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**SUMMARY**

Exploration on EL 1/93 during the licence year has been concentrated within the Proterozoic Oonah Formation in search for a shale/carbonate hosted massive sulphide deposit. Follow up of the North Ross Creek aeromagnetic anomaly was conducted through an electromagnetic survey and drilling of hole NRC1.

The eastern portion of EL 1/93 has had no activity carried out on it during the licence year.

## 1 INTRODUCTION

This report documents work completed on the Pasmaenco Exploration Huskisson River EL 1/93 from May 1996 to April 1997, and summarises all exploration during tenure.

Exploration on the Huskisson River EL is managed by Pasmaenco Exploration, a division of Pasmaenco Australia Ltd. The Huskisson River EL covers 36km<sup>2</sup>, and lies 19km north-northwest of Rosebery. It includes the Silver Falls workings hosted by the Cambrian Mt Read Volcanics, the North Ross Creek anomaly, the Will O'Wisp prospect, and the Just In Time prospect, all three of which are hosted in Precambrian Oonah Formation (Figure 1). The western section is approached via the Forestry track known as Huskisson Drive, whilst the eastern section of the tenement is accessed by a rough track that heads north from Boco Road.

Work during the 96/97 year has been limited to a fixed loop EM survey and the drilling of DDH NRC1 following up the North Ross Creek aeromagnetic anomaly.

## 2 TENURE

The Huskisson River EL 1/93 was granted to Pasmaenco Australia Ltd (Pasmaenco) on 21st May, 1993, covering 36km<sup>2</sup> (Figure 2).

The EL is subject to a number of land classifications. The tenure includes Deferred Forest Land, Multiple Use Forest Land and a small section of Mt Ramsay Recommended Area for Protection (Figure 2).

## 3 REGIONAL GEOLOGY

EL1/93 straddles the western flank of the Dundas trough in western Tasmania. Two sequences prospective for base metals occur, Proterozoic shales and carbonates and mid to late Cambrian Mt Read Volcanics.

Basement in western Tasmania is Precambrian in age, comprising predominantly greenschist facies metasediments with minor basalts and dolerites, although higher grade amphibolite and eclogite facies rocks are also present (Burrett and Martin, 1989). In the western part of the Huskisson River licence, Precambrian Oonah basement is exposed (Figure 3).

Cambrian volcanism and sedimentation developed on the margin and within the rift can be subdivided into the Eo-Cambrian tholeiitic Crimson Creek Formation (CCF) and the mid to late Cambrian Dundas Group and predominantly calc-alkaline Mt Read Volcanics (MRV).

The CCF was deposited in shallow but rapidly subsiding basins (Brown, 1986 and Haines, 1991) and consists of basaltic lavas and volcanoclastics, haematite facies turbidites, carbonates, chert and minor evaporites. The formation is exposed in the south-west corner of and immediately 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 (Figure 3). The ultramafics are interpreted at depth between North Pinnacles and Silver Falls by Leaman (1993).

A package of sediments which post-dates the ultramafics and possibly predates the MRV occurs in the eastern sector of the licence and in the footwall to the Rosebery Fault. These calcareous siltstones, wackes and polymict conglomerates are correlated with the Westcott Argillite/Salisbury Conglomerate in the Rosebery area and are considered to form the basal units 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. The sequence is correlated with the Stitt Quartzite at Rosebery.

Volcanics within the MRV include intermediate to felsic lavas, subvolcanic porphyries and granites, volcanoclastics and basement-derived sedimentary rocks. In EL 1/93

equivalents of the MRV are restricted to a narrow strip between the Rosebery Fault and the licence boundary with EL 2/90. At this locality, the MRV comprise pumiceous volcanics, quartz feldspar crystal sandstone and shales.

Regional structures associated with the MRV are the Rosebery Fault, splays of which extend into the Silver Falls area, and Henty Fault which is located 15km 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 Tabberabberan Orogeny (Keele, 1991). The development of folding, cleavage and regional thrusts in lower Palaeozoic rocks were associated with this event. Fold trends in the licences are N to NNE.

Deformation was followed by the extensive intrusion of Devonian to Carboniferous granitoids. The Meredith Granite and its hornfels aureole outcrop in the western part of EL 1/93 (Brown, 1986). The Meredith Granite dominates the regional gravity feature in the licence area (Leaman and Richardson 1989).

The Devonian granites are associated with carbonate replacement tin 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 sub-volcanic sediments were deposited. Remnants of the basalt flows are preserved between the Ramsay and Coldstream Rivers in the north of the licence.

## 4 OONAH FORMATION EXPLORATION

### 4.1 Previous Exploration

The previous exploration within the Oonah Formation has been outlined in Poltock (1993), Poltock and Saxon (1994) and Saxon and Basford (1995), and is summarised below in Table 1. Past and current prospect areas are outlined on Figure 4 and outcrop geology is in Figure 5.

### 4.2 Summary Of Work Completed by Pasminco 1993-96

Work conducted by Pasminco since 1993 within the Proterozoic has consisted of the following:

- Review of previous exploration
- Surface mapping of the Will O'Wisp area including structural mapping and reassessment of gossans to ironstones.
- Compilation of soil geochemistry data from the CAB grid over the Will O'Wisp prospect
- Geological investigation of the Just-in-Time workings area
- Compilation of soil geochemistry data over the Just-in-Time workings.
- Acquisition and interpretation of aeromagnetic data over the exploration licence.
- Establishment of the North Ross Creek grid
- Acquisition of ground magnetic data along the North Ross Creek grid.
- Mapping and rock chip sampling in the North Ross Creek area

All of this work is described in detail in Poltock (1993), Poltock and Saxon (1994) and Saxon and Basford (1995).

Table 1

Company	Year	Licence	Targets	Work Completed
Comstaff	1969	EL 5/63, Part 2	Coldstream-Huskisson-Ramsay area for asbestos, Ni, Sn and Au + base metals	Stream sediment sampling and reconnaissance mapping
	1969-1972			Drainage sampling defining Will O Wisp
	1972		Pb anomalism	Geological mapping, gossans outlined, CMT and WOW grids established
	1972-1973		Pb anomalism - WOW grid	Self Potential, ground magnetics and CRONE Electromagnetic surveys
	1973		WOW grid	Diamond Drilling of CR1-6 - results being dolostone-black shale sequence
	1975			INPUT EM survey, highlighting CAB anomaly. Followed up by establishment of CAB grid, soil sampling, ground magnetics and ground EM. Airborne anomaly not located
	1983		WOW prospect	Resampling / logging of CR1-6, anomalous Pb-Zn in shales.
	1983-1984			Restoration of CAB grid, extension to SW and auger sampling. GENIE EM over grid. CAB anomaly correlated with outcropping black shales
	1985		Just-In-Time prospect	1915 Workings cleared, new costeaning with chip sampling. Qtz-Ba-Pb veins revealed. Grid established and auger sampled
	1985		CAB grid	Repeat GENIE EM survey, plus IP and auger sampling. Minor stream sediment survey also.
	1985			Partial relinquishment of EL 5/63 Part 2, WOW and JIT retained
Comstaff BHP JV	1985			Review of work, but no active field work
	1988			Licence dropped
RGC	1990	EL 12/90 EL 15/90	Sn associated with Meredith granite	Minimal work, relinquished in 1992.

### 4.3 Work Completed May 1996-April 1997

#### 4.3.1 Fixed Loop Electromagnetic Survey

A fixed loop electromagnetic survey was designed to determine if the source of the North Ross Creek magnetic anomaly was massive pyrrhotite and therefore possibly related to mineralisation. A single 400m by 200m fixed loop (Figure 6) was used to generate the primary field and a portable CRONE roving receiver was used to record the secondary response. Line 5000N was recorded, starting from inside the loop at 5280E. Readings were taken every 20m along the line, recording both the X and Y components of the secondary field, with the survey finishing at station 4700E. A current of 4 amps was circulated through the transmitter loop.

Two anomalous responses were recorded in both the Z and X component data (Figure 7). Both anomalies are characterised by two stations, implying shallow responses, or noise. The first feature is located at 5020E, the second at 4820E.

The feature located at 5020E is coincident with the magnetic response observed from the airborne and ground magnetic surveys. The feature is extremely weak and could be associated with noise after crossing the loop front. As the response is not large, the magnetic source is probably related to magnetite.

The second feature at 4820E is directly in line with the strike extension of the fault separating the Proterozoic Oonah formation from Cambrian Dundas sediments, and is thus assumed to represent this feature. The fault is actually characterised by a large shear zone which would be expected to have a weak EM response.

#### 4.3.2 Soil Survey over North Ross Creek Anomaly

Two soil samples were taken over the North Ross Creek anomaly and analysed for base metals (see figure 8 for location of samples). Assay results are in appendix i. No anomalism was detected.

#### 4.3.3 Drilling of Diamond Drill Hole NRC1

NRC1 was drilled to test the aeromagnetic / ground magnetic anomaly located in the North Ross Creek region close to the fault structure separating Proterozoic Oonah Formation from Cambrian Dundas sediments (Figure 9; see drilling proposal Appendix ii).

A drill hole log is included in Appendix iii and drill section in Figure 10. A summary of the sequence intersected follows:

0 - 21.20m

Siltstone and Sandstone units, with brecciation and fracturing at the lower depths.

21.20 - 25.80m

Clayey siltstone unit

25.80 - 52.50m

Basic lava containing felspar phyric magnetite, and siltstones

52.50m - 142.1m

Massive fine grained magnetic basalt, probably associated with the Crimson Creek Formation.

A minor alteration zone was intersected between 83.20 and 84.60m Basalt is slightly chloritised and carbonatised, with disseminated trace pyrite associated with veins and contacts.

Assays results were insignificant and no further work is warranted (see appendix iv).

## **5 MT READ VOLCANICS EXPLORATION**

### **5.1 Previous Exploration**

Previous exploration within the Mt Read Volcanics has been limited to the Silver Falls area and is summarised in Poltock (1993), Poltock and Saxon (1994) and Saxon and Basford (1995). Prospect areas are outlined in Figure 4 and outcrop geology in Figure 11 & 12.

Four shallow depth holes were drilled to test mineralisation in 1949 by EZ. Aberfoyle conducted grid based soil geochemistry, IP and geological mapping. EZ also conducted grid based exploration along the northern strike extension of the Silver Falls host sequence, using soil/rock geochemistry, IP, mapping and costeaning, between 1980 and 1984.

### **5.2 Summary Of Work Completed by Pasminco 1993-96**

*Pasminco undertook grid based exploration in conjunction with work on neighbouring exploration licences over the Silver Falls trend. Diamond drill hole HRD1 was drilled in early 1994 based on results from previous exploration.*

No further work was undertaken by Pasminco in 1996-1997.

## **6 ENVIRONMENTAL DISTURBANCE AND REHABILITATION**

Eight hundred metres of cutting was conducted in the form of two four hundred metre lines for the fixed loop electromagnetic survey.

A minor amount of cutting was also required to create a long-drop area to put the drill rig on site. The area was located 10m from the drill collar location and the drill rig was winched through the scrub creating no further disturbance to the environment. Access to the hole was through the use of the 300m access track to the grid and then walking along the grid line to the hole.

## 7 EXPENDITURE SUMMARY 1995-96

The total expenditure on EL 1/93 during the third year of tenure to 31 March 1997 is \$63,930. A detailed breakdown of this expenditure is presented in the statement below.

	\$
Personnel: salaries, wages & on-costs	19,565
Travel & Accommodation	1,037
Geological Contractors	(3,950)
Geochemical Consultants & Assays	1,160
Geophysical Surveys & Consultants	0
Other Consultants	14,195
Drilling: including contractor, access & core storage	16,815
Stores & Supplies	830
Vehicles Plant & Equipment	1,497
Land	44
Computing	745
Office Running Costs	5,271
Administration	<u>5,721</u>
<b>TOTAL</b>	<b><u>\$62,930</u></b>

## 8 CONCLUSIONS AND RECOMMENDATIONS

Diamond drill hole NRC1 intersected a magnetite rich basaltic unit of the Crimson Creek Formation, which correlates with the location of the anomalous magnetic feature. No anomalous metals appear to be associated with this unit.

Prospectivity for base metals appears to be low and there are few obvious targets remaining. The potential for new targets will be evaluated in the content of regional prospectivity analysis.

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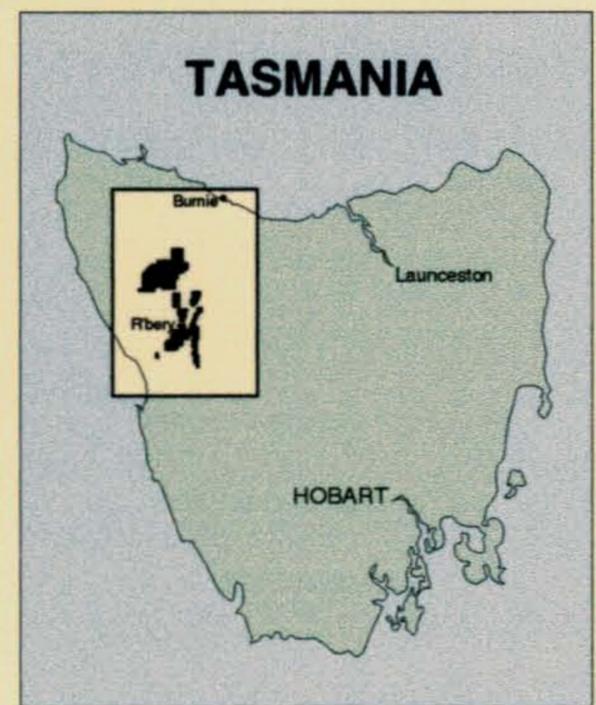
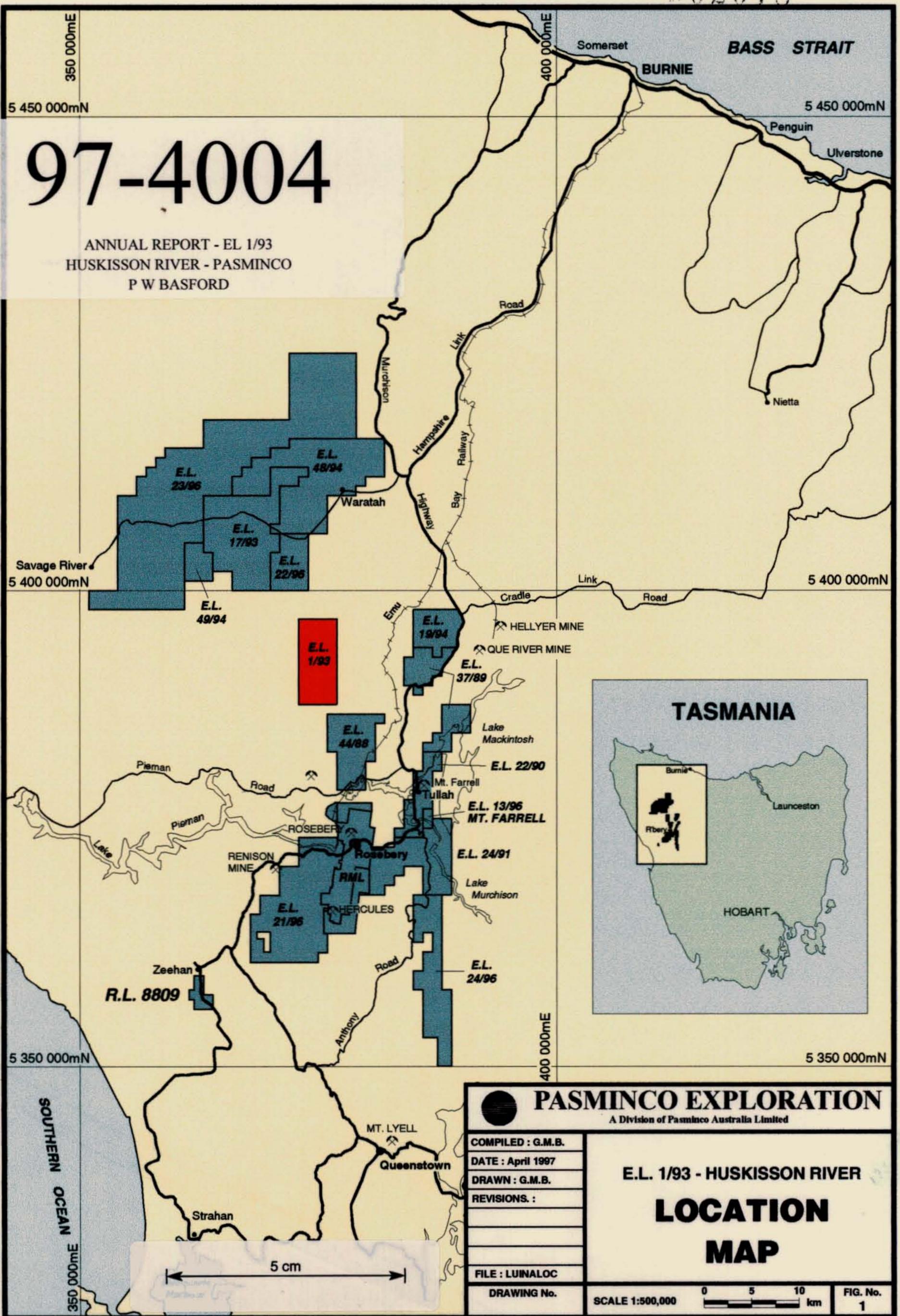
## 10 KEYWORDS AND LOCALITY

HUSKISSON, SILVER FALLS, WILL O' WISP, JUST IN TIME, MT READ  
VOLCANICS, OONAH FORMATION, VHMS, WHITE SPUR FORMATION,  
PUMICE BRECCIA, ROSEBERY FAULT, STITT QUARTZITE, WESTCOTT  
ARGILLITE, GALENA SPHALERITE, GEOPHYSICS, MAGNETICS,  
MODELLING.

PARSONS & RAMSAY 1:25 000

# 97-4004

ANNUAL REPORT - EL 1/93  
HUSKISSON RIVER - PASMINGO  
P W BASFORD



**PASMINGO EXPLORATION**  
A Division of Pasmingo Australia Limited

COMPILED : G.M.B.
DATE : April 1997
DRAWN : G.M.B.
REVISIONS :
FILE : LUINALOC
DRAWING No.

**E.L. 1/93 - HUSKISSON RIVER**

## LOCATION MAP

SCALE 1:500,000

0 5 10 km

FIG. No. 1

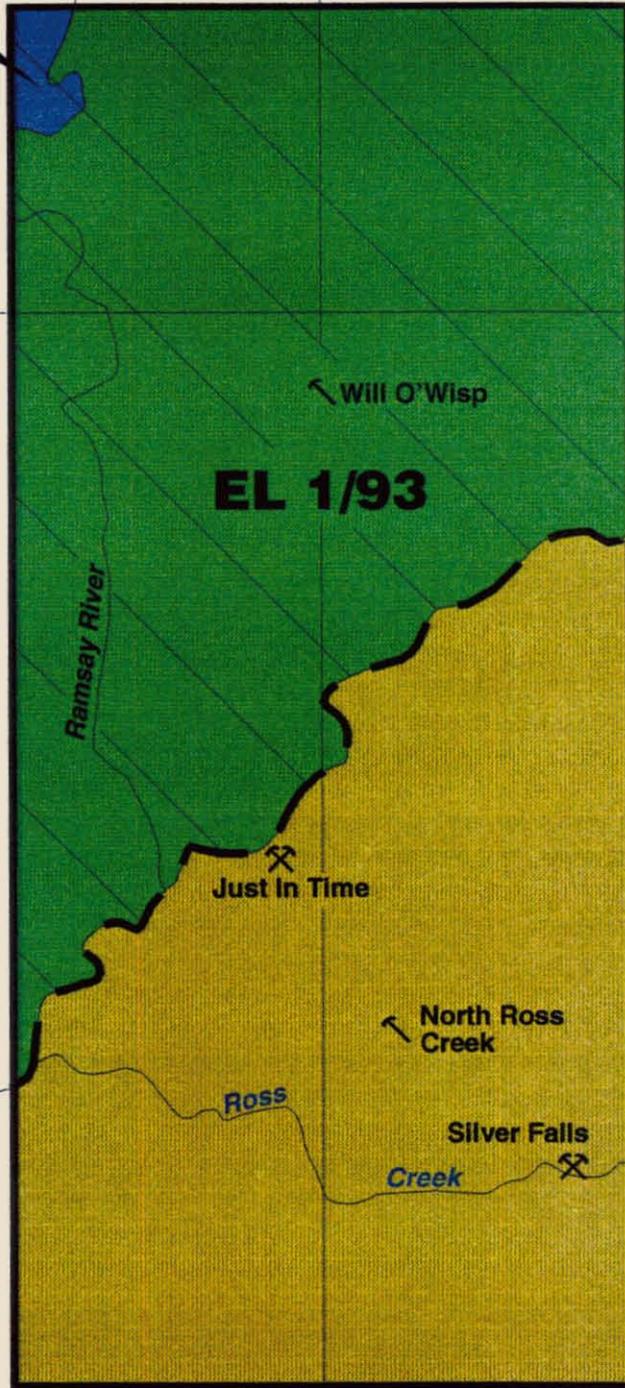
302019

MT. RAMSAY  
RAP

375 000mE

5 395 000mN  
△  
MT. RAMSAY

5 390 000mN



97-4004

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HUSKISSON RIVER - PASMINCO  
P.W. BASFORD

**LEGEND**



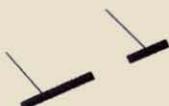
**RAP - Recommended Area for Protection**



**Deferred Forest**



**Multiple Use Forest**



**Proposed Tarkine  
Wilderness Area  
Register of National Estate**

5 cm



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DATE : April 1996

DRAWN : G.M.B.

REVISIONS :

FILE : HUSGEOL

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315-GN-004

**E.L. 1/93 - HUSKISSON RIVER**

**LAND  
TENURE**

SCALE 1:50,000

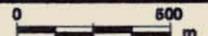


FIG. No.  
2



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HUSKISSON RIVER - PASMINCO  
P W BASFORD

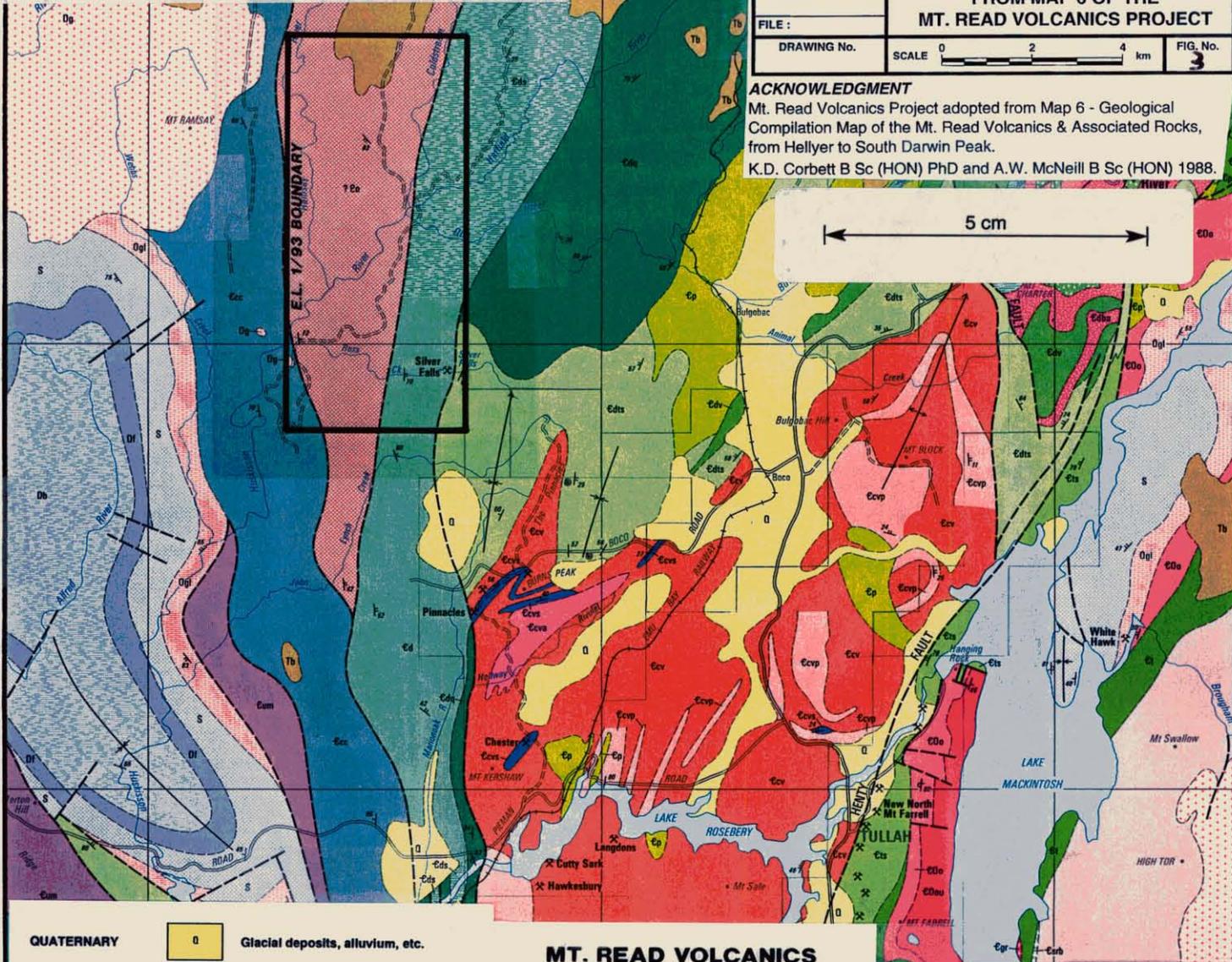
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DATE : April 1997  
DRAWN :  
REVISIONS  
FILE :

E.L. 1/93 - HUSKISSON RIVER  
**REGIONAL GEOLOGY**  
FROM MAP 6 OF THE  
MT. READ VOLCANICS PROJECT

DRAWING No. SCALE 0 2 4 km FIG. No. **3**

**ACKNOWLEDGMENT**

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



<b>QUATERNARY</b>	Q	Glacial deposits, alluvium, etc.
<b>TERTIARY</b>	Tb	Basalt
	Ts	Sediments - gravel, sand, clays
<b>JURASSIC</b>	Jd	Dolerite
<b>PERMIAN - CARBONIFEROUS</b>	F	Undifferentiated
<b>DEVONIAN</b>	Dd	Dolerite
	Dg	Granite
<b>DEVONIAN - SILURIAN</b>	Db	Bell Shale
	S-O Df	Florence Sandstone
	S	Silurian
<b>ORDOVICIAN</b>	Og	GORDON GROUP limestone
<b>EARLY ORDOVICIAN - LATE CAMBRIAN</b>	EOou	Upper sandstone sequence including Pioneer Beds (EOou)
	EOo	Undifferentiated conglomerate and sandstone (EOo)
	EOon	Newton Creek Sandstone (EOon) - interbedded sandstone siltstone and conglomerate with marine fossils

**MT. READ VOLCANICS**

**NORTH AND WEST OF HENTY FAULT  
DUNDAS GROUP AND CORRELATES**

Ep	Quartz-feldspar porphyry, mostly intrusive
Eds	Mostly sedimentary rocks - greywacke, siltstone, conglomerate
Edt	Interbedded tuffs and sedimentary rocks
Ed	Quartzwacke-slate-siltstone units, e.g. Stilt Quartzite
Edv	Mostly felsic volcanics - mainly tuffs
Edm	Mixed felsic and mafic volcanics and epiclastic breccias, Que-Hellyer area
Eda	Basaltic to andesitic volcanics

**SOUTH AND EAST OF HENTY FAULT  
TYNDALL GROUP AND CORRELATES**

Et	Mainly sed. rocks, incl Farrell Slat
Etv	Mainly quartz-feldspar-phyric volcanic and volcanoclastic rocks (Et)
Etcl	Mainly volcanoclastic congl. and sandstone
Etcb	Sticht Range Beds - sandstone, siltstone, siliciclastic conglomerate

**CAMBRIAN INTRUSIVE ROCKS**

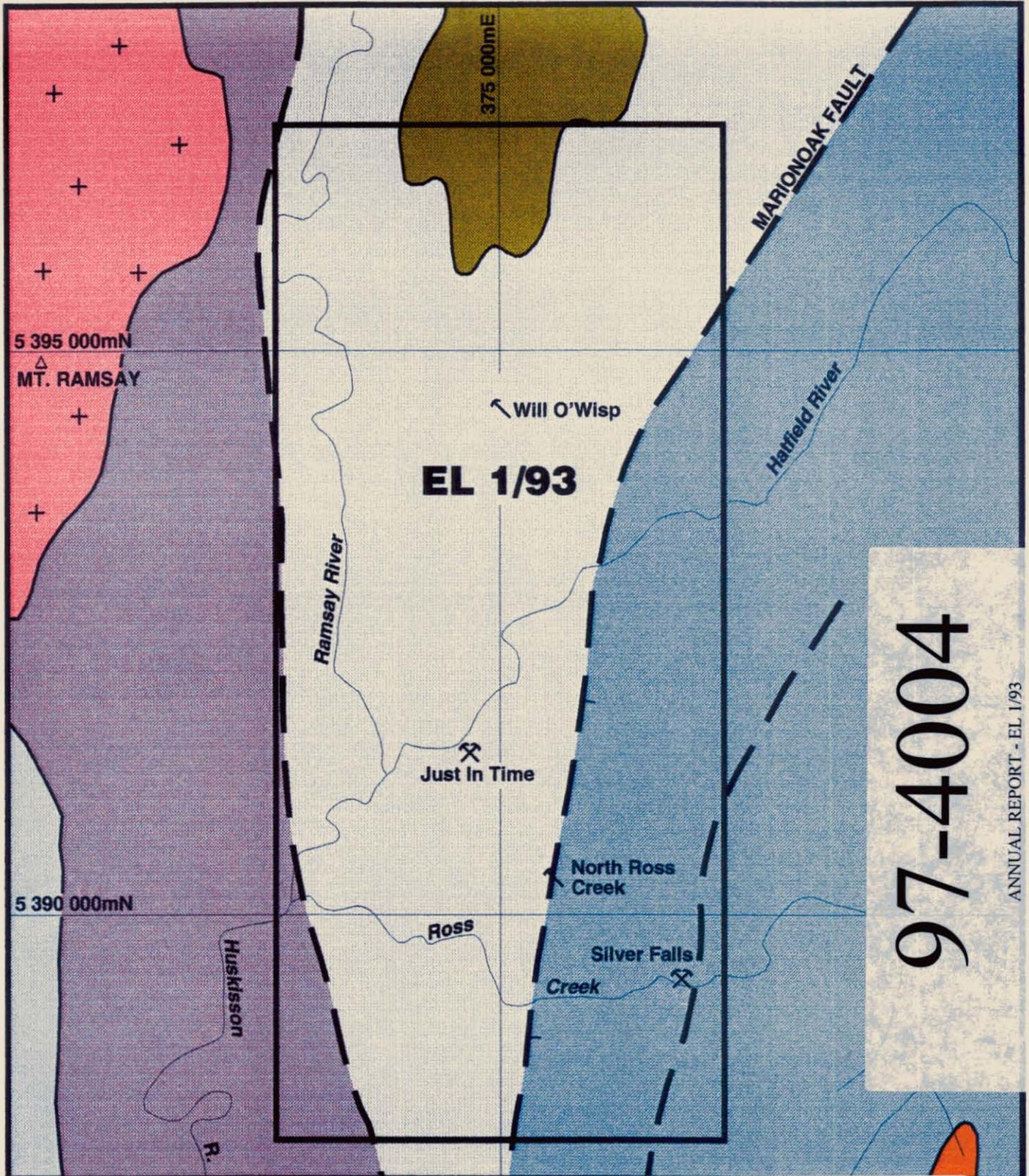
Ep	Granite
Ep	Felsic porphyry
Ep	Gabbro
Cum	Ultramafic rocks & serpentinite

**CENTRAL VOLCANIC COMPLEX**

EOv	Mainly feldspar-phyric volcanics - dacite, rhyolite, minor andesite (EOv)
Ep	Felsic porphyry, mainly intrusive
EOvp	Mainly pyroclastic rocks
EOvs	Sedimentary rocks, mainly shale and sandstone
EOva	Andesitic volcanics

**PRECAMBRIAN**

EO	Quartzite-slate sequences - correlates of Onah Formation
Em	Metamorphosed sequences of Tyennan Group



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**LEGEND**

- |                                                                                     |                    |                                                                                     |                         |
|-------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------|-------------------------|
|  | Tertiary Basalt    |  | Crimson Creek Formation |
|  | Devonian Granite   |  | Oonah Formation         |
|  | Gordon Group       |                                                                                     |                         |
|  | Dundas Group       |                                                                                     |                         |
|  | Pinnacles Rhyolite |                                                                                     |                         |

5 cm

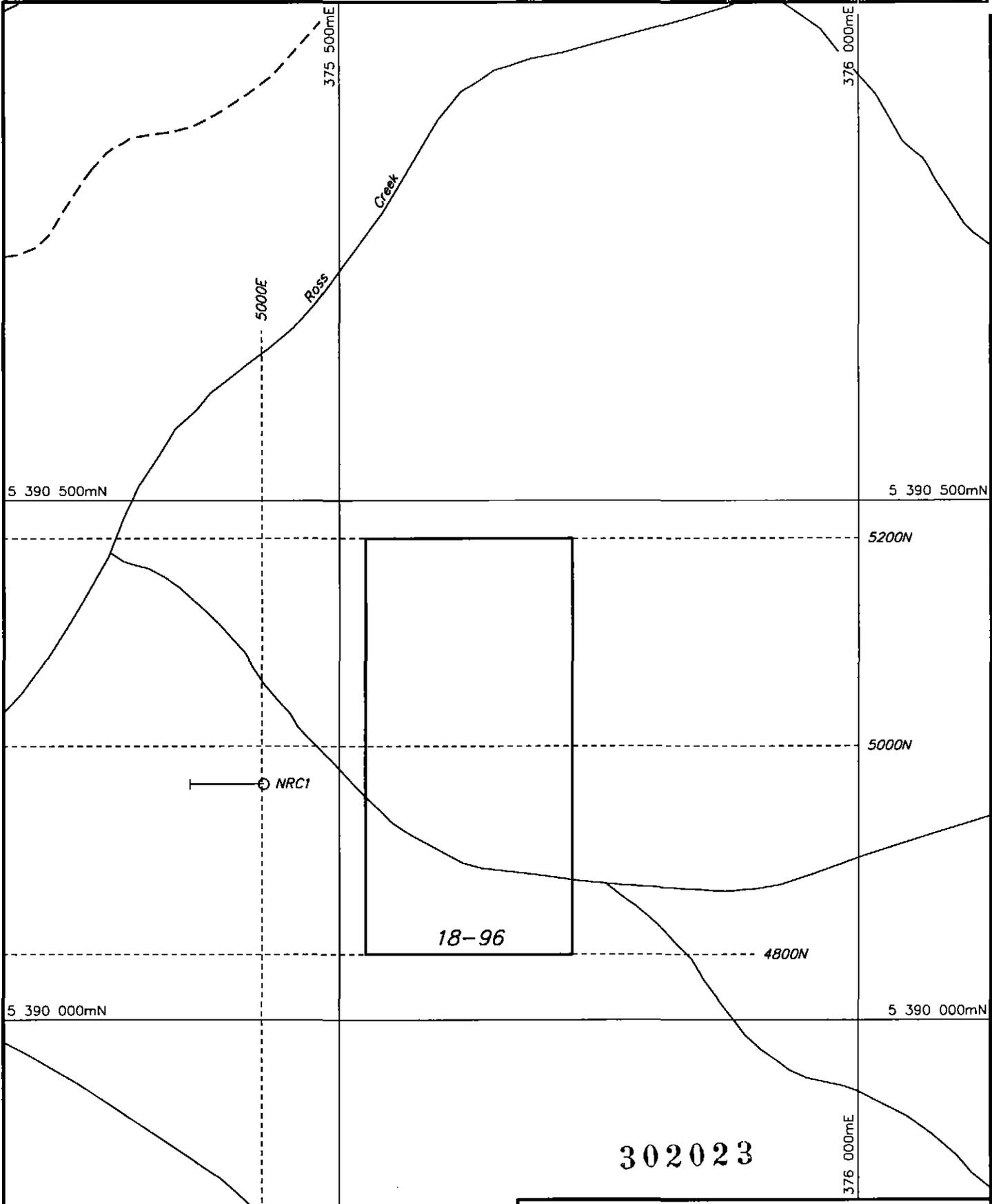
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 DATE : April 1998  
 DRAWN : G.M.B.  
 REVISIONS :  
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 \_\_\_\_\_  
 FILE : HUSGEOL

E.L. 1/93 - HUSKISSON RIVER  
**SIMPLIFIED  
 GEOLOGY AND  
 PROSPECT AREAS**

DRAWING No.      SCALE 1:60,000      0      500      m      FIG. No. 4





5 cm

# 97-4004

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 HUSKISSON RIVER - PASMINGO  
 P W BASFORD

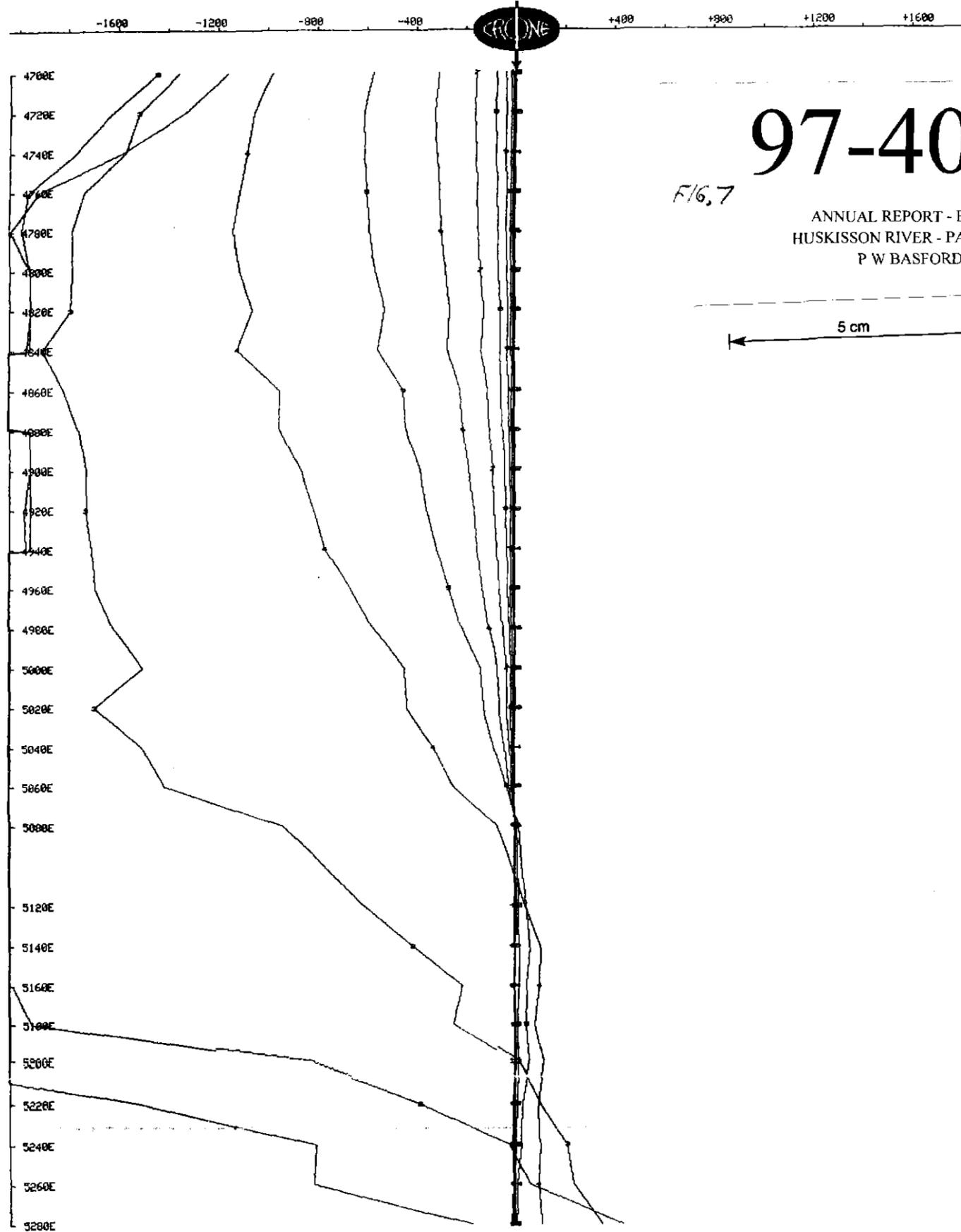
 <b>PASMINGO EXPLORATION</b> A Division of Pasmingo Australia Limited	
COMPILED : P.W.B.	E.L. 1/93 - HUSKISSON RIVER NORTH ROSS CREEK <b>FIXED          LOOP LAYOUT</b>
DATE : June 1996	
DRAWN : G.M.B.	
REVISIONS :	
FILE : LLFLOOP	
DRAWING No.	
SCALE 1:5000	FIG. No. <b>6</b>

Pasminco Exploration  
SURFACE PEM

Client : BURNIE, Tasmania  
Grid : North Ross Creek  
Date : May 23, 1976

Line : 5000N  
Tx Loop : 18-96  
File name : 5000N.PEM

IN-LINE HORIZONTAL COMPONENT  $dBx/dt$  nanoTesla/sec - 17 channels  
Scale: 1:2500 Unit Scale: 1cm = 200  
/s



97-4004

FIG. 7

ANNUAL REPORT - EL 1/93  
HUSKISSON RIVER - PASMINGO  
P W BASFORD

5 cm

Pasminco Exploration  
SURFACE PEM

302025

Client : BURNIE, Tasmania  
Grid : North Ross Creek  
Date : May 23, 1996

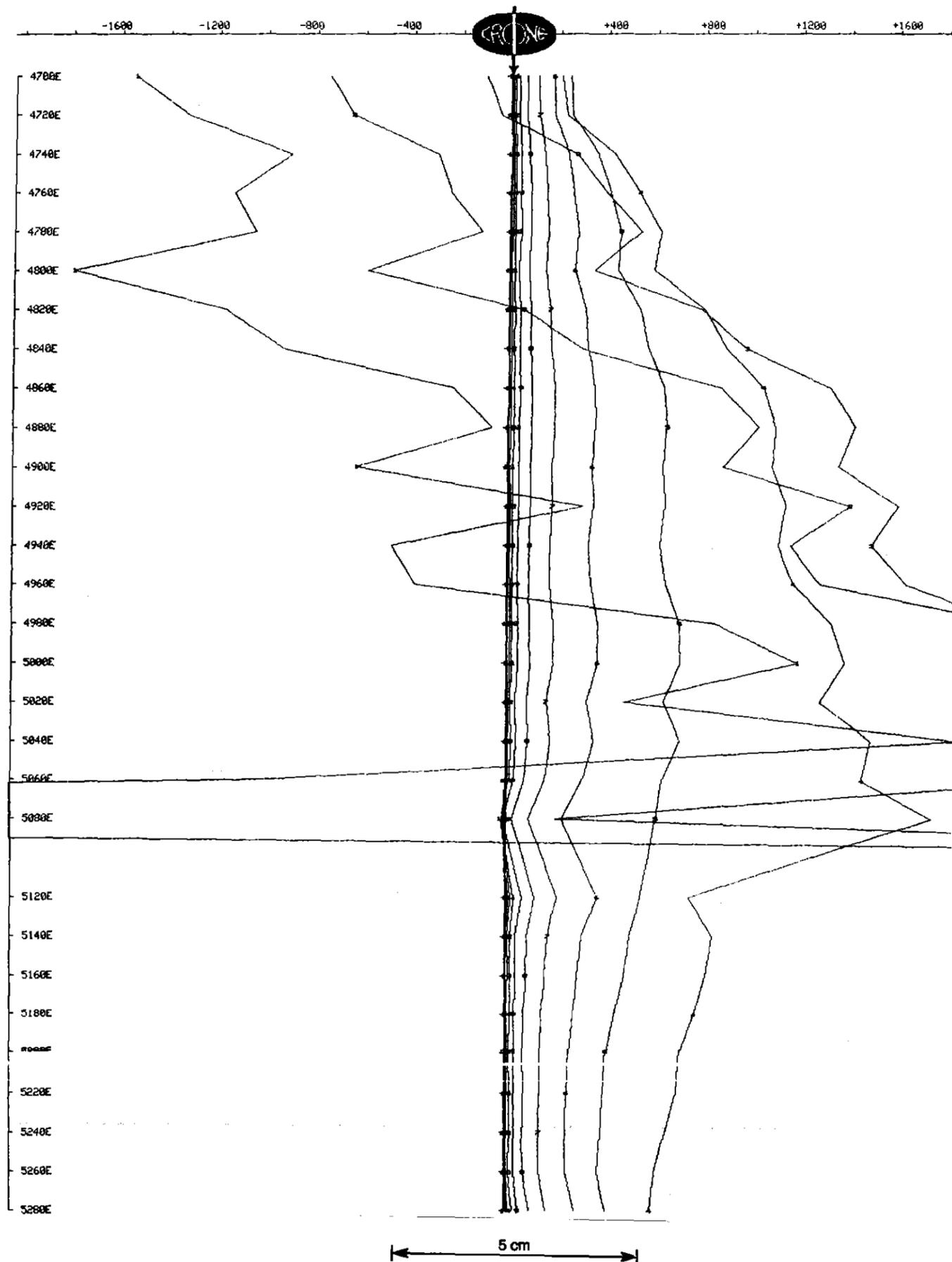
Line : 5000N  
Tx Loop : 18-96  
File name : 5000N.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 17 channels

Scale: 1:2500

Unit Scale: 1cm = 200

T/s



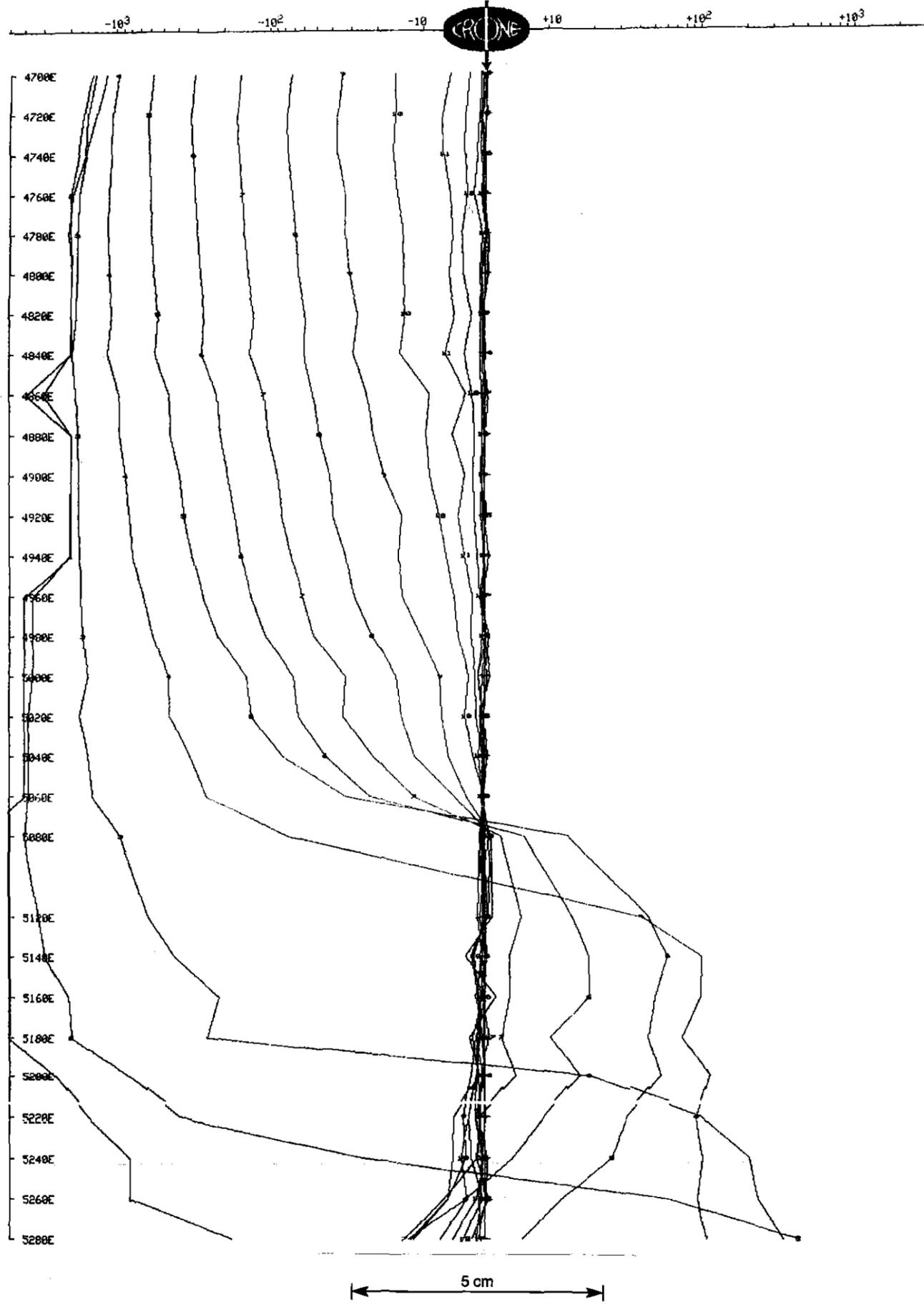
Pasminco Exploration  
SURFACE PEM

302026

Client : BURNIE, Tasmania  
Grid : North Ross Creek  
Date : May 23, 1996

Line : 5000N  
Tx Loop : 18-96  
File name : 5000N.PEM

IN-LINE HORIZONTAL COMPONENT dBx/dt nanoTesla/sec - 17 channels  
Scale: 1:2500



Pasminco Exploration  
SURFACE FEM

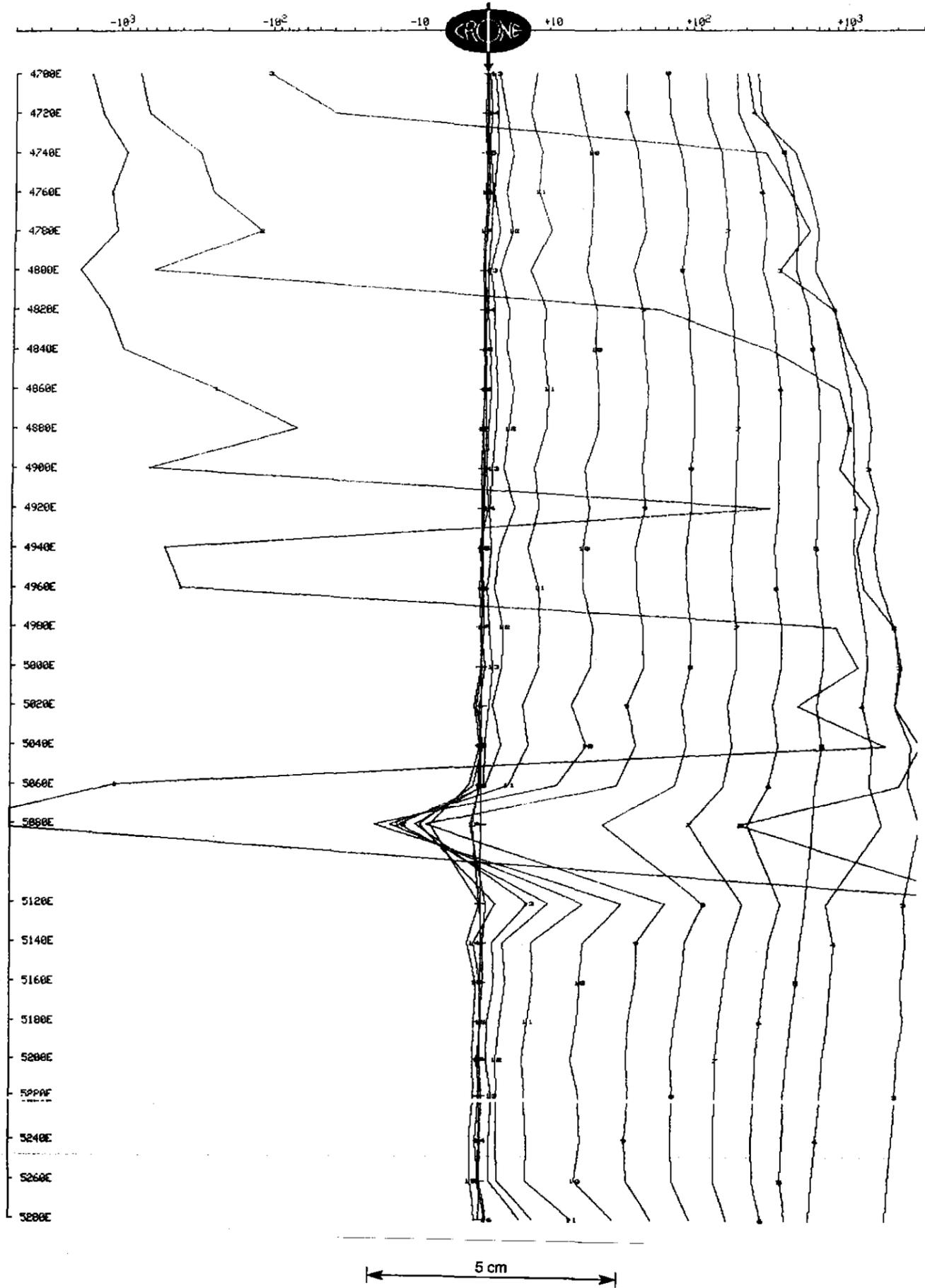
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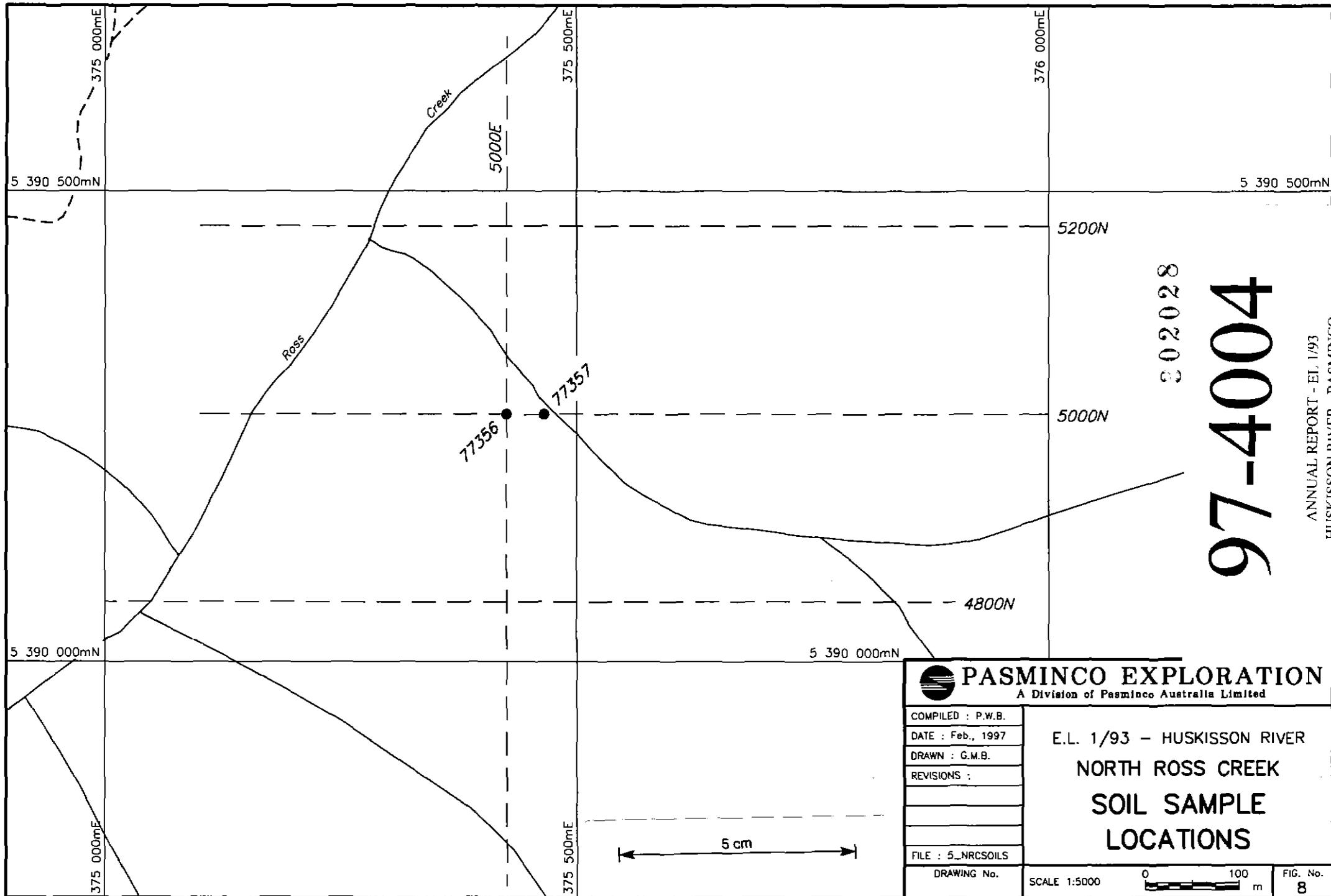
Client : BURNIE, Tasmania  
Grid : North Ross Creek  
Date : May 23, 1996

Line : 5000N  
Tx Loop : 18-96  
File name : 5000N.PEM

VERTICAL COMPONENT dBz/dt nanoTesla/sec - 17 channels

Scale: 1:2500





302028

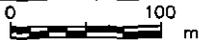
# 97-4004

ANNUAL REPORT - EL. 1/93  
HUSKISSON RIVER - PASMINCO

**PASMINCO EXPLORATION**  
A Division of Pasminco Australia Limited

COMPILED : P.W.B.
DATE : Feb., 1997
DRAWN : G.M.B.
REVISIONS :
FILE : 5_NRCISOILS
DRAWING No.

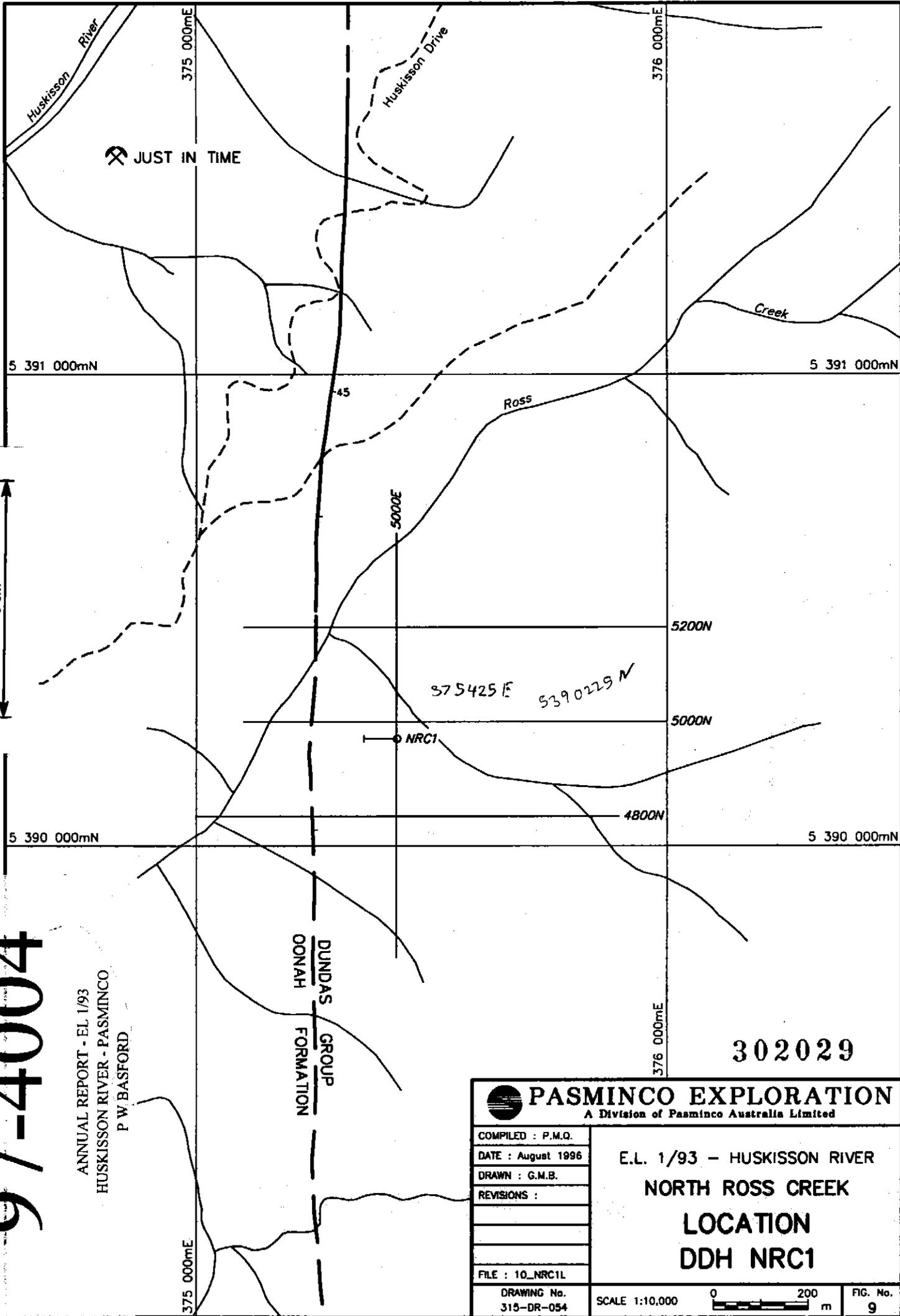
E.L. 1/93 - HUSKISSON RIVER  
NORTH ROSS CREEK  
SOIL SAMPLE  
LOCATIONS

SCALE 1:5000  FIG. No. 8

# 97-4004

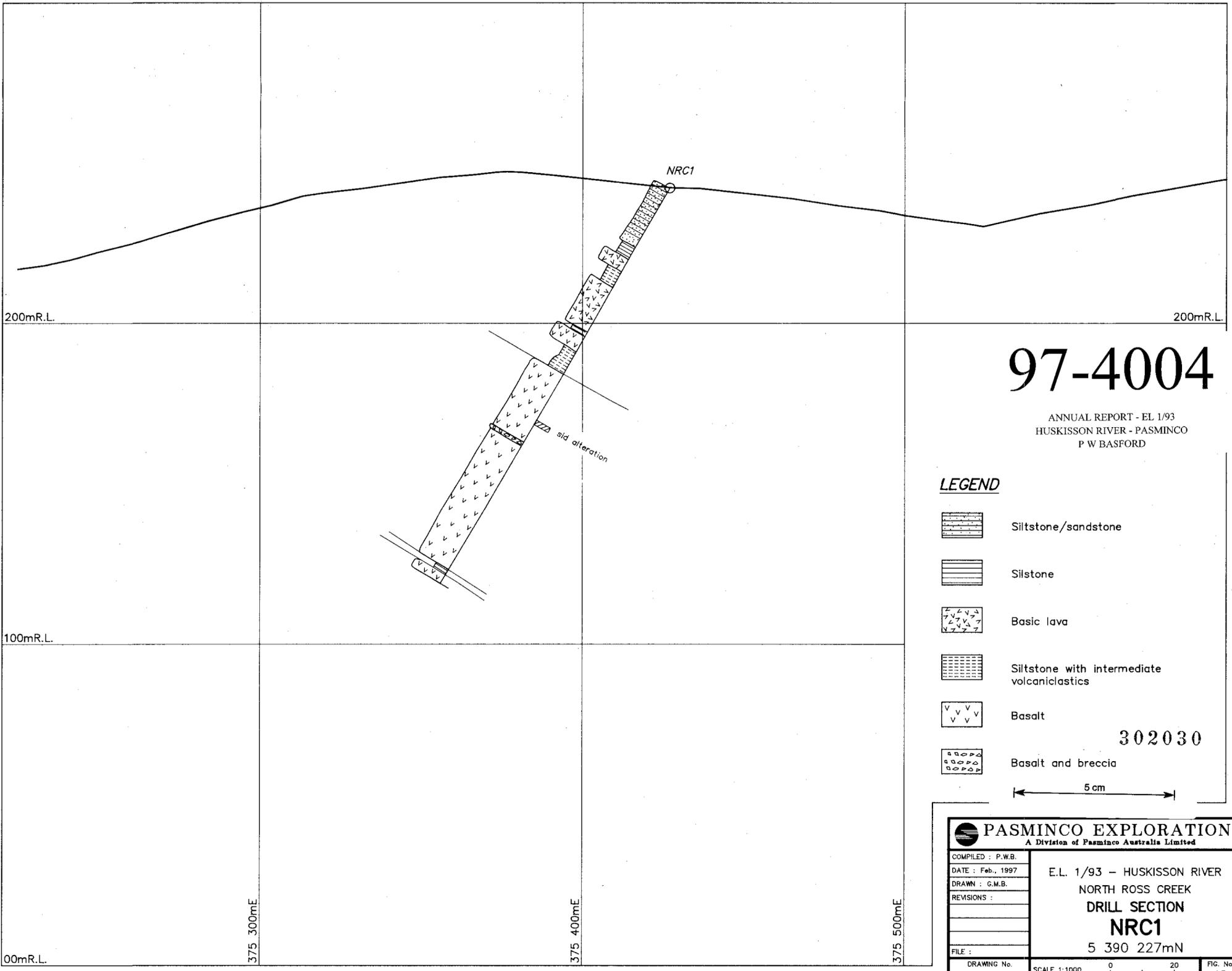
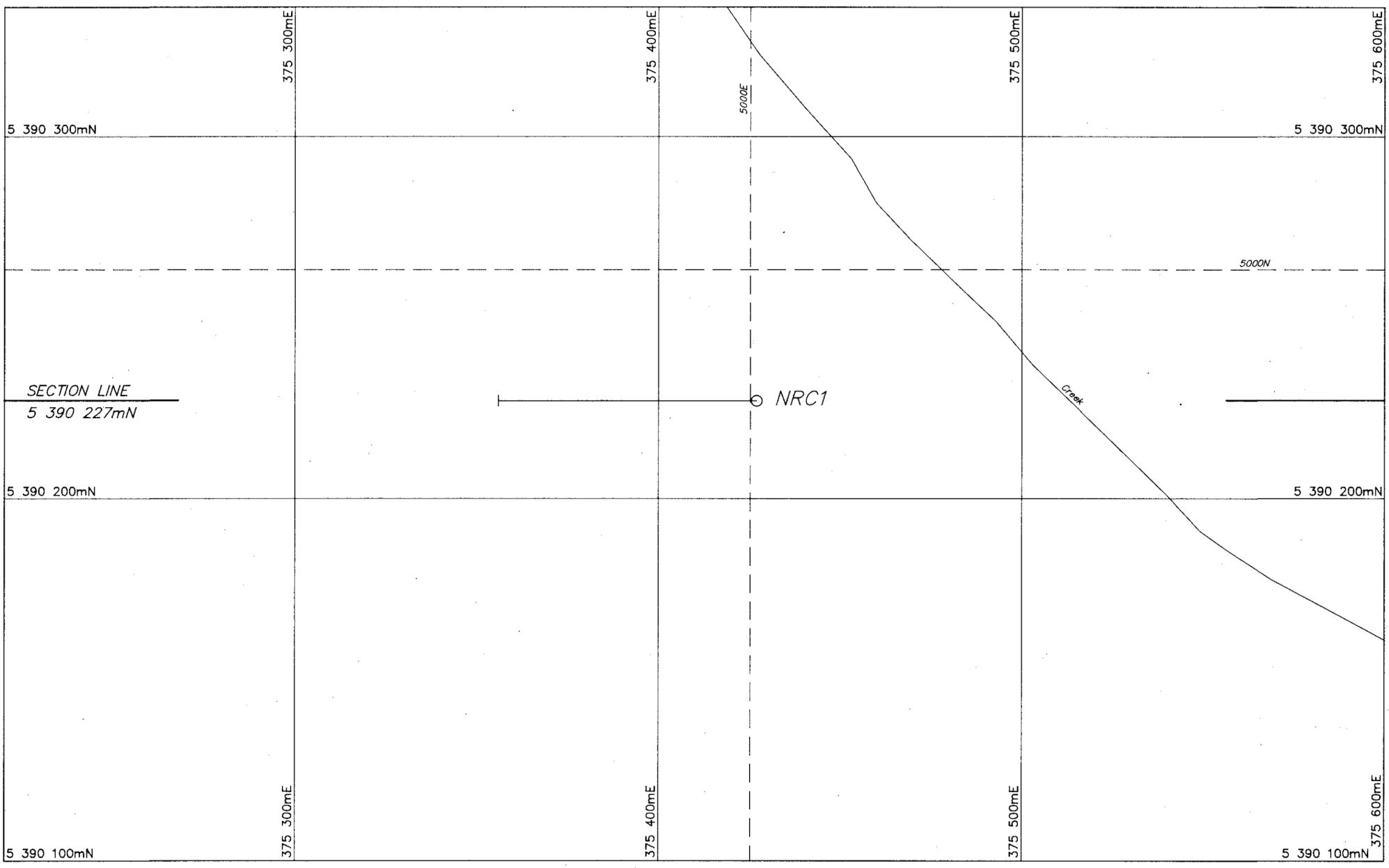
ANNUAL REPORT - EL 1/93  
HUSKISSON RIVER - PASMINCO  
P W BASFORD

DUNDAS GROUP  
FORMATION



302029

 <b>PASMINCO EXPLORATION</b> A Division of Pasminco Australia Limited			
COMPILED : P.M.Q.	<b>E.L. 1/93 - HUSKISSON RIVER NORTH ROSS CREEK LOCATION DDH NRC1</b>		
DATE : August 1996			
DRAWN : G.M.B.			
REVISIONS :			
FILE : 10_NRC1L			
DRAWING No. 315-DR-054	SCALE 1:10,000		FIG. No. 9



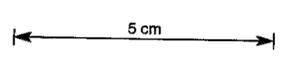
# 97-4004

ANNUAL REPORT - EL 1/93  
 HUSKISSON RIVER - PASMINGO  
 P W BASFORD

### LEGEND

-  Siltstone/sandstone
-  Siltstone
-  Basic lava
-  Siltstone with intermediate volcanoclastics
-  Basalt
-  Basalt and breccia

302030



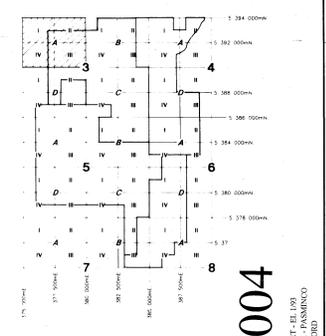
<b>PASMINCO EXPLORATION</b> A Division of Pasminco Australia Limited			
COMPILED : P.W.B.	E.L. 1/93 - HUSKISSON RIVER NORTH ROSS CREEK <b>DRILL SECTION</b> <b>NRC1</b> 5 390 227mN		
DATE : Feb., 1997			
DRAWN : G.M.B.			
REVISIONS :			
FILE :			
DRAWING No.	SCALE 1:1000	0 20 m	FIG. No. 10



**LEGEND**

- 1. General Form**  
 Colour, grain size, overall texture, Rock Type, constituents & textures, alteration, mineralisation. Descriptors and Rock Types to be separated by comma or slash. Derwent series 19 colours (in brackets) are intended for the Cambrian sequences.
- 2. Rock Types**
- |                          |          |                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Lavas</b>             | <b>L</b> | l (30) acid<br>l (40) intermediate<br>l (50) basaltic<br>l (60) rhyolitic<br>l (70) dacitic<br>l (80) andesitic                                                                                                                                                                                                                                                   |
| <b>Intrusives</b>        | <b>I</b> | i (10) acid<br>i (40) intermediate<br>i (60) felsic<br>i (70) porphyritic<br>i (80) granitic<br>i (90) pegmatitic                                                                                                                                                                                                                                                 |
| <b>Volcaniclastics</b>   | <b>V</b> | vm (7) pumiceous mass flow<br>v (30) quartz phytic mass flow<br>vst (30) sandstone<br>vst (30) graded crystal tuffic                                                                                                                                                                                                                                              |
| <b>Sediments</b>         | <b>S</b> | sh (30) shale<br>sl (30) siltstone<br>st (30) sandstone<br>td (30) turbidite<br>w (30) waste<br>com (30) conglomerate<br>br (30) breccia<br>cht (30) chert<br>lm (30) limestone<br>dol (30) dolomite<br>q (30) quartzite<br>fe (30) iron formation<br>gl (30) glacial deposits<br>fg (30) fluvio-glacial deposits<br>al (30) alluvial deposits<br>m (30) mudstone |
| <b>Metamorphic Rocks</b> | <b>M</b> | sch (30) schist<br>sp (30) semi-pelite<br>ps (30) psammite<br>amp (30) amphibolite<br>gran (30) granulite<br>sk (30) skarn<br>mb (30) marble<br>m (30) mylonite                                                                                                                                                                                                   |
- 3. Descriptors**
- Colour:**  
 plc pale bl blue  
 dk dark wh white  
 or clear ylt yellow  
 or orange ol olive  
 blk black gln green  
 pk pink psl purple  
 rd red  
 brn brown  
 crn cream
- Grain Size:**  
 fg fine grained  
 mg medium grained  
 cg coarse grained  
 vcg very coarse grained
- Overall Texture:**  
 aug augen  
 p porphyritic  
 fol foliated  
 clef cleaved  
 msv massive  
 blk blocky  
 bc bedded  
 lam laminated  
 sct cross bedded  
 klm cross laminated  
 br brecciated  
 b flow banded  
 fa flow brecciated  
 upf upwards fining sequence  
 hyl hydroclastic  
 pil pillared  
 pep pebbly
- Constituents & Internal Textures:**  
 f felspar  
 q quartz  
 ilb ilitic  
 pm pyroxene  
 styl stylolites  
 wls wls  
 ves vesicles  
 sph spherulites  
 lib lithology  
 mic micaceous  
 mag magnetite  
 cr chromite  
 py pyrite  
 hb hornblende  
 oph ophiolite
- Alteration:**  
 ab altered  
 co carbonate alt  
 chl chloritised  
 ser sericitised  
 kaol kaolinised  
 ep epidotised  
 al altered
- Mineralisation:**  
 dis disseminated  
 str stringer  
 msv massive  
 gas gascon  
 bx boxwork  
 py pyrite  
 ps pyrrhotite  
 asp arsenopyrite  
 gn galena  
 ap apatite  
 mag magnetite  
 hm haematite

- 3. Mapping Symbols**
- Unassigned [Symbol] Use alone or as a qualifier to other rock types where uncertain.
- |                                                   |                                         |
|---------------------------------------------------|-----------------------------------------|
| [Symbol] Strike and Dip of Strata                 | [Symbol] Unconformity                   |
| [Symbol] Strike and dip of inverted strata        | [Symbol] Fault                          |
| [Symbol] Strike and dip of cleavage or foliation  | [Symbol] Thrust Fault                   |
| [Symbol] Plunge of lineation                      | [Symbol] Plunging antiform              |
| [Symbol] Geological boundary position accurate    | [Symbol] Plunging synform               |
| [Symbol] Geological boundary position approximate | [Symbol] Shear/strung cleavage          |
| [Symbol] Mine                                     | [Symbol] S1 + Ser + Py Alteration Zone  |
| [Symbol] Abandoned prospect or mine               | [Symbol] I.P. Anomaly                   |
| [Symbol] Costean or trench                        | [Symbol] Magnetic/Gravity/TM Lineaments |
| [Symbol] Diamond drill hole, including projection | [Symbol] Magnetic Trend Line            |



97-4004

ANNUAL REPORT ON THE HUSKISSON RIVER, TASMANIA P.W. BARNFORD

302031

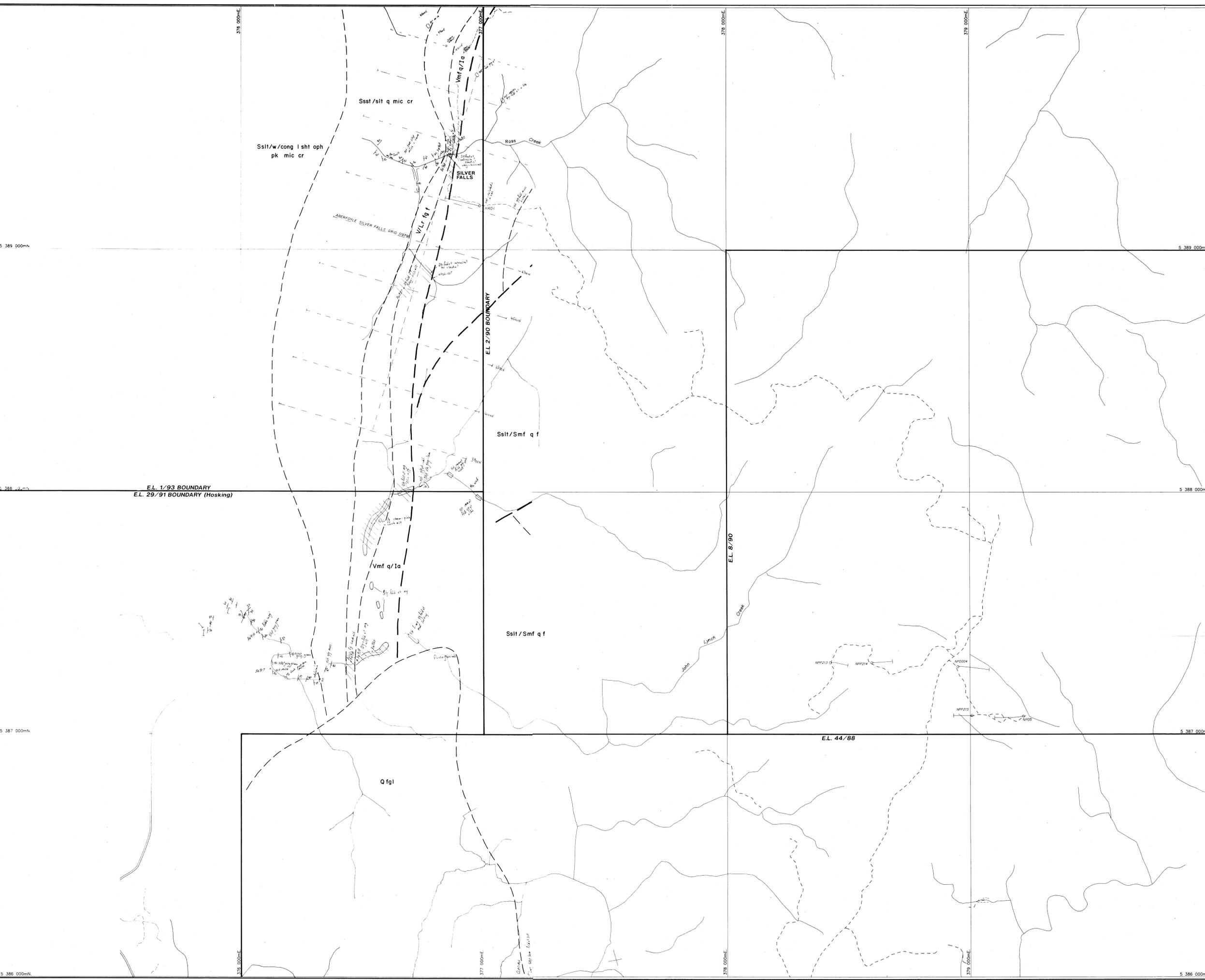
**PASMINCO EXPLORATION**  
A Division of Pasminco Australia Limited

COMPILED: R.A.P.  
 DATE: April, 1993  
 DRAWN: G.M.B.  
 REFERENCE:  
 REVISIONS:

**EL. 1/93 - HUSKISSON RIVER  
 OUTCROP GEOLOGY,  
 INTERPRETIVE  
 GEOLOGY AND ROCK  
 SAMPLE LOCATIONS**

DRAWING No. 315-GL-015 SCALE 1:5000

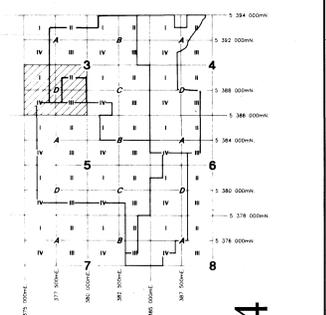
FIG. No. 11



**LEGEND**

- 1. General Form**  
 Colour, grain size, overall texture, Rock Type, constituents & textures, alteration, mineralisation.  
 Descriptors and Rock Types to be separated by comma or slash. Derwent series 19 colours (in brackets) are intended for the Cambrian sequences.
- 2. Rock Types**
- Lavas L**
- |     |              |
|-----|--------------|
| (a) | acid         |
| (i) | intermediate |
| (b) | basaltic     |
| (r) | ryholitic    |
| (d) | dacitic      |
| (n) | andesitic    |
- Intrusives I**
- |       |              |
|-------|--------------|
| (a)   | acid         |
| (i)   | intermediate |
| (b)   | basaltic     |
| (f)   | felsic       |
| (p)   | porphyritic  |
| (g)   | granitic     |
| (peg) | pegmatitic   |
- Volcaniclastics V**
- |      |                         |
|------|-------------------------|
| (pm) | pumiceous mass flow     |
| (a)  | quartz phytic mass flow |
| (st) | sandstone               |
| (mt) | graded crystal tuffic   |
- Sediments S**
- |        |                         |
|--------|-------------------------|
| (sh)   | shale                   |
| (sl)   | slate incl. black slate |
| (st)   | siltstone               |
| (sd)   | sandstone               |
| (sb)   | sublithic               |
| (w)    | waacke                  |
| (cong) | conglomerate            |
| (b)    | breccia                 |
| (sh)   | shert                   |
| (i)    | imestone                |
| (d)    | dolomite                |
| (q)    | quartzite               |
| (t)    | iron formation          |
| (d)    | glacial deposits        |
| (fg)   | fluvial deposits        |
| (al)   | alluvial deposits       |
| (mt)   | mudstone                |
- Metamorphic Rocks M**  
 Colours should be hatched
- |       |             |
|-------|-------------|
| (sch) | schist      |
| (sp)  | semi-pelite |
| (ps)  | psammite    |
| (am)  | amphibolite |
| (gr)  | granulite   |
| (sk)  | skarn       |
| (mb)  | marble      |
| (m)   | mylonite    |
- 3. Descriptors**
- Colour:**
- |     |        |    |        |
|-----|--------|----|--------|
| pl  | pale   | bl | blue   |
| dk  | dark   | wh | white  |
| cl  | clear  | yl | yellow |
| or  | orange | ol | olive  |
| bl  | black  | gr | green  |
| pk  | pink   | pl | purple |
| rd  | red    | cr | cream  |
| brn | brown  |    |        |
- Grain Size:**
- |     |                     |
|-----|---------------------|
| fg  | fine grained        |
| mg  | medium grained      |
| cg  | coarse grained      |
| vog | very coarse grained |
- Overall Texture:**
- |      |                         |
|------|-------------------------|
| oag  | auger                   |
| p    | porphyritic             |
| fol  | foliated                |
| cid  | cleaved                 |
| msv  | massive                 |
| bl   | blocky                  |
| bd   | bedded                  |
| lam  | laminated               |
| abd  | acid bedded             |
| slom | slom cross laminated    |
| br   | brecciated              |
| bf   | flow banded             |
| fb   | flow brecciated         |
| ufs  | upwards facing sequence |
| hd   | hydroclastic            |
| pl   | pillowed                |
| pep  | peperitic               |
- Constituents & Internal Textures:**
- |     |             |
|-----|-------------|
| f   | feldspar    |
| q   | quartz      |
| i   | illite      |
| pm  | pumice      |
| stl | stylonites  |
| wsp | woolwags    |
| ves | vesicles    |
| sp  | spheralites |
| lph | lithophysae |
| mic | micaceous   |
| mag | magnetite   |
| or  | chromite    |
| gr  | garnet      |
| hb  | hornblende  |
| op  | ophiolite   |
- Alteration:**
- |      |             |
|------|-------------|
| ca   | carbonate   |
| cd   | chloritised |
| ser  | sericitised |
| kaol | kaolinised  |
| ep   | epidiorised |
| sl   | silicified  |
- Mineralisation:**
- |     |              |
|-----|--------------|
| dis | disseminated |
| str | stringer     |
| msv | massive      |
| gss | gossan       |
| bx  | boxwork      |
| py  | pyrite       |
| ps  | pyrrhotite   |
| asp | arsenopyrite |
| gn  | galena       |
| sp  | sphalerite   |
| mag | magnetite    |
| hem | hematite     |

- 3. Mapping Symbols**
- Use alone or as a qualifier to other rock types where uncertain.
- |       |                                          |                                |
|-------|------------------------------------------|--------------------------------|
| 25    | Strike and dip of Strata                 | Unconformity                   |
| 25    | Strike and dip of inverted strata        | Fault                          |
| 25    | Strike and dip of cleavage or foliation  | Thrust Fault                   |
| 90    | Plunge of lineation                      | Plunging outcrop               |
| —     | Geological boundary position accurate    | Plunging synform               |
| - - - | Geological boundary position approximate | Shear/strong cleavage          |
| ⊗     | Mine                                     | SB + Ser + Py Alteration Zone  |
| ⊗     | Abandoned prospect or mine               |                                |
| ⊗     | Crozier or trench                        |                                |
| ⊗     | Diamond drill hole, including projection |                                |
| ⊗     | I.P. Anomaly                             | Magnetic/Gravity/TM Lineaments |
| —     |                                          | Magnetic Trend Line            |



302032

5 cm

**PASMINCO EXPLORATION**  
 A Division of Pasminco Australia Limited

COMPILED : R.A.P.  
 DATE : April, 1993  
 DRAWN : G.M.B.  
 REFERENCE :  
 REVISIONS :

**E.L. 1/93 - HUSKISSON RIVER**  
**OUTCROP GEOLOGY,**  
**INTERPRETIVE**  
**GEOLOGY AND ROCK**  
**SAMPLE LOCATIONS**

DRAWING No. 315-GL-016 SCALE 1:5000 FIG. No. 12

97-4004  
 ANNUAL REPORT - EL 1/93  
 HUSKISSON RIVER - PASMINCO  
 P.W. BASTFORD

# 97-4004

ANNUAL REPORT - EL 1/93  
HUSKISSON RIVER - PASMINGO  
P W BASFORD

302033

## Appendix 1

Soil Geochemistry

Sample No.	AMG_E	AMG_N	Grid East	Grid North	Cu	Pb	Zn	Mn	Fe%	As	Cr	Ni	Ag	Au	Sn	W
77356	375465	5390262	5040	5000	187	149	122	2140	9.58	10	59	82	-1	0.003	-5	15
77357	375425	5390262	5000	5000	106	127	73	820	8.77	1	89	49	-1	0.003	-5	-10
77358	375950	5392610			50	61	103	953	7.48	3	116	71	-1	0.002	-5	10

202034

# 97-4004

ANNUAL REPORT - EL 1/93  
HUSKISSON RIVER - PASMINGO  
P W BASFORD

302035

## Appendix 2

**TO:** MJ Tomkinson

**COPIES TO:** PM Quayle

**FROM:** PW Basford

**DATE:** 29 July 1996

**SUBJECT:** **Diamond Drill Hole Proposal - NRC1 - Huskisson River EL 1/93**

#### Summary

The proposed diamond drill hole NRC1 will test an unexplained aeromagnetic / ground magnetic anomaly coincident with a fault structure that separates the Precambrian Oonah Formation and Cambrian Dundas sediments. A weak electromagnetic conductor exists coincident with the modelled edge of the magnetic body, inferring a contact with a conductivity contrast. Hole depth will be approximately 150m.

#### Geology and Geophysics

Two large bulls-eye aeromagnetic anomalies evident in the regional data set of the Huskisson River EL 1/93 licence have not been explained. They lie close to a major fault separating Precambrian Oonah Formation and Cambrian Dundas sediments. The fault is also evident within the aeromagnetic data, as Dundas sediments are cemented with a haematite matrix which produces a magnetic susceptibility contrast. Aeromagnetic data infers a northwest jog in the fault at the position of the anomalies. The aeromagnetic bulls-eye anomaly has similarities to that over Renison, Cleveland and Mt Bischoff.

The Meredith Granite occurs to the northwest of the area, with minor outcrop located within the licence from regional mapping carried out by Tasmanian Department of Resources.

Ground magnetic data collected over the anomaly confirmed the existence of the aeromagnetic feature, and enabled better modelling of the source. Differences between the aeromagnetic model and ground magnetic model are few. The ground data has inferred the possibility of two sources close to each other, appearing as one from the air.

A single line of electromagnetic data using a fixed loop source indicated a weak response coincident with the edge of the ground magnetic modelled source.

The source could be an ultramafic intrusion, however, the shape of the aeromagnetic anomaly is different to the known intrusions on the west coast, and the source may be related to mineralisation. Limited soil geochemistry over the anomaly did not indicate any anomalous elements. Ground reconnaissance did not indicate evidence for or against an ultramafic intrusive.

### Mineralisation Model

The target is either a magnetic skarn or carbonate replacement. Carbonates are known to occur within the Oonah Formation and Dundas sediments. The Meredith Granite is the proposed heat and fluid source, with fluids moving up the fault and minerals depositing upon interaction with a carbonate host. Regional gravity data indicates the area of the magnetic anomaly to be structurally complex, inferring the possibility of spines of granite existing under the region.

### Drilling

Hole NRC1 will be drilled to a depth of approximately 150m. The hole has been designed to test the anomalies centre 80m from the surface (90m down hole), however, it should come into contact with the magnetic feature from around 30m. It is hoped to push the hole past the fault, however, its location is unknown. The collar is located at 5000E, 4960N on the local grid, drilling at an angle of 60 degrees and bearing 270 degrees AMG (258 degrees magnetic). Dependant upon results of the first hole, there are two proposals for the second hole. One would be to collar the hole 100m south at 4860N to intersect the centre of the two magnetic features. The alternative is to change the azimuth of the hole perpendicular to the proposed fault jog (approximately 232 degrees AMG), move the collar west towards the fault (50-100m west) and drill to intersect the fault.

# 97-4004

ANNUAL REPORT - EL 1/93  
HUSKISSON RIVER - PASMINGO  
P W BASFORD

302038

Appendix 3

PASMINCO EXPLORATION  
DIAMOND DRILL HOLE LOG

Hole No.

NRC1

5 cm

PROJECT:

Vertical Scale 1 : 200

Page 1 of 1

DESCRIPTION					GRAPHIC			STRUCTURES
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	
0.00	5.00	SILTSTONE AND SANDSTONE red orange, fine grained	highly oxidised					
5.00	6.20	SILTSTONE AND SANDSTONE white orange, fine grained. brecciated in places						
6.20	21.20	SILTSTONE AND SANDSTONE orange red, fine grained. clay rich sediment, fractures stained with hematite and/or manganese						
21.20	21.70	SILTSTONE blue grey, fine grained, laminated. clayey siltstone. CONTACT: gradational						
21.70	25.80	SILTSTONE brown orange, fine grained. clayey siltstone. CONTACT: indistinct						
25.80	29.40	BASIC LAVA WITH MINOR SILTSTONE brown, fine grained medium grained, porphyritic, feldspar phyrnic magnetite. v weathered, strong Fe Mn staining. CONTACT: indistinct	highly oxidised. strong Fe Mn staining, base of oxidation 57.9					

BROKEN CORE

PRIMARY FABRIC AS

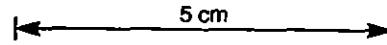
302039

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Hole No.

NRC1



PROJECT:

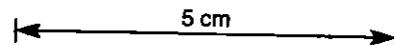
Vertical Scale 1 : 200

Page of 1

DESCRIPTION			GRAPHIC					
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	STRUCTURES
25.80	29.40	BASIC LAVA WITH MINOR SILTSTONE brown, fine grained medium grained, porphyritic, feldspar phyric magnetite. v weathered, strong Fe Mn staining. CONTACT: indistinct	highly oxidised, strong Fe Mn staining, base of oxidation 57.9		30			PRIMARY FABRIC P40
29.40	34.50	SILTSTONE WITH MINOR GREYWACKE WITH MINOR INTERMEDIATE VOLCANICLASTIC brown, fine grained medium grained, bedded, feldspar phyric. some tuffaceous beds with clay after feldspar. CONTACT: indistinct						
34.50	51.20	BASIC LAVA WITH MINOR SILTSTONE brown, fine grained medium grained, massive porphyritic, feldspar phyric magnetite. weathered, strong Fe Mn staining. CONTACT: indistinct			40			BROKEN CORE
51.20	52.50	SILTSTONE WITH MINOR BRECCIA brown, fine grained. CONTACT: indistinct			50			
52.50	57.00	BASALT brown green, fine grained, massive, feldspar phyric magnetite. still very weathered. CONTACT: indistinct				Lba		

302040

PASMINCO EXPLORATION  
DIAMOND DRILL HOLE LOG



Hole No. **NRC1**

PROJECT: Vertical Scale 1 : 200 Page of 1

DESCRIPTION				GRAPHIC				
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	STRUCTURES
52.50	57.00	BASALT brown green, fine grained, massive, feldspar phyrlic magnetite. still very weathered. CONTACT: indistinct	highly oxidised. strong Fe Mn staining. base of oxidation 57.9					
57.00	65.80	SILTSTONE WITH MINOR GREYWACKE WITH MINOR INTERMEDIATE VOLCANICLASTIC brown green, fine grained medium grained, laminated. felsic hematite rich sediments and tuff? feldspar to clay. CONTACT: conformable abrupt	slightly chloritised, slightly carbonatised. basalt is weakly chloritised with weak fine carbonate, around sediment contacts basalt is altered with matrix going to fine wormy clays, hematite altered patches, strong carbonate (+quartz) veining	DISSEMINATED trace pyrite	60	Lba		BROKEN CORE  PRIMARY FABRIC A30
65.80	72.20	BASALT WITH MINOR SILTSTONE green brown, fine grained, massive, feldspar phyrlic magnetite. interflow hematitic silts or inclusion of siltstone fragments to 40cm, weak alteration of basalt next to sediments (fine wormy clays). CONTACT: gradational			70			PRIMARY FABRIC A45
72.20	75.50	BASALT green grey, fine grained, massive, feldspar phyrlic magnetite. CONTACT: gradational						
75.50	77.90	BASALT green grey, fine grained medium grained, massive, feldspar phyrlic magnetite amygdales. amygdales?? to 2mm, spheroidal, filled with chlorite, this section is not very magnetic. CONTACT: gradational		DISSEMINATED pyrite very minor chalcopyrite in veins DISSEMINATED trace pyrite. possible rare chalcopyrite				
77.90	83.20	BASALT green grey, fine grained, massive, feldspar phyrlic magnetite. 0		DISSEMINATED chalcopyrite minor haematite. possible galena and sphalerite		Lba		
83.20	84.60	ALTERATION ZONE white yellow, coarse grained. siderite (quartz) vein (some magnetite?)		DISSEMINATED trace pyrite. possible rare chalcopyrite. sulphides often associated with veins, basalt contacts, and in selected beds (coarser) in sediments	80			VEIN
						a/z		

302041

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Vertical Scale 1 : 200

Hole No.

NR01

5 cm

PROJECT:

Page of 1

DESCRIPTION			GRAPHIC					
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	STRUCTURES
83.20	84.60	ALTERATION ZONE white yellow, coarse grained. siderite (quartz) vein (some magnetite?)  BASALT green grey, fine grained, massive, feldspar phyric magnetite. CONTACT: gradational	slightly chloritised, slightly carbonatised. basalt is weakly chloritised with weak fine carbonate, around sediment contacts basalt is altered with matrix going to fine wormy clays, hematite altered patches, strong carbonate (quartz) veining	DISSEMINATED trace pyrite, possible rare chalcopyrite, sulphides often associated with veins, basalt contacts, and in selected beds (coarser) in sediments	90	a/z		
84.60	91.50							
91.50	93.70	BASALT AND BRECCIA AND QUARTZITE green white, fine grained coarse grained, feldspar phyric magnetite. a series of quartz veins containing rounded fragments of quartz, basalt, and siltstone?, mamillary textures in hematite and quartz, basalt altered (wormy clays) adjacent to veins. CONTACT: gradational						
93.70	107.00	BASALT green grey, fine grained medium grained, massive, feldspar phyric magnetite. CONTACT: gradational				Lba		VEIN
107.00	117.50	BASALT green grey, medium grained fine grained, massive porphyritic, feldspar phyric magnetite. basalt is becoming coarser feldspar and pyroxene? crystals to 2mm. CONTACT: gradational						

302042

PASMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Vertical Scale 1 : 200

Hole No.

NRC1

5 cm

PROJECT:

Page of 1

DESCRIPTION			GRAPHIC					
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	Struct	STRUCTURES
107.00	117.50	BASALT green grey, medium grained fine grained, massive porphyritic, feldspar phyric magnetite. basalt is becoming coarser feldspar and pyroxene? crystals to 2mm. CONTACT: gradational	slightly chloritised. slightly carbonatised. basalt is weakly chloritised with weak fine carbonate, around sediment contacts basalt is altered with matrix going to fine waxy clays, hematite altered patches. strong carbonate (+quartz) veining	DISSEMINATED trace pyrite. possible rare chalcopyrite, sulphides often associated with veins, basalt contacts, and in selected beds (coarser) in sediments				
117.50	118.40	BASALT WITH MINOR SILTSTONE green grey, medium grained fine grained, porphyritic, feldspar phyric magnetite. inclusion of strung out green siltstone parallel to LCA, bleaching of the porphyritic basalt, some magnetite destruction?. CONTACT: gradational						
118.40	137.20	BASALT green grey, medium grained, massive porphyritic, feldspar phyric magnetite. CONTACT: conformable abrupt			120	Lba		
							VEIN	
							VEIN R20 carbonate quartz	
					130			
137.20	139.00	SILTSTONE brown green, fine grained, laminated. hematite rich siltstone some coarser green tuffaceous? lithologies,. CONTACT: conformable abrupt						
139.00	142.10	BASALT green grey, medium grained, massive porphyritic, feldspar phyric magnetite						
						Lba		

302043

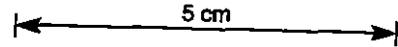
PRSMINCO EXPLORATION

DIAMOND DRILL HOLE LOG

Vertical Scale 1 : 200

Hole No.

NRC1



PROJECT:

Page of 1

DESCRIPTION				GRAPHIC			STRUCTURES
FROM	TO	LITHOLOGY	ALTERATION	MINERALISATION	Depth	Lith	
139.00	142.10	BASALT green grey, medium grained, massive porphyritic, feldspar phytic magnetite	slightly chloritised, slightly carbonatised. basalt is weakly chloritised with weak fine carbonate, around sediment contacts basalt is altered with matrix going to fine wormy clays, hematite altered patches, strong carbonate (quartz) veining	DISSEMINATED trace pyrite, possible rare chalcopyrite, sulphides often associated with veins, basalt contacts, and in selected beds (coarser) in sediments	140 150 160	Lba	VEIN

302044

# 97-4004

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P W BASFORD

302045

## Appendix 4

## DDH NRC1 Assay Results

Sample	From	To	Cu	Pb	Zn	Mn	Fe%	Ag	As	Au	Ni
76951	0	6	337	57	368	2340	12.36	1	26	0.008	76
76952	6	12	248	94	256	5460	16.19	3	50	0.009	100
76953	12	18	324	158	343	2570	15.24	-1	328	0.034	106
76954	18	24	64	22	138	852	6.72	-1	17	0.005	35
76955	24	30	277	150	474	1960	9.98	1	16	0.008	86
76956	30	36	201	33	434	1580	9.98	-1	25	0.012	124
76957	36	42	266	35	482	1570	11.45	-1	12	0.007	149
76958	42	48	202	74	336	1390	10.97	-1	12	0.006	117
76959	48	54	270	40	214	1110	9.13	-1	24	0.01	68
76960	54	57	205	61	232	1180	8.74	-1	10	0.008	75
76961	57	60	195	58	281	1420	9.27	-1	13	0.006	80
76962	60	63	135	-5	132	1220	7.13	-1	10	0.005	37
76963	63	66	112	5	107	1000	6.88	-1	11	0.005	41
76964	66	69	211	19	138	2060	9.02	-1	11	0.006	34
76965	69	72	234	42	185	1680	8.79	-1	13	0.007	41
76966	72	75	200	35	188	1360	7.78	-1	11	0.006	59
76967	75	78	123	68	189	1190	6.93	-1	16	0.004	64
76968	78	81	211	22	143	1290	8.43	-1	9	0.007	46
76969	81	84	179	-5	122	6160	11.89	-1	11	0.004	66
76970	84	87	30	-5	70	13700	15.15	-1	13	0.001	75
76971	87	90	177	10	216	1720	8.04	-1	12	0.008	46
76972	90	93	171	271	317	1590	8.49	-1	12	0.005	50
76973	93	96	160	175	341	1670	7.55	-1	12	0.006	42
76974	96	99	167	179	287	1420	8.60	-1	12	0.007	48
76975	99	102	179	101	246	1300	7.80	-1	11	0.006	45
76976	102	105	160	70	196	1150	6.63	-1	9	0.005	41
76977	105	108	138	88	294	2000	7.51	-1	15	0.012	50
76978	108	111	201	29	315	1380	7.65	-1	11	0.035	62
76979	111	114	170	14	282	1300	7.18	-1	13	0.01	59
76980	114	117	148	19	356	1400	7.12	-1	11	0.016	65
76981	117	120	187	22	298	1260	7.56	-1	12	0.008	63
76982	120	123	171	6	214	1080	6.82	-1	10	0.01	52
76983	123	126	176	16	178	1050	7.12	-1	11	0.035	44
76984	126	129	208	-5	124	1040	6.68	-1	10	0.008	42
76985	129	132	210	5	165	1330	8.04	-1	9	0.006	68
76986	132	135	211	7	130	1310	7.58	-1	11	0.007	76
76987	135	138	138	7	112	1010	7.05	-1	10	0.008	78
76988	138	142.1	184	-5	92	1310	7.73	-1	12	0.008	51

302046

# 97-4004

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P W BASFORD

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## Appendix 5

## MINERALOGY OF CORE SAMPLES

### 1. INTRODUCTION

Two samples were received from Dr M Tomkinson of Pasminco Exploration, Burnie with a request for quantitative determination of mineralogy.

### 2. PROCEDURE

A portion of each sample was pulverised and then analysed for major elements by ICP and analysed for crystalline phases by X-ray diffraction. The yellow powder on one surface of sample 77929 and the black particles in 77930 were also separately analysed by X-ray diffraction.

Accurate calculation of the mineral contents is not possible without further information, particularly the composition of the pyroxene and smectite in 77929 and the composition of the unidentified clay mineral in 77930. An approximate content of some minerals was calculated from the ICP assays using stoichiometric mineral compositions. The procedure was as follows:

- (a) Smectite and chlorite in 77929 and the unidentified clay mineral in 77930 were not considered in the calculations.
- (b) All  $\text{Na}_2\text{O}$  was allocated to albite in both samples.
- (c) Residual  $\text{Al}_2\text{O}_3$  in 77929 was allocated to anorthite (assuming no  $\text{Al}_2\text{O}_3$  in pyroxene). The plagioclase content is the sum of the albite and anorthite contents.
- (d) Residual  $\text{Al}_2\text{O}_3$  in 77930 was allocated to kaolinite.
- (e) In 77929 all  $\text{CaO}$ , all  $\text{MgO}$  and residual  $\text{SiO}_2$  were allocated to  $\text{CaSiO}_3$ ,  $\text{MgSiO}_3$  and  $\text{FeSiO}_3$  respectively. The pyroxene content is the sum of the contents of these end-members.
- (f)  $\text{Fe}_2\text{O}_3$  in 77930 was allocated to hematite and magnetite in the ratio 5:3. This ratio was estimated from the XRD trace. It is possible that amorphous iron oxide is also present, as the calculated contents of the two minerals appear to exceed their contents estimated from the XRD trace.

### 3. RESULTS

The ICP analysis results are given in Appendix A. The semi-quantitative mineralogies of the samples are listed below. The bracketed numbers are the calculated mineral contents. Note that although the mineral contents are quoted to one unit for convenience, such a degree of accuracy is not implied; this is because the calculated values are dependent on the assumptions given in the "Procedure" section and if the assumed mineral compositions differ from the actual mineral compositions, the calculated values will differ from the true values.

77929			77930		
Plagioclase	D	(49)	Kaolinite	D	(45)
Pyroxene	SD	(31)	Plagioclase	A	(12)
Smectite	Tr		Quartz	A	(15)
Chlorite	Tr		Unidentified clay	?A	
?Ilmenite	Tr		Hematite	Tr	(11)
			Magnetite	Tr	(7)

The yellow powder on one surface of sample 77929 is smectite and the black particles in 77930 are lithiophorite  $(\text{Li,Al})\text{MnO}_2(\text{OH})_2$ .

### Semiquantitative abbreviations

D = Dominant. Used for the component apparently most abundant, regardless of its probable percentage level.

CD = Co-dominant. Used for two (or more) predominating components, both or all of which are judged to be present in roughly equal amounts.

SD = Sub-dominant. The next most abundant component(s) providing its percentage level is judged above about 20.

A = Accessory. Components judged to be present between the levels of roughly 5 and 20%.

Tr = Trace. Components judged to be below about 5%.

## Analytical Chemistry

Final  
Job Number: 6AD2880  
O/N : G649500G

## ANALYTICAL REPORT

Element Unit	77929	77930		
Al2O3 %	12.7	20.2	IC4	0.01 DL
CaO %	7.90	0.04	IC4	0.01 DL
Fe2O3 %	14.5	17.7	IC4	0.01 DL
K2O %	0.09	0.11	IC4	0.01 DL
MgO %	5.24	1.19	IC4	0.01 DL
MnO %	0.15	1.54	IC4	0.01 DL
Na2O %	3.70	1.37	IC4	0.01 DL
P2O5 %	0.20	0.28	IC4	0.01 DL
SiO2 %	45.9	43.5	IC4	0.01 DL
TiO2 %	2.02	2.36	IC4	0.01 DL
LOI %	5.52	11.2	GRAV7	0.01 DL

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Appendix 6

**PETROGRAPHIC REPORT.**

HUSKINSSON RIVER. GRADED SANDSTONE/SILTSTONE.

**A: SAMPLE 41428.**

Hand specimen: This sample is a graded sandstone, with bedding of very coarse to fine sand on a 3cm (approx.) scale. Well rounded, sub spherical granules (up to 8mm) occur within the coarse sand fraction. The medium to fine grained sand fraction is well sorted, while the coarse sand fraction is only moderately sorted. Grains are broadly elongate and aligned perpendicular to the direction of grading. The outer rim of the sample is coated with black (manganese) oxide and the sample is limonite stained throughout.

Thin section: This is a loosely packed aggregate with an interstitial clay matrix. The matrix makes up between 15 and 20% of the sandstone, and is thus classified as a 'wacke'. The estimated mode of the sand grade fraction is 30% quartz and 70% lithics. The quartz is monocrystalline and angular to sub rounded, the finer quartz fraction is more angular. In comparison the lithic clasts are generally well rounded. Alteration to limonite and clays through weathering makes identification of the lithic clasts difficult.

**B: SAMPLE 41429:**

Hand specimen: This sample is broadly similar to S#41428. It is made up of intercalated sand and silt. The coarse to very fine graded sand laminations occur on a 0.5-1cm scale, however the coarse fraction of the sand layers do not contain granules which are observed in S#41428. The silt fraction is finely laminated with fine sand layers and small lenses of coarse sand. Load structures on the sand-silt contact indicate an 'up direction' which corresponds to normal grading in the sand fraction. The outer rim of the sample is altered by manganese oxide and limonite staining occurs throughout.

Thin section: The sand fraction of this sample is similar in mode and percentage matrix to S#41428, although it lacks the granule sized particles. The silt grade fraction contains 5% (approx) of fine angular quartz grains. Other particles are indistinguishable due to their very fine grain size.