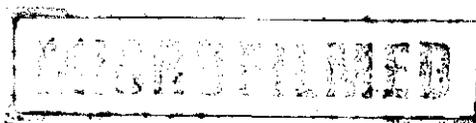


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AUSTAMAX RESOURCES LIMITED



FINAL REPORT
ON
EXPLORATION ACTIVITIES
WITHIN E.L. 33/83, PALOONA
NORTHERN TASMANIA

R.M. VIVIAN
 SEPTEMBER, 1984



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1. SUMMARY

This report outlines the assessment of EL 33/83 during the period of tenure from 21 September 1983 to 20 September 1984. Field work involved regional bulk stream sediment sampling for gold in conjunction with reconnaissance mapping in Cambrian volcanics and sediments, and evaluation of old prospects.

Cambrian lithologies strike in a general north westerly direction. They are dominated by fine-medium grained volcanoclastic sediments with scattered trachyandesite lavas, intrusives and crystal tuffs, and carbonate conglomerates. Regional alteration and deformation is minimal in the Cambrian. Thickly bedded units with strong jointing are typical. Near the northern boundary of the E.L., Precambrian metamorphic basement is exposed. Post Cambrian cover includes the basal Ordovician Dial Conglomerate and extensive Tertiary basaltic lavas.

Minor prospects for copper, barite and silver occur throughout the E.L. This mineralisation is interpreted to be stratabound hydrothermal alteration of permeable horizons which can be carbonate, chert, volcanoclastic conglomerates or pumiceous tuffs. Hydrothermal fluids probably emanated from subvolcanic intrusives.

Bulk stream gold assays only indicated weak anomalies in the Sprent area, gold probably being shed from sub-basaltic Tertiary sediments which have been the focus in the past of minor alluvial gold prospecting. An isolated anomaly is located in a tributary of the Don River, draining the carbonate-rich Bott Conglomerate and quartzose Dial Conglomerate.

Rock chip analytical values from the area are disappointing, the only significant values being from Lucas and Perry's prospect at Lower Wilmot; here a deeply weathered (carbonate rich) conglomerate assayed 2500 ppm Pb, 5200 ppm Zn, 4 ppm Ag, and .04 ppm Au. The dimensions of this mineralisation are considered to be too small to be of further interest.

2. CONCLUSIONS AND RECOMMENDATIONS

From previous stream sampling by B.H.P. and C.R.A.E., and current field work, it is considered that there is little scope for the existence of significant outcropping deposits of base or precious metals in EL 33/83.

The only prospective potential may be precious metals associated with stratabound hydrothermal mineralisation in tuff and conglomerate horizons. The conglomerates occur extensively, and may be more highly mineralised in proximity to major structures in coincidence with subvolcanic intrusives.

3. INTRODUCTION

Exploration Licence 33/83 was granted to Austamax Operations Pty. Limited over a 134 km² area in the vicinity of Palooa on 21 September, 1983.

This property was considered to have some potential for massive sulphide mineralisation given that several copper ± lead, zinc prospects are recorded from the area and perhaps represent volcanogenic mineralisation which has been remobilized into its present expression by post depositional deformation. In addition the Cambrian volcanic and sedimentary rocks perhaps correlate with Dundas Trough rocks and thus may host Que River/Rosebery-style massive sulphide mineralisation.

Exploration activities included reconnaissance mapping of the Cambrian volcanics and sediments, augmented by rock chip and stream sediment sampling, evaluation of the old prospects and regional bulk gold sediment sampling. This work was largely undertaken by Austamax staff, and by R. Poltock, a contract geologist employed during the latter part of the project life.

3.1 Location, Access

The licence area is located at about longitude 146°12' east, 41°18' south and is situated southwest of Devonport on the north coast of Tasmania (Figure 1.). A good network of sealed roads services the area. Forestry tracks provide road access to the more rugged areas.

3.2 Climate, Vegetation, Physiography

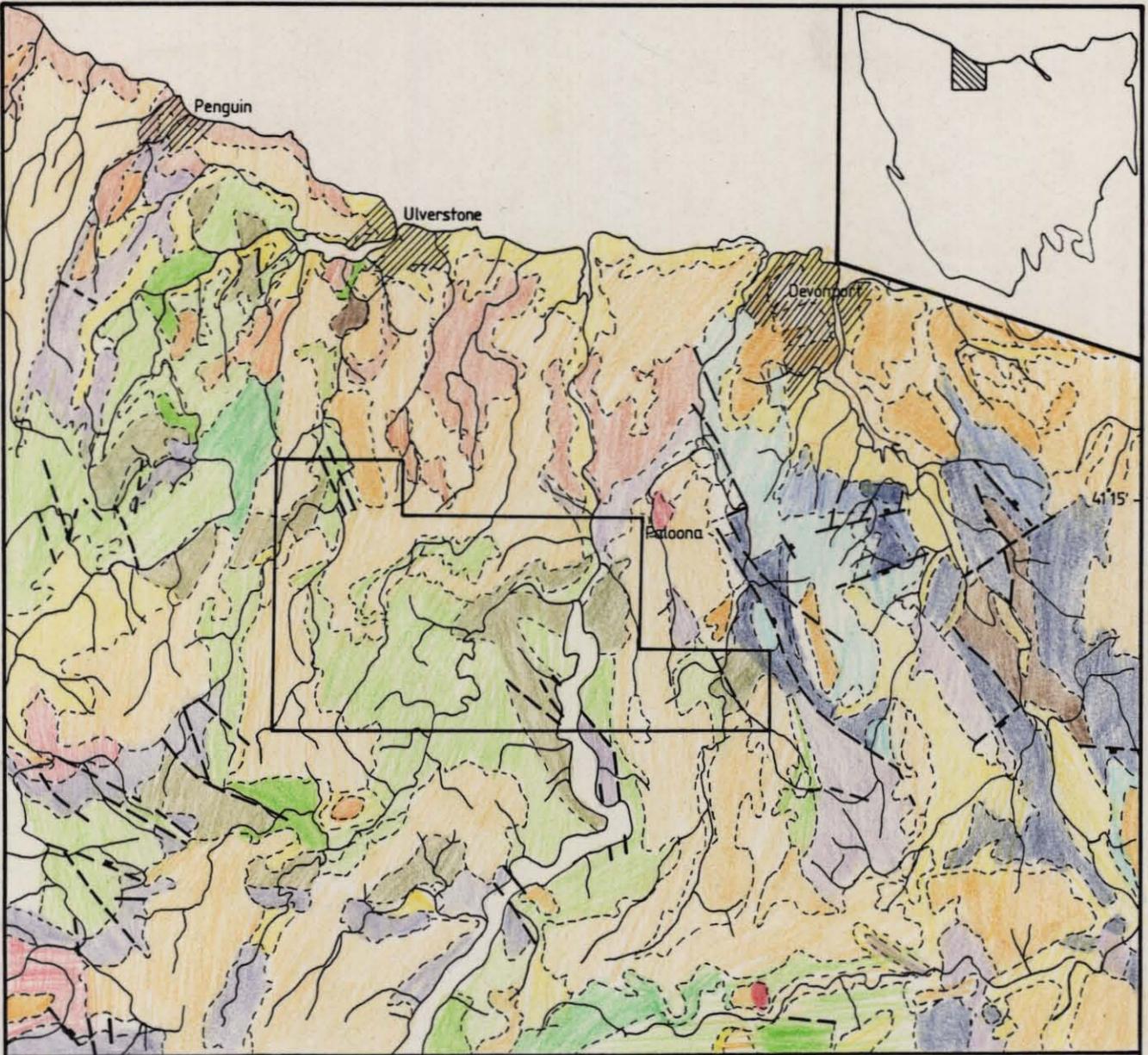
The Palooka area enjoys a temperate climate with the summer months between November and March recording temperatures rising to a mean of 18°C in February from a low of 7° during the winter months.

Average rainfall is approximately 1140 mm and is in general higher in the more elevated southern portions of the area. Wettest months are July and August which each record a mean of about 212 mm.

The physiography of the E.L. area can be divided into two terrain styles. In the south the Wilmot and Forth Rivers and their tributaries have incised gorges along much of their courses; this highly dissected terrain is covered by thick eucalypt rain forests with myrtle and sassafras and lies within State Forests below the confluence of the two rivers. In the north, Tertiary basalts form flat-lying plateaux which have been cleared for crops and dairy farming.

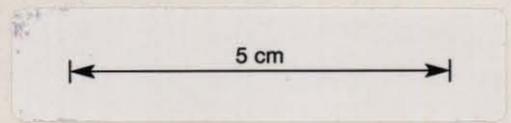
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Holocene		Alluvium, sand, gravel and talus
Tertiary		Non-marine sequence Basalt and related igneous rock types
Triassic		Upper glacio-marine sequence of pebbly mudstone, sandstone & limestone
Permian		Fresh water sequence with some coal measures
Carboniferous		Lower glacio-marine sequence of pebbly mudstone, sandstone, minor limestone, Tasmanian oil shale & basal tillite
Lower Devonian		Limestone - siltstone
Silurian		Limestone sequence
Ordovician		Siliceous terrestrial conglomerate marine quartzwacke & siltstone
Cambrian		Fossiliferous greywacke turbidite sequence
		Intermediate volcanic & associated rocks
		Basic-intermediate volcanic & associated rocks
		Unfossiliferous greywacke turbidite sequence
Precambrian		Pelitic sequences
		Metaquartzite sequences

Jurassic		Dolerite & related rock type
Lower Carboniferous Upper Devonian		Dominantly adamellite - granite



E. L. 33/83 PALOONA
REGIONAL GEOLOGY OF
NORTHERN TASMANIA

SCALE 1: 250,000

146°10'

146°20'

FIGURE 1

4. REGIONAL GEOLOGY

Cambro-Ordovician sediments and volcanics are the dominant rock types within E.L. 33/83 (Figure 1.). These lithologies are unconformably underlain by pelitic and orthoquartzitic sequences and amphibolite of the Precambrian Forth Block, a small outcrop area of which occurs in the north eastern corner of the E.L.

Cambrian sedimentation comprises a complex pile of chert, greywacke and volcanic material about 400m thick deposited in an actively developing NW-SE trending basin, the Fossey Mountain Trough.

The Cambrian succession comprises initial sedimentation of chert within the axial portion of the trough in the south. In the northern part of the trough this was preceded by the Cateena Group which comprises alternating volcanics and greywacke to mudstones. Deposition of the Cateena Group was terminated by the Hardstaff Movement resulting in an unconformity with the overlying Barrington Chert.

Basic lavas and pyroclastic breccias of the Beulah Formation (and correlate Molton Spillite) were deposited along the flanks of the trough. These were contaminated by chert sediments shed from the emerging Barrington Ridge. To the south thick sequences of greywacke turbidites (Gog Range greywacke) were then deposited, while to the north the Radfords Creek Group comprising greywackes, greywacke conglomerates, mudstones and intermediate volcanics, disconformably overlies the Hardstaff Unconformity.

The Ordovician rocks of the Roland Conglomerate and Moina Sandstone are of terrestrial origin, unconformably overlying the Cambrian System. Tertiary basalts partly

cover the above lithologies. Quaternary deposits occur as river alluvium and are particularly abundant near the junction of the Forth and Wilmot Rivers and as terrace alluvium downstream of Paloona Bridge. Basalt talus occurs around the margins of the basalt plateau areas.

5. KNOWN MINERALISATION

Minor prospecting was carried out in the late 1800's, the main impetus for this was probably the discovery of alluvial gold in the Clayton Rivulet, Sprent and Paloona areas. Hard rock prospects are limited to trenches and shallow shafts, with the exception of Alma Copper Mine where two exploratory adits were driven (Figure 2.).

Prospecting was based on pyritic occurrences and gossans, the latter formed on carbonate/dolomitised conglomerates.

Alma/Barrington Copper Mine

The area was reported on by Twelvetrees (1909), who described the workings and styles of mineralisation.

Mineralisation here consists of pyrite-barite-quartz-siderite-chalcopyrite veins to a maximum thickness 2.5 m, occurring in shales and dolomitised conglomerates. Prospecting interest was initially copper and barite, a 9 cwt parcel of pyritic ore being produced.

Gossans developed on the dolomitised conglomerates probably first attracted attention to the area. Workings include trenching, shafts and two adits, only the Devonport adit is now open; the main Barrington adit is thought to have been submerged by Lake Paloona.

A soil geochemical survey centred on the prospect was carried out by the Mines Department (Cromer 1973). Isolated copper and lead values were obtained, with maximum values of 1000 and 960 ppm respectively; the highest Pb values were associated with gossans. The mean values were Cu 4 ppm, Pb 8 ppm, Zn 10 ppm.

The best rock chip samples obtained by Austamax from the area were:

A6648 Black siltstone: A medium grained carbonate rich pyritic sediment. Zn 165 ppm, As 63 ppm.

A6662 Black siltstone with veins of pyrite, chalcopyrite, siderite and barite from the Devonport adit dump. Cu 425 ppm.

A6663 Gossan from shafts/trenching. Zn 340 ppm, As 46 ppm.

Lucas and Perry's Prospect

This prospect is located 500 m NW of Eardley Tor, which is 500 m south of where the prospects are plotted on the Sheffield 1:63 360 sheet.

A recent logging track passes through the prospect exposing the gossans. The workings are briefly discussed by Twelvetrees (1909): "two lines of gossans in slate - with shafts 38 ft and 40 ft deep - assays from each 6 & 2 dwts/ton Ag."

Four samples of gossan and deeply weathered rock were assayed, the latter interpreted to have been a dolomitised conglomerate (similar to A6661). This contained the only significant values for the E.L.: Cu 730 ppm, Pb 2500 ppm, Zn 5200 ppm, As 18 ppm, Ag 4.00 ppm, Au 0.04 ppm.

The dominant lithologies in the area are fine grained siltstone and tuffaceous sediments.

Duncan and Maclaren's

Shallow excavations are located on the eastern bank of the Gawler River approximately 250 m downstream from East and West Gawler River confluence.

A locally pyritic contact zone has been exposed between a shale and weakly altered intermediate intrusive porphyry (see A6620 petrological description appendix 3.)

Of the samples taken by Austamax, the best values were:

A6619 disseminated pyrite in shale and porphyry
 Ag 0.5 ppm, As 64 ppm.

A6621 massive pyrite from dump, probably gouged from
 the 10 cm wide pyritic contact between the
 shale and porphyry.
 Ag .02 ppm, As 150 ppm.

A second prospect "Fork of the Gawlers" is located at the confluence of the East and West Gawler Rivers. Only minor signs of prospecting could be seen, the only lithologies of interest here are a pyritic (<5%) black siltstone (A6622) from which no significant values were obtained, and a carbonate conglomerate/breccia, which may be an intraformational breccia, containing minor amounts of pyrite.

Immediately upstream of the Isandula bridge on the West Gawler River, a third prospect is marked on the Mines Department 1:63,360 sheet. No sign of prospecting could be located, and the only outcrop is a chert limestone pebble conglomerate with scattered grains of pyrite and pyrrhotite. A6615 returned no significant assay (see Appendix 1a).

Wilmot River Barite

Barite-siderite veins less than 10cm thick are exposed on the eastern bank of Wilmot River 2.2 km south of the licence boundary in E.L. 49/82. The veins occur in calcareous shales, tuffaceous sandstone and an altered volcanic:

A6666 (Geochempet) "Heavily carbonated and moderately sericitised lithic crystal pumice tuff with traces of pyrite."

The above sample and A6665 (siderite veins) were assayed with no significant result (see Appendix 1b).

Central Castra Barite

This prospect wasn't located, as plotted on the 1:63 360 Sheffield sheet on East Gawler River. Austamax sampling A6512-18 from the area gave no significant results. The petrological description of A6513 by Central Mining Services was "sheared altered volcanic - conspicuous sideritic carbonate." (Appendix 3b).

McPherson's Copper

This prospect was not located, the area indicated on the 1:63,360 sheet was traversed several times. No references have been cited for this prospect.

The geology is well exposed in the East Gawler River, and includes thickly bedded tuffaceous siltstone, greywackes and coarser volcanoclastics (<10mm grainsize). A medium grained pumice tuff outcrops extensively between the river and Upper Castra Road, this is the only interesting lithology. A description of Sample A6608 by Geochempet Services was "Weathered, intensely sericitised pumice tuff, formerly rich in disseminated sulphides."

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Outcrops of this unit typically have a limonitic crust and limonite developed on joints. Sericitised horizons are underlain by massive unaltered fine grained vitric tuffs and sediments. The pumice tuff has been interpreted as a permeable unit which facilitated entry of hydrothermal solutions.

A6608 and A6609 samples of this alteration were submitted for assay with no significant results (see Appendix 1b).

Alluvial Gold Prospects

1. Sprent Moreton Road Area

The only reference to these workings is on the 1:63,360 Sheffield sheet, two prospects are plotted but no signs of prospecting activity were located at either locality. The southwestern area is now the site of a large irrigation dam; the geology here is considered to be a window in Tertiary basalts exposing sub-basaltic quartz rich gravels with Cambrian volcanic bedrock. The auriferous alluvium is considered to be Precambrian derived.

These gravels were sampled for bulk gold analysis, resulting in a weak anomaly (Sample A6623, Appendix 2).

The Cambrian bedrock (A6624) has been described by Geochempet as "Quartz bearing pyroxene trachyandesite with light alteration to epidote and chlorite - part of a sill or dyke."

The northeastern of the two NE occurrences is probably another small window in Tertiary basalt, scattered rounded quartz pebbles indicating presence of sub-basaltic gravels.

2. Cooper-Smiths

This area has been reported on by Burns (1957) and Jennings (1978). Workings are located on alluvial flats at the Paloona Bridge and the confluence of Forth and Wilmot Rivers. The auriferous alluvium is considered to be sub-basaltic, part of the palaeo Paloona River (see Figure 2) with a source area in the Sheffield-Lower Barrington area (Burns, 1957).

Samples of hematite and black shale (A6432-34) collected by Austamax in this area returned no significant assays.

6. PREVIOUS WORK

Recent exploration of the Palooa area commenced with B.H.P. Ltd. which conducted between 1965 and 1969 a programme of aeromagnetism, ground follow-up and regional stream sediment geochemistry over 4380km² in North Central Tasmania. This covered the western part of the present E.L. area. Exploration targets were magnetite and sulphide ore deposits associated with granites and ultrabasics.

Ground follow-up of aeromagnetic anomalies failed to sustain interest in them and all significant sediment anomalies were located outside the present area of interest.

C.R.A. Exploration Pty. Ltd. pegged most of the area in 1972 primarily to explore for stratiform copper-lead-zinc mineralisation. By 1974 detailed geochemical drainage sampling and geological mapping had failed to detect economic mineralisation with good surface expression on favourable stratigraphic units.

7. EXPLORATION ACTIVITIES

7.1 Geology

Emphasis was placed in the field work on Cambrian lithologies. There are no indications that the Precambrian metamorphics or the post Cambrian sediments are of any prospective significance, although minor detrital gold is reported in sub-basaltic gravels at Sprent and Palooka. (Jennings, 1979).

Compilation of Figure 2 is based on data from scattered locations. No attempt has been made to map units in detail. The extent of lithologies other than the Cambrian have been copied from the Mines Department 1:63,360 Devonport and Sheffield sheets.

Precambrian

Silicified quartzites of this age were only located at the head of Claytons Rivulet. Burns (1957) and Jennings (1979) discuss these metamorphics in detail. Lithologies include graphitic-chloritic schist, gneiss and quartzite. They are considered to be part of the Forth metamorphic nucleus.

Cambrian

Deposition of the Cambrian does not appear to have taken place in a well defined trough but overlaps on to the Precambrian basement. Similarly, the overlying basal Ordovician conglomerates and sandstone have an overlapping relationship.

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The Cambrian is dominated by fine to medium grained tuffaceous sediments, derived from an intermediate volcanic terrain. Trachyandesitic lava intrusives and tuffs are closely associated with the sediments.

The gross depositional environment is subaqueous and distal to a volcanic centre, and has been subdivided by Burns and Jennings of the Tasmanian Mines Department into three broad subdivisions: The Gog Range Greywacke, Barrington Chert and Bott Conglomerate. More detailed mapping was undertaken by Burns in the Wilsonia and Isandula area in 1957.

In 1974, T.M. Porter of C.R.A.E. made further subdivisions with emphasis on volcanic lithologies, i.e. tuffaceous sediments with rhyolitic - rhyodacitic lavas, intrusives and pyroclastics. From current mapping many of these subdivisions are only applicable locally and the volcanism is more andesitic. Rhyolites are probably more extensive in the Nietta area.

From current mapping there appears to be a similar style of sedimentation throughout the E.L., ^{evidence (?)} dominated by fine vitric tuffs (Barrington Chert), siltstone and medium grained tuffaceous sediments.

A representative suite of lithologies have been described by Geochempet Services and Central Mining Services (see Appendix 3.) Three broad subdivisions of the Cambrian have been made on the basis of locally abundant volcanics and coarse grained volcanoclastics - carbonate rich conglomerates. These units strike northwest; there is no indication of stratigraphic relationships.

The rock descriptions are summarised below:

Fine vitric tuffs, siltstone and medium grained tuffaceous sediments

- A6646 described by Geochempet Services as "Finely recrystallised, fine vitric tuff derived from a trachyandesitic source".
- A6508A (CMS) "Welded rhyolitic tuff".
- A6509A (CMS) "Vitric crystal tuff - may be welded."
- A6652 (Geochempet) "Volcaniclastic arenite derived from intermediate and acid source rocks."

Coarse grained volcaniclastics - carbonate rich conglomerates

Sedimentation correlates with the Gog Range Greywacke and Bott Conglomerate.

The unit is considered to be the most prospective, mineralisation being closely associated with carbonate volcaniclastic conglomerates at Alma Copper Mine, Lucas and Perry's, and possibly Crawfords's Lodes at Alma (the latter was not located but the description by Twelvetrees has similarities to the other two prospects).

A6661 described by Geochempet as "Finely pyritic, heavily dolomitised pebbly volcaniclastic arenite". This sample from the eastern side of Lake Palooka is interbedded with finer grained carbonates.

The Bott Conglomerate which is interpreted to be a similar sediment, occurs further east in the Don River/Barren Hill area. Here Precambrian chlorite schist and quartz detritus forms a major part of the rock with scattered carbonate and chert pebbles in a calcareous matrix. Deep weathering of the conglomerate has produced residual quartz gravels which have been extensively quarried.

Trachyandesite volcanics include intrusives, lavas and crystal lithic tuffic, typically weathering to red brown clay soils. Small intrusives are associated with pyrite mineralisation at Duncan and MacLarens prospect on the Gawler River. See A6620.

(Descriptions by Geochempet):

- A6620 Intrusive felsite porphyry with mild carbonate-chlorite-rutile alteration.
- A6624 Quartz-bearing pyroxene trachyandesite intrusive with light alteration to epidote and chlorite.
- A6634 Chloritised, partly recrystallised, amygdaloidal trachyandesite lava.
- A6672 Chloritic reworked pyroxene andesite crystal tuff.

The lavas are considered to be subaqueous and are clearly interlayered with fine-medium grained tuffaceous greywacke sediments in Payne Creek.

Pumice/glass rich tuffaceous sediments - pyroclastics

Outcrop in the SW area of licence, in the field they were considered to possibly be rhyolitic ignimbrites

- on the basis of the absence of reworking and abundance of pumice clasts. McPherson's copper prospect may be associated with one of these units A6608.

Petrological descriptions:

A6608 (Geochempet) "Weathered intensely sericitised pumice tuff, formerly rich in sulphides."

A6666 (Geochempet) "Chloritic, intermediate lithic crystal vitric tuff."

A6513A (CMS) "Sheared altered volcanic - may have been a lava or pyroclastic rock."

7.2 Geochemistry

In the current exploration two phases of sampling were carried out, the first by Austamax personnel and the second by Roger Poltock Geological Services Pty. Ltd. All assaying was done by Analabs.

a) Austamax Sample Nos A3427, A6432-6434 and A6508- 6522, a total of 20 rock chips and four -80# stream sediments (see Appendix 1a).

b) Poltock Sample Nos. A6601-90 includes 44 bulk stream sediment samples analysed for gold via cyanide leach, 26 rock chips (see Appendices 1b and 2).

All sample sites are marked with permatags and red/white tape, and have been plotted on Figure 1.

Bulk 5 kg stream sediments - taken from stream bed gravels, the coarser detritus being discarded by hand. Only occasionally were good trap sites located, there is no association between better gold values and these sites. Only major streams draining Cambrian lithology were sampled, detritus was frequently dominated by Tertiary basalt, tending to dilute samples.

Stream gold values are reported in the following manner:

Au1. Micrograms of gold per gram of zinc.

Au2. Calculated total gold leached from the whole sample in micrograms.

Au3. Calculated grade of the sample in micrograms per tonne.

Four weak anomalies occur (see Appendix 2)

Result	Au1.	Au2.	Au3.
No. A6623	.19	.8	290
No. A6626	.14	.9	210
No. A6627	.14	.8	205
No. A6678	.16	1.7	235

The first three sites are interpreted to be shed from Tertiary gravels occurring in the Sprent and Gawler River area. These gravels outcropping at A6623 (reported alluvial gold prospect) are quartzose and probably Precambrian derived.

A6678 is an isolated occurrence in a tributary of the Don River at Lower Barrington. The drainage

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area includes the Cambrian carbonate-rich Bott Conglomerate and quartzose Dial Conglomerate. No recorded mineralisation occurs in this area. The value may be elevated due to pot hole sampling. Tertiary sediments occur in the area, but if this is the gold source it should also be reflected in A6675 and A6676.

A fifth anomalous sample A6688 is actually a deeply weathered rock sample from a shaft at Lucas and Perry's prospect. This was mistakenly included in the stream sediments.

-80# stream sediments

Four sites were sampled in Barrington Creek near Alma Copper Mine and a tributary of Ingram Creek (mistakenly thought to be draining the Lucas and Perry's Prospect. Maximum values at the former location were 15 ppm Cu, 85 ppm Pb, 230 ppm Zn, Ag < D.L.

Previously most of the E.L. was covered by C.R.A.E. sampling (T.M. Porter, 1974) which detected two weak zinc anomalies (neither of which correlate with bulk stream gold anomalies). They are located:

- a) Seven hundred metres southeast of the Paloona Dam Wall, on the eastern bank of Lake Paloona.

Maximum value 22 ppm Cu, 18 ppm Pb, 187 ppm Zn, may be associated with dolomitised pyritic volcanoclastic (Sample No. 6661).

- b) Groove Creek, a western tributary of Wilmot River, maximum values were 160 ppm Zn and 150 ppm Cu from different sites. Mapping in this

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area by Porter (1974) outlined a body of massive rhyolitic pyroclastics and granodioritic - rhyolitic intrusives, the unit wasn't traversed in the current field programme.

Rockchip

With the exception of A6635 and 6636 all other results have been discussed under Previous Work; these two were the only samples with Sn and W above the detection limit. They were collected from the same area 2 km south of Sprent.

A6635 Deeply weathered andesitic volcanic? with quartz stringers
Sn 5 ppm, W 32 ppm.

A6636 Quartz specular hematite float block
Sn 41 ppm, W 39 ppm.

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8. EXPENDITURE STATEMENT

STATUTORY DECLARATION

I, Alan Ian Alistair Stewart of 223 Pacific Highway, North Sydney in the State of New South Wales do solemnly and sincerely declare that this is a true statement of expenditures for Palooka E.L. 33/83 from inception (21st September, 1983) to 20th September, 1984.

Publication, Maps, Reports & Memberships	\$ 804
Contractors (except Drilling)	3,370
Consultants	1,847
Drafting Services & Supplies	863
Assaying & Analysis	3,076
Office Rent	2,115
Office Maintenance	287
Telephone, Postage, Freight	894
Stationery & Office Supplies	252
Field Materials	197
Car Hire & Taxis	652
Air Travel	198
Lodgings & Meals	1,243
Vehicles - Maintenance	1,897
Allocated Salaries Incl. Fringe	16,688
Allocated Overheads	3,351

Expenditures for the Period 21st September 1983 to 20th September 1984.	<u>\$37,734</u>
--	-----------------

And I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act, 1900.

Subscribed and declared at)
Sydney this second day of)
November One thousand nine)
hundred and eighty four)
before me:)



J. Hoelder, J.P.
A Justice of the Peace

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APPENDIX 1A.

REGIONAL ROCK CHIP GEOCHEMICAL RESULTS -

No. A6508 - 22, A6432 - 34

A3427

AUSTAMAX SAMPLES

SAMPLE RECORD

KINDRED 1 : 25000 TOPO

1:250,000 Sheet Area

AMAX IRON ORE CORPORATION
(MINERALS EXPLORATION DIVISION)

PALOONA

Property or Prospect

White: Office
Yellow: Project Geologist
Green: Sampler

030

Date: _____ Collected by: _____ Sample Batch No. _____ Analyses by: ANALABS

Sample No.	Description	Location	Analyses (ppm unless otherwise stated)						Comments
			Cu	Pb	Zn	As	Fe% Mn	Au Ag	
A6508	ashflow tuff, f. gr. white, siliceous, wisps of ? chlorite and siliceous flow streaks around large feldspars define flow, occasional green (fuch site) altern of feldspars	Lake Isandula 274331	25	35	120	20	1.45 100	x 0.5	A6508A- thin set Wilsonia Volc.
A6509	ashflow crystal tuff; dark grey, fine-med.gr. much green chlorite replacing large feldspar phenos, groundmass is qtz crystals + biotitised hb. latns aligned and aggregates; clots dissemi- nated pyrite, a siliceous rock; rope large ragged qtz phenos	274329	10	20	55	11	1.50 125	x 0.5	A6509A-thin secti
A6510	well weathered, brown feldspar, tuff	280 335 Duncanc-McClarens X	10	25	40	8	5.10 115	x x	possibly Kerrison volcanics
A6510A	fault vein qtz material, limonitic and manganese stained	2880 325 Duncan-McClaren prospect	130	20	85	30	2.55 655	x 0.5	faulted contact on above volcanic
A6511	yellow brown leached arsenopyrite stains & Fe stained, some arsenopyrite boxworks in cleaved siltstone	Fork of River Prospect/Fault	70	50	40	31	5.40 425	x 0.5	

267031

SAMPLE RECORD

AMAX IRON ORE CORPORATION
(MINERALS EXPLORATION DIVISION)

White: Office
Yellow: Project Geologist
Green: Sampler

031

1:250,000 Sheet Area

CASTRA 1 : 25000

Property or Prospect

PALOONA

Date: 21 March 1984

Collected by: R. Vivian

Sample Batch No.

Analyses by: ANALABS

Sample No.	Description	Location	Analyses (ppm unless otherwise stated)							Fe ₂	Au	As
			Cu	Pb	Zn	Ag	Mn	Ba				
A6512	cream textures rock (volcanic) silicified; seritised	Castra 427200 5427200 E. Gawler River	10	x	70	x	2650	410	3.30	x	2	
A6513	med.gr. altered volcanic; cream with greenish tinge due to sericitisation of plagioclase; silicified cloudy groundmass	E. Gawler R. Castra 427200 5427200	10	x	50	0.5	2000	200	5.10	x		
A6514	tension vein qtz in indurated siltstone or fine gr. tuff	E. Gawler Rd. Castra 42680 542665	10	x	15	x	150	100	6700	x		
A6516	rock chip samples: strongly fractured/sheared? volcanic. Max 1.5 cm	Castra 42666 54270 E. Gawler R. Gossan	15	x	50	x	1350	130	14.5	x		
A6516A	fractures, red-brown FeOx & waxy conchoidal black MnO ₂ as filling (weathered in places to give open fractures). Minor qtz veining textured of host obliterated		20	5	70	x	2050	170	13.5	x		
A6516B												

267032

032

SAMPLE RECORD

AMAX IRON ORE CORPORATION
(MINERALS EXPLORATION DIVISION)

White: Office
Yellow: Project Geologist
Green: Sampler

1:250,000 Sheet Area **CASTRA & KINDRED 1 : 25000**

Property or Prospect **PALOONA**

Date: **21 March 1984**

Collected by: **D. ELLIS & R. VIVIAN**

Sample Batch No.

Analyses by: **ANALABS**

Sample No.	Description	Location	Analyses (ppm unless otherwise stated)								Comments	
			Cu	Pb	Zn	Ag	Fe%	Mn	Au	Ba		As
A6517	cream, siliceous rock, texture indistinct, subpl FeOx lined tear fractures	E. Gawler R. Castra 427 480 5426440	10	x	20	x	2.90	490	x	210	3	similar to A6512 (Wilsona volc)
A6518	Apple green, sericitised rock, cloudy matrix, weakly cleaved	427500 5426400	10	x	20	x	3.30	2350	x	305	1	similar to A6513 (Wilsona volc)
A6519A	porphyritic volcanic - sericitised plagioclase & chlorite pseudomorphing hornblende phenocrysts aphanitic matrix	Paloona Bridge	10	x	95	x	4.65	450	x	130	1	Kerrison Volcanics
A6520	pink-cream, highly weathered saprochitic volc	Moreton-Sprent Rd	35	10	35	x	1.90	75	x	25	13	Kerrison Volcanics
A6521	as per A6519 med.gr. volcanics (lava or lithic tuff) crowded plagioclase phenos (chloritised margins) and smaller hornblende laths plys angular chert fragments	Paloona Bridge pump house Preson Road near Kerrisons Ck	20	5	115	x	3.05	480	x	50	3	Kerrison volcanic dacitic lava
A6522	Kerrison Volcanics	Preston Rd kindred 27350 39020	20	15	240	x	3.15	610	x	70	4	

26703

033

267034

APPENDIX 1B.

REGIONAL ROCK CHIP GEOCHEMICAL RESULTS -

Nos. A6607-9, 15, 19, 21, 22, 35, 36, 44, 48, 55-57
61-63, 65, 66, 74, 77, 87-91

POLTOCK SAMPLES

SAMPLE RECORD

AMAX IRON ORE CORPORATION
(MINERALS EXPLORATION DIVISION)

White: Office
Yellow: Project Geologist
Green: Sampler

1:250,000 Sheet Area 1-25000

Property or Prospect EL 33/83

Date: Collected by: R. POLTOCK

Sample Batch No.

Analyses by: ANALARS

Sample No.	Description	SHEET	Location	Analyses (ppm unless otherwise stated)						Comments
				Ca	Pb	Zn	Ag/Au	As	Sn/W	
A 6604	Volcaniclastic medgrained felds xt dominia	CASTRA SHEET		—	—	—	—	—	—	
A 6607	Gossan - deeply weathered rock	WILMOT		25	40	170	x/01	14	x/x	
A 6608	Weathered intensely silicified pumice tuff (Joyce)	"		10	25	120	x/x	2	x/x	
A 6609	As above with limonitic stockwork imp	"		25	25	155	x/x	12	x/x	
A 6611	Crystal lathic tuff (<10mm grainsize) clastic	"		—	—	—	—	—	—	
A 6615	Conglomerate chert frags <20mm carbonate matrix	CASIRA		110	30	190	x x	3	x x	
A 6616	Vitric tuff fine grained water laid.	"		—	—	—	—	—	—	
A 6619	Durom pyrite in black schistone, altered felsic porphyry	"	CAWLER R Duncan MacLennan	30	65	110	0.5 x	64	x x	
A 6620	Felsite porphyry ± mild carbonate/chlorite/rutile alteration	"	"	—	—	—	—	—	—	
A 6621	Massive pyrite prospect dump	"	"	30	80	95	2.5/02	150	x x	
A 6622	Black schistone, minor pyrite	"	FORK of Hawkshead	60	45	145	x x	12	x x	
A 6624	Trachyandesite - quartz bearing, pyroxene epidote rich alkali	"	Alluvial fill Clayton Dale	—	—	—	—	—	—	
A 6625	Tuffaceous sediment fine med grain	"		—	—	—	—	—	—	
A 6628	Silicified of quartzite	"		—	—	—	—	—	—	
A 6631	Fine vitric tuff water laid	WILMOT		—	—	—	—	—	—	
A 6634	Trachyandesite lava amygdaloidal chloritized	"		—	—	—	—	—	—	
A 6635	Iron schistone with iron ore - limonite crust	"		30	30	200	x x	5	5/32	
A 6636	Iron schistone with iron ore - limonite crust	"		15	25	135	x x	1	4/100	

267035

SAMPLE RECORD

AMAX IRON ORE CORPORATION
(MINERALS EXPLORATION DIVISION)

White: Office
Yellow: Project Geologist
Green: Sampler

1:250,000 Sheet Area 1:25000

Property or Project EL 33/83

Date: Collected by: R. POLTOCK

Sample Batch No. Analysis by: ANALABS

Sample No.	Description	SHEET	Location	Analyses (ppm unless otherwise stated)						Comments	
				Cu	Pb	Zn	Ag	Au	As		Sn
A 6640	Tuffaceous sediment, fine grained	WILMOT		—	—	—	—	—	—	—	
A 6641	" med grained, laminar joints	"		10	20	155	x	x	x	x	
A 6643	Fine vitric tuff water laid	"		—	—	—	—	—	—	—	
A 6646	" " " "	"		—	—	—	—	—	—	—	
A 6648	Black silt + carbonate pyritic	"	Banston Ck	70	45	165	0.5	x	63	x	x
A 6649	Conglomerate, coarse, poorly sorted, carbonate rich	"		—	—	—	—	—	—	—	
A 6652	Volcaniclastic arenite (grey)	"		—	—	—	—	—	—	—	
A 6655	Conglomerate carbonate minor py	"		45	25	160	x	x	8	x	x
A 6656	Spherulitic dolomitic float black pyritic	"		55	25	120	0.5	x	15	x	x
A 6657	Grosser like A6655 conglomerate?	"		180	30	245	x	x	15	x	x
A 6661	limestone + pyritic dolomitic pebbles volcaniclastic (grey)	"		60	30	140	x	x	3	x	x
A 6662	Black silt, carbonate with py cop pyroxide	"	Adit dump Banston Co.	425	25	140	x	x	15	x	x
A 6663	Angly with carbonate? - grosser	"	Shelf	75	45	340	x	x	46	x	
A 6664	Tuffaceous sediment fine-med grained	"		—	—	—	—	—	—	—	
A 6665	Basaltic tuffaceous sandstone calc shales	"	Wilmot R. Banston Co.	20	25	145	x	x	20	x	
A 6666	limestone + pyritic dolomitic pebbles volcaniclastic	"	"	15	25	105	x	x	12	x	
A 6667	Chert + limestone siltstone conglomeratic tuff (grey)	"		—	—	—	—	—	—	—	
A 6669	" " " "	"		—	—	—	—	—	—	—	

267036

SAMPLE RECORD

AMAX IRON ORE CORPORATION
(MINERALS EXPLORATION DIVISION)

White: Office
Yellow: Project Geologist
Green: Sampler

1:250,000 Sheet Area 1:25,000

Property or Prospect EL 33/83

Date:

Collected by: R. Pollock

Sample Batch No.

Analyses by: ANALABS

Sample No.	Description	Sheet	Location	Analyses (ppm unless otherwise stated)								Comments		
				Co	Pb	Zn	Ag	Au	As	Sw	W			
A 6672	Alonke reworked pyroxene andite xt ^{dykes}	"	"	-	-	-	-	-	-	-	-	-	-	
A 6674	Ferric crete	Railton	"	40	30	155	x	x	11	x	x	x	x	
A 6677	Carbonate (Eb) variety laminae carbonate matrix	"	"	30	25	130	x	x	3	x	x	x	x	
A 6680	Vitic tuff fine grained	Wilmet	"	-	-	-	-	-	-	-	-	-	-	
A 6681	Trachyandesite amygdaloidal lava	"	"	-	-	-	-	-	-	-	-	-	-	
A 6687	Gossan trench/shaft	"	Lucas Perry's	85	55	125	x	x	10	x	x	x	x	
A 6688	"	"	"	-	-	-	-	-	-	-	-	-	-	
A 6689	Fine and grained stone float pitrip after py	"	"	25	15	110	x	x	2	x	x	x	x	
A 6690	Deeply weathered carbonate conglomerate	"	"	730	2500	5200	40/00	x	18	x	x	x	x	
A 6691	Gossan on track 20m 5th shaft	"	"	75	85	220	x	x	51	x	x	x	x	

267037

036

267038

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.
52 Murray Road, Welshpool, W.A. 6106

Phone (09) 458 7999

Telex AA92560

ANALYTICAL REPORT No. 3.1 00 2576

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

Client: Australia Ltd
5 Osborne Avenue
Invercullen
Linneston TAS 7250

ORDER No.	PROJECT
EL30/83	PILCOON R
DATE RECEIVED	RESULTS REQUIRED
17.7.84	ASAP

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
		3	70

STATE OF SAMPLES	REFER BELOW	SAMPLE NUMBERS	PRE-TREATMENT						ANALYSIS				
			DRY	CRUSH	SPLIT	PULV-VERSE	SEYS	OTHER OR REMARKS	IONIC	REFER TO ANALYSIS SECTION	PREPARATION	METHOD	
	10.	0807, 8, 9, 15 19, 21, 22, 35, 36, 41, 43, 55, 56, 57, 61, 62, 63, 65, 66, 74, 77, 87, 88, 89, 90, 91	1	2	4	3c 5					Cu Pb Zn As As Sn W Au		103 114 401 309
	1.	Various 5 Pq Samples	1								Au		128

RESULTS

As Above

TO

RESULTS

Roger Pollock
C/- Post Office
Wilmot
Tasmania 7310

REMARKS

STATE OF SAMPLES	ANALYSIS - PREPARATION	ANALYSIS - METHOD
whole core split core cutting rock soil pulp water tissue stream sediment heavy mineral	WC SC CU Ro SO PU WA TI SS HIA	perchloric acid hydrochloric acid nitric acid aqua regia nitric-perchloric HF mixture HF under pressure fusion
	A1 A2 A3 A4 A5 A6 A7 A8	total acid specific sulphide other reduced acids alkaline attack volatilization ignition pressed powder ICP glass fusion XRF
	CA SS MA AA VO IO PP CP	atomic absorption x-ray fluorescence spectrophotometry colorimetry chromatography titration other chemical means miscellaneous fluorescence inductively coupled plasma
		AAS XRF SPEC COL CHR TTN CHEM MISC FLUOR ICP

AUTHORISED OFFICER *[Signature]*

038

267039

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX		REPORT NUMBER	REPORT DATE	CLIENT ORDER No.	PAGE					
		2.1 08 2576	2.9.64	EL 03/63	1 OF 1					
TUBE No.	SAMPLE No.	Cu	Pb	Zn	Hg	Pb	Sn	W	Flu	
1	66601	25	10	170	X	14	X	X	0.01	
2	66602	10	25	120	X	2	X	X		
3	66603	25	25	155	X	12	X	X		
4	66615	110	30	190	X	3	X	X		
5	66610	30	35	110	0.5	64	X	X	X	
6	66623	30	30	95	2.5	150	X	X	0.02	
7	66624	25	15	145	X	12	X	X		
8	66625	41	30	200	X	3	5	32	X	
9	66630	15	25	135	X	1	41	39	X	
10	66633	15	20	155	X	X	X	X	X	
11	66648	20	45	165	0.5	63	X	X	X	
12	66655	45	25	160	X	8	X	X	X	
13	66656	55	25	120	0.5	15	X	X	X	
14	66677	100	30	245	X	15	X	X	X	
15	66681	50	30	140	X	3	X	X	X	
16	66682	15	25	140	X	15	X	X	X	
17	66683	25	45	340	X	46	X	X	X	
18	66684	20	25	145	X	20	X	X	X	
19	66666	15	25	105	X	12	X	X	X	
20	6674	10	30	155	X	11	X	X	X	
21	6677	30	25	130	X	3	X	X	X	
22	6687	30	25	185	X	10	X	X	X	
23	6688	SAMPLE	NOT	SUBMIT	TED	-	-	-	-	
24	6689	25	15	110	X	2	X	X	X	
25	6690	230	2500	5200	4.0	18	X	X	0.04	

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 *Almough*

039

267040

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	As	Sn	W	Hg	
		J. I 08 2576		2.8.84		EL 30/83		OF		
1		75	85	220	X	51	X	X		
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	5	5	0.5	1	3	10	0.008	
24	DETECTION									
25	DETECTION	103	103	103	103	114	401	401	100	

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 *R. J. ...*

APPENDIX 2.

STREAM SEDIMENT GEOCHEMICAL RESULTS

SAMPLE RECORD

AMAX IRON ORE CORPORATION
(MINERALS EXPLORATION DIVISION)

White: Office
Yellow: Project Geologist
Green: Sampler

1:250,000 Sheet Area

1:25000 CASTRA WILMOT RAILTON

Property or Prospect

EL 33/83

Date:

Collected by:

R. POLTOCK

Sample Batch No.

Analyses by:

ANALARS

Sample No.	Description	Location	Analyses (ppm unless otherwise stated)					Comments
A 6601	5kg BULK STREAM SEDIMENT							
A 6602	"							
A 6603	"							
A 6605	"							
A 6610	"							
A 6612	"							
A 6613	"							
A 6614	"							
A 6617	"							
A 6618	"							
A 6623	"							
A 6626	"							
A 6627	"							
A 6629	"							
A 6630	"							
A 6632	"							
A 6633	"							
A 6637	"							

267042

041

SAMPLE RECORD

AMAX IRON ORE CORPORATION
(MINERALS EXPLORATION DIVISION)

White: Office
Yellow: Project Geologist
Green: Sampler

1:250,000 Sheet Area CASIRA WILMOT RAILTON Property or Prospect EL 33/83

Date: _____ Collected by: R POLTOCK Sample Batch No. _____ Analyses by: ANALARS

Sample No.	Description	Location	Analyses (ppm unless otherwise stated)						Comments
66 38	5kg Bulk stream sediments								
66 39	"								
A 66 42	"								
A 66 44	"								
A 66 45	"								
A 66 47	"								
A 66 50	"								
66 51	"								
66 53	"								
66 54	"								
66 58	"								
66 59	"								
66 60	"								
66 68	"								
66 70	"								
671	"								
66 73	"								
66 75	"								

267043

042

045

ANALABS

267046

A Division of MacDonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

3.1 08 2576

03.08.84

1 OF

TIME No.	SAMPLE No.	DRY WT	%CN	Flu(1)	Flu(2)	Flu(3)				
	6601	4.4	0.133	0.10	0.6	145				
2	6602	4.3	0.140	0.09	0.6	130				
	6603	4.9	0.122	0.09	0.6	135				
	6605	5.5	0.120	0.10	0.6	145				
5	6610	4.7	0.125	0.10	0.7	145				
	6612	3.8	0.125	0.10	0.5	145				
7	6613	4.2	0.134	0.09	0.6	140				
	6614	3.9	0.131	0.10	0.6	145				
	6617	4.0	0.124	0.10	0.6	150				
10	6618	4.0	0.141	0.09	0.6	140				
	6623	2.6	0.133	0.19	0.8	290				
12	6626	4.1	0.123	0.14	0.9	210				
13	6627	4.1	0.130	0.14	0.8	205				
14	6629	4.4	0.125	0.05	0.3	70				
15	6630	4.2	0.132	0.05	0.3	70				
16	6632	4.4	0.123	x	x	x				
17	6633	4.3	0.122	x	x	x				
18	6637	1.5	0.132	0.12	0.3	185				
19	6638	3.9	0.130	x	x	x				
20	6639	4.3	0.132	x	x	x				
21	6642	4.3	0.121	x	x	x				
22	6644	4.7	0.133	x	x	x				
23	6645	4.4	0.129	x	x	x				
24	6647	4.9	0.120	0.05	0.4	80				
25	6650	4.3	0.118	0.05	0.3	70				

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

[Signature]

046

ANALABS

267047

A division of MacDonal Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

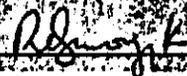
PAGE

TIME	SAMPLE No.	DRY WT	%CH	As (1)	As (2)	As (3)				
H			3.1	08	2576	03.08.84				2 OF
1	6651	5.1	0.127	x	x	x				
	6653	5.9	0.120	0.07	0.6	100				
	6654	4.5	0.131	0.09	0.6	140				
4	6658	4.3	0.125	0.10	0.6	145				
	6659	4.7	0.117	0.05	0.3	70				
	6660	4.7	0.124	0.05	0.3	70				
7	6665	5.8	0.124	0.06	0.5	85				
	6670	6.1	0.126	0.05	0.5	75				
9	6671	4.3	0.120	0.05	0.3	80				
	6673	3.4	0.129	0.05	0.3	80				
	6675	5.6	0.130	x	x	x				
12	6676	6.3	0.151	x	x	x				
	6678	7.0	0.136	0.16	1.7	235				
14	6679	5.3	0.131	x	x	x				
	6682	5.8	0.129	x	x	x				
	6683	4.5	0.127	0.04	0.3	60				
17	6684	4.8	0.148	x	x	x				
	6685	4.4	0.124	x	x	x				
19	6686	6.2	0.140	x	x	x				
20	6688	2.4	0.196	0.24	0.9	360				
22										
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



047

267048

ANALABS

A Division of MacDonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

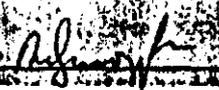
H		3.1 08 2576				03.08.64				3 OF 3
TUBE No.	SAMPLE No.	DRY WT	MOCH	BU(1)	BU(2)	BU(3)				
1	STU	-	-	1.02	7.7	-				
2	STU	-	-	1.09	8.2	-				
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.1	0.001	0.01	-	-				
24	DIGESTION	-	TTN	328	-	-				
25	METHOD	-	TTN	328	-	-				

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


048

267049

ANALABS

A division of MacDonald Hamilton & Co. Pty. Ltd.

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

A

3.1 13 2576

03.08.8

4 OF 4

LINE No.	SAMPLE No.								
		NOTE Samples treated on AS RECEIVED BASIS							
2		Dry weight expressed in Kilograms as calculated from Moisture Det.							
3		Au 1 result expressed in micrograms of Gold per gram of Zinc							
4		Au 2 is the calculated TOTAL GOLD leached from the whole sample							
5		in micrograms.							
6		Au 3 is the calculated grade of the sample in micrograms per tonne							
7		that is cyanide extractable gold per tonne							
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
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21									
22									
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 *[Signature]*

049

267050

APPENDIX 3A.

PETROLOGICAL REPORT - GEOCHEMPET SERVICES

Geochempet Services

604
267051

PETROLOGICAL and GEOCHEMICAL CONSULTANTS

REGISTERED IN QUEENSLAND

Principal : A.S. Joyce B.Sc. (Hons), Ph.D.
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Chapel Hill, Qld. 4069

Telephone: (07) 375 5258
A/H 378 6467

PETROLOGICAL REPORT ON TEN SAMPLES
FROM EL 33/83 PALOONA, TASMANIA

prepared for

ROGER POLTOCK GEOLOGICAL PTY. LTD.

Copies : R. Poltock (2)
R. Vivian, Amax (1)

Stan Joyce

A. S. Joyce, B.Sc. (Hons), Ph.D.

30th July, 1984.



050

GENERAL COMMENTS

1. Sample A 6646, the dominant rock type of the area is identified as a recrystallized, fine vitric tuff derived from a trachyandesitic source, but its small vitric shards are not welded and it could represent vitric silt derived from tuffaceous terrain. If it were alternatively distal airfall material I would expect fine laminations to dominate outcrops. The textures do not favour interpretation that the sample originated directly by ashflow deposition.

The associated rock type A 6652 is a volcanoclastic arenite derived from intermediate and acid source rocks and transported by water.

2. The carbonate-rich rock A 6661 is a finely pyritic, heavily dolomitized pebbly volcanoclastic arenite which is thought to have experienced hydrothermal alteration and mineralization perhaps from an intermediate intrusion.
3. The "volcanic" suite A 6624, A 6634, A 6667 and A 6672 embraces an intrusive trachyandesite, an amygdaloidal trachyandesite lava, a lithic crystal vitric tuff of mixed intermediate parentage and a reworked pyroxene andesite crystal tuff.
4. The sample A 6608 from a copper prospect is an intensely sericitized pumice tuff, rich in disseminated sulphides prior to weathering.
5. The sample A 6620 from a pyritic prospect is considered to be an intrusive intermediate felsite porphyry, probably fractionated from andesite, and it reveals evidence of having accumulated volatiles capable of generating chlorite-calcite-quartz-pyrite assemblages. Gold could possibly accompany the carbonate fluids. Perhaps this type of intrusion is responsible for the extensive carbonate and pyrite replacement seen in A 6661.
6. The sample A 6666 is heavily carbonated, moderately sericitized intermediate lithic crystal pumice tuff and its alteration may well be related to processes responsible for nearby baryte-siderite veins. Again an intermediate subvolcanic intrusion could be the source of the fluids.
7. The overall impression was gained that the ten samples reflect intermediate (generally trachyandesitic) volcanism. Tuffs, reworked tuffs, lava and subvolcanic intrusions are represented but no welded ashflows nor laminated airfall tuffs were received. Perhaps deposition has occurred mainly in or near water, rather than in a terrestrial setting.

Chloritic secondary mineral assemblages may well be products of diagenesis/low grade metamorphism, but carbonate and sericite alteration in some samples may reflect hydrothermal alteration by fluids emanating from subvolcanic intrusions.

052

Sample Number : A 6608

Identification : Weathered, intensely sericitized pumice tuff, formerly rich in disseminated sulphides

Description :

The sample is a small, weathered hand specimen of tuff which displays grey green pumiceous wisps, about 1 to 4mm long, in a greyish orange matrix. There are many fine pores, some with shapes suggestive of former pyrite.

A cobaltinitrite staining test revealed no K-feldspar.

In thin section the sample is seen to display numerous sericite pseudomorphs after randomly orientated, weakly compressed, ragged pumice clasts. They are set in a lightly iron-stained matrix of clay and minor sericite. There are very sparse, angular clasts of quartz, up to 0.3mm in size.

Throughout the pumiceous clasts and the matrix there are many simple pores, some plainly recognisable as representing former pyrite cubes about 0.05 to 0.5mm in size. There are rare examples of goethite cubes.

An approximate mode is :

45-55%	completely sericitized pumice clasts
40-50%	iron-stained, argillaceous and sericitic matrix
0.1-0.2%	quartz clasts
5-8%	pores after pyrite and possibly other disseminated sulphides

Comments and Interpretations :

The sample is interpreted confidently to have been an unwelded pumice tuff and it has experienced intense sericitization and impregnation by disseminated sulphides. An initially very porous and permeable nature in the tuff would have facilitated entry of hydrothermal fluids.

The argillaceous matrix of the rock may reflect weathering of finely feldspathic components or reconstitution of sericite by acid solutions generated during weathering of the disseminated sulphides.

053

267054

Sample Number : A 6620

Identification : Felsite porphyry with mild carbonate-chlorite-rutile alteration and disseminated pyrite

Description :

The sample is a lightly weathered, small hand specimen which displays 0.3 to 3mm pale grey and greenish yellow altered phenocrysts in a medium light grey to pale olive grey groundmass. Disseminated pyrite is conspicuous and there is yellow jarositic staining on a weathered surface.

A cobaltinitrite staining test revealed that fine K-feldspar is moderately abundant in the groundmass.

In thin section the sample is seen to have a glomeroporphyritic texture resembling an intrusive porphyry.

The phenocrysts are mainly twinned, poorly zoned plagioclase (oligoclase), generally free of alteration. Mafic phenocrysts of uncertain derivation are represented by chlorite with a few grains of secondary sphene (perhaps former mica or amphibole) and by carbonate with abundant secondary sphene (perhaps former ilmenite). There are a few small phenocrysts of quartz, not with recognisable β -form. The phenocrysts commonly agglomerate and resemble xenoliths. There are several oval amygdales, about 3mm in size, containing quartz, then chlorite and a core of carbonate.

The groundmass has an allotriomorphic texture with primary grainsizes of about 0.1mm. It consists of poorly twinned plagioclase, orthoclase, minor quartz, chlorite, minor carbonate and tiny clusters of rutile, probably after ilmenite.

There are a few discontinuous, thin replacement veins of carbonate. No sulphide is present in the part of the sample which has been sectioned but it is conspicuously disseminated in other parts of the sample.

An approximate mode is :

15-20%	plagioclase phenocrysts
2-3%	chloritized mafic phenocrysts
0.1%	sphene-carbonate pseudomorphs of (?) ilmenite phenocrysts
0.5-0.6%	quartz phenocrysts
55-65%	groundmass plagioclase
8-12%	groundmass orthoclase
1-2%	groundmass quartz
2-3%	groundmass chlorite
0.3-0.4%	groundmass secondary rutile
3-5%	carbonate (apparently calcite) in veinlets and replacement patches
rare	amygdales of quartz-chlorite-calcite
0-1%	pyrite

Comments and Interpretations :

The sample is interpreted to be an intrusive porphyry with an intermediate felsite composition, probably fractionated from andesite. It seems that the intrusion has accumulated volatiles which are capable of causing chloritization of mafic silicates, carbonate veining and partial alteration of plagioclase and (?) ilmenite, conversion of probable ilmenite to sphene, generation of a few amygdales of quartz-chlorite-calcite, and deposition of disseminated pyrite.

Carbonated hydrothermal fluids generated from quartz-bearing intermediate intrusions do give rise to gold mineralization in some cases.

055
Sample Number : A 6624

Identification : Quartz-bearing pyroxene trachyandesite with light alteration to epidote and chlorite

Description :

The sample is a small hand specimen of lightly weathered porphyry which displays numerous phenocrysts of pale grey feldspar, up to several millimetres in size, and some mafic minerals in a pale reddish brown groundmass.

A cobaltinitrite staining test revealed that the groundmass is dominated by fine K-feldspar.

In thin section the sample displays a glomeroporphyritic texture of intrusive appearance. Phenocrysts are subhedral and 0.3 to 2mm in size, whilst the groundmass is allotriomorphic and about 0.05 to 0.2mm in grain size. There are two subspherical, 1mm amygdales with radiating quartz and chlorite.

The most abundant phenocrysts are lightly epidotized plagioclase. Some clinopyroxene grains occur, partly altered to chlorite. There are also numerous completely chloritized phenocrysts which were probably pyroxene. Subhedral magnetite phenocrysts are prominent, some rimmed by sphene.

The groundmass consists of untwinned feldspar (clouded by hematite "dust" and largely potassic), amoeboid to crudely micrographic quartz, minor chlorite and epidote, and traces of apatite.

An approximate mode is :

25-30%	plagioclase phenocrysts, lightly epidotized
2-4%	clinopyroxene phenocrysts, partly chloritized
3-5%	completely chloritized mafic phenocrysts
0.5-0.6%	magnetite phenocrysts, some rimmed by sphene
40-50%	groundmass orthoclase
10-12%	groundmass quartz
4-5%	groundmass plagioclase
6-7%	groundmass chlorite
1-2%	groundmass epidote
trace	apatite

Comments and Interpretations :

The sample has the composition of a quartz-bearing pyroxene trachyandesite and its textures are considered to be consistent with an intrusive, subvolcanic porphyry, perhaps from a sill or dyke. There are several quartz-chlorite amygdaloidal structures which raise the question of extrusive origin, but amygdales can occur in subvolcanic intrusions and the allotriomorphic to crudely graphic textures of the groundmass are considered to favour an intrusive setting.

No sulphides were detected, but the chlorite-epidote assemblage in the rock may reflect light propylitic alteration.

056

Sample Number : A 6634

Identification : Chloritized, partly recrystallized,
amygdaloidal trachyandesitic lava

Description :

The sample is a small hand specimen of lightly weathered dark greenish grey, fine rock which displays many phenocrysts less than about 2mm long and many ovoid to subspherical amygdales which are about 0.5 to 4mm in size and susceptible to weathering.

A staining test revealed that the fine groundmass is rich in K-feldspar.

In thin section the sample is seen to consist of abundant subhedral phenocrysts, about 0.4 to 2mm in size, set in a groundmass which has recrystallized to a poikiloblastic mosaic with a grain size of about 0.2mm but retains numerous remnants of former tiny laths, about 0.03mm long. There are numerous ovoid amygdales, variously filled with quartz, quartz-chlorite and quartz-chlorite-ankerite.

The most abundant phenocrysts are strongly zoned andesine, moderately altered to chlorite and sericite. Former mafic phenocrysts with forms suggestive of pyroxene have been pseudomorphed by chlorite and minor rutile. Small phenocrysts pseudomorphed largely by elongate lozenges of sphene may have been ilmenite.

The groundmass consists now of untwinned feldspar (largely potassic), chlorite, sphene and minor quartz. The distribution of chlorite outlines the ghost of a cellular jointing pattern with polygonal cells 1 to 2mm in size.

An approximate mode is :

8-10%	plagioclase phenocrysts, moderately chloritized and sericitized
4-5%	chloritized mafic phenocrysts
0.1-0.3%	sphene pseudomorphs of (?) ilmenite
70-80%	groundmass feldspar, largely potassic
0.4-0.6%	groundmass quartz
5-7%	groundmass chlorite
0.1-0.2%	groundmass sphene
5-8%	amygdales of quartz, chlorite and ankerite

Comments and Interpretations :

This sample is interpreted confidently to have originated as a vesicular lava of probable pyroxene trachyandesite composition. At some stage the vesicles have been filled by quartz, chlorite and ankeritic carbonate. Low grade metamorphism or weak propylitic alteration has moderately chloritized the rock and healed a crackle pattern of fractures. Groundmass feldspar was extensively, but incompletely recrystallized to a coarser mosaic and sphene and minor sericite were generated as additional secondary minerals.

Sample Number : A 6646

Identification : Finely recrystallized, fine vitric tuff
derived from a trachyandesitic source

Description :

The sample is a small hand specimen of hard, massive, fine-grained rock which is light olive grey where least weathered, but commonly pigmented in brown and grey weathering tones.

A staining test revealed that the rock is rich in fine K-feldspar.

In thin section the sample is seen to consist largely of cryptocrystalline and microcrystalline anhedral feldspar and quartz, but there are weak but distinct ghosts of unwelded or poorly welded, vitric shards, about 0.1 to 0.2mm in size. Some of the coarser feldspar and quartz grains also have clastic forms, up to 0.2mm in size. Minor components of the rock are aggregates of very fine, yellowish brown biotite and tiny clusters of sphene or rutile granules. There are sparse limonitic aggregates which resemble former subhedral pyrite cubes, 0.1mm in size.

An approximate mode is :

0.1-0.2%	quartz phenocrasts
0.2-0.3%	plagioclase phenocrasts
2-3%	biotite aggregates
0.3-4%	sphene or rutile aggregates
40-50%	cryptocrystalline and microcrystalline K-feldspar
40-50%	cryptocrystalline and microcrystalline plagioclase
1-3%	microcrystalline quartz
rare	oxidized pyrite

Comments and Interpretations :

The sample is confidently interpreted to have originated as an assemblage of small vitric shards accompanied by a few small phenocrasts of feldspar, quartz and mafic minerals. The shards were unwelded or poorly welded, but it is not clear whether the rock was deposited as distal ashflow tuff, airfall tuff or subaqueous vitric silt. The source magma was probably trachyandesitic.

The fine biotite may reflect incipient thermal metamorphism, although the very fine nature of the feldspathic devitrification argues against much heating.

There were probably sparse crystals of pyrite.

Sample Number : A 6652

Identification : Volcaniclastic arenite derived from intermediate and acid source rocks

Description :

The sample is a small hand specimen of lightly weathered, medium grey, moderately sorted arenite. Most of the clasts are sand sized but there are some pebble sized components, including irregular dark platy to amoeboid clasts, up to 17mm in size.

A staining test revealed that some sand grains consist of K-feldspar and some others are lithic clasts with abundant K-feldspar.

In thin section the sample is confirmed to have a moderately sorted, sandy texture with angular to subrounded clasts, mostly 0.1 to 1mm in size, but with scattered larger clasts.

Twinned and untwinned grains of plagioclase are abundant; most are fresh to lightly clouded. There are a few clasts of K-feldspar with weak microcline twinning. Angular to subrounded quartz grains are abundant and some have recognisably embayed β forms. Small lithic clasts consist of variously sericitized and non-sericitized feldspathic volcanic rock and a few examples of crystal tuff. There are some epidotized mafic silicate clasts and a few partly leucoxenized opaque oxides. The large dark clasts are seen to consist of chlorite and to have shapes consistent with fragments of glass which have not been subjected to abrasion; some carry feldspar phenocrysts. Other smaller pebble-sized clasts are sericitic and variously carry epidote, quartz and plagioclase phenocrysts; they display shapes transitional between amoeboid and rounded.

There is a cement of epidote group minerals and grey-green chlorite in most of the sample but it is sericitic in places. Pyrite forms a few subhedral porphyroblasts, about 0.2mm in size, centred on cement.

An approximate mode is :

40-50%	plagioclase clasts
25-30%	quartz clasts
2-3%	K-feldspar clasts
0.5-1%	epidote clasts
0.1%	opaque clasts
10-15%	volcanic lithic clasts, some richly potassic
2-3%	chloritized glassy clasts
3-4%	sericitized glassy clasts
5-7%	cement of epidote and chlorite
0.2-0.3%	cement of sericite
0.1%	pyrite

Comments and Interpretations :

The sample is a volcaniclastic arenite formed by aqueous transport and deposition of mineral and rock fragments derived from intermediate and acid volcanic sources. Some dollops of glass were apparently dropped into the depositional environment by tuffaceous processes; those which experienced some aqueous transport and abrasion have become sericitic, others which were buried without aqueous reworking have become chloritic. The sand is cemented mainly by fine epidote group minerals and a few grains of pyrite have formed.

059

Sample Number : A 6661

Identification : Finely pyritic, heavily dolomitized pebbly volcaniclastic arenite

Description :

The sample is a small hand specimen of lightly weathered, generally medium grey, pebbly sandstone. Rounded light and dark grey clasts attain maximum dimensions of about 8mm. Pyrite is visible as fine disseminations and as aggregates replacing some clasts up to 3mm in size.

A staining test revealed that K-feldspar dominates some clasts, including a laminated lithic clast.

In thin section the sample is seen to have a poorly sorted sedimentary texture. Rounded pebbles up to 8mm in size are scattered through a matrix of rounded and subrounded sand grains about 0.05 to 2mm in size.

Many of the pebbles consist largely of fine-grained, colourless carbonate of high relief (possibly dolomitic), but there are numerous remnants of subhedral, twinned feldspar which suggest a volcanic or volcaniclastic precursor. Carbonate-poor and carbonate-free pebbles are potassic and have cryptocrystalline, finely vitroclastic textures similar to Sample A 6646. A large, laminated, potassic clast has silty textures and carries a moderate abundance of quartz.

The sand fraction carries many clear, twinned grains of albite and orthoclase, minor quartz and a great deal of carbonate as a cement and as a replacement of former sand grains, at least some of which seem to have been feldspar and others of which appear to have been lithic.

Pyrite is abundantly disseminated throughout the rock. Some cubes and pyritohedrons attain 0.3mm, but there are very many other grains with grainsizes of only a few microns. They occur in both carbonated and non-carbonated clasts.

An approximate mode is :

- 10-12% pebbles of mainly potassic, intermediate tuff and siltstone
- 7-8% pebbles of heavily carbonated intermediate volcanic and/or volcaniclastic rock
- 10-12% sand grains of albite and orthoclase
- 0.5-1% sand grains of quartz
- 55-65% carbonate (dolomitic) as a cement and replacement of sand grains
- 4-6% disseminated sulphides, largely or wholly pyrite

Comments and Interpretations :

This sample is considered to have originated as an immature pebbly sandstone composed of mineral fragments and lithic clasts derived from various trachyandesitic to andesitic tuffs, siltstones and lavas.

2.

It now carries abundant carbonate which appears to be dolomite and seems to occur as heavy replacements of perhaps andesitic clasts and plagioclase sand. The rock is also heavily impregnated with disseminated fine sulphides.

Intense dolomitization and pyritization of volcanic components of a clastic sediment suggests hydrothermal action from an intermediate intrusion.

061

267062

Sample Number : A 6666

Identification : Heavily carbonated and moderately sericitized lithic crystal pumice tuff with traces of pyrite

Description :

The sample is a small hand specimen of lightly weathered rock with ragged greyish yellow and medium grey clasts, about 1 to 14mm in size, resembling former pumice.

A staining test revealed no K-feldspar.

In thin section the sample is seen to be heavily carbonated and moderately sericitized but its primary textures are consistent with a tuff composed of angular feldspar clasts (about 0.2 to 2mm), many porphyritic felsite or andesite (about 1 to 4mm), many ragged pumiceous clasts (up to 5mm) and a few small quartz phenocrysts (generally less than 0.2mm). Anhedral carbonate, with properties suggestive of ankerite or dolomite has replaced much of the feldspar clasts and phenocrysts. Sericite has intensely replaced the pumiceous clasts and lightly attacked the lithic clasts. Leucoxene and sphene replace a few 0.5 to 2mm clasts.

A few aggregates of very fine subhedral pyrite partly replace several sericitized clasts. Several fracture-controlled replacement veins, up to 0.5mm wide, carry anhedral ankerite and quartz.

An approximate mode is :

30-35%	heavily carbonated plagioclase clasts
50-60%	lightly carbonated and sericitized andesite or felsite lithic clasts
10-15%	intensely sericitized pumice
0.1-0.3%	sphene and leucoxene, probably after opaques
0.5-0.7%	quartz clasts
0.1%	pyrite
0.2-0.3%	veins of ankerite and quartz

Comments and Interpretations :

The sample is considered to be an intermediate lithic-crystal-pumice tuff which has been heavily carbonated and moderately sericitized by hydrothermal processes which also account for traces of pyrite and a few quartz-carbonate veins. The carbonate throughout the rock seems to be ankerite or possibly dolomite, but not calcite.

It is quite likely that the alteration in this rock could be related to baryte-siderite veins and metallic mineralization.

062

267063

Sample Number : A 6667

Identification : Chloritic, intermediate lithic crystal vitric tuff

Description :

The sample is a small hand specimen of lightly weathered rock of tuffaceous appearance, with ovoid moderate orange pink lithic clasts (1 to 12mm), pale pinkish grey feldspar phenocrysts (less than 2mm), stringy greenish black clasts (perhaps former glass or pumice fragments a few millimetres in size) and greenish grey indistinct lithic clasts.

A staining test revealed that some of the lithic clasts are dominated by fine K-feldspar.

In thin section the orange pink lithic clasts are seen to be very finely crystalline porphyritic trachyte, with phenocrysts of twinned albite set in groundmass of mainly K-feldspar, minor quartz and some albite. Some such clasts have perlitic fracture patterns and appear to have crystallized by devitrification. Several clasts carry disseminated very fine pyrite (0.05mm and finer).

The green clasts resemble former irregular dollops of glass and now consist of chlorite with a few plagioclase phenocrysts. Very few were vesicular.

The phenocrysts are mainly lightly clouded, twinned plagioclase (andesine). A few contain minor epidote. There are a few sphene-chlorite aggregates after former opaques or mafic silicates and very sparse, small quartz clasts.

Much of the rock consists of rather indistinct felsite clasts, composed largely of poorly twinned plagioclase with a few phenocrysts of feldspar and chlorite-sphene aggregates. Some have devitrification textures.

A small amount of chlorite, sphene and epidote occurs as a cement in a few parts of the sample and there are a few replacement patches of calcite.

An approximate mode is :

25-35%	clasts of potassic quartz-trachyte
5-8%	chloritized glass clasts
45-55%	felsite clasts
8-12%	plagioclase clasts
0.2-0.3%	sphene-chlorite aggregates after mafic clasts
0.1-0.2%	quartz clasts
1-2%	chlorite-sphene-epidote cement
0.2-0.3%	replacement calcite
tr	fine pyrite in several clasts

Comments and Interpretations :

This sample is considered to be a lithic crystal vitric tuff formed by accumulation of clasts which probably came from several intermediate sources and were deposited either on land or into still water.

2.

There is no indication of any aqueous reworking. Many of the "lithic" clasts have textures indicating that they were glassy before or possibly at the time of their deposition. The chloritic clasts have forms consistent with dollops or splashes of glass at the time of deposition.

Traces of pyrite occur in some clasts and the rock has secondary minerals consistent with diagenetic or weak propylitic alteration.

06A

Sample Number : A 6672

Identification : Chloritic reworked pyroxene andesite crystal tuff

Description :

The sample is a small hand specimen of lightly weathered, speckled light and dark greenish grey rock resembling reworked crystal tuff with coarse sand-sized clasts.

A staining test revealed very minor fine K-feldspar as cement.

In thin section the sample is seen to have a moderately sorted, sedimentary texture composed mainly of subrounded, subhedral, tabular feldspar grains and pyroxene prisms, generally 0.4 to 2mm long. The plagioclase is heavily clouded by fine epidote group minerals and subordinate sericite. The clinopyroxene is partly replaced by chlorite and calcite along fractures. Subhedral magnetite and a few leucoxenized grains are minor components of the rock. There are some irregular chlorite clasts with phenocrysts of plagioclase and pyroxene and these appear to reflect glassy clasts. Quartz is confined to several angular clasts, about 0.2mm in size.

The rock has a minor matrix of chlorite and fine sphene, accompanied by inconspicuous K-feldspar. There is one small replacement patch of pyrite.

An approximate mode is :

80-85%	plagioclase clasts, clouded by epidote and minor sericite
4-5%	clinopyroxene clasts partly altered to chlorite and calcite
0.8-1%	magnetite clasts
tr	leucoxenized clasts
3-4%	chloritized vitric clasts
0.1%	quartz
5-8%	matrix of chlorite, sphene and minor K-feldspar
tr	pyrite

Comments and Interpretations :

This sample shows definite evidence of aqueous rounding and sorting of grains but the component clasts are consistent with a pyroxene andesite crystal tuff composed mainly of crystal fragments, but with a few formerly glassy fragments (now chloritic). Identification as reworked tuff appears justified and distinguishes the sample from the volcanoclastic arenite sample A 6652 which appears to be derived from more than one source rock.

The secondary mineral assemblage is consistent with moderate propylitic alteration or low grade metamorphism. One small cluster of pyrite is present.

065

267066

APPENDIX 3B.

PETROLOGICAL REPORT - C.M.S.

066

267067

617

Central Mineralogical Services



39 Beulah Road
Norwood, S.A. 5067
Telephone 42 3489

Mr. R. Vivian
AMAX Exploration (Aust.) Inc.
5, Osborne Avenue
LAUNCESTON / TAS. 7250

3rd April, 1984

REPORT CMS 84/3/35

YOUR REFERENCE:	Letter dated 21.3.1984
DATE RECEIVED:	23rd March, 1984
SAMPLE NOS.:	3 Samples
SUBMITTED BY:	R. Vivian
WORK REQUESTED:	Petrology

H. W. Fander
H.W. Fander, M. Sc.

REPORT CMS 84/3/35

Three rock samples were received for petrological study; thin-sections were prepared, and the offcuts were subjected to potash stain tests to assist identification and interpretation.

Summary

All three rocks are volcanic, and two are clearly tuffs, but the third is too severely altered to be accurately classified. The glassy components, in the form of shards and lava fragments, are devitrified and partly silicified, as is commonly the case with these relatively unstable phases; the results of the K-stain tests indicate that much of the glass is K-silicate. It is suspected that both tuffs are welded, but this is conjectural; they are believed to be subaerial. Minor sericite and chlorite have developed, and represent a low-grade hydrothermal type of alteration. The green streaks in A 6509A are Mg-chlorite and could represent altered ?intermediate glass or an Mg clay of volcanic origin.

A 6513A is altogether much more severely altered and is also sheared. Abundant ankeritic or sideritic carbonate has pervaded the rock, both as patches and dispersed grains and as veins; some are fractured and displaced.

H.W. Fander, M. Sc.

Sample No.	Rock Type - Composition	Fabric	Minor Minerals	Comments
A6508A (T.S. 49286)	<u>Welded Rhyolitic Tuff.</u> Mainly composed of devitrified, partly silicified shards of K-silicate glass, with scattered splinters of quartz, albite, K-feldspar, and glassy lava.	Closely-packed particles, orientated fabric. Flow-banding in some fragments.	Sporadic sericite and chlorite aggregates. Biotite shreds. Some Fe-staining.	Rock is relatively fresh considering its proneness to alteration. Minor low-grade hydrothermal, argillic alteration. No real evidence of sulphides.
A6509A	<u>Vitric-Crystal Tuff.</u> Splinters and cleavage-fragments of quartz, plagioclase, devitrified glassy lava and shards, with streaks of fine Mg-chlorite; fine carbonate throughout.	Coarse-sand-size grains, quite well-sorted and bedded. Good shards textures.	A few muscovite flakes. Minor sericitic alteration. Chert fragments.	Could be welded, but details obscured by devitrification. Green streaks are chlorite, possibly derived from montmorillonite.
A6513A (T.S. 49288)	<u>Sheared, Altered Volcanic.</u> Now composed of subparallel streaks of sericite intergrown with very fine quartz, and sericite pseudomorphs. Conspicuous sideritic carbonate.	Semi-schistose; no primary textures recognisable. Post-vein movement.	Leucoxene-rutile streaks and aggregates. Minor fine chlorite. Carbonate veins.	Rock is too severely altered for classification; may have been a lava or a pyroclastic rock. Extensively carbonated.

267009



LEGEND

TERTIARY

- Tb Basalt
- Ts Sub-basalt sediments

PERMIAN

- P Sediments

ORDOVICIAN

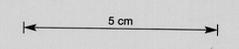
- ○ ○ Dial Conglomerate
- ○ ○ Well sorted, Pre-cambrian derived sandstone and conglomerate

CAMBRIAN

- • • Fine grained vitric tuffs
- • • Conglomerates
- v v Trachy andesite lavas amygdaloid
- + + Trachy andesite intrusives fine grained - porphyritic
- + + Trachy andesite crystal tuff
- ▲ ▲ Pumice and glass rich pyroclastics

PRE-CAMBRIAN

- § § § Quartzites and schists



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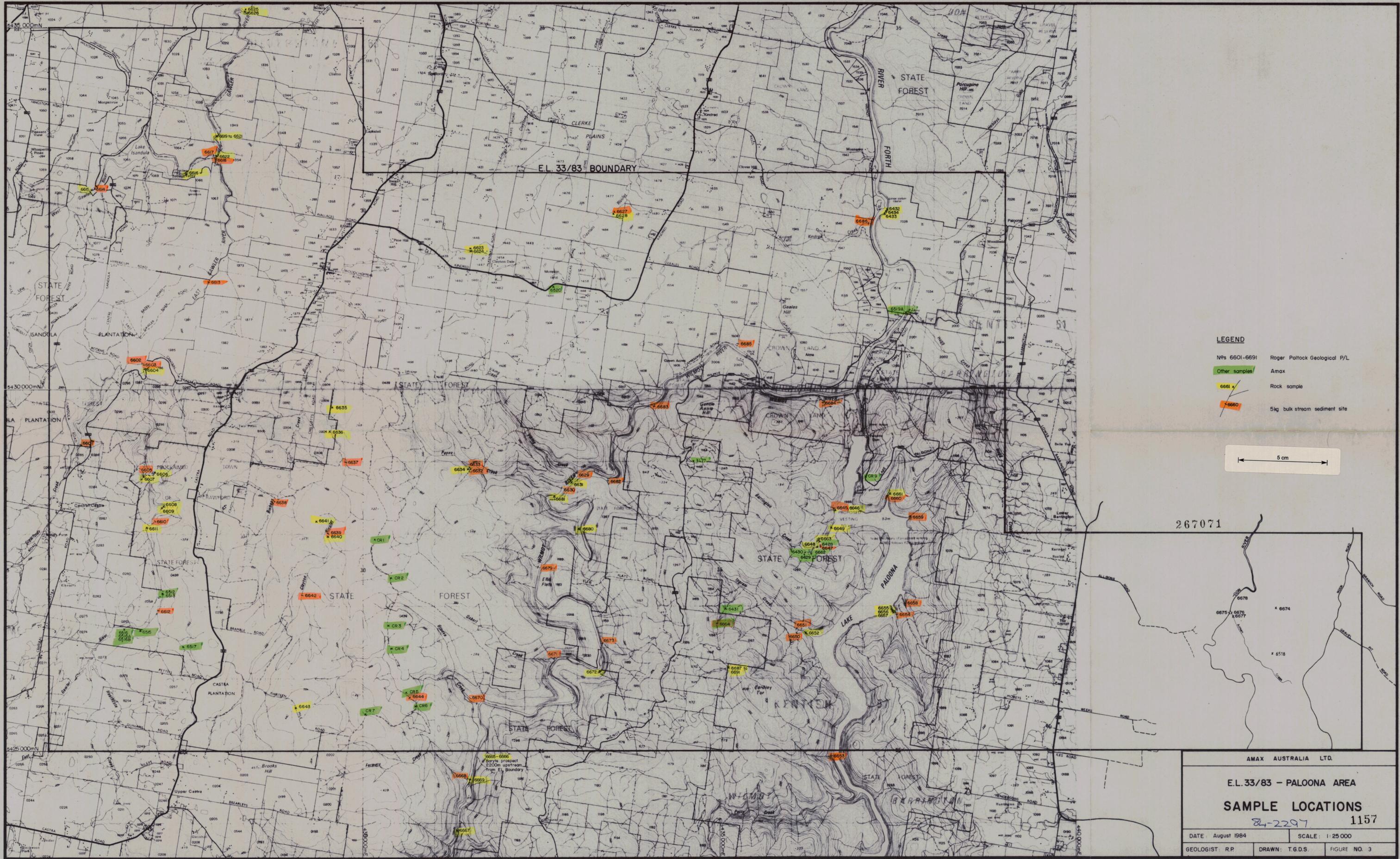
E.L. 33/83 - PALOONA AREA

GEOLOGICAL FACT 1156

& INTERPRETATION PLAN

84-2297

DATE	AUGUST 1984	SCALE	1:25 000
GEOLOGIST	RP	DRAWN	T.G.D.S.
		FIGURE NO.	2



LEGEND

- Nos 6601-6691 Roger Poltock Geological P/L
- Other samples Amax
- 6661 Rock sample
- 6660 5kg bulk stream sediment site

5 cm

267071

AMAX AUSTRALIA LTD.		
E.L. 33/83 - PALOONA AREA		
SAMPLE LOCATIONS		
84-2297		1157
DATE: August 1984	SCALE: 1:25 000	
GEOLOGIST: R.P.	DRAWN: T.G.D.S.	FIGURE NO. 3