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Progress Report, Exploration Licence

11/74

FARM CREEK, Tasmania

for six months ending July 31, 1975.

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1. SUMMARY

A programme of geological mapping and detailed stream sediment geochemistry in the Farm Creek exploration licence area was undertaken to search for base metal mineralisation related to the favourable Mt. Read Volcanics.

At the east a north-south striking sedimentary sequence of Cambrian age (the Farrell Group) was found to be overturned and dipping steeply to the west. The remainder of the licence area is underlain by a volcanic pile of andesitic to rhyolitic lavas, tuff-lavas, tuffs and lava-breccias, part of the Cambrian Mt. Read Volcanics suite. Textural bedding in a crystal tuff showed the volcanic sequence is west dipping and not overturned.

Quaternary fluvioglacial deposits cover much of the Mackintosh Valley and other areas of low elevation within the EL.

A detailed stream sediment sampling programme did not disclose any significant geochemical anomalies.

The licence area is now to be assessed by geophysical methods. An airborne combined EM-magnetics survey was flown but analysis and interpretation is not yet complete.

2. INTRODUCTION

A. History

The Farm Creek property is situated in the favourable Mt. Read Volcanic belt. Acquisition followed the discovery in 1974 of base metal mineralisation at the Que River prospect, located some 15 km. to the north-north-east.

Base metal mining in this region has been in progress since late last century and is current at Queenstown (Mt. Lyell Mine), Williamsford (Hercules Mine), Rosebery and Tullah (New North Mt. Farrell Mine).

Exploration is currently being conducted in the area surrounding the Farm Creek EL by Comstaff Pty. Ltd., Conzinc Riotinto of Australasia, Electrolytic Zinc Company of Australasia Ltd., Asarco Australia Pty. Ltd. and Cominco Exploration Pty. Ltd.

B. Ownership

Farm Creek EL 11/74 is held by Cominco Exploration Pty. Ltd. on behalf of the Abex Joint Venture. It was granted on July 31, 1974 and is renewable at six monthly intervals.

C. Location

41°42'S 145°37'E (approximate centre of licence)

The licence is located in the central north-west of Tasmania approximately 6 km north of Tullah and covers an area of 8 sq.km.

The Murchison Highway runs through part of the western section of the EL and the Emu Bay Railway line is situated about one km. outside the western boundary of the EL. Several tracks from the highway provide access into the licence area.

Topography is typically rugged and clothed in dense rainforest (myrtle, sassafras, leatherwood and horizontal scrub). Within the licence the drainage is into Farm Creek and the Mackintosh River. Stream gradients are frequently steep and upper levels flow over rapids and waterfalls.

D. Previous Exploration

Comstaff conducted detailed stream sediment sampling on most of the streams draining through the EL. Sample intervals were nominally 500 feet.

E. Objectives

The objective was to assess the potential for stratiform base metal mineralisation within the tuffs and intercalated lavas of the favourable Mt. Read Volcanic pile.

3. EXPLORATION

The licence area covers a portion of the Mt. Read Volcanics of Cambrian age. The Mt. Read Volcanics constitute an important mineralised belt of predominantly acid volcanic rocks lying at the western margin of the Tyennan Geanticline. The age, stratigraphy and relationships of the volcanics have long been problematical and their complexity and alteration have tended to discourage detailed mapping (Corbett et al, 1974).

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CEPL 1:25,000 scale aerial photographs were used for geological mapping along rivers, creeks, tracks and roads. Mapping was based on field identification of rock minerals and textures utilizing a control specimen suite with petrographic descriptions. A surface outcrop geology map at 1:10,000 was compiled (see Plate FC 2). In several instances significantly different interpretations of the same rock by two petrographic service organisations has demonstrated the difficulty in rock classification in this type of acid volcanic environment. Petrographic descriptions are appended to this report.

4. GEOLOGY

A north-south trending volcanic pile of andesitic to rhyolitic lavas, tuffs and agglomerates (Mt. Read Volcanics) appears to overlie the Farrell Group, a sedimentary sequence in the east of the licence. The Farrell Group is of Cambrian age and hosts the silver-lead mineralisation in the Mt. Farrell mining field at Tullah.

These sediments strike slightly west of north and are comprised of sandstones, greywackes, reworked tuffs, shales and chert and rarer beds of crystal tuffs. Load casts and graded bedding in these sediments in the Mackintosh River indicate the sequence there is overturned. Dips are steep ($70-80^{\circ}$) westerly. Quartz-sericite schists and phyllites also occur in this section along the Mackintosh River.

Within the volcanic sequence, rocks of andesitic composition are the most abundant (refer Appendix). Typically, these rocks lack quartz phenocrysts, and primary quartz in the groundmass but quartz amygdules are common. They have a significant amount of ferromagnesium minerals now altered to chlorite and altered plagioclase feldspar phenocrysts (andesine). These rocks carry pyrite from a trace to one or two percent.

The rocks of a wholly tuffaceous origin and andesitic composition are difficult to delineate. Andesitic crystal tuffs were encountered near the Mackintosh River north of Tullah and a pyroclastic origin is postulated for the tuff-breccias along the Mackintosh River west of Tullah. The rocks in the Farm Creek/Tramway Creek region are believed to be andesitic lavas although heterogeneous textures in some rocks suggest a pyroclastic origin. Vesicular, breccia and flow textures are common and a combination of these indicates many rocks are flows,

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autobrecciated flows (lava-breccias) and tuff-lavas. Deuteric late-stage alteration, shearing and brecciation mask rock textures making positive field identification between tuff and lava extremely difficult.

Rhyolitic ash-fall tuffs distinguished by their very fine grain size and light greyish-white colour occur in the west of the licence area. Typically the rock is laminated and comprised of ultra fine clay-sericite, quartz and feldspar.

Sporadic pyrite mineralisation occurs throughout the sequence. The pyrite is believed to be syngenetic. Pyrite generally constitutes about 1% of the rock but in some cases it may be up to 7%, as in rocks just west of the Murchison Highway along Tramway Creek.

A facing within the volcanic sequence was determined from graded bedding in a crystal tuff outcropping in Tramway Creek. The sequence is not overturned; dip is variable but around 20° west. Further up Tramway Creek a very thinly bedded ash tuff was found to dip 45-50° west.

Quaternary fluvio-glacial deposits mantle areas of lower elevation, especially along the Mackintosh Valley and in the eastern lobe of the licence. The deposits are generally unstratified and comprised of boulders to 30 cm., gravels, sands and clays. Thickness of Quaternary cover may reach 5 metres in places.

5. GEOCHEMISTRY

A programme of detailed stream sediment sampling was undertaken. Emphasis was placed on the sampling of small creeks and minor tributaries, resulting in a sample density of 13 per sq. km.

The samples were submitted for assay for Cu-Pb-Zn by atomic absorption spectroscopy. The following detection limits are quoted:

- Cu 2 ppm
- Pb 20 ppm
- Zn 2 ppm

The -40# was used and samples were prepared by dissolving 0.5g in perchloric acid.

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Geochemical data is presented in Plate FC 4A at 1:10,000 scale. Background values are approximately 10 ppm Cu, 20 ppm Zn and <20 ppm Pb. With the exception of two zinc values (120 ppm and 150 ppm) no anomalous results were disclosed within the licence area.

The 120 ppm zinc value is coupled with high lead but low copper values and is not considered significant because of other low values close to this sample location.

The 150 ppm zinc value is also not considered significant. Corresponding copper and lead values are background. The sample may possibly be contaminated by metallic waste from the highway.

Quaternary fluvioglacial deposits, especially in the vicinity of the Mackintosh River and the eastern lobe of the licence area may have both a diluting and masking effect on the geochemical results.

6. GEOPHYSICS

During March 1975, a helicopter-borne dual frequency quadrature McPhar H400 Em system combined with a Geometrics proton precession magnetometer, was flown at approximately 150 metre line spacings over Farm Creek licence area. Compilation of data and results are not yet complete.

7. FINANCE

Expenditure for six months ending June 30, 1975:

Geology	\$3,924
Survey	26
Geophysics	461
Geochemistry	392
Tenure	23
Miscellaneous	<u>186</u>
	<u>\$5,012</u>

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8. CONCLUSIONS

Geological mapping has defined a north-south trending volcanic/pyroclastic sequence of altered andesitic to rhyolitic rocks, bounded in the east by sediments belonging to the Farrell Group.

Detailed stream sediment geochemistry did not disclose any significant anomalies within the volcanic pile.

The area is to be further assessed by the EM-magnetics survey.

9. APPENDIX

Petrographic Descriptions.

10. ATTACHMENTS

- Plate FC 2 Surface Outcrop Geology 1:10,000 scale
- FC 4A Stream Sediment Geochemistry 1:10,000 scale.

11. REFERENCES

CORBETT, H.D., 1974 - "The Mount Read Volcanics and Cambrian-Ordovician Relationships of Queenstown, Tasmania."
 REID, H.O.,
 CORBETT, E.E.,
 GREEN, G.R.,
 WELLS, K., and *Jour. Geol. Soc.*, Vol. 21, Part 2, pp 173-186.
 SHEPPARD, N.W.

GROVES, D.I. and 1964 - "Geology of the Tullah Mining Field"
 NOLDART, A.J. *Tasmania Department of Mines, Technical Reports No.9, 1964, pp 43-54.*

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Endorsed L.V. Gentle
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 Chief Geologist

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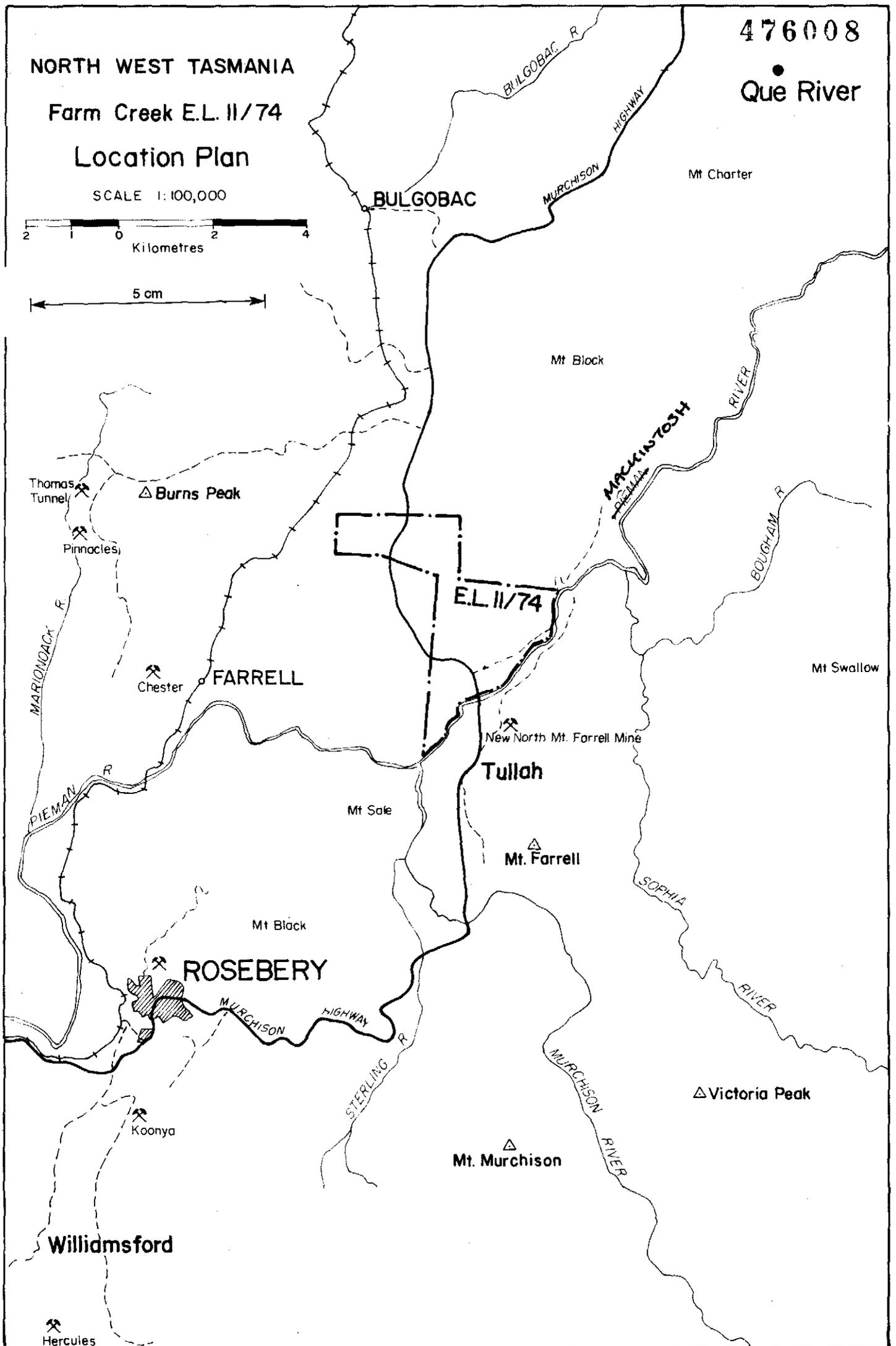
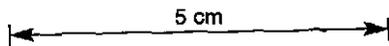
Que River

NORTH WEST TASMANIA

Farm Creek E.L. 11/74

Location Plan

SCALE 1:100,000



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CENTRAL MINERALOGICAL SERVICES PTY. LTD.

Date 3rd February 1975

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

Job No. GMS 75/1/9 Date Received: 10/1/75
 Reference Order No. 5241
 Sample No. 95985
 Nature of Sample: Hand specimen

IDENTIFICATION
95985
Porphyritic Rhyolite

DESCRIPTION SECTION No. 15910

a. Hand Specimen:

Brown-grey, fine grained porphyritic igneous.

K feldspar stain reaction positive for groundmass.

b. Microscopic:

This is a porphyritic sodi-potassic rhyolite, reasonably fresh and without evidence of any metamorphism. It is a high level or minor intrusive.

The phenocrysts are well formed prismatic crystals and small crystal-clusters of albite; quartz phenocrysts are very common. The phenocrysts are set in a microcrystalline groundmass of quartz and K-feldspar, whose fabric is subradiating and typical of rapid cooling. Fine black opacues and dusty hematite provide the pigmentation for the rock.

Small patches of granular quartz, with chlorite, leucocratic rutile and zoisite-epidote, occur in small fractures and vugs and are postmagmatic. They cannot be regarded as metamorphic, however.

With a reduction in quartz content this rock would grade into a trachyte.

H. W. Fender, M.Sc.

476010

Date 3rd February 1975

CENTRAL MINERALOGICAL SERVICES PTY. LTD.

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

Job No. CMS 75/1/9 Date Received: 10/1/75

Reference Order No. 5241

Sample No. 95993

Nature of Sample: Hand specimen

DESCRIPTION SECTION No. 15911

IDENTIFICATION

95993

Porphyritic Sodic
Rhyolite (Quartz-
Keratophyre)

a. Hand Specimen:

Grey-brown, fine grained porphyritic igneous rock;
abundant phenocrysts. K stain test negative.

b. Microscopic:

This is a fairly extensively altered porphyritic sodic rhyolite or quartz-keratophyre (sodic trachyte). There is some suggestion that rocks of this type are part of the spilitic suite of rocks (see Hatch, Walls & Walls, Igneous Petrology). It is probably related to 95988, though K feldspar is absent; it may have been present originally but now sericitised.

The phenocrysts, which constitute about 20% of the rock, are extensively sericitised small albite crystals. They are set in a groundmass of micro-crystalline quartz, albite, sericite and pale chlorite. This has a relict perlitic fabric and textures suggesting that the groundmass was partly vitric. There is also some suggestion of relict flow banding, in places.

Altered primary oxide opaques are scattered through the rock. Secondary minerals, generally very fine grained, include sericite, pale chlorite, and leucoxene.

The absence of quartz phenocrysts is unusual and is a characteristic of Mt. Read volcanics of this composition.

H. W. Fonder, M.Sc.

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476011

CENTRAL MINERALOGICAL SERVICES PTY. LTD.

Date ~~3rd February 1975~~

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

Job No. CMS 75/1/S Date Received: 10/1/75
 Reference Order No. 5241
 Sample No. 151937
 Nature of Sample: Hand specimen

IDENTIFICATION
151937
Porphyritic Potassic Rhyolite

DESCRIPTION SECTION No. 15912

a. Hand Specimen:

Pale, cream coloured porphyritic igneous rock.
 K stain test positive for groundmass.

b. Microscopic:

A well defined porphyritic potassic rhyolite, this rock differs substantially from 95985 and 95993.

It consists of large euhedral, embayed and corroded quartz phenocrysts, occasional sericitised feldspar crystals, and altered biotite flakes, set in a devitrified groundmass with a quartz/K feldspar composition. The groundmass textures are typically finely spherulitic-perlitic, and now consist of vague small interlocking subspherical patches, often with radiating textures. Interstitial fine sericite is common throughout.

Secondary minerals include fine sericite, and chlorite partially replacing biotite.

The rock lacks flow banding or other extrusive characteristics, and is regarded as a shallow or minor intrusive (subject to field evidence to the contrary).

Main differences between this rock and 95985/95993 are quartz phenocrysts, absence of albite, potassic composition and the presence of biotite.

H. W. Fander, M.Sc.

476012

CENTRAL MINERALOGICAL SERVICES PTY. LTD.

Date 3rd February 1975

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

Job No. CMS 75/1/9 Date Received: 10/1/75Reference Order No. 5241Sample No. 151541Nature of Sample: Hand specimenDESCRIPTION SECTION No. 15913

a. Hand Specimen:

Fine grained porphyritic igneous/pyroclastic rock.

K stain test negative.

b. Microscopic:

Most probably a rhyolitic tuff lava, though devitrification and alteration have obscured or obliterated many of the finer details.

Small, sericitised feldspar crystals and crystal fragments, and occasional quartz splinters, are embedded in a host consisting of devitrified glassy material. Much of this shows flow banding, shard textures and other features characteristic of extrusive glassy lava. Flow brecciation is present, with fragments showing variable orientation.

Secondary quartz (filling small cavities), pale chlorite, and sericite occur; of these, sericite is the most common, as a mineral replacing primary feldspar and as an interstitial component.

The fragmented nature of the rock and the presence of feldspar crystals and fragments, are characteristic of these "tuff lavas" which combine the features of tuffs and lavas.

H. W. Fander, M.Sc.

IDENTIFICATION

151541

Rhyolitic Tuff-Lava

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476013

CENTRAL MINERALOGICAL SERVICES PTY. LTD.

Date 3rd February 1975

SAMPLE REPORT (Mineralogy, Petrology, Ore Microscopy)

Job No. CMS 75/1/9 Date Received: 10/1/75
 Reference Order No. 5241
 Sample No. 151948
 Nature of Sample: Hand specimen

IDENTIFICATION
151948
Altered Ash Tuff

DESCRIPTION SECTION No. 15914

a. Hand Specimen:

Pale, fine grained, finely banded rock (? pyroclastic).
 Faint K-stain reaction of some layers.

b. Microscopic:

This fine grained rock is believed to be an altered ash tuff. Due to alteration it is not possible to determine whether the rock is (or was) welded or sintered, but this is likely.

The rock is composed of exceedingly fine grained quartz and sericite (altered feldspar), with occasional coarser splinters and small spheres of quartz. Very fine relict chord textures are detectable, though not sharply defined because of devitrification and sericitisation.

The rock is faintly banded; the banding is divergent and may be indicative of flow; although it appears similar to tuffaceous rocks, there are differences. The banding is due to the presence of fine leucoxene in some layers, and to variations in quartz and sericite (ie. feldspar or feldspathic glass). Graded bedding was not detected; there is a zoned effect in hand specimen due to gradual variations in pigmentation in some layers.

The rock is broadly of "rhyolitic" composition, and shows the usual alteration (devitrification, sericitisation) to which these rocks are prone.

H. W. Fender, M.Sc.

95977: altered, moderately potassic
amygdaloidal andesite

This is a porphyritic fine grained andesite with phenocrysts of albitised plagioclase in an amygdaloidal groundmass.

The plagioclase is commonly weakly sericitised and/or argillised and has small rosettes of pumpellyite. The amygdales are filled by quartz, chlorite and/or epidote, and have a rim of k-felspar rich composition commonly separated from the groundmass by concentric clay-limonite filled fractures. There are some patches of clay in some vesicles. These features are clearly seen macroscopically on the stained section offcut.

The groundmass appears to be albite and/or quartz with minor k-felspar, clay-sericite and leucoxene.

The rock is cut by chlorite-quartz veins.

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95985: altered amygdaloidal andesite
or trachyandesite

This rock is similar to 95977 but has a more potassic groundmass. It has weakly altered plagioclase phenocrysts in a fine grained groundmass of plagioclase, alkali feldspar and opaque granules. Vesicles are filled by clay-sericite, quartz and prismatic-epidote, commonly with zircon, apatite, and limonite-stained undefined grains in many.

95993: altered andesite micro breccia

This rock consists of a rather confused mass of generally microcrystalline quartz, sericite, chlorite and carbonate (?siderite) with minor residual plagioclase crystals which originally occurred as phenocrysts in the fine groundmass. Aggregates of plagioclase and ferromagnesian phenocrysts (?pyroxene) can also be recognised, and these were xenoliths of ophitic textured rock - possibly dolerite or basalt with vesicles filled by quartz.

The general heterogeneous texture suggests a pyroclastic rather than a flow. However the lithic fragments seem most likely xenoliths rather than tuffaceous fragments and the confused relationships in the remainder of the rock seems to be an auto brecciation developed during flow. The rock is interpreted as an altered andesite rather than a pyroclastic.

151937: altered amygdaloidal andesite

This rock has argillised albite-sericite-epidote pseudomorphs after plagioclase phenocrysts, chlorite-epidote pseudomorphs after ferromagnesian phenocrysts, and aggregates of leucoxene in a groundmass replaced by albite and clay-sericite. Vesicles (15-20%) are commonly elongated in a direction of flow and filled variably by quartz and chlorite.

151941: altered andesitic tuff-lava

Sericite pseudomorphs after feldspar phenocrysts are an important constituent of this rock, and set in a sericite-quartz-chlorite groundmass, with a strong schistosity, and with relict irregular vesicles filled with quartz.

Localised patches up to 10 mm across appear to be largely adsorbed volcanic rock fragments, they are porphyritic and their groundmass commonly exhibits shard textures. These may be tuffaceous fragments, or xenoliths caught up in a flow rock.

The rock is interpreted as an altered tuff-lava, in which fragments of glassy lava are contained within a microvesicular andesite as represented in several rocks above.

151942: altered vesicular andesite or
andesitic ash-flow tuff

This appears to be a very highly vesicular (scoriaceous) lava with phenocrysts of plagioclase in a porous groundmass, with some suggestion of autobrecciation. The phenocrysts are chloritised and sericitised and the groundmass heavily chloritised, with patches of well oriented clay-sericite.

Vesicles are characterised by fine (0.2 mm) lensoid to spherical bleb-like bodies of quartz randomly scattered through the groundmass. Minor, irregular very small glassy patches are also scattered.

The rock contains a xenolith of more competent, but still highly vesicular, lava, with weakly sericitised plagioclase phenocrysts and chlorite pseudomorphs after ferromagnesian phenocrysts.

It is not completely certain whether this rock is a pyroclastic (ash flow tuff) or a flow rock. If it was a flow it was very scoriaceous and contained several xenoliths.

151948: laminated (quartz) clay-sericite
slate; almost certainly a
very fine ash-fall tuff

This rock consists of intercalated layered made up of variable concentrations of ultra fine, well oriented clay-sericite. Minor very small angular fragments and rare spheroidal grains of cryptocrystalline quartz, fragments of feldspar, and fragments of limonite-chlorite (after primary mafic crystals) are randomly scattered.

Trace, minute altered pyrite grains are present. The coarser components, particularly in the context of this suite, seem almost certainly to be tuffaceous. The finer clay-sericite may also be interpreted to have a similar origin.

151954: altered andesite or trachyandesite

Albite-sericite pseudomorphs after relatively more basic plagioclase phenocrysts (with only a little sericite) and epidote-actinolite pseudomorphs after hornblende phenocrysts are abundant in this rock. These, and smaller crystals of leucoxene (commonly in groups), and crystals of magnetite are randomly, but evenly, disposed through a homogeneous groundmass.

This groundmass consists of diffuse microcrystalline mosaic of chlorite, epidote and potash feldspar, apparently a reconstituted primary, trachyandesite groundmass.

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151965: altered andesitic or trachyandesitic
tuff breccia (i.e. a pyroclastic rock)

Pyroclastic fragments of scoriaceous andesite to 5 mm, contain weakly epidotised and albitised plagioclase phenocrysts, also epidote-chlorite and epidote-actinolite pseudomorphs after ferromagnesian phenocrysts. These are loosely packed and randomly disposed through a matrix of k-felspar, chlorite and quartz.

The amygdales in the fragments are commonly filled by quartz, and the rest of the fragment altered to k-felspar, chlorite and epidote. Accessory small patches of possible pumpellyite are present, and partly leucoxenised opaques are disseminated. The common occurrence of k-felspar between fragments, and the way it pervades these fragments suggests that it is probably a secondary hydrothermal alteration product, rather than a magmatic constituent. This is difficult to determine however.



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 COMINCO EXPLORATION PTY. LTD.
 NORTH WEST TASMANIA
 Farm Creek Exploration Licence
 STREAM SEDIMENT GEOCHEMISTRY, Cu, Pb, Zn ppm
 1855
 DRAWN BY: SA
 CHECKED BY: SA
 TRACED BY: EA
 REVISION: 1/85
 SCALE: 1:5000
 DATE: MAY 1985
 PLATE NO: FCA1A



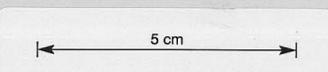
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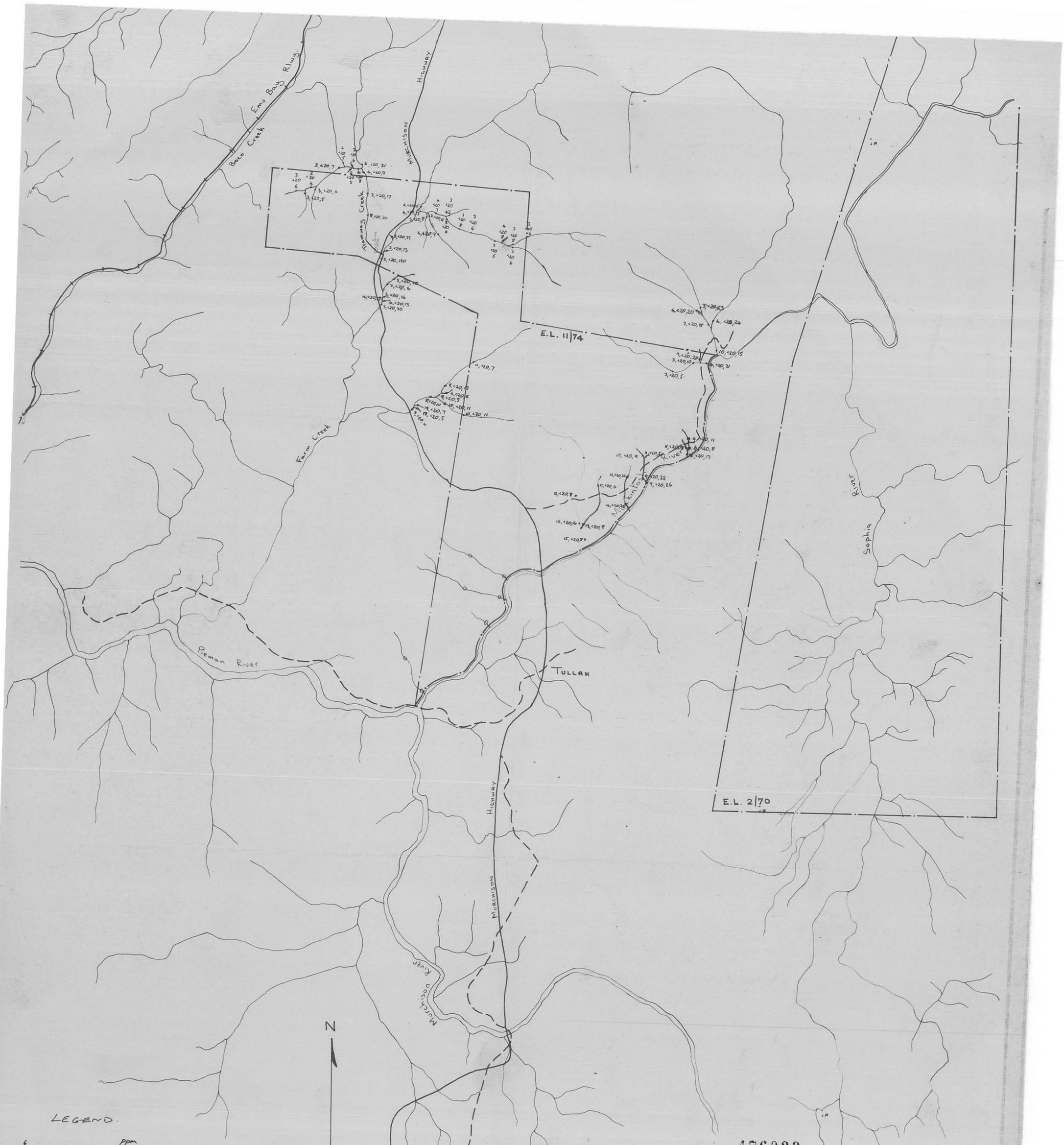


LEGEND

Fault legend and alteration notes etc
as per QR Cross sections.



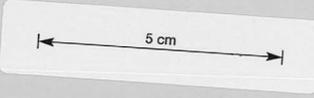
COMINCO EXPLORATION PTY. LTD. 476022
 FARM CREEK EXPLORATION LICENCE.
 11/74.
 SURFACE OUTCROP GEOLOGY - Preliminary Edition.
 Scale: 1 to 25000
 75-1146 1656 GR EHS.



LEGEND.

ppm
 Cu
 Pb
 Zn
 sample number

Proposed sample locations.



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COMINCO EXPLORATION PTY. LTD.

FARM CREEK EXPLORATION LICENCE.
 11/74.

STREAM SEDIMENT GEOCHEMISTRY - PRELIMINARY ED.
 Scale: 1 to 25000 Cu-Pb-Zn

75-1146

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GR. HLF