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PLUTONIC OPERATIONS LIMITED

A.C.N. 004 680 997

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EXPLORATION LICENCES 4/92 AND 7/92

SORELL PENINSULA

Annual Report on Exploration Activity

September 1992 to August 1993

93-3514.

SEE FOLIO 51 ON EL 4/92

SEE FOLIO 49 ON EL 7/92

Plutonic

Grant MacDonald
August 1993

962002

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1.0 SUMMARY AND RECOMMENDATIONS

1.1 Summary

EL's 4/92 and 7/92 cover a largely unexplored belt of the highly prospective Mt Read Volcanics, host to the base metal orebodies of Mt Lyell, Hercules, Rosebery, Que River and Hellyer and the gold orebody at Henty.

Exploration in the 1992/93 season has not diminished this prospectivity as the three phases of work targeted small discrete parts of the belt and the belt has still not seen a regional stream sediment sampling survey. That work will be carried out in the coming 1993/94 season.

12 BLEGS taken from the two creeks draining into the Wanderer River and reported to have anomalous gold, as determined by the new Huminex waters technique, revealed no anomalous gold, calling into question the validity of the technique.

Hand held Genie EM surveys over three of the four DIGHEM airborne EM anomalies in the Briggs Creek area failed to reveal any responses due to conductive sulphides. Soil, rock and stream geochemistry over all four airborne anomalies produced no significantly anomalous geochemistry and mapping revealed no significant alteration. The grids were correctly positioned to cover the anomalies and so the original airborne survey interpretation is questioned.

Reconnaissance mapping and soil and rock chip geochemistry at the Thomas Creek Prospect supported the results of previous sampling (up to 1 g/t Au, 3360 ppm Cu). Mapping/petrology indicates a 400m x 300m zone of strongly altered mafic/intermediate lavas with the characteristics of a porphyry Cu-Au deposit.

1.2 Recommendations

Two phases of exploration are recommended for the 1993/94 field season.

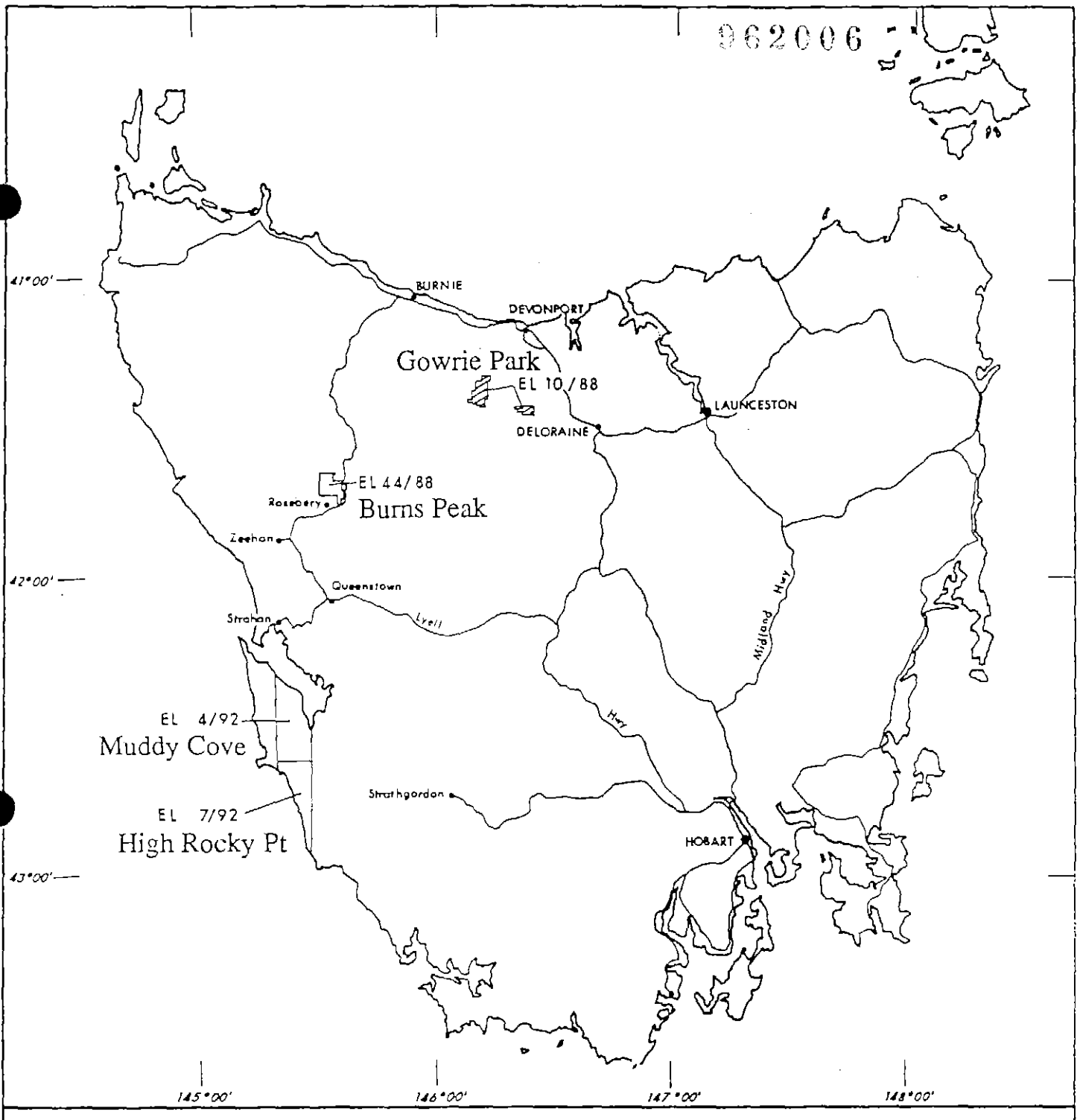
The first phase should be the uncompleted regional stream sediment sampling/reconnaissance mapping programme (ie. phase four as planned for the 1992/93 season). Much of the belt is unexplored Mt Read Volcanics with the potential to host a world class orebody.

In particular the area between Timbertops and Point Hibbs (and inland) should be targeted.

Desirable stream sampling locations and helipads, tracks and camps to be used are shown in Figures 29 and 30. It is envisioned that a two or three man team should complete the programme in six to eight weeks.

The second phase should be a dipole-dipole IP survey over the Thomas Creek grid in order to define the best drill target which could be tested, if shallow, by N Poltock's hand-held diamond drill rig (capable of coring 50m).

962006



5 cm

SCALE 1:2000000

10 0 10 20 30 40 50 60 70 80 90 100 km

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REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997
Technical Report No:	PROJECT: TASMANIA GENERAL
ORG. OFFICE	PROJECT LOCATIONS
CHECKED BY:	
DATE: APR. 1992 DRAWN BY: K.G.F. / L.H.B.	DWG. No.
SCALE: 1:2000000 GEOLOGIST: K.M.T.	PROJECT No 701

FIGURE 1

2.0 INTRODUCTION

2.1 Tenure

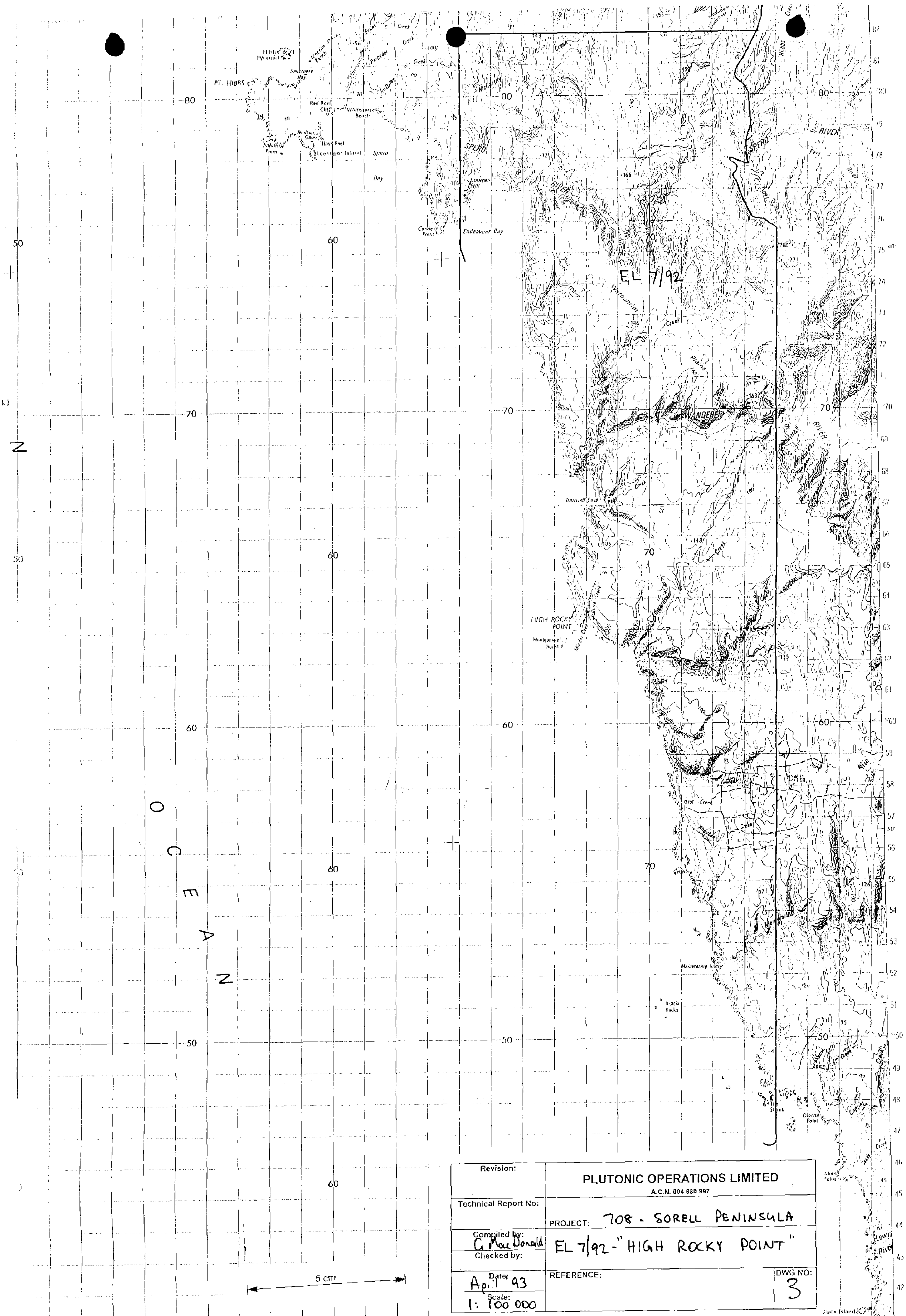
EL's 4/92 "Muddy Cove Creek" (243 km²) and 7/92 "High Rocky Point" (183 km²) were granted to Plutonic Operations Limited on 11 September 1992. The EL's are located in Tasmania's south-west (see Figures 1, 2 and 3).

2.2 Access and Land Usage

Access to both EL's is problematic with no vehicular access possible except for trail bikes in a few peripheral areas. The prospective rocks are invariably under thick bush with few natural helipads. Passage through this bush is generally slow and physically demanding. Creeks can also be clogged and difficult to travel along.

The Sorell Peninsula is on Tasmania's south-west coast, receiving the full brunt of the roaring forties so that exploration in the winter months is not possible.

All of the area in both EL's is included in the South-West Conservation Area. This means that although exploration is allowed, there are more stringent guidelines than in Crown Land elsewhere.



Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997	
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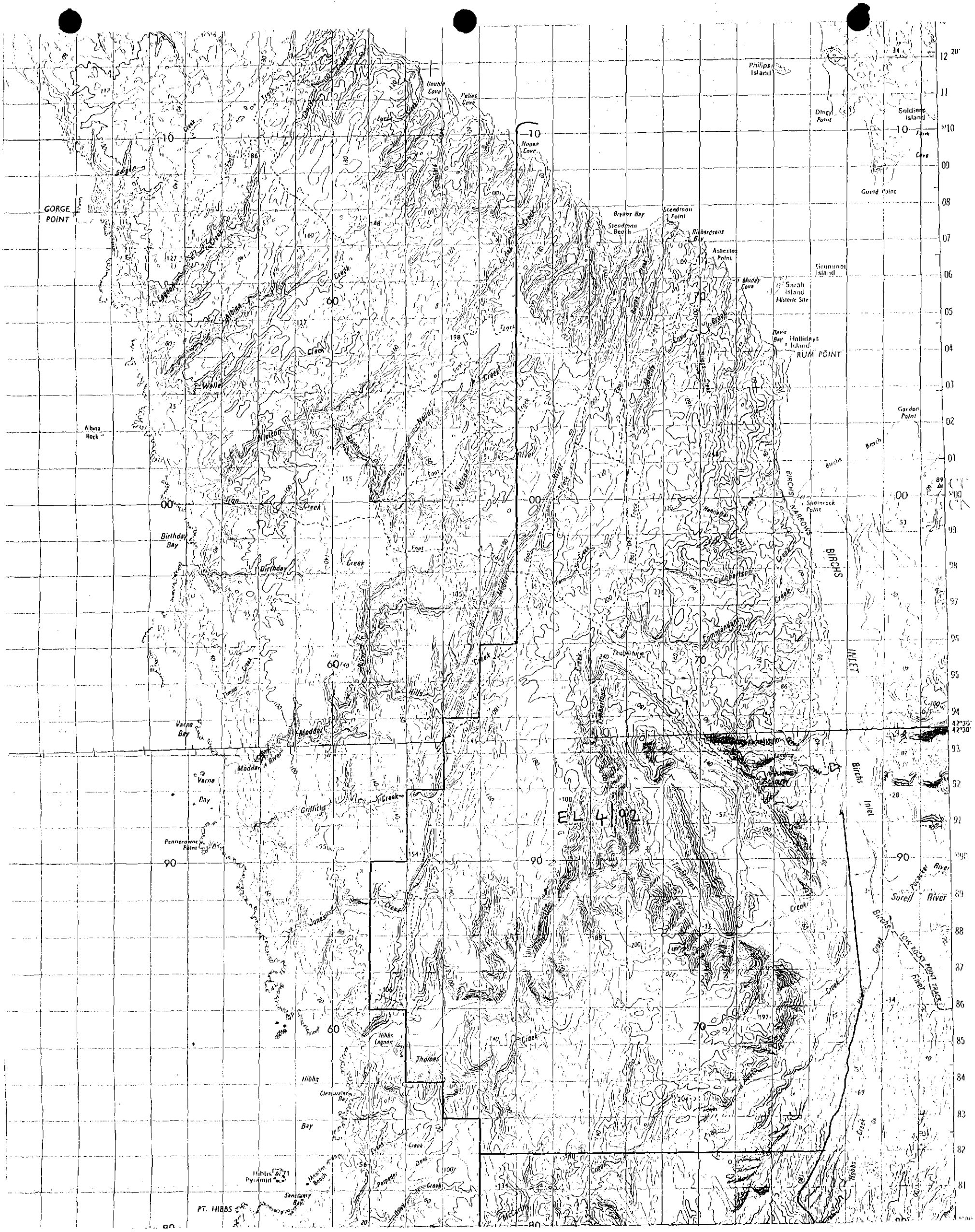

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Technical Report No:	PROJECT: 708 - "SORELL PENINSULA"
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Date: April '93 Scale: 1: 100 000	REFERENCE: DWG NO: 2

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3.0 REGIONAL GEOLOGY

3.1 Introduction

Due to the difficulty of access, lack of outcrop and the limited amount of exploration to date, the geology of the Sorell Peninsula is relatively poorly understood. For this reason a detailed account of the geological work conducted in the area is included in this section.

The main part of the Mt Read Volcanics belt runs south from Hellyer, through Rosebery and Queenstown along the West Coast Range to South Darwin Peak where it disappears under a Tertiary graben, reappears on the D'Aguillar Range, disappears under another Tertiary graben and then reappears on the coast at Elliott Bay.

The Noddy Creek Volcanics lies to the west of the D'Aguillar Range and is not part of this main belt. The Noddy Creek Volcanics are correlated with the Mt Reads on the basis of their petrology and calc-alkaline geochemical characteristics by a number of workers, however, it is difficult to structurally relate these volcanics with the main belt.

From regional scale magnetics and gravity it is clear that there is a major structure running north-south through Birch's Inlet on the east side of the Sorell Peninsula and a second structure running under Macquarie Harbour. As discussed later, associations with some more exotic boninitic rocks suggest that the Noddy Creek Volcanics and indeed the whole Sorell Peninsula may have been faulted south from near Zeehan though the possibility of a separate sub-arc should not be discounted.

3.2 Geology

The geology of the Sorell Peninsula and the volcanics in particular has been described in company reports for BHP and Amoco/Cyprus, in White's PhD thesis and in recent Mines Department mapping by A Brown, D Seymour, M McClenaghan and D Findlay.

The first detailed mapping of the area was completed by BHP in the late 1960's, however, it was based upon coastal and a few inland traverses and relied to a large degree on photo interpretation with the Cambrian and Precambrian left largely undifferentiated (Ferris, 1984). Nevertheless Amoco/Cyprus relied upon this mapping to a large degree in their exploration producing no map of their own other than the rough maps of their areas of interest.

The only separate mapping undertaken in the area is the 1:50,000 regional survey mapping of the Tasmania Mines Department. The area north of Varna Bay is covered by the Macquarie Harbour (1989) sheet with the area south of High Rocky Point covered by the Montgomery (1988) sheet. This mapping is used as the basis for Figures 4 and 5. Unfortunately re-prioritising of regional survey funds has meant that the Point Hibbs sheet which lies between the other two has been shelved indefinitely. In its place is an A4 sized map and interpreted cross-section included in Brown *et al's.* (1991) synopsis of the regional geology of the Macquarie Harbour, Montgomery and Point Hibbs 1:50,000 sheets. The significant differences between this mapping

and that of BHP/Amoco/Cyprus is the extension of the Noddy Creek Volcanics south to the coast at High Rocky Point and the associated sediments down to Veridian Point. The two small outliers of Noddy Creek Volcanics in the Point Hibbs quadrangle are interpreted solely from aeromagnetics with the location of the rest of the Noddy Creek Volcanics in the Point Hibbs quadrangle also relying to a degree on aeromagnetics as well as reconnaissance mapping.

Apart from Precambrian quartzites, phyllites and dolomites, Ordovician siliciclastics and limestones and post Devonian rocks including minor dolerite, Brown *et al.* (1991) recognise the following Cambrian volcano-sedimentary associations in the area referred to in this report.

Timbertops Volcanics

In the Timbertops region (partially included on the western side of EL 4/92) is an outcrop of boninitic (high Mg andesitic) lavas, breccias and crystal lithic tuffs with interbedded mudstones and siltstones (McClenaghan and Findlay, 1989; Brown *et al.*, 1991). The poor outcrop makes it impossible to determine the physical character of the lavas. These are juxtaposed against the calc-alkaline Noddy Creek volcanics with the unexposed contact possibly a low angle thrust. These rocks are invariably altered with relatively pristine rocks consisting of talc and chlorite pseudomorphs of pyroxene in a matrix of talc, chlorite and spinel. Microprobe analysis of spinels correlates these rocks with boninitic lavas around Zeehan.

White (1975) refers to these rocks as altered ultramafics, probably pyroxenites, and considers that these rocks are interbedded with the Noddy Creek Volcanics but notes that the lack of exposure makes this conclusion uncertain and that contacts may be faulted.

BHP (McGregor and Bumstead, 1969) described the volcanics in the area mapped as Timbertops Volcanics by Brown *et al.* as being andesitic lavas with very minor basalt and gabbro bodies. They also noted the presence of talc and chlorite alteration of the andesites near contacts with intrusive diorite bodies.

Amoco (Ferris, 1984) followed up the talc alteration previously noted by BHP's exploration. Amoco note a strong correlation between nickel in soils, chrome in sediments and the volcanics west of the Timbertops region corresponding to the boninitic rocks of McClenaghan and Findlay (1989). However, Amoco also note the existence of the same association with basic volcanics (weathering to a blue clay) further south in an area again mapped as basic (boninitic?) volcanics (McClenaghan and Findlay, 1989). This correlation suggests that soil geochemistry for Ni and stream geochemistry for chrome may be a useful mapping tool in delineating the boundary of the prospective calc-alkaline Noddy Creek Volcanics.

Amoco also note the different trend of the volcanics in the area compared with that of the Noddy Creek Volcanics elsewhere.

Birch's Inlet-Mainwaring River Volcanics

Brown *et al.* (1991) consider that the volcanics and associated sediments in the south of the area referred to in this report and those outcropping immediately to the west of Birch's Inlet, and hence just to the east of the Noddy Creek Volcanics, are from the same north-south trending belt with the middle part hidden by Tertiary cover. Previous workers have considered the two outcrops separately with the Mainwaring River Volcanics receiving by far the most attention.

The two outcrops are correlated on the basis of geochemical affinities, similar stratigraphy and the aeromagnetic data which suggests that the volcanics continue under the Tertiary cover.

Brown *et al.* refer to this belt as being a picritic basalt-basalt association with intra-plate and island-arc affinities. The sequence is described as consisting of vesicular, pillow and sheet flows of pyroxene phyric and/or plagioclase phyric basaltic rocks inter layered with hyaloclastite and basalt breccia. Sedimentary rocks in the sequence increase in proportion to the south and consist of interbedded mudstones and chert, volcaniclastics siltstone, lithicwacke, carbonates and siliceous pebbly conglomerates and lithicwackes. The sequences predominantly faces east.

Brown *et al.* note the existence of two groups of lavas in both localities with the lower group generally picritic and the upper group tholeiitic. The lower group resembles lavas from the Miners Ridge basalt further north at Queenstown. These lavas are considered to represent the base of the Mt Read Volcanic sequence at Queenstown and hence possibly occupy a similar stratigraphic position here. This is in contrast to Ferris (1984) who, incorrectly, correlates the volcanics with the calc-alkaline basic-intermediate Que-Hellyer Volcanics from the uppermost part of the Mt Read Volcanics.

i) Birch's Inlet Area:

White (1975) refers to the northern outcrop as the Birch's Inlet Volcanics and describes them as consisting of spilites with thin bands of basaltic tuff, volcanic greywacke and serpentinite.

Amoco refer to the northern outcrop as the Karnebunyer Creek area and although ground work was planned, none was ever carried out.

BHP (McGregor and Bumstead, 1969) describe the rocks as spilitic basalts and also describe laminated siltstones in the area.

ii) Mainwaring River

The southern outcrop has received considerable attention with regards to the northern outcrop and indeed most of the Sorell Peninsula. It was perhaps the main focus of Amoco/Cyprus's exploration and also received attention from BHP.

In the north of the southern outcrop the rocks are dominated by basalt whilst in the south sediments predominate (Brown, 1988). The sequence is described as being east facing, however, isoclinal folds are noted in sediments.

Amoco/Cyprus (Ferris, 1984) describe the Mainwaring Volcanics as occurring within a discrete vent area due to the abnormal amount of explosive volcanic rocks (agglomerates and breccias) interbedded with tuffaceous sediments. They note the presence of a minor acidic volcanic component.

BHP (Hall and Corbett, 1969) describe the lower part of the Mainwaring Group as consisting of argillites, phyllites and greywackes cross-cut by diorite and gabbro bodies and intruded by andesitic sills. The upper part is described as consisting predominantly of thick basaltic to andesitic tuffs also cut by small sill-like gabbro and diorite. The upper part also contains bands of Cambrian derived conglomerate.

Ultramafic Rocks (Hibbs River Belt)

These rocks were the focus of BHP's exploration, particularly for Ni and asbestos. The rocks consist of peridotite which is variably massive to highly sheared and is invariably serpentinised. The fault-bounded ultramafics are associated with gabbroic bodies with small gabbroic bodies also occurring within the strongly sheared serpentinite. Similar rocks occur much further north in the Dundas Trough near Zeehan. There the ultramafics are spatially associated with the high Mg andesite (boninite) lavas. The ultramafics on the Sorell Peninsula are associated with the sheared, talc rich, probably boninitic rocks at Timbertops and hence have a similar association.

Noddy Creek Volcanics

The Noddy Creek Volcanics differ from the other volcanics on the Sorell Peninsula by the fact that they are a calc-alkaline suite of rocks as opposed to the more exotic (by Mt Read standards) alkaline, tholeiitic and picritic basalts and boninitic andesites and ultramafics elsewhere on the peninsula.

It appears almost certain that the Noddy Creek Volcanics are a correlate of the VHMS hosting rocks of the Mt Read Volcanics and indeed Brown *et al.* state that "this sequence is considered to be a southern extension of the Middle Cambrian pyroxene-plagioclase phyric andesitic rocks of the Lynchford and Que River (and hence also Hellyer) areas. As such, it is a correlate of one of the more mineralised parts of the Mt Read Volcanics". The only question to be resolved is how they attained their current position. Based upon correlations with the other volcanic suites on the Peninsula, Brown (pers. comm.) feels that they may have been faulted south from around Zeehan. An alternative explanation suggested by McClenaghan and Corbett (1989) is that they are a separate sub-arc.

The Noddy Creek Volcanics and associated sediments were originally mapped by BHP in the 1960's , however, they concentrated on the Timbertops area and the ultramafics running down the western side of the volcanics and sediments. Amoco/Cyprus gave a few localities some attention but not to the degree warranted by the prospectivity of the rocks.

Rocks considered by Brown (1988), McClenaghan and Findlay (1989), Brown *et al.* (1991), Brown (pers. comm.) and Seymour (pers. comm.) to be part of the Noddy Creek volcano-sedimentary association have been previously described in Hall *et al.* (1969), White (1975), McClenaghan and Corbett (1989). BHP and Amoco/Cyprus considered most of the sediments associated with these volcanics, including those running down the coast inland and south of High Rocky Point, to be part of the Dundas Group.

Brown (1988), McClenaghan and Findlay (1989), Brown *et al.* (1991) and Seymour (pers. comm.) define the Noddy Creek volcano-sedimentary association in their mapping as being either pyroclastic, extrusive or intrusive, predominantly intermediate-acidic, calc-alkaline Cambrian volcanics or volcaniclastics and epiclastics derived from these volcanics. Where the association is dominated by the sedimentary component the volcanic units occur as pillowed and sheet lavas, breccia flows and porphyritic flows with volcanic xenoliths. These rocks are often interbedded with thin (2 to 3m thick) vitric tuff or volcaniclastic siltstone with preserved angular glass shards and 10-15mm thick volcanicwacke beds.

Within the sediment dominated part of the section the sedimentary rocks form a flyschoid sequence which includes channellised sandstone and pebble-cobble conglomerate, suggesting a proximal submarine fan origin. The thickest sandstones and conglomerates are about 2m thick, and occur in channels as thick as ten metres. Sedimentary structures include scoured bases, truncated cross-bedding, convolute bedding, flame structures and zones of slump folding.

The granule to pebble conglomerate beds include clasts of locally derived volcanic rocks as well as angular clasts of locally derived black mudstone. The main clastic component is derived from a quartz-rich acid volcanic terrane with a minor component of metamorphic rock, exotic volcanic clasts and quartz fragments showing graphic intergrowths with feldspar. The particular composition of the sedimentary rocks closely reflects the particular volcanic beds with which they are associated, thus indicating local erosion. In the south these rocks face east.

Geochemically the rocks are calc-alkaline with island-arc affinities. In the south, around High Rocky Point, three groups of pyroxene/plagioclase basaltic-andesite to andesitic rocks, and a later group of hornblende-bearing andesite-dacite dykes have been recognised, defining a chemically evolving suite of volcanic rocks consistent with the east facing nature of the sequence.

In the northern part of the outcrop two distinct groups of rocks have been recognised. The first group consists of pyroxene/plagloclase phyric andesite lavas, while the second group consists of quartz/feldspar phyric rhyolitic lavas.

Geochemically the basaltic andesite and andesitic rocks have geochemical similarities with the Que-Hellyer Volcanics which host the Que River and Hellyer massive sulphide deposits whilst the andesitic-dacite dykes from the southern part and the rhyolitic rocks form the northern part have geochemical similarities with the bulk of the acid to intermediate rocks of the Mt Read Volcanics.

Petrologically the Noddy Creek Volcanics seen by White (1975) were described as follows; acid lavas, quartz-albite-phyric, occasionally with orthoclase, with a groundmass of quartz, feldspars and variable sericite and chlorite; welded tuffs with quartz and lithic fragments in a sericitic groundmass; fine-grained non-porphyritic andesitic rocks consisting of flow-aligned albite; augite-albite-phyric andesites, including breccias, with feldspathic groundmass and crystal (quartz and albite) lithic-vitric tuffs. The samples described by White (1975) are from the Timbertops area north to the position of Amoco's traverse 17. White (1975) does state that the volcanics he saw from the Noddy Creek Volcanics differ from volcanics that he had seen in the main Mt Read volcanic belt and at Elliott Bay in that the Noddy Creek Volcanics are "less extensive, less deformed and altered, and more compositionally variable" than those at Elliott Bay and in the main volcanic belt south of Queenstown.

The petrological report included with Ferris (1984) states that the rocks from the Timbertops area include augite ± orthopyroxene-phyric basalts and basaltic andesitic tuffs and lavas, rhyodacites and siliceous andesites to trachyandesites as well as quartz microdiorites. Alteration in the rocks is considered to be due to lower greenschist metamorphism.

Rocks from the northern-most part of the Muddy Cove Creek area are described in Kay (1985) as acid tuffs, dacites, andesites as well as basalts, dolerite, gabbro and gabbro/norite and sediments including cherts. Low temperature alteration and metamorphism are described in nearly all rocks, against suggesting that alteration is regional in nature. The geology of part of this area is described in more detailed in Section 5.2.

The rocks south of Timbertops in the Hibbs River and Thomas Creek areas include basaltic-andesitic lapilli tuffs, pyroxene diorities, andesites, dacites and trachyandesites. The geology of the Thomas Creek Prospect is described in detail in Section 5.3.

3.3 Structure

The structure of the Sorell Peninsula is discussed in Brown *et al.* (1991), Carey and Berry (1988) and McClenaghan and Corbett (1989). Two fault bounded belts of Cambrian rocks occur on the northern part of the Sorell Peninsula. The western-most contains the tholeiitic Lucas Creek Volcanics and associated carbonate and greywacke-mudstone sequences. The eastern belt comprises the Noddy Creek Volcanics, the Hibbs River ultramafic belt and extensive greywacke-mudstone sequences.

Faults trend NNE and are steeply dipping to the east. They have been interpreted to be westward directed thrusts. The most widespread folds in the northern part have variably plunging fold axis but a uniformly NNE directed axial plane. These folds are considered to be associated with the thrusting. Thrusting was probably post-Ordovician and hence probably Devonian. Four domains are described in McClenaghan and Corbett (1989). The contrast in cleavage directions between domains 1 and 2 is taken to mean that the Birch's Inlet Volcanics and Noddy Creek

Volcanics have been brought together by faulting. However, this interpretation also sees the sediments, mapped by McClenaghan and Findlay (1989) as associated with the Noddy Creek volcanics, in fault contact with the Noddy Creek volcanics. Perhaps the only conclusion to be drawn is that there is some structural complexity in the area which has not been adequately resolved in the mapping to date.

There is evidence of later stage, probably Devonian, transcurrent movement along some of these NNE trending faults.

In the south of the peninsula rootless isoclinal folds are common. Three fault-bounded domains are recognised corresponding to the three volcano-sedimentary associations (Mainwaring Volcanics, Noddy Creek Volcanics and the Lewis River Volcanics, the latter being the host to mineralisation at Elliott Bay).

The early development of high strain zones and repetition of sequences by isoclinal folding has significant ramifications for exploration.

4.0 EXPLORATION PHILOSOPHY

The prospective rocks in EL's 4/92 and 7/92 are correlates of the Mt Read Volcanics. As such they are prospective for medium to large tonnage base metal deposits with gold credits a-la Rosebery or Hellyer. In particular the predominance of mafic/intermediate volcanics and derived sediments suggests a rough time correlation with Hellyer and Que River.

The Henty gold mine is also hosted in the Mt Read Volcanics. Hence Cambrian hosted gold orebodies are a potential target.

The reported presence of dioritic intrusives in the Timbertops area and further south around Thomas Creek, the latter associated with anomalous copper and gold in altered mafic/intermediate volcanics, indicates that the area is also very prospective for porphyry Cu-Au deposits.

5.0 LOCAL GEOLOGY

5.1 Wanderer River

Exploration at this prospect was concentrated solely on the two creeks with reported anomalous gold. Mapping was carried out on outcrop and float in these creeks with some short traverses to view outcrop. The geological map is shown in Figure 6.

The rocks in the northern creek are predominantly fine to medium grained, green, lesser pale brown, sediments which have probably been derived from mafic/intermediate volcanics. These sediments dip moderately steeply towards the north-west and face the same way. A steep puggy fault zone crosses the creek near sample point 4 trending just west of north.

The rocks in and adjacent to the southern creek include the fine grained green sediments in outcrop in the first 100m. Outcropping in the creek at 120m and on the slope to the east is a hornblende pyroxene plagioclase phyric diorite. The sediments outcropping near the diorite are moderately pyritic and chloritic.

Further upstream is outcrop of fine grained sediments and a medium grained volcaniclastic, both probably derived from mafic/intermediate volcanics.

Also appearing as float in the southern creek above the diorite outcrop and in the west branch where the creek forks is a medium grained plagioclase rich dacitic tuff. This latter rock does not outcrop. Where seen, bedding orientations in the sediments are the same as those in the northern creek.

5.2 Briggs Creek

Outcrop in the Briggs Creek area is sparse with most of the area covered by dense bauera/cutting grass/tea tree/horizontal scrub. The airphoto covering anomalies 2, 5 and 4 is in Figure 7.

Previous workers (White, 1975) had noted the existence of felsic lavas to the west of anomalies 3 and 4. Exploration in the 1992/93 season involved the clearing of tracks and cutting of grid lines over three airborne EM anomalies with a traverse over a fourth. Mapping was carried out on all tracks, grids and traverses and in Briggs Creek. The fact and interpreted geology is shown at 1:5,000 in Figure 9.

In the Camp Sorell area the rocks are serpentinised ultramafics and hornfelsed sediments. These rocks are not discussed any further as they were not the focus of exploration in the area.

Outcrop and float on the track leading from the Line 2 to the Line 5 access consists of a fine grained beige green sediment, probably felsic volcanic derived. Other than this all other rocks are of mafic/intermediate composition. These include pyroxene plagioclase phyric lavas/intrusives, coarse grained fragmentals with fragments of pyroxene plagioclase phyric lavas and fine to medium grained mafic/intermediate derived sediments.

The geological interpretation in Figure 9 is based on the limited outcrop and the aeromagnetics data.

962019

372 000mE

373 000mE

5 271 000m N

5 270000m N

5 269 000m N

150

100

50

WANDERER RIVER

5P

5P gn

5P gn py

5P gn w py

5S gn

5S gn-ft

ft-5P gn

5Vmc

2I

2I hb fsp px

2I hb fsp px w py

ft- 2I
- 5V mc

ft-5P gn
-3T
-5Vmc

5 cm

KEY

5P Green > beige siltstones & lesser sandstones – volcanic derived & intermediate derived volcaniclastics

2I Mafic intrusive horneblende – pyroxene plagioclase phyric

80 bedding; younging direction

80 cleavage

fault

outcrop

5P	siltstones	hb	hornblende
5S	sandstones	mc	mafic
5V	volcaniclastics	px	pyroxene
3T	intermediate tuff	py	pyrite
fsp	feldspar	w	with
ft	float		
gn	green		

SAMPLE RESULTS

Sample no.	Res.-Au(ppb)
1. (S01901)	0·57
2. (S01902)	0·07
3. (S01903)	0·07
4. (S01904)	0·84
5. (S01905)	0·12
6. (S01906)	<0·05
7. (S01907)	<0·05
8. (S01908)	0·05
9. (S01909)	0·24
10.	Not assayed
11. (S01911)	0·26
12. (S01912)	0·34

REVISION	PLUTONIC OPERATIONS LIMITED ACN 004 680 997 (INC IN NSW)
TECH. REP. No.	PROJECT 708 - SORELL PENINSULA
COMPILED BY G. Mac DONALD	WANDERER RIVER GEOLOGY AND GEOCHEMISTRY
DRAWN BY O. HEDDITCH	
DATE AUG. 93 SCALE 1:10,000	REFERENCE DWG. No. 6

Apart from the abovementioned rocks, jasper float was taken in creeks which drain the eastern and western ends of line 4. There is also a considerable amount of vein quartz in most creeks.

Alteration is almost non-existent with only very occasional epidote alteration seen in creek float.

5.3 Thomas Creek

Mapping of the Thomas Creek Prospect is based on hand specimen and petrological interpretation of rock chips taken from soil auger holes with almost non-existent float let alone outcrop. The area is covered by dense bauera/cutting grass/tea tree/horizontal scrub with the soil a peaty bog. The airphoto of the prospect is in figure 8. The geological map is shown in Figure 27 and the petrological descriptions are included as Appendix B. The rocks are dominated by lavas and intrusives, the exception being a volcaniclastic.

To the north of the gridded area the rocks are predominantly a plagioclase augite phyric diorite. Elsewhere mafic/intermediate plagioclase augite phyric lavas predominate with one felsic lava described.

The diorite/felsic lava contact described in the petrology for the sample from 200W 50N may be that between an apophyse of the main diorite body and the lava or it may be the main diorite body itself.

In the gridded area these rocks are generally strongly altered by (variable) chlorite-pyrite-silica-tourmaline-magnetite.

The alteration assemblage is consistent with that produced by intrusive diorites into a mafic/intermediate package seen in porphyry copper-gold deposits. The anomalous copper, and more patchy but still anomalous gold in soils, supports this.

The alteration zone is around 300m x 400m but is open ended to the south-west and east and may continue further to the north-west.

The airborne magnetics data shows that there are magnetic highs to the north-east and south-east of the gridded area with a low roughly coincident with the gridded area but extending somewhat to the north-west. The diorites mapped on the 400N lines to the east and west of the main track are probably responsible for magnetic highs.

962021

6.0 EXPLORATION HISTORY

The area referred to in this report has little of the evidence of small mining or scratchings which characterise most of the west coast north of Macquarie Harbour. Asbestos was mined from Asbestos Point around the turn of the century and there is a small copper prospect hosted in carbonates at Birthday Bay on the west coast of the peninsula.

6.1 1956/62: LEE

In 1956 Mt Lyell (now part of RGC) and the EZ Co. (now Pasminco), formed Lyell-EZ Exploration (LEE) and were granted a special prospectors licence which was replaced in 1959 by EL 3/59, referred to as the "Gordon Concession" including the area which is the subject of this report. This, together with EL 1/59 (the "Arthur Concession") covered a total of over 70,000 km² (maximum size for a "minerals" EL now is 250 km²).

The Gordon Concession and parts of the Arthur Concession were flown with an aeromagnetic survey and more restricted airborne EM survey. Average line spacing of 500-700m was used with ground clearance of 160m, however, the EM survey was very insensitive and recovery on photomosaics was poor. Amoco's detailed aeromagnetic survey superseded the LEE survey. The ground work was based on the follow-up of selected aeromagnetic anomalies and involved extensive ground geophysics with minor geological and geochemical investigations.

Most of the detailed work concentrated on the area between Macquarie Harbour and Elliott Bay and east to the Moores Valley (D'Aguilar Range area).

Four EM anomalies, out of a total of 31, are located within or very near to the Noddy Creek volcano-sedimentary belt. Anomaly 20/6, a first order anomaly, was located and found to be due to graphite in carbonaceous shales. Anomaly 20/4, a second order anomaly, was not located with ground EM and was considered to be due to fluctuations in the aircraft's orientation. Anomalies 10/4a and 10/4, second order and fourth order anomalies respectively, were located and shown to be correlated with the strongly sheared contact between ultramafics and the sediments associated with the Noddy Creek Volcanics. These latter two anomalies received further attention from BHP.

Exploration in the Noddy Creek volcano-sedimentary belt effectively ceased following the follow-up of these anomalies with LEE devoting their attention elsewhere. EL 3/59 was terminated in 1962.

6.2 1964/72: BHP

In 1964 BHP were granted EL's 1/64 and 13/65 covering 9600 km². Although not specified in any available reports, it appears that they were looking for all minerals. BHP flew an aeromagnetics survey to fill in gaps in the LEE survey, but no ground based exploration covered the area referred to in this report until the 1966-67 season.

BHP based their exploration on follow-up of the LEE aeromagnetics and EM surveys, with stream sediment geochemistry as their other main regional technique, however, Au was not assayed for.

In 1966/67 work was conducted from a base camp at the southern end of Birch's Inlet. Exploration in the area referred to in this report consisted of boat traverses along the south-eastern end of Macquarie Harbour as well as the navigable parts of rivers in the area. Foot traverses were made along the rest of the larger rivers and creeks. The geology of large areas of unmapped country was interpreted from air photos.

Two prospective areas lying within EL's 4/92 and 7/92 were defined by exploration in the 1966/67 season.

i) Cypress Creek

The area is the location of an aeromagnetics anomaly coincident with pyritic Cambrian chert and black shale which were considered to explain the magnetics, however, it is also the location of very anomalous Cu and Zn stream sediments in Cypress Creek which lies between the Mainwaring and Urquhart Rivers. Copper staining is seen in Cambrian tuffs in the Urquhart River. The host rocks are the basic-intermediate volcanics and gabbros of the Mainwaring River Volcanics.

ii) Hibbs River Belt (specifically the Noddy Creek area)

The Noddy Creek area, in what BHP refer to as the Hibbs River (ultramafic) belt, which runs from the Muddy Cove area in Macquarie Harbour to Endeavour Bay on the west coast was shown to be the location of a coincident airborne EM anomaly and anomalous Zn stream sediments.

26 miles of track was bulldozed over Cambrian rocks immediately west of Birch's Inlet chasing a linear aeromagnetics anomaly (presumably anomalies 10/4 and 10/4a from the LEE survey). The ultramafics in the area were mapped at 1:4800 and compiled at 1:24000. Ground magnetics and EM at 100 ft spacing revealed a magnetics anomaly on the eastern side of the ultramafics coincident with the contact between the ultramafics and a graphitic siltstone, both rocks with pyrite. RC sampling from costeans across this contact gave up to 0.8% Cu and 0.15% Ni. Asbestos was discovered in the northern part of the ultramafics and this became a major focus of further exploration by BHP in the area.

In the 1967/68 season BHP carried out the following work in the area covered by EL's 4/92 and 7/92.

i) Hibbs River Belt

Detailed magnetics, EM and SP surveys were conducted every 25 ft on lines spaced 100 ft apart across the contact between the eastern side of the ultramafics and the Cambrian sediments. A DDH located to test the peak of an EM anomaly intersected 11 ft of graphitic siltstone at the contact. No volcanics were intersected. Towards the south of the belt an area of anomalous Zn and Ni was determined from stream sediment sampling in creeks between Hibbs Lagoon and Point Hibbs.

ii) Mainwaring Belt (including Cypress Creek)

The Cu and Zn anomalies in Cypress Creek were followed up with the discovery of native copper in sheared tuff in the Mainwaring River, copper staining in tuff in the Urquhart River, chalcopyrite in sheared, chloritic, epidote stained conglomerate and in greywacke at the mouth of Copper Creek, chalcopyrite between the Urquhart River and Cypress Creek and pyrite in tuff in South Cypress Creek, all in the Mainwaring River Volcanics but near to the contact with the Noddy Creek volcano-sedimentary association (Brown *et al.* 1991). The location of the anomalous Cu, Zn and Ni was shown to be located between the headwaters of Cypress and South Cypress Creeks in a thick scrub covered area of the Mainwaring River Volcanics. Maximum (ppm) values obtained were 252 Cu, 165 Zn and 215 Ni from stream sampling and 1875 Cu, 250 Zn and 810 Ni for bank samples. Maps with sample locations and values were seen in writing this report, however, it is difficult to correlate them with more modern maps of the area so their location is uncertain.

The rocks underlying the anomalous area consist of "thick andesitic and basaltic tuffs, locally agglomeratic and with minor interbedded sediments and small dioritic and gabbroic intrusions" (Hall *et al.* 1969). The rocks are described as containing chlorite and epidote, due to hydrothermal alteration, and are strongly sheared. The alteration zone probably continues north of the Mainwaring River where there are a series of first class airborne EM anomalies (LEE 20/4 and 20/6).

Exploration in the 1968/69 season concentrated on the Cu anomalism in the Cypress Creek area as well as the Copper Creek area further south nearer to Elliott Bay. Systematic geological mapping (quite detailed) at 1:4800, soil sampling, SP and ground magnetics were conducted over the area. McGregor (1969) describes native copper from two zones in a dense intermediate volcanic breccia unit and from a sheared, talcose gabbro, both units from the Mainwaring River Volcanics. Fine grained disseminated chalcopyrite is also seen in these rocks.

Soil sampling outlined a zone of Cu anomalism in acidic volcanics, considered by BHP to be correlatable with those from the Lewis River Volcanics in Elliott Bay. The maximum value was 370 with a number of samples in the 200's. Further west, in intermediate volcanics, anomalous Cu soil samples were also taken with a maximum of around 350 ppm. An RC sample gave 1300 ppm Cu. It was recommended that drilling be undertaken in the vicinity of the latter sample to test for Cu anomalism at depth. This was not carried out.

Exploration on the Sorell Peninsula from 1969 to 1971 concentrated on the asbestos potential of the Hibbs River Belt.

In 1971/72 BHP followed up an aeromagnetic anomaly south-west of Birch's Inlet with ground magnetics, soil sampling and RC sampling (Thomas Creek Prospect). The results are presented unprocessed with no discussion and it appears that there was no follow-up. The centre of the magnetics anomaly was located with no associated soil geochemical anomalism, however, 1500 ft north a number of RC

samples gave anomalous Cu, Pb, Zn and Ag with individual samples yielding 920, 800, 130 and 10.5 Cu, Pb, Zn and Ag respectively. Other samples yielded 640, 680, 100, 10.0; 1000, 100, 62, 2.9 and 760, 310, 84, 5.0 respectively. A single sample from 400 ft west of the magnetic peak gave 640, 1000, 120 and 6.2 respectively. The samples were taken from rocks with visible disseminated sulphides, some of the rocks being boulders. Soil sampling in the area of the RC sampling does not support the anomalism, however, BHP did not consider the results to be accurate because of the lack of B-Horizon and soil development in a number of places. Since some magnetic anomalies in the area further north are due to dioritic intrusions, the possibility remained that the samples were taken from mineralisation associated with such an intrusion.

BHP mapping of the area identified four units; (a) shales with minor sandstones, (b) andesitic lavas and pyroclastics, (c) basaltic/andesitic lavas and (d) mainly acid volcanics and possibly sub-volcanic rocks. The magnetic anomaly was thought to be due to disseminated magnetite in the acid volcanics. This general area was explored by Amoco who referred to it as Thomas Creek (see section on Amoco's exploration).

BHP's interest in the Sorell Peninsula was relinquished in 1972. It pulled out rather quickly as a result of a decision by upper management (McClenaghan pers. comm.).

6.3 1983/88: Amoco (Cyprus)/Poseidon/Placer J.V.

In 1983 Placer were granted three EL's on the Sorell Peninsula south of Macquarie Harbour. Placer held the EL's with Amoco and Poseidon joint venturing the project 50% apiece but returning 5% of profits to Placer. Amoco, who later became Cyprus, were the managers of the project.

As an initial reconnaissance tool in the 1983/84 season, two of the three volcanic belts, ie. the Lucas Creek Volcanics and the Mainwaring River Volcanics, were flown with an airborne DIGHEM survey, with the third group, the "Muddy Cove" (or Noddy Creek) Volcanics scheduled to be flown with the same survey the following season. At the same time Austirex were contracted to fly an aeromagnetics survey covering all three EL's. The aeromagnetics survey used a line spacing of 150m and an average height of 70m.

The DIGHEM survey used the same line spacing and height as the aeromagnetics. Unfortunately only the very north-western and south-western corners of the survey over the Mainwaring River Volcanics overlapped onto the sediments considered to be associated with the Noddy Creek Volcanics.

A radiometric survey was run concurrently with the DIGHEM survey as the equipment was already in the aircraft. The instruments were not calibrated and the data was not processed. Stacked profiles of the raw total count radiometric data at 1:50,000 were considered to be unsatisfactory, however, they do indicate trends and suggested that a detailed survey may be a useful aid to mapping (Bishop, 1985).

Exploration in those areas not covered by the DIGHEM survey, ie. predominantly the Noddy Creek Volcanics, consisted of a single traverse along the middle of the belt often following the ridge lines, from north of Camp Sorell to south of Thomas Creek. A number of side traverses were made to adjacent creeks. Mapping, soil and stream sediment sampling was carried out on all traverses.

In the Muddy Cove (or Noddy Creek) Volcanics north of Timbertops it was intended to geochemically sample the volcanics and to ascertain the presence of acid volcanics. Six traverses, spaced 1,000m apart, were planned but not all were completed and no traverse managed to cross the entire belt of volcanics. Outcrop was poor but where observed consisted predominantly of andesitic tuffs and lavas with minor interbedded shale, sandstone and reworked tuff. Some coarse breccia and agglomerate was observed on the track south to Timbertops. One rhyodacite outcrop was observed at GR 694038 on traverse 17. Some fine Au was observed in panned concentrates at the end of traverse 16 though not confirmed by repeat assays. Soil samples at the eastern end of traverse 15 reveal a very weak Zn and Ba (Pb?) association.

In the "Timbertops" area the aim of follow-up work was to define the nature of the volcanics and reported talc alteration zones around diorite intrusions. No Au was observed. A weak Pb-Zn-Ag-As association at GR 688955 was possibly due to vein mineralisation adjacent to diorite intrusions. A correlation between chrome in stream sediments, chrome in soils and volcanics was apparent in most of the area.

In the Hibbs River headwaters area, the aim was to conduct broad scale geochemical sampling and to determine the nature and extent of previously interpreted volcanics. No geochemical anomalies were revealed, however, it appears that there was an association between diorites and Cu-As-(Ba). 110m west of Thomas Creek helipad a soil sample yielded 2000 ppm Cu, 1050 ppm Ba, 30 ppm Sn and 0.97 ppm Au and was considered to be related to a sub-surface diorite intrusion. Other than the diorites and a microgranite the rocks consisted of basic to intermediate pyroclastics and predominantly trachy-andesitic lavas. The end of traverse 21 corresponds roughly with the location of the anomalous rock chips sampled by BHP in 1972. BHP's soil sampling revealed no anomalous results, however, three soil samples taken by Amoco along the traverse had over 300 ppm Cu and a few samples had anomalous Ba.

In the Cypress Creek region, the aim was to test previous reports of alluvial gold from the area. Three localities were targeted but really only the Urquhart River received anything like a reasonable assessment. The rocks are described as basalts, basic to intermediate tuffs and siltstones. Strong silicification was shown by some siltstones and acid tuffs with the basalts and more basic tuffs variably chloritised and sericitised. A pyritic tuff was petrographically identified as a meta-basalt. Fine gold was panned in the south arm of the Urquhart River. With the report of gold in the upper Mainwaring River the source probably lay in the common watershed. Cu, Zn and Ni levels concur with the sampling of BHP in the area, however, these were considered to simply represent the underlying basaltic lithologies. Effectively all of the sampling was from the Mainwaring River Volcanics with only minor sampling along Flat Creek in the Noddy Creek Volcanics and associated sediments.

Amoco's exploration for the 1984/85 season consisted of the following work:

i) **Thomas Creek**

This area adjacent to the Hibbs River area was sampled to check the 0.97 ppm Au soil sample from the previous year. Sample intervals down to 12.5m including two samples at the same location as the previous sample failed to repeat any Au anomalism. However, a strong Cu soil anomaly covered the

whole area with values up to 3360 ppm but with no associated Pb or Zn. Visible pyrite is described in variably altered intermediate extrusive or intrusive volcanics, however, the outcrop was poor and mapping was done using soil augers. The Cu anomaly was unexplained but the lack of an associated Pb or Zn anomaly was disappointing. VLF-EM and ground magnetics did not correlate with the geochemistry and it was proposed to cover the area with a DIGHEM survey.

ii) Double Cove-Muddy Cove Coastal Traverse

This traverse revealed relatively high background levels for Au in the Lucas Creek Volcanics to the west of EL 4/92 but generally low geochemical responses for the Muddy Cove/Noddy Creek Volcanics except for two samples which yielded 310 and 98 ppm Pb.

The major recommendations flowing from the field work conducted in the 84/85 season was the need for DIGHEM coverage of the Muddy Cove/Noddy Creek Volcanics.

From Bishop's (1984) interpretation of the aeromagnetics and DIGHEM data available at the time, the following prospects remained untested.

i) Thomas Creek (West) - GR 5 287 500 mN/367 000 mE

Convergence of trends of the magnetic map may warrant geological and geochemical follow-up.

ii) Gaps (South) - GR 5 291 000 mN/368 000 mE

A magnetic high over a diorite intrusion may warrant ground magnetics and geochemical follow-up.

iii) Gaps (West) - GR 5 292 000 mN/365 500 mE

Linear magnetic highs in Cambrian sediments may warrant geological, VLF-EM and ground magnetics follow-up.

iv) McCarthy Creek - GR 5 280 000 mN/369 000 mE

A series of offset magnetic highs in Cambrian sediments may warrant follow-up with geological mapping, VLF-EM, and ground magnetics.

As well as this Bishop (1984) stated that the volcanics in the Hibbs River and Muddy Cove areas definitely warranted a DIGHEM survey.

The 1985/86 season saw the flying of a DIGHEM survey over the Muddy Cove and Wanderer River North areas (the DIGHEM sheets for this area are referred to as Spero River) in conjunction with the survey flown over EL 40/85 at Elliott Bay to the south. Initially the survey was to include both the Muddy Cove and Hibbs River

outcrops of the Noddy Creek Volcanics, however, the latter area was dropped and replaced with the Wanderer River North further south in the Mainwaring River Volcanics. The survey was flown with 150m line spacings and a maximum height of 50m.

In the Muddy Cove area no significant anomalies were recorded, however Pb-Zn rich VMS deposits are unlikely to give a first class anomaly so this was not considered to be a problem.

Bishop provided a full interpretation of the DIGHEM survey for Amoco in 1986. In his interpretation Bishop describes five anomalies. These anomalies were never followed up though this was recommended by Jones (1987) and Poltock (1988).

Bishop (1986) considered a max-min EM system with maximum frequency of 3555 Hz be used for the ground follow-up as it was more sensitive than the 'genie' system used previously, with some problems, on the Sorell Peninsula. He also recommended the hiring of a satellite navigation system to locate the anomalies accurately.

No exploration in the area covered by EL's 4/92 and 7/92 was carried out in the 1986/87 and 1987/88 seasons. At the time of writing the 1987/88 report, Cyprus and Poseidon were looking for a new joint venture partner to continue exploration in the two northern EL's.

The joint venture partners relinquished EL 35/83, 36/83 and 37/83 in 1988.

6.4 Tasmanian Department of Mines

In order to test a new sampling technique, samples of waters, from creeks draining into a number of the major rivers in both EL's, were collected. These samples were taken to be assayed for the amount of metal bonded to humic acids. To date only those from the Wanderer River have been assayed with anomalous gold (9.4 and 14.2 ppt against a background of 0.2 to 1.8) reported from two creeks draining rocks along strike from one other, from both sides of the river approximately 5 km upstream.

7.0 WORK CONDUCTED 12 MONTHS TO AUGUST 1993

7.1 Introduction

Four phases of work were planned for the 1992/93 field season. Due to priorities elsewhere, and the onset of winter weather, the fourth phase, a regional stream sediment sampling programme, was postponed.

7.2 Wanderer River (EL 7/92)

Anomalous gold in creeks draining along strike rocks from the north and the south of the Wanderer River, about 5 km upstream, were the target of this phase. The gold anomaly was determined from the Huminex waters technique being developed at the Tasmanian Department of Mines. Two men spent three days in the area and 12 BLEGS were taken from both creeks (7 from the north and 5 from the south). No anomalous results were returned, however, the northern creek drains volcanic derived sediments cut by significant fault whilst the southern creek drains volcanic derived sediments intruded by a diorite and weakly pyritic in places. Sample results are shown in Figure 6.

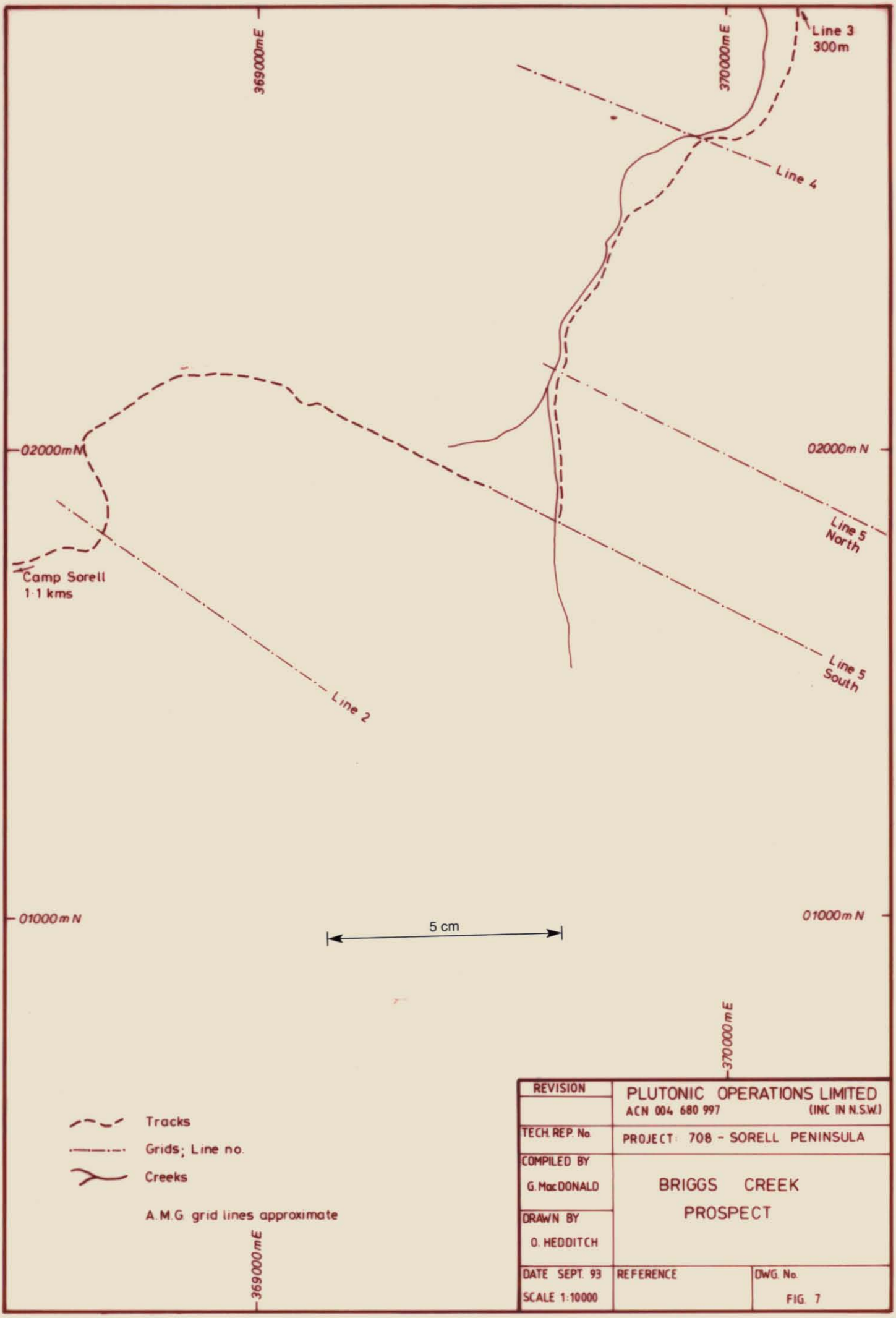
The lack of significantly anomalous gold in the BLEGS has severely down graded the prospect although the original anomaly may be real.

7.3 Briggs Creek EL 4/92

The four airborne EM anomalies recorded in the Amoco DIGHEM survey, and coinciding with prospective Noddy Creek Volcanics, were the target in this phase. One of these anomalies (Anomaly 5) was supported by moderately anomalies Ba and Zn from an Amoco traverse (15).

The airborne EM anomalies are numbered according to J Bishop's interpretation. With anomaly 1 possibly due to a fault and accessible from the coast in phase 4 of exploration it was decided to follow up anomalies 2, 3, 4 and 5. The anomalies are:

Anomaly No.	DIGHEM Anomaly No's	Follow-Up
2	10360C 10370B	Single 700m line, anomaly centre at 1400E; ground magnetics, Genie EM, soil and stream geochemistry and mapping.
3	10230G 10240E 10250D	Single reconnaissance line, anomaly centre 240 east of Briggs Creek on line; soil and stream geochemistry and mapping.
4	10262C 10270E 10282B	Single 600m line, anomaly centre at 1400E; ground magnetics, Genie EM, soil and stream geochemistry and mapping.
5	10310B 10320A 10330A 10340B 10350A	Two 800m lines, anomaly centre on 1400E both lines; ground magnetics, Genie EM, soil and stream geochemistry and mapping.



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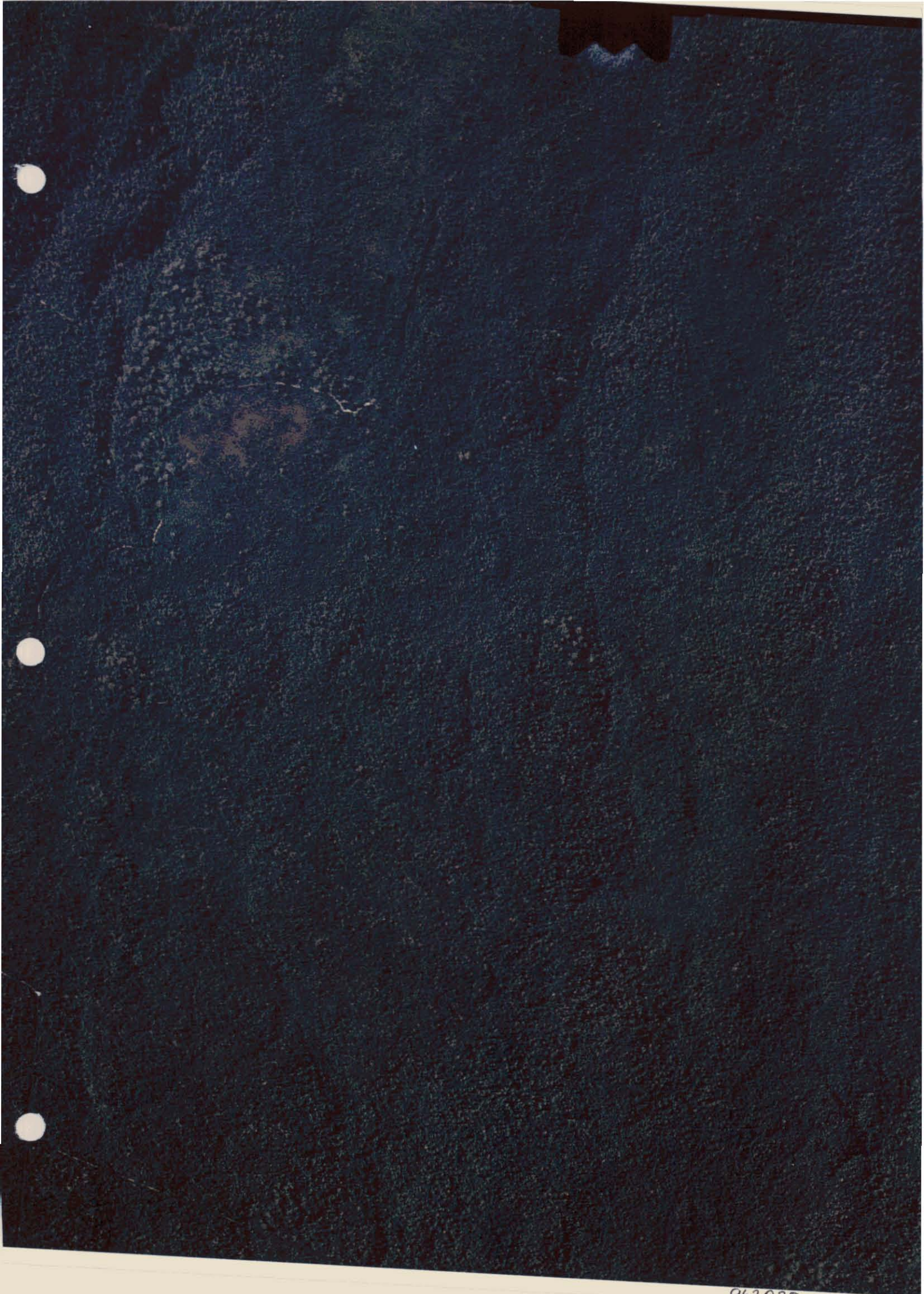
TECH. REP. No.	PROJECT: 708 - SORELL PENINSULA
COMPILED BY G. MacDONALD	BRIGGS CREEK PROSPECT
DRAWN BY O. HEDDITCH	
DATE SEPT. 93 SCALE 1:10000	REFERENCE DWG. No. FIG. 7

962029



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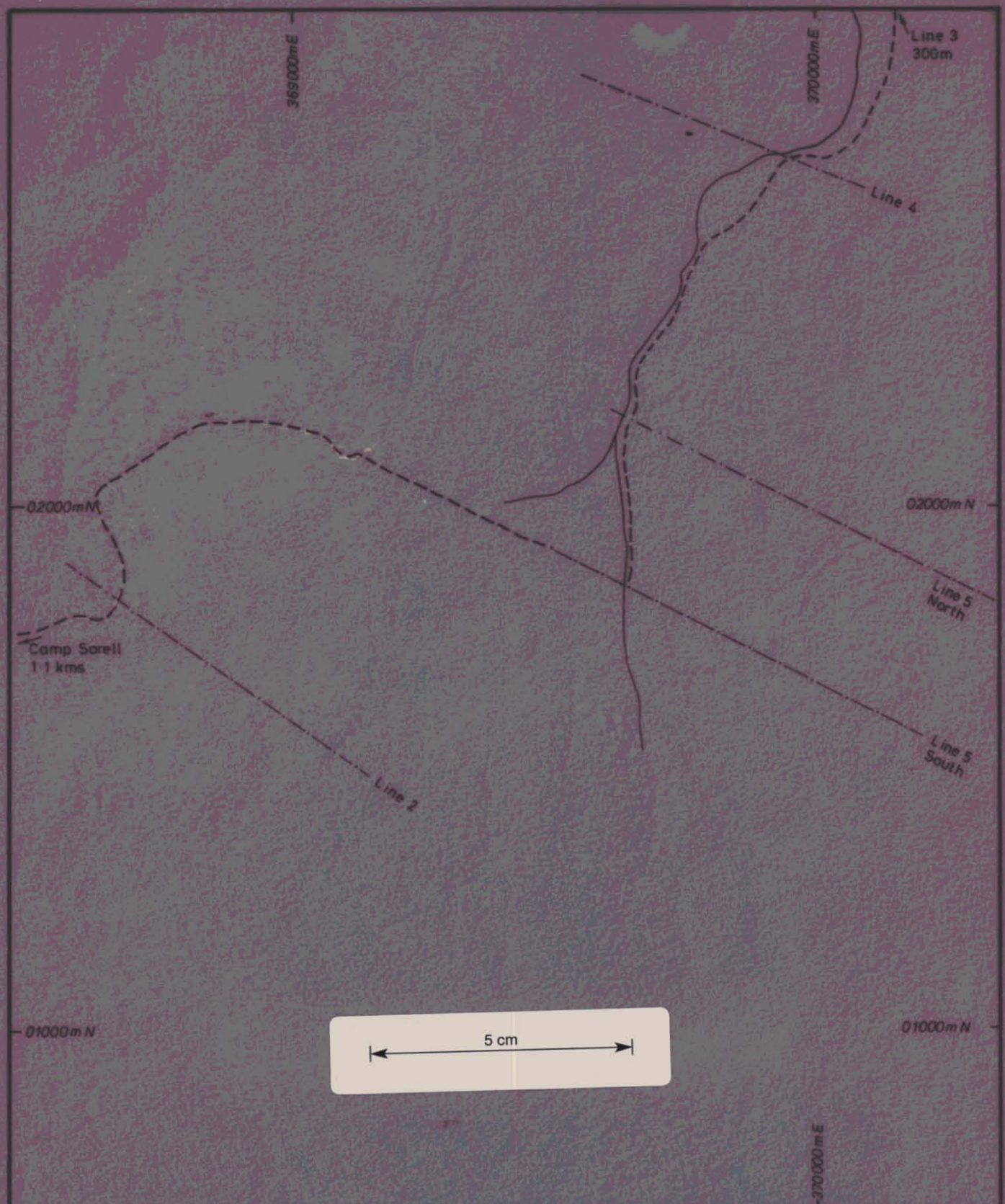

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962029

Five men spent around three and a half weeks in the area camping at the old BHP Camp Sorell. 1.3 km of old BHP/Amoco track was cleared, 2.0 km of new track was cut and 2.9 km of grid lines were cut. Mapping was carried out on all tracks, grids and major (Briggs) creeks. Soil sampling was carried out every 25m on grids and ground magnetics and a hand held Genie EM survey conducted over the grids. Due to time constraints only three of the four anomalies had ground magnetics and EM coverage, however, all four were mapped and soil sampled.

The hand held Genie EM system used gave no responses due to conductive sulphides, however, the ground magnetics, GPS and aerial photos all indicate that the grid lines were correctly positioned. Genie EM profiles are included as Figures 11 to 22 and the ground magnetics in Figures 23 to 26.

Some gold was assayed in a panned concentrate taken from a creek crossing the western end of line 4 and line 5 south has some weakly anomalous Zn (to 175 ppm) in soils around 1400E, however, these results are not significant. Geochemical results are shown in Figure 10 and the geology in Figure 9.

Hence the lack of significantly anomalous geochemistry in soils and stream sediments and the lack of alteration in the rocks seen in the area are sufficient to downgrade this prospect.

7.4 Thomas Creek (EL 4/92)

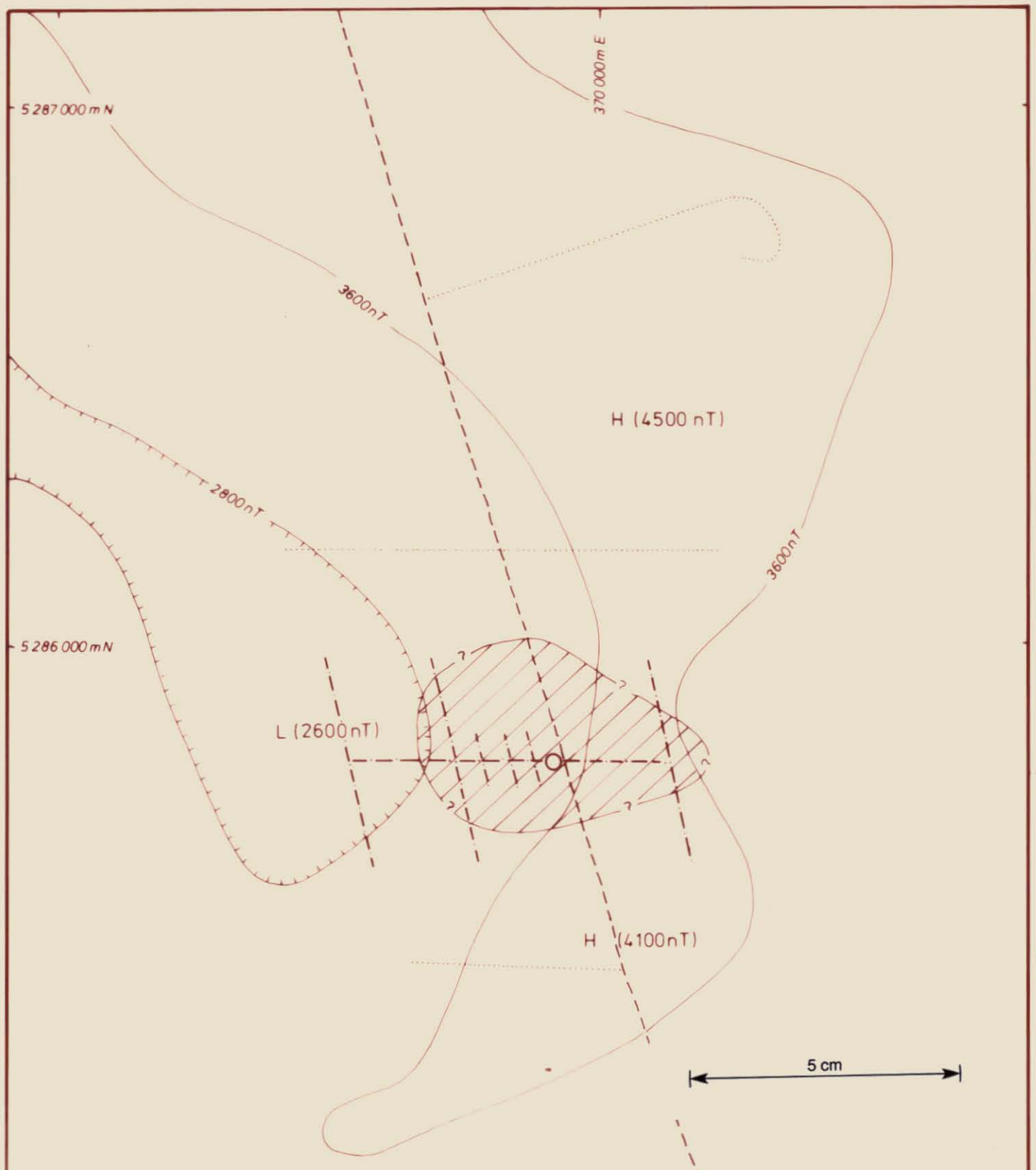
The Thomas Creek Prospect lies in the headwaters of the Hibbs River. It was identified by Amoco's traverse along the Noddy Creek belt in the 1983/84 season and followed-up the following year with gridding, soil sampling, VLF-EM and magnetics.

The intention of this phase of exploration was to check the original sample results and to obtain rock samples to seek to explain these anomalous values. A second aim was to locate and sample the sulphidic rocks BHP described from its exploration in the area.

Four men spent five days in the area. No soil sample results (in Figure 28) better than those of the Amoco survey were obtained, however, the results do support the Amoco survey. These results, coupled with geological mapping (in Figure 27) based on rock chips from auger holes, indicate that there is a 300m x 400m (minimum) zone of highly altered rocks with anomalous Cu and Au. This zone is covered by a peaty bog, however, the rock chips suggest that the rocks are predominantly mafic/intermediate lavas. The presence of tourmaline in the chlorite-sericite-silica-pyrite-magnetite altered rocks, the presence of diorites to the north and north-east and the existence of a magnetic high to the north-west point to a dioritic intrusive being responsible for alteration and mineralisation. Petrological descriptions of 14 rock samples are included as Appendix B.

The sulphidic rocks reported by BHP were located and shown to be eroded from a pyritic vein in altered mafic/intermediate lavas in the creek bed. The presence of ilmenite in this vein supports a porphyry model for mineralisation the Thomas Creek Prospect.

This prospect has considerable potential and demands further work. It may also serve as a model for mineralisation elsewhere in the belt.



Known extent of alteration zone

Track

Grids

Traverses

Helipad

2800nT Magnetic contour - low (nanoteslas)

L Magnetic low (approx value in nanoteslas)

3600nT Magnetic contour - high (nanoteslas)

H Magnetic high (approx value in nanoteslas)

Note : A.M.G. grid lines approximate only

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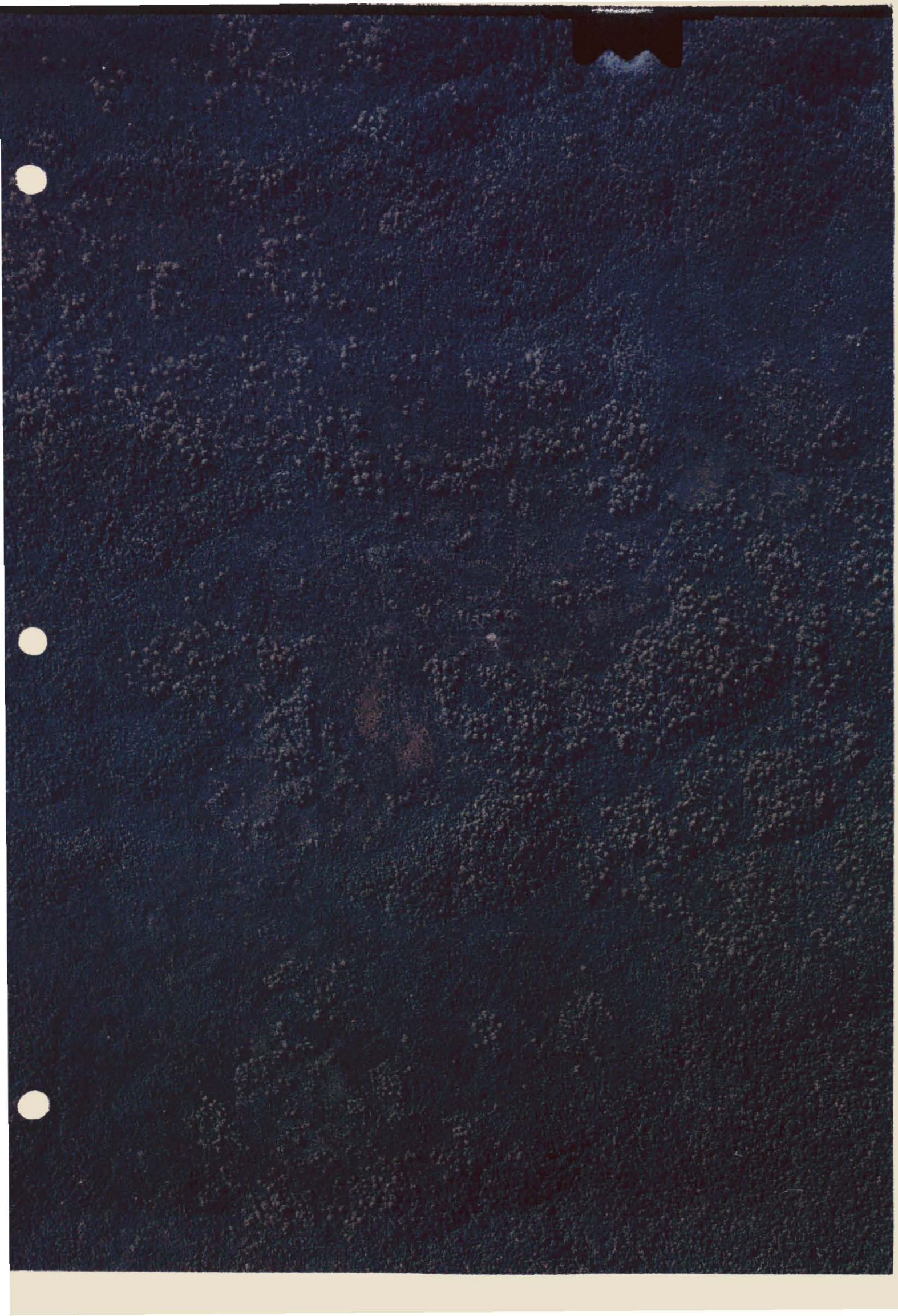
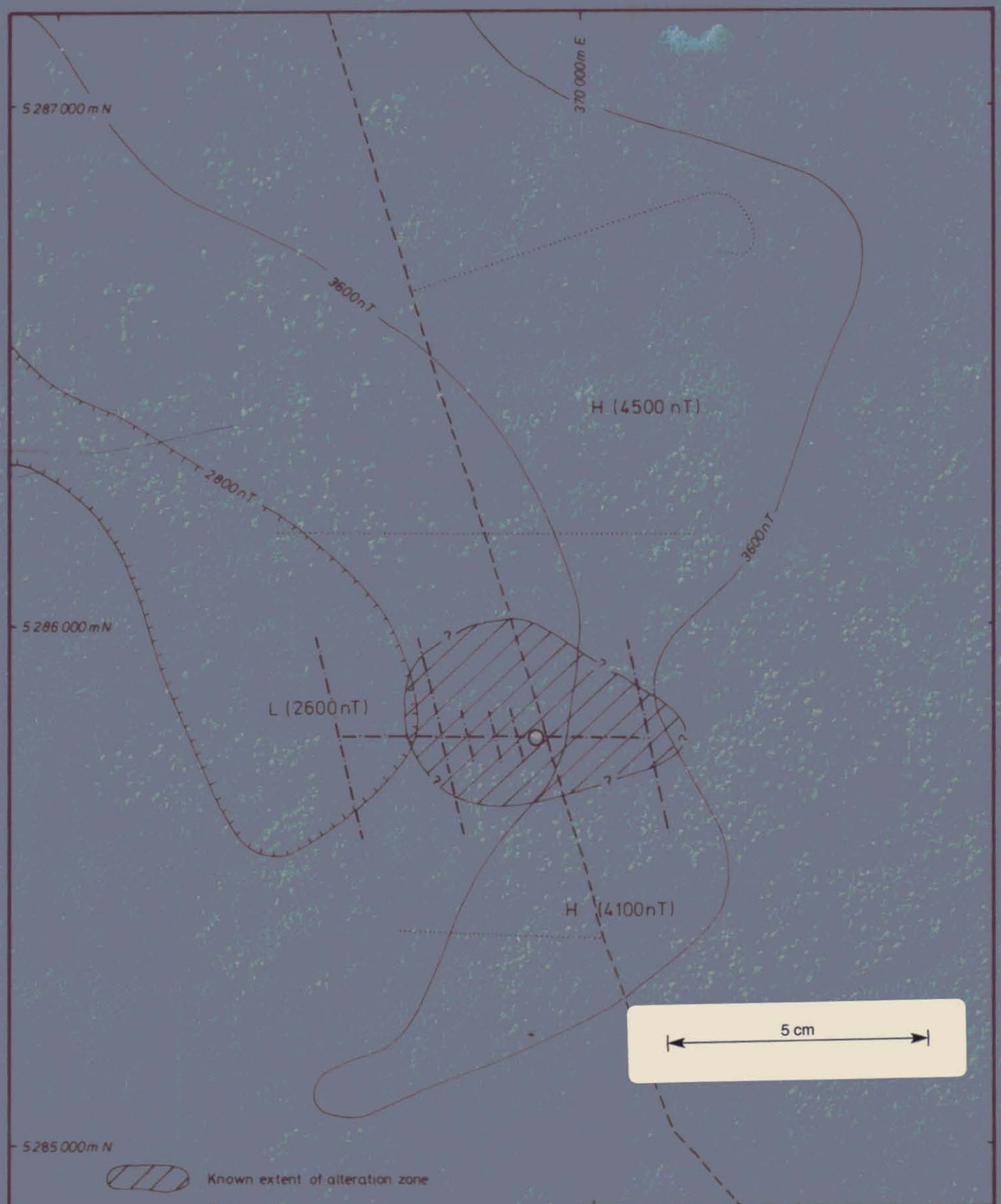
COMPILED BY G. MacDONALD	THOMAS CREEK PROSPECT
DRAWN O. HEDDITCH	
DATE SEPT 93 SCALE 1:10 000 approx.	REFERENCE FIG No 8

962032





Known extent of alteration zone

Track

Grids

Traverses

Helipad

2800nT Magnetic contour - low(nanoteslas)

L Magnetic low (approx value in nanoteslas)

3600nT Magnetic contour - high(nanoteslas)

H Magnetic high (approx value in nanoteslas)

Note : A.M.G. grid lines approximate only

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TECH. REP. No.	PROJECT 708 - SORELL PENINSULA
COMPILED BY G. MacDONALD	THOMAS CREEK PROSPECT
DRAWN O. HEDDITCH	
DATE SEPT 93 SCALE 1:10 000 approx.	REFERENCE FIG. No. 8

962032

962034

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APPENDIX A

Assay Results for all Sorell Peninsula Work

962037

ANALABS

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 591 664

Phone (004) 316837 | 14 Thirkell St. CODEE TAS 7320 | Fax (004) 318890

ANALYTICAL REPORT No. 111715.60.09266

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

INVOICE TO:
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT
TBA	

DATE RECEIVED	RESULTS REQUIRED
02/02/93	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
2	16/02/93	1	39

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
S00871/98	DC Prep : SP033,SP034	Cu,Pb,Zn/6A101, Cu,Pb,Zn/6A104
S00901/09,S00911,S00912	SD Prep : SP001,SP006	Au/66340
LBD1 extended (also some EL 7/92 results) :-	Wanderer River prospect	

REMARKS

RESULTS TO
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO

RESULTS TO

AUTHORISED OFFICER

962038

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09266	16/02/93	2.2.93	1 OF 2

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Au ppm.	From	To.
1	S00871	825	-	510	-	470	-	-	206.4	207.4
2	S00872	2200	-	245	-	690	-	-	214	215
3	S00873	705	-	105	-	195	-	-	215	216
4	S00874	4300	-	70	-	145	-	-	216	216.4
5	S00875	3250	-	34	-	105	-	-	216.4	217
6	S00876	2100	-	22	-	80	-	-	217	218.15
7	S00877	1650	-	25	-	100	-	-	218.15	219
8	S00878	1400	-	25	-	110	-	0.012	219	220
9	S00879	4150	-	1600	-	9050	-	0.026	220	222
10	S00880	>10000	1.32	2100	0.20	>10000	1.02	0.118	222	223.3
11	S00881	>10000	1.79	445	0.05	1400	-	0.084	223.3	234
12	S00882	3100	-	1200	-	8750	-	-	234	235
13	S00883	795	-	1200	-	665	-	-	235	236
14	S00884	3650	-	2950	-	2850	-	-	236	237
15	S00885	5900	-	1900	-	9600	-	-	237	238
16	S00886	2500	-	2100	-	7750	-	0.029	238	239
17	S00887	>10000	3.62	4200	0.57	8500	-	0.312	239	240
18	S00888	6500	-	1200	-	2300	-	-	240	242.9
19	S00889	>10000	1.57	>5000	1.18	7050	-	-	242.9	244
20	S00890	8300	0.95	>5000	1.49	>10000	1.04	0.044	244	245
21	S00891	10000	-	4350	-	3600	-	0.057	245	246.1
22	S00892	>10000	1.74	2400	0.24	5650	-	0.058	246.1	247
23	S00893	>10000	1.07	78	-	440	-	0.032	247	249
24	S00894	9000	-	39	-	90	-	-	249	250
25	S00895	>10000	1.47	195	-	500	-	-	250	251

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
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ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09266	16/02/93	2.2.93	2 OF 2

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Au ppm	From	To
1	S00896	3500	–	68	–	48	–	–	252.5	253.5
2	S00897	5450	–	163	–	125	–	0.026	253.5	254.5
3	S00898	>10000	1.83	>5000	0.59	4200	–	0.039	283.2	283.6
4	S00901	–	–	–	–	–	–	0.57	↑ Sample Nº	1.
5	S00902	–	–	–	–	–	–	0.07		2.
6	S00903	–	–	–	–	–	–	0.07	results.	3.
7	S00904	–	–	–	–	–	–	0.84		4.
8	S00905	–	–	–	–	–	–	0.12		5.
9	S00906	–		–	–	–	–	<0.05	7/92	6.
10	S00907	–	–	–	–	–	–	<0.05		7.
11	S00908	–	–	–	–	–	–	0.05	EL	8.
12	S00909	–	–	–	–	–	–	0.24		9.
13	S00911	–	–	–	–	–	–	0.26		11.
14	S00912	–	–	–	–	–	–	0.34	↓	12.
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	4	0.01	5	0.01	4	0.01	0.05		
24	UNITS	ppm	%	ppm	%	ppm	%	ppb		
25	METHOD	GA101	GA104	GA101	GA104	GA101	GA104	GG340		

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

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962040

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A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 591 664

Phone (004) 316837 | 14 Thirkell St, DODEE TAS 7320 | Fax (004) 318890

ANALYTICAL REPORT No. 111715.60.09352

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

INVOICE TO:
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT
TBA	

DATE RECEIVED	RESULTS REQUIRED
05/03/93	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
7	29/03/93	1	172

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
S00932/1070	S0 Prep : PULVERISE	Cu,Pb,Zn/GA101
S01096/103	Prep : BLEGS	Au/GG340
S01071,73,75,78,80/81,87,90,92,95	Prep :	Au,Wt/GG300
S01072/094	Prep : PULVERISE	Cu,Pb,Zn/GA101

Briggs Creek.

Briggs

RESULTS TO
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO

RESULTS TO

REMARKS

IS = INSUFFICIENT SAMPLE

AUTHORISED OFFICER

ANALABS 962041

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE.
	111715.60.09352	29/03/93	TBA	1 OF 7

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au	Wt			
1	S00932	<4	6	49	-	-	-	Soil.	Line 2	1125E
2	S00933	4	8	23	-	-	-			1150E
3	S00934	<4	7	28	-	-	-			1175E
4	S00935	<4	<5	28	-	-	-			1200E
5	S00936	<4	<5	34	-	-	-			1225E
6	S00937	5	5	27	-	-	-			1250E
7	S00938	4	<5	27	-	-	-			1275E
8	S00939	<4	<5	27	-	-	-			1300E
9	S00940	8	8	34	-	-	-			1325E
10	S00941	27	14	74	-	-	-			1350E
	S00942	24	<5	50	-	-	-			1375E
12	S00943	17	<5	48	-	-	-			1400E
13	S00944	14	<5	42	-	-	-			1425E
14	S00945	23	<5	12	-	-	-			1450E
15	S00946	36	<5	40	-	-	-			1475E
16	S00947	13	<5	71	-	-	-			1500E
17	S00948	20	6	121	-	-	-			1525E
18	S00949	<4	<5	167	-	-	-			1550E
19	S00950	<4	<5	56	-	-	-			1575E
20	S00951	4	<5	108	-	-	-			1600E
21	S00952	85	<5	171	-	-	-			1625E
22	S00953	8	9	178	-	-	-			1650E
23	S00954	19	<5	98	-	-	-			1675E
	S00955	5	8	92	-	-	-			1700E
25	S00956	<4	<5	17	-	-	-			1725E

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

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962042

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A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09352	29/03/93	TBA	2 OF 7

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au	Wt			
1	S00957	<4	<5	17	-	-	-	Soils	Line 2 east.	1750E
2	S00958	<4	9	124	-	-	-			1775E
3	S00959	5	10	50	-	-	-			1800E
4	S00960	<4	9	56	-	-	-			1825E
5	S00961	14	<5	19	-	-	-		Line 4	1075E
6	S00962	<4	10	13	-	-	-			1100E
7	S00963	<4	7	9	-	-	-			1125E
8	S00964	63	<5	38	-	-	-			1150E
9	S00965	15	<5	78	-	-	-			1175E
10	S00966	<4	13	47	-	-	-			1200E
11	S00967	<4	9	61	-	-	-			1225E
12	S00968	54	26	96	-	-	-			1250E
13	S00969	<4	7	38	-	-	-			1275E
14	S00970	14	12	78	-	-	-			1300E
15	S00971	7	16	59	-	-	-			1325E
16	S00972	<4	14	275	-	-	-			1350E
17	S00973	<4	<5	29	-	-	-			1375E
18	S00974	<4	<5	58	-	-	-			1400E
19	S00975	6	6	56	-	-	-			1425E
20	S00976	<4	<5	21	-	-	-			1450E
21	S00977	11	5	65	-	-	-			1475E
22	S00978	19	5	85	-	-	-			1500E
23	S00979	8	10	62	-	-	-			1525E
24	S00980	5	7	32	-	-	-			1550E
25	S00981	13	6	96	-	-	-			1575E

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09352	29/03/93	TBA	3 OF 7

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au	Wt			
1	S00982	8	<5	51	–	–	–	Soils	Line 4 cont	1600E
2	S00983	26	<5	92	–	–	–			1625E
3	S00984	13	<5	51	–	–	–			1650E
4	S00985	<4	<5	22	–	–	–			1675E
5	S00986	6	<5	64	–	–	–			1700E
6	S00987	5	<5	15	–	–	–	Soils	Line 5 Sth	1000E
7	S00988	<4	<5	27	–	–	–			1025E
8	S00989	<4	<5	40	–	–	–			1075E
9	S00990	<4	<5	126	–	–	–			1100E
10	S00991	<4	6	49	–	–	–			1125E
11	S00992	11	<5	34	–	–	–			1150E
12	S00993	8	<5	53	–	–	–			1175E
13	S00994	6	<5	48	–	–	–			1200E
14	S00995	6	<5	69	–	–	–			1225E
15	S00996	4	<5	47	–	–	–			1250E
16	S00997	<4	<5	54	–	–	–			1275E
17	S00998	<4	5	89	–	–	–			1300E
18	S00999	4	12	110	–	–	–			1325E
19	S01000	5	13	26	–	–	–			1350E
20	S01001	4	14	139	–	–	–			1362.5E
21	S01002	<4	<5	9	–	–	–			1375E
22	S01003	6	14	175	–	–	–			1387.5E
23	S01004	15	8	42	–	–	–			1400E
24	S01005	4	<5	116	–	–	–			1412.5E
25	S01006	5	<5	20	–	–	–			1425E

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER

962044

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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09352	29/03/93	TBA	4 OF 7

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au	Wt			
1	S01007	5	12	140	-	-	-	Soils	Line 5 cont	1437.5E ~~1775E~~
2	S01008	8	<5	10	-	-	-			1450E
3	S01009	11	5	48	-	-	-			1475E
4	S01010	7	<5	30	-	-	-			1500E
5	S01011	12	5	67	-	-	-			1575E
6	S01012	6	<5	44	-	-	-			1600E
7	S01013	<4	<5	34	-	-	-			1625E
8	S01014	4	<5	26	-	-	-			1650E
9	S01015	5	<5	42	-	-	-			1675E
10	S01016	6	<5	74	-	-	-			1700E
11	S01017	6	<5	34	-	-	-			1725E
12	S01018	8	<5	32	-	-	-			1750E
13	S01019	15	8	79	-	-	-			1775E
14	S01020	<4	<5	112	-	-	-			1050E
15	S01021	11	29	64	-	-	-	Soils	Line 4 nth	1000E
16	S01022	9	13	39	-	-	-			1025E
17	S01023	6	6	87	-	-	-			1075E
18	S01024	5	8	32	-	-	-			1050E
19	S01025	<4	<5	69	-	-	-			1100E
20	S01026	<4	<5	12	-	-	-			1125E
21	S01027	7	6	86	-	-	-			1175E ~~1200E~~
22	S01028	6	8	96	-	-	-			1200E ~~1225E~~
23	S01029	4	<5	13	-	-	-			1225E
24	S01030	<4	<5	13	-	-	-			~~1250E~~
25	S01031	<4	<5	8	-	-	-			1275E ~~1300E~~

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

962045

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09352	29/03/93	TBA	5 OF 7

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au	Wt			
1	S01032	4	<5	12	–	–	–	Soils	4 nm Line	1300E
2	S01033	<4	<5	25	–	–	–			1325E
3	S01034	<4	9	17	–	–	–			1350E
4	S01035	<4	<5	12	–	–	–			1375E
5	S01036	24	<5	83	–	–	–			1400E
6	S01037	21	5	77	–	–	–			1425E
7	S01038	9	5	149	–	–	–			1450E
8	S01039	<4	9	65	–	–	–			1475E
9	S01040	23	30	66	–	–	–			1500E
10	S01041	13	6	40	–	–	–			1525E
11	S01042	21	12	29	–	–	–			1550E
12	S01043	5	<5	10	–	–	–			1575E
13	S01044	13	<5	145	–	–	–			1600E
14	S01045	6	<5	33	–	–	–			1625E
15	S01046	19	<5	30	–	–	–			1650E
16	S01047	7	<5	25	–	–	–			1675E
17	S01048	10	<5	29	–	–	–			1700E
18	S01049	8	<5	35	–	–	–			1725E
19	S01050	6	<5	43	–	–	–			1750E
20	S01051	6	7	32	–	–	–			1775E
21	S01052	8	11	44	–	–	–			1800E
22	S01053	12	<5	84	–	–	–	Soils	Line 3	90m Chain
23	S01054	13	9	71	–	–	–			90m A hor
24	S01055	5	<5	52	–	–	–			120m Chain
25	S01056	14	19	36	–	–	–			120m A hor

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09352	29/03/93	TBA	6 OF 7

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au	Wt		
1	S01057	5	<5	12	-	-	-	Soils	Line 3 150m C horiz
2	S01058	8	7	12	-	-	-		150m A horiz
3	S01059	8	<5	31	-	-	-		180m C horiz
4	S01060	9	6	35	-	-	-		180m A horiz
5	S01061	4	<5	17	-	-	-		210m C horiz
6	S01062	8	8	21	-	-	-		210m A horiz
7	S01063	8	<5	19	-	-	-		240m C horiz
8	S01064	10	6	27	-	-	-		240m A horiz
9	S01065	5	<5	58	-	-	-		270m C horiz
10	S01066	11	14	26	-	-	-		270m A horiz
11	S01067	9	7	51	-	-	-		300m C horiz
12	S01068	11	16	32	-	-	-		300m A horiz
13	S01069	<4	<5	24	-	-	-		330m C horiz
14	S01070	12	11	30	-	-	-		330m A horiz
15	S01096	-	-	-	0.53	-	-	Stream Sed - BLEG	Line 4 1220E
16	S01097	-	-	-	0.09	-	-		Line 4 1610E
17	S01098	-	-	-	1.25	-	-		Line 4 1195E
18	S01099	-	-	-	0.31	-	-		Line 5 SM 905E
19	S01100	-	-	-	0.25	-	-		Line 5SM 985E
20	S01101	-	-	-	0.18	-	-		Line 3 340m
21	S01102	-	-	-	0.18	-	-		Line 3 75m (Briggs C
22	S01103	-	-	-	<0.05	-	-		Line 5 SM 1130E
23	S01071	-	-	-	-	<0.2	24.56	Stream Sed - panalan	Line 2 1155E
24	S01073	-	-	-	-	<0.2	47.88		Line 2 ~~1630E~~ 1790E
25	S01075	-	-	-	-	IS	-		Line 2 ~~1740E~~ 1630E

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

962047

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09352	29/03/93	TBA	7 OF 7

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au	Wt	
1	S01078	-	-	-	-	IS	-	Stream sediment - pan con Line 5 nth 1130E
2	S01080	-	-	-	-	0.5	86.55	Line 5 nth 1085E
3	S01081	-	-	-	-	0.2	79.97	Line 5 nth 1600E
4	S01087	-	-	-	-	<0.2	34.39	Line 5 sth 1510E
5	S01090	-	-	-	-	0.3	65.90	Line 5 sth 1280E
6	S01092	-	-	-	-	0.3	91.28	Line 4 1545E
7	S01095	-	-	-	-	33.3	95.31	Line 4 1195E
8	S01072	14	5	66	-	-	-	Stream sediment -80# Line 2 1155E
9	S01074	5	<5	31	-	-	-	Line 2 1790E ~~1630E~~
10	S01076	9	6	64	-	-	-	Line 2 1630E ~~1790E~~
11	S01077	10	6	64	-	-	-	Line 5 nth 1130E
12	S01079	7	<5	37	-	-	-	Line 5 nth 1085E
13	S01082	10	5	106	-	-	-	Line 5 nth 1600E
14	S01083	7	6	36	-	-	-	Line 5 sth 985E
15	S01084	10	6	81	-	-	-	Line 5 sth 1280E
16	S01085	8	<5	18	-	-	-	Line 5 sth 905E
17	S01086	9	<5	40	-	-	-	Line 5 sth 1510E
18	S01088	9	6	79	-	-	-	Line 3 75m (Briggs Ck)
19	S01089	8	<5	23	-	-	-	Line 3 340m
20	S01091	6	<5	44	-	-	-	Line 4 1195E
21	S01093	11	5	44	-	-	-	Line 4 1610E
22	S01094	14	<5	42	-	-	-	Line 4 1545E
23	DETECTION	4	5	4	0.05	0.2	0.01	
24	UNITS	ppm	ppm	ppm	ppb	ug	g	
25	METHOD	GA101	GA101	GA101	GG340	GG300	GG300	

Results in ppm unless otherwise specified
T = element present, but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

ANALABS

962048

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 591 664

Phone (004) 316837 | 14 Thirkell St. CODEE TAS 7320 | Fax (004) 318890

ANALYTICAL REPORT No. 11715.60.0943

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

INVOICE TO:
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

ORDER No.	PROJECT
TBA	

DATE RECEIVED	RESULTS REQUIRED
14/04/93	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
4	22/04/93	1	89

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
901111/199	RO Prep : GP006,GP009,GP018	Cu,Pb,Zn/GA101
Various		Au,Au(R),Au(S)/GG309

Thomas Creek prospect, Sorell Peninsula. and some Briggs Creek rocks.

REMARKS

RESULTS TO
Mr Grant MacDonald
Plutonic Operations Limited
41 Bass Highway
DELORAINE TAS 7304

RESULTS TO

RESULTS TO

AUTHORISED OFFICER

962049

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09436	22/04/93		1 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au(R)	Au(S)		
1	S01111	6	9	65	<0.008	-	-	Soils 400S	400W
2	S01112	7	9	32	-	-	-	400S	350W
3	S01113	6	9	26	<0.008	-	-	400S	300W
4	S01114	6	6	24	-	-	-	400S	250W
5	S01115	23	7	13	<0.008	-	-	400S	200W
6	S01116	532	<5	54	-	-	-	400S	150W
7	S01117	289	<5	22	<0.008	-	-	400S	100W
8	S01118	238	<5	82	-	-	-	400S	50W
9	S01119	146	<5	26	-	-	-	400S	0W
10	S01120	51	8	12	0.008	-	-	580N 400S	0W
11	S01121	26	10	12	-	-	-	600N	0W
12	S01122	192	<5	33	-	-	-	680N	0W
13	S01123	200	6	14	-	-	-	700N	0W
14	S01124	235	6	26	-	-	-	800N	0W
15	S01125	1533	13	21	-	-	-	820N	0W
16	S01126	832	<5	35	-	-	-	830N	0W
17	S01127	222	<5	76	-	-	-	870N	0W
18	S01128	145	<5	47	-	-	-	880N	0W
19	S01129	158	5	14	-	-	-	25S	50W
20	S01130	70	7	67	-	-	-	0N	122E
21	S01131	31	<5	15	<0.008	-	-	470N	300W
22	S01132	29	<5	28	-	-	-	470N	250W
23	S01133	31	7	17	-	-	-	470N	235W
24	S01134	101	8	22	<0.008	-	-	200N	0W
25	S01135	66	9	8	<0.008	-	-	50S	0W

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

962050

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09436	22/04/93		2 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au(R)	Au(S)			
1	S01136	29	12	12	0.008	-	-	Soils 100S	0W	
2	S01137	1220	12	31	0.052	-	-	150S	0W	
3	S01138	240	<5	68	0.008	-	-	0N	50W	
4	S01139	232	11	63	0.009	0.011	-	45N	50W	
5	S01140	1015	17	23	<0.008	-	-	22N	100W	
6	S01141	310	5	80	<0.008	-	-	25N	100W	
7	S01142	920	<5	57	<0.008	-	<0.008	0N	120W	
8	S01143	709	9	35	<0.008	-	-	100N	200W	
9	S01144	98	<5	31	<0.008	-	-	150N	200W	
10	S01145	81	33	76	<0.008	-	-	0N	300W	
[redacted]	S01146	44	<5	34	-	-	-	30S	200E	
12	S01147	352	<5	30	<0.008	-	-	rocks	470N 350E	
13	S01148	63	<5	16	<0.008	-	-		470N 250E	
14	S01149	25	<5	8	<0.008	-	-		470N 100E	
15	S01150	19	<5	13	<0.008	<0.008	-		470N 50E	
16	S01151	14	<5	10	-	-	-		470N 50W	
17	S01152	15	<5	9	<0.008	-	-		470N 95W	
18	S01153	9	<5	10	-	-	-		470N 145W	
19	S01154	10	<5	13	<0.008	-	-		470N 250W	
20	S01155	34	<5	10	-	-	-		470N 300W	
21	S01156	29	<5	25	-	-	-		470N 330W	
22	S01157	81	6	59	<0.008	-	-		470N 330W	
23	S01158	8	6	11	<0.008	-	-		470N 350W	
[redacted]	S01159	30	<5	14	<0.008	-	-		4N0N 400W	
25	S01160	84	13	11	<0.008	-	-		100N 0W	

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

962051

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09436	22/04/93		3 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au(R)	Au(S)			
1	S01161	303	19	64	<0.008	-	-	Rocks.	ON	100E
2	S01162	765	<5	31	0.009	-	0.010		ON	250W
3	S01163	64	<5	37	<0.008	-	-		250N	OW
4	S01164	43	22	69	<0.008	-	-		800N	800E
5	S01165	20	<5	45	<0.008	-	-		50N	200W
6	S01166	48	6	44	0.008	-	-		25N	50W
7	S01167	1129	8	31	0.128	-	-		50N	OW
8	S01168	31	<5	63	<0.008	-	-		45N	100W
9	S01169	166	<5	48	-	-	-	outcrop S01174)	in creek at 0m	see
10	S01170	48	<5	50	<0.008	-	-		ON	122E
11	S01171	786	5	35	0.017	-	-		100S	200W
12	S01172	56	<5	121	-	-	-	outcrop S01174)	in creek at 6m	(see
13	S01173	14	<5	47	-	-	-	outcrop S01174)	in creek at 9m	(see
14	S01174	22	<5	20	-	-	-	float in creek 800N replace	where 0m met creek	
15	S01175	160	<5	34	-	-	-		"	
16	S01176	22	5	35	-	-	-		"	
17	S01177	16	6	25	-	-	-		"	
18	S01178	2606	31	44	-	-	-		"	
19	S01179	24	9	25	0.051	-	-	pyrite - ilmenite vein in creek - 108m upstr		
20	S01180	36	17	15	0.044	-	-	"		
21	S01181	9	<5	98	-	-	-	1m sth of py - ilm vein		
22	S01182	7	<5	87	-	-	-	0.5m sth "		
23	S01183	7	<5	83	-	-	-	0.5m sth "		
24	S01184	6	18	23	-	-	-	Briggs Ck rocks		Like 5 1600E
25	S01185	26	11	114	-	-	-		Like 5	1800E

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

962052

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 864

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09436	22/04/93		4 OF 4

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Au	Au(R)	Au(S)			
1	S01186	13	10	153	-	-	-	Briggs Creek rocks	Line 5 sth in	Briggs Ck
2	S01187	28	25	18	-	-	-	Line 2	1790 E	
3	S01188	9	13	307	-	-	-	Grid Refs 70 180 E 03 150 N		
4	S01189	6	13	173	-	-	-	on track between Line 5S and Line 4		
5	S01190	18	31	111	-	-	-	Line 4	1335 E	
6	S01191	6	14	158	-	-	-	on track between Line 5S and Line 4		
7	S01192	1353	15	52	-	-	-	Soils -	Thomas 150N	Creek 0W
8	S01193	1765	<5	152	-	-	-		300N	0W
9	S01194	309	21	55	-	-	-		350N	0W
10	S01195	69	6	24	-	-	-		468N	0W
11	S01196	10	<5	10	-	-	-		0N	20W
12	S01197	42	13	17	-	-	-		0N	18W
13	S01198	136	<5	41	-	-	-		0N	125W
14	S01199	132	<5	36	-	-	-		0N	133W
15										
16										
17										
18										
19										
20	DETECTION	4	5	4	0.008	0.008	0.008			
21	UNITS	ppm	ppm	ppm	ppm	ppm	ppm			
22	METHOD	GA101	GA101	GA101	GG309	GG309	GG309			
23										
24										
25										

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
- = element not determined

AUTHORISED OFFICER

ANALABS

962053

A Division of Inchcape Inspection and Testing Services Australia Pty. Ltd.
A.C.N. 004 591 564

Phone (004) 316837 | 14 Thirkell St. COOEE TAS 7320 | Fax (004) 318890

ANALYTICAL REPORT No. 111715.60.09633

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

INVOICE TO:
Mr Grant MacDonald
Plutonic Operations Limited
112 Best Street
DEVONPORT TAS 7310

ORDER No.	PROJECT
TBA	

DATE RECEIVED	RESULTS REQUIRED
19/07/93	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
3	22/07/93	1	49

SAMPLE NUMBERS	SAMPLE DESCRIPTION	ELEMENT/METHOD
S01112/199 NOT CONTINUOUS Thomas Creek	PU Prep : NIL	Au,Au(R)/GG309

RESULTS TO
Mr Grant MacDonald
Plutonic Operations Limited
112 Best Street
DEVONPORT TAS 7310

RESULTS TO

RESULTS TO

REMARKS

AUTHORISED OFFICER

962054

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09633	22/07/93	TBA	1 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)							
1	S01112	<0.008	–		Soils, rocks + stream seds.					
2	S01114	<0.008	<0.008		See previous sample sheets					
3	S01116	<0.008	–		for sample descriptions / locations.					
4	S01118	<0.008	–							
5	S01119	<0.008	–							
6	S01121	<0.008	–							
7	S01122	<0.008	–							
8	S01123	<0.008	–							
9	S01124	<0.008	–							
10	S01125	0.010	–							
11	S01126	<0.008	–							
12	S01127	<0.008	<0.008							
13	S01128	0.008	–							
14	S01129	0.031	–							
15	S01130	0.008	–							
16	S01132	<0.008	–							
17	S01133	0.017	–							
18	S01146	<0.008	–							
19	S01151	<0.008	<0.008							
20	S01153	<0.008	–							
21	S01155	<0.008	–							
22	S01156	<0.008	<0.008							
23	S01169	<0.008	–							
24	S01172	<0.008	–							
25	S01173	0.045	–							

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER Gary Lindberg

962055

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 864

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09633	22/07/93	TBA	2 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)							
1	S01174	0.018	0.018							
2	S01175	0.038	–							
3	S01176	0.132	–							
4	S01177	0.085	–							
5	S01178	0.501	–							
6	S01181	<0.008	–							
7	S01182	<0.008	–							
8	S01183	<0.008	–							
9	S01184	<0.008	–							
10	S01185	<0.008	–							
11	S01186	<0.008	–							
12	S01187	<0.008	<0.008							
13	S01188	<0.008	–							
14	S01189	<0.008	–							
15	S01190	<0.008	–							
16	S01191	<0.008	–							
17	S01192	0.009	0.010							
18	S01193	<0.008	–							
19	S01194	0.008	–							
20	S01195	<0.008	–							
21	S01196	0.029	0.024							
22	S01197	0.010	0.016							
23	S01198	<0.008	–							
24	S01199	<0.008	–							
25										

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER Gary Lindberg

962056

ANALABS

A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	111715.60.09633	22/07/93	TBA	3 OF 3

TUBE No.	SAMPLE No.	Au	Au(R)							
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.008	0.008							
24	UNITS	ppm	ppm							
25	METHOD	GG309	GG309							

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
– = element not determined

AUTHORISED OFFICER Gary Lindberg

APPENDIX B

Petrology Thomas Creek Prospect - Dr A Crawford

SAMPLE NUMBER: PLUTONIC 400N 100E

SUMMARY: This is a greenschist facies rather coarse-grained dioritic intrusive rock likely to be comagmatic with the plagioclase+augite-phyric andesites on this grid. It contains abundant interstitial hydrothermal pyrite.

HAND SPECIMEN:

This sample is a mottled, very strongly altered andesitic dyke rock (?) with abundant disseminated pyrite

THIN SECTION DESCRIPTION:

This is a rather coarse-grained holocrystalline dioritic intrusive rock dominated by large complexly intergrown blocky to tabular albitized plagioclase crystals to about 4mm long maximum, with subordinate interstitial actinolite-altered augite, quartz and anhedral FeTi oxides. Plagioclase crystals are slightly sericitized and many contain abundant extremely fine-grained epidote granules. Anhedral interstitial augite is replaced by fibrous actinolite and chlorite, with nor uncommon almost colourless epidote-clinozoisite. Pyrite occurs as subidiomorphic to anhedral fractured crystals and crystal aggregates always sited interstitially, at the margin of plagioclase and former augite crystals.

This is a dioritic intrusive rock almost certainly comagmatic with the plagioclase +augite-phyric andesites described above. The relatively coarse grain size is perhaps surprising, and contrasts with the quenched lavas.Probably this diorite is fault-emplaced up into cogenetic lavas, and it is striking similar to the diorites associated with andesites on the Preston EL in the Leven Gorge area. The quite abundant disseminated pyrite is clearly of hydrothermal origin, although it is clear that the fluids responsible pervaded the interstices of the diorite rather than cracking and invading the rock. There is minimal other evidence that this rock is hydrothermally altered.

SAMPLE NUMBER: PLUTONIC OW 340S

SUMMARY: This is a well-preserved moderately plagioclase-phyric acid andesite to dacite lava with a low-grade burial metamorphic alteration assemblage.

HAND SPECIMEN:

This sample is a brown plagioclase-phyric andesitic to dacitic lava.

THIN SECTION DESCRIPTION:

This is a texturally very well-preserved probably acid andesite to dacite lava characterized by the presence of around 15 modal% of well-formed tabular albitized plagioclase laths to about 3mm long. These vary from clear albite, to quite heavily sericitized, and only rarely occur in clots of three or more crystals. A few former augite(?) phenocrysts are present but are altered to chlorite and silica. Former FeTi oxide phenocrysts make up perhaps 1 modal% of the rock, and and are replaced by leucoxene. Bladed crystals of hematite up to 0.5mm long are scattered through the groundmass, and appear to be of secondary origin, as they are concentrated in some sericitic patches

The groundmass of this rock was vitrophyric, with narrow laths of albite, and smaller acicular chloritized augite microlites and laths set in glass that has crystallized to rather coarse-grained albite and quartz riddled with tiny equant FeTi oxide grains. Patchy development of green chlorite is relatively minor, and the alteration assemblage is typical of low-grade burial metamorphosed felsic to intermediate lavas. The sample is cut by a number of veinlets composed of polycrystalline quartz and messy brown limonitic material (probably not after pyrite).

The presence of quite abundant albeit very fine-grained (former) augite in the groundmass of this sample suggests to me that it is a silicic andesite gradational to a dacitic composition.

SAMPLE NUMBER: PLUTONIC 470N 330W

SUMMARY: This is a greenschist facies mafic diorite intrusive almost certainly comagmatic with the andesites from this same grid.

HAND SPECIMEN:

This sample is a light-coloured plagioclase-rich intrusive dioritic rock with abundant epidote.

THIN SECTION DESCRIPTION:

This is a rather coarse-grained intrusive dioritic rock with enough former augite to make it transitional to a gabbro. About 70 modal% of the rock consists of large (>3mm long) blocky albitized plagioclase phenocrysts that are almost entirely replaced by very fine-grained almost isotropic epidote, minor chlorite and sericite. Probably 10-15 modal% of the rock consists of former augite crystals, mainly subhedral in form, that are up to 5mm across. These are all replaced by almost colourless actinolite that is variably oxidized to yellowish red ultra-fine-grained alteration products around the margins of many larger crystals. Former augite also filled interstitial areas between plagioclase , sometimes intergrown with minor FeTi oxides that are leucoxenitized. Yellowish chlorite and minor almost colourless epidote-clinozoisite occur with quartz in interstitial areas.

This is clearly a rather mafic diorite, transitional to a gabbroic composition, and I would argue that it is almost certainly comagmatic with the andesites described in this set. The alteration is greenschist facies burial metamorphism, and there is no convincing evidence that this sample has suffered any hydrothermal alteration. Again, the higher metamorphic grade of this intrusive rock might suggest that it has been fault emplaced to its present stratigraphic level.

SAMPLE NUMBER: PLUTONIC 470N 350W

SUMMARY: This is a former rather mafic dioritic intrusive that has suffered intense epidote alteration.

HAND SPECIMEN:

This sample is a coarse-grained dioritic intrusive with pinkish feldspar and large crystals of oxidized augite/actinolite, and interstitial chlorite.

THIN SECTION DESCRIPTION:

This is a strongly epidote-altered dioritic intrusive rock originally composed of large tabular to blocky plagioclase crystals (to at least 3mm long), subordinate quite large anhedral augite crystals, and one or two modal% of FeTi oxides that exsolved ilmenite along octahedral planes during low temperature oxidation and cooling. The plagioclase crystals are about 80-90% replaced by exceptionally fine-grained to lath-like small epidote crystals that are barely pleochroic, and occasionally grow in clots as much larger prismatic crystals intergrown with quartz. Former augite crystals are replaced by fibrous very pale green actinolite and minor chlorite, and FeTi oxide have the ilmenite altered to leucoxene and the host phase (altered magnetite altered to a chlorite-type pale brown very fine-grained mineral.

There is no tourmaline in this rock, but the alteration is pronounced enough to classify this rock as an epidotized diorite. Implied is that the alteration fluids were very calcic and rather oxidizing, and that temperatures were probably around 300oC.

SAMPLE NUMBER: PLUTONIC 100S 200W

SUMMARY: This is a greenschist facies recrystallized former strongly plagioclase+augite-phyric andesitic lava; it can be confidently correlated with the Beulah Formation-type andesites further north and west of this area.

HAND SPECIMEN:

This sample is a plagioclase+altered augite-phyric andesitic lava with quite strong alteration.

THIN SECTION DESCRIPTION:

This was a strongly plagioclase+augite-phyric andesitic lava that shows a greenschist facies recrystallization assemblage. It consists of around 25 modal% of tabular albitized plagioclase phenocrysts to about 2mm long that show mild sericite speckling, and about 10-15 modal% of augite phenocrysts of similar maximum size that are entirely replaced by fibrous pale green actinolite and subordinate chlorite, and that now have very ragged and diffuse shapes due to the recrystallization. Former FeTi oxide phenocrysts in this sample are altered to messy aggregates of leucoxene.

The greenschist facies recrystallization has led also to strong alteration of the groundmass, which now consists of a very patchy and heterogeneous intergrowth that varies between fairly 'clean' sugary quartzose material that is probably silicified devitrified glass, to very 'dirty' actinolite-chlorite-riddled quartzo-feldspathic material with common trails and ragged aggregates of fine-grained magnetite and small granular yellow epidote crystals.

This was a typical 'Beulah Formation'-type plagioclase+augite-phyric mafic andesite that has suffered strong recrystallization at low greenschist facies conditions.

SAMPLE NUMBER: PLUTONIC 96m o/c

SUMMARY: This is a formerly plagioclase+augite-phyric andesitic lava that has suffered strong hydrothermal alteration, producing pervasive chlorite-pyrite assemblages.

HAND SPECIMEN:

This sample is a dark plagioclase-phyric fine-grained andesitic to dacitic lava.

THIN SECTION DESCRIPTION:

This is a petrographically simple plagioclase-phyric dacitic to acid andesite lava. It contains around 25-30 modal% of altered euhedral plagioclase phenocrysts to about 2mm long, although many occur in multi-crystal clots up to at least 7mm across. All plagioclase phenocrysts have been albitized, then heavily sericitized, and some have been strongly overprinted by chlorite and fine granular magnetite. Others have maintained perfect crystal shapes, but recrystallized internally to a holocrystalline medium-grained albite intergrowth. Former augite phenocrysts make up around 2-4 modal% of this rock, are mainly <1mm long, and have been thoroughly pseudomorphed by green chlorite. Uncommon small FeTi oxide phenocrysts are altered to messy leucoxene.

The groundmass of this sample has been totally replaced by dense green chlorite in which are immersed abundant tiny acicular and lath-like microlites of albite; this indicates that the groundmass was vitrophyric-textured. Abundant disseminated pyrite, in subidiomorphic to anhedral grains sometimes up to 2-3mm across, are scattered through the rock, being present in both the chloritized groundmass and the altered plagioclase and augite phenocrysts. It sometimes forms narrow trains of small crystals arranged along fractures.

This is a strongly chlorite-pyrite-altered formerly vitrophyric plagioclase+augite-phyric andesitic lava.

SAMPLE NUMBER: PLUTONIC 250N 0W

SUMMARY: This is a strongly plagioclase+augite-phyric andesitic lava with a regional burial low greenschist facies metamorphic overprint. It is petrographically typical of the Que Footwall and Beulah Formation andesites.

HAND SPECIMEN:

This sample is a rather pale and bleached plagioclase+augite-phyric andesitic lava.

THIN SECTION DESCRIPTION:

This sample is a very strongly porphyritic andesitic lava composed of around 30 modal% of altered plagioclase phenocrysts and 10 modal% of altered former augite phenocrysts. The plagioclase phenocrysts are mainly 1-2mm long, blocky to tabular prisms that are all are heavily sericitized. Relic compositional zoning is reflected in zonal variations in the intensity of sericite development. Former augite phenocrysts are up to 2mm long and vary from equant to rather elongate prisms that are totally replaced by almost colourless fibrous actinolite, sometimes with intergrown epidote. Surprisingly perhaps, there is no sign of former FeTi oxide phenocrysts or microphenocrysts in this rock. A small cognate gabbroic inclusion composeed of 0.2-0.4mm-sized former augite and plagioclase phenocrysts is present.

The groundmass of this sample was definitely glassy, and the devitrified glass has altered to a messy intergrowth of quartz, albite, exceptionally fine-grained almost opaque epidote, and common yellowish dull chlorite. The metamorphic grade of this sample is clearly lowermost greenschist facies, and the metamorphic degradation is of regional burial metamorphic rather than local hydrothermal origin. This is a typical Que-Hellyer-type andesitic lava with regional correlates being the Beulah Formation, the Que Footwall andesites and the andesites around Tullah.

SAMPLE NUMBER: PLUTONIC ON 250W

SUMMARY: This is a greenschist facies plagioclase+sparsely augite-phyric andesitic lava.

HAND SPECIMEN:

This sample is a dark brown quite strongly plagioclase-phyric andesitic lava transected by diffuse streaky alteration veins of more chloritized rock marking pathways of fluid ingress.

THIN SECTION DESCRIPTION:

This is a texturally very well-preserved andesitic lava with approximately 20-25 modal% of albitized plagioclase phenocrysts and a few modal% of actinolite-altered former augite phenocrysts, in a formerly vitrophyric groundmass. Some of the former augite phenocrysts are up to 4mm long, and contain chlorite and granular epidote intergrown with the fibrous actinolite. Plagioclase phenocrysts are also up to 4mm long, and many have recrystallized internally to an intergrowth of small albite crystals. Most are partially overprinted by sericite. Occasional slightly rounded and reacted 0.1-0.2mm-sized FeTi oxide(?) phenocrysts appear to be fresh despite the greenschist facies metamorphism, suggesting that these may be either secondary magnetite, or even pyrite.

The groundmass of this sample has a very well-developed vitrophyric texture composed of small plagioclase laths, acicular chloritized augite and abundant tiny equant Fe(Ti) oxides set in a quartzo-feldspathic groundmass after glass. Remarkably, none of the fluid passageways marked by chloritization are sampled by this thin section, which is a clearly a greenschist facies metamorphosed plagioclase+ augite-phyric andesitic lava.

SAMPLE NUMBER: PLUTONIC 100N 0W

SUMMARY: This is a strongly silica+tourmaline-altered, formerly glassy, almost aphyric felsic lava.

HAND SPECIMEN:

This sample is a bleached and rather weathered highly altered felsic lava(?).

THIN SECTION DESCRIPTION:

This is a difficult sample to diagnose but was probably originally a nearly aphyric felsic lava that devitrified and crystallized to a coarse mosaic of quartzo-feldspathic material. This mosaic has in turn, been strongly recrystallized and probably silicified to a dusty raggedy quartz-rich intergrowth in which are set common small patches and rosettes of strongly pleochroic tourmaline and subordinate pale green chlorite. Former FeTi oxide phenocrysts make up much less than 1 modal% of this rock, and have altered to messy brown leucoxene. There are a few vague suggestions of the former presence of some small albite phenocrysts, but these have been obliterated by the silica overprinting.

This sample was a glassy dacitic lava that has been thoroughly silica-tourmaline-altered presumably by granite-derived hydrothermal fluids.

SAMPLE NUMBER: PLUTONIC 25N 50W

SUMMARY: This is a strongly hydrothermally altered (silica-tourmaline-chlorite) formerly glassy plagioclase-phyric acid andesite to dacite lava.

HAND SPECIMEN:

This sample is a pale bleached, strongly weathered and oxidized formerly pyritic(?) andesite or dacite lava.

THIN SECTION DESCRIPTION:

This is a strongly altered and recrystallized formerly plagioclase-phyric andesitic to dacitic lava. Plagioclase phenocrysts (albitized) make up about 15 modal% of the rock, but are patchily recrystallized with rather ragged margins against the strongly recrystallized groundmass. There are no convincing former augite phenocrysts in this sample, and any former FeTi oxides are weathered and altered to limonitic gunge.

The originally glassy groundmass of this sample is extensively recrystallized and probably silicified. It consists of a sugary-textured intergrowth of quartz and very subordinate oxidized reddish chlorite. A very important alteration feature of this rock is the presence of tiny clots and occasional coarser rosettes of blue-green tourmaline sited in recrystallized sugary quartz.

This rock was originally a glassy plagioclase-phyric acid andesite or dacite lava that has suffered strong silica-chlorite-tourmaline alteration, again presumably granite-related.

SAMPLE NUMBER: PLUTONIC 45N 100W

SUMMARY: This is a formerly glassy plagioclase-phyric andesitic lava with strong granite-related hydrothermal alteration that has caused common tourmaline-chlorite alteration to overprint a low greenschist facies regional burial metamorphic assemblage.

HAND SPECIMEN:

This sample is a very altered plagioclase-phyric andesite (?) with strong spotting by chlorite/actinolite.

THIN SECTION DESCRIPTION:

This is a fairly altered and recrystallized plagioclase-phyric, probably formerly glassy andesitic to dacitic lava. Tabular prismatic albitized plagioclase phenocrysts to about 1mm long vary from strongly to weakly overprinted by very fine-grained sericite. I am certain that there were originally augite phenocrysts in this rock, but they have recrystallized as pale green to reddish (oxidized) actinolite that often occurs as packed and matted aggregates of small crystals, often intergrown with chlorite, that rarely preserve the shape of the former augite that they are replacing. Former FeTi oxide phenocrysts are replaced by leucoxenitic aggregates.

The groundmass of this rock may have been originally glassy, but the strong recrystallization and alteration make it difficult to be certain. In many places, the groundmass is a very variably-textured quartzo-feldspathic aggregate riddled by pale green chlorite. However, the key feature of the alteration assemblage is the relatively abundant clots and rosettes of very strongly pleochroic (deep greenish brown to clear) tourmaline growing in either chlorite or quartz. These make up a few modal % of the rock and indicate thorough soaking by B-bearing almost certainly granite-related hydrothermal fluids.

SAMPLE NUMBER: PLUTONIC 50N 200W

SUMMARY: This is a contact between a formerly glassy aphyric felsic lava and a dioritic intrusive rock. It shows a greenschist facies of metamorphic degradation, but no tourmaline alteration.

HAND SPECIMEN:

This sample a contact between a pink felsic lava or shallow intrusive rock against a darker grey-green actinolite-altered andesite or diorite.

THIN SECTION DESCRIPTION:

This is a fairly difficult sample to diagnose. Certainly the light-coloured end of the small sample is a formerly glassy aphyric felsic lava in which the groundmass crystallized to a patchwork mosaic of quartzo-feldspathic material. The remainder of the sample is heavily altered and recrystallized and it is not a straightforward problem to determine whether it was originally a dioritic intrusive such as some of the samples described above from this grid, or a plagioclase +augite-phyric crystal-rich andesitic lava. On balance, I favour the former, as in many places the sample contains quite large areas of adjacent interlocking blocky to prismatic albitized plagioclase crystals intergrown with subordinate actinolite-altered augite and messy yellow-green chlorite. In other areas, this coarser rock appears to have a finer-grained matrix composed of sugary silica and chlorite; however, these areas may be recrystallized matrix of the original dioritic rock.

This sample clearly shows a low greenschist facies of metamorphic recrystallization. No tourmaline was noted, despite a careful search. I suggest that this is a dioritic intrusive rock similar to those described above. It is difficult to rule out the notion that the formerly glassy rock at one end of this section represents a chilled margin of the dioritic intrusive, but it is odd that it lacks augite relative to the diorite. Outcrop information would be more useful in determining the relationships of this sample.

SAMPLE NUMBER: PLUTONIC ON 100E

SUMMARY: This is either a crystal lithic tuff, or a volcanogenic sandstone derived from plagioclase+augite-phyric andesitic to dacitic lavas similar to those described above. The rock shows a low-grade burial metamorphic alteration.

HAND SPECIMEN:

This sample is a dark grey plagioclase-phyric andesitic to dacitic lava.

THIN SECTION DESCRIPTION:

Thin section examination shows that this is not a lava, but either a lithic crystal tuff or a volcanogenic sandstone composed of discrete angular broken plagioclase phenocrysts (albitized), occasional actinolite-altered augite phenocrysts and abundant 0.5 to 4mm-sized lithic clasts of plagioclase-phyric formerly glassy dacites. The lithic clasts are easily distinguished due to the abundance of magnetite or hematite in their groundmasses. The plagioclase phenocryst fragments, and the phenocrysts in the lithic clasts show either intense alteration to yellowish green chlorite, or are unaltered albite.

This sample contained only a relatively minor matrix component that was probably glassy, but has totally altered to a messy chlorite-quartz ± sericite aggregate. The metamorphic grade is below greenschist facies, as the sample lacks actinolite, and the alteration is likely to be burial metamorphic in origin. The crystalline and lithic components in this rock do not appear to be transported, and I suggest that the rock is a crystal lithic tuff derived from similar volcanics that produced the preceding lavas described above. It is difficult however, to rule out that this is a volcanogenic sandstone derived from the same volcanics.

SAMPLE NUMBER: PLUTONIC ON 122E

SUMMARY: This is a plagioclase-phyric acid andesite or dacite lava very similar originally to OW 122E, but it has suffered granite-related chlorite-magnetite-tourmaline hydrothermal alteration

HAND SPECIMEN:

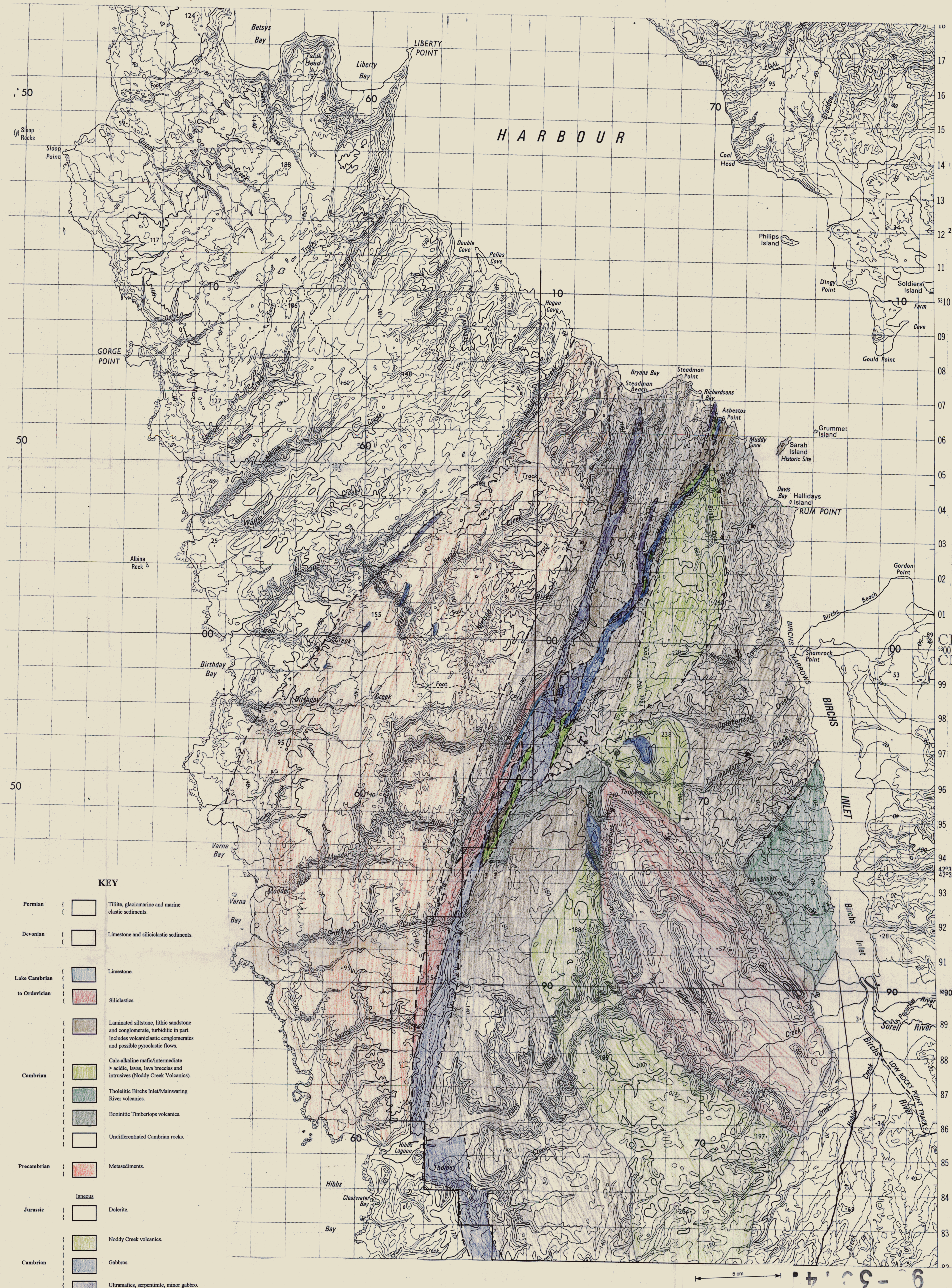
This sample is a brown plagioclase-phyric evolved andesitic to dacitic lava very similar to OW 340S, except that this sample also contains a number of dark chloritic patches to almost 1cm across.

THIN SECTION DESCRIPTION:

This is a moderately plagioclase-phyric dacitic to andesitic lava very similar originally to OW 340S, composed of about 15-20 modal% of tabular albitized plagioclase phenocrysts to 2mm long set in what was probably a fairly glassy groundmass. The plagioclase phenocrysts show an unusual alteration style, being replaced by abundant dense dull yellow green chlorite. A few small chloritized former augite crystal sites are present, and a number of relatively large FeTi oxide phenocrysts are present but totally replaced by messy brown leucoxene.

The groundmass of this lava was glassy to vitrophyric but has crystallized to rather coarse-grained patchy albite-quartz intergrowth with abundant chlorite, all peppered with equant fresh magnetite grains. Interstitial areas of dense chlorite up to 2mm across are common. The unusual dark chloritic domains evident in the hand specimen are clots of intense localized alteration composed dominantly of chlorite (often rather crystalline) but with quite large magnetite(?) grains, and in and least two 'spots', fibrous rosettes of tourmaline.

This was a moderately plagioclase-phyric dacitic or acid andesite lava, originally very similar to OW 340S, that suffered regional burial metamorphic alteration, and at a later time quite intense hydrothermal alteration that produced extensive magnetite-chlorite alteration, and more localized magnetite-chlorite-tourmaline alteration in pockets of high volatile pressure. The latter hydrothermal alteration is likely to be granite-related.



KEY

Period		Description
Permian	(blank)	Tillite, glaciomarine and marine clastic sediments.
Devonian	(blank)	Limestone and siliciclastic sediments.
Lake Cambrian to Ordovician	(light blue)	Limestone.
	(red)	Siliclastics.
Cambrian	(brown)	Laminated siltstone, lithic sandstone and conglomerate, turbiditic in part. Includes volcaniclastic conglomerates and possible pyroclastic flows.
	(yellow-green)	Calc-alkaline mafic/intermediate > acidic, lavas, lava breccias and intrusives (Noddy Creek Volcanics).
	(green)	Tholeiitic Birchs Inlet/Mainwaring River volcanics.
	(grey)	Boninitic Timbertops volcanics.
	(blank)	Undifferentiated Cambrian rocks.
Precambrian	(red)	Metasediments.

Igneous

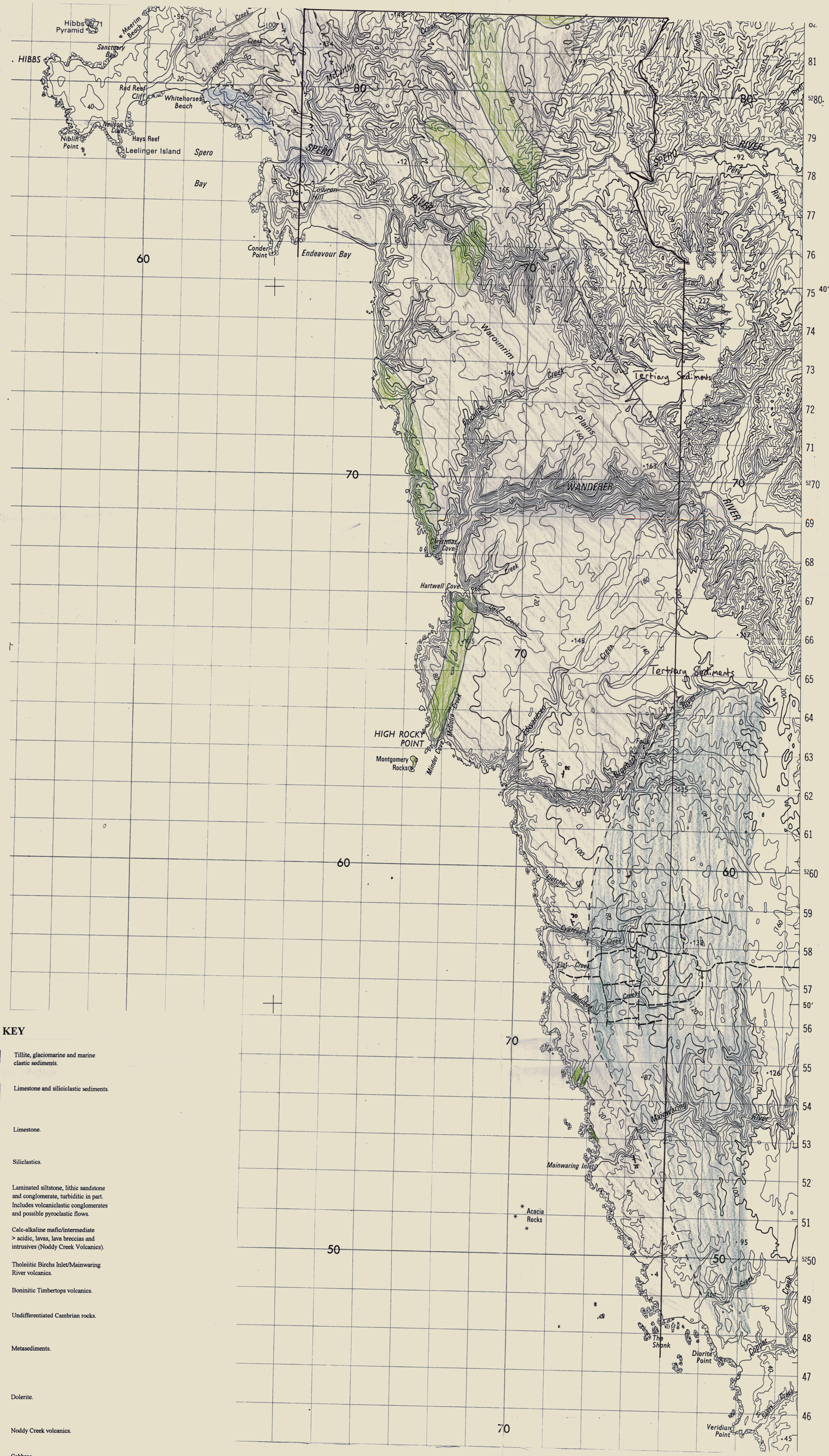
Period		Description
Jurassic	(blank)	Dolerite.
Cambrian	(yellow-green)	Noddy Creek volcanics.
	(blue)	Gabbros.
	(purple)	Ultramafics, serpentinite, minor gabbro.

- Fault - position approximate.
- Thrust fault - teeth on upper plate - position approximate.
- Geological contact.
- 80 Representative bedding orientation.

9 - 3 . 4 .

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997	
Technical Report No:	PROJECT: 708 - "SORELL PENINSULA"	
Compiled by: G MacDonald Checked by:	EL 4/92 - "MUDDY COVE CREEK" GEOLOGY	
Date: April '93 Scale: 1:50000	REFERENCE: 93-3514.	DWG NO: 4

962072



KEY

Permian
- Tillite, glaciomarine and marine clastic sediments.

Devonian
- Limestone and siliciclastic sediments.

Lake Cambrian to Ordovician
- Limestone.
- Siliclastics.

Cambrian
- Laminated siltstone, lithic sandstone and conglomerate, turbiditic in part. Includes volcaniclastic conglomerates and possible pyroclastic flows.
- Calc-alkaline mafic/intermediate > acidic, lavas, lava breccias and intrusives (Noddy Creek Volcanics).
- Tholeiitic Birchs Inlet/Mainwaring River volcanics.
- Boninitic Timbertops volcanics.
- Undifferentiated Cambrian rocks.

Precambrian
- Metasediments.

Igneous

Jurassic
- Dolerite.

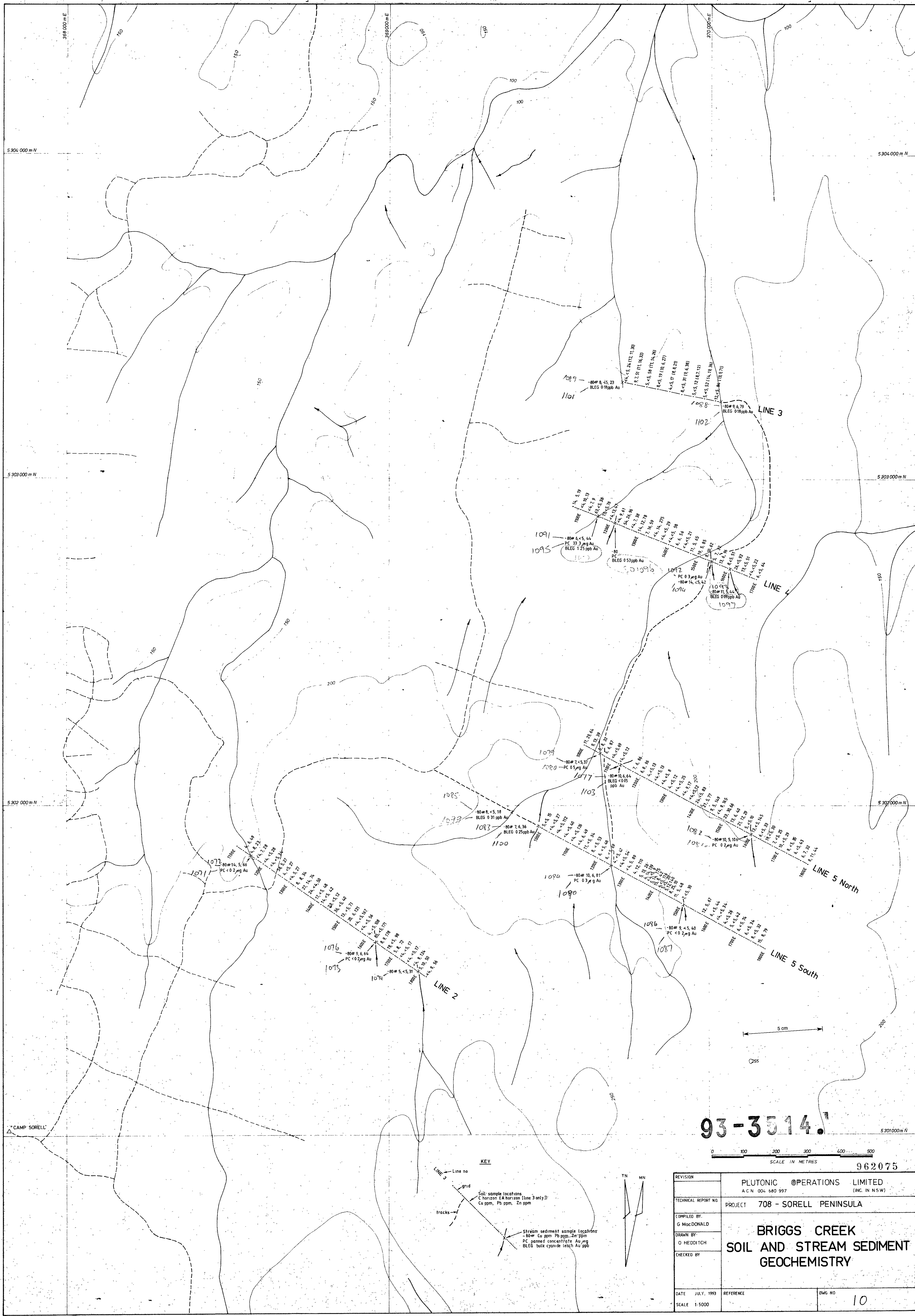
Cambrian
- Noddy Creek volcanics.
- Gabbros.
- Ultramafics, serpentinite, minor gabbro.

- Fault - position approximate.
- Thrust fault - teeth on upper plate - position approximate.
- Geological contact.
- Representative bedding orientation.

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997
Technical Report No:	PROJECT: 708 - "SORELL PENINSULA"
Compiled by: G MacDonald	EL 7/92 - "HIGH ROCKY POINT"
Checked by:	GEOLOGY
Date: April '93	REFERENCE: 93-3514. DWG NO: 5
Scale: 1:50000	

962073


368 000 mE
369 000 mE
370 000 mE
5 304 000 m N
5 303 000 m N
5 302 000 m N
5 301 000 m N
5S/5P
2I
4F
3F?
4F (position approximate)
3F px fsp ?
3F px fsp
LINE 2
LINE 3
LINE 4
LINE 5 North
LINE 5 South
3M int frag
5S int der
5S int der
ft - 3F - 4F? - 5S gn - jasper
5P gn msv
5P gn my sts
5P gn
5P
3M int frag
5P/5S gn
ft - q - 3M int frag - jasper
3F fsp px
ft - q - 3F px fsp
ft - q - 3F fg?
3F px fsp
ft - 3F px fsp
ft - 3F fsp px
3F fsp px
3M int frag
ft - 3F px fsp
3M mc frag
ft - q - 4F?
ft - 5P gn - q
5P gn int der
5V int / 5S gn
5S gn / 5V mc
ft - q - 5S gn
5S bge gn
5S bge gn fc?
ft - 3M int frag - q - 4F?
ft - 5S gn - 5S fc? - 3F?
5V int
ft - 5V int - 5P gn
"CAMP SORELL"
93-3514.
KEY
bge beige
der derived
fc felsic
fg fine grained
fsp feldspar
ft float
frag fragmental
gn green
int intermediate
msv massive
my moderately
px pyroxene
q quartz
sts schistose
3F px fsp Andesitic lavas/intrusives? Pyroxene and feldspar phyric
5S/5P Sandstones/siltstones, this unit appears to be felsic derived to the east and intermediate derived with intermediate fragmentals (3M int frag) to the west
4F Felsic (rhyodacitic?) lavas
2I Gabbros variably serpentinised. Not apparently genetically related to the andesites
Bedding
Cleavage
Outcrop
Subcrop / float
Fault / interpreted
Tracks
Grid lines
TN MN
SCALE IN METRES
962074
PLUTONIC OPERATIONS LIMITED
A.C.N. 004 680 997 (INC. IN N.S.W.)
PROJECT 708 - SORELL PENINSULA
BRIGGS CREEK GEOLOGY
(factual and interpretative)
COMPILED BY G. MacDONALD
DRAWN BY: O. HEDDITCH
DATE JULY, 1993
SCALE 1:5000
5 cm
9



368 000 m E
369 000 m E
370 000 m E
5 304 000 m N
5 303 000 m N
5 302 000 m N
5 301 000 m N
100
150
200
250
255
LINE 2
LINE 3
LINE 4
LINE 5 North
LINE 5 South
"CAMP SORELL"
-80# 9, 6, 79
BLEG 0·18ppb Au
-80# 8, <5, 23
BLEG 0·18ppb Au
-80# 6, <5, 44
PC 33 3 µg Au
BLEG 1 25 ppb Au
-80
PC
BLEG 0 53ppb Au
PC 0 3 µg Au
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BLEG <0·05 ppb Au
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BLEG 0 31 ppb Au
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BLEG 0 25ppb Au
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PC <0 2 µg Au
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PC <0 2 µg Au
-80# 5, <5, 31
5 cm
0 100 200 300 400 500
SCALE IN METRES
KEY
Line no
grid
Soil sample locations
C horizon (A horizon (line 3 only))
Cu ppm, Pb ppm, Zn ppm
tracks
Stream sediment sample locations
-80# Cu ppm Pb ppm Zn ppm
PC panned concentrate Au µg
BLEG bulk cyanide leach Au ppb
TN
MN

93-3514.

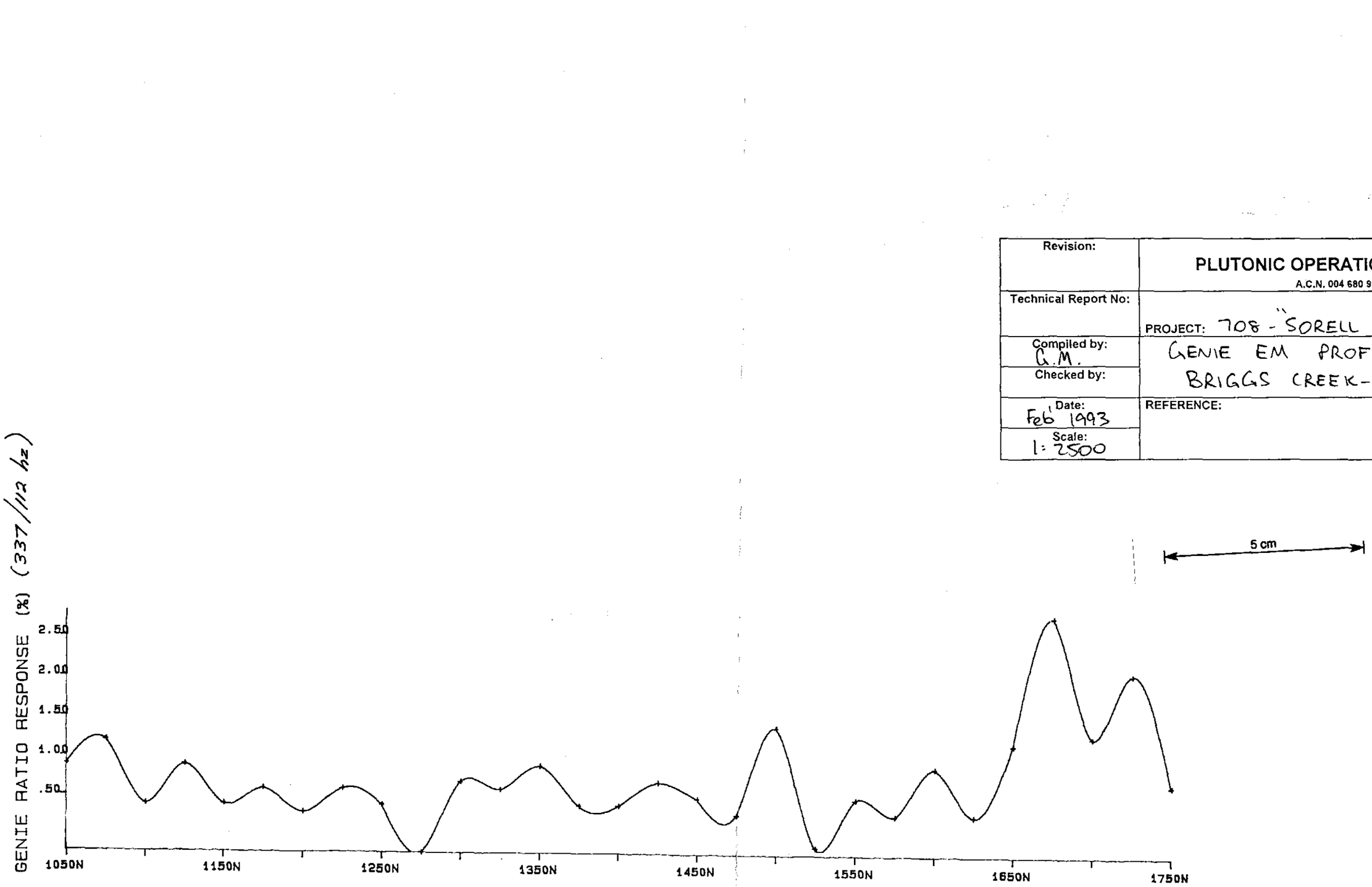
962075

REVISION	PLUTONIC OPERATIONS LIMITED A C N 004 680 997 (INC. IN N S W)
TECHNICAL REPORT NO.	PROJECT 708 - SORELL PENINSULA
COMPILED BY: G MacDONALD DRAWN BY: O HEDDITCH CHECKED BY	BRIGGS CREEK SOIL AND STREAM SEDIMENT GEOCHEMISTRY
DATE JULY, 1993 SCALE 1:5000	REFERENCE — DWG NO 10

962076

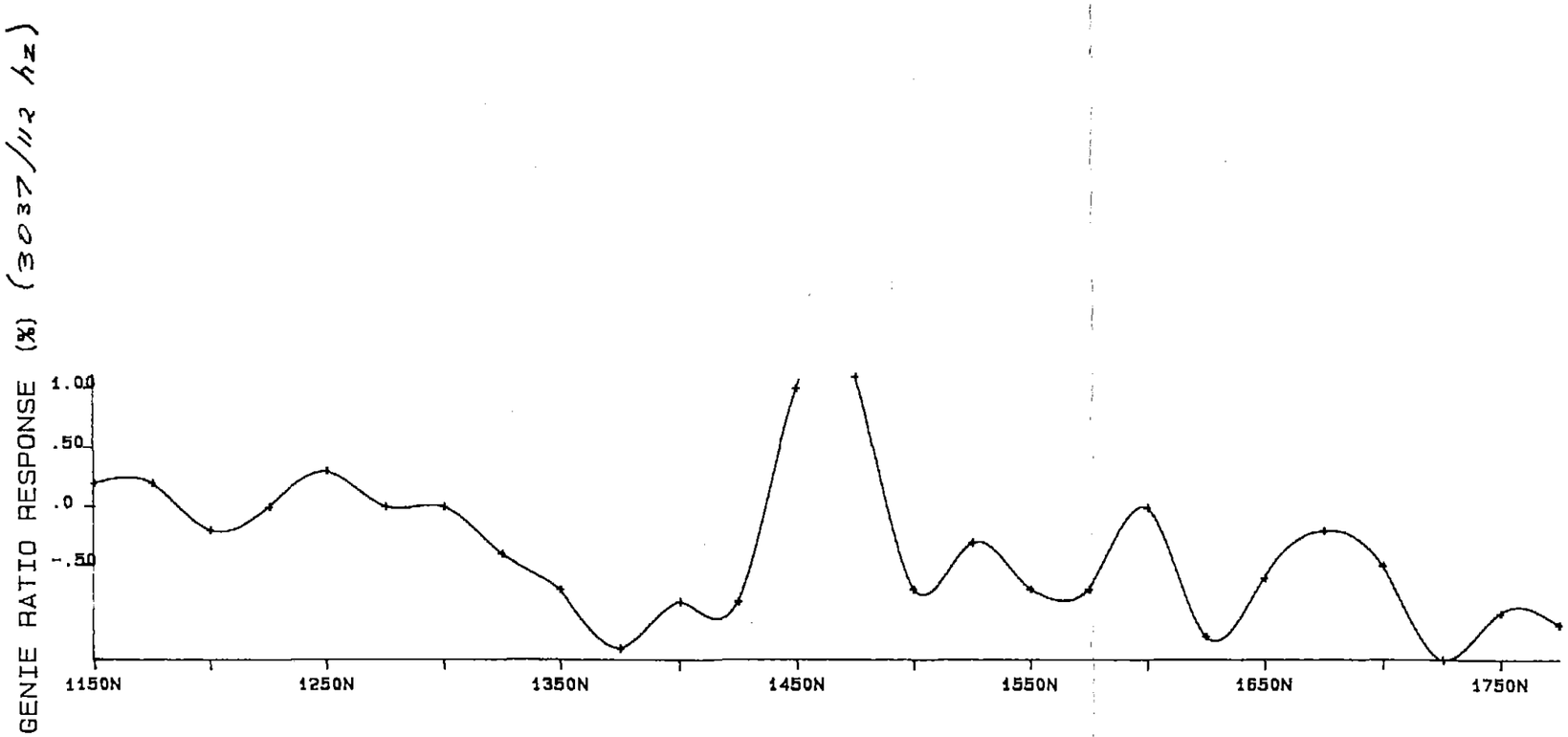
Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997	
Technical Report No:	PROJECT: 708 - "SOREL PENINSULA"	
Compiled by: G.M. Checked by:	GENIE EM PROFILE - 337 Hz BRIGGS CREEK - LINE 5 South	
Date: Feb 1993 Scale: 1:2500	REFERENCE:	DWG NO: 14

GENIE RATIO RESPONSE (%) (337 Hz)



LINE 5.0S SCALE 1:2500.0

93-3514.



LINE 2.0 SCALE 1:2500.0

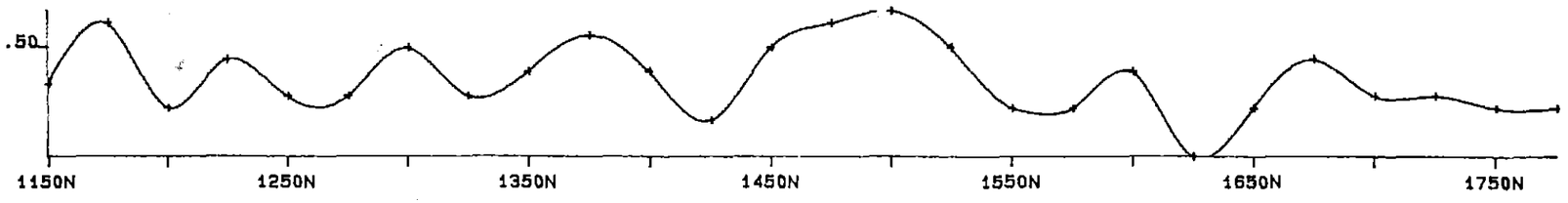
5 cm

93-3514.1

062077

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997
Technical Report No:	PROJECT: 708-"SORELL PENINSULA"
Compiled by: G.M.	GENIE EM PROFILE - 3037 Hz
Checked by:	BRIGGS CREEK - LINE 2
Date: Feb 1993	REFERENCE: DWG NO: 13
Scale: 1:2500	

GENIE RATIO RESPONSE (%) (1012/112 Hz)

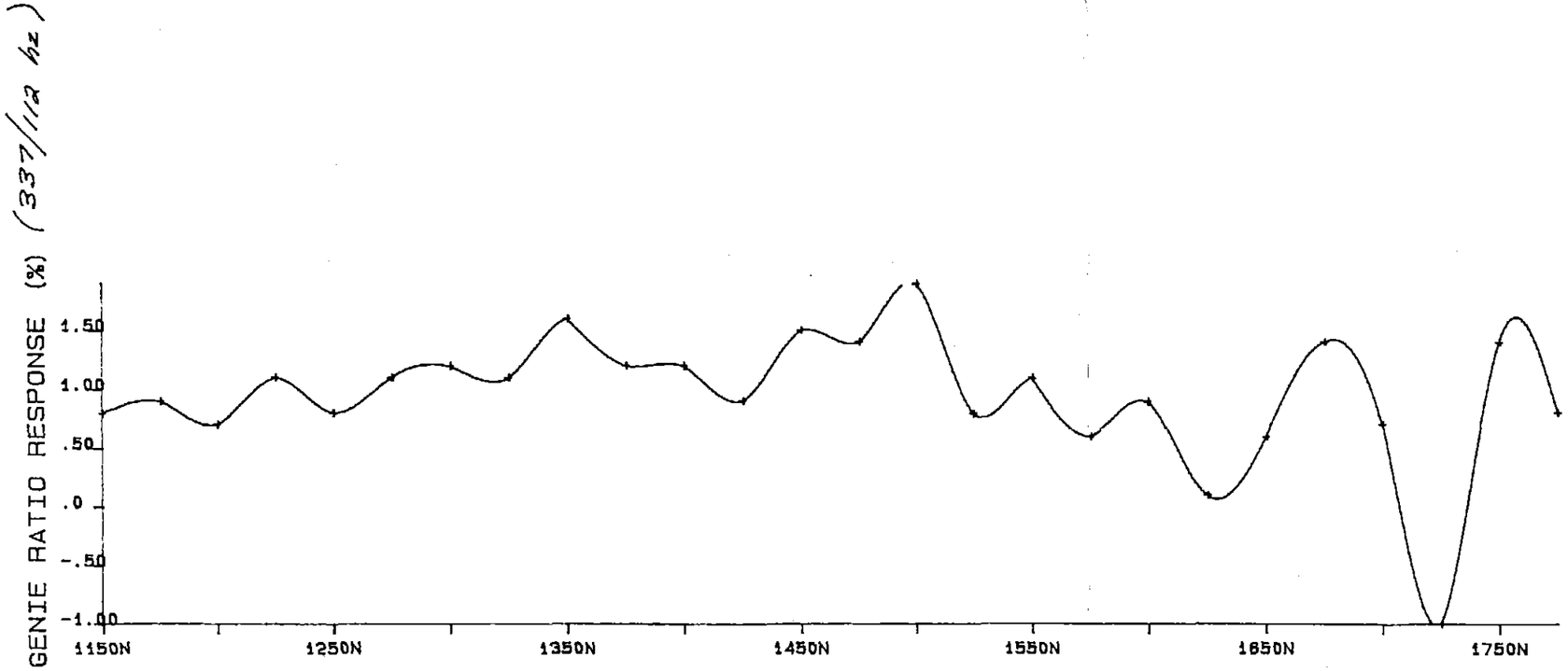


LINE 2.0 SCALE 1:2500.0

5 cm

93-3514. 962078

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997
Technical Report No:	PROJECT: 708 - "SOREL PENINSULA"
Compiled by: G.M.	GENIE EM PROFILE - 1012 Hz
Checked by:	BRIGGS CREEK - LINE 2
Date: Feb 1993	REFERENCE:
Scale: 1:2500	DWG NO: 12



LINE 2.0 SCALE 1: 2500.0

5 cm

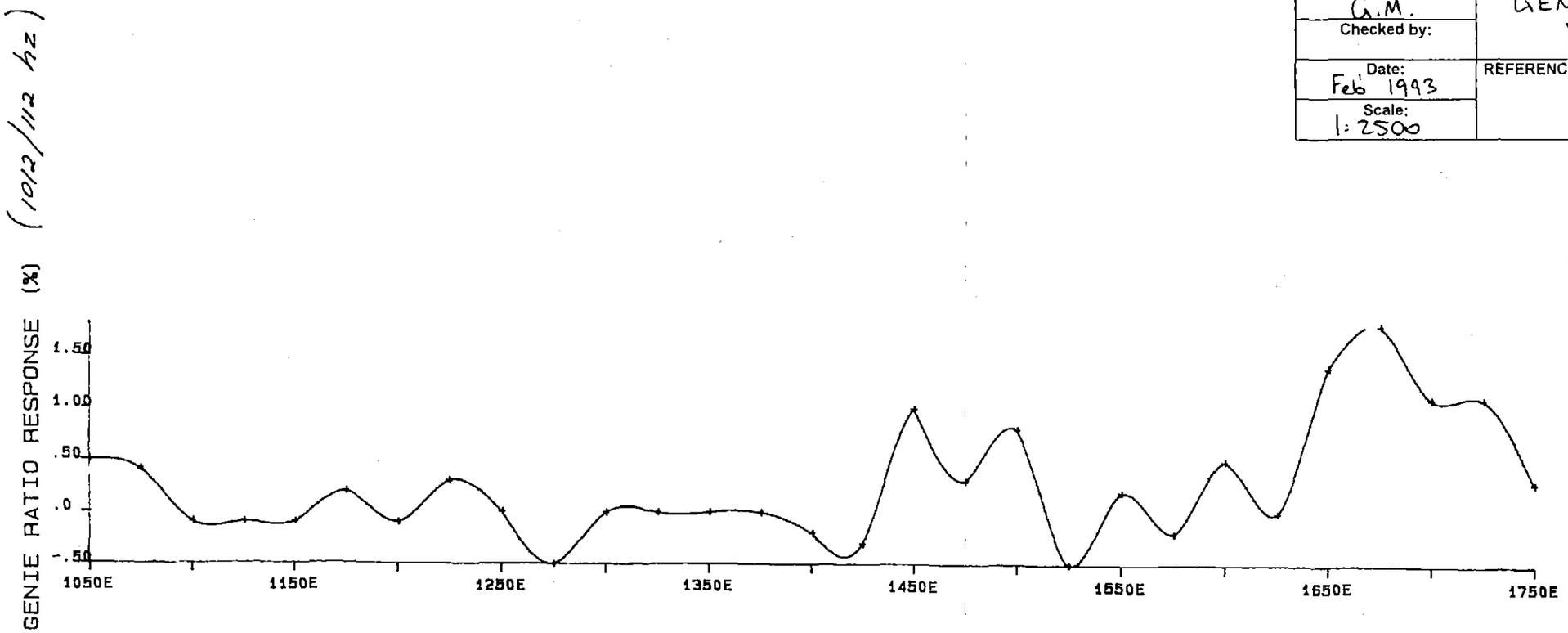
93-3514.1

962079

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997
Technical Report No:	PROJECT: 708 - "SORELL PENINSULA"
Compiled by: G.M.	GENIE EM PROFILE - 337 Hz
Checked by:	BRIGGS CREEK - LINE 2
Date: Feb 1993	REFERENCE:
Scale: 1: 2500	DWG NO: 11

Revision:	**PLUTONIC OPERATIONS LIMITED** A.C.N. 004 680 997
Technical Report No:	PROJECT: 708 - "SORELL PENINSULA"
Compiled by: G.M.	GENIE E.M. PROFILE - 1012 Hz
Checked by:	BRIGGS CREEK - LINE 5 South
Date: Feb 1993	REFERENCE:
Scale: 1:2500	DWG NO: 15

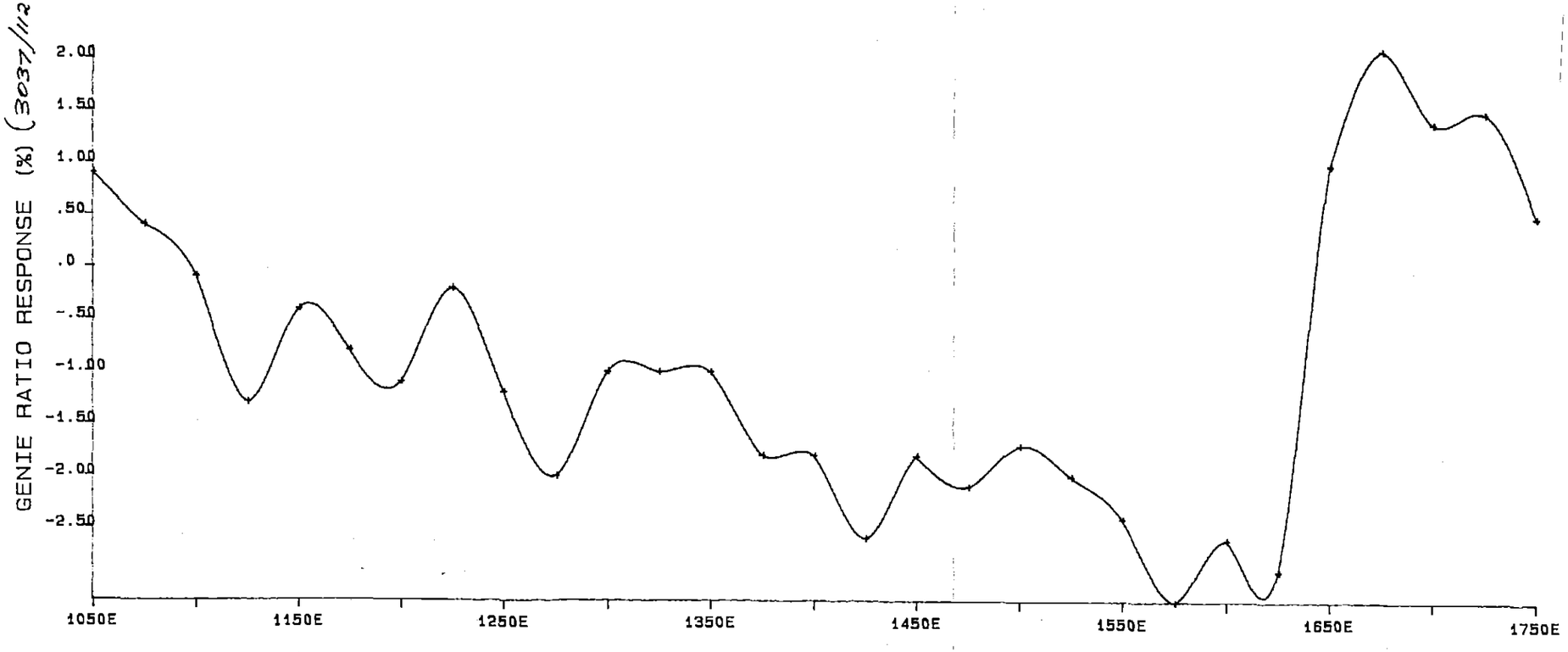
962080



93-3514.

Revision:	**PLUTONIC OPERATIONS LIMITED** A.C.N. 004 680 997
Technical Report No:	PROJECT: 708 - "SORELL PENINSULA"
Compiled by: G.M.	GENIE E.M. PROFILE - 3037 Hz
Checked by:	BRIGGS CREEK - LINE 5 South
Date: Feb 1993	REFERENCE:
Scale: 1:2500	DWG NO: 16

(NZ)

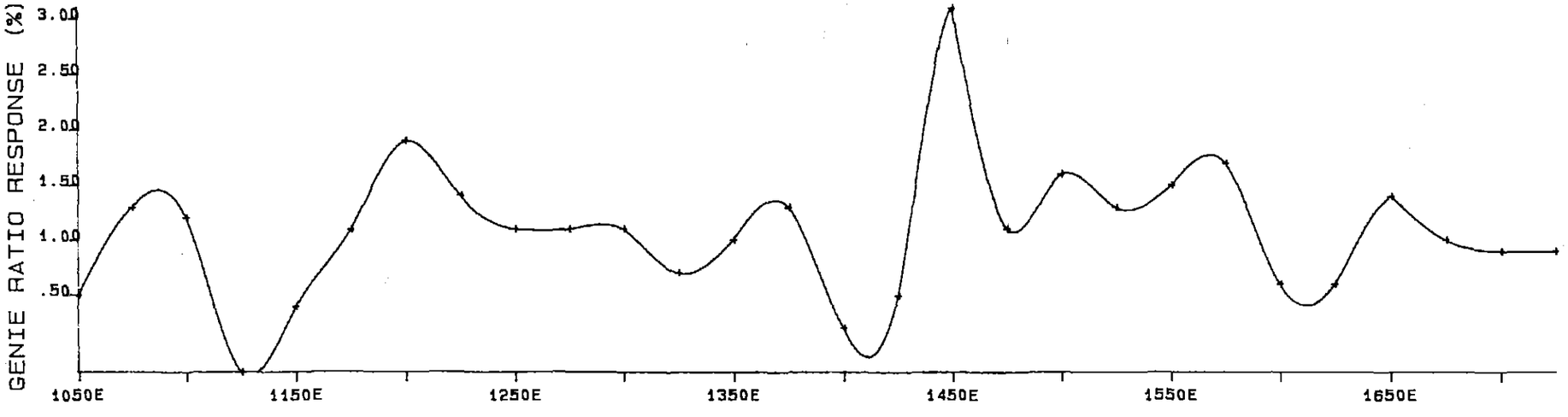


962081

93-3514.

LINE 5.0S SCALE 1:2500.0

(337/112 hz)



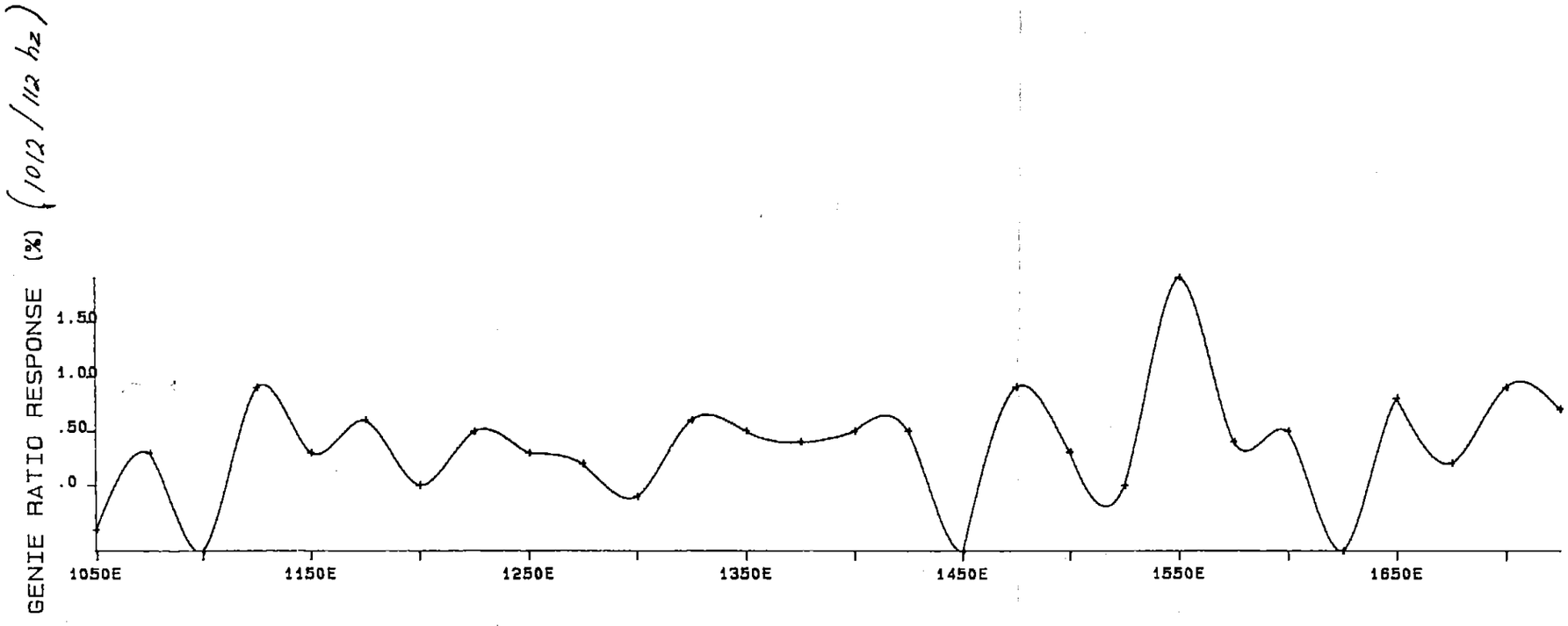
962082

93-3514.

5 cm

LINE 5.0N SCALE 1: 2500.0

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997
Technical Report No:	PROJECT: 708 - "SOREL PENINSULA"
Compiled by: C.M.	GENIE EM PROFILE - 337 Hz
Checked by:	BRIGGS CREEK - LINE 5 North
Date: Feb 1993	REFERENCE:
Scale: 1: 2500	DWG NO: 17

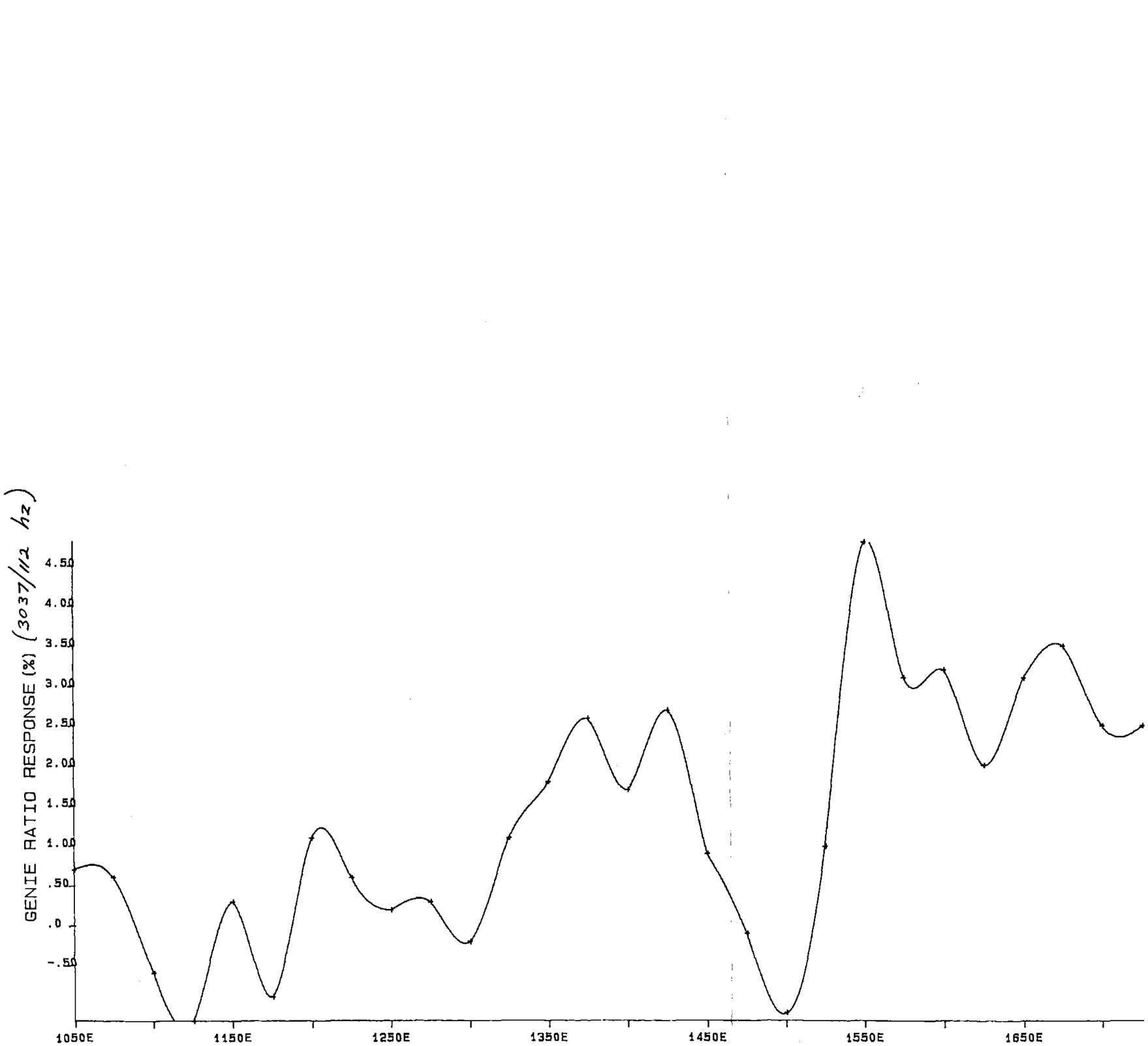


5 cm

93-3514.

962083

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 660 997
Technical Report No:	PROJECT: 708 - "SOREL PENINSULA"
Compiled by: GM.	GENIE EM PROFILE - 1012 Hz
Checked by:	BRIGGS CREEK - LINE 5 North
Date: Feb 1993	REFERENCE:
Scale: 1:2500	DWG NO: 18



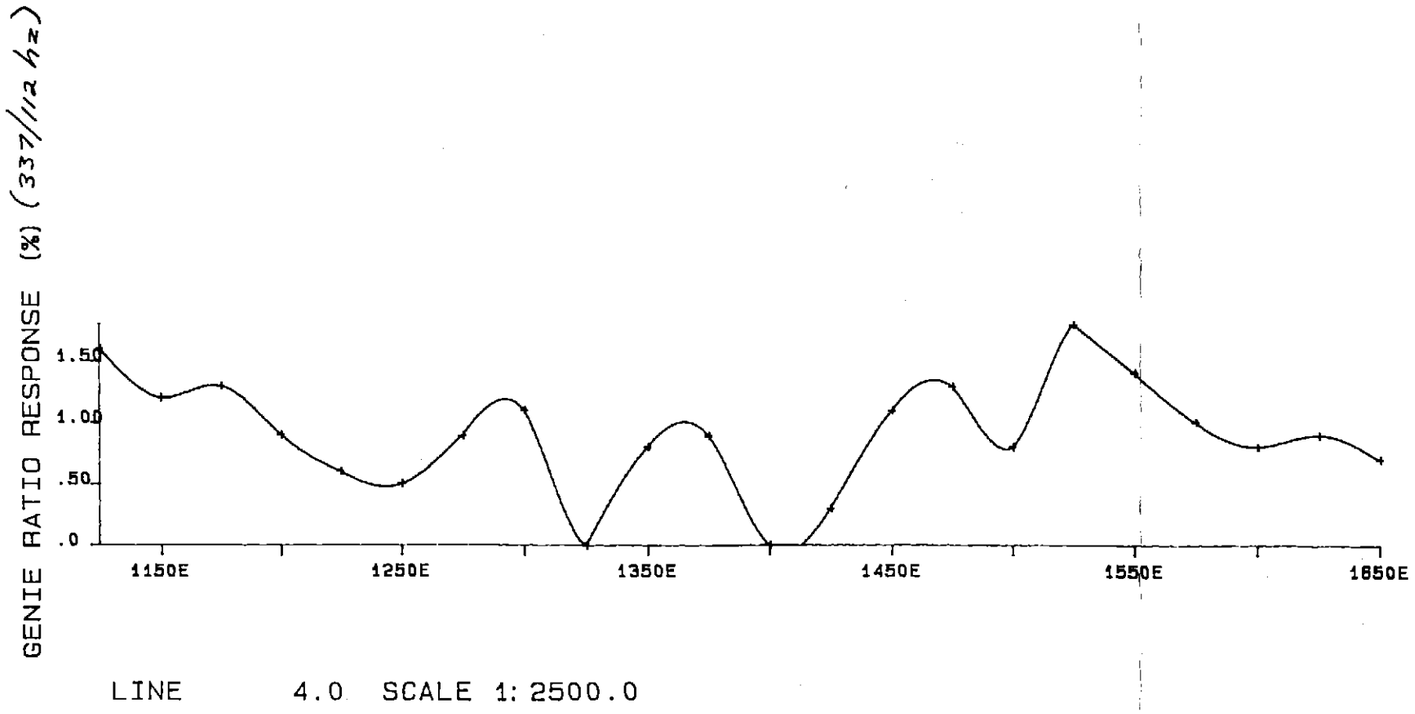
LINE 5.0N SCALE 1: 2500.0

5 cm

93-3514.

962084

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 580 997
Technical Report No:	PROJECT: 708- "SOREL PENINSULA"
Compiled by: G.M.	GENIE EM PROFILE - 3037 Hz
Checked by:	BRIGGS CREEK - LINE 5 North
Date: Feb 1993	REFERENCE: DWG NO: 19
Scale: 1: 2500	



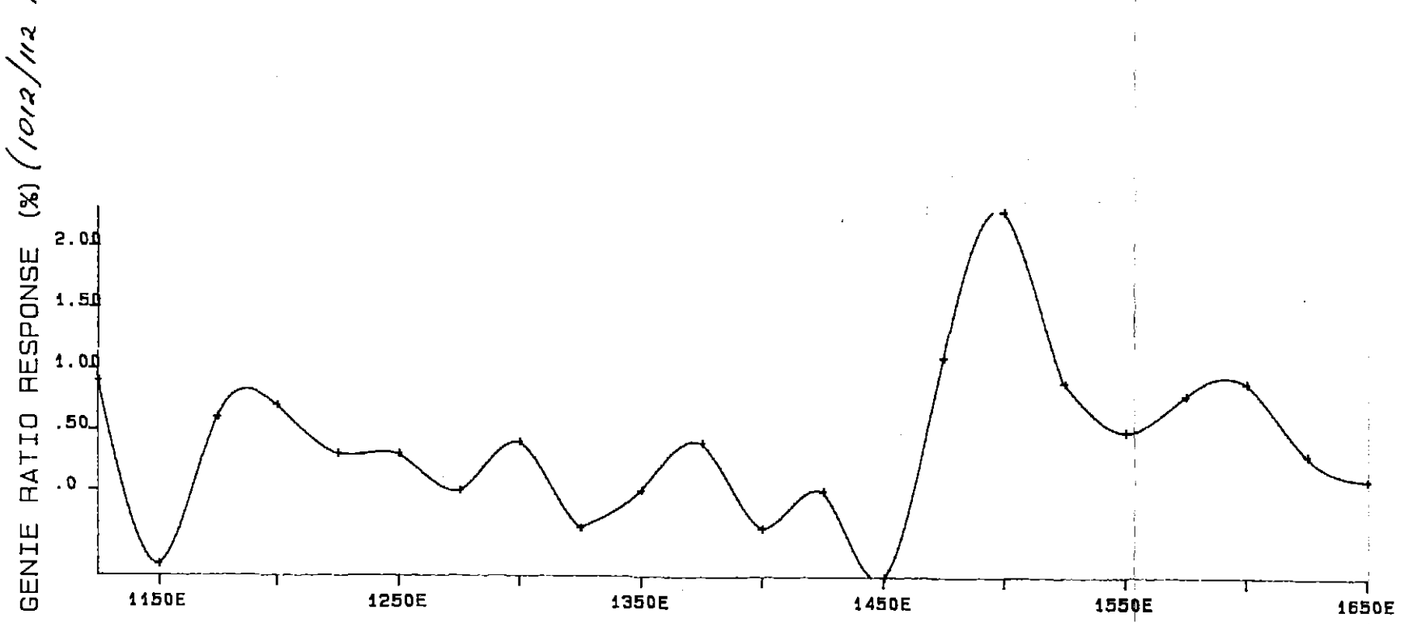
5 cm

93-3514.

962085

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997	
Technical Report No:	PROJECT: 708 - "SORELL PENINSULA"	
Compiled by: GM Checked by:	GENIE EM PROFILE - 337 Hz BRIGGS CREEK - LINE 4	
Date: Feb 1993 Scale: 1: 2500	REFERENCE:	DWG NO: 20

GENIE RATIO RESPONSE (%) (1012/112 Hz)



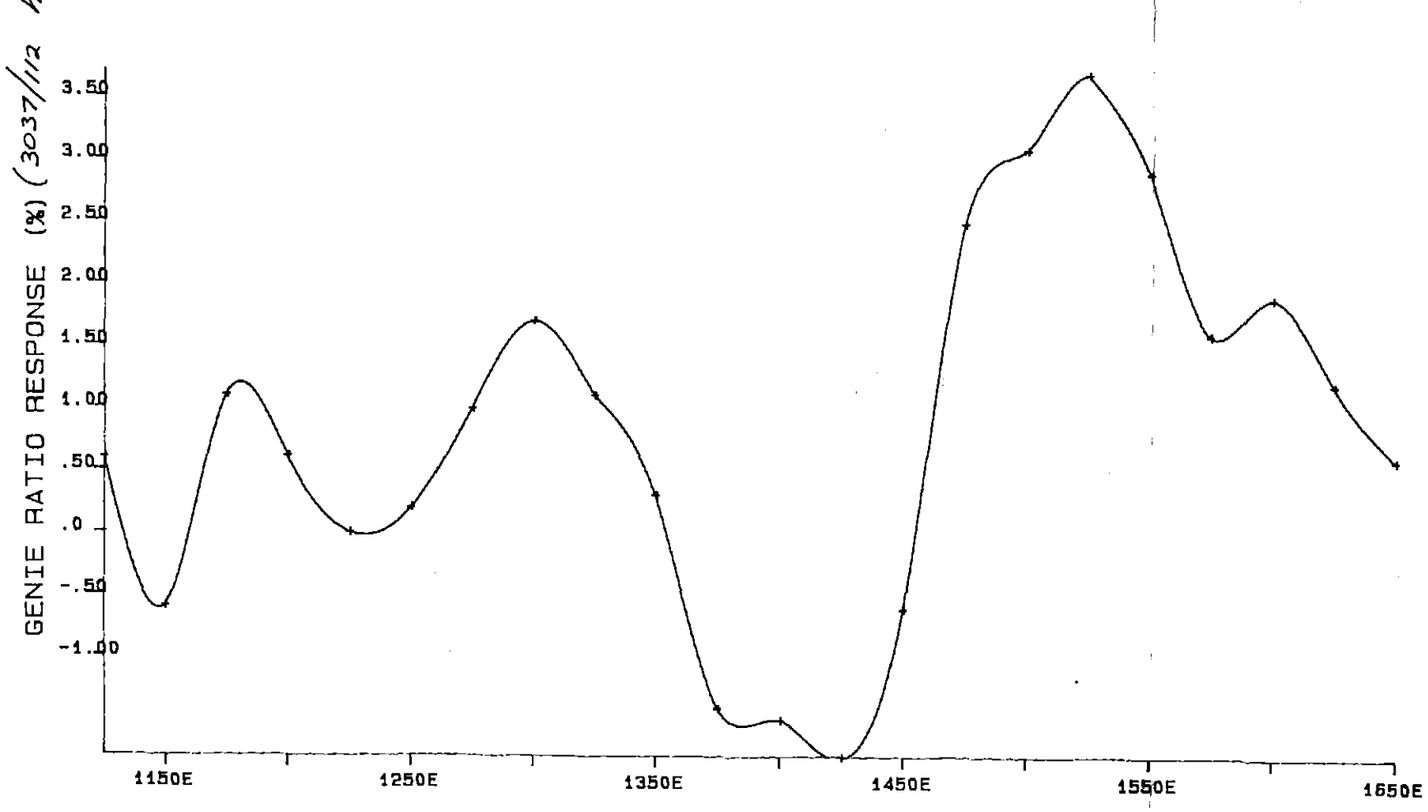
LINE 4.0 SCALE 1: 2500.0

5 cm

93-3514.

962086

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997
Technical Report No:	PROJECT: 708 - "SORELL PENINSULA"
Compiled by: GM.	GENIE EM PROFILE - 1012 Hz
Checked by:	BRIGGS CREEK - LINE 4
Date: Feb' 1993	REFERENCE:
Scale: 1: 2500	DWG NO: 21



LINE 4.0 SCALE 1: 2500.0

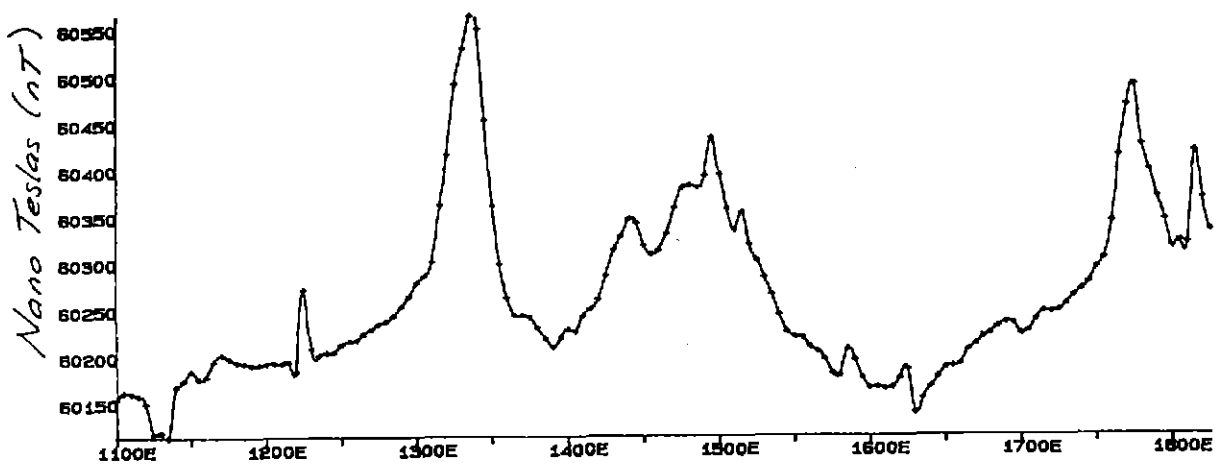
5 cm

962087

93-3514.

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997
Technical Report No:	PROJECT: 708 - "SORELL PENINSULA"
Compiled by: GM,	GENIE EM PROFILE - 3037 Hz
Checked by:	BRIGGS CREEK - LINE 4
Date: Feb' 1993	REFERENCE:
Scale: 1: 2500	DWG NO: 22

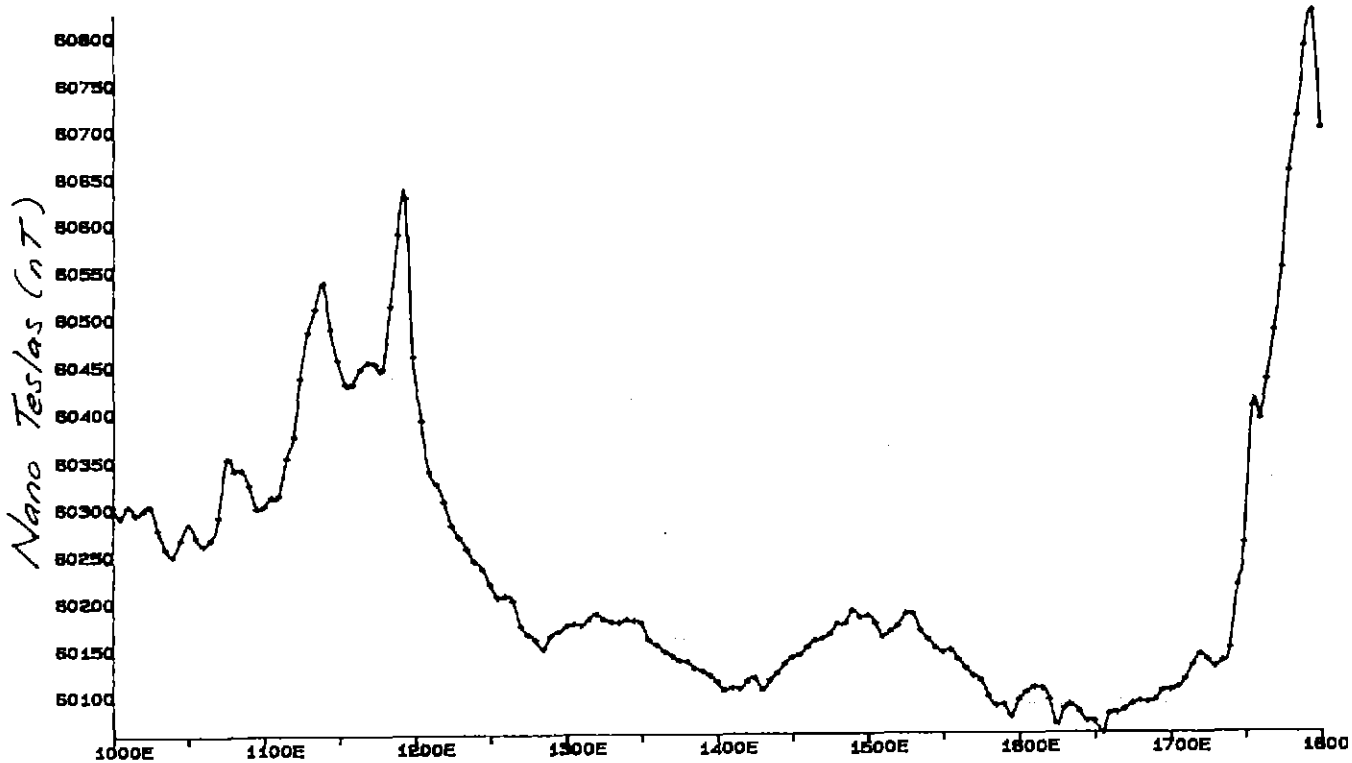
962088



LINE 2.0 SCALE 1: 5000.0

5 cm

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 897
Technical Report No:	PROJECT: 708 - SORELL PENINSULA
Compiled by: G.M.	GROUND MAGNETICS PROFILE
Checked by:	BRIGGS CREEK - LINE 2
Date: Feb 1993	REFERENCE: DWG NO: 23
Scale: 1: 5000	



LINE 5.0S SCALE 1: 5000.0

93-3514

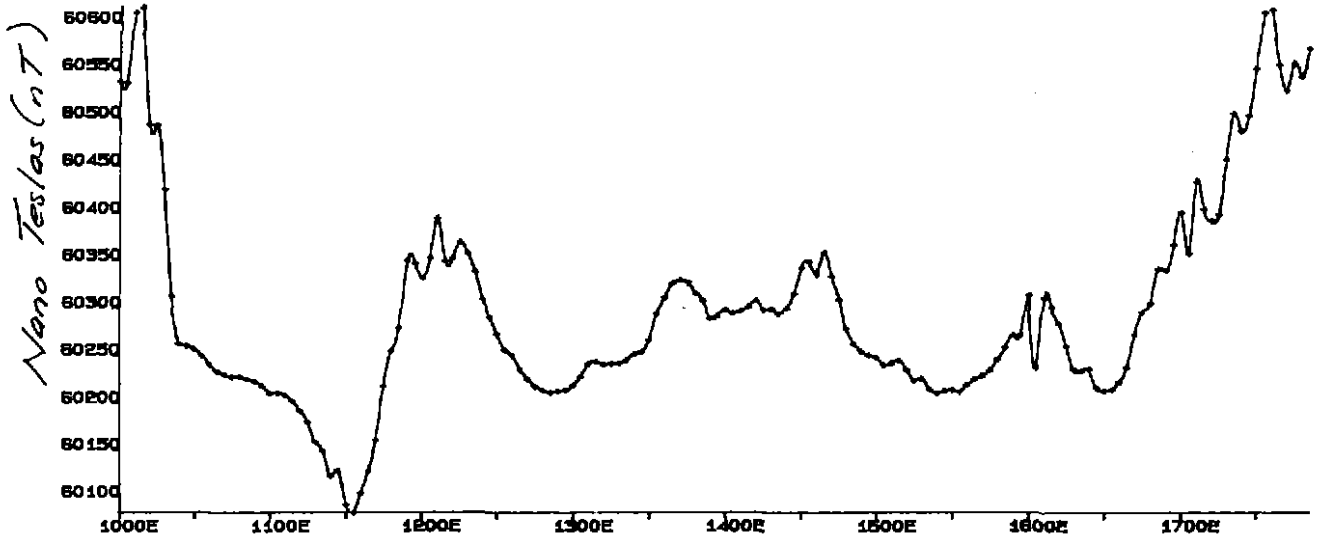
962089

5 cm

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997
Technical Report No:	PROJECT: 708- "SOREL PENINSULA"
Compiled by: G.M. Checked by:	GROUND MAGNETICS PROFILE BRIGGS CREEK- LINE 5 South
Date: Feb 1993 Scale: 1:5000	REFERENCE: DWG NO: 24

24

93-574



LINE 5.0N SCALE 1: 5000.0

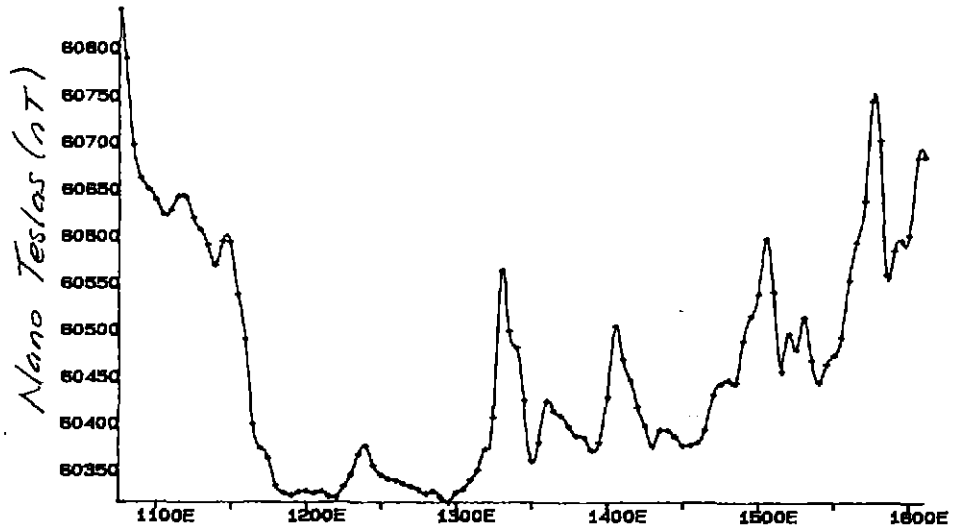
5 cm

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 897
Technical Report No:	PROJECT: 708 - "SORELL PENINSULA"
Compiled by: G.M.	GROUND MAGNETICS PROFILE
Checked by:	BRIGGS CREEK - LINE 5 North
Date: Feb 1993	REFERENCE:
Scale: 1: 5000	DWG NO: 25

962090

93-3514.

962091



LINE 4.0 SCALE 1: 5000.0

5 cm

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997
Technical Report No:	PROJECT: 708- "SOREL PENINSULA"
Compiled by: G.M. Checked by:	GROUND MAGNETICS PROFILE BRIGGS CREEK - LINE 4
Date: Feb 1993 Scale: 1: 5000	REFERENCE: DWG NO: 26

5287000 m N

370000 m E

pyrite iltmonite vein

3F plag > ang
sy altd cl py mag

234

3I?
3I?
3I?

3I

220

3I
3I

3I plag
aug epi

3I plag aug
epi altd

3I
3I
3I
3I
3I
3I
3I plag >aug
sy altd w py
3I
3I
LINE 400N

3I?

5286 000 m N

3I plag aug

200N
200N
200N

?

3F py

py
py
py

3F py

4F(?) fg sy altd si
fm cl

4F fg/3I plag aug
sy altd cl py

3F plag sy altd
fm cl py

3F/4F?

3F plag sy altd
cl fm py si

3F plag aug
sy altd mag cl fm

3F plag >aug
my altd cl py

5V intermediate
plag aug rich

3F plag aug
sy altd cl act epi

220

200S
200S
200S

LINE 400W
LINE 200W
LINE 200E

200

3F plag>aug

LINE 400S

3F
3F

TN
MN

5 cm

0 50 100 150 200 250
SCALE IN METRES

962092

KEY

Intrusive plagioclase augite phyric diorite (3I)

Andesitic to dacitic plagioclase ± augite phyric lavas (3F) with lesser fine grained felsic lavas (4F)

act	actinolite
altd	altered
aug	augite
cl	chlorite
epi	epidote
fg	fine grained
mag	magnetite
my	moderately
plag	plagioclase
py	pyrite
si	silica
sy	strongly
tm	tourmaline

Alteration zone
? = areas where alteration zone may extend further

Geological contact - approximate

Geological contact - uncertain - determined largely from aeromagnetics

Grids / tracks

5285 000 m N

REVISION	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997 (INC. IN N.S.W.)
TECHNICAL REPORT NO	PROJECT 708 - SORELL PENINSULA
COMPILED BY G. Mac DONALD	THOMAS CREEK PROSPECT
DRAWN BY O. HEDDITCH	GEOLOGY
CHECKED BY	93-3514.
DATE JULY 1993	REFERENCE
SCALE 1: 2,500	DWG. NO. 27

5287000 m N

370000 m E

R 43, X

float
R 22, 0·018
R 160, 0·038
R 22, 0·132
R 16, 0·085
R 2606, 0·501

116, X
56, X

R 14, 0·045

vein R 24, 0·051
R 36, 0·044
selvedges R9, X
R7, X
R7, X

234

145, 0·008
222, X

832, X
1533, 0·010

235, X

69, X

200, X
192, X

220

26, X
51, X

R 352, X
R 29, X
R 81, X
R 35, X
31, X
R 10, X
29, X
31, 0·017
R 9, X
R 15, X
R 14, X
R 19, X
R 25, X
R 63, X
R 352, X

309, 0·008

1765, X

R 64, X

5286 000 m N

(210)
(76)
(290)
(205)
(125)
(98)
(48)
(425)
(210)
(245)
(150)
(300)
(560)

(440)
98, X (88)
709, X (70)
R 20, X (79)
(54)
(600)
(350)
(285)
R 786, 0·017 (1000)
(300)
(220, 0·08)

101, X
1353, 0·010
R 84, X
R 31, X (890)
(50)
310, X (1480, 0·12)
(1640, 0·06) (1020)
1015, X (610)
132, X (3360)
136, X
(1220)
920, X
(630)
(450)
(145)
(325)
(185)
232, 0·010 (220)
R 48, 0·008 (800)
(300)
(2180)
240, X (92)
(2520, 0·05)
158, 0·031
(145, 0·08)
R 1129, 0·128 (215)
10, 0·024
42, 0·016
(1200)
(480)
R 303, X
(1200)
70, X
R 48, X
(930)
66, X (58)
29, 0·008
7220, 0·052

(23)
(38)
(84)
(210)
(330)
44, X
(3440)
(455)
(115)
(357, 0·06)

200

5 cm

TN MN

6, X
7, X
6, X
6, X
23, X
532, X
289, X
238, X
146, X

0 50 100 150 200 250
SCALE IN METRES

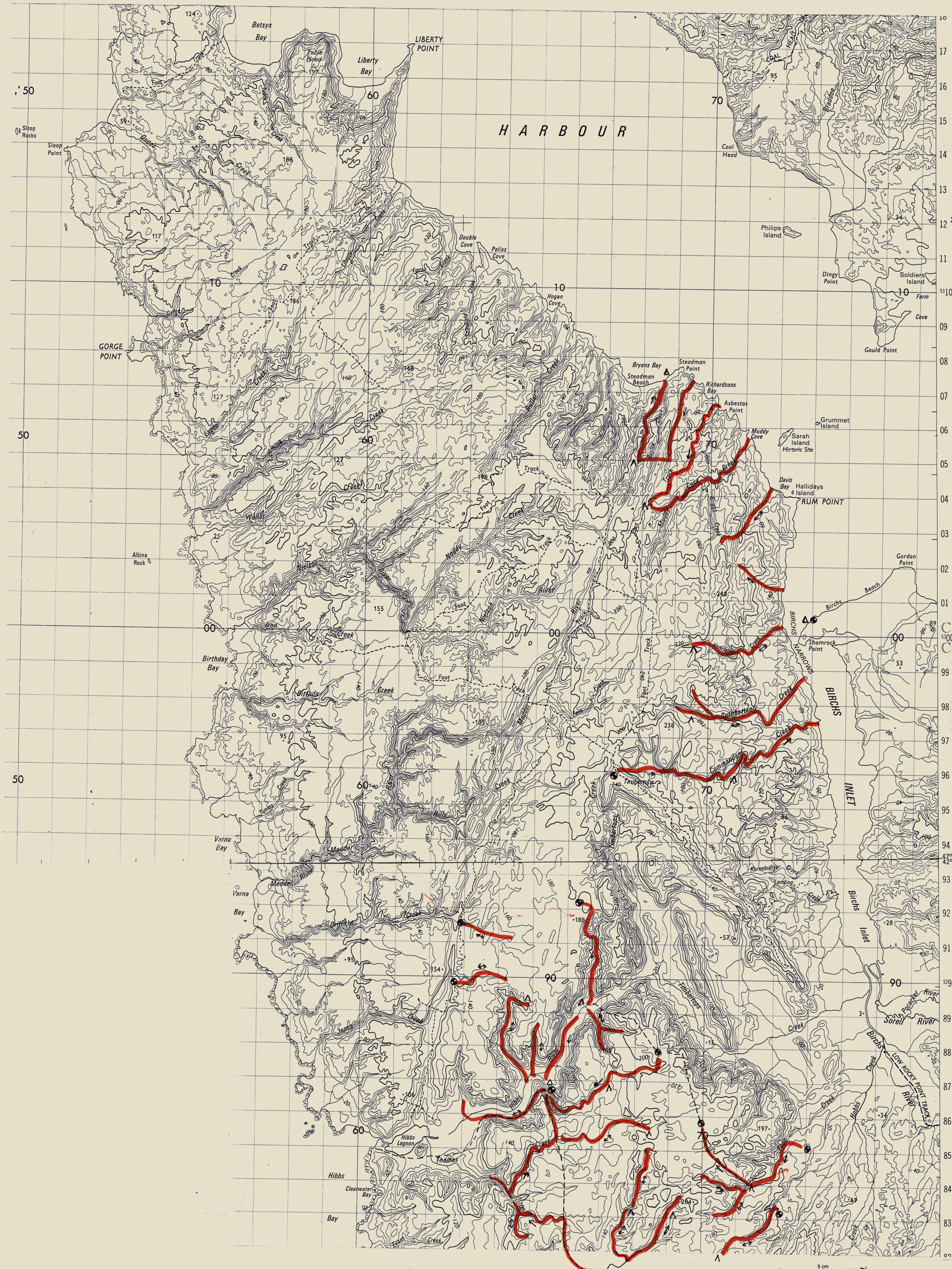
962093

KEY

C horizon unless R prefix when rock chip Assays for Cu ppm and Au shown, X = Au below detection limit. Results in parentheses are from Amoco's survey, Cu ppm, Au ppm (Au shown when above detection limit)

5285 000 m N

REVISION	PLUTONIC OPERATIONS LIMITED A C N 004 680 997 (INC IN N.S.W.)
TECHNICAL REPORT NO	PROJECT 708 - SORELL PENINSULA
COMPILED BY G. MacDonald	THOMAS CREEK GEOCHEMISTRY
DRAWN BY O. Hedditch	93-3514.
CHECKED BY	
DATE JULY 1993 SCALE 1:2500	REFERENCE DWG NO 28



962094

Key

- Sampling traverse
- Helipad - natural or man-made
- Δ Major camp
- Λ Fly camp
- → Direction of travel

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997	
Technical Report No:	PROJECT: 708- SORELL PENINSULA.	
Compiled by: G. MacDonald. Checked by:	EL 4/92 - STREAM SEDIMENT SURVEY PLANNED SAMPLING TRAVERSES	
Date: September '93 Scale: 1: 50 000	REFERENCE: 93-3514.	DWG NO: 29

Key

- Sampling traverse
- Δ Major camp
- Λ Fly camp
- Helipad - natural or man-made
- → Direction of travel

Revision:	PLUTONIC OPERATIONS LIMITED A.C.N. 004 680 997	
Technical Report No:	PROJECT: 708 - "SORELL PENINSULA"	
Compiled by: G MacDonald. Checked by:	EL 7/92 - Stream Sediment Survey Traverse locations.	
Date: September 93 Scale: 1: 50000	REFERENCE: 93-3514.	DWG NO: 30