	1.5-3.0	0.5-1.5
CU %	>1		0.25-0.5

5 cm

>60 TMU ore blocks
(Ore blocks for >40 and >50 are identical)

99-4262

J/V ANNUAL REPORT - EL 44/88
BURNS PEAK – PASMINCO R'BERY
EDWARDS, MURPHY, WHITBREAD
Vol 3 of 3

2 0 2 4 6 8 Metres

SCALE 1:100

558315

PASMINCO MINING - ROSEBERY

BROWNS TUNNEL

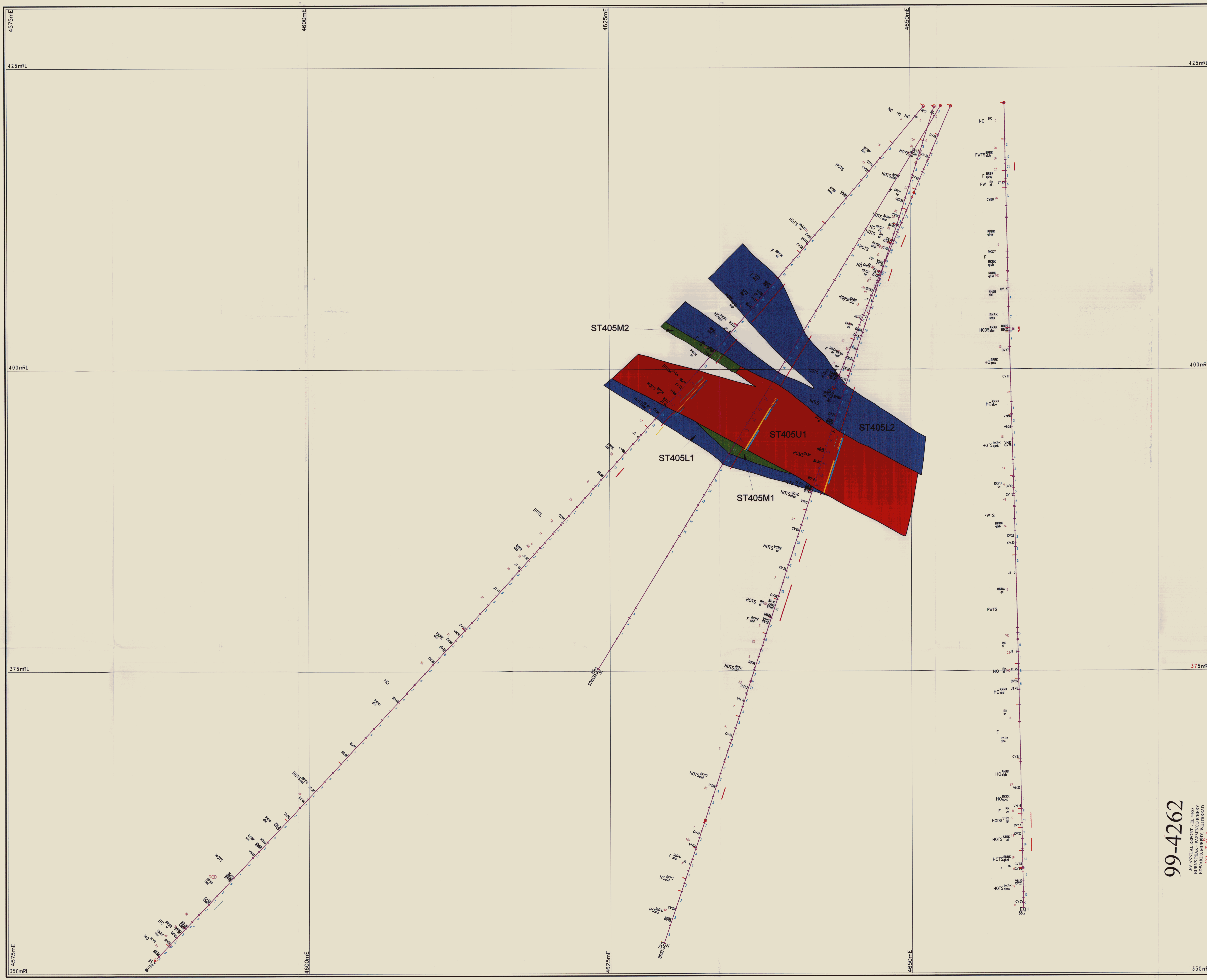
CROSS SECTION AT 5370N

INFERRED GEOLOGICAL RESOURCE

3m MINIMUM HORIZONTAL WIDTH

Influence (20N, 20S)

DATE	5 JAN 99	DRAWN		DESIGNED	
				CHECKED	
DWG No	7	DATAMINE		APPROVED	



99-4262

J/V ANNUAL REPORT - EL 44/88
BURNS PEAK – PASMINCO R'BERY
EDWARDS, MURPHY, WHITBREAD
vol 3 of 3

LEGEND

CALCULATION MODEL = TMU DOLLARS
TMU > 80
TMU 65-80
TMU40-65
TMU 00-40

Lith above Alteration

HOLE VERIFIED AND GROUTED
HOLE VERIFIED (Not grouted - Unkn wn)
HOLE NOT VERIFIED

Right	Solid	Dashed	Small Bar
ZN %	>10	6-10	1-6
FE %	>15	10-15	5-10
AUg/t	>3.0	1.5-3.0	0.5-1.5
CU %	>1		0.25-0.5

Ore block >60 TMU
Ore block >40 <60 TMU
Ore block >20 <40TMU

5 cm

2 0 2 4 6 8 Metres

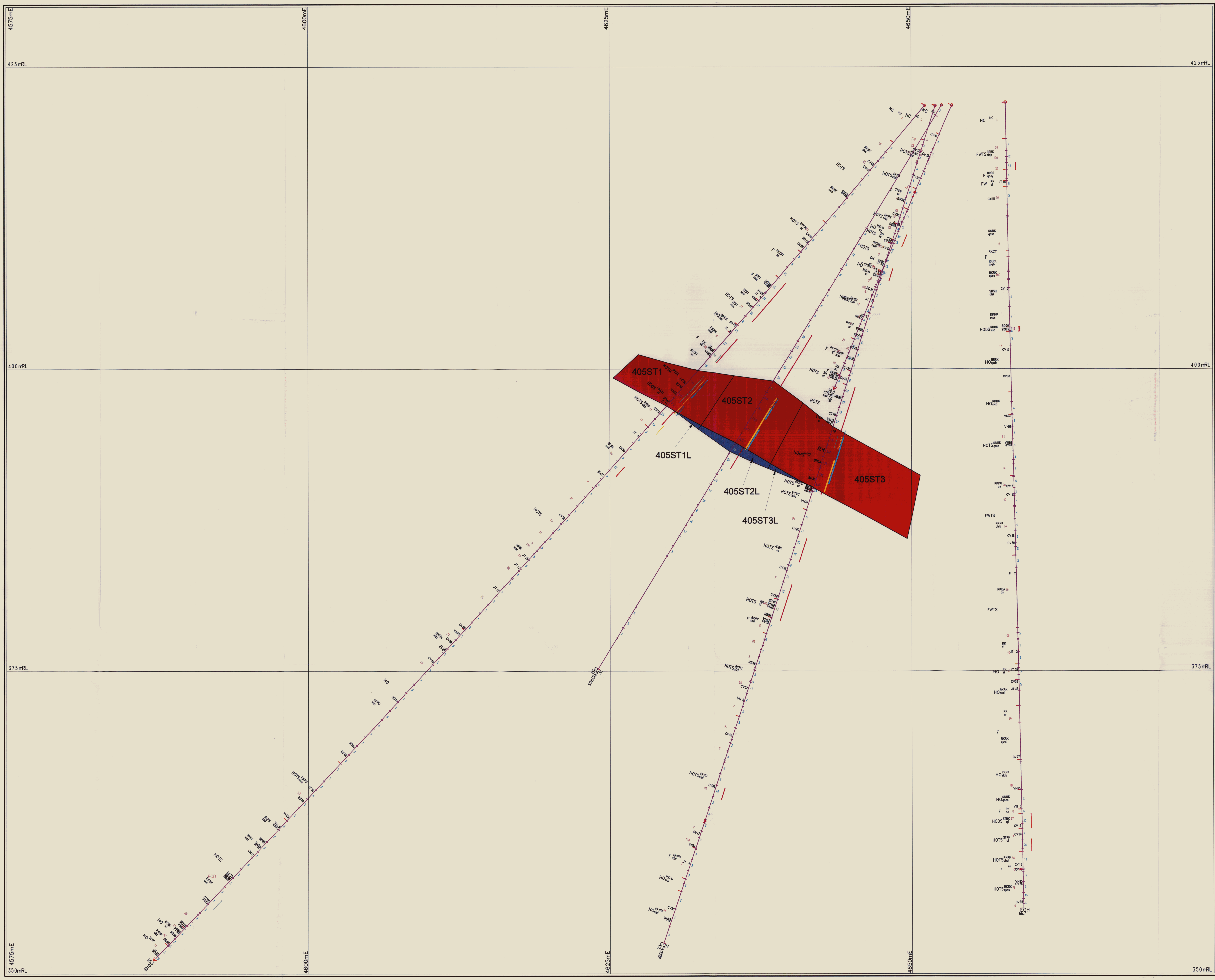
SCALE 1:100

558316

PASMINCO MINING - ROSEBERY

SOUTHERN TRENCHES
CROSS SECTION AT 4405N
INFERRED GEOLOGICAL RESOURCE
Influence (10N, 10S)

DATE	5 JAN 99	DRAWN		DESIGNED	
DWG No	8	DATAMINE		CHECKED	
				APPROVED	



LEGEND

CALCULATION MODEL = TMU DOLLARS
TMU > 80
TMU 65-80
TMU40-65
TMU 00-40

Lith above Alteration

HOLE VERIFIED AND GROUTED
HOLE VERIFIED (Not grouted - Unknown)
HOLE NOT VERIFIED

Right	Solid	Dashed	Small Bar
ZN %	>10	6-10	1-6
FE %	>15	10-15	5-10
AUg/t	>3.0	1.5-3.0	0.5-1.5
CU %	>1		0.25-0.5

5 cm

>60 TMU ore blocks
(>50 TMU cut off blocks identical)

40–50 TMU ore blocks

99-4262

J/V ANNUAL REPORT - EL 44/88
BURNS PEAK – PASMINCO R'BERY
EDWARDS, MURPHY, WHITBREAD
Vol 3 of 3

2 0 2 4 6 8 Metres

SCALE 1:100

553317

PASMINCO MINING - ROSEBERY

SOUTHERN TRENCHES
CROSS SECTION AT 4405N
INFERRED GEOLOGICAL RESOURCE
3m MINIMUM HORIZONTAL WIDTH
Influence (10N, 10S)

DATE	5 JAN 99	DRAWN		DESIGNED	
				CHECKED	
DWG No	9	DATAMINE		APPROVED	