GEOLOGY AND MINERALISATION

OF THE KERIMENGE-LEMENGE PROSPECT.

WAU DISTRICT, PAPUA NEW GUINEA

by

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DECEMBER 1993

Thesis submitted in partial fulfilment for the
Master of Economic Geology Degree.

THESIS TOPIC

In this thesis the Kerimenge Prospect is investigated. Two metallurgically distinct styles of gold mineralisation occur, the majority of gold is difficult to extract, but some is readily extractable. This study concentrates on the latter type.

The above is translated into Pidgin by Casper N Onbaiye.

Insait long dispela painimaut bilong kamap bilong Kerimenge Prospek, tupela narakain na ples klia rot i soim kain stail bilong hausait ston gol i bin kamap long graun long Kerimenge.

Plenti bilong ol dispela kain kamap bilong ol ston gol em i hat tumas long kamautim long graun, tasol sample em i orait.

Deispela wok painimaut i lukluk tasol long rot bilong hausait yumi igen rausim o kamautim dispela ol kain kamap bilong ston gol.

DISCLAIMER

This thesis contains no material that has been accepted for the award of any higher degree or graduate diploma in any Tertiary Institution and contains no material previously published or written by another person, except when due reference is made in the text of the thesis.

Signed

Kim Denwer

ABSTRACT

Mineralisation at the Kerimenge and Lemenge deposits, Wau, Papua New Guinea, is an example of a fault controlled, porphyry-related, gold-carbonate-base metal epithermal system. Repeated intrusion of Edie Porphyry (2.4 to 3.8 Ma) was accompanied by a local permeability-generating phreatomagmatic eruption to form a diatreme. Deposition of quartz-manganocarbonate-sulfide-telluride-gold mineralisation was controlled by the Kerimenge Fault within the Kerimenge Sill Porphyry.

The gold mineralisation was deposited in two events. In the first event, gold was deposited in four stages from convecting meteoric water. The four stages are: Stage I quartz-pyrite-minor gold; Stage II quartz-pyrite-gold, Stage III carbonate-quartz-arsenopyrite-gold and Stage IV (mangano)carbonate-minor gold. The mineral paragenetic sequence reflects cooling of the system with Stage I and II veins deposited from a boiling CO_2-rich fluid with concomitant partitioning of volatiles including CO_2 and H_2S into the vapour phase. Condensation of the vapour phase higher and laterally within the system resulted in deposition of Stage IV veins. Stage III veins are regarded as transitional between Stages I,II and Stage IV. Quartz-sericite/(illite)-pyrite-rutile±carbonate phyllic alteration within the Kerimenge Sill Porphyry forms an selvage to Stage I, II and III veins.

Gold is present throughout the four stages of mineralisation but dominantly occurs in Stage II and III veins. Gold occasionally occurs as electrum intergrown within Stage II pyrite but in this study gold is observed to occur primarily within the lattice of Stage II pyrite and Stage III arsenopyrite. This mineralisation is not amenable to conventional cyanide extraction. An uneconomic resource of 55Mt @ 1g/t Au has been delineated within this refractory mineralisation (Hutton et al 1990).

A second mineralisation event was recognised during this

study. It is a gold and telluride-rich stage (Stage V) of silica-carbonate-hessite(Ag_2Te)-electrum-galena±tetrahedrite-tennantite mineralisation. The electrum occurs as up to 20μm inclusions exclusively within hessite and is recoverable by standard cyanide extraction techniques (i.e. non-refractory). This mineralisation temporarily interrupts the stage IV manganocarbonate mineralisation and is crosscut by an additional (barren) stage (Stage VI) of manganocarbonate deposition.

The Stage V event brecciates porphyry and earlier phases of mineralisation. The clasts are cemented by fine grained anhedral quartz ± sericite and subordinate calcite, which evolves to vuggy quartz ± calcite ± barite.

The telluride mineralisation has only been intersected in one drillhole and its extent is unknown. It occurs in two main localities within Stage V mineralisation, Stage Va and Stage Vb. Stage Va mineralisation consists of hessite-galena and electrum and occurs within fine grained quartz close to the contact with Stage VI manganocarbonate. The Stage Vb mineralisation occurs as a late vug fill of tetrahedrite-tennantite within the coarse quartz veins. The tetrahedrite-tennantite contains inclusions of hessite, galena and electrum.

The telluride mineralisation was deposited from a relatively hot (temperature range of 190-258°C, average 220°C), low salinity (1.0-2.7 wt% NaCl equiv.), fluid with log fS_2 = -11.39 and log fTe_2 *increasing during telluride deposition from -13.5 to -12. The majority of the hessite and electrum deposition occurs when fluid conditions changed from deposition of silica to carbonate in response to one, or a combination of the following, a pulse of (magmatic?) fluid enriched in Te (i.e. increased* fTe_2*), Au, Ag, Cu and Sb, rapid cooling (by mixing with manganocarbonate depositing Stage IV fluid), or a pH increase.*

ACKNOWLEDGMENTS

I would like to thank the following organisations and individuals for their assistance in the production of this thesis.

* CODES Key Centre Staff for their assistance and discussion in particular Dr Bruce Gemmell my supervisor for his encouragement, valuable advice and proof reading.

* RGC Exploration for their support and sponsorship of this thesis and my attendance at the Masters of Economic Geology Short courses. In particular Keith Wells, Phillip Uttley and Roger Shakesby.

* RGC Exploration geological personnel for useful discussion and to the support staff in PNG for assisting me in the field and office.

* Jim Graham, Dennis Richards and Graeme Davis for proof reading this thesis.

* Terry Leach for valuable discussion on conclusions.

* Fluid inclusion studies were completed with the help of Dr Khin Zaw and Electron Microprobe Analysis with the assistance of Mr Wieslaw Jablonski.

* Foremost to my friend Amanda and my three children Aaron, Claire and Zachariah for putting up with me being away from home for even more time than usual.

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1. INTRODUCTION

The Kerimenge-Lemenge gold prospects are located in Papua New Guinea approximately 9km south-southwest of Wau at Lat 7 deg 25'S, Long 146 deg 43'E on the Wau (SB 55-14) 1:250,000 geological sheet (Figure 1.1). The mineralisation lies within the drainage of Kwembu Creek, a tributary of the Bulolo River. The topography is rugged, jungle clad and ranges in elevation from 1700-2000m ASL. Access into the area is via helicopter and various foot-tracks.

Gold was reportedly discovered at the confluence of Koranga Creek and the Bulolo River in unchartered territory by Arthur Darling in 1910. However the discovery is usually attributed to William "Shark Eye" Parks (Lowenstein, 1982). Cecil John (CJ) Levien was a man of great vision and recognised the potential of the huge alluvial terraces in the Bulolo River. His enthusiasm paid off and in 1930 Bulolo Gold Dredging Ltd (a subsidiary of Placer Development Limited) was floated to mine the alluvial gold. (Idriess, 1933)

Most of the production to 1977 of 100,000 kg Au, and 95,000 kg Ag was from alluvial sources. A total of 16,000 kg Au and 23,000 kg Ag was produced from hardrock sources to 1977. The main sources of hardrock gold were discovered in the 1920's at the Upper Ridges Mine at Wau and the Edie Creek Lodes 6km southwest of Wau.

In recent times additional resources have been identified using modern exploration techniques at Hamata (9Mt @ 3.3g/t Au, Wells and Young 1991), Kerimenge (55Mt @ 1g/t Au, Hutton et.al., 1990) and Hidden Valley (37 Mt @ 2.1g/t Au, 31 g/t Ag, Nelson et.al., 1990).

The Kerimenge and Lemenge prospects were discovered by RGC personnel during regional reconnaissance exploration in 1983.

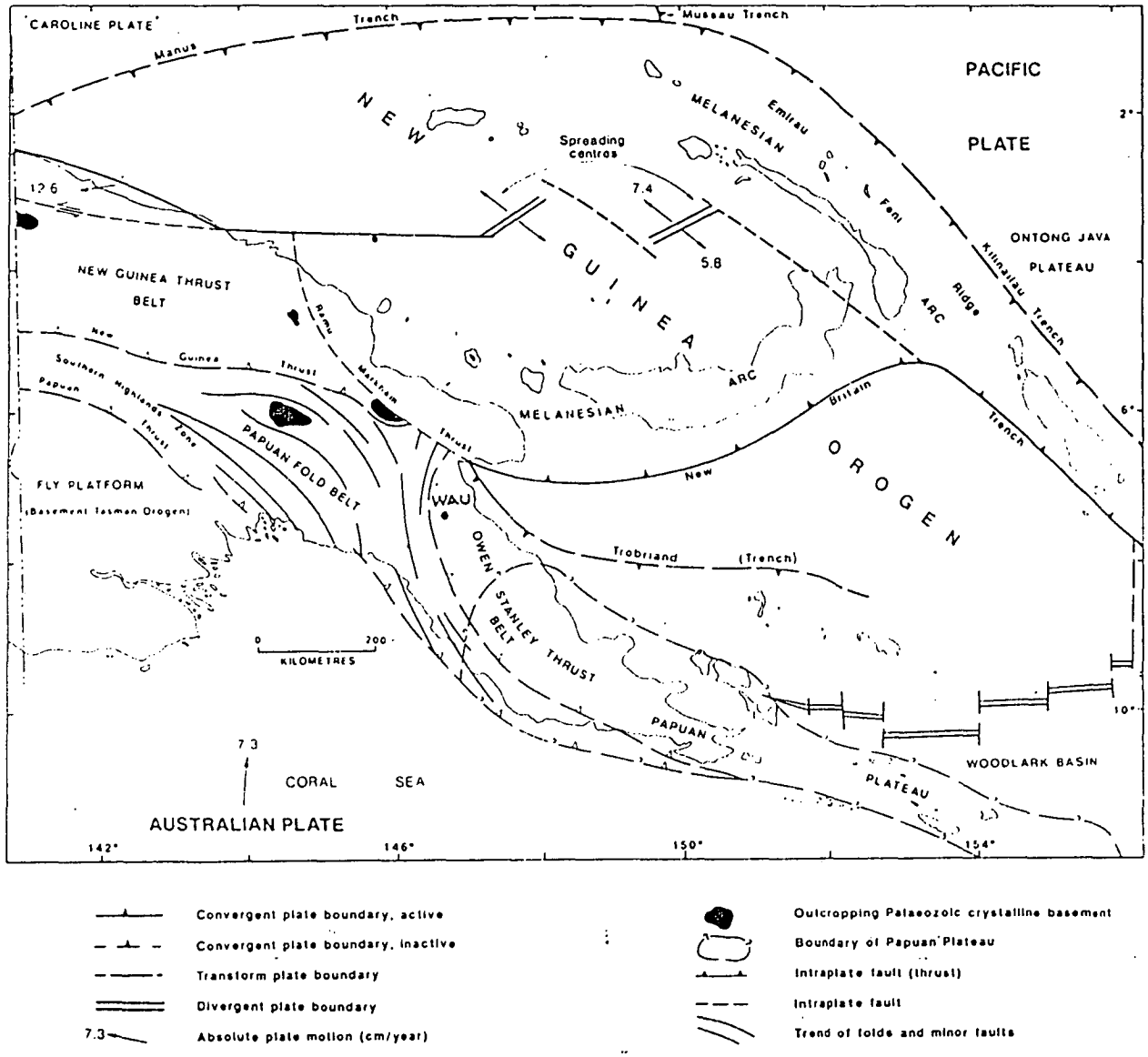

Figure 1.1. Locality Map and PNG Geology (after Rogerson, 1990)

The Kerimenge and Lemenge prospects are part of the same epithermal system with relief increasing from the former to the latter (Figure 1.2). Lower and middle levels of the epithermal system are exposed at Kerimenge and the upper part of the system is exposed at Lemenge.

A total of 127 diamond drillholes at Kerimenge and Lemenge have defined a global resource of 55 Mt at 1.0g/t Au, using a 0.5g/t cutoff (Hutton et.al. 1990). Most of the primary mineralisation is refractory and gold recovery is typically <30% using standard cyanide extraction techniques. The deposit is currently uneconomic due to the low gold grade and the poor gold recovery. Gold values at the Lemenge prospect are low and no resource has been established.

Drillhole QD85 at Kerimenge, drilled in 1986, intersected a high grade gold zone assaying 54m @ 6.3g/t Au (including 24m @ 10.5 g/t Au) within manganocarbonate/quartz veins. The mineralisation in this zone is non-refractory (>90% gold recovered using standard cyanide extraction techniques) and has a chemistry that has not been recognised elsewhere in the Kerimenge Prospect. The non-refractory nature and the higher gold grade of this intersection makes this mineralisation type an important exploration target.

This thesis presents a study of the geology, mineralogy, fluid chemistry of the non-refractory mineralisation in drillhole QD 85. The aim of the study is to better understand this style of mineralisation and use this understanding to pursue the following objectives:

1) Explore for additional non-refractory mineralisation (previously unrecognised) within the Kerimenge drilling data base;

2) Explore for additional resources within the Kerimenge-Lemenge area;

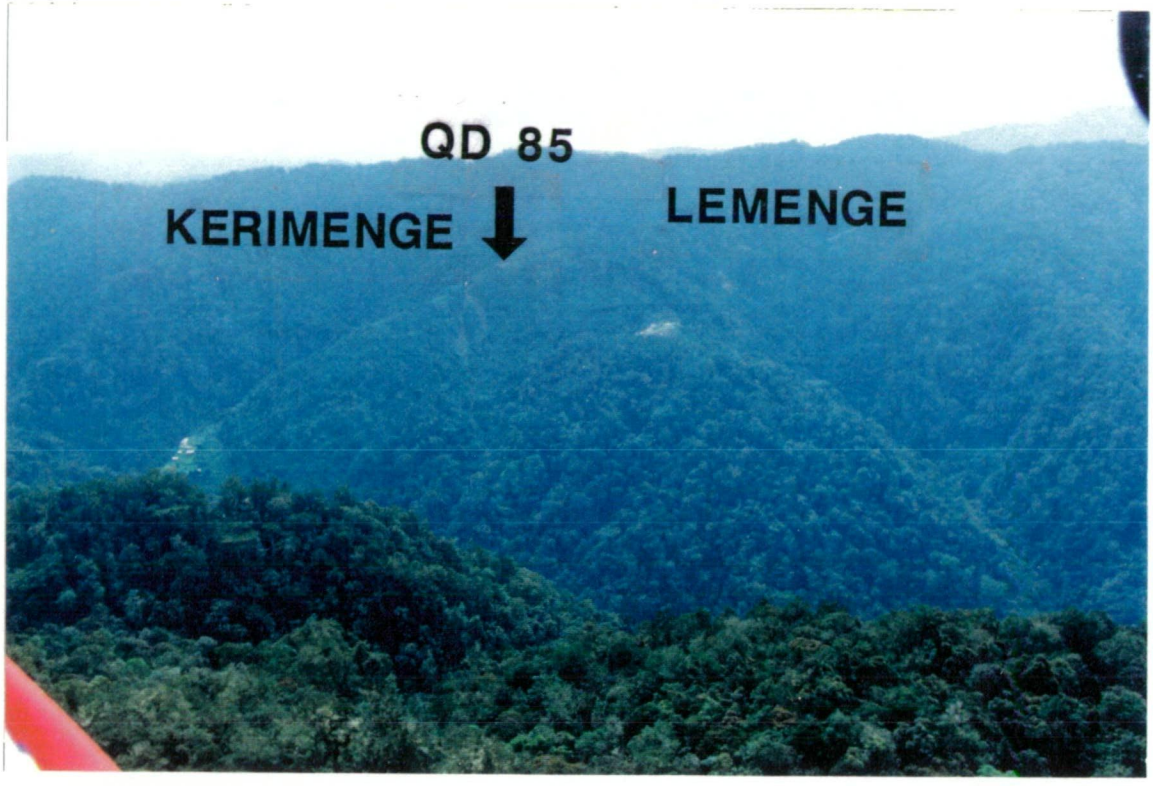

FIGURE 1.2 Photograph of the Kerimenge and Lemenge Prospects looking West. Note location of hole QD 85.

3) Develop an exploration model to assist exploration for additional reserves of this mineralisation type.

The Kerimenge and Lemenge prospects have previously been investigated by numerous RGC personnel and reported in numerous inhouse reports. An honours thesis has been written by Syka (1985) and papers have been published by Akiro (1986), Syka and Bloom (1990) and Hutton et.al (1990).

2. REGIONAL GEOLOGY

Papua New Guinea (PNG) lies between the north moving Australian Plate and the south moving Pacific Plate (Figure 1.1). On the PNG mainland the tectonic development was dominated by a compressional regime, and evidence for foreland thrusting is common (Rogerson, 1987). The PNG islands lie in both compressional and extensional environments, with production of new crust at spreading centres and destruction of crust within subduction zones (Rogerson, 1987).

The geology of the Wau district presented here has been summarised from Lowenstein (1982) and also represents work by RGC personnel.

The Wau district lies within the Owen Stanley Foreland Thrust Belt which represents the southerly extension of the New Guinea Thrust Belt (Figure 1.1). The basement rocks in the area are the Mesozoic Owen Stanley Metamorphics locally termed the Kaindi Metamorphics (Figure 2.1). The Kaindi Metamorphics include blue-black slate and shale, chloritic and sericitic schist and phyllite, and subordinate limestone/marble and volcanolithic arenite. The age of the Kaindi Metamorphics is uncertain, although a Cretaceous age has been confidently assigned to part of the sediment sequence (Lowenstein 1982). The Kaindi Metamorphics near Wau gave Rb-Sr ages of 21.0 ± 4 Ma which is interpreted as the age of regional metamorphism (Page 1977).

The Kaindi Metamorphics were intruded by a Middle Miocene batholith, the Morobe Granodiorite. The granodiorite has been radiometrically dated by K-Ar and Rb-Sr methods at 12 to 13 Ma (Page, 1977). Resurgence of igneous activity in the Pliocene culminated in the intrusion of stocks and plugs of Edie Porphyry, the extrusion of the Bulolo Volcanics and emplacement of several diatremes. Lowenstein (1982) recognised two phases of Edie Porphyry, with K-Ar ages of 2.4 and 3.4-

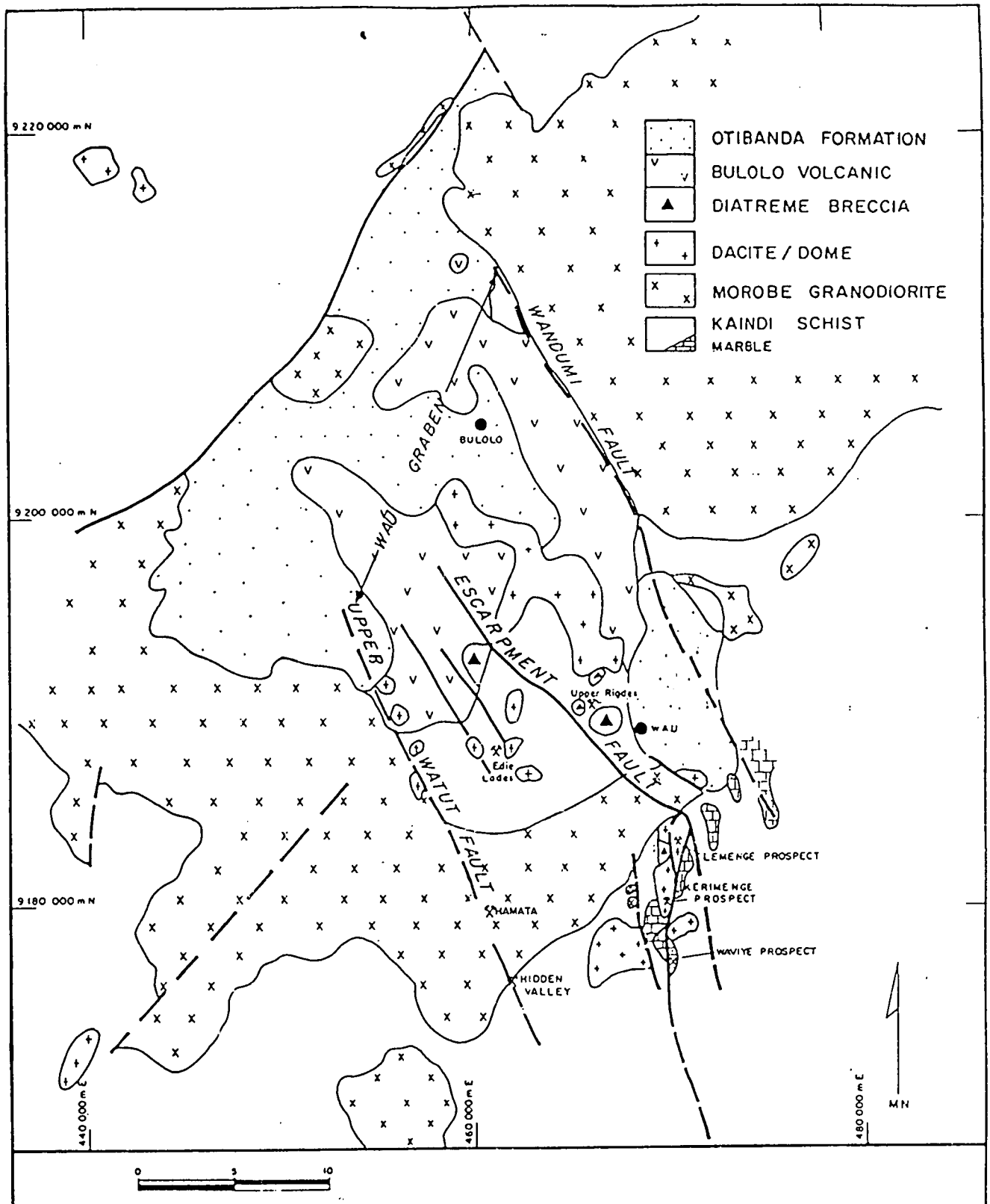

Figure 2.1 Wau District Regional Geology (Modified from Lowenstein, 1982)

3.8 Ma (Pliocene). It is more probable that porphyries were emplaced continually between 3.8 and 2.4 Ma. The Pliocene sedimentary Otibanda Formation unconformably overlies these units, consisting mainly of (?fluvial/shallow water sequences).

The Pliocene igneous activity is confined to a northwest trending corridor, locally termed the Wau Graben. This corridor is bound to the southwest by the Upper Watut Fault and to the northeast by the Wandumi Fault (Figure 2.1). The northwest trending boundary faults and subparallel faults within the graben are the principal regional structures and are interpreted as normal faults that have undergone later left lateral displacement. The faults were active during the Miocene and Pliocene periods, focussing the igneous activity as well as gold mineralisation.

3. REGIONAL MINERALISATION

Two styles of mineralisation have been recognised in the Wau district: early gold mineralisation associated with intrusion of the Morobe Granodiorite and later epithermal gold-silver mineralisation associated with the intrusion of the Lower Edie and other porphyries. Lowenstein (1982) divided the porphyry-related mineralisation into mesothermal and epithermal to reflect the depth of emplacement, however deeper "mesothermal" mineralisation is rare. The most abundant hardrock mineralisation is of the epithermal style.

The mineralisation associated with the intrusion of the Morobe Granodiorite occurs near the granodiorite contact as small quartz veinlets up to 0.25m wide and a few metres in length. These veins are not large enough to form payable reefs but where vein densities are high, alluvial deposits are formed (Lowenstein 1982).

Epithermal gold-silver was mined until recently at the Wau mine (opencut operation with reserves of 2.5Mt @ 3g/t Au, Carswell 1990) and has been mined historically at both Wau (underground 640,000t @ 16g/t Au and opencut 6.22 Mt @ 2.9g/t Au, Carswell 1990) and Edie Creek (0.3Mt @ 11.7g/t Au Lowenstein 1982). In recent years geological resources have been established by RGC at Kerimenge (55Mt @ 1.0g/t Au, Hutton et.al., 1990) and at Hamata (9Mt @ 3.3g/t Au, Wells and Young 1991) and by CRA at Hidden Valley (37Mt @ 2.1g/t Au, 31g/t Ag, Nelson et.al., 1990). To date at least 120 tonnes of Au has been produced from the field with 85% from alluvial operations.

At Wau, Edie Creek and Kerimenge, gold occurs in quartz-manganocarbonate-basemetal veins and minor breccias associated with, and hosted within, Edie Porphyry intrusions and/or diatremes. At Hamata and Hidden Valley the mineralisation is hosted within Morobe Granodiorite. Porphyry

bodies have been identified at these two deposits and are loosely correlated with the Edie Porphyry and although a genetic association between the porphyry and mineralisation has not been established, a link is suspected. Mineralisation at Hidden Valley has been dated by K-Ar methods at 4.15 Ma (Nelson, 1990) which is within the time range of intrusion of Edie Porphyry.

All gold resources/production in the Wau district is from deposits located on the major northwest Wau Graben structures. The regional structures are important foci for porphyry and diatreme emplacement and subsequent mineralising fluids. At all deposits a strong link between faulting and mineralisation is well established. The diatreme breccias typically predate mineralisation and were important in ground preparation and in creating permeability.

A typical sequence of mineralising events would be:

1. Intrusion of Edie Porphyry along a regional structure, often with associated phreatomagmatic eruption and diatreme development.

2. Fluid circulation cells developed as a result of the increased ambient temperature with the main fluid flow along regional structures and/or diatreme-related ring structures.

3. Boiling of the fluid and subsequent deposition of quartz, bladed carbonate, manganocarbonate, colloform-crustiform quartz/carbonate, basemetals and precious metals.

4. Repeated choking of fluid pathways, fluid overpressuring and subsequent hydrothermal eruption.

The mineralisation within the Wau District is an example of porphyry-related, carbonate-base metal systems (Leach and

Corbett, 1992). Discussion of the Wau mineralisation can be found in Sillitoe et.al (1984) and Carswell (1990).

4. KERIMENGE-LEMENGE GEOLOGY

The prospect geology is shown in Figure 4.1.

The basement rocks in the Kerimenge-Lemenge area are intercalated calcareous to pelitic schists, phyllite (Figure 4.2a) and marble of the Mesozoic Kaindi Metamorphics. The metamorphics are intruded by the Kerimenge Sill Porphyry, a sub-volcanic tabular body of feldspar-amphibole-biotite phyric quartz andesite/dacite member of the Edie Porphyry. The Sill Porphyry is at least 300m thick (Figure 4.2b).

The Sill Porphyry is cut by an irregular cone shaped steep-sided fine-grained tuffaceous unit with a 1.5km diameter. The unit is massive and matrix supported and consists of variably rounded fragments up to a few centimetres in diameter, set in a fine-grained groundmass. The fragments generally constitute less than 20% of the rock and are predominantly porphyry, but also include Owen Stanley Metamorphic fragments (Figure 4.3a). Locally accretionary-lapilli are recognised. Towards the margins the proportion of schist fragments decreases. This unit is interpreted as diatreme fill.

At the Lemenge prospect, a suite of feldspar-biotite-amphibole quartz andesite/dacite domes and associated lithologies are recognised. The associated rocks include flow-banded porphyry (Figure 4.3b) and crumble breccia (autobreccia). The domes occupy a northwest trending structural corridor, the Lemenge Corridor, which is located at the contact between the diatreme and the sill porphyry. This corridor is also a major control on mineralisation. Although the dome porphyries postdate the Sill Porphyry, they are both interpreted to be intrusive phases of the Pliocene Edie Porphyry. In the Kerimenge area late sericite-rich porphyry dykes have intruded along fault planes. These dykes are tentatively correlated with the dome porphyry. It is suspected that dome porphyries also occur in the Kerimenge area but this has not been substantiated.

9180500mN

LEMENGE CORRIDOR

KUSKOM FAULT ZONE

LEMENGE FAULT

Lemenge Creek

QD11

QD10

LD201

QD12

LD202

LEMENGE PROSPECT

9180000mN

NEW KERIMENGE FAULT

WESTERN KERIMENGE FAULT

OLD KERIMENGE FAULT

EASTERN FAULT ZONE

QD85

QD18

QD80

Kerimenge Creek

9179500mN

BOUNDARY OF KERIMENGE RESOURCE

Kwembu Creek

468500mE

469000mE

469500mE

9179000mN

DIATREME BRECCIA

DACITE SILL PORPHYRY

OWEN STANLEY METAMORPHICS

DACITE PORPHYRY DOME

MASSIVE MANGANOCARBONATE VEIN OR WAD

INFERRED FAULTS

PRE-SYN MINERAL FAULT

POST-MINERAL FAULT

EXISTING DRILLHOLE

RGC EXPLORATION PTY. LIMITED

COMPILED	K.DENWAR
DRAWN	M.WALTER
DATE	7/93
CHECKED	
1:25000 REF.	

MT. KAINDI

LEMENGE PROSPECT
GEOLOGY & MINERALISATION

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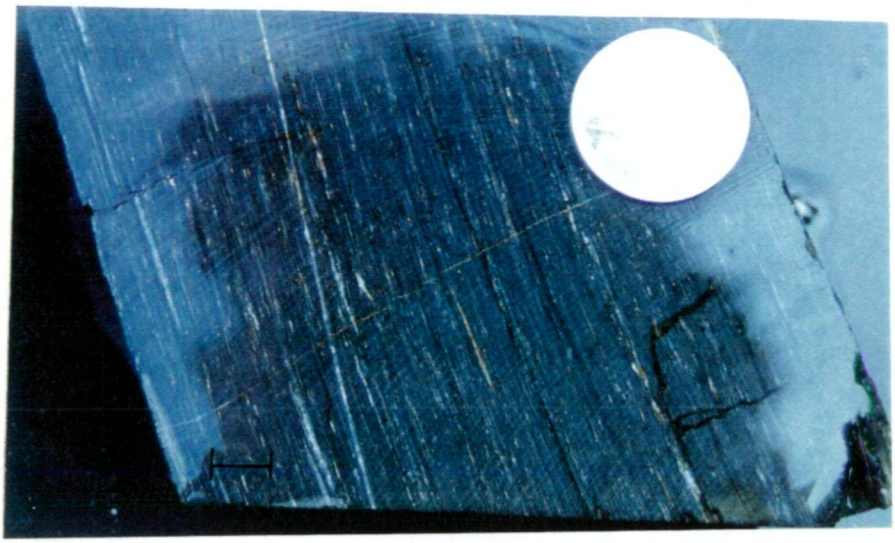


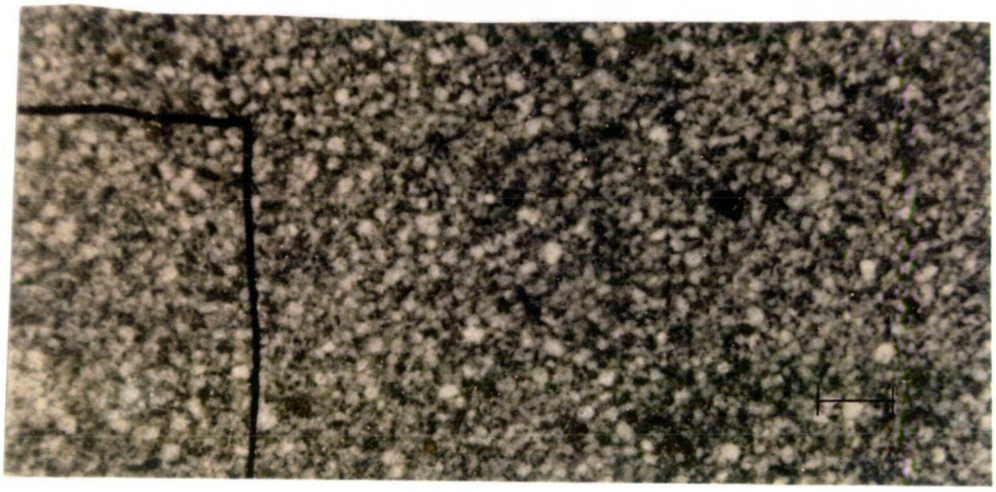


Figure 4.2 Rock photographs Kerimenge-Lemenge Prospects - Scale Bar = 1cm

a) Black phyllite, typical of the Kaindi Metamorphics in the Kerimenge area

b) Typical Sill Porphyry, QD 115 - 195.8m (phyllic altered)

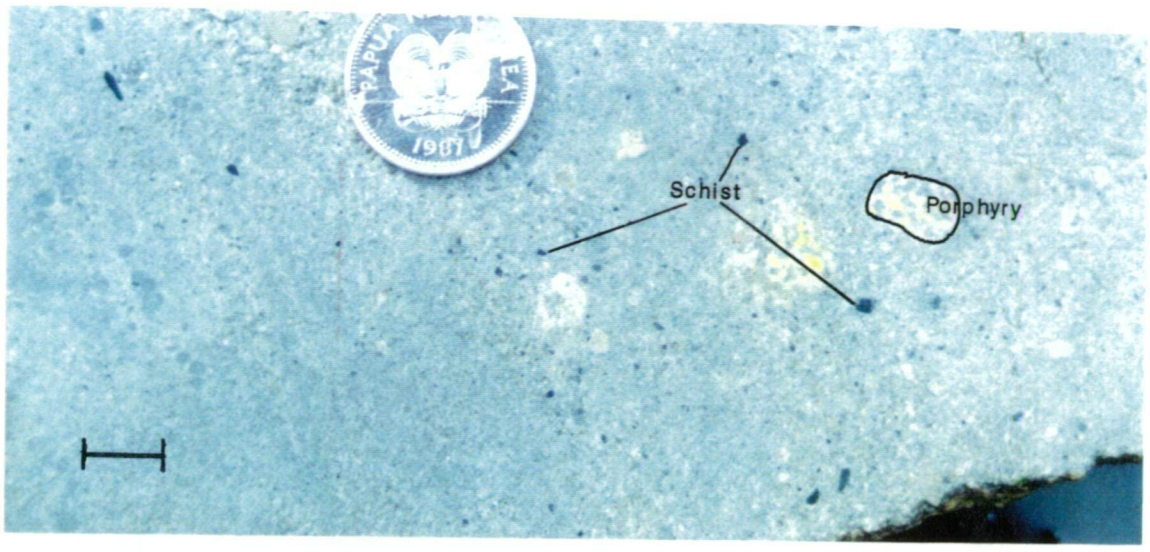


Figure 4.3 Rock photographs Kerimenge-Lemenge Prospect. Scale bar = 1cm

a) Diatreme Breccia QD 122, 30.3m. Note small black clasts are Kaindi metamorphic clasts

b) Flow banded Dome Porphyry. QD 11, 79.2m (alteration is phyllic)

The two porphyry types are indistinguishable in hand specimen, having similar texture and composition. The primary composition ranges from andesite (5% quartz) to dacite (>30% quartz) however almost all the quartz is groundmass quartz and may be subtle groundmass silicification. The two porphyries can only be distinguished by recognition of flow banding and crumble breccias associated with the dome porphyries.

5. STRUCTURE.

The main structural feature and control on mineralisation at Kerimenge is the complex north-northeast trending, steep east and west dipping Old Kerimenge Fault (Figure 4.1). Movement indicators on fault planes, such as slickensides, show there has been strike-slip and both reverse and normal dip-slip movements. The expression of the fault ranges from a narrow (typically <5m) zone of silicification and brecciation in the south to a wide zone (to 30m wide) of brecciation and manganocarbonate stockwork in the north.

Mineralisation is best developed at intersections between the Kerimenge Fault and west dipping, northwest striking cross structures, where major rock shattering and brecciation has occurred (Figure 5.1).

A major change in structural orientation from northeast to northwest is evident in the north of Kerimenge and through to Lemenge (Figure 4.1). This change parallels the margin of the diatreme and is probably related to ring faults. The northwest faults parallel the structures defining the Wau Graben and form a northwest structural corridor, termed the Lemenge Corridor. which is the focus for dome intrusion and manganocarbonate mineralisation.

At Lemenge the main mineralised structure is the Kuskom Fault Zone which contains continuous fissure-fill veins of manganocarbonate to 10m wide, the margins of which are stockworked by manganocarbonate veins. Where the Kuskom Fault Zone is intersected by northeast to east-northeast structures the mineralisation flares out into these structures resulting in star-shaped zones of manganocarbonate mineralisation (Figure 4.1).

Late (post mineral?) faults are characterised by subrounded rock fragments set in a grey rock flour matrix.

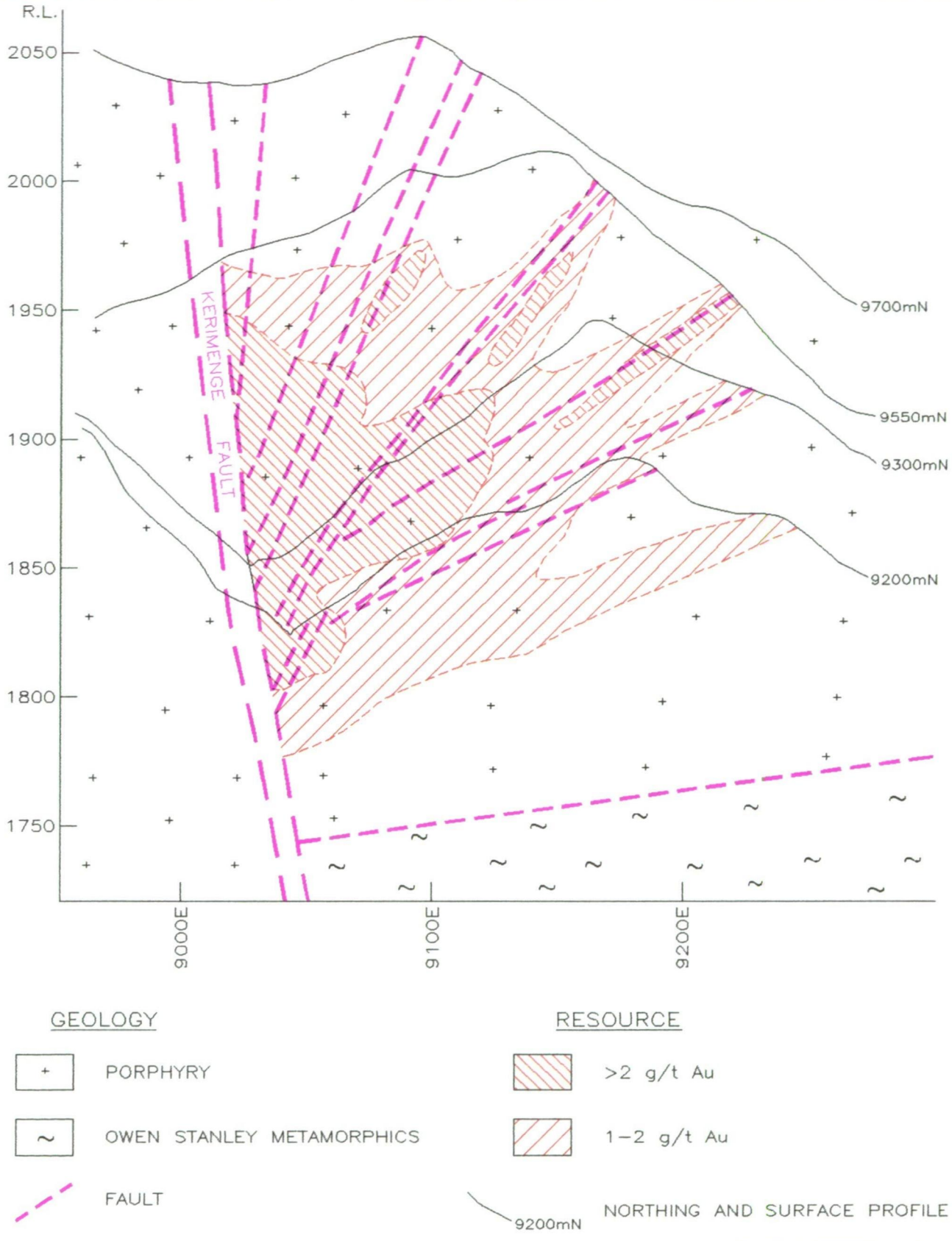


Figure 5.1

Composite section showing generalised resource outline, Kerimenge Prospect (From Hutton et. al 1990). *Note how mineralisation is controlled by the Kerimenge Fault and thickens at fault intersections.

6. MINERALISATION

6.1 Previous Investigations

References to previous work on the Kerimenge Prospect have been given in the introduction. Previous work has described the refractory mineralisation. The possibility of an additional style of mineralisation (non-refractory) was raised by Syka and Bloom (1990).

No work following up this possibility has been reported.

One of the major thrusts of this thesis is to clearly identify and describe this non-refractory mineralisation.

6.2 Previously Described Refractory Mineralisation.

Much of this section is based on previous work referred to in the introduction, however, additional data from this investigation including, re-examination of drill holes, petrology and microprobing has enabled some modifications to be made.

All mineralisation at Kerimenge is hosted by porphyry. In the southern parts of Kerimenge the mineralisation is present within a series of silicified fractures and crackle breccias. Crackle breccias are best developed at structural intersections and become fissure fill veins away from intersections (Figure 6.1). They comprise altered porphyry clasts in a matrix of microcrystalline quartz. Higher gold grades are associated with the crackle breccias and grade reduces into the fissure veins.

Manganocarbonate veinlets, wide manganocarbonate stockworks and fissure filling veins progressively become predominant over siliceous breccias and veins to the north. From the

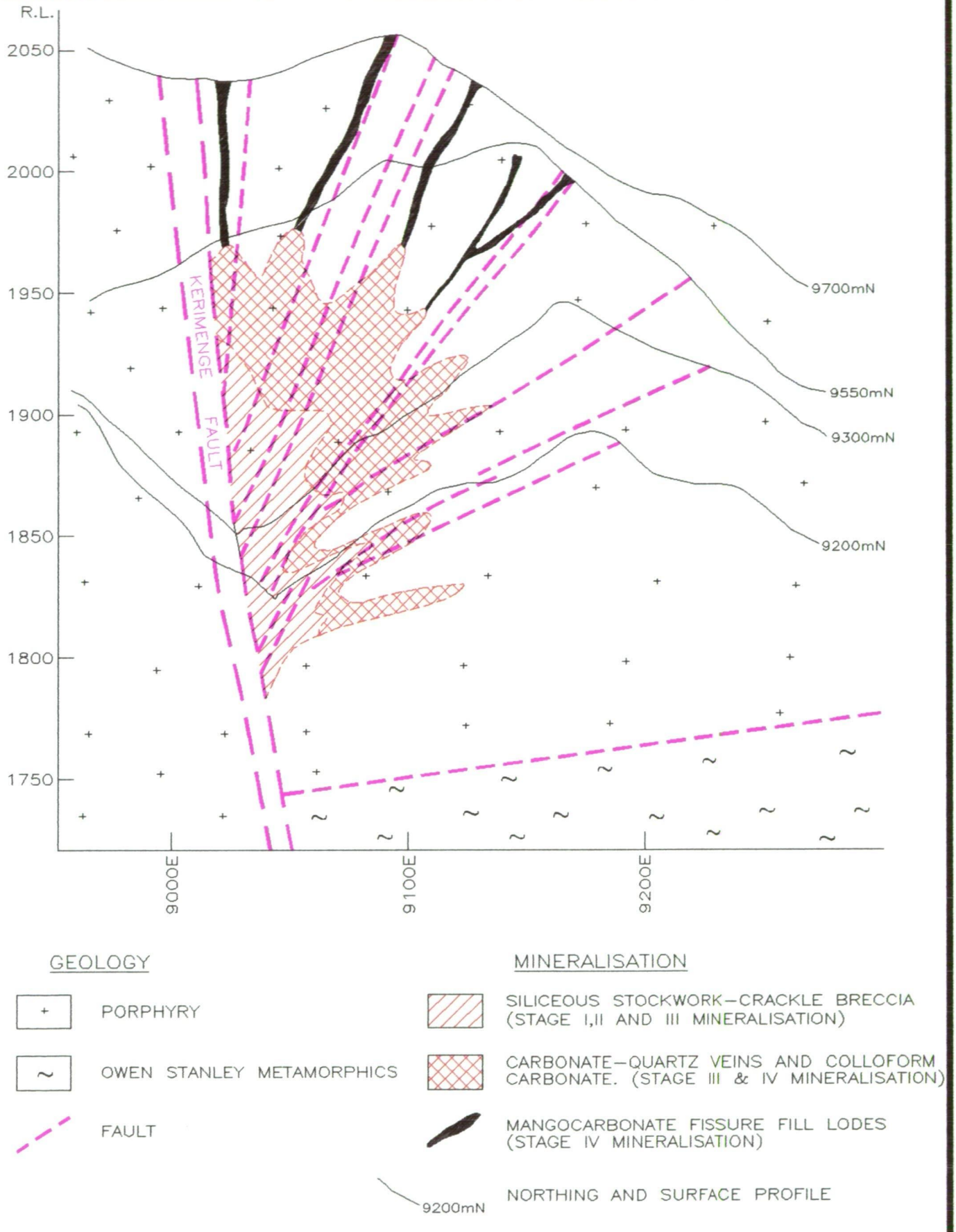


Figure 6.1

Composite section showing variation in mineralisation style with depth.(From Hutton et.al 1990)

northern part of Kerimenge through to Lemenge, stockworks and wide veins are predominant.

The paragenetic sequence for the main refractory mineralisation at Kerimenge has been elucidated by Syka (1985) and Syka & Bloom (1990) and their results are only slightly altered in this study.

Evidence for an early magmatic phase of mineralisation (pre-gold mineralisation) is preserved in porphyry xenoliths and diatreme fragments. These fragments contain quartz-pyrite veins deposited from NaCl saturated, CO_2 rich fluids (Syka 1985).

Four stages of gold bearing vein mineralisation were identified, however the first two stages are often indistinguishable. According to Syka and Bloom (1990) the majority of the gold was deposited during Stage II although the present study shows that Stage III is also a major gold phase. The paragenetic sequence determined by Syka and Bloom (1990) is presented in Figure 6.2 with modifications from this study.

Stage I - Quartz-pyrite ± sphalerite ± muscovite

Stage II - Quartz-pyrite-gold ± adularia ± sphalerite ± chalcopyrite ± galena ± arsenopyrite.

Both Stage I and Stage II vein types are commonly narrow, 5 to 20mm in width, and have identical textural features, dominated by open space fill euhedral quartz crystals (Figure 6.3a). Stage I veins are mineralogically gradational into Stage II veins. Stage II veins are distinguished by the presence of euhedral adularia crystals, (Figure 8.2a) in veins (Syka 1985). Stage I and II mineralisation was deposited from a boiling fluid (Syka and Bloom, 1990).

In this study Stage II pyrite and arsenopyrite from drillhole QD 34 (25.8m) were analysed by microprobe analysis for low

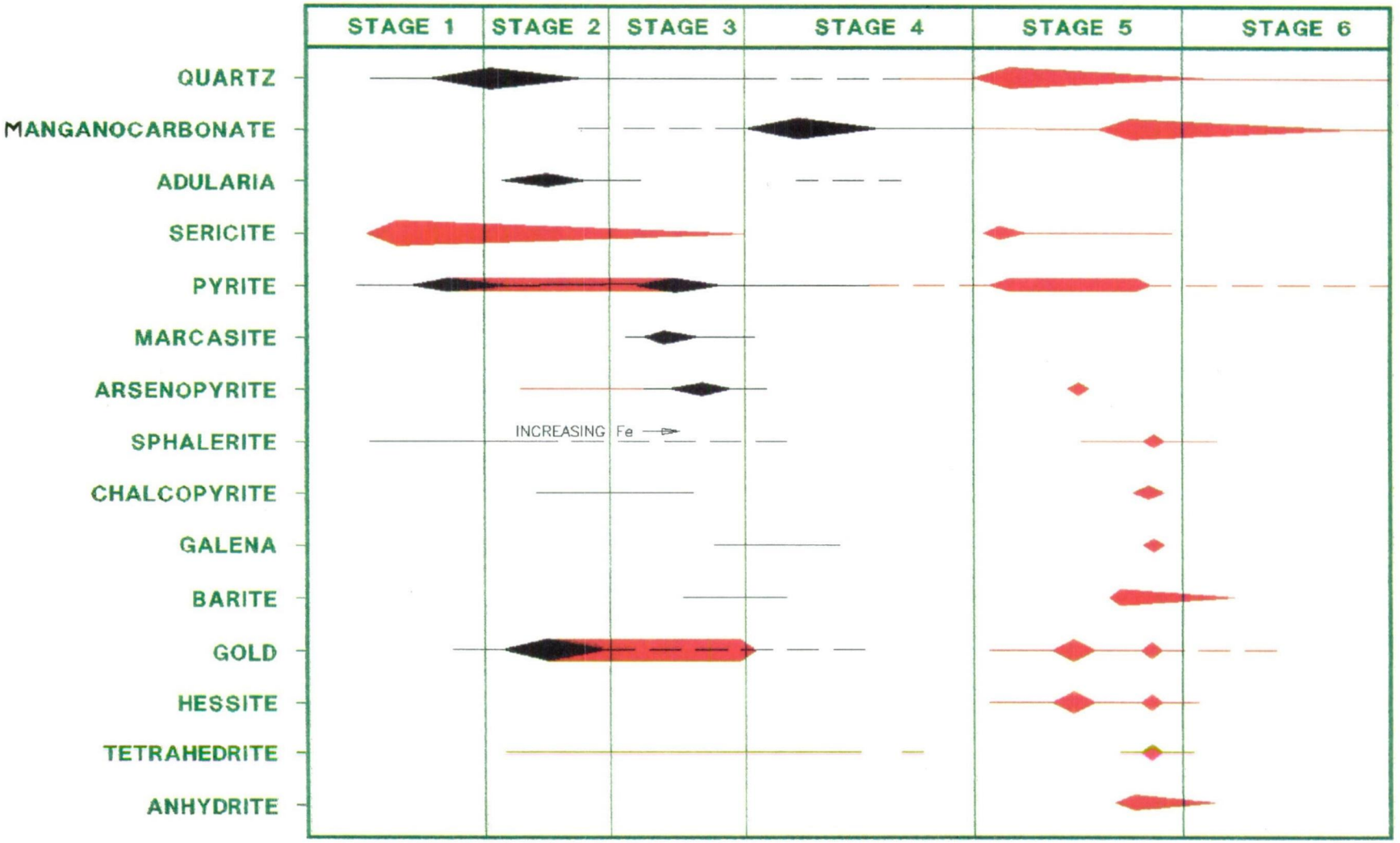


FIGURE 6.2. Generalised paragenetic scheme for Kerimenge mineralisation. Paragenesis shown in black is that of Syka and Bloom (1990). Paragenesis shown in red is that discovered and/or modified by this study.

level gold. Stage II pyrite in this sample has a gold content ranging from 313ppm to 526ppm (Table 6.1) and Stage II arsenopyrite has a gold content below the detection limit (120ppm). Gold occurs in Stage II veins as electrum grains, up to 30μm, intergrown with pyrite (non-refractory) and also as sub-microscopic particles within the pyrite lattice (refractory). Electrum grains in Stage II pyrite has a fineness of 850 (Table II).

Stage III - Quartz-arsenopyrite-gold-manganocarbonate± pyrite ± galena ± barite veinlets.

Stage III veinlets occur as a late stage vein fill within Stage I and Stage II veins (Photograph in Figure 6.3a) and also as microveins (0.1 to 2mm wide) crosscutting Stage I and II veins. Stage III veinlets show local variation; either quartz or carbonate may be the dominant gangue.

Prior to this study no gold has been identified in Stage III veinlets. Microprobe analysis of Stage III pyrite and arsenopyrite from drillhole QD 34 (25.8m) (Table 6.1) demonstrates that Stage III arsenopyrite can contain up to 540 ppm gold and that Stage III pyrite has gold values below the detection limit. (c.f. Stage II results where pyrite is auriferous and arsenopyrite is barren). Gold is occurring as either submicron inclusions or is substituting into the arsenopyrite lattice. This gold is refractory.

Stage IV - Manganocarbonate ± quartz ± adularia ± pyrite ± galena ± tetrahedrite.

These are fissure filling, crustiform manganocarbonate veins which are developed higher in the system. They occur as stockworks at depth and with elevation coalesce and become discrete veins to 3m wide. Within the veins a textural zonation is recognised from massive to crustiform to colloform-crustiform with increased depth.

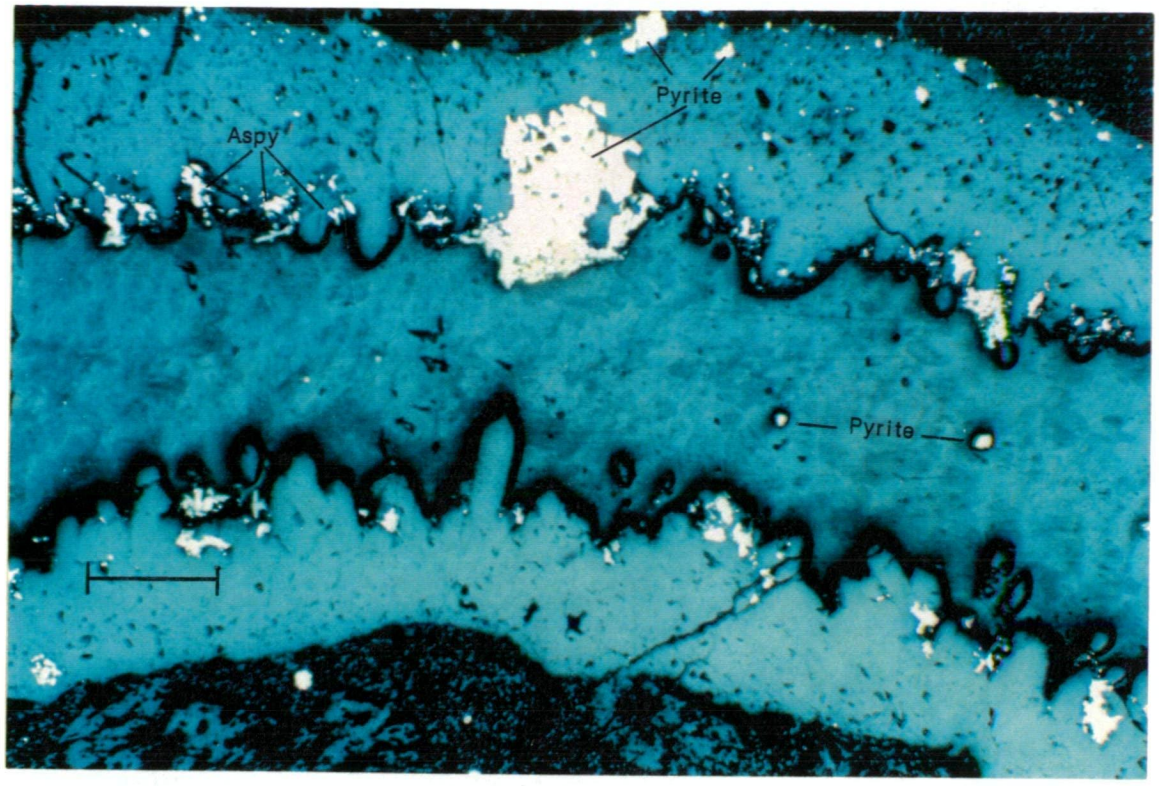


Figure 6.3 a) Stage II Quartz Pyrite Vein Infilled With Stage III Carbonate Arsenopyrite. Pyrite Occurs Within The Quartz, Arsenopyrite Occurs At The Quartz-Carbonate Contact. (QD 34, 25.8m, Reflected Light. Scale Bar Is 500μm.)

b) Massive Stage IV Manganocarbonate Vein-Lemenge Prospect.

weight percentage (wt%)

MINERAL	STAGE	S	Fe	As	Au(ppm)
Py	III	53.24	45.95	1.00	0
Aspy	III	21.30	33.96	43.93	290
Py	II	53.40	45.86	0.60	526
Py	II	51.69	45.11	3.80	313
Py	II	53.20	45.58	0.97	508
Aspy	II	20.87	33.35	44.80	0
Aspy	III	22.53	34.05	42.72	540
Py	III				0
* Py	III				80
* Aspy	III				255

TABLE 6.1. **Microprobe Composition (wt %) and Gold Content for Stage II and III pyrite and arsenopyrite from QD 34, 25.8m.**
Detection limit for gold = 120ppm
*** Arsenopyrite grain with pyrite intergrowths.**

Weight percentage (Wt%)

	1	2	3
Au	85.1	85.9	84.5
Ag	14.9	14.1	16.26

Table 6.2. **Composition (Wt %) of 20-30 micron Electrum Grains Intergrown with Stage II Pyrite.**

The vertical zoning of ore and gangue mineralogy reflects CO_2 and H_2S loss during vertically controlled boiling. This progression in mineralisation style from south to north at least in part reflects the paragenesis of the mineralised system with elevation increasing to the north. A reverse

sequence is noted with depth in the northern parts of the system i.e. manganocarbonate veins/stockworks near surface through manganocarbonate veinlets/stockworks to siliceous crackle breccias and fissure-fill veins with depth.

6.3. Non-refractory Mineralisation QD 85.

Drillhole QD 85 is located in the northern part of the Kerimenge Prospect (Figure 4.1). This vertical hole is 282.1m deep and was drilled entirely in variably altered porphyry interpreted as the Sill Porphyry. Two major gold intersections, one refractory and the other non-refractory were intersected. The mineralisation is considered to lie at the intersection of the Kerimenge Fault and the Eastern Fault Zone which plunge at 60° to 280°. The hole has been studied in detail as it contains the only intersection of non-refractory high grade gold within unoxidised mineralisation yet encountered. The geological log for drillhole QD85 is included as appendix 4.

The high grade mineralisation ranges in style from fissure veins to a stockwork within a porphyry host. Two main vein orientation are noted, one horizontal to, and another at 30° to, the (vertical) core axis.

Three main styles of mineralisation are recognised in this high grade non-refractory mineralisation:

1. Fine grained anhedral quartz (<0.05mm) rimming clasts of silicified porphyry containing fine grained hessite (<0.025mm, Ag_2Te) ± tetrahedrite-tennantite and evolving to vuggy quartz (up to 5mm) with tetrahedrite-tennantite filled vugs. The early fine grained hessite occurs at the outer edge of the fine grained quartz.

2. Hydrothermal breccia. Clasts of porphyry, silicified porphyry, manganocarbonate clasts (Stage IV) and

mineralisation described in 1. set in manganocarbonate cement. Bladed crystals of carbonate and quartz interpreted to be after anhydrite occur early in this event.

3. Manganocarbonate veins. These veins are white to pink in colour reflecting increasing manganese content. The carbonate usually infills the two mineralisation styles described above but locally crosscutting veins are developed. Two main textural types of veins have been identified:

   a) Crystalline massive pink manganocarbonate
   b) Crustiform +/- colloform manganocarbonate

Samples from these different mineralisation types were investigated petrographically in this study to determine the mineral species present (Appendix 1). Mineral compositions were determined by electron microprobe. Two main stages of mineralisation were identified by this study. These stages are termed Stage V and Stage VI for compatibility with mineralisation stages recognised previously at Kerimenge.

STAGE V Stage V mineralisation is veining and/or hydrothermal brecciation cemented by quartz ± sericite ± manganocarbonate ± arsenopyrite ± hessite ± tetrahedrite-tennantite ± galena / hessite ± chalcopyrite ± gold ± anhydrite ± barite

STAGE VI Manganocarbonate ± quartz veining (= Stage IV ?) and/or breccia cemented by manganocarbonate.

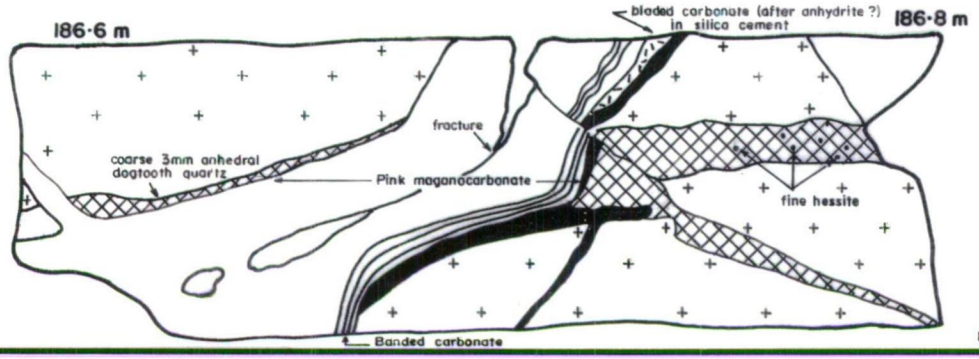
These two mineralisation stages are discussed in greater detail in Section 6.4 and 6.5.

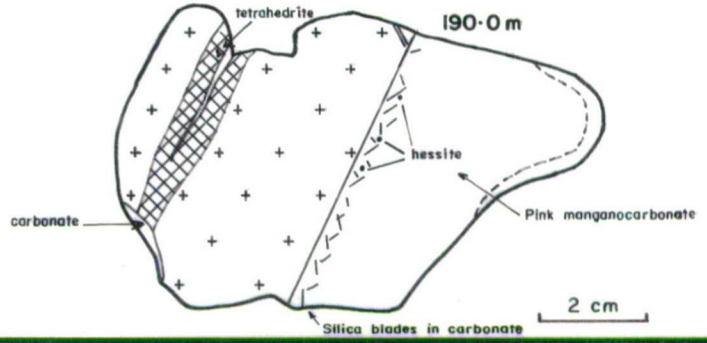
The relationship between the two stages are well illustrated in the following examples:

1. **QD 85 186.6m (Figure 6.4).** In this example earlier silica-pyrite occurs along the vein wall (Kerimenge Stage II mineralisation). This is followed by fine grained to vuggy crystalline quartz clasts (Stage V) crosscut by thin manganocarbonate veinlets (weakly developed breccia matrix) and locally containing bladed crystals of carbonate after anhydrite (Stage VI breccia). Fine hessite occurs within the quartz close to the contact with carbonate. The two vein types are crosscut by a pink manganocarbonate vein with a crustiform rim and massive core (Stage VI).

2. **QD 85 190.0m (Figure 6.4).** In this example two conjoining veins are observed. One vein contains fine to coarse anhedral quartz (Stage V) with an irregular core of pink manganocarbonate (Stage VI). Abundant tetrahedrite-tennantite occurs within coarse quartz at the carbonate-quartz contact. The second vein is a massive pink manganocarbonate vein (Stage VI) with a thin (<1mm) veneer of fine quartz (Stage V) and slightly later bladed quartz after anhydrite (Stage VI breccia). Abundant grains of hessite occur within this veneer.

3. **QD 85 188.2m (Figure 6.5).** This is an example of zoned veining in porphyry and strongly silicified porphyry. At the vein wall a 3mm quartz-pyrite-minor tetrahedrite vein (Kerimenge Stage II vein) occurs. Moving towards the centre, a complex zone 20mm wide exists with early blade-like holes after anhydrite followed by slabby quartz clasts (Stage V) with hessite predominantly on one side of the silica slabs. These are cemented in fine carbonate (Stage VI breccia). This breccia is interpreted to have formed by hydrothermal brecciation by ripping up of Stage V mineralisation with concomitant deposition of anhydrite, with subsequent cementation by carbonate (Stage VI breccia). The predominance of hessite on one side of the silica slabs indicates that the deposition of





L E G E N D

- PORPHYRY
- SILICA – PYRITE – TETRAHEDRITE (Stage II / III)
- FINE QUARTZ TO COARSE VUGGY CRYSTALLINE QUARTZ AND CARBONATE, FINE HESSITE AT CONTACT BETWEEN QUARTZ AND CARBONATE (Stage V)
- AS ABOVE WITH BLADED QUARTZ AND/OR CARBONATE AFTER ANHYDRITE (Stage V)
- BANDED TO MASSIVE PINK MANGANOCARBONATE (Stage VI)

RGC (PNG) EXPLORATION PTY. LIMITED

INCORPORATED IN PAPUA NEW GUINEA

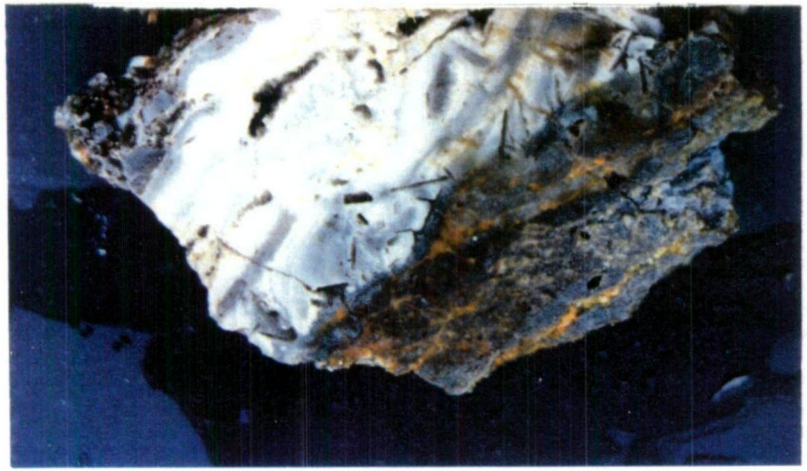
COMPILED	KPD	P.A. 497 —— MT. KAINDI
DRAWN	WRP	
DATE	9/93	KERIMENGE PROSPECT
CHECKED		HOLE QD 85, 186·6 m AND 190·0 m
1:250 000 Reference	WAU	

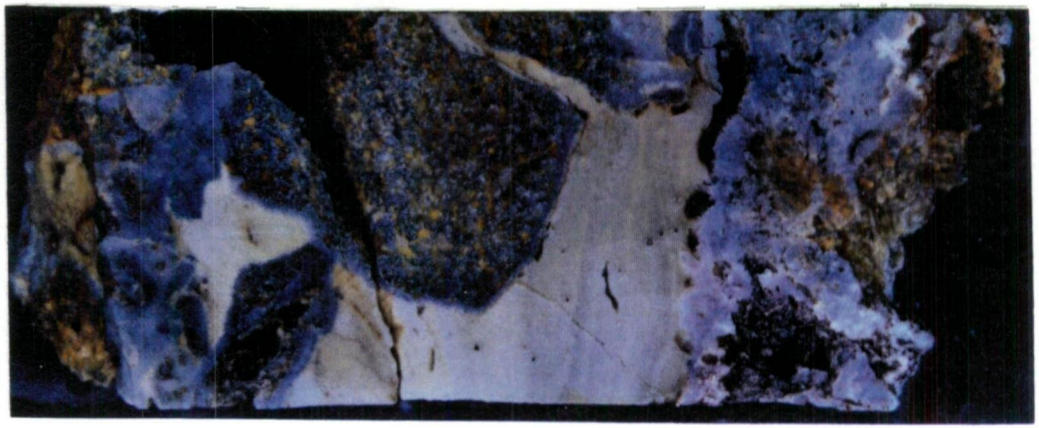
BASE DWG. N°

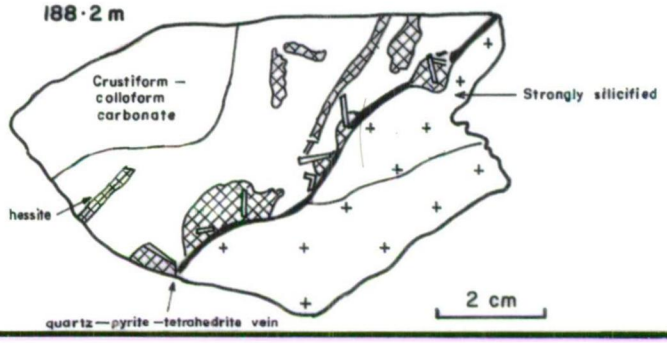
DWG. N° 6508/KER/E/54

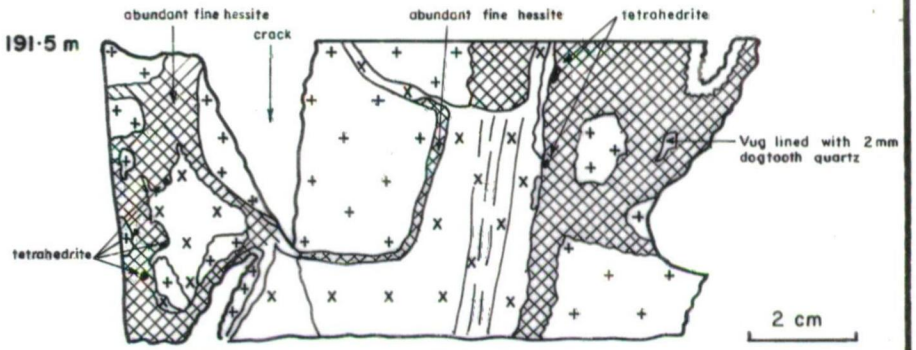
NOT TO SCALE

FIG. 6.4









L E G E N D

- PORPHYRY
- APLITE DYKE (WEAKLY STRATIFIED)
- FINE SILICA EVOLVING TO COARSE VUGGY QUARTZ. AT 188·2 m ONLY FINE SILICA stage Va and Vb
- CARBONATE (stage VI)
- HOLE AFTER ANHYDRITE LATHS

RGC (PNG) EXPLORATION PTY. LIMITED

INCORPORATED IN PAPUA NEW GUINEA

COMPILED	KPD	P.A. 497 —— MT. KAINDI
DRAWN	WRP	
DATE	9/93	KERIMENGE PROSPECT
CHECKED		HOLE QD 85, 188·2 m AND 191·5 m
1:250000 Reference	WAU	

BASE DWG. N°

DWG. N° 6508/KER/E/5

NOT TO SCALE

FIG. 6.5

hessite was pre-brecciation. The breccia is followed by finely banded colloform-crustiform manganocarbonate, which occurs in the central zone of the vein (Stage VI).

4. **QD 85 191.5m (Figure 6.5).** In this example the porphyry is rimmed by up to 10mm of fine quartz (Stage Va) then intruded by a fine yellow banded lithology. This is subsequently cut by coarse anhedral quartz (Stage Vb). The fine yellow banded lithology has been emplaced syn Stage V mineralisation. This lithology may be a fine grained intrusive however XRD analysis (Terry Leach pers.comm) indicates it is a quartz-illite phase and is more likely to be hydrothermally derived rather an igneous phase.

6.4 Stage V Mineralisation

The Stage V event brecciates porphyry and, locally, earlier phases of mineralisation. The clasts are cemented by fine grained anhedral quartz ± sericite and subordinate calcite, evolving to vuggy quartz ± calcite ± barite. Strongly silicified porphyry clasts are difficult to distinguish from the fine matrix. The distinction is achieved by recognition of relict textures and the dominance of pyrite in the latter. In places early fine grained Stage V mineralisation is ripped up and cemented by manganocarbonate with concomitant growth of anhydrite needles (Stage VI breccia). Zoned quartz crystals, up to 1mm, grow into the cavities as do laths of barite up to 3mm.

Locally the Stage V breccia contain clasts of manganocarbonate. This manganocarbonate is interpreted to be stage IV manganocarbonate.

Gold mineralisation occurs in two main localities within Stage V mineralisation and are termed Stage Va and Vb mineralisation.

Stage Va mineralisation occurs within fine quartz close to the contact between the quartz and Stage VI manganocarbonate. The very specific location of Stage Va mineralisation suggests that specific conditions were required for deposition. This mineralisation is well developed in breccias where the silica occurs as laths or clasts within manganocarbonate and within the siliceous rims surrounding bladed quartz (after anhydrite) of manganocarbonate veins. Grains of hessite are typically <50μm in longest dimension and are usually intergrown with galena (Figure 6.6a), but also includes tetrahedrite-tennantite and chalcopyrite as discrete grains and as intergrowths. In one sample a composite grain of petzite ($AuAg_3Te_2$), hessite and galena was observed. Electrum occurs exclusively within the hessite as inclusions and intergrowths to 20μm and has a fineness of approximately 800 (Table 6.3). The hessite has a near perfect stoichiometry and contains only minor impurities (Table 6.4).

Weight percentage (Wt%)

	*186.9	*190.0	182.5	182.5	182.5	182.5	AVERAGE
Au	85.45	87.6	78.9	81.5	81.0	76.3	81.80
Ag	14.5	11.9	21.1	18.2	19.0	23.7	18.10
Hg	0.0	0.4	0.0	0.3	0.0	0.0	0.1

TABLE 6.3 **Composition (Wt %) of Stage V Electrum Grains from QD 85. Proportions shown are weight percentages.* - Stage Vb electrum, others are stage Va. Numbers on upper tier refer to sample depth in QD 85**

Stage Vb mineralisation occurs as a late vug fill of tetrahedrite-tennantite within the coarse quartz veins (Figure 6.6b). The tetrahedrite-tennantite is up to 4mm in diameter and occurs as a coarsely crystalline vug fill and intergrown with the quartz. The tetrahedrite-tennantite commonly contains inclusions of hessite, galena and rare sphalerite and

locally has a chalcopyrite rim (Figure 6.7a). Hessite and galena occur as discrete inclusions and also as composite grains with diffuse boundaries (Figure 6.7b). The blebs are concentrated as an annulus within the tetrahedrite-tennantite about $^1/_5$ of the diameter in from the rim. They are subrounded and from 20 -100μm diameter. Hessite locally occurs as discrete grains to 1.0mm but are typically <100μm. The specific location of hessite-galena suggests that they are deposited over a very specific chemical condition.

Observed electrum within Stage Vb mineralisation occurs exclusively as 5-10μm inclusions within hessite that is itself included within tetrahedrite-tennantite. Electrum was not observed in free grains of hessite. The electrum is ovoid to ragged and has a fineness of 860 (Table 6.3). In some hessite grains the Au content is elevated (to 5.3 wt %) but is typically <0.5 wt % (table 6.4). This probably reflects submicroscopic grains of electrum within the hessite rather than formation of gold tellurides.

The tetrahedrite-tennantite has an average stoichiometry of $[(Cu_{9.4}\ Ag_{0.3})\ (Zn_{1.7}\ Fe_{0.1})]\ (Sb_{4.25-x}\ As_x)\ S_{13}$ $(0.6<x<2.6)$. The composition is consistent throughout the mineralised zone except for coupled variations in As and Sb (Table 6.5). In some grains the core is Sb-rich and the edge As-rich.

Lead is often elevated to 0.5% with sulfur <0.1%, suggesting minor altaite (PbTe) is forming within the tetrahedrite-tennantite.

Other species within the tetrahedrite-tennantite includes rare yellow sphalerite (Fe content in sphalerite = mean of 700ppm over a range of 500-800ppm Table 6.6) and pyrite. Pyrite is euhedral and occurs within tetrahedrite-tennantite and hessite. Chalcopyrite often occurs as a 20-30μm rim to the tetrahedrite-tennantite.

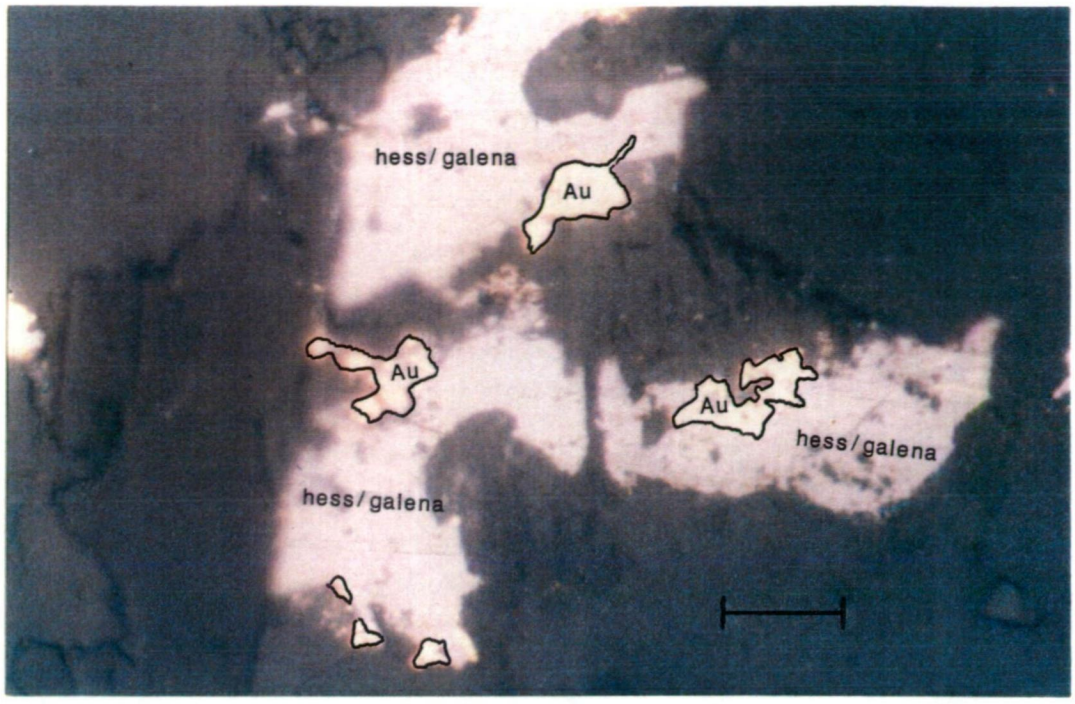
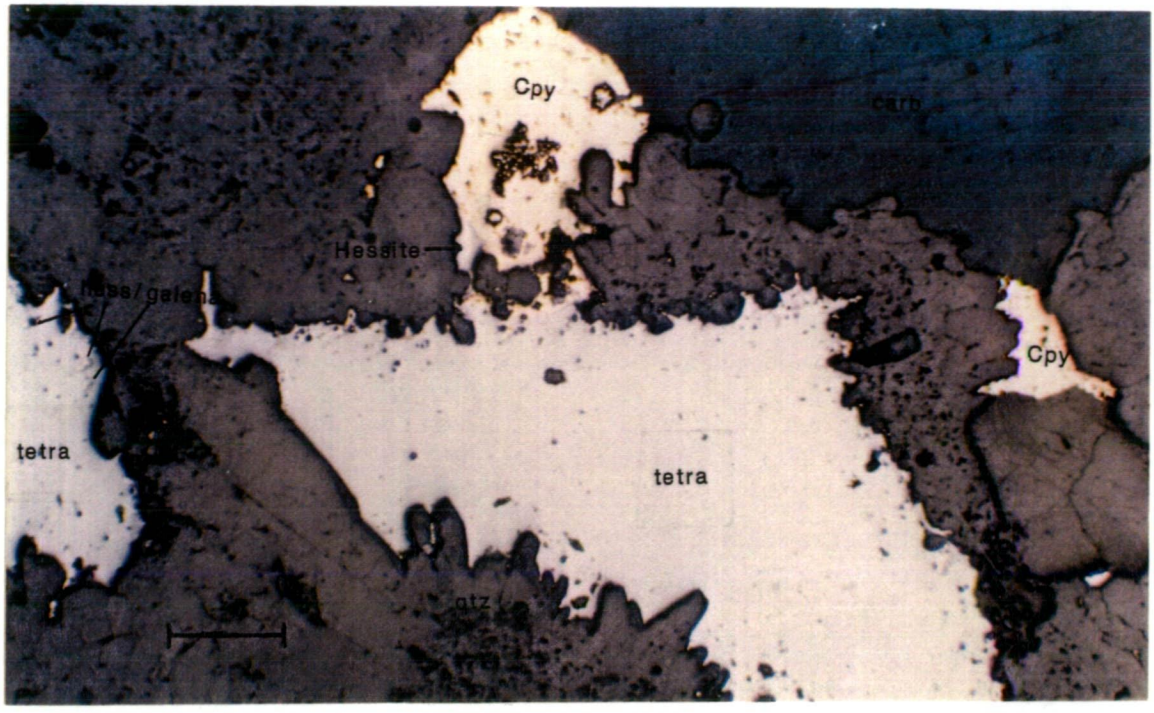


Figure 6.6

a) QD85, 182.6m, reflected light. Stage Va mineralisation. Intergrown hessite (hess) and galena with inclusions of electrum (Au) within the hessite. Gangue is quartz. Scale bar is 10μm long.

b) QD 85, 186.9m, transmitted light. Stage Vb tetrahedrite-tennantite (black) vug fill within a Stage Vb quartz vein. Scale bar is 500μm long.



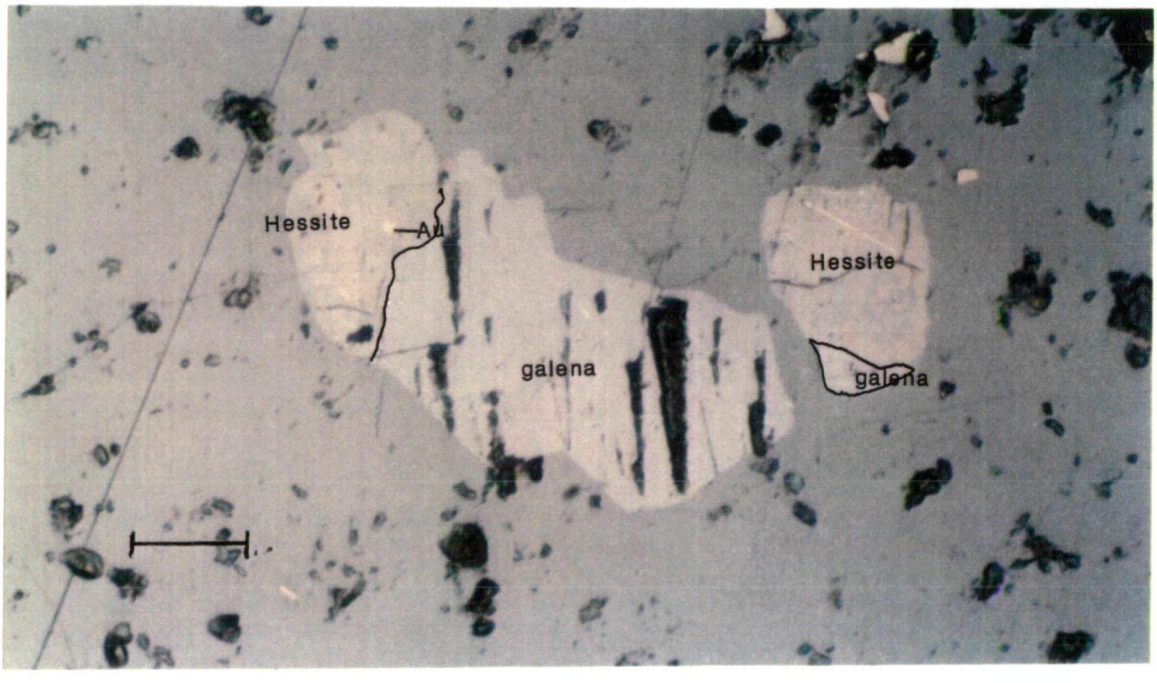


Figure 6.7

a) QD 85 186.9m reflected light. Stage Vb tetrahedrite-tennantite (tetra) within Stage Vb quartz vein with carbonate (carb) in top right hand corner. Note chalcopyrite (cpy) on edge and inclusions of galena/hessite. (Scale bar is 500μm long)

b) QD 85 186.9m reflected light. Stage Vb mineralisation. Galena/hessite/electrum (Au) inclusions within tetrahedrite. Scale bar is 25μ long.

Weight percentage (Wt%)

SAMPLE NUMBER	S	Ag	Te	Au	Pb	Mineral
QD 85-190 R_3	0.02	62.03	39.59	0.05	1.74	hessite
QD 85-190 R_2.	0.08	62.94	37.87	0.12	0.80	hessite
QD 85-190 R_3	0.02	63.31	37.73	0.16	0.76	hessite
QD 85-186.9 R_1	0.02	63.50	38.01	0.16	0.17	hessite
QD 85-186.9 R_1	0.06	61.27	35.26	3.30	0.84	hessite minor electrum
QD 85-186.9 R_1	0.05	63.04	38.03	0.08	0.0	hessite
QD 85-186.9 R_2	0.03	63.41	37.91	0.0	0.49	hessite
QD 85-186.9 R_2	0.02	61.74	37.65	0.08	0.00	hessite
QD 85-186.9 R_3	0.04	63.22	37.69	0.47	0.10	hessite
QD 85-186.9 R_4	0.07	62.74	37.45	0.19	0.48	hessite
QD 85-186.9 R_6	0.06	63.84	38.18	0.16	0.80	hessite
QD 85-186.9 R_7	0.05	60.11	39.94	0.36	0.86	hessite
*QD 85-189.7 R_1	0.02	65.97	33.20	0.05	0.68	hessite
*QD 85-189.7 R_1	0.01	58.39	37.20	9.98	0.91	intergrown hessite-petzite
*QD 85-189.7 R_1	0.02	42.94	33.99	25.11	1.12	petzite
QD 85-189.7 R_2	0.05	63.62	38.08	0.38	0.32	hessite
QD 85-189.7 R_2	0.02	56.12	33.51	5.39	0.32	hessite minor electrum
QD 85-189.7R_2	0.04	64.12	37.94	0.41	0.05	hessite
*QD 85 182.5R_1	0.00	63.26	37.38	0.27	0.13	hessite
*QD 85 182.5R_1	0.0	60.84	41.53	0.16	0.0	hessite
*QD 85 182.5R_1	0.0	60.88	36.53	5.09	0.00	hessite minor electrum

TABLE 6.4. Telluride compositions (Wt %) QD 85.
*** = Stage Va others are Stage Vb mineralisation.**

	Weight percentage (Wt%)						
SAMPLE #	**S**	**Fe**	**Cu**	**Zn**	**As**	**Ag**	**Sb**
QD85 190 R_2	26.74	0.35	38.12	6.98	10.52	2.28	16.3
QD85 190 R_2	26.75	0.47	38.63	7.12	10.90	2.10	15.86
QD85 190.0 R_1	26.76	0.27	38.61	6.99	10.34	2.10	15.98
QD85 186.9 R_1	27.07	0.31	39.46	6.92	13.20	1.32	13.29
QD85 186.9 R_1	25.36	0.26	36.36	7.10	2.99	2.41	25.34
QD85 186.9 R_4	26.64	0.29	37.97	6.91	9.21	1.71	17.62
QD85 186.9 R_4	27.02	0.30	38.82	6.91	11.36	1.46	15.48
QD85 186.9 R_6	27.23	0.44	39.43	6.93	13.70	1.88	12.44
QD85 186.9 R_6	26.20	0.21	37.52	6.92	7.39	2.57	20.17

TABLE 6.5 Tetrahedrite-tennantite Compositions (Wt %)

	SAMPLE #			
	QD85-189.7 R_3	**-189.7 R_3**	**-189.7 R_3**	**189.7 R_3**
Fe(ppm)	804	780	669	512

TABLE 6.6 Fe Content (ppm) of Sphalerite in Stage Vb tetrahedrite-tennantite.
* Fe detection limit 110ppm

6.5 Stage VI Mineralisation

Three phases of manganocarbonate quartz mineralisation are recognised within this stage. They are as follows, listed in paragenetic order:

1. Hydrothermal Brecciation. Clasts of porphyry, Stage IV manganocarbonate and slab like fragments of Stage Va silica-hessite set in a white manganocarbonate-quartz matrix.

2. Pink Manganocarbonate. Manganocarbonate occurs as veins up to 20cm in width, typically with a banded rim and a massive crystalline core.

3. Colloform-Crustiform Carbonate.

The first two manganocarbonate events are closely related. The first manganocarbonate event can be locally explosive (1.) and/or passive (2).

7. GEOCHEMISTRY.

During the resource evaluation at Kerimenge, two metre drill intervals were routinely assayed for Au, Ag and As with sporadic basemetal analyses. Gold was analysed by fire assay (FA), which analyses all gold, and also by cyanide extraction techniques (CN), which analyses free gold. The ratio of Au(CN):Au(FA) gives an indication of how much gold can be recovered using standard CIP extraction techniques.

The high grade zone in QD 85 was recognised in this limited data base to have a chemistry contrasting to the rest of Kerimenge with higher gold and silver, low arsenic and a high Au(CN) to Au(FA) ratio (i.e non-refractory mineralisation).

Multi-element analysis (40 elements) of all two metre intervals and selected samples in hole QD85 was completed to chemically fingerprint the non-refractory mineralisation (QD 85, 176-200m) and the refractory (QD 85, 92-126m) mineralisation. Selected samples of mineralisation, dominated by Stage Va and Vb, were analysed to compare the chemistry of these substages.

Geochemical fingerprinting will assist with:

1) exploring for additional non-refractory mineralisation in the Kerimenge-Lemenge area and;

2) generating an exploration model.

Multi-element assay results by ALS and Becquerel laboratories are included in Appendix I.

7.1 Stage V Mineralisation

Selected samples of Stage Va and Vb mineralisation were analysed to fingerprint their chemistry. These results (Table 7.1) show a strong contrast between the two stages. Stage Va is anomalous in

Au and Ag only while Stage Vb is anomalous in Au, Ag, As, Sb, Cu, Pb and Zn. This confirms the observation that Stage Va is essentially a hessite-electrum stage whereas stage Vb is a tetrahedrite-tennantite, hessite, galena, sphalerite and electrum phase.

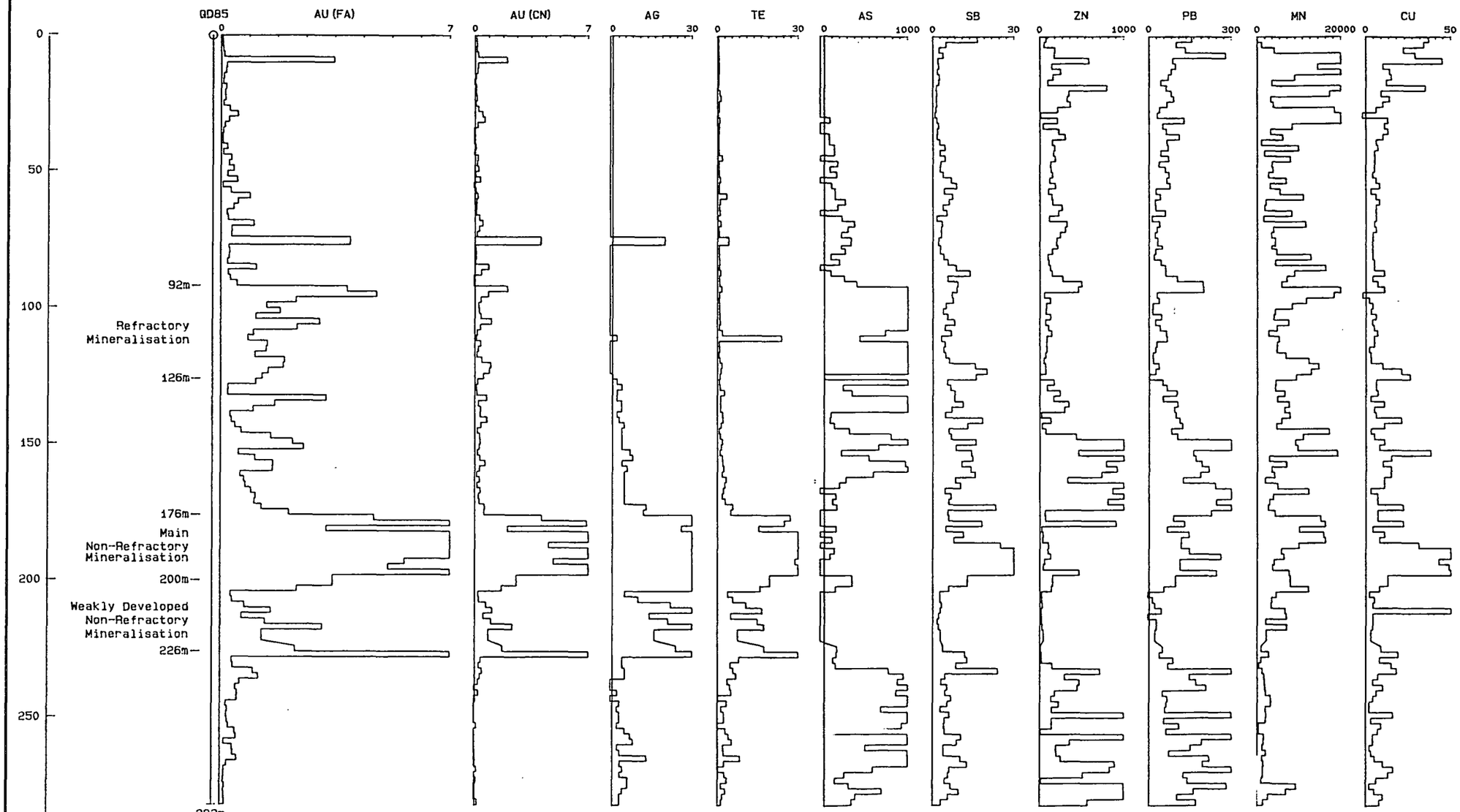
Hole QD 85.

SAMPLE #	Cu	Pb	Zn	Ag	As	Sb	Mn%	Te	Au
186.9m*	.86%	.20 %	.20%	.11	1450	1280	0.1	na	13.6
187.7m*	2750	867	.13%	670	470	n/a	0.2	216	37.2
182.5m+	19	114	26	670	54	n/a	0.9	na	82.6
183.6m+	4	26	12	53	548	n/a	4.8	na	7.1
187.1m+	49	66	50	85	35	24	2.7	46	12.3
190.8m+	46	11	43	124	28	25	1.3	60	17.0

TABLE 7.1 **Geochemical Results from Selective Analysis of Stage V Mineralisation QD 85. Results in ppm except where shown as percentage.**
+ --Stage Va mineralisation.
*** --Stage Vb mineralisation.**

7.2 QD 85 Downhole Geochemistry.

The downhole histograms for Au, Ag, Te, As, Sb, Zn, Pb, Mn and Cu highlight geochemical signatures for the refractory and non-refractory mineralisation types (Figure 7.1). Average analysis for the different styles of mineralisation are presented in Table 7.2.



NOTES :
All values in ppm.

XSCALE 1: 500
YSCALE 1: 1500

DATE 06/10/93
REF No.

SHEET 1 of 1

FIGURE 7.1
QD85 Histogram Plots

RGC Exploration Pty Ltd

Hole QD 85.

Interval	Cu	Pb	Zn	Mn %	As	Sb	Te	Ag	Au FA	Au CN
92-126m	7	14	79	0.9	686	7	<5	1	1.7	0.55
176-200m	33	99	200	1.0	29	29	50	87	9.4	8.74
200-228m	11	23	24	0.5	21	4	16	27	2.4	n/a

Table 7.2 **Geochemical Results of Selected Intervals. Results shown are ppm unless stated otherwise. FA= fire assay, CN = cyanide extraction technique.**

7.2a Non-Refractory Mineralisation

The high grade mineralisation (176-200m) averages 9.4g/t Au by FA and 8.7g/t Au by CN techniques over the 24 metre interval (Table 7.2). This gives a cyanide gold recovery of 93% and implies the mineralisation is non-refractory. The predominance of Ag and Te over Cu indicate that although visually the coarser grained (up to 4mm diameter) Cu-rich tetrahedrite-tennantite is the dominant mineral, volumetrically the finer grained (up to 100μm) Ag and Te rich hessite is the dominant economic mineral phase. This in turn implies that Stage Va hessite dominated mineralisation is much more common (ie the main gold phase) than the Stage Vb tetrahedrite-tennantite dominated mineralisation.

The Ag:Te ratio of 1.7:1 is the perfect stoichiometric proportion for hessite and indicates that hessite is the dominant Ag and Te mineral.

As, Zn and Pb are depleted in this zone but enriched both up and down the hole from this zone. This mineralisation predates the non-refractory mineralisation and is diluted by the later mineralisation. This indicates that the non-refractory mineralisation postdates the As, Zn and Pb mineralisation.

The interval from 200-228m has a similar geochemical response (Figure 7.1, Table 7.2) to the 176 to 200m interval and is the same mineralisation style. The main visual difference in this interval is the predominance of very fine grained silicification and minor quartz and a much lower carbonate content.

7.2b Refractory Mineralisation

The mineralised interval from 92-126m is typical Kerimenge refractory mineralisation. The interval assays 1.7g/t Au (Table 7.2) but only 0.55g/t Au is recoverable by cyanide extraction techniques (ie 32 % recovery). The interval is enriched in Au, As and Fe and relatively depleted in all other elements analysed.

The correlation between Au, As, and Fe reflects the simple mineralogy of quartz-pyrite and carbonate-quartz-arsenopyrite (Stage II and III mineralogy, respectively). Locally Au correlated well with As in zones dominated by the arsenopyrite rich Stage III mineralisation, while in areas dominated by Stage II mineralisation (ie lower As) the Au-As correlation is much weaker.

Two additional element correlation zones are noted in hole QD 85:

a) A strong Mn, Pb and Zn correlation from 0-92m and 150-176m. This reflects the mineralogy of the manganocarbonate veins; and

b) A strong Pb, Zn and As correlation and a weaker Ag correlation from 228- 282.1m (=EOH). The mineralogy here is uncertain but it probable reflects deeper level Stage II and III veins that are gold poor and basemetal rich.

7.3 Fluid Inclusion Study

Fluid inclusion studies for Stages I to IV have been investigated previously by Syka (1985) and Syka and Bloom (1990). The present study of Stage V mineralisation was instigated to investigate the following:

1) to gain insight into fluid temperatures and salinities for Stage V mineralisation;

2) to enable comparison of the Stage V fluid with the stage I to IV fluids;

3) to use temperature constraints for fluid chemistry.

In this study microthermometric data was collected from liquid dominated primary fluid inclusions in growth zones in the coarse parts of Stage V (ie Stave VB) veins. Fluid inclusions in the early fine grained quartz stage (stage Va) were too small to be studied. No vapour dominated inclusions were observed. Observations were made at the University of Tasmania using a USGA heating freezing stage. Primary inclusions were identified as relatively large inclusions isolated from both grain boundaries and secondary fluid inclusion trails.

Results from Syka and Bloom's (1990) study of mineralisation Stages I-IV are as follows:

a) Stage I and II. High CO_2 fluid

Fluid Temperature range	145-230°C
Fluid Temperature average	196°C
Salinity (Wt% NaCl Equiv)	0.0-3.3%

The fluids underwent two-stage boiling at temperatures of 145 to 230°C. The average fluid temperature was 196°C. Marked differences in melting point depression within coeval growth zones and the presence of dawsonite bearing inclusions ($NaAlCO_3[OH]_2$) reflects significant variation in the CO_2 content of the fluid. Assuming gas loss on boiling, then the difference in the highest and lowest T_m indicates loss of up

3 wt % CO_2 to the vapour phase during boiling.

b)	Stage III.	Fluid Temperature range	150-200°C
		Fluid Temperature average	176°C
		Salinity (Wt% NaCl Equiv)	0.86-1.57%
C)	Stage IV.	Fluid Temperature range	160-170°C
		Fluid Temperature average	165°C
		Salinity (Wt% NaCl Equiv)	0.25-1.25%

A gradual decrease in temperature from Stage I to Stage IV supports the notion of progressive cooling of a single mineralising fluid throughout the vein stages.

Stage Vb Mineralisation (investigated in this study)

Homogenisation temperature (T_h) results (Figure 7.1) range from 190-258°C and average 220°C. The high variation in T_h may indicate that the fluid was boiling, although vapour rich inclusions where not observed. Freezing point depression measurements (T_m) were made on four inclusions and ranged from -0.6 to -1.2°C which corresponds to a salinity range of 1.0-2.07% NaCl equiv.

The Stage Vb fluid is hotter than fluid in Stages I-IV. This suggests that Stage V mineralisation formed in response to a different mineralising event rather than continued evolution of the one fluid.

7.4 Fluid Chemistry

Using the equations of Affifi et.al (1988a) the fTe_2 can be established from the Ag mole fraction of electrum in equilibrium with hessite (calculated in Appendix 3). Using the data in Table 6.3 this gives values of log fTe_2 of -13.5 and -12 for Stages Va and Vb respectively. These values assume a constant temperature of 220°C (the average temperature for Stage Vb quartz as determined in the fluid inclusion study) and cast some doubt on the validity of

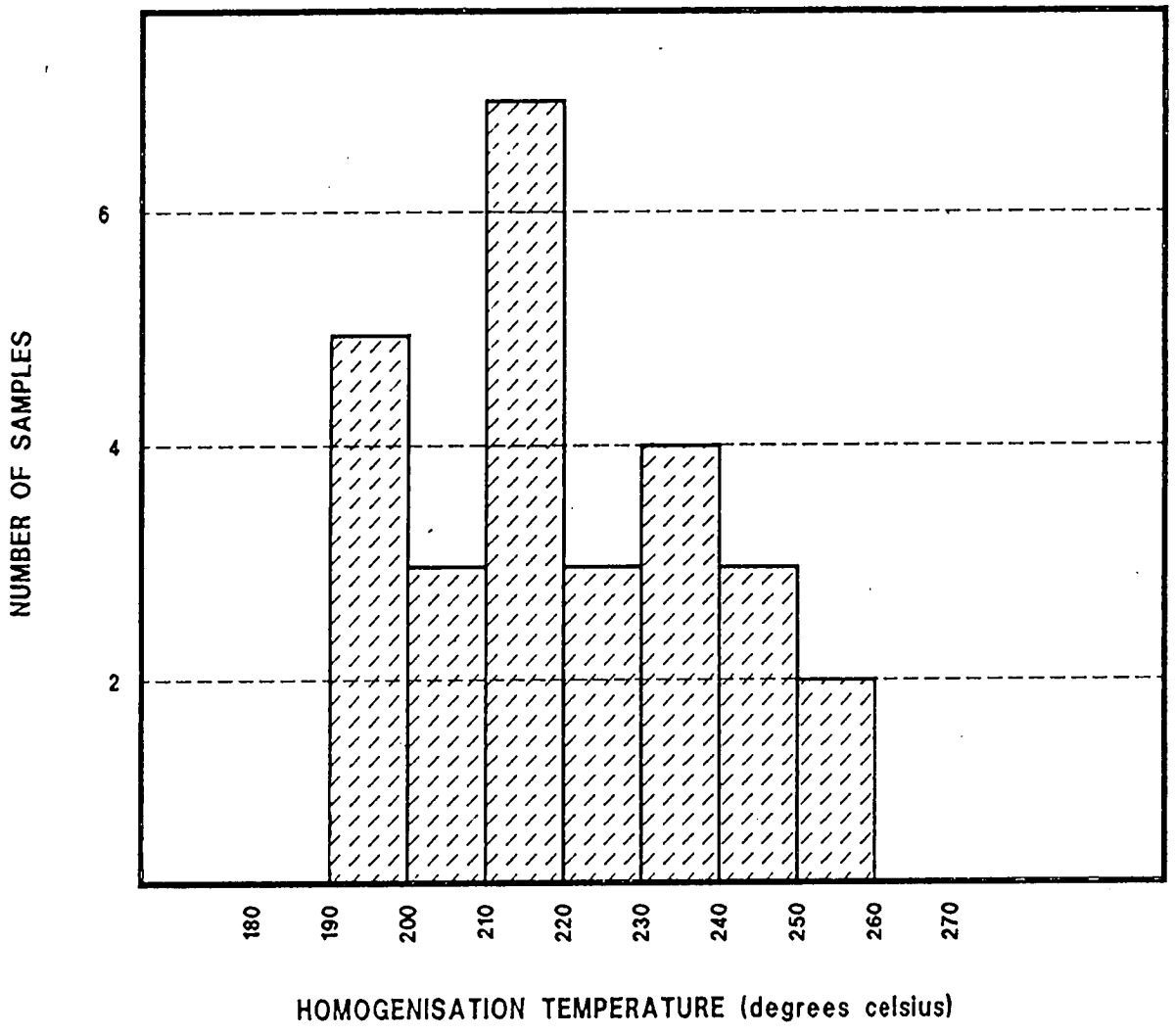


FIGURE 7.2. Fluid Inclusion Homogenisation Temperature from Stage Vb Mineralisation, QD85.

the value for the Stage Va fluid which was probably hotter. This indicates that log fTe_2 has increased from Stage Va to Vb. The presence of petzite, which forms at relatively high log fTe_2 in Stage Va mineralisation indicates the log fTe_2 was fluctuating and locally high.

Similarly, using the equation of Barnes (1979) the log fS_2 can be established from the Fe content in Stage Vb sphalerite (calculated in Appendix 3). Sphalerite was only observed in Stage Vb veins and log fS_2 = -11.39 is obtained for the Stage Vb fluid. These values assume a constant temperature of 220°C.

8. ALTERATION

The dominant alteration associated with mineralisation is a fault-related quartz-sericite/illite-pyrite-rutile±carbonate (phyllic) alteration assemblage which overprints a regionally extensive chlorite-carbonate-pyrite±sericite±epidote (propylitic) assemblage (Figure 8.1a). The propylitic alteration is regional and predates the mineralisation. The fault-related phyllic alteration is directly related to mineralisation and is the only alteration discussed further herein.

The fault-related phyllic alteration is well defined within the host porphyry but is much more subtle within the diatreme breccia. Within the porphyry the original mafic phenocrysts (biotite and hornblende) are totally altered, typically to sericite. Alteration of feldspar ranges from alteration of groundmass to potash feldspar-sericite distal to structures, to total sericitisation proximal to structures (Figure 8.1b, and 8.2a).

This phyllic alteration is associated with Stage I, II and III quartz sulfide veins and is developed as an alteration selvage. This relationship is well demonstrated in Figure 8.2b where several 3-5mm wide Stage II and III quartz sulfide veins have 30-40 mm wide alteration selvages that almost overlap. The degree (continuity) of alteration is a function of vein thickness and density. In areas with thick veins and/or high vein densities alteration selvedges overlap and the alteration is pervasive.

Silicification is locally developed within and adjacent to crackle breccias and intensely stockwork veined porphyry in all stages of mineralisation, excluding Stages IV and VI. In areas of Stage V mineralisation small clasts of porphyry are totally silicified and larger porphyry fragments have a thin selvage (<20mm) of silicification.

Sericite is commonly intergrown with a weakly birefringent clay. X-ray Diffraction Analysis (Henley, 1988) indicates this mineral is

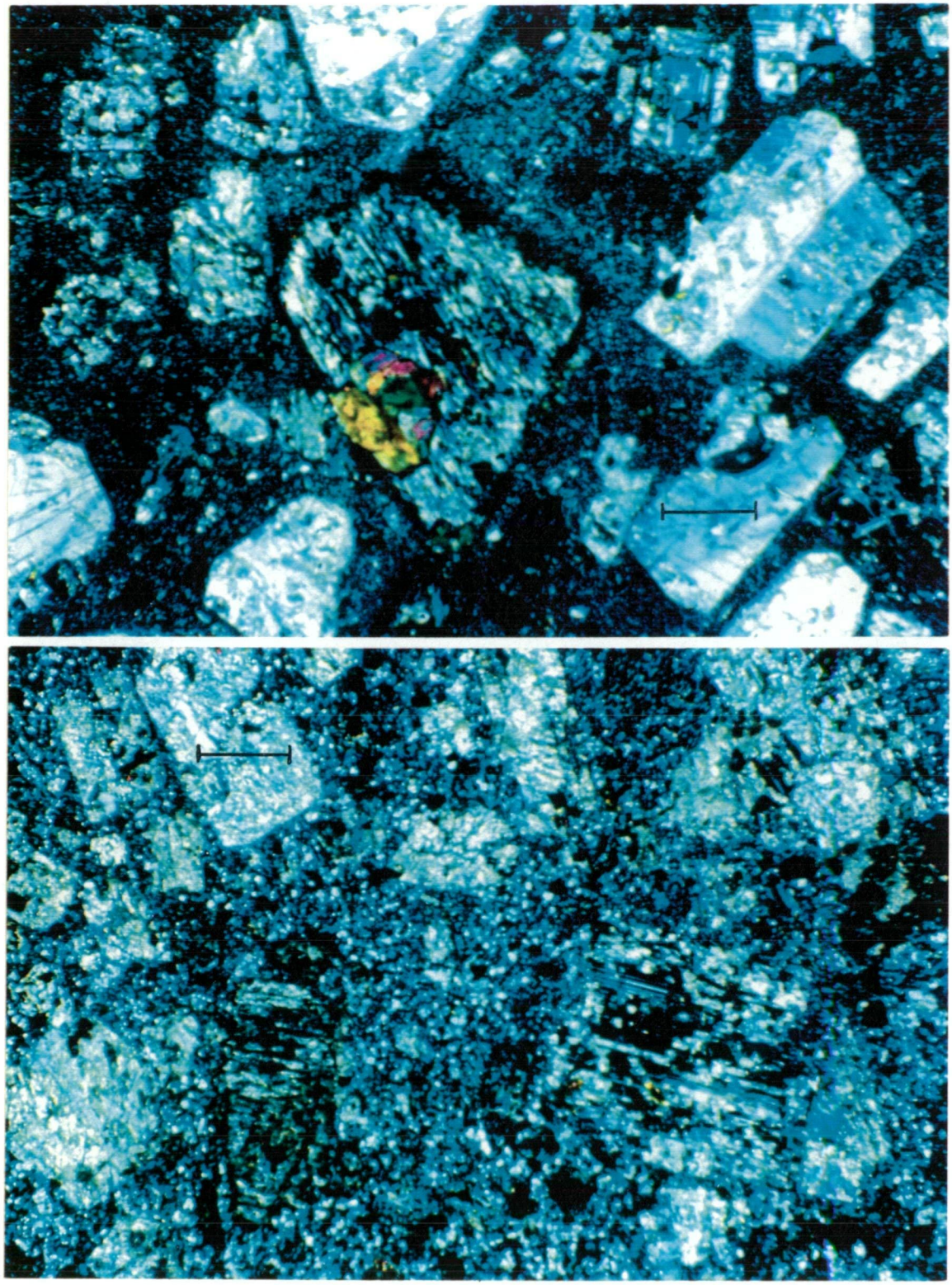


Figure 8.1 Alteration of the Kerimenge Sill Porphyry. Scale bar = 500μm

a) QD 120, 145.4m. Regional propylitic, alteration of mafic minerals to sericite, chlorite and epidote and weak sericitization of feldspar phenocrysts.

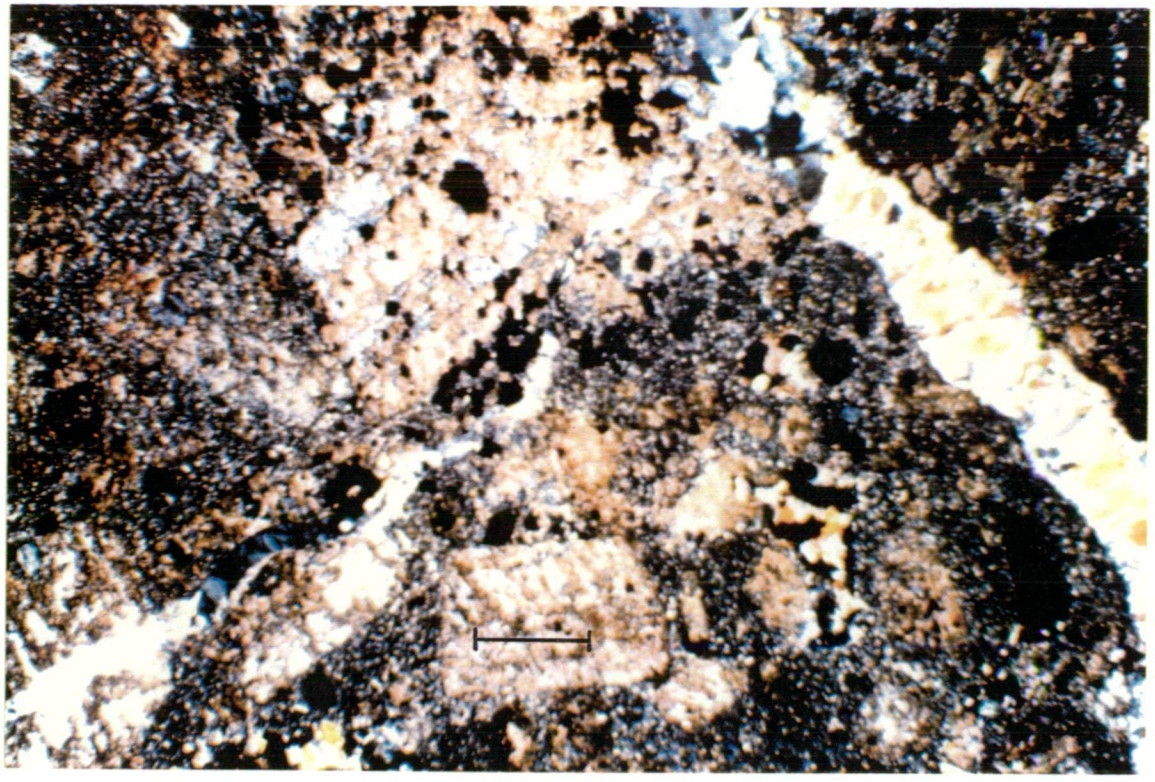
b) QD 120, 94.0m. Distal Phyllic, alteration of mafics to sericite and partial alteration of plagioclase to sericite.

illite. The illite is interpreted as being retrograde alteration probably associated with the cooler Stage IV mineralisation.

Stage II veins contain adularia (Figure 8.2a) and also have adularia selvadges. Where vein adularia is well developed, the associated host porphyry is permeated by patches and microveinlets of optically continuous adularia (Syka 1985). Adularia selvages are up to 30mm wide and sericite progressively becomes the dominant alteration mineral.

Stage IV manganocarbonate mineralisation is typically restricted to the quartz-sericite alteration but locally crosscuts it. This crosscutting relationship is well demonstrated in Figure 8.2b where a 5-10mm manganocarbonate vein clearly crosscuts the alteration selvage of the Stage II and III veins. The crosscutting of alteration types indicates that the manganocarbonate mineralisation is post quartz-sericite alteration. An associated carbonate alteration selvage is suspected in Stage IV veins as the carbonate content of the porphyry increases over several metres towards major manganocarbonate veins.

Occasionally the alkali feldspar alteration is sodic rather than potassic. This is particularly well developed in the crumble breccias in the Lemenge area.



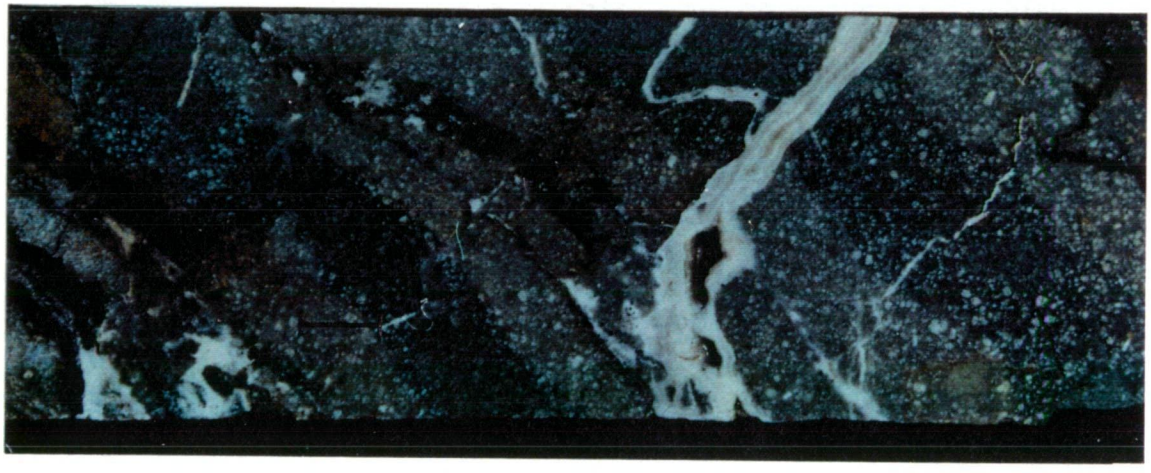


Figure 8.2 Alteration of the Kerimenge Sill Porphyry.

a) QD 34, 13.6m. Proximal Phyllic Alteration- Plagioclase and mafics totally altered to sericite, groundmass of quartz and sericite. Porphry is crosscut by Stage II Quartz-Adularia veins. Note: dark grey mineral is adularia. Scale bar = 500μm

b) QD 80, 60.3m. 5mm wide Stage II and III Quartz-Sulfide Veins with 3-4cm wide Phyllic Alteration Selvages. Stage IV Manganocarbonate Vein Crosscuts Alteration. Scale bar = 1cm

9. DISCUSSIONS AND CONCLUSIONS

The mineralisation history of the Kerimenge-Lemenge deposit commenced in the Pliocene with intrusion of Edie Porphyry into the Mesozoic Kaindi Metamorphics. At Kerimenge the intrusive pathway was along the Kerimenge Fault. The upper parts of the porphyry penetrated along a bedding weakness within the Kaindi Metamorphics to form the Kerimenge Sill. Along the northern part of the Kerimenge Fault an exogenous phreatomagmatic/magmatic eruption formed the Kerimenge Diatreme and a minor tuff ring. This explosive volcanism generated high permeability especially along the Kerimenge Fault and the Kuskom Fault Zone.

Porphyry intrusion elevated the ambient temperature and circulating fluid cells were developed. These fluids flowed preferentially along the more permeable faults and in particular the Kerimenge Fault. Fluid flow within the Kerimenge Fault is suspected to have been sourced in the south with fluid cooling both vertically and laterally as it travelled to the north. Multiple brecciation events and pervasive silicification in the lower parts of the Kerimenge Fault suggest local fluid overpressurising within the self sealing fault. Episodic rupture of the seal was caused by gas overpressurising (dominantly CO_2) and resulted in fluid boiling and concomitant (hydrothermal) brecciation (Syka and Bloom 1990). Boiling caused a rapid drop in temperature and quartz and pyrite deposited (Stage I and II veins). This fluid is responsible for the main phyllic alteration.

As a consequence of boiling up to 3 wt % CO_2 and other volatiles, such as H_2O and H_2, were lost to the vapour phase (Syka and Bloom 1990). Condensation of the vapour phase higher in the system resulted in the progressive deposition of Stage IV (mangano)carbonate stockworks and later fissure fill veins. The carbonate deposition occurred vertically and laterally in the southern part of the Kerimenge Fault and resulted in deposition of thick manganocarbonate fissure fill veins at Lemenge and the northern part of Kerimenge. The Stage III quartz-carbonate-

arsenopyrite veins are regarded as transitional between the stage II and IV vein sets.

The Stage I to IV mineral paragenesis reflects cooling of the mineralisation system. The individual veinlets do not represent different fluid inputs but reflect the evolution of the fluid. Vertically the paragenesis reflects cooling, with progressively cooler events overlying each other. In any location within the system any vein stage may be crosscut by any younger stage.

Gold was deposited during all phases of mineralisation but the majority of the gold was deposited during stages II and III. The majority of the gold is contained within the lattice of Stage II pyrite and Stage III arsenopyrite, although locally within Stage II veins gold occurs as electrum intergrown with pyrite. The gold within the sulfide lattice is refractory and results in variable but typically poor, gold recovery within the primary mineralisation. Local high recoveries reflect a high proportion of free electrum within Stage II veins. Variable correlation between Au and As from poor to excellent reflects varying proportions of Stage II (poor As correlation) and Stage III (good As correlation) veins.

Porphyry domes were emplaced concomitant with mineralisation. These domes intrude the Sill Porphyry and are themselves mineralised by Stage IV veins.

The mineralising fluid was predominantly meteoric as confirmed by stable isotope studies. $\delta O^{18}H_2O$ and $\delta C^{13}H_2O$ from manganocarbonate veins have ranges of -3.01 to - 7.03‰ and -8 to -11.5‰ respectively (Syka 1985). These values fall within the field of modern meteoric fluids from the region (Chivas et al., 1983).

In the northern part of Kerimenge a pulse of telluride-rich non-refractory mineralisation (Stage V) was recognised during this study. This mineralisation stage crosscuts Stages I, II and III mineralisation. The relationship of Stage V mineralisation with

the manganocarbonate veins is enigmatic. Stage V mineralisation is both predated (stage IV) and postdated (Stage VI) by managnocarbonate mineralisation.

The telluride-rich non-refractory mineralisation has a very distinct chemistry that can be used to explore for additional resources of this mineralisation style. Chemistry in the primary mineralisation is strongly enriched in Au (cyanide extractable), Ag and Te, enriched in Cu and Sb , strongly depleted in As and Zn and moderately depleted in Pb. This contrasts significantly with the refractory mineralisation that is enriched only in Au (lower values), As and Fe only.

Stage V telluride mineralisation is a quartz-dominated breccia phase with deposition of early fine grained quartz evolving to coarse vuggy quartz.

Telluride mineralisation occurs at two specific locations within the Stage V mineralisation. These are:

1. The most important (Stage Va) occurs within stage V quartz close to the contact between the early fine quartz and Stage VI carbonate in veins and breccias. Hessite with electrum inclusions is the dominant mineralogy. Stage Va mineralisation contains the majority of the gold in this intersection.

2. The other, Stage Vb, is a late stage vug fill. The vugs are filled with tetrahedrite-tennantite and hessite (containing electrum inclusions) occurs as inclusions within the tetrahedrite-tennantite. The hessite tends to occur as an incomplete annulus of inclusions within the tetrahedrite and suggests that specific fluid conditions were required for telluride deposition.

Given the very specific deposition intervals in both Stage Va and Stage Vb mineralisation it is possible that the telluride mineralisation events are synchronous. The location of hessite and

electrum indicates that the chemical changes that caused the dominant mineralogy to change from quartz to carbonate was also responsible for telluride deposition.

The telluride mineralisation was deposited from a relatively hot (220°C) oxidised fluid. During deposition of tellurides from Stage Va to Vb, the log fTe_2 increased from -13.5 to -12. Log fTe_2 values were predominantly within the hessite stability field but during Stage Va locally increased into the petzite stability field. Log fS_2 = 11.39 during deposition of Stage Vb mineralisation.

Stage V fluid is hotter than the earlier mineralisation stages suggesting an additional fluid rather than an evolved Stage I-IV fluid. Stage V mineralisation is pre (Stage IV) and postdated (Stage VI) by manganocarbonate mineralisation. This suggests that stage IV and stage VI manganocarbonate veins are deposited by the same mechanism and the manganocarbonate depositing system is crosscut by a short-lived mineralisation (Stage V) episode.

The fluid source for the Stage V mineralisation is uncertain. Affifi et.al (1988b) studied seventeen telluride rich epithermal deposits and concluded that tellurium had a magmatic source. In all these examples telluride deposition occurred at a specific location and Affifi et.al (1988b) concluded that a shortlived high fTe_2 fluid was generated by the magma.

The evolution of Stage V quartz from early fine, to latter vuggy quartz, indicates early rapid deposition from a hot, silica saturated fluid and progressive establishment of equilibrium. This may reflect mixing of a hot (magmatic?) fluid with meteoric fluid (Stage IV). Fluid inclusion salinities in the latter coarse Stage V quartz are low suggesting that during deposition of the quartz that the proportion of magmatic fluid was low. However if the high fTe_2 fluid generated by the magma is short lived then evidence of the magmatic input would only be recognizable within the Stage Va and Vb telluride mineralisation.

Late stage, high grade Au-Ag telluride mineralisation has been noted in many epithermal systems (eg Bonham, 1986 and Sillitoe, 1988). This mineralisation is closely related to alkalic igneous intrusions. Bonham 1986 described many characteristics of these Au-Ag telluride deposits, many of which are observed at the Kerimenge prospect. These include

1) District-wide propylitic alteration,

2) Mineralisation in veins, stockworks and hydrothermal breccias,

3) Narrow alteration haloes around the mineralised structures, and

4) Low sulfur, high Au-Ag assemblages including Au-Ag tellurides, auriferous pyrite and minor basemetal sulfides.

Based on the current geological and geochemical observations a likely scenario for the development of the Au-Ag mineralisation at Kerimenge is:

1) Porphyry intrusion into the Kerimenge fault (syn Stage IV manganocarbonate mineralisation) at the intersection with the Eastern Fault Zone.

2) Generation (explosive?) of a hot (magmatic?) fluid enriched in Te and probably Au, Ag, Cu and Sb.

3) Mixing of the magmatic fluid with the existing manganocarbonate depositing convecting meteoric water system and precipitation of fine silica and some carbonate as veins and as a matrix to breccias. Precipitation of Stage V electrum, hessite and tetrahedrite at the contact between silica and carbonate and in vugs is a response to one, or a combination, of the following, a pulse of magmatic fluid

saturated in Te, Au, Ag, Cu and Sb, rapid cooling, or a pH increase.

4) Cessation of input of hot (magmatic?) fluid which caused stage V mineralisation and continuation of the manganocarbonate depositing meteoric system.

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APPENDIX 1.

PETROLOGICAL DESCRIPTION

DRILLHOLE QD85, KERIMENGE PROSPECT.

Descriptions by K.P.Denwer

QD 85, 93.5m

Assays - 2130ppm As, 4.36ppm Au, low Cu, Pb, Zn.

Hand Specimen - Angular clasts of pink manganocarbonate and carbonate brecciated carbonate to 2cm in a quartz carbonate matrix.

Thin Section - In polished thin section the sample contains evidence of multiple brecciation. Clasts are predominantly bladed carbonate and range in size from 20μ - 50mm (+) but include breccia clasts. The breccia clasts are fragments of bladed carbonate in a carbonate - quartz-arsenopyrite matrix. The arsenopyrite is fine (1μ - 10μ) and acicular.

The cement of the main breccia is equant quartz (100μ) and minor carbonate locally containing abundant fine acicular arsenopyrite.

The breccia is crosscut by late stage fine grained equigranular quartz veins (50μ).

No gold was observed in this sample.

Paragenesis

1. Manganocarbonate veining (**stage IV**)
2. Repeated brecciation (hydrothermal), quartz ± carbonate ± Arsenopyrite cement (**stage V**)
3. Late quartz veining (**stage VI?**)

QD 85, 94.3m

Assays - 229ppm As, 0.99g/t Au - low basemetals.

Hand Specimen - Similar to QD 85, 93.5m.

Manganocarbonate vein with locally developed manganese oxide veins crosscut by a breccia zone. Within the breccia angular clasts of white carbonate and clear carbonate to 25mm occur within a clear quartz-carbonate cement.

Thin Section - In polished thin section a complicated paragenesis is revealed. The breccia consists of clasts of, bladed manganocarbonate, equant carbonate and minor clasts of carbonate breccia, from 20μ to 25mm. Many of the clasts are rimmed by 1-3mm of colloform-crustiform carbonate.

The matrix to the breccia is equant quartz (from 10μ-100μ) subordinate carbonate and rare fine (1-10μ) acicular arsenopyrite.

The breccia is crosscut by crustiform, weakly colloform carbonate veins that are partially oxidised to manganese oxides along growth zones. These veins locally have a core of quartz and elsewhere the breccia is crosscut by equigranular (100μ) quartz veins.

Paragenesis

1. Banded and equant carbonate veining (**stage IV**).
2. Repeated brecciation (hydrothermal) with a matrix of variable composition, including quartz-carbonate and arsenopyrite (**stage V**).
3. Late carbonate and quartz veining (**stage VI**).

QD 85, 153.0m

Assays - none, - low Pb, Zn, Ag, As, Au = 0.06ppm

Hand Specimen - Weakly brecciated finely banded manganese oxide and calcite vein. Minor vugs are lined with quartz and carbonate.

Thin Section - The sample is dominated by complexly oxidised bladed manganocarbonate. The manganocarbonate is only partially oxidised, and the manganese oxide products occur as curved elongations along crystal edges. The manganese oxide also outline growth zones in some of the crystals.

Irregular late veins are filled by quartz (<50μ) / sericite / pyrite and in other cases, calcite and minor quartz. Coarser veins are lined with toothy quartz (0.1 to 0.4mm) locally filled by calcite and black manganese oxides.

Paragenesis
1. Colloform - crustiform manganocarbonate veining (**stage IV**).
2. Quartz - calcite - pyrite - sericite veining (**stage V**)
3. Superficial oxidation

QD 85, 167.0m

Assays - 5ppm Cu, 86ppm Pb, 102ppm Zn, 1ppm Ag, 51ppm As, 0.1g/t Au.

Hand Specimen - This sample is from the edge of a manganocarbonate vein (petrology 167.1m) and shows the paragenesis from porphyry to massive carbonate vein grading to interbanded crustiform-colloform brown oxidised manganocarbonate, and finally to massive pink manganocarbonate.

Thin Section - In thin section the above paragenesis is confirmed. The porphyry texture is still preserved, and the porphyry is sericite altered. Feldspar phenocrysts are strongly sericitised, pyrite-rutile congregates on mafic sites and a few quartz phenocrysts are preserved in a matrix of dominantly quartz.

Encrusting the porphyry is a 2-3mm calcite vein of anhedral equant (0.2-2mm) carbonate. Away from the porphyry the grain size decreases and manganese oxide appears along growth zones (colloform-crustiform) until a zone of interbanded crustiform calcite (<0.5mm) and thinner (<0.2mm) crustiform-colloform carbonate is encountered. This finely interbanded zone is 1-20mm wide. This gives way to a calcite vein similar to that abutting the porphyry. Vugs and minor veins are filled with equant quartz.

Paragenesis

1. Massive manganocarbonate veining (**stage IV**)
2. Colloform-Crustiform manganocarbonate veining (**stage IV**).
3. Massive manganocarbonate veining (**stage IV**)
4. Quartz infill and veining (**stage V?**)
5. Oxidation

QD 85, 167.1m

Assays - <2 Cu, 39ppm Pb, 158ppm Zn, 2ppm Ag, 89ppm As, 0.26g/t Au.

Hard Specimen - Massive pink manganocarbonate with minor fracture oxidation to brown manganese oxides.

Thin Section - The vein consists of anhedral elongate bladed carbonate up to 25mm in length. The blades display wavy extinction. Within the vein (probably projections or rafts) are elongate clasts of silicified sericitized porphyry.

At one end of the thin section a zone of interbanded carbonate-manganese oxide is noted similar to that in QD 167.0m.

Crosscutting the vein are minor thin quartz veins 0.2mm wide consisting of anhedral (0.05-0.4mm) to toothy quartz. The carbonate is much finer 0.2mm either side of the quartz vein.

Paragenesis
1 Manganocarbonate veining (**stage IV**)
2 Quartz vein (**stage V**)

QD 85, 182.5m

Assays - 19ppm Cu, 114ppm Pb, 26ppm Zn, 670ppm Ag, 64ppm As, 82.6ppm Au.

Hand Specimen - Carbonate veined, light grey cherty rock.

Thin Section - This sample is dominated by cryptocrystalline quartz. Randomly orientated laths of quartz are typically less than 50μ, and are crosscut by irregular anhedral toothy 100μ quartz veins. The fine silica contains sericite as dissemination and in aggregates. The sericite aggregates are to approximately 1mm diameter, and may represent clasts, or the original porphyry, with this sample representing a strongly silicified porphyry. Pyrite tends to occur with the sericite aggregates.

At one side is a 2mm carbonate vein. The vein is coarse (1mm grains), bladed and has wavy extinction. The edge of the vein (at the contact with the silica) has feathery textures indicating open space filling (ie pre-silica). A tetrahedrite-chalcopyrite-sphalerite grain occurs at the contact between carbonate and silica. The sphalerite is light yellow indicating low Fe content. The carbonate vein is cut by a 30μ toothy quartz vein.

The other side of the carbonate vein abuts the edge of the slide and a thin sulfide rich quartz vein is observed. The quartz vein is 200μ wide and has a coarse subhedral rim and fine <10μ core. The sulfides are to 100μ diameter and occur with the coarse section of the vein. Sulfides are dominated by galena and a silver telluride mineral (hessite), with abundant 10-20μ inclusions of gold. Gold tends to occur as inclusions within the hessite.

No other sulfides were noted in this sample.

Paragenesis
1. Manganocarbonate veining (**stage IV**)
2. Silicification and quartz veining - early deposition of galena, hessite, gold and minor sphalerite, chalcopyrite and tetrahedrite (**stage Va and minor Vb**).

QD 85, 183.6m

Assays - 4ppm Cu, 26ppm Pb, 12ppm Zn, 53ppm Ag, 548ppm As, 7.09g/t Au.

Hand Specimen - Complex vein with multiple calcite veining, grey silica veining and brecciation.

Thin Section - The sample is a small slice of drill core displaying a lenticular, vuggy segment of vein material featuring banded whitish calcite and subordinate light grey quartz. A thin veneer of altered host rock exists along one edge of the specimen.

In polished thin section the veneer of host rock is seen to be intensely, finely silicified, sericitized and pyritized porphyry: primary rock textures remain recognisable. Disseminated pyrite forms subhedral cubes and modified forms about 0.01 to 0.1mm in size.

The first zone within the vein is about 3mm wide and consists of relatively coarse, elongate, encrusting calcite (**stage IV**).

The next zone (3 to 4mm wide) is a breccia zone with clasts of pyritic, altered porphyry and vein calcite cemented by anhedral quartz about 0.05mm to 0.1mm in grainsize.

The next zone (2 to 3mm wide) consists of fine, anhedral calcite and subordinate quartz (both about 0.05mm grainsize), passing abruptly into an encrusting zone (6 to 10mm wide) of much coarser, elongate calcite (grains commonly several millimetres long). Another 7 thin bands over the next 2 to 4mm consist of quite fine calcite, initially associated with rare small grains of pyrite and then with rare fine, acicular grains of arsenopyrite.

Then there is a second zone of breccia in which angular clasts of altered porphyry and banded, coarse vein calcite are cemented by fine calcite with disseminated, very fine, acicular arsenopyrite (0.01 to 0.2mm long).

The next zone is of breccia and minor porphyry with clasts of bladed carbonate (to 2cm) rimmed by quartz replacement of early acicular bladed anhydrite (to 3mm long). The matrix is dirty brown carbonate and is rich in fine laths of arsenopyrite ($<20\mu$) and rare blebs of chalcopyrite and gold. The sulfide are best developed close to the clasts. The matrix contains coarser irregular quartz veins.

QD 85, 183.6m (continued)

Paragenesis

1. Carbonate veining (**stage IV**)
2. Brecciation - early anhydrite followed by Arsenopyrite/Chalcopyrite/Gold in a fine dirty carbonate matrix (**stage V**).
3. Fine grey silica (hand specimen)
4. Manganocarbonate veining (**stage VI**)

QD 85, 186.9m

Assays - 8610ppm Cu, 2000ppm Pb, 2000ppm Zn, 1130ppm Ag, 1450ppm As, 13.6ppm Au.

Hand Specimen - This sample displays vague clasts of porphyry in a light grey silica matrix. Numerous specs of black metallic sulfides are observed.

This Section - Vague clasts of porphyry to 3cm are recognised by ghosted textures and by the dominance of sericite. The clasts are strongly sericitized and silicified. Euhedral pyrite is disseminated throughout the porphyry clasts but is more abundant in the sericite rich zones. Locally rare sphalerite and pyrite share grain boundaries.

The clasts are cemented by anhedral to toothy quartz which grades from very fine (<10μ) disseminated to coarse 0.2m - 2mm in the core of veins cross cutting the fine material. The quartz veins are anhedral and vuggy. The vugs are lined with dogtooth quartz and have been filled with argentiferous tetrahedrite (confirmed by probing) and hessite. Locally the cavity fill is dominated by hessite.

The tetrahedrite is to 3-4mm diameter and contains blebs of hessite +/- galena to 1.0mm, but typically <0.05mm. The hessite and galena form discrete grains and is composite veins sharing a grain boundary. The inclusions of galena and hessite occur close to the edge of the tetrahedrite grain. Right on the edge of the tetrahedrite and typically just within the quartz vein are blebs of chalcopyrite typically <0.1mm but to 1.5mm. Rare inclusions of sphalerite within the tetrahedrite are light yellow indicating low Fe content.

Abundant grains of fine gold (to 30μ) occur within the hessite. Gold is not observed in any other setting.

The silica crosscuts an earlier bladed carbonate vein. On the contact crystals of silica have grown into the manganocarbonate.

Paragenesis
1. Carbonate veining (**stage IV**).
2. Brecciation silica cement - minor sericite. Evolving to coarse vuggy quartz late sulfide infill (**stage V**).

QD 85, 187.1m

Assays - 49ppm Cu, 66ppm Pb, 50ppm Zn, 85ppm Ag, 35ppm As, 23ppm Sb, 12.3ppm Au.

Hand Specimen - Silicified porphyry breccia in a silica cement crosscut by irregular veinlets.

Thin Section - In thin section porphyry clasts to 2cm, but typically less than 5mm are recognised. The clasts are subrounded, and sericite altered. Pyrite occurs dominantly within these clasts as euhedral to ragged disseminations.

The clasts are cemented in cryptocrystalline silica to 100μ, but typically much finer. Pyrite occurs as irregular fine (<50μ) disseminations within the matrix.

The silica is crosscut by vuggy quartz carbonate veins. The carbonate is early and has euhedral grains to 0.7mm. Quartz is later, anhedral, and typically lines cavities. One cavity is filled with tetrahedrite with subspherical blebs of galena and hessite occurring as inclusions within the tetrahedrite and minor chalcopyrite. Galena and hessite occur as discreet grains and as composite grains sharing a grain boundary. Minor very fine (2μ) blue inclusions within the tetrahedrite are interpreted as covellite.

No gold was observed in this sample.

Paragenesis
1. Manganocarbonate (observed in hand specimen) veining (**stage IV**)
2. Brecciation and fine quartz carbonate cement (**stage Va**)
3. Veining, early carbonate later coarse vuggy quartz with late tetrahedrite, galena and hessite (**stage Vb**).

QD 85, 189.7m

Assays - 2000ppm Cu, 857ppm Pb, 1290ppm Zn, 670ppm Ag, 472ppm As, 37ppm Au, 1280ppm Sb, 489ppm W.

Hand Specimen - Silicified porphyry breccia in a silica matrix. Silica contains tetrahedrite and chalcopyrite.

Thin Section - In thin section complex vein and breccia relationships are noted. Clasts in the breccia are dominantly subrounded porphyry clasts to 5mm which are strongly silicified and sericitised. The replacement silica is cryptocrystalline.

Forming a matrix to the breccia and as discrete vuggy veins is euhedral quartz to 0.7mm locally with well developed growth zones. The coarser quartz veins have micro-plumose textures indicative of recrystallisation . Tetrahedrite grains to 0.5mm occur within the quartz veins and contains 100μ blebs of galena and hessite and minor low iron sphalerite as inclusions. Gold occurs as <20μ inclusions within the hessite.

The breccia is crosscut by several weakly brecciated carbonate veins which locally contain needle of anhydrite? where strongly brecciated. At the manganocarbonate veins and fine silica contact, grains of hessite / galena / chalcopyrite and minor tetrahedrite are noted hosted just within the silica and at the contact. One grain contains galena / hessite and a gold-silver telluride speculated at being petzite.

The relationship between the manganocarbonate veins and silica matrix is difficult to elucidate. In one case the vein has a straight edge and clearly crosscuts the silica and in another example the veins is brecciated and has a fine silica cement indicating manganocarbonate mineralisation predates silica.

Paragenesis

1. Carbonate veining (**stage IV**).
2. Brecciation, silicification early hessite-galena-chalcopyrite deposited at contact with manganocarbonate veins, later quartz veining with coarser tetrahedrite-galena-hessite-sphalerite (**stage V**).
3. Manganocarbonate veining.(**stage VI**).

QD 85, 190.8m

Assays - Cu 46ppm, Pb 11ppm, Zn 43ppm, Ag 124ppm, As 28ppm, Sb 24ppm, 4050ppm Ba, 17ppm Au.

Hand Specimen - Strongly silicified porphyry grading to white weakly stratified quartz vein. Crosscut by vuggy carbonate vein.

Thin Section - In thin section brecciated fragments of porphyry to 1mm and minor bladed carbonate clasts to 3mm are cemented in a quartz-sericite-carbonate-barite? matrix. Pyrite occurs predominantly within the porphyry clasts.

This grades rapidly into a 1cm zone devoid of porphyry clasts and consisting of cryptocrystalline quartz <50μ, coarser sericite <200μ and minor calcite. The sericite is concentrated in bands giving a stratified appearance is hand specimen.

At the contact between the silica and manganocarbonate, either as veins or clasts, rare sulfides are noted, including pyrite chalcopyrite and grains of tetrahedrite / galena and hessite.

A manganocarbonate vein in one corner grades from coarse bladed carbonate (bladed to 3mm) to dirty crustiform carbonate. This later carbonate contains 0.1mm spherules of manganese oxide and acicular needles mostly replaced by quartz, but several anhydrite needles are preserved.

Paragenesis The paragenetic location of manganocarbonate with respect to the silicification event is difficult to elucidate. Manganocarbonate occurs as clasts within the silica and therefore clearly predates the silica. However in another location thin quartz veins within the silica terminate at the contact with the continuous manganocarbonate-anhydrite vein. The most likely scenario is that both observations are correct and manganocarbonate mineralisation both pre and post dates silicification and the following paragenesis is proposed.

Paragenesis

1. Manganocarbonate veining (**stage IV**).
2. Brecciation - quartz - sericite - carbonate cement. Tetrahedrite ± hessite ± galena ± gold? at contact with manganocarbonate (**stage V**).
3. Later manganocarbonate -anhydrite (**stage VI**).

QD 85, 211.5m

Assays - 37ppm Cu, 13ppm Pb, 39ppm Zn, 16ppm Ag, 39ppm As, 1.53ppm Au.

Hand Specimen - Silicified brecciated porphyry in a silica matrix.

Thin Section - In thin section remnant porphyry clasts are identified by patches of sericite and pyrite. The original porphyry textures are ghosted by intense silicification and sericitic alteration. The replacement silica is cyrptocrystalline.

The clasts are cemented by anhedral to toothy quartz from <20μ to coarse 0.1-0.4mm veins with residual vugs. The early fine silica contains dispersed sericite and minor pyrite.

The main difference (besides grade!) between this sample and QD 186.9m, is that this sample has no manganocarbonate and the late vugs do not contain tetrahedrite.

APPENDIX 2.

GEOCHEMICAL RESULTS

HOLE QD85, KERIMENGE PROSPECT.

SELECTIVE SAMPLES.

Sample #	Selective sample metreage
PX 102962	153.0m
PX 102963	167.0m
PX 102964	167.1m
PX 102965	182.5m
PX 102966	183.6m
PX 102967	186.9m
PX 102968	211.5m
PX 102969	93.5m
PX 102970	94.3m
PX 103456	187.1m
PX 103457	189.7m
PX 103458	190.8m
PX 103459	180.8m

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ANALYTICAL REPORT

QD 85 - SELECTIVE SAMPLES

ENT: RGC EXPLORATION PTY LTD
ESS: P O BOX 1166
MILTON CENTRE
QLD 4064

CT: MR G DAVIS

LABORATORY: STAFFORD
BATCH NUMBER: ST5665-0

No. of SAMPLES: 9
DATE RECEIVED: 22/03/93
DATE COMPLETED: 27/03/93

6961 SAMPLE TYPE: PULP PROJECT No:

PLE NUMBER	ELEMENT UNIT METHOD	Cu ppm IC580	Pb ppm IC580	Zn ppm IC580	Ag ppm IC580	As ppm IC580
QD 85						
153.0	PX 102962	<2	6	16	1	41
167.0	PX 102963	5	86	102	1	51
167.1	PX 102964	<2	39	158	2	89
182.5	PX 102965	19	114	26	670	64
183.6	PX 102966	4	26	12	53	548
186.9	PX 102967	8610	2000	2000	1130	1450
211.5	PX 102968	37	13	39	16	39
93.5	PX 102969	7	8	3	1	2130
94.3	PX 102970	<2	6	<2	1	229
:		2	5	2	1	1

*** DUPLICATE ASSAYS.

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Southern Cross Laboratory
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All pages of this report have been checked and approved for release.

Signed

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ANALYTICAL REPORT

ENT:RGC EXPLORATION PTY LTD
ESS:P O BOX 1166
MILTON CENTRE
QLD 4064

ACT:MR G DAVIS

LABORATORY:STAFFORD
BATCH NUMBER:ST5665-0

No. of SAMPLES:9
DATE RECEIVED:22/03/93
DATE COMPLETED:27/03/93

6961 SAMPLE TYPE:PULP PROJECT No:

PLE NUMBER	ELEMENT UNIT METHOD	Fe % IC580	Mn ppm IC580	Cd ppm IC580	Co ppm IC580	Cr ppm IC580
PX 102962		0.21	4.64%	<1	9	11
PX 102963		0.47	5.06%	<1	7	13
PX 102964		0.14	5.50%	<1	<5	16
PX 102965		0.64	8450	<1	8	<5
PX 102966		0.25	4.82%	<1	<5	13
PX 102967		1.32	1910	17	32	<5
PX 102968		1.57	198	<1	36	<5
PX 102969		0.31	4.61%	<1	12	11
PX 102970		0.11	2.57%	<1	<5	5
:		0.01	5	1	5	5

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ANALYTICAL REPORT

NT: RGC EXPLORATION PTY LTD
SS: P O BOX 1166
MILTON CENTRE
QLD 4064

CT: MR G DAVIS

LABORATORY: STAFFORD
BATCH NUMBER: ST5665-0

No. of SAMPLES: 9
DATE RECEIVED: 22/03/93
DATE COMPLETED: 27/03/93

961 SAMPLE TYPE: PULP PROJECT No:

LE NUMBER	ELEMENT UNIT METHOD	Mo ppm IC580	Ni ppm IC580	P ppm IC580	V ppm IC580	Bi ppm IC580
PX 102962		<2	<5	<10	<10	<5
PX 102963		<2	<5	<10	<10	<5
PX 102964		<2	8	<10	<10	<5
PX 102965		<2	<5	127	<10	<5
PX 102966		<2	5	<10	<10	<5
PX 102967		<2	<5	191	<10	20
PX 102968		<2	<5	204	<10	<5
PX 102969		<2	<5	<10	<10	<5
PX 102970		<2	<5	<10	<10	<5
		2	5	10	10	5

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ENT: RGC EXPLORATION PTY LTD
ESS: P O BOX 1166
MILTON CENTRE
QLD 4064

ACT: MR G DAVIS

LABORATORY: STAFFORD
BATCH NUMBER: ST5665-0

No. of SAMPLES: 9
DATE RECEIVED: 22/03/93
DATE COMPLETED: 27/03/93

6961 SAMPLE TYPE: PULP PROJECT No:

PLE NUMBER	ELEMENT UNIT METHOD	Au ppm PM209	Au PM209 ppm CHECKS			
PX 102962		0.06				
PX 102963		0.10				
PX 102964		0.26				
PX 102965		82.6	90.0			
PX 102966		7.09				
PX 102967		13.6				
PX 102968		1.53				
PX 102969		4.36				
PX 102970		0.99				
IT:		0.01	0.01			

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ANALYTICAL REPORT

CLIENT: RGC EXPLORATION PTY LTD
ADDRESS: P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT: MR K DENNER

LABORATORY: STAFFORD
BATCH NUMBER: ST5758-0

No. of SAMPLES: 26
DATE RECEIVED: 05/04/93
DATE COMPLETED: 23/04/93

ER No: 6969 SAMPLE TYPE: CORE PROJECT No:

SAMPLE NUMBER	ELEMENT UNIT METHOD	Fe % IC580	Mn ppm IC580	Cd ppm IC580	Co ppm IC580	Cr ppm IC580
PX 103456		0.86	2.71%	<1	16	11
PX 103457		1.65	1090	8	54	<5
PX 103458		0.47	1.34%	<1	18	6
PX 103459		1.81	9070	<1	16	6

SAMPLE NUMBER	ELEMENT UNIT METHOD	Cu ppm IC580	Pb ppm IC580	Zn ppm IC580	Ag ppm IC580	As ppm IC580
PX 103456		49	66	50	85	35
PX 103457		2750	857	1290	670	472
PX 103458		46	11	43	124	28
PX 103459		39	79	244	5	101

SAMPLE NUMBER	ELEMENT UNIT METHOD	Mo ppm IC580	Ni ppm IC580	P ppm IC580	V ppm IC580	Bi ppm IC580
PX 103456		<2	13	301	13	<5
PX 103457		<2	<5	359	17	10
PX 103458		<2	6	132	<10	<5
PX 103459		<2	8	339	24	<5

SAMPLE NUMBER	ELEMENT UNIT METHOD	Au ppm PM208	Au PM209 ppm CHECKS	Au PM208 ppm CHECKS		
PX 103456		12.3				
PX 103457		37.2	33.7			
PX 103458		17.0	13.7			
PX 103459		0.35				

NEUTRON ACTIVATION ANALYSIS

NEUTRON ACTIVATION ANALYSIS REPORT

Date: 12-05-93

RGC EXPLORATION PTY LIMITED. (QLD) ORDER E6969, BATCH No: ST5758

BECQUEREL JOB # 183

NOTE:- A NEGATIVE SIGN INDICATES 'LESS THAN'.
- RESULTS ARE IN PARTS PER MILLION (ppm) UNLESS OTHERWISE INDICATED.
- ELEVATED DETECTION LIMITS FOR SOME ELEMENTS IN SAMPLES WITH LOW WEIGHTS.
- ELEVATED DETECTION LIMITS FOR SOME ELEMENTS IN SAMPLES WITH INCREASED BACKGROUND FROM HIGH As, Sb OR Zn.

ELEMENT	DL	PX103456 (30.275g)	PX103457 (1.5120g)	PX103458 (16.097g)	PX103459 (30.817g)	PX103460 (29.682g)	PX103461 (29.322g)	PX103462 (9.3410g)	PX103463 (23.032g)	PX103464 (12.814g)	PX103465 (0.7010g)
ANTIMONY	.2	23.50	1280.00	24.60	15.50	3.52	4.57	16.50	27.10	14.70	8.67
ARSENIC	1.0	33.90	442.00	22.70	129.00	8.24	25.30	43.90	171.00	95.60	154.00
BARIUM	100.0	-100.0	384.0	4050.0	355.0	-100.0	-100.0	5870.0	2040.0	5310.0	1880.0
BROMINE	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
CERIUM	2.0	15.60	6.70	7.16	18.90	14.20	5.00	2.34	4.50	5.49	12.10
CAESIUM	1.0	2.54	-1.00	1.25	7.39	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
CALCIUM	5.0	-5.0	-13.0	-5.0	7.5	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
COBALT	1.0	16.20	47.40	17.60	19.30	2.16	5.12	1.79	2.06	6.30	7.98
EUROPIUM	.5	4.26	.56	1.69	1.26	5.72	1.73	1.60	2.38	1.40	3.27
GOLD, ppb	5.0	12900.0	35200.0	16400.0	378.0	61.9	129.0	1580.0	47000.0	4850.0	15200.0
HAFNIUM	.5	1.14	-1.20	-.50	1.84	-.50	-.50	-.50	-.50	-.50	-.50
IRIDIUM, ppb	20.0	-20.0	-50.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	.75	1.31	.43	1.93	-.05	.05	-.05	.12	.07	.17
LANTHANUM	.5	8.30	2.83	3.51	8.30	7.49	2.44	1.76	5.03	3.10	3.47
LUTETIUM	.2	-.20	-.20	-.20	-.20	-.20	-.20	-.20	-.20	-.20	-.20
MOLYBDENUM	5.0	-5.0	-50.0	-10.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-50.0
POTASSIUM, %	.2	.67	2.17	.27	1.38	-.20	-.20	-.20	-.20	-.20	-.20
RUBIDIUM	20.0	30.9	23.8	-20.0	78.2	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
SAMARIUM	.2	2.34	1.06	1.17	2.48	2.95	.91	.57	1.26	1.11	1.95
SCANDIUM	.1	2.43	2.23	1.36	5.58	-.10	-.10	-.10	-.10	-.10	.27
SELENIUM	5.0	-5.0	-20.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-10.0
SILVER	5.0	88.2	663.0	120.0	-5.0	-5.0	-5.0	12.6	21.9	-5.0	-5.0
SODIUM, %	.01	.01	.01	.01	.03	-.01	-.01	-.01	.02	-.01	.03
TANTALUM	1.0	-1.00	-2.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
THORIUM	.5	1.62	-1.30	.73	3.25	-.50	-.50	-.50	-.50	-.50	.65
[illegible]	500.0	-500.0	-1000.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-750.0
TUNGSTEN	2.0	142.00	489.00	170.00	134.00	19.50	44.80	16.00	17.60	57.90	74.90
URANIUM	2.0	-2.00	-6.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-4.00
YTTERBIUM	.5	.62	-.50	-.50	.96	.80	-.50	-.50	-.50	-.50	-.50
ZINC	100.0	-100.0	1340.0	-100.0	307.0	-100.0	-100.0	-100.0	-100.0	-100.0	538.0
ZIRCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

BECQUEREL LABORATORIES
A.C.N. 003 271 832

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Facsimile: (02) 543 2655
P.O. BOX 93
MENAI, NSW, 2234

N E U T R O N A C T I V A T I O N A N A L Y S I S

NEUTRON ACTIVATION ANALYSIS REPORT Date: 19-07-95

GC EXPLORATION PTY LIMITED. (QLD) ORDER E6969. BATCH No: ST5758
ECQUEREL JOB # 183 Page 1 of 1
OTE: - A NEGATIVE SIGN INDICATES 'LESS THAN'.
- ALL SAMPLE NUMBERS ARE PREFIXED 'PX'.

ELEMENT	DL	#103456	# 103457	# 103458	# 103459	# 103460	# 103461	# 103462	# 103463	# 103464	# 103465
ELLURIUM	5.	45.8	216.0	69.6	-5.0	-5.0	-5.0	8.5	7.3	-5.0	-5.0

ELEMENT	DL	#103466	# 103467	# 103468	# 103469	# 103470	# 103471	# 103472	# 103473	# 103474	# 103475
ELLURIUM	5.	-5.0	-5.0	-5.0	-5.0	7.6	-5.0	-5.0	-5.0	-5.0	-5.0

ELEMENT	DL	#103476	# 103477	# 103478	# 103479	# 103480	# 103481
ELLURIUM	5.	-5.0	-5.0	-5.0	21.7	-5.0	-5.0

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MENAI, NSW, 2234

2 METRE SAMPLE INTERVALS.

SAMPLE PX	INT	SAMPLE PX	INT	SAMPLE PX	INT	SAMPLE PX	INT
103926	0-2m	103927	-4m	103928	-6m	103929	-8m
103930	-10m	103931	-12m	103932	-14m	103933	-16m
103934	-18m	103935	-20m	103936	-22m	103937	-24m
103938	-26m	103939	-28m	103940	-30m	103941	-32m
103942	-34m	103943	-36m	103944	-38m	103945	-40m
103946	-42m	103947	-44m	103948	-46m	103949	-48m
103950	-50m	103951	-52m	103952	-54m	103953	-56m
103954	-58m	103955	-60m	103956	-62m	103957	-64m
103958	-66m	103959	-68m	103960	-70m	103961	-72m
103962	-74m	103963	-76m	103964	-78m	103965	-80m
103966	-82m	103967	-84m	103968	-86m	103969	-88m
103970	-90m	103971	-92m	103972	-94m	103973	-96m
103974	-98m	103975	-100m	103976	-102m	103977	-104m
103978	-106m	103979	-108m	103980	-110m	103981	-112m
103982	-114m	103983	-116m	103984	-118m	103975	-120m
103986	-122m	103987	-124m	103988	-126m	103989	-128m
103990	-130m	103991	-132m	103992	-134m	103993	-136m
103994	-138m	103995	-140m	103996	-142m	103997	-144m
103998	-146m	103999	-148m	104000	-150m	104001	-152m

---cont.

SAMPLE PX	INT	SAMPLE PX	INT	SAMPLE PX	INT	SAMPLE PX	INT
104402	-154m	104403	-156m	104404	-158m	104405	-160m
104406	-162m	104407	-164m	104408	-166m	104409	-168m
104410	-170m	104411	-172m	104412	-174m	104413	-176m
104414	-178m	104415	-180m	104416	-182m	104417	-184m
104418	-186m	104419	-188m	104420	-190m	104421	-192m
104422	-194m	104423	-196m	104424	-198m	104425	-200m
104426	-202m	104771	-204m	104772	-206m	104773	-208m
104774	-210m	104775	-212m	104776	-214m	104777	-216m
104778	-218m	104779	-220m	104780	-222m	104781	-224m
104782	-226m	104783	-228m	104784	-230m	104785	-232m
104786	-234m	104787	-236m	104788	-238m	104789	-240m
104790	-242m	104791	-244m	104792	-246m	104793	-248m
104794	-250m	104795	-252m	104796	-254m	104797	-256m
104798	-258m	104799	-260m	104800	-262m	104801	-264m
104802	-266m	104803	-268m	104804	-270m	104805	-272m
104806	-274m	104807	-276m	104808	-278m	104809	-280m
104810	282.1						

AUSTRALIAN LABORATORY SERVICES P/L
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Facsimile: (07) 352 5109

ANALYTICAL REPORT

CLIENT: RGC EXPLORATION PTY LTD Selected 2m intervals from QD 18,80
ADDRESS: P O BOX 1166 and all 2m intervals from
MILTON CENTRE QD 85.
QLD 4064

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

CONTACT: K DENWER Te is wrong — see appended sheet.

No. of SAMPLES: 179
DATE RECEIVED: 18/06/93
DATE COMPLETED: 01/07/93

R No: 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER		ELEMENT UNIT METHOD	Cu ppm IC591	Pb ppm IC591	Zn ppm IC591	Ag ppm IC591	Fe % IC591
0-2	PX 103926		37	73	58	<1	3.95
-4	PX 103927		34	37	50	2	3.65
-6	PX 103928		22	73	47	2	3.50
-8	PX 103929		89	195	122	3	3.44
-10	PX 103930		45	87	441	2	1.12
-12	PX 103931		10	65	115	1	2.78
-14	PX 103932		14	55	201	1	2.85
-16	PX 103933		15	47	130	1	3.51
-18	PX 103934		12	25	96	1	3.09
-20	PX 103935		35	67	622	2	1.82
-22	PX 103936		9	58	337	1	2.88
-24	PX 103937		14	61	299	1	3.18
-26	PX 103938		10	39	319	1	3.37
-28	PX 103939		6	15	185	1	2.06
-30	PX 103940		<2	<5	15	1	0.82
-32	PX 103941		13	90	173	1	2.23
-34	PX 103942		11	33	41	2	2.85
-36	PX 103943		13	50	188	1	2.26
-38	PX 103944		10	88	273	1	3.04
-40	PX 103945		6	36	123	<1	1.81
-42	PX 103946		7	42	137	1	1.06
-44	PX 103947		5	24	122	<1	0.76
-46	PX 103948		5	42	146	2	0.72
-48	PX 103949		5	20	105	1	1.17
-50	PX 103950		5	31	106	1	0.94
-52	PX 103951		4	49	143	<1	0.56
-54	PX 103952		6	33	90	1	0.42
-56	PX 103953		8	58	159	1	0.36
-58	PX 103954		3	14	83	1	0.85
-60	PX 103955		6	22	140	4	0.82
TION LIMIT:			2	5	2	1	0.01

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All pages of this report have been checked and approved for release.

Signed

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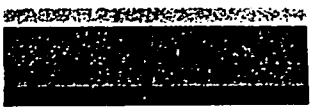

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ANALYTICAL REPORT

CLIENT: RGC EXPLORATION PTY LTD
ADDRESS: P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT: K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No. of SAMPLES: 179
DATE RECEIVED: 18/06/93
DATE COMPLETED: 01/07/93

ORDER No: 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT / UNIT / METHOD	Cu ppm IC591	Pb ppm IC591	Zn ppm IC591	Ag ppm IC591	Fe % IC591
-62	PX 103956	8	10	145	2	1.18
-64	PX 103957	6	6	242	<1	1.26
-66	PX 103958	6	36	230	1	0.80
-68	PX 103959	6	<5	91	<1	1.76
-70	PX 103960	5	19	289	2	1.24
-72	PX 103961	6	14	222	1	1.44
-74	PX 103962	4	11	254	<1	1.56
-76	PX 103963	7	58	305	2	0.40
-78	PX 103964	4	15	188	4	1.25
-80	PX 103965	4	27	184	1	0.93
-82	PX 103966	4	9	117	<1	1.00
-84	PX 103967	4	12	76	1	0.44
-86	PX 103968	5	22	87	1	0.78
-88	PX 103969	5	16	100	2	0.30
-90	PX 103970	11	30	94	3	0.40
-92	PX 103971	4	68	229	1	0.66
-94	PX 103972	7	149	460	2	0.86
-96	PX 103973	11	115	358	3	0.66
-98	PX 103974	<2	<5	42	<1	0.59
-100	PX 103975	2	<5	99	<1	1.05
-102	PX 103976	4	<5	60	1	1.34
-104	PX 103977	3	<5	54	1	1.40
-106	PX 103978	6	19	101	<1	1.77
-108	PX 103979	4	6	53	1	1.30
-110	PX 103980	5	9	68	<1	1.28
-112	PX 103981	7	36	105	2	0.70
-114	PX 103982	5	36	62	1	0.59
-116	PX 103983	5	6	53	<1	1.39
-118	PX 103984	2	<5	53	<1	1.23
	PX 103985	3	<5	47	<1	1.30
CTION LIMIT:		2	5	2	1	0.01

MENTS:

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ANALYTICAL REPORT

CLIENT: RGC EXPLORATION PTY LTD
ADDRESS: P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT: K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No. of SAMPLES: 179
DATE RECEIVED: 18/06/93
DATE COMPLETED: 01/07/93

ER No: 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT / UNIT / METHOD	Cu ppm IC591	Pb ppm IC591	Zn ppm IC591	Ag ppm IC591	Fe % IC591
-120	PX 103986	3	<5	36	<1	0.56
-122	PX 103987	10	<5	49	1	1.08
-124	PX 103988	21	5	65	1	1.54
-126	PX 103989	26	7	46	1	1.42
-128	PX 103990	6	26	124	<1	1.52
-130	PX 103991	6	32	65	1	0.60
-132	PX 103992	7	62	192	2	0.50
-134	PX 103993	3	26	145	1	0.69
-136	PX 103994	11	72	247	1	0.64
-138	PX 103995	5	50	245	1	0.93
-140	PX 103996	6	57	16	1	0.33
-142	PX 103997	21	74	72	2	0.38
-144	PX 103998	11	83	20	3	0.36
-146	PX 103999	3	<5	57	1	0.17
-148	PX 104000	5	66	310	2	0.36
-150	PX 104001	11	193	788	2	0.72
-152	PX 104002	8	239	1040	2	0.67
-154	PX 104003	38	67	384	5	0.52
-156	PX 104004	15	128	1790	4	0.72
-158	PX 104005	10	153	604	3	0.87
-160	PX 104006	15	167	753	2	0.53
-162	PX 104007	15	139	605	3	0.48
-164	PX 104008	11	100	278	5	0.66
-166	PX 104009	11	200	996	3	0.33
-168	PX 104010	3	272	663	3	0.29
-170	PX 104011	7	486	1380	3	0.37
-172	PX 104012	7	206	675	5	0.50
-174	PX 104013	22	341	1040	9	0.41
-176	PX 104014	7	167	46	6	0.24
-178	PX 104015	7	41	30	26	0.17
TION LIMIT:		2	5	2	1	0.01

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ANALYTICAL REPORT

CLIENT: RGC EXPLORATION PTY LTD
ADDRESS: P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT: K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No. of SAMPLES: 179
DATE RECEIVED: 18/06/93
DATE COMPLETED: 01/07/93

ER No: 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT / UNIT / METHOD	Cu ppm IC591	Pb ppm IC591	Zn ppm IC591	Ag ppm IC591	Fe % IC591
-180	PX 104016	22	74	746	58	0.16
-182	PX 104017	4	45	14	21	0.18
-184	PX 104018	11	73	21	135	0.14
-186	PX 104019	8	50	25	40	0.13
-188	PX 104020	31	65	76	90	0.13
-190	PX 104021	57	91	39	167	0.19
-192	PX 104022	58	183	109	230	0.16
-194	PX 104023	43	66	31	58	0.19
-196	PX 104024	49	77	29	81	0.20
-198	PX 104025	100	160	360	117	0.18
-200	PX 104026	9	262	900	21	0.21
-202	PX 104771	13	59	110	42	0.18
-204	PX 104772	8	35	105	18	0.15
-206	PX 104773	2	13	8	4	0.51
-208	PX 104774	5	15	9	7	0.22
-210	PX 104775	4	18	10	14	0.45
-212	PX 104776	57	21	8	33	0.19
-214	PX 104777	4	8	7	8	0.45
-216	PX 104778	4	20	8	12	0.20
216-220	PX 104779	4	17	10	19	0.17
-222	PX 104780	3	14	12	7	0.21
-224	PX 104781	10	26	11	5	0.25
-226	PX 104782	9	32	11	13	0.27
-228	PX 104783	19	25	10	164	0.19
-230	PX 104784	8	50	12	4	0.16
-232	PX 104785	15	42	106	4	0.28
-234	PX 104786	18	236	622	8	0.33
-236	PX 104787	7	92	224	7	1.00
-238	PX 104788	4	97	290	3	0.73
-240	PX 104789	10	110	311	2	0.55
TION LIMIT:		2	5	2	1	0.01

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ANALYTICAL REPORT

CLIENT: RGC EXPLORATION PTY LTD
ADDRESS: P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT: ~~MR~~ K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No. of SAMPLES: 179
DATE RECEIVED: 18/06/93
DATE COMPLETED: 01/07/93

R No: 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT UNIT METHOD	Cu ppm IC591	Pb ppm IC591	Zn ppm IC591	Ag ppm IC591	Fe % IC591
-242 PX 104790		6	28	121	5	0.54
-244 PX 104791		4	36	165	1	0.54
-246 PX 104792		2	34	172	1	0.45
-248 PX 104793		2	37	121	1	0.55
-250 PX 104794		816	305	844	1	0.33
-252 PX 104795		3	20	125	1	0.28
-254 PX 104796		9	38	13	4	0.19
-256 PX 104797		7	37	41	4	0.15
-258 PX 104798		4	293	998	4	0.25
-260 PX 104799		4	133	290	4	0.24
-262 PX 104800		2	104	202	1	0.31
-264 PX 104801		3	38	167	1	0.33
-266 PX 104802		5	125	204	7	0.15
-268 PX 104803		10	116	750	1	0.48
-270 PX 104804		16	66	352	1	0.31
-272 PX 104805		13	65	348	1	0.28
-274 PX 104806		6	86	12	2	0.30
-276 PX 104807		2	144	820	1	0.17
-278 PX 104808		5	94	929	2	0.19
-280 PX 104809		10	60	958	1	0.22
-282/1 PX 104810		8	215	889	1	0.54

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ANALYTICAL REPORT

CLIENT: RGC EXPLORATION PTY LTD
ADDRESS: P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT: K. DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No. of SAMPLES: 179
DATE RECEIVED: 18/06/93
DATE COMPLETED: 01/07/93

ORDER No: 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT UNIT METHOD	Se ppm IC591	Te ppm IC591	Au ppm PM208	Au PM208 ppm CHECKS
PX 103956		<0.05	<0.05	0.60	
PX 103957		<0.05	<0.05	0.28	0.26
PX 103958		<0.05	<0.05	0.16	0.20
PX 103959		<0.05	<0.05	0.21	
PX 103960		<0.05	<0.05	0.79	0.87
PX 103961		<0.05	<0.05	0.43	
PX 103962		<0.05	<0.05	0.28	
PX 103963		<0.05	<0.05	0.15	
PX 103964		<0.05	<0.05	1.89	1.90
PX 103965		<0.05	<0.05	0.24	
PX 103966		<0.05	<0.05	0.24	
PX 103967		<0.05	<0.05	0.23	
PX 103968		<0.05	<0.05	0.22	
PX 103969		<0.05	<0.05	0.51	
PX 103970		<0.05	<0.05	0.21	
PX 103971		<0.05	<0.05	0.29	
PX 103972		<0.05	<0.05	0.48	
PX 103973		<0.05	<0.05	3.56	3.50
PX 103974		<0.05	<0.05	4.44	4.36
PX 103975		<0.05	<0.05	2.07	2.10
PX 103976		<0.05	<0.05	1.27	
PX 103977		<0.05	<0.05	1.51	
PX 103978		<0.05	<0.05	0.92	
PX 103979		<0.05	<0.05	2.66	
PX 103980		<0.05	<0.05	2.21	
PX 103981		<0.05	<0.05	0.50	
PX 103982		<0.05	<0.05	0.37	
PX 103983		<0.05	<0.05	1.14	
PX 103984		<0.05	<0.05	1.21	
PX 103985		<0.05	<0.05	0.88	
DETECTION LIMIT:		0.05	0.05	0.01	0.01

COMMENTS:

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Charters Towers Laboratory
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Orange Laboratory
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Bendigo Laboratory
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Perth Laboratory
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AUSTRALIAN
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P.O. Box 66, Everton Park, Q 4053
Telephone. (07) 352 5577
Facsimile (07) 352 5109

ANALYTICAL REPORT

CLIENT: RGC EXPLORATION PTY LTD
ADDRESS: P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT: K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No. of SAMPLES: 179
DATE RECEIVED: 18/06/93
DATE COMPLETED: 01/07/93

ORDER No. 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT UNIT METHOD	Se ppm IC591	Te ppm IC591	Au ppm PM208	Au PM208 ppm CHECKS
PX 103986		<0.05	<0.05	1.80	1.88
PX 103987		<0.05	<0.05	1.69	1.66
PX 103988		<0.05	<0.05	1.24	
PX 103989		<0.05	<0.05	1.11	
PX 103990		<0.05	<0.05	0.94	
PX 103991		<0.05	<0.05	0.26	0.28
PX 103992		<0.05	<0.05	0.43	0.40
PX 103993		<0.05	<0.05	2.65	2.64
PX 103994		<0.05	<0.05	1.44	
PX 103995		<0.05	<0.05	0.78	
PX 103996		<0.05	<0.05	0.25	
PX 103997		<0.05	<0.05	0.31	
PX 103998		<0.05	<0.05	0.51	
PX 103999		<0.05	<0.05	0.54	
PX 104000		<0.05	<0.05	1.33	
PX 104001		<0.05	<0.05	1.82	
PX 104002		<0.05	<0.05	1.30	
PX 104003		<0.05	<0.05	0.52	
PX 104004		<0.05	<0.05	0.61	
PX 104005		<0.05	<0.05	1.36	
PX 104006		<0.05	<0.05	1.42	
PX 104007		<0.05	<0.05	0.58	
PX 104008		<0.05	<0.05	0.70	
PX 104009		<0.05	<0.05	0.58	0.58
PX 104010		<0.05	<0.05	0.91	
PX 104011		<0.05	<0.05	0.96	
PX 104012		<0.05	<0.05	0.86	
PX 104013		<0.05	<0.05	1.17	
PX 104014		<0.05	<0.05	1.83	
PX 104015		<0.05	<0.05	4.88	
DETECTION LIMIT:		0.05	0.05	0.01	0.01

COMMENTS:

AUSTRALIAN LABORATORY SERVICES P/L
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ANALYTICAL REPORT

CLIENT: RGC EXPLORATION PTY LTD
ADDRESS: P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT: K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No of SAMPLES: 179
DATE RECEIVED: 18/06/93
DATE COMPLETED: 01/07/93

ER No: 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT	Se	Te	Au	Au PM208
	UNIT	ppm	ppm	ppm	ppm
	METHOD	IC591	IC591	PM208	CHECKS
PX 104016		<0.05	<0.05	8.36	
PX 104017		<0.05	<0.05	3.11	
PX 104018		<0.05	<0.05	33.4	24.4
PX 104019		<0.05	<0.05	3.16	5.78
PX 104020		<0.05	<0.05	9.61	9.90
PX 104021		<0.05	<0.05	19.8	20.4
PX 104022		<0.05	<0.05	17.1	18.1
PX 104023		<0.05	<0.05	5.78	
PX 104024		<0.05	<0.05	6.12	
PX 104025		<0.05	<0.05	9.00	8.80
PX 104026		<0.05	<0.05	2.50	2.56
PX 104771		<0.05	<0.05	3.10	3.42
PX 104772		<0.05	<0.05	2.03	
PX 104773		<0.05	<0.05	0.32	
PX 104774		<0.05	<0.05	0.34	
PX 104775		<0.05	<0.05	0.81	
PX 104776		<0.05	<0.05	1.42	
PX 104777		<0.05	<0.05	0.60	
PX 104778		<0.05	<0.05	1.15	
PX 104779		<0.05	<0.05	2.60	
PX 104780		<0.05	<0.05	0.43	
PX 104781		<0.05	<0.05	0.62	
PX 104782		<0.05	<0.05	2.14	
PX 104783		<0.05	<0.05	15.5	15.9
PX 104784		<0.05	<0.05	0.50	
PX 104785		<0.05	<0.05	0.39	
PX 104786		<0.05	<0.05	0.99	
PX 104787		<0.05	<0.05	0.92	0.84
PX 104788		<0.05	<0.05	0.48	
PX 104789		<0.05	<0.05	0.48	
TION LIMIT:		0.05	0.05	0.01	0.01

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boratory
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Perth Laboratory
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ANALYTICAL REPORT

CLIENT: RGC EXPLORATION PTY LTD
ADDRESS: P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT: K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No. of SAMPLES: 179
DATE RECEIVED: 18/06/93
DATE COMPLETED: 01/07/93

R No: 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT UNIT METHOD	Se ppm IC591	Te ppm IC591	Au ppm PM208	Au PM208 ppm CHECKS
PX 104790		<0.05	<0.05	0.50	
PX 104791		<0.05	<0.05	0.47	
PX 104792		<0.05	<0.05	0.48	
PX 104793		<0.05	<0.05	0.17	
PX 104794		<0.05	<0.05	0.22	
PX 104795		<0.05	<0.05	0.24	
PX 104796		<0.05	<0.05	0.21	
PX 104797		<0.05	<0.05	0.19	
PX 104798		<0.05	<0.05	0.34	
PX 104799		<0.05	<0.05	0.50	
PX 104800		<0.05	<0.05	0.11	
PX 104801		<0.05	<0.05	0.41	
PX 104802		<0.05	<0.05	0.41	
PX 104803		<0.05	<0.05	0.48	0.48
PX 104804		<0.05	<0.05	0.11	0.12
PX 104805		<0.05	<0.05	0.09	
PX 104806		<0.05	<0.05	0.11	
PX 104807		<0.05	<0.05	0.12	
PX 104808		<0.05	<0.05	0.16	
PX 104809		<0.05	<0.05	0.11	
PX 104810		<0.05	<0.05	0.13	

NEUTRON ACTIVATION ANALYSIS

BECQUEREL JOB # 360

QD80 ← QD85

0.2 -4 -6

ELEMENT	DL #	103234# -98	103235# -100	103236# -102	103237# -104	103238# -106	103239# -108	103240# -110	103926#	103927#	103928
ANTIMONY	.2	33.10	17.40	7.17	6.40	7.08	10.60	19.40	14.60	14.90	8.52
ARSENIC	1.0	317.00	143.00	97.40	185.00	187.00	90.10	842.00	21.40	20.80	26.40
BARIUM	100.0	160.0	160.0	244.0	528.0	1040.0	1420.0	1320.0	353.0	661.0	1060.0
BROMINE	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	6.11	-2.00	-2.00
CERIUM	2.0	19.20	13.20	13.30	6.94	6.87	17.60	37.10	38.40	35.80	48.50
CAESIUM	1.0	5.85	3.75	2.30	-1.00	-1.00	4.16	12.90	11.70	14.80	13.20
CHROMIUM	5.0	143.0	85.2	55.6	23.3	36.6	96.1	116.0	103.0	118.0	72.0
COBALT	1.0	4.29	3.15	1.87	-1.00	-1.00	2.46	7.77	1.61	-1.00	2.73
EUROPIUM	.3	1.57	1.91	2.62	3.67	2.85	2.65	.99	.52	.80	.94
GOLD, ppb	5.0	436.0	404.0	979.0	1190.0	816.0	434.0	1290.0	41.1	30.2	63.1
HAFNIUM	.5	1.38	.81	.63	-.50	-.50	1.10	2.76	4.37	4.25	4.22
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	1.76	1.08	.62	.14	.12	.90	3.07	4.70	4.27	4.24
LANTHANUM	.5	8.90	6.34	6.98	4.44	4.89	8.82	16.70	16.90	17.80	22.40
LUTETIUM	.2	-.20	-.20	-.20	-.20	-.20	-.20	.25	.23	.28	.28
MERCURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
POTASSIUM, %	.2	1.33	.84	.54	-.20	-.20	.82	2.78	2.14	2.86	2.33
RUBIDIUM	20.0	68.3	48.4	25.7	-20.0	-20.0	42.0	141.0	114.0	123.0	137.0
SAMARIUM	.2	2.14	1.69	1.62	1.17	1.40	2.14	3.71	2.60	3.40	4.31
SCANDIUM	.1	6.47	4.21	3.62	.32	.13	2.31	9.46	14.70	13.80	14.20
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.0	-5.0	-5.0	9.3	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SODIUM, %	.01	.02	.02	.02	-.01	-.01	.02	.10	.10	.13	.21
TANTALUM	1.0	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TELLURIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
THORIUM	.5	2.95	1.91	1.28	-.50	-.50	2.04	5.60	7.09	7.49	7.53
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	3.17	-2.00	2.53	-2.00
URANIUM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
YTTERBIUM	.5	1.09	.83	.97	-.50	-.50	.71	1.62	1.72	2.07	2.14
ZINC	100.0	1400.0	428.0	763.0	-100.0	-100.0	-100.0	226.0	131.0	108.0	112.0
ZIRCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

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MENAI, NSW, 2234

NEUTRON ACTIVATION ANALYSIS

BECQUEREL JOB # 260

		-8	-10	-12	-14	-16	-18	-20	-22	-24	-26
ELEMENT	DL #	103929#	103930#	103931#	103932#	103933#	103934#	103935#	103936#	103937#	103938
ANTIMONY	.2	14.90	6.26	8.43	6.05	8.86	7.90	5.99	5.08	4.76	5.12
ARSENIC	1.0	39.00	51.20	26.50	47.60	22.60	48.10	36.30	49.10	24.50	26.20
BARIUM	100.0	2710.0	7770.0	3080.0	2530.0	1670.0	1730.0	5040.0	1760.0	1510.0	1330.0
BROMINE	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
CERIUM	2.0	48.70	85.00	36.60	36.50	33.10	29.70	40.50	36.60	45.60	44.50
CAESIUM	1.0	21.30	19.40	10.80	12.70	15.20	13.30	11.70	15.60	17.40	16.60
CHROMIUM	5.0	64.8	37.6	80.4	64.4	60.5	76.9	64.1	63.2	55.5	74.4
COBALT	1.0	82.40	205.00	7.82	24.00	7.01	3.90	15.50	9.91	11.00	11.90
EUROPIUM	.5	.88	2.87	.95	.97	.80	.67	4.69	1.30	1.48	1.26
GOLD, ppb	5.0	80.1	2250.0	157.0	165.0	64.0	45.6	146.0	129.0	152.0	65.3
HAFNIUM	.5	3.90	.94	3.34	3.49	3.93	3.73	2.13	3.33	3.70	3.89
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	3.95	1.44	3.50	3.41	4.05	3.72	2.25	3.31	3.95	3.97
LANTHANUM	.5	20.00	15.00	17.90	16.10	16.70	15.90	20.90	19.00	22.90	22.90
LUTETIUM	.2	.26	.20	.21	.24	.24	.20	.34	.29	.29	.32
MERCURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
POTASSIUM, %	.2	2.52	1.22	2.63	3.00	3.91	3.42	1.76	3.34	3.85	4.25
RUBIDIUM	20.0	156.0	87.2	135.0	157.0	202.0	173.0	116.0	182.0	210.0	205.0
SAMARIUM	.2	4.28	4.84	3.61	3.32	3.17	2.94	5.90	4.37	5.09	4.92
SCANDIUM	.1	13.30	5.55	10.90	10.90	12.90	13.10	7.38	10.70	12.40	12.30
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SODIUM, %	.01	.11	.06	.13	.08	.08	.08	.07	.07	.08	.10
TANTALUM	1.0	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TELLURIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
THORIUM	.5	7.24	2.40	6.14	6.16	7.34	7.09	3.80	6.44	7.01	6.85
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
URANIUM	2.0	2.16	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	2.14	-2.00
YTTERBIUM	.5	1.93	1.54	1.55	1.50	1.57	1.47	2.41	2.05	2.28	2.33
ZINC	100.0	191.0	584.0	192.0	303.0	194.0	146.0	789.0	442.0	427.0	428.0
ZIRCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

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NEUTRON ACTIVATION ANALYSIS

ECQUEREL JOB # 360

		-28	-30	-32	-34	-36	-38	-40	-42	-44	-46
ELEMENT	DL #	103939#	103940#	103941#	103942#	103943#	103944#	103945#	103946#	103947#	103948
TIMONY	.2	4.03	3.10	6.06	8.38	7.19	6.02	4.88	6.07	5.79	6.07
SENIC	1.0	53.80	10.00	41.70	25.80	21.60	28.40	35.00	84.70	79.70	68.60
RIUM	100.0	967.0	793.0	1450.0	1010.0	929.0	1180.0	801.0	871.0	1090.0	1580.0
OMINE	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
RIUM	2.0	29.70	13.50	30.80	36.90	49.90	43.40	41.90	36.90	42.00	39.30
ESIUM	1.0	13.20	6.46	11.80	19.60	29.70	16.70	17.70	14.40	14.80	14.60
ROMIUM	5.0	40.6	36.9	89.2	86.2	161.0	64.9	101.0	112.0	69.4	76.9
BALT	1.0	7.07	3.29	7.23	9.34	8.76	11.30	10.10	9.68	11.20	9.90
ROPIUM	.5	1.06	.56	1.44	1.07	1.51	1.09	1.07	1.29	1.18	1.15
LD. ppb	5.0	240.0	566.0	346.0	70.2	57.4	42.6	22.2	147.0	79.4	194.0
TIUM	.5	2.73	1.10	2.68	3.02	3.85	4.13	3.67	3.61	3.89	3.37
.IUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
ON, %	.05	2.58	1.14	2.72	3.23	2.92	3.90	3.72	3.31	3.73	3.35
NTHANUM	.5	16.60	6.62	15.10	18.10	27.80	21.20	20.70	19.20	20.40	18.40
TETIUM	.2	.24	-.20	.21	.26	.28	.32	.28	.26	.30	.29
RCURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
LYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
TASSIUM, %	.2	2.81	.76	1.57	2.34	2.41	3.58	3.22	2.87	3.73	3.83
BIDIUM	20.0	160.0	33.5	86.5	116.0	135.0	210.0	171.0	141.0	195.0	199.0
MARIUM	.2	3.59	1.48	3.20	4.12	6.25	4.67	4.41	4.09	4.50	3.98
NADIUM	.1	8.55	3.20	8.62	10.70	9.24	12.50	11.90	10.40	12.20	10.90
LENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
LVER	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
DIUM, %	.01	.06	.12	.14	.21	.13	.19	.16	.52	.60	.24
NTALUM	1.0	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
LLURIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
ORIUM	.5	4.83	2.19	4.68	6.16	7.08	7.17	6.96	6.44	7.18	6.17
	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
NGSTEN	2.0	-2.00	-2.00	-2.00	2.55	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
TIUM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
TERBIUM	.5	1.65	.51	1.42	1.69	2.03	2.18	2.02	1.94	2.17	1.92
C	100.0	259.0	-100.0	253.0	-100.0	266.0	412.0	186.0	233.0	200.0	227.0
RCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

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N E U T R O N A C T I V A T I O N A N A L Y S I S

BECQUEREL JOB # 260

-48 -50 -52 -54 -56 -58 -60 -62 -64 -66

ELEMENT	DL #	103949#	103950#	103951#	103952#	103953#	103954#	103955#	103956#	103957#	103958
ANTIMONY	.2	3.60	3.37	4.60	9.21	11.50	6.10	13.60	10.00	6.93	6.42
ARSENIC	1.0	123.00	57.20	42.50	43.40	35.20	131.00	310.00	298.00	191.00	62.80
BARIUM	100.0	1180.0	1100.0	1150.0	781.0	836.0	1360.0	1240.0	1550.0	1160.0	1130.0
BROMINE	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
CERIUM	2.0	38.60	41.30	40.00	35.70	38.70	39.40	43.50	49.40	46.20	43.40
CAESIUM	1.0	12.50	12.80	15.90	12.60	12.40	16.90	18.10	17.80	15.70	15.10
CHROMIUM	5.0	77.3	82.4	63.6	127.0	95.8	85.1	71.5	80.2	60.6	101.0
COBALT	1.0	9.90	10.50	10.00	8.84	13.10	15.30	14.30	13.80	12.40	13.00
EUROPIUM	.5	1.01	1.27	1.05	1.01	.99	1.14	1.30	1.47	1.13	1.29
GOLD, ppb	5.0	246.0	421.0	141.0	655.0	38.9	260.0	825.0	565.0	278.0	193.0
[illegible]IUM	.5	3.88	3.68	3.44	3.07	3.62	3.19	3.75	3.85	4.23	3.51
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	3.56	3.57	3.67	3.17	4.08	4.25	4.29	4.00	4.01	3.76
LANTHANUM	.5	19.80	19.80	20.40	17.80	19.10	18.90	20.50	23.00	22.80	21.40
LUTETIUM	.2	.27	.30	.30	.27	.29	.31	.33	.34	.31	.31
MERCURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
POTASSIUM, %	.2	3.38	3.38	3.75	2.71	2.97	4.14	3.93	4.00	3.81	3.42
RUBIDIUM	20.0	157.0	164.0	199.0	118.0	160.0	234.0	235.0	226.0	204.0	178.0
SAMARIUM	.2	4.27	4.35	4.44	3.86	4.37	4.54	4.81	5.04	4.88	4.53
SCANDIUM	.1	11.30	11.40	11.70	9.60	14.10	15.70	14.80	12.70	13.10	11.70
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SODIUM, %	.01	1.17	.85	.29	.32	.10	.08	.10	.17	.54	.21
TANTALUM	1.0	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TELLURIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
THORIUM	.5	6.67	6.62	7.02	5.68	5.82	6.05	6.64	7.53	7.79	7.01
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	3.14	-2.00	-2.00
[illegible]IUM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	2.48	-2.00	-2.00	-2.00
YTTERBIUM	.5	2.00	2.07	1.99	1.76	2.16	2.27	2.33	2.28	2.20	2.04
ZINC	100.0	179.0	179.0	238.0	150.0	272.0	175.0	221.0	217.0	360.0	326.0
ZIRCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

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NEUTRON ACTIVATION ANALYSIS

NO 74-76

BECQUEREL JOB # 260

-68 -70 -72 -74 -76 -77 -78 -80 -82 -84 -86

ELEMENT	DL #	103959#	103960#	103961#	103962#	103964#	103965#	103966#	103967#	103968#	103969
ANTIMONY	.2	2.45	6.24	4.50	5.01	3.32	4.89	4.36	5.95	7.24	11.00
ARSENIC	1.0	235.00	378.00	339.00	212.00	343.00	229.00	268.00	98.40	165.00	85.30
BARIUM	100.0	1040.0	1320.0	1250.0	854.0	1350.0	1550.0	1720.0	1280.0	1530.0	669.0
BROMINE	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
CERIUM	2.0	44.00	41.50	44.40	44.30	44.40	42.30	43.80	37.70	40.10	27.00
CAESIUM	1.0	11.20	10.20	10.90	12.90	11.80	11.50	11.60	8.73	12.30	9.18
CHROMIUM	5.0	87.7	109.0	72.9	86.6	85.9	100.0	98.4	76.1	100.0	89.2
COBALT	1.0	10.20	12.80	13.10	11.90	14.20	12.00	10.90	9.18	10.50	5.90
EUROPIUM	.5	.80	1.15	1.08	1.18	1.00	1.01	.94	1.19	.96	1.14
GOLD, ppb	5.0	188.0	1010.0	272.0	484.0	5560.0	208.0	266.0	288.0	216.0	489.0	
[illegible]UM	.5	3.76	3.54	3.81	3.77	3.95	3.75	3.60	3.02	3.26	2.02
HAFNIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	3.65	3.40	3.82	3.69	3.78	3.78	3.62	3.04	3.45	2.10
LANTHANUM	.5	20.30	19.70	21.50	20.80	21.10	20.10	20.20	17.20	19.40	12.90
LUTETIUM	.2	.31	.29	.31	.30	.29	.27	.31	.25	.28	.20
MERCURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	5.9	-5.0	-5.0	-5.0
POTASSIUM, %	.2	3.23	4.35	3.65	3.25	3.58	3.81	3.83	3.31	3.42	1.99
RUBIDIUM	20.0	158.0	219.0	188.0	174.0	186.0	197.0	184.0	161.0	176.0	103.0
SAMARIUM	.2	4.50	4.36	4.65	4.62	4.52	4.39	4.42	3.83	4.15	2.99
SCANDIUM	.1	12.20	11.30	12.60	12.30	12.60	12.70	12.00	9.86	11.40	6.82
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.0	-5.0	-5.0	-5.0	6.2	-5.0	-5.0	-5.0	-5.0	-5.0
SODIUM, %	.01	1.42	.72	1.00	.78	1.32	.86	1.02	.64	.57	.07
TANTALUM	1.0	-1.00	-1.00	-1.00	1.01	1.04	-1.00	1.41	1.02	-1.00	-1.00
TELLURIUM	5.0	-5.0	-5.0	5.0	-5.0	8.3	-5.0	5.0	-5.0	-5.0	-5.0
THORIUM	.5	7.02	6.75	7.44	6.90	7.21	7.17	7.20	5.44	6.98	3.78
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	2.52	-2.00	-2.00	-2.00	-2.00	-2.00
[illegible]UM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
[illegible]RBIUM	.5	1.97	1.88	2.06	2.11	1.95	1.91	2.02	1.71	1.96	1.33
ZINC	100.0	162.0	402.0	364.0	332.0	292.0	271.0	201.0	150.0	151.0	163.0
ZIRCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

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NEUTRON ACTIVATION ANALYSIS

BECQUEREL JOB # 260

-88 -90 -92 -94 -96 -98 -100 -102 -104 -106

ELEMENT	DL #	103970#	103971#	103972#	103973#	103974#	103975#	103976#	103977#	103978#	103979
ANTIMONY	.2	15.10	7.70	12.60	23.20	11.80	10.90	9.69	9.89	7.12	12.50
ARSENIC	1.0	76.30	225.00	339.00	1700.00	2930.00	1950.00	1660.00	2110.00	1350.00	2760.00
BARIUM	100.0	1010.0	1450.0	1230.0	530.0	880.0	1090.0	1230.0	1640.0	1460.0	1040.0
BROMINE	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
CERIUM	2.0	32.10	39.00	36.20	21.00	20.90	33.70	36.00	42.00	42.20	37.80
CAESIUM	1.0	14.50	19.30	16.00	25.20	5.54	9.10	10.10	11.60	14.80	13.50
CHROMIUM	5.0	126.0	74.4	176.0	129.0	85.7	81.7	74.3	100.0	78.4	91.5
COBALT	1.0	7.22	6.89	9.29	5.03	4.82	7.10	8.90	8.99	9.64	9.02
EUROPIUM	.5	1.15	.99	.85	1.89	1.74	1.56	1.33	.88	1.00	1.89
GOLD, ppb	5.0	203.0	238.0	474.0	3690.0	4600.0	2070.0	1320.0	1580.0	929.0	2790.0
HAFNIUM	.5	2.36	3.06	2.90	.92	1.07	2.23	2.72	2.73	3.24	2.70
INDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	2.58	3.32	3.54	1.74	1.80	2.50	2.96	3.36	3.47	3.10
LANTHANUM	.5	15.20	17.80	17.20	10.90	10.40	14.70	16.70	18.20	19.00	17.10
LUTETIUM	.2	.27	.27	.25	-.20	-.20	-.20	.24	.24	.28	.23
MERCURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
POTASSIUM, %	.2	2.68	3.33	2.95	1.57	2.45	3.14	3.27	3.95	3.69	3.02
RUBIDIUM	20.0	158.0	176.0	163.0	98.6	116.0	169.0	155.0	199.0	200.0	171.0
SAMARIUM	.2	3.45	3.94	3.84	2.76	2.58	3.39	3.84	4.07	4.18	3.87
SCANDIUM	.1	8.38	10.20	10.40	6.01	5.72	8.36	9.71	11.10	11.70	10.10
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SODIUM, %	.01	.07	.26	.24	.04	.07	.15	.43	.65	.45	.29
TANTALUM	1.0	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TELLURIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
THORIUM	.5	4.88	5.75	5.63	2.94	2.96	4.72	5.48	6.15	6.67	5.56
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
URANIUM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
YTTERBIUM	.5	1.60	1.79	1.73	1.12	.81	1.35	1.62	1.62	1.89	1.52
ZINC	100.0	160.0	318.0	634.0	525.0	-100.0	180.0	124.0	124.0	178.0	120.0
ZIRCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

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NEUTRON ACTIVATION ANALYSIS

CQUEREL JOB # 260

		-108	-110	-112	-114	-116	-118	-120	-122	-124	-126
EMENT	DL #	103980#	103981#	103982#	103983#	103984#	103985#	103986#	103987#	103988#	103989
TIMONY	.2	15.20	13.50	6.49	12.80	14.70	9.76	13.90	16.60	18.30	17.40
ENIC	1.0	3070.00	813.00	280.00	2110.00	2910.00	1680.00	2370.00	3130.00	2820.00	2500.00
RIUM	100.0	1150.0	1260.0	493.0	828.0	735.0	771.0	587.0	987.0	1020.0	1240.0
MINE	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
RIUM	2.0	36.70	38.30	35.90	40.50	39.30	35.50	32.80	29.00	28.40	36.20
SIUM	1.0	12.00	22.60	10.70	11.80	15.10	11.40	11.20	8.42	10.00	11.50
OMIUM	5.0	66.7	112.0	90.9	64.9	52.4	54.0	65.4	71.8	55.6	74.5
ALT	1.0	9.22	9.75	10.80	9.88	10.10	8.39	6.92	6.64	7.04	7.96
OPIUM	.5	.88	1.27	1.34	1.02	1.29	1.44	2.06	1.64	1.61	1.89
O, ppb	5.0	2200.0	843.0	367.0	1190.0	1250.0	946.0	1780.0	1730.0	1210.0	1150.0
IUM	.5	2.73	2.98	2.87	2.83	2.61	2.90	1.62	1.85	1.91	2.54
DIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
N, %	.05	3.13	3.55	3.50	3.22	3.33	3.01	2.22	2.19	2.41	2.93
THANUM	.5	17.00	18.40	17.00	18.50	18.70	16.90	14.30	12.90	13.20	16.80
ETIUM	.2	.23	.24	.26	.25	.26	.25	.21	.20	-.20	.26
CURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
YBDENUM	5.0	6.7	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
ASSIUM, %	.2	2.55	2.73	2.32	2.39	2.98	2.64	2.15	2.50	3.07	3.14
IDIUM	20.0	145.0	137.0	106.0	143.0	162.0	141.0	120.0	127.0	143.0	165.0
ARIUM	.2	3.86	4.08	3.71	4.20	4.28	3.75	3.54	3.12	3.33	4.00
NDIUM	.1	10.30	10.60	9.50	11.00	11.20	10.10	7.30	7.32	8.15	9.76
ENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
VER	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
IUM, %	.01	.46	.05	.06	.73	.54	.49	.22	.06	.09	.13
TALUM	1.0	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
LURIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
RIUM	.5	5.74	6.47	5.42	6.32	6.77	5.93	4.17	4.24	5.09	5.58
	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
GSTEN	2.0	-2.00	-2.00	2.19	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
IUM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	2.55	-2.00	-2.00	-2.00	-2.00
ERBIUM	.5	1.50	1.60	1.67	1.69	1.74	1.54	1.42	1.38	1.30	1.79
	100.0	137.0	168.0	126.0	126.0	114.0	108.0	-100.0	109.0	124.0	118.0
CONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

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NEUTRON ACTIVATION ANALYSIS

BECQUEREL JOB # 260

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ELEMENT	DL #	103990#	103991#	103992#	103993#	103994#	103995#	103996#	103997#	103998#	103999
ANTIMONY	.2	15.00	11.10	16.10	18.70	27.90	12.40	5.90	23.70	15.30	15.80
ARSENIC	1.0	2420.00	209.00	360.00	2780.00	2110.00	1350.00	61.50	93.80	159.00	325.00
BARIUM	100.0	937.0	1250.0	928.0	1110.0	1050.0	1240.0	869.0	739.0	2560.0	968.0
BROMINE	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
CERIUM	2.0	41.00	38.20	37.70	38.50	35.30	41.20	34.10	35.70	31.20	23.70
CAESIUM	1.0	13.40	19.70	8.24	12.10	12.00	12.10	10.80	10.20	11.40	4.22
CHROMIUM	5.0	69.2	131.0	91.7	98.4	82.3	84.6	150.0	148.0	176.0	89.7
COBALT	1.0	10.50	10.70	8.46	8.35	7.99	9.19	4.70	6.21	3.86	4.06
EUROPIUM	.5	1.21	1.32	1.48	.96	1.16	1.23	1.42	1.12	1.08	1.77
GOLD, ppb	5.0	958.0	248.0	388.0	2760.0	1450.0	799.0	230.0	306.0	443.0	541.0
[illegible]UM	.5	2.79	3.31	3.08	2.58	2.20	2.63	2.68	2.88	2.42	1.30
HAFNIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	3.62	3.36	3.29	3.18	2.87	3.23	1.46	2.39	1.23	1.92
LANTHANUM	.5	18.40	17.90	17.60	17.30	16.10	18.20	17.00	16.90	15.30	11.10
LUTETIUM	.2	.28	.24	.33	.26	.30	.31	-.20	.24	-.20	.25
MERCURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	6.2	-5.0	-5.0	-5.0	-5.0	5.2	-5.0
POTASSIUM, %	.2	3.11	2.55	2.21	2.83	2.32	2.36	1.89	2.39	2.16	1.14
RUBIDIUM	20.0	142.0	136.0	108.0	144.0	134.0	138.0	100.0	107.0	101.0	54.0
SAMARIUM	.2	4.41	4.33	4.10	3.92	3.91	4.15	3.00	3.29	2.66	3.07
SCANDIUM	.1	12.40	10.70	10.60	10.80	9.73	10.10	5.48	8.74	5.16	6.20
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SODIUM, %	.01	.21	.04	.06	.08	.07	.12	.02	.03	.01	.02
TANTALUM	1.0	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TELLURIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
THORIUM	.5	6.49	5.99	5.74	5.89	5.20	5.65	4.68	4.73	4.48	2.56
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
[illegible]UM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
TERBIUM	.5	1.90	1.53	2.03	1.67	2.09	1.91	1.11	1.65	.93	1.71
ZINC	100.0	211.0	130.0	283.0	248.0	347.0	373.0	-100.0	135.0	-100.0	112.0
ZIRCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

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NEUTRON ACTIVATION ANALYSIS

BECQUEREL JOB # 260

-146 -150 -152 -154 -156 -158 -160 -162 -164 -166

ELEMENT	DL #	104090#	104001#	104002#	104003#	104004#	104005#	104006#	104007#	104008#	104009
ANTIMONY	.2	10.90	20.60	12.30	32.50	19.90	16.00	23.00	26.50	13.30	14.90
ARSENIC	1.0	860.00	1800.00	854.00	266.00	681.00	1010.00	1560.00	623.00	333.00	479.00
BARIUM	100.0	1740.0	685.0	1750.0	327.0	1350.0	1840.0	1280.0	1380.0	3270.0	2910.0
BROMINE	2.0	2.21	-2.00	-2.00	-2.00	-2.00	2.78	-2.00	-2.00	-2.00	-2.00
CERIUM	2.0	29.00	32.40	27.30	17.20	37.80	35.30	37.30	37.10	34.60	35.50
CAESIUM	1.0	5.81	8.13	6.92	4.84	11.80	13.70	10.70	9.26	6.85	8.51
CHROMIUM	5.0	105.0	115.0	110.0	88.3	98.3	110.0	102.0	131.0	159.0	138.0
COBALT	1.0	5.44	6.78	6.16	3.01	9.62	8.87	8.24	8.87	8.57	8.58
EUROPIUM	.5	1.32	1.35	1.18	1.48	1.05	1.05	.96	1.04	.97	1.18
GOLD, ppb	5.0	1200.0	1750.0	1250.0	476.0	609.0	1160.0	1240.0	498.0	646.0	514.0
H UM	.5	1.80	1.85	1.85	.96	3.26	2.53	2.82	2.82	2.80	2.93
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	2.35	3.04	2.36	1.45	3.61	3.33	3.56	3.45	3.13	3.51
LANTHANUM	.5	12.60	14.00	13.10	8.05	18.40	15.80	17.50	16.80	15.10	16.50
LUTETIUM	.2	.23	.24	-.20	-.20	.33	.32	.28	.31	.30	.35
MERCURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
POTASSIUM, %	.2	1.49	1.81	1.82	.82	2.84	2.07	2.48	2.38	2.23	2.67
RUBIDIUM	20.0	69.9	90.1	85.0	38.5	143.0	103.0	121.0	121.0	100.0	107.0
SAMARIUM	.2	3.17	3.40	3.33	2.22	4.26	3.73	4.11	4.05	3.91	3.94
SCANDIUM	.1	7.69	8.47	8.16	4.06	12.50	10.80	10.80	12.30	10.20	13.10
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.0	-5.0	-5.0	5.4	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SODIUM, %	.01	.04	.03	.03	.02	.19	.04	.05	.04	.03	.03
TANTALUM	1.0	-1.00	-1.00	-1.00	-1.00	1.03	-1.00	-1.00	-1.00	-1.00	-1.00
TELLURIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	5.3	-5.0
THORIUM	.5	3.41	4.39	3.82	1.68	6.59	5.22	6.35	5.17	4.71	5.42
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	2.75	-2.00	-2.00	-2.00	-2.00	-2.00
U UM	2.0	-2.00	-2.00	-2.00	-2.00	2.13	-2.00	-2.00	-2.00	-2.00	2.29
YTTERBIUM	.5	1.62	1.62	1.25	.97	2.30	2.16	1.96	2.16	1.77	2.43
ZINC	100.0	393.0	989.0	1210.0	523.0	2110.0	775.0	939.0	780.0	363.0	1210.0
ZIRCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

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NEUTRON ACTIVATION ANALYSIS

BECQUEREL JOB # 260

-168 -170 -172 -174 -176 -178 -180 -182 -184 -186

ELEMENT	DL #	104010#	104011#	104012#	104013#	104014#	104015#	104016#	104017#	104018#	104019
ANTIMONY	.2	7.42	10.80	9.81	27.50	11.50	36.90	32.70	10.30	22.20	14.10
ARSENIC	1.0	138.00	191.00	156.00	200.00	208.00	123.00	99.30	157.00	73.20	113.00
BARIUM	100.0	2200.0	2070.0	1950.0	3490.0	2590.0	1190.0	316.0	1950.0	153.0	170.0
BROMINE	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
CERIUM	2.0	30.00	32.20	34.80	34.90	28.00	29.10	25.50	26.00	16.50	17.00
CAESIUM	1.0	5.49	6.81	6.18	7.14	6.57	3.81	3.98	6.05	2.91	3.45
CHROMIUM	5.0	133.0	150.0	175.0	164.0	181.0	155.0	131.0	152.0	137.0	124.0
COBALT	1.0	6.25	7.85	8.11	8.73	6.71	5.68	4.65	5.84	3.11	3.30
EUROPIUM	.5	1.76	1.01	1.03	1.05	1.20	3.12	2.61	1.62	2.48	2.17
GOLD, ppb	5.0	899.0	845.0	772.0	1130.0	1770.0	4670.0	8150.0	3150.0	24900.0	6260.0
IUM	.5	2.07	2.68	2.78	2.99	2.62	1.87	1.45	1.95	.74	1.01
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	2.29	2.82	3.07	3.16	2.45	2.18	1.76	2.27	1.21	1.13
LANTHANUM	.5	14.00	15.20	16.20	16.30	13.50	14.10	11.70	12.40	8.63	8.69
LUTETIUM	.2	-.20	.26	.27	.30	-.20	-.20	-.20	-.20	-.20	-.20
MERCURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
POTASSIUM, %	.2	1.74	2.14	2.29	2.41	1.96	1.55	1.34	1.56	.86	.82
RUBIDIUM	20.0	73.5	100.0	92.9	105.0	82.7	55.6	43.6	68.4	38.5	32.8
SAMARIUM	.2	3.24	3.47	3.70	3.81	3.00	3.51	3.11	2.84	2.48	2.67
SCANDIUM	.1	10.30	10.90	11.30	12.80	9.36	6.57	6.53	6.97	3.44	3.20
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.0	-5.0	-5.0	5.6	9.4	29.4	65.6	23.2	176.0	64.0
SODIUM, %	.01	.02	.03	.03	.03	.02	.02	.01	.02	.01	.02
TANTALUM	1.0	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TELLURIUM	5.0	-5.0	-5.0	-5.0	5.1	5.2	21.1	34.9	15.6	93.4	32.7
THORIUM	.5	4.05	5.07	4.83	4.84	4.15	3.17	2.89	4.00	2.25	1.77
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	2.35	-2.00
IIUM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
YTTERBIUM	.5	1.03	1.72	1.74	2.03	.93	.98	1.21	.91	.85	.88
ZINC	100.0	845.0	1650.0	779.0	1240.0	100.0	-100.0	976.0	-100.0	-100.0	-100.0
ZIRCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

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BECQUEREL JOB # 260

		-185	-190	-192	-194	-196	-198	-200	-202	-204	-206
ELEMENT	DL #	104020#	104021#	104022#	104023#	104024#	104025#	104026#	104771#	104772#	104773
ANTIMONY	.2	42.60	208.00	138.00	65.00	59.20	135.00	15.40	19.50	9.47	6.55
ARSENIC	1.0	82.90	146.00	72.40	70.70	60.30	103.00	323.00	308.00	129.00	37.30
BARIUM	100.0	414.0	112.0	933.0	159.0	119.0	375.0	392.0	370.0	233.0	516.0
BROMINE	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
CERIUM	2.0	33.10	24.20	19.50	23.00	19.50	21.70	19.60	16.80	16.90	7.57
CAESIUM	1.0	3.75	4.89	3.80	5.80	5.99	4.34	5.13	4.35	3.19	2.33
CHROMIUM	5.0	128.0	164.0	198.0	289.0	293.0	240.0	195.0	181.0	156.0	546.0
COBALT	1.0	6.70	6.56	3.71	4.99	3.34	4.21	4.75	4.19	3.77	3.44
EUROPIUM	.5	2.25	1.64	1.40	1.10	.72	1.18	1.56	.90	1.91	-.50
GOLD, ppb	5.0	9160.0	19600.0	18000.0	5490.0	6070.0	9010.0	2470.0	3350.0	2180.0	274.0
[illegible]UM	.5	1.88	1.46	1.41	1.72	1.70	1.25	1.68	1.56	1.14	.79
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	2.49	2.13	1.24	2.02	1.55	1.59	1.87	1.90	1.37	1.67
LANTHANUM	.5	15.30	12.10	7.88	9.82	10.10	10.00	10.20	8.84	8.55	4.19
LUTETIUM	.2	.22	-.20	-.20	.22	-.20	-.20	-.20	-.20	-.20	-.20
MERCURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	29.1
POTASSIUM, %	.2	1.69	1.79	1.22	1.51	1.56	1.58	1.69	1.30	.93	.72
RUBIDIUM	20.0	71.2	71.0	51.4	53.3	50.1	68.0	82.9	60.6	41.6	30.4
SAMARIUM	.2	3.86	2.86	2.11	3.52	2.36	2.24	2.44	2.13	2.44	1.20
SCANDIUM	.1	10.00	6.36	4.47	5.32	5.08	5.12	6.55	4.41	3.95	2.77
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	92.8	222.0	242.0	85.0	87.2	135.0	16.9	44.9	32.3	6.0
SODIUM, %	.01	.02	.02	.02	.02	.02	.02	.03	.06	.02	.01
TANTALUM	1.0	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TELLURIUM	5.0	48.1	97.7	115.0	37.8	43.9	55.8	8.1	23.0	16.0	5.0
THORIUM	.5	4.30	3.93	2.88	3.61	2.85	2.58	3.12	2.86	1.97	1.76
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	2.19	2.97	2.69	3.16	-2.00	-2.00	-2.00	-2.00	-2.00
[illegible]UM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
YTTERBIUM	.5	1.53	.97	.80	1.49	.78	.74	.95	.75	.91	-.50
ZINC	100.0	140.0	141.0	171.0	-100.0	-100.0	495.0	1160.0	167.0	155.0	-100.0
ZIRCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

BECQUEREL LABORATORIES
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MENAI, NSW, 2234

BECQUEREL JOB # 260

216-220

ELEMENT	DL #	-208 104774#	-210 104775#	-212 104776#	-214 104777#	-216 104778#	-218 104779#	-222 104780#	-224 104781#	-226 104782#	-228 104783
ANTIMONY	.2	6.40	6.54	6.45	8.30	6.52	7.43	6.30	5.68	9.52	17.40
ARSENIC	1.0	40.50	49.50	57.90	35.80	43.50	111.00	58.70	47.80	187.00	189.00
BARIUM	100.0	131.0	297.0	381.0	921.0	748.0	1330.0	342.0	2520.0	125.0	398.0
BROMINE	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
CERIUM	2.0	13.30	16.40	24.30	8.82	18.10	21.60	29.90	28.60	27.50	28.10
CAESIUM	1.0	3.19	3.85	5.24	1.82	4.59	4.84	5.29	4.60	2.86	4.23
CHROMIUM	5.0	298.0	475.0	202.0	518.0	229.0	195.0	228.0	282.0	280.0	190.0
COBALT	1.0	5.19	5.92	8.68	3.39	6.44	5.93	9.73	13.70	12.60	8.44
EUROPIUM	.5	.67	.61	1.04	.63	.55	1.12	.89	.80	.64	.86
GOLD, ppb	5.0	331.0	753.0	1410.0	597.0	1210.0	2810.0	1000.0	616.0	2410.0	15400.0
[illegible]IUM	.5	1.15	1.52	1.94	.69	1.68	1.66	2.58	2.78	2.09	2.06
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	1.82	2.36	2.89	1.53	2.28	2.57	3.19	3.93	4.26	3.19
LANTHANUM	.5	6.54	7.81	11.50	4.09	8.11	10.40	14.60	13.50	12.50	13.20
LUTETIUM	.2	-.20	-.20	-.20	-.20	-.20	-.20	-.20	-.20	-.20	-.20
MERCURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
MOLYBDENUM	5.0	-5.0	21.5	-5.0	29.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
POTASSIUM, %	.2	1.04	1.31	1.55	.47	1.19	1.31	1.96	1.86	1.68	1.73
RUBIDIUM	20.0	38.4	55.5	64.7	23.9	56.6	48.5	79.8	79.3	64.1	79.7
SAMARIUM	.2	1.75	1.72	2.35	1.18	1.92	2.48	3.27	2.54	2.60	2.87
SCANDIUM	.1	3.67	4.19	4.00	2.24	4.46	5.34	7.82	5.02	5.01	4.50
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	8.7	20.3	33.3	8.9	20.5	30.1	12.1	-5.0	23.8	208.0
SODIUM, %	.01	.02	.02	.02	.01	.02	.01	.02	.03	.03	.04
TANTALUM	1.0	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TELLURIUM	5.0	-5.0	10.9	16.6	5.6	9.2	17.1	7.3	-5.0	16.2	107.0
THORIUM	.5	2.34	2.61	2.98	1.18	2.95	2.84	4.44	4.54	4.70	4.29
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	2.32	-2.00	-2.00	-2.00	-2.00	3.56	2.33	-2.00
[illegible]IUM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
YTTERBIUM	.5	.63	.55	.60	-.50	.53	.75	.81	.50	.51	.77
ZINC	100.0	-100.0	-100.0	-100.0	-100.0	-100.0	-100.0	-100.0	-100.0	-100.0	-100.0
ZIRCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

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BECQUEREL JOB # 260

ELEMENT	DL #	-230 104784#	-232 104785#	-234 104786#	-236 104787#	-238 104788#	-240 104789#	-242 104790#	-244 104791#	-246 104792#	-248 104793
ANTIMONY	.2	14.70	10.50	34.40	16.60	12.00	19.20	13.80	30.70	31.70	10.20
ARSENIC	1.0	164.00	185.00	993.00	1090.00	854.00	1240.00	857.00	2770.00	2930.00	652.00
BARIUM	100.0	148.0	324.0	418.0	581.0	605.0	466.0	894.0	1390.0	1380.0	1420.0
BROMINE	2.0	-2.00	-2.00	2.43	2.59	2.46	-2.00	-2.00	-2.00	-2.00	-2.00
CERIUM	2.0	38.90	37.70	32.40	42.30	39.10	34.90	32.20	36.50	36.40	43.30
CAESIUM	1.0	8.01	18.90	21.90	10.00	8.97	11.60	8.91	14.70	14.30	16.10
CHROMIUM	5.0	129.0	223.0	127.0	96.4	81.0	108.0	106.0	164.0	61.5	81.1
COBALT	1.0	10.70	12.40	9.50	9.54	9.52	8.81	9.14	8.04	8.53	10.40
EUROPIUM	.5	.92	.91	.77	.82	.70	.80	.62	.96	.87	.85
GOLD, ppb	5.0	485.0	377.0	959.0	856.0	473.0	428.0	467.0	417.0	461.0	181.0
H :UM	.5	3.42	2.92	2.39	3.07	3.11	2.64	2.96	2.66	2.47	3.44
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	4.25	3.98	3.29	3.51	3.30	3.04	3.24	3.04	3.07	3.51
LANTHANUM	.5	19.30	17.60	16.20	18.90	18.70	16.60	15.70	15.40	16.90	19.90
LUTETIUM	.2	-.20	-.20	.22	.22	.28	.24	.26	.21	.22	.31
MERCURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
MOLYBDENUM	5.0	-5.0	7.5	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
POTASSIUM, %	.2	2.48	2.34	2.17	2.49	2.49	2.87	3.25	3.64	3.57	4.49
RUBIDIUM	20.0	118.0	120.0	98.8	135.0	149.0	133.0	154.0	174.0	186.0	220.0
SAMARIUM	.2	4.17	3.26	3.25	4.18	4.00	3.69	3.52	3.53	3.94	4.40
SCANDIUM	.1	9.11	8.11	10.00	11.00	10.60	10.30	10.60	9.44	10.00	11.20
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.0	-5.0	6.1	6.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SODIUM, %	.01	.06	.05	.11	.08	.06	.05	.06	.06	.06	.08
TANTALUM	1.0	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TELLURIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
THORIUM	.5	6.18	5.68	4.91	6.14	5.63	5.80	5.82	6.15	6.42	6.30
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
U :UM	2.0	-2.00	-2.00	2.01	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
YTTERBIUM	.5	1.26	1.08	1.47	1.46	1.74	1.62	1.66	1.47	1.40	1.95
ZINC	100.0	-100.0	158.0	802.0	346.0	383.0	429.0	194.0	305.0	264.0	183.0
ZIRCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

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BECQUEREL JOB # 260

		-250	-252	254	256	258	260	262	264	266	268
ELEMENT	DL #	104794#	104795#	104796#	104797#	104798#	104799#	104800#	104801#	104802#	104803
ANTIMONY	.2	23.50	20.40	5.50	5.82	19.30	22.40	7.79	20.60	23.00	25.20
ARSENIC	1.0	1290.00	1440.00	73.60	70.80	1240.00	1460.00	421.00	1530.00	1260.00	1030.00
BARIUM	100.0	1280.0	1440.0	277.0	168.0	928.0	1510.0	1420.0	1460.0	1230.0	806.0
BROMINE	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
CERIUM	2.0	40.60	39.10	30.20	31.10	39.70	36.70	42.00	38.70	36.10	38.50
CAESIUM	1.0	14.70	9.46	13.70	12.80	15.50	12.20	9.20	11.80	10.80	13.30
CHROMIUM	5.0	123.0	119.0	196.0	169.0	87.2	95.5	102.0	91.2	110.0	84.7
COBALT	1.0	9.41	9.28	1.30	1.95	9.22	7.61	8.78	9.38	8.93	8.91
EUROPIUM	.5	.91	.77	.83	.64	.79	.93	1.06	.74	.96	.95
GOLD, ppb	5.0	203.0	218.0	212.0	240.0	339.0	501.0	110.0	410.0	370.0	468.0
P IUM	.5	2.97	3.58	2.93	2.73	2.95	2.86	3.71	3.17	2.43	3.16
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	3.71	3.22	.68	.65	3.16	3.00	3.31	3.33	3.41	3.49
LANTHANUM	.5	19.10	18.30	15.70	16.20	19.00	18.00	19.00	17.80	16.90	18.30
LUTETIUM	.2	.27	.25	-.20	-.20	.27	.21	.22	.23	.28	.37
MERCURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
MOLYBDENUM	5.0	-5.0	-5.0	6.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
POTASSIUM, %	.2	3.92	4.13	2.72	2.77	2.59	2.85	3.21	3.67	2.70	2.75
RUBIDIUM	20.0	211.0	198.0	114.0	124.0	146.0	125.0	155.0	197.0	135.0	130.0
SAMARIUM	.2	4.34	4.17	2.01	2.06	4.18	3.55	4.04	4.16	4.09	4.32
SCANDIUM	.1	11.00	10.20	6.18	6.32	10.80	9.35	10.60	10.70	9.47	11.60
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	5.7	-5.0
SODIUM, %	.01	.06	.07	.07	.06	.05	.05	.04	.05	.05	.26
TANTALUM	1.0	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TELLURIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
THORIUM	.5	6.08	6.18	4.74	4.10	6.59	5.87	6.44	5.82	6.13	6.11
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	3.03	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
U IUM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	2.16	-2.00
YTTERBIUM	.5	1.84	1.64	-.50	-.50	1.72	1.36	1.49	1.51	1.96	2.53
ZINC	100.0	1020.0	189.0	122.0	-100.0	1170.0	389.0	290.0	238.0	300.0	955.0
ZIRCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

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NEUTRON ACTIVATION ANALYSIS

BECQUEREL JOB # 260

270 272 274 276 278 280 282.1

ELEMENT	DL #	104804#	104805#	104806#	104807#	104808#	104809#	104810
ANTIMONY	.2	8.64	9.02	8.47	8.87	14.50	9.94	6.56
ARSENIC	1.0	210.00	237.00	96.80	256.00	663.00	388.00	435.00
BARIUM	100.0	284.0	286.0	611.0	1420.0	1080.0	514.0	328.0
BROMINE	2.0	-2.00	-2.00	-2.00	-2.00	2.02	-2.00	-2.00
CERIUM	2.0	38.60	40.90	35.40	26.50	32.00	42.10	38.80
CAESIUM	1.0	15.60	16.90	11.90	4.17	8.61	8.22	7.26
CHROMIUM	5.0	298.0	136.0	160.0	98.9	83.2	83.7	133.0
COBALT	1.0	11.00	11.80	12.60	6.39	7.36	9.47	9.31
EUROPIUM	.5	1.20	1.28	.99	1.51	1.21	1.21	.89
GOLD, ppb	5.0	110.0	113.0	112.0	95.4	137.0	120.0	140.0
H IUM	.5	2.95	3.10	2.86	1.94	2.31	3.51	3.22
IRIDIUM, ppb	20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
IRON, %	.05	4.35	4.58	5.45	2.52	2.93	3.96	3.45
LANTHANUM	.5	17.20	18.70	16.60	12.90	15.10	19.00	17.70
LUTETIUM	.2	.29	.29	-.20	.27	.29	.29	.27
MERCURY	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
MOLYBDENUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
POTASSIUM, %	.2	2.22	2.32	2.23	1.79	2.10	2.96	2.76
RUBIDIUM	20.0	109.0	119.0	100.0	78.9	109.0	136.0	135.0
SAMARIUM	.2	4.08	4.41	3.35	3.42	4.13	4.25	3.68
SCANDIUM	.1	10.90	11.70	5.50	9.80	9.02	11.30	10.80
SELENIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SILVER	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
SODIUM, %	.01	.04	.04	.03	.03	.03	.07	.04
TANTALUM	1.0	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
TELLURIUM	5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
THORIUM	.5	6.05	6.24	6.29	4.27	5.24	6.49	5.68
TIN	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0
TUNGSTEN	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
U IUM	2.0	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
YTTERBIUM	.5	2.02	2.06	1.19	1.89	1.60	1.81	1.90
ZINC	100.0	454.0	484.0	-100.0	1130.0	1250.0	1280.0	1120.0
ZIRCONIUM	500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0	-500.0

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AUSTRALIAN
LABORATORY
SERVICES P/L
A.C.N. 009 936 029

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ANALYTICAL REPORT

CLIENT RGC EXPLORATION PTY LTD
ADDRESS P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No of SAMPLES 179
DATE RECEIVED 18/06/93
DATE COMPLETED 01/07/93

ORDER No 6991 SAMPLE TYPE: SOIL PROJECT No

SAMPLE NUMBER	ELEMENT / UNIT / METHOD	Mn ppm IC591	Ca ppm IC591	Mo ppm IC591	Cd ppm IC591	Co ppm IC591
PX 103926		61	57	<5	<1	<5
PX 103927		1060	100	<5	<1	<5
PX 103928		4150	249	<5	<1	<5
PX 103929		2.63%	278	<5	<1	61
PX 103930		11.19%	2130	<5	3	133
PX 103931		1.44%	149	<5	<1	6
PX 103932		2.54%	360	<5	<1	18
PX 103933		8960	175	<5	<1	6
PX 103934		3480	149	<5	<1	<5
PX 103935		7.36%	1740	<5	2	13
PX 103936		1.73%	315	<5	<1	8
PX 103937		3250	320	<5	<1	8
PX 103938		3890	624	<5	<1	9
PX 103939		1.85%	7.70%	<5	<1	6
PX 103940		3.09%	18.80%	<5	<1	<5
PX 103941		3.32%	3.05%	<5	<1	6
PX 103942		8350	3020	<5	<1	7
PX 103943		3210	1790	<5	<1	6
PX 103944		6210	2100	<5	<1	7
PX 103945		964	2300	<5	<1	<5
PX 103946		9910	2.12%	<5	<1	<5
PX 103947		1720	2.36%	<5	<1	<5
PX 103948		7970	3.97%	<5	<1	<5
PX 103949		3560	2.61%	<5	<1	<5
PX 103950		3810	1.74%	<5	<1	<5
PX 103951		2760	1.97%	<5	<1	<5
PX 103952		7040	4.82%	<5	<1	<5
PX 103953		3090	1.60%	<5	<1	<5
PX 103954		5540	1.64%	<5	<1	<5
PX 103955		1.11%	4810	<5	<1	<5
DETECTION LIMIT		5	10	5	1	5

COMMENTS

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ANALYTICAL REPORT

CLIENT: RGC EXPLORATION PTY LTD
ADDRESS: P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT: K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6293-0

No of SAMPLES: 179
DATE RECEIVED: 18/06/93
DATE COMPLETED: 01/07/93

ORDER No: 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT	Mn	Ca	Mo	Cd	Co
	UNIT	ppm	ppm	ppm	ppm	ppm
	METHOD	IC591	IC591	IC591	IC591	IC591
PX 103956		2110	2810	<5	<1	<5
PX 103957		1790	2880	<5	<1	<5
PX 103958		2300	2630	<5	<1	<5
PX 103959		1550	9010	<5	<1	<5
PX 103960		1.16%	7870	<5	<1	<5
PX 103961		3880	2740	<5	<1	<5
PX 103962		3380	2390	<5	<1	<5
PX 103963		3920	2300	<5	<1	<5
PX 103964		4360	4070	<5	<1	<5
PX 103965		3510	3450	<5	<1	<5
PX 103966		4750	1.24%	<5	<1	<5
PX 103967		1.29%	5.30%	<5	<1	<5
PX 103968		4400	2.64%	<5	<1	<5
PX 103969		1.64%	11.16%	<5	<1	<5
PX 103970		8950	6.40%	<5	<1	<5
PX 103971		7170	4.06%	<5	<1	<5
PX 103972		5910	3.11%	<5	<1	<5
PX 103973		1.99%	8.48%	<5	<1	<5
PX 103974		1.83%	12.57%	<5	<1	<5
PX 103975		1.17%	9.18%	<5	<1	<5
PX 103976		8350	6.23%	<5	<1	<5
PX 103977		4330	3.20%	<5	<1	<5
PX 103978		4000	2.43%	<5	<1	<5
PX 103979		7680	4.98%	<5	<1	<5
PX 103980		4830	4.46%	<5	<1	<5
PX 103981		2820	1.34%	<5	<1	<5
PX 103982		5360	3.46%	<5	<1	<5
PX 103983		4840	4.26%	<5	<1	<5
PX 103984		4800	4.28%	<5	<1	<5
PX 103985		6950	6.63%	<5	<1	<5
DETECTION LIMIT		5	10	5	1	5

COMMENTS:

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ANALYTICAL REPORT

CLIENT: RGC EXPLORATION PTY LTD
ADDRESS: P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT: K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No of SAMPLES: 179
DATE RECEIVED: 18/06/93
DATE COMPLETED: 01/07/93

ORDER No: 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT	Mn	Ca	Mo	Cd	Co
	UNIT	ppm	ppm	ppm	ppm	ppm
	METHOD	IC591	IC591	IC591	IC591	IC591
PX 103986		1.24%	11.16%	<5	<1	<5
PX 103987		1.47%	9.89%	<5	<1	<5
PX 103988		1.29%	8.89%	<5	<1	<5
PX 103989		9380	6.91%	<5	<1	<5
PX 103990		4440	2.98%	<5	<1	<5
PX 103991		4360	3.09%	<5	<1	<5
PX 103992		6660	4.68%	<5	<1	<5
PX 103993		4950	3.18%	<5	<1	<5
PX 103994		7750	5.18%	<5	<1	<5
PX 103995		6710	4.65%	<5	<1	<5
PX 103996		7920	6.31%	<5	<1	<5
PX 103997		5950	5.02%	<5	<1	<5
PX 103998		4690	3.66%	<5	<1	<5
PX 103999		1.72%	15.11%	<5	<1	<5
PX 104000		1.10%	8.11%	<5	<1	<5
PX 104001		9170	6.31%	<5	2	<5
PX 104002		9740	6.32%	<5	3	<5
PX 104003		1.92%	16.31%	<5	<1	<5
PX 104004		2890	1.57%	<5	8	<5
PX 104005		7080	3.36%	<5	1	<5
PX 104006		3510	1.74%	<5	3	<5
PX 104007		4250	2.71%	<5	2	<5
PX 104008		1970	1.34%	<5	<1	<5
PX 104009		5030	3.42%	<5	3	<5
PX 104010		1.24%	7.16%	<5	1	<5
PX 104011		3920	2.45%	<5	4	<5
PX 104012		3000	1.26%	<5	1	<5
PX 104013		2650	1.23%	<5	3	<5
PX 104014		4360	2.05%	<5	<1	<5
PX 104015		1.52%	7.89%	<5	<1	<5
DETECTION LIMIT:		5	10	5	1	5

COMMENTS:

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ANALYTICAL REPORT

CLIENT RGC EXPLORATION PTY LTD
ADDRESS P O BOX 1166
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QLD 4064

CONTACT K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No. of SAMPLES: 179
DATE RECEIVED: 18/06/93
DATE COMPLETED: 01/07/93

ORDER No 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT UNIT METHOD	Mn ppm IC591	Cs ppm IC591	Mo ppm IC591	Cd ppm IC591	Co ppm IC591
PX 104016		1.63%	8.30%	<5	2	<5
PX 104017		1.01%	5.42%	<5	<1	<5
PX 104018		1.59%	10.66%	<5	<1	<5
PX 104019		1.63%	12.40%	<5	<1	<5
PX 104020		9960	7.13%	<5	<1	<5
PX 104021		5910	3.72%	<5	<1	<5
PX 104022		6510	5.33%	<5	<1	<5
PX 104023		4090	4.36%	<5	<1	<5
PX 104024		3690	2.57%	<5	<1	<5
PX 104025		7700	4.86%	<5	<1	<5
PX 104026		1.01%	6.50%	<5	2	<5
PX 104771		7940	5.00%	<5	<1	<5
PX 104772		1.23%	7.20%	<5	<1	<5
PX 104773		4560	2.92%	18	<1	<5
PX 104774		3480	2.76%	<5	<1	<5
PX 104775		3310	3.09%	13	<1	<5
PX 104776		6710	5.41%	<5	<1	<5
PX 104777		7000	5.46%	16	<1	<5
PX 104778		2030	1.48%	<5	<1	<5
PX 104779		7120	5.09%	<5	<1	<5
PX 104780		2200	1.97%	<5	<1	<5
PX 104781		505	6210	<5	<1	<5
PX 104782		938	1.11%	<5	<1	<5
PX 104783		2800	2.19%	<5	<1	<5
PX 104784		910	1.17%	<5	<1	<5
PX 104785		316	5340	7	<1	<5
PX 104786		1190	1.70%	<5	2	<5
PX 104787		1600	1.33%	<5	<1	<5
PX 104788		1710	2.20%	<5	<1	<5
PX 104789		1770	2.76%	<5	<1	<5
DETECTION LIMIT		5	10	5	1	5

COMMENTS:

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ANALYTICAL REPORT

CLIENT RGC EXPLORATION PTY LTD
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QLD 4064

CONTACT K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No. of SAMPLES: 179
DATE RECEIVED 18/06/93
DATE COMPLETED 01/07/93

ORDER No 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT	Mn	Ca	Mo	Cd	Co
	UNIT	ppm	ppm	ppm	ppm	ppm
	METHOD	IC591	IC591	IC591	IC591	IC591
PX 104790		1950	2.07%	<5	<1	<5
PX 104791		3180	3.88%	<5	<1	<5
PX 104792		3270	4.05%	<5	<1	<5
PX 104793		1960	1.73%	<5	<1	<5
PX 104794		2110	1.89%	<5	<1	<5
PX 104795		1980	2.13%	<5	<1	<5
PX 104796		274	4300	<5	<1	<5
PX 104797		276	4220	<5	<1	<5
PX 104798		1540	1.39%	<5	2	<5
PX 104799		1480	1.68%	<5	<1	<5
PX 104800		1180	8880	<5	<1	<5
PX 104801		1980	2.05%	<5	<1	<5
PX 104802		1100	1.24%	<5	<1	<5
PX 104803		1390	1.49%	<5	2	<5
PX 104804		1260	1.63%	5	<1	<5
PX 104805		1230	1.61%	<5	<1	<5
PX 104806		923	1.03%	<5	<1	<5
PX 104807		9330	9.91%	<5	1	<5
PX 104808		6920	7.05%	<5	3	<5
PX 104809		2550	3.14%	<5	3	<5
PX 104810		1380	1.19%	<5	2	<5

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QLD 4064

CONTACT K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No of SAMPLES 179
DATE RECEIVED 18/06/93
DATE COMPLETED 01/07/93

ORDER No 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT / UNIT / METHOD	Ni ppm ICS91	As ppm ICS91	Bi ppm ICS91	Hg ppm ICS91	Sb ppm ICS91
PX 103926		5	15.3	2.01	<0.05	16.6
PX 103927		<5	16.7	2.32	<0.05	4.79
PX 103928		<5	19.5	3.15	<0.05	2.26
PX 103929		8	31.8	1.70	<0.05	3.76
PX 103930		254	39.6	0.77	<0.05	1.80
PX 103931		6	20.5	1.19	<0.05	2.09
PX 103932		15	40.1	0.87	<0.05	1.60
PX 103933		<5	20.0	0.78	<0.05	2.32
PX 103934		<5	40.0	0.90	<0.05	2.07
PX 103935		114	21.0	0.90	0.05	1.21
PX 103936		13	43.6	0.85	<0.05	1.45
PX 103937		7	20.8	0.79	<0.05	1.20
PX 103938		8	32.8	0.73	<0.05	1.36
PX 103939		11	47.2	0.50	<0.05	1.13
PX 103940		20	10.7	0.39	<0.05	0.73
PX 103941		24	35.8	1.37	<0.05	1.52
PX 103942		8	23.0	1.49	<0.05	2.09
PX 103943		6	15.8	0.85	<0.05	1.64
PX 103944		7	23.7	1.42	<0.05	1.91
PX 103945		<5	19.0	0.97	<0.05	2.50
PX 103946		6	18.9	0.76	<0.05	4.42
PX 103947		<5	8.24	0.38	<0.05	2.59
PX 103948		<5	20.8	0.42	<0.05	4.43
PX 103949		<5	12.5	0.29	<0.05	2.86
PX 103950		<5	4.88	0.80	<0.05	2.71
PX 103951		<5	6.67	0.61	<0.05	3.84
PX 103952		<5	6.46	0.79	<0.05	6.82
PX 103953		<5	6.99	1.55	<0.05	8.78
PX 103954		<5	15.6	0.40	<0.05	4.23
PX 103955		5	40.3	0.34	<0.05	7.22
DETECTION LIMIT		5	0.05	0.05	0.05	0.05

COMMENTS:

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ANALYTICAL REPORT

CLIENT RGC EXPLORATION PTY LTD
ADDRESS P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT K DENNER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No of SAMPLES 179
DATE RECEIVED 18/06/93
DATE COMPLETED 01/07/93

ORDER No 6991 SAMPLE TYPE SOIL PROJECT No

SAMPLE NUMBER	ELEMENT	Ni	As	Bi	Hg	Sb
	UNIT	ppm	ppm	ppm	ppm	ppm
	METHOD	IC591	IC591	IC591	IC591	IC591
PX 103956		<5	89.3	0.31	<0.05	5.96
PX 103957		<5	56.1	0.30	<0.05	3.75
PX 103958		5	22.1	1.03	<0.05	5.12
PX 103959		6	10.7	0.09	<0.05	1.40
PX 103960		8	35.0	0.12	<0.05	3.38
PX 103961		5	31.4	0.15	<0.05	3.07
PX 103962		<5	41.1	0.09	<0.05	3.06
PX 103963		<5	10.3	0.62	<0.05	4.43
PX 103964		<5	18.3	0.17	<0.05	2.10
PX 103965		<5	23.0	0.28	<0.05	2.86
PX 103966		<5	15.8	0.10	<0.05	2.78
PX 103967		5	8.16	0.17	<0.05	4.11
PX 103968		<5	11.8	0.38	<0.05	5.62
PX 103969		7	9.89	1.32	<0.05	8.67
PX 103970		<5	12.9	1.43	<0.05	13.8
PX 103971		<5	23.0	0.48	<0.05	5.46
PX 103972		6	26.0	0.79	<0.05	9.20
PX 103973		10	1020	1.32	<0.05	8.85
PX 103974		9	829	0.51	<0.05	7.02
PX 103975		6	641	0.21	<0.05	7.40
PX 103976		5	390	0.15	<0.05	4.77
PX 103977		<5	283	0.13	<0.05	3.71
PX 103978		<5	626	0.60	<0.05	5.42
PX 103979		<5	1040	0.26	<0.05	8.06
PX 103980		<5	343	0.19	<0.05	4.49
PX 103981		<5	247	1.24	<0.05	6.79
PX 103982		<5	65.5	2.42	<0.05	3.13
PX 103983		<5	294	0.13	<0.05	4.49
PX 103984		<5	421	0.17	<0.05	3.97
PX 103985		<5	354	0.09	<0.05	4.69
DETECTION LIMIT		5	0.05	0.05	0.05	0.05

COMMENTS.

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ANALYTICAL REPORT

CLIENT RGC EXPLORATION PTY LTD
ADDRESS P O BOX 1166
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QLD 4064

CONTACT [redacted] K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No of SAMPLES 179
DATE RECEIVED 18/06/93
DATE COMPLETED 01/07/93

ORDER No 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT UNIT METHOD	Ni ppm IC591	As ppm IC591	Bi ppm IC591	Hg ppm IC591	Sb ppm IC591
PX 103986		6	511	0.24	<0.05	6.07
PX 103987		8	1570	0.45	<0.05	15.7
PX 103988		7	1730	0.42	<0.05	20.0
PX 103989		6	1300	0.24	<0.05	15.9
PX 103990		<5	458	0.17	<0.05	5.29
PX 103991		<5	64.9	1.44	<0.05	6.52
PX 103992		<5	73.7	1.89	<0.05	8.09
PX 103993		<5	422	1.98	<0.05	8.11
PX 103994		<5	308	0.49	<0.05	11.2
PX 103995		<5	557	0.67	<0.05	6.97
PX 103996		<5	61.2	1.39	<0.05	4.57
PX 103997		<5	57.5	1.50	<0.05	18.4
PX 103998		<5	139	1.42	<0.05	12.8
PX 103999		9	141	2.76	<0.05	5.89
PX 104000		6	256	2.67	<0.05	6.75
PX 104001		6	987	1.05	<0.05	15.9
PX 104002		5	455	1.38	<0.05	8.52
PX 104003		11	184	0.46	<0.05	14.2
PX 104004		<5	20.4	1.68	<0.05	14.7
PX 104005		<5	513	1.01	<0.05	10.6
PX 104006		<5	408	3.39	<0.05	14.9
PX 104007		<5	207	5.16	<0.05	15.7
PX 104008		<5	131	7.07	<0.05	8.34
PX 104009		<5	150	3.97	<0.05	10.3
PX 104010		5	74.4	0.90	<0.05	4.48
PX 104011		<5	97.2	1.17	<0.05	6.69
PX 104012		<5	93.1	1.22	<0.05	5.89
PX 104013		<5	106	3.80	<0.05	33.3
PX 104014		<5	103	2.73	<0.05	5.48
PX 104015		6	46.6	1.79	<0.05	5.94
DETECTION LIMIT.		5	0.05	0.05	0.05	0.05

COMMENTS:

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[redacted]

Brisbane Head Office and Laboratory
32 Shand Street, Stafford, Q. 4053
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Telephone (07) 352 5577
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ANALYTICAL REPORT

CLIENT RGC EXPLORATION PTY LTD
ADDRESS P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT [redacted] K DENNER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No of SAMPLES: 179
DATE RECEIVED: 18/06/93
DATE COMPLETED: 01/07/93

ORDER No 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT / UNIT / METHOD	Ni ppm IC591	As ppm IC591	Bi ppm IC591	Hg ppm IC591	Sb ppm IC591
PX 104016		7	31.2	1.42	<0.05	18.2
PX 104017		5	55.7	3.33	<0.05	4.74
PX 104018		7	16.5	1.88	<0.05	11.3
PX 104019		8	41.4	1.48	<0.05	7.64
PX 104020		<5	18.9	5.10	<0.05	25.0
PX 104021		<5	37.6	3.05	<0.05	44.3
PX 104022		<5	23.1	1.30	<0.05	55.2
PX 104023		6	15.8	1.51	<0.05	37.8
PX 104024		<5	18.6	1.86	<0.05	42.0
PX 104025		6	32.6	1.15	<0.05	88.8
PX 104026		6	9.98	0.66	<0.05	9.10
PX 104771		<5	26.7	1.35	<0.05	12.7
PX 104772		7	14.9	0.88	<0.05	5.85
PX 104773		6	3.67	3.88	<0.05	2.52
PX 104774		5	8.76	1.98	<0.05	2.57
PX 104775		5	6.85	3.35	<0.05	2.15
PX 104776		5	7.99	3.64	<0.05	2.64
PX 104777		6	5.14	1.22	<0.05	2.05
PX 104778		<5	9.47	1.16	<0.05	1.56
PX 104779		<5	15.8	1.60	<0.05	2.13
PX 104780		<5	23.3	2.69	<0.05	2.81
PX 104781		<5	17.1	0.88	<0.05	2.24
PX 104782		<5	88.1	1.82	<0.05	3.70
PX 104783		<5	49.3	1.83	<0.05	11.9
PX 104784		<5	40.8	2.08	<0.05	12.7
PX 104785		<5	12.8	3.15	<0.05	8.51
PX 104786		<5	91.9	3.16	<0.05	24.0
PX 104787		<5	98.2	0.40	<0.05	4.47
PX 104788		<5	88.5	0.40	<0.05	3.04
PX 104789		<5	141	1.03	<0.05	5.19
DETECTION LIMIT:		5	0.05	0.05	0.05	0.05

COMMENTS:

Townsville Laboratory
Phone (077) 79 9155 Fax (077) 79 9729
Charters Towers Laboratory
Phone (077) 87 4155 Fax (077) 87 4220
Orange Laboratory
Phone (063) 63 1722 Fax (063) 63 1189
Bendigo Laboratory
Phone (054) 46 1390 Fax (054) 46 1389
Perth Laboratory
Phone (09) 249 2988 Fax (09) 249 2942
Kalgoorlie Laboratory
Phone (090) 21 1457 Fax (090) 21 6253
Alice Springs Laboratory
Phone (089) 52 6020 Fax (089) 52 6028
Mt Isa Laboratory
Phone (077) 49 5545 Fax (077) 48 5546

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ANALYTICAL REPORT

CLIENT RGC EXPLORATION PTY LTD
ADDRESS P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT MS K DENWER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No. of SAMPLES 179
DATE RECEIVED. 18/06/93
DATE COMPLETED: 01/07/93

ORDER No 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT	Ni	As	Bi	Hg	Sb
	UNIT	ppm	ppm	ppm	ppm	ppm
	METHOD	IC591	IC591	IC591	IC591	IC591
PX 104790		<5	137	0.52	<0.05	4.58
PX 104791		<5	147	0.39	<0.05	6.65
PX 104792		<5	187	0.25	<0.05	5.36
PX 104793		<5	83.9	0.56	<0.05	2.84
PX 104794		<5	123	0.33	<0.05	6.15
PX 104795		<5	117	0.17	<0.05	4.39
PX 104796		<5	10.6	1.16	<0.05	4.12
PX 104797		<5	9.97	1.76	<0.05	4.38
PX 104798		<5	304	1.13	<0.05	10.5
PX 104799		<5	386	1.27	<0.05	8.86
PX 104800		<5	125	1.77	<0.05	3.88
PX 104801		<5	140	0.51	<0.05	3.92
PX 104802		<5	126	3.08	<0.05	10.2
PX 104803		<5	110	1.10	<0.05	12.6
PX 104804		<5	87.0	3.03	<0.05	6.04
PX 104805		<5	75.6	2.99	<0.05	5.52
PX 104806		<5	30.2	2.14	<0.05	4.44
PX 104807		<5	26.4	4.10	<0.05	6.66
PX 104808		<5	78.1	4.61	<0.05	9.65
PX 104809		<5	52.9	3.72	<0.05	5.61
PX 104810		<5	14.2	1.69	<0.05	2.94

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ANALYTICAL REPORT

CLIENT RGC EXPLORATION PTY LTD
ADDRESS P O BOX 1166
MILTON CENTRE
QLD 4064

CONTACT K DENNER

LABORATORY: STAFFORD
BATCH NUMBER: ST6283-0

No. of SAMPLES: 179
DATE RECEIVED: 18/06/93
DATE COMPLETED: 01/07/93

ORDER No 6991 SAMPLE TYPE: SOIL PROJECT No:

SAMPLE NUMBER	ELEMENT	Se	Te	Au	Au PM208
	UNIT	ppm	ppm	ppm	ppm
	METHOD	IC591	IC591	PM208	CHECKS
PX 103926		<0.05	<0.05	0.03	
PX 103927		<0.05	<0.05	0.03	
PX 103928		<0.05	<0.05	0.05	
PX 103929		<0.05	<0.05	0.10	
PX 103930		<0.05	<0.05	2.22	2.08
PX 103931		<0.05	<0.05	0.13	
PX 103932		<0.05	<0.05	0.15	
PX 103933		<0.05	<0.05	0.07	
PX 103934		<0.05	<0.05	0.04	
PX 103935		<0.05	<0.05	0.14	
PX 103936		<0.05	<0.05	0.13	
PX 103937		<0.05	<0.05	0.15	
PX 103938		<0.05	<0.05	0.07	
PX 103939		<0.05	<0.05	0.25	
PX 103940		<0.05	<0.05	0.52	
PX 103941		<0.05	<0.05	0.24	0.20
PX 103942		<0.05	<0.05	0.07	
PX 103943		<0.05	<0.05	0.05	
PX 103944		<0.05	<0.05	0.04	
PX 103945		<0.05	<0.05	0.02	
PX 103946		<0.05	<0.05	0.16	
PX 103947		<0.05	<0.05	0.08	
PX 103948		<0.05	<0.05	0.32	
PX 103949		<0.05	<0.05	0.16	
PX 103950		<0.05	<0.05	0.58	
PX 103951		<0.05	<0.05	0.18	
PX 103952		<0.05	<0.05	0.36	
PX 103953		<0.05	<0.05	0.04	
PX 103954		<0.05	<0.05	0.09	
PX 103955		<0.05	<0.05	0.82	
DETECTION LIMIT:		0.05	0.05	0.01	0.01

COMMENTS:

APPENDIX 3.

FLUID CHEMISTRY

HOLE QD85, KERIMENGE PROSPECT.

APPENDIX 3

Calculation of logfTe_2

Using equation 1.1 (of Affifi et.al 1988a) if the Ag mole fraction of electrum in equilibrium with hessite is known log fTe_2 can be established.

$$\log fTe_2 = 4.576T^{-1} \{ G_T^\circ (Ag_2Te) - 18.302T \log X_{Ag} + 4(1-X_{Ag})^2 [5650-1600(1-X_{Ag}) - 1.375T] \} \quad \text{equation 1.1}$$

where G_T° = -50197 +16.32T calories

T = Temperature (Kelvin) = 493K

X_{Ag} = mole fraction Ag in electrum in equilibrium with hessite.

Stage Va mineralisation

Electrum composition ranges from 76-81.5 wt % (Table 6.1) and average electrum composition is 79.5wt % Au, 20.5 wt % Ag.

X_{Ag} = 20.5 x mw Ag / 20.5 x mw Ag + 79.5 x mw Au

= 0.32

substituting into equation 1.1 gives

$\log fTe_2 = -13.5$

Stage Vb mineralisation

Electrum composition ranges from 85.5-87.6 wt % (Table 6.1) and average electrum composition is 86.5 wt % Au, 13.5 wt % Ag.

X_{Ag} = 13.5 x mw Ag / 13.5 x mw Ag + 86.5 x mw Au

= 0.22

substituting into equation 1.1 gives

APPENDIX 3

Calculation of logfTe_2

Using equation 1.1 (of Affifi et.al 1988a) if the Ag mole fraction of electrum in equilibrium with hessite is known log fTe_2 can be established.

$$\log fTe_2 = 4.576T^{-1} \{ G_T^\circ (Ag_2Te) - 18.302T \log X_{Ag} + 4(1-X_{Ag})^2 [5650-1600(1-X_{Ag}) - 1.375T] \} \quad \text{equation 1.1}$$

where $G_T^\circ = -50197 + 16.32T$ calories

T = Temperature (Kelvin) = 493K

X_{Ag} = mole fraction Ag in electrum in equilibrium with hessite.

Stage Va mineralisation

Electrum composition ranges from 76-81.5 wt % (Table 6.1) and average electrum composition is 79.5wt % Au, 20.5 wt % Ag.

X_{Ag} = 20.5 x mw Ag / 20.5 x mw Ag + 79.5 x mw Au
= 0.32

substituting into equation 1.1 gives

log fTe_2 = -13.5

Stage Vb mineralisation

Electrum composition ranges from 85.5-87.6 wt % (Table 6.1) and average electrum composition is 86.5 wt % Au, 13.5 wt % Ag.

X_{Ag} = 13.5 x mw Ag / 13.5 x mw Ag + 86.5 x mw Au
= 0.22

substituting into equation 1.1 gives

QD 85 LOGGING LEGEND.

LITHOLOGY

 Kerimenge Sill Porphyry

 Breccia

STRUCTURE

 Pug Fault

 Pug Fault with clasts

 Breccia

---

ALTERATION

Ser- Sericite dominated assemblage

Epr- Epidote propylitic assemblage

Pr- Propylitic assemblage

Ser/Pr-Sericite overprint on propylitic alteration.

Si- Silicification

INTENSITY of ALTERATION (in porphyry)

A3 (weak) primary feldspars preserved,

A2 (mod) feldspars altered, texture preserved.

A3 (strong) texture destroyed.

MINERALISATION

Type and style discussed in geological notes.

 Massive manganocarbonate

 Stockworked manganocarbonate (strongly developed)

 Stockworked manganocarbonate (weakly developed)

 Silica-sulfide (Si-Sf) veins.

RGC EXPLORATION PTY LTD

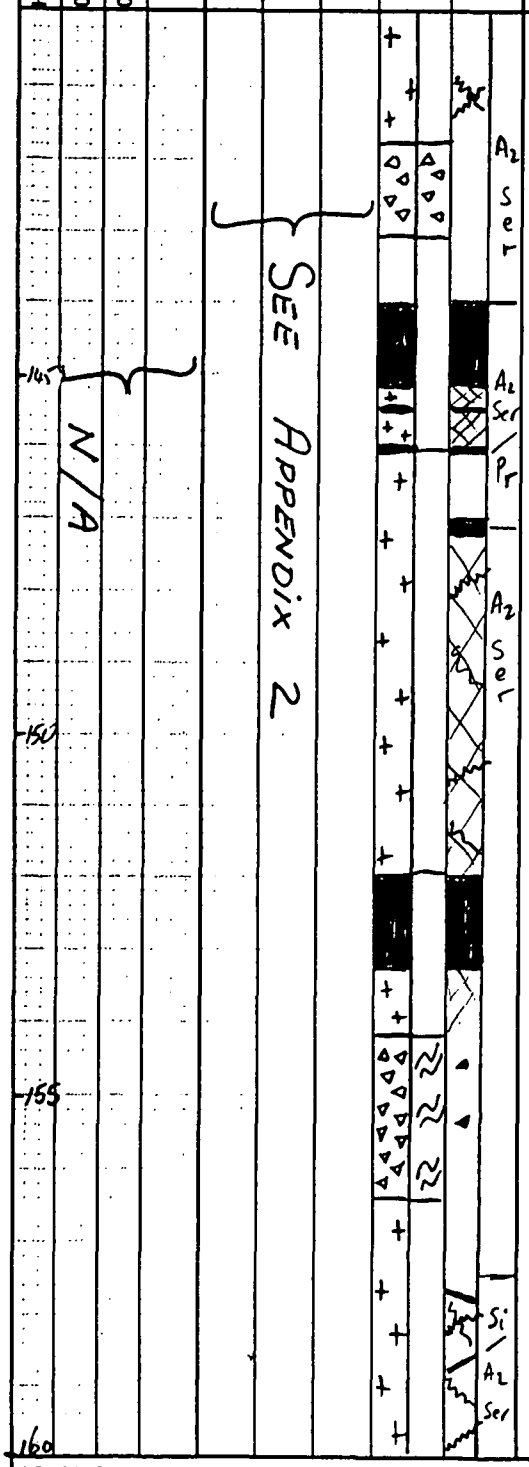
DRILL HOLE No QD 85

SHEET 8 **OF** 14

SEE FRONT PAGE FOR LEGEND

PROJECT :	KWEMBU CREEK
PROSPECT :	KERIMENGE
DATE :	March 1993
LOGGED BY :	KPD

HOLE DEPTH | CORE RECOVERY | CORE QUALITY | SAMPLE NO PREFIX | ASSAY RESULTS | PICTORIAL LOG: LITH STRUC, MIN ALT | GRAPHIC LOG | GEOLOGY NOTES | SUMMARY LOG



manganocarbonate fill (stage IV) Si-Sf rims (stage III, II?)

as at 139.4 – 140.0 m,

massive manganocarbonate vein with minor localised crustiform banding

manganocarbonate stockwork crosscuts minor patches of (stage II - III) silica - sulfide veinlets.

open space gypsum filling.

silicified selvages to Si-Sf veinlets

Manganocarbonate vein with a massive core and colloform-crustiform rim.

minor manganocarbonate clasts within fault breccia.

stage IV

manganocarbonate veins crosscut (and contain clasts of) stage II, III Si-Sf veinlets. Si-Sf veinlets have a selvage of silicification.

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No QD 85

SHEET 9 **OF** 14

SEE FRONT PAGE FOR LEGEND

PROJECT :	KWEMBU CREEK
PROSPECT :	KERIMENGE
DATE :	March 1993
LOGGED BY :	KPD

HOLE DEPTH | CORE RECOVERY | CORE QUALITY | SAMPLE NO PREFIX | ASSAY RESULTS | PICTORIAL LOG (LITH STRUC / MIN ALT) | GRAPHIC LOG | GEOLOGY NOTES | SUMMARY LOG

ASSAY RESULTS: SEE APPENDIX 2

CORE RECOVERY: N/A

PICTORIAL LOG: A_2 ser; minor Si selvages to Si-Sf veinlets

GEOLOGY NOTES:

quartz vein

stage IV manganocarbonate / stage III, II Si-Sf.

occasionally observed. (stage IV) 10mm manganocarbonate vein / stage III) Si-Sf veinlets.

white-pink manganocarbonate (stage IV) locally crosscut by grey silica (stage V) with minor tetrahedrite.

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No QD 85

SHEET 10 **OF** 14

SEE FRONT PAGE FOR LEGEND

PROJECT	:	KWEMBU CREEK
PROSPECT	:	KERIMENGE
DATE	:	March 1993
LOGGED BY	:	KPD

HOLE DEPTH	CORE RECOVERY	CORE QUALITY	SAMPLE NO PREFIX	ASSAY RESULTS	PICTORIAL LOG LITH STRUC	PICTORIAL LOG MIN ALT	GRAPHIC LOG	GEOLOGY NOTES	SUMMARY LOG
185	N/A			SEE APPENDIX 2		A_2 Ser; Si / A_2 Ser; Si A_2 Ser; A_2 Ser		← slabs of silica-hessite (stage V) in a manganocarbonate (stage VI) cement. ← as at 181.7m, ← porphyry clasts rimmed by stage V silica in a manganocarbonate (stage VI) cement. ← hessite at $MnCO_3$-Si contact. } pink manganocarbonate (pre dating) stage IV and post dating (stage VI) fine-coarse silica locally with abundant tetrahedrite. ← silicified porphyry rimmed by breccia of silica/barite ± $MnCO_3$. Abundant hessite at $MnCO_3$-Silica contact. finely banded yellow silica (= porphyry?) abundant tetrahedrite within stage V quartz, silica crosscuts early $MnCO_3$, ← porphyry rimmed by silica-tetrahedrite-hessite then fine yellow banded silica (= porphyry?) Si dominated system, silica-minor tetrahedrite both pre and post dates manganocarbonate.	
190					Very broken core = fault				
195									
200									

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No QD 85

SHEET 11 OF 14

SEE FRONT PAGE FOR LEGEND

PROJECT	:	KWEMBU CREEK
PROSPECT	:	KERIMENGE
DATE	:	March 1993
LOGGED BY	:	KPD

HOLE DEPTH	CORE RECOVERY	CORE QUALITY	SAMPLE NO PREFIX	ASSAY RESULTS	PICTORIAL LOG LITH STRUC	PICTORIAL LOG MIN ALT	GRAPHIC LOG	GEOLOGY NOTES	SUMMARY LOG
205	N/A			See Appendix 2		Si / A_2 / S_{er}		brecciated porphyry (strongly silicified) cemented by manganocarbonate (stage IV) and crosscut by later thin quartz (stage V) veins.	
210						Si / A_2 / S_{er}		Silicification and discrete veins are difficult to distinguish. only very minor manganocarbonate in this zone dominant veining is stage V quartz.	
215								T Core loss.	
220									

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No QD 85

SHEET 12 **OF** 14

SEE FRONT PAGE FOR LEGEND

PROJECT	:	KWEMBU CREEK
PROSPECT	:	KERIMENGE
DATE	:	March 1993
LOGGED BY	:	KPD

HOLE DEPTH	CORE RECOVERY	CORE QUALITY	SAMPLE NO PREFIX	ASSAY RESULTS	PICTORIAL LOG: LITH STRUC	PICTORIAL LOG: MIN ALT	GRAPHIC LOG	GEOLOGY NOTES	SUMMARY LOG
227	N/A			SEE APPENDIX 2	Az Si; minor Si; Sor/Pl			← badly broken core, when compared with 1986 core photographs, has deteriorated significantly minor quartz stockwork, pink manganocarbonate and silica tetrahedrite ± hessite. milky quartz vein.	
230									
235									
240									

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No QD 85

SHEET 13 OF 14

SEE FRONT PAGE " FOR LEGEND

PROJECT :	KWEMBU CREEK
PROSPECT :	KERIMENGE
DATE :	March 1993
LOGGED BY :	KPD

HOLE DEPTH	CORE RECOVERY	CORE QUALITY	SAMPLE NO PREFIX	ASSAY RESULTS	PICTORIAL LOG LITH STRUC	PICTORIAL LOG MIN ALT	GRAPHIC LOG	GEOLOGY NOTES	SUMMARY LOG
25	N/A			SEE APPENDIX 2		Sel / Pl		minor thin quartz veins.	
						A_2 Sel		badly broken core	
250						Pl		milky quartz veins,	
						A_3 Sel minor Si		fault. minor quartz vein fragments within	
275						A_3 Sel			
300									

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No QD 85

SHEET 14 OF 14

SEE FRONT PAGE FOR LEGEND

PROJECT	:	KWEMBU CREEK
PROSPECT	:	KERIMENGÉ
DATE	:	March 1993
LOGGED BY	:	KPD

HOLE DEPTH	CORE RECOVERY	CORE QUALITY	SAMPLE NO PREFIX	ASSAY RESULTS	PICTORIAL LOG LITH STRUC	PICTORIAL LOG MIN ALT	GRAPHIC LOG	GEOLOGY NOTES	SUMMARY LOG
265	N/A			SEE APPENDIX 2		Sel A2 minor Py		← badly broken core – core has deteriorated significantly since the 1986 drilling quartz-pyrite veins (stage II?) minor carbonate stockwork. Carbonate vein, 282.1m = EOH.	
270									
275									
280									

REMARKS TO 282.1m = EOH as at 277 – 280.

RGC EXPLORATION PTY LTD

DRILL HOLE No QD 85

SHEET 1 OF 14

SEE FRONT PAGE FOR LEGEND

PROJECT :	KWEMBU CREEK
PROSPECT :	KERIMENGE
DATE :	March 1993
LOGGED BY :	KPD / GMD

HOLE DEPTH	CORE RECOVERY	CORE QUALITY	SAMPLE NO PREFIX	ASSAY RESULTS	PICTORIAL LOG: LITH STRUC	PICTORIAL LOG: MIN ALT	GRAPHIC LOG	GEOLOGY NOTES	SUMMARY LOG
5	N/A			SEE APPENDIX 2		A_2 Ser		1mm Si-sf, Totally oxidized sill Porphyry to 39.5m.	
10								Manganese wad,	
15						A_2 Ser		1-2mm qtz-/m veining - thin selvage of silicification.	
20								Manganese wad.	

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No QD 85

SHEET 2 OF 14

SEE FRONT PAGE FOR LEGEND

PROJECT :	KWEMBU CREEK
PROSPECT :	KERIMENGE
DATE :	March 1993
LOGGED BY :	KPD / GMD

HOLE DEPTH	CORE RECOVERY	CORE QUALITY	SAMPLE NO PREFIX	ASSAY RESULTS	PICTORIAL LOG LITH STRUC	PICTORIAL LOG MIN ALT	GRAPHIC LOG	GEOLOGY NOTES	SUMMARY LOG
25	N/A			SEE APPENDIX 2		A_2		Weak thin manganocarbonate wad stockwork.	
30								colloform-crustiform manganocarbonate (stage IV) vein.	
								1-10mm manganocarbonate wad (stage IV) 1-3mm si-sf veinlets.	
35						A_3 Sel		pug fault with milled quartz clasts.	
								Weak manganocarbonate stockwork.	
								30mm quartz vein (stage II/III)	
40						A_3 A_2		— Base of Total Oxidation.	

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No QD 85

SHEET 3 OF 14

SEE FRONT PAGE FOR LEGEND

PROJECT :	KWEMBU CREEK
PROSPECT :	KERIMENGE
DATE :	March 1993
LOGGED BY :	KPD

HOLE DEPTH	CORE RECOVERY	CORE QUALITY	SAMPLE NO PREFIX	ASSAY RESULTS	PICTORIAL LOG: LITH STRUC	PICTORIAL LOG: MIN ALT	GRAPHIC LOG	GEOLOGY NOTES	SUMMARY LOG
45	N/A			SEE APPENDIX 2		Ser; A_2 Ser; c PR		10-100m black crustiform banded manganese wad.	
50									
55						A_2 Ser		100mm crustiform manganocarbonate vein. 1-5mm $MnCO_3$ vein (stage IV) 1-10mm Si-Sf veinlets (stage II, III)	
						A_1 Ser / e_{pr}		white-grey pug and milled porphyry and quartz clasts.	

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No QD 85

SHEET 4 OF 14

SEE FRONT PAGE " FOR LEGEND

PROJECT :	KWEMBU CREEK
PROSPECT :	KERIMENGE
DATE :	March 1993
LOGGED BY :	KPD / GMD

HOLE DEPTH	CORE RECOVERY	CORE QUALITY	SAMPLE NO PREFIX	ASSAY RESULTS	PICTORIAL LOG LITH STRUC	PICTORIAL LOG MIN ALT	GRAPHIC LOG	GEOLOGY NOTES	SUMMARY LOG
65	N/A			SEE APPENDIX 2		A_2 ser / e_{pr}		1-10mm si-py veinlets (stage II)	
								clear euhedral quartz infill (stage V) / 10mm pink manganocarbonate vein (stage IV)	
70								1-3mm si-py veinlets (stage II)	
								10mm si-py veins (stage II)	
75						A_2 ser / e_{pr}		1-10mm si-py veinlets (stage II)	
80								increasing carbonate alteration ↓	

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No QD 85

SHEET 5 OF 14

SEE FRONT PAGE FOR LEGEND

PROJECT :	KWEMBU CREEK
PROSPECT :	KERIMENGE
DATE :	March 1993
LOGGED BY :	KPD / GMD

HOLE DEPTH	CORE RECOVERY	CORE QUALITY	SAMPLE NO PREFIX	ASSAY RESULTS	PICTORIAL LOG LITH STRUC	PICTORIAL LOG MIN ALT	GRAPHIC LOG	GEOLOGY NOTES	SUMMARY LOG
85	N/A			SEE APPENDIX 2		A_1 Ser/Pr; A_2 Ser; A_2 Ser; Pr		carbonate alt'n	
90								40mm quartz tetrahedrite (stage V) 1m pink manganocarbonate vein (stage IV) manganocarbonate stockwork. manganocarbonate clasts within fault and manganocarbonate veins crosscut fault.	
95								stage IV manganocarbonate breccia cemented by silica-sulfide (stage V), subsequently crosscut by manganocarbonate veins (stage VI) manganocarbonate stockwork (weak)	
100									

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No QD 85

SHEET 6 OF 14

SEE FRONT PAGE FOR LEGEND

PROJECT	:	KWEMBU CREEK
PROSPECT	:	KERIMENGE
DATE	:	March 1993
LOGGED BY	:	KPD / GMD

HOLE DEPTH	CORE RECOVERY	CORE QUALITY	SAMPLE NO PREFIX	ASSAY RESULTS	PICTORIAL LOG LITH STRUC	PICTORIAL LOG MIN ALT	GRAPHIC LOG	GEOLOGY NOTES	SUMMARY LOG
105	N/A			SEE APPENDIX 2		A_1 Ser P_{pr}		manganocarbonate stockwork.	
110						A_2 Ser P_{pr}		manganocarbonate vein (stage IV) si-sf veinlet (stage II, III)	
115						A_2 Ser P_{pr}		manganocarbonate stockwork, weak carbonate alt^n of porphyry.	
120									

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No QD 85

SHEET 7 OF 14

SEE FRONT PAGE FOR LEGEND

PROJECT	:	KWEMBU CREEK
PROSPECT	:	KERIMENGE
DATE	:	March 1993
LOGGED BY	:	KPD

HOLE DEPTH	CORE RECOVERY	CORE QUALITY	SAMPLE NO PREFIX	ASSAY RESULTS	PICTORIAL LOG: LITH STRUC	PICTORIAL LOG: MIN ALT	GRAPHIC LOG	GEOLOGY NOTES	SUMMARY LOG
125	N/A			See Appendix 2		A_2 Ser / Pr		manganocarbonate stockwork. minor si-sf veins,	
130								← clasts of porphyry in a black si-sf matrix (stage II, III)	
135						A_2 Ser / Pr		crustiform manganocarbonate vein.	
140								Polymict breccia pipe, schist + porphyry clasts – Stage IV veins crosscut breccia.	

REMARKS