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GOLDFIELDS EXPLORATION

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ANNUAL REPORT
Part 2

A REVIEW OF EXPLORATION OVER THE LAKE SELINA AREA

EL 19/98

ANTHONY

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EL19/98 PT1
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Vol 1 of 1
Text and Appendices

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12 August 1999

PROSPECTS: Lake Selina

MAP SHEETS: **1:25,000: Selina** **1:100,000: Sophia**

GEOGRAPHIC COORDS

GEOGRAPHIC COORDS	**Min East:**	**385,000mE**	**Max East:**	**387,000mE**
	Min North:	**5,360,000mN**	**Max North:**	**5,364,000mN**

COMMODITY(s): Au, Cu, Pb, Zn, Ag

KEY WORDS: Selina, Mount Read Volcanics (MRV), Central Volcanic Complex (CVC), Eastern Quartz Phyric Sequence (EQPS), Tyndall Group, volcanic hosted massive sulphides (VHMS), kuroko style

Distribution:

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Annual Report Part 2 - A Review of Exploration over
the Lake Selina Area - EL 19/98
Goldfields Exploration Pty Ltd*
Godsall W EL19/98

598002

CONTENTS

LIST OF FIGURES

(Note: Figures 9 to 19 are contained in Appendix I)

LIST OF TABLES

LIST OF APPENDICES

598004

SUMMARY

This report documents a review of exploration activities carried over the Lake Selina area.

Previous exploration identified favourable alteration regimes with potential setting for massive sulphides. Exploration was carried out over several phases with several prominent explorers involved. Geophysics has been a favoured exploration tool and has had some success in identifying zones of mineralisation. Surface geochemistry has tended to be constrained by poor access and glacial cover, although has been a success in delineating an anomalous zone (Mt Selina Anomalous Zone). A total of fourteen diamond drillholes have been completed in the area, with drilling carried out over several campaigns. Intersected mineralisation has been of a weak tenor with low value assay results returned.

The geology of the Selina area is that of a hydrothermally altered volcanic belt constrained to the north by the Murchison Granite and by rhyolitic lavas to the south. The western boundary of the volcanics is demarcated by the Anthony Fault which was reactivated during the Tabberabberan Orogeny with associated remobilisation of sulphides. To the east the block is bounded by PreCambrian rocks of the Sticht Range Beds, and to the west by Owen Conglomerate lithotypes. The Selina area is characterised by two extensive linear belts of strongly altered volcanics that carry low tenor sulphide mineralisation (WPZ and EPZ). A further anomalous zone (MSAZ) has not been satisfactorily explained. The Selina Fault has been identified as possible growth structure trending north-south through the middle of the block. Additional east-west tending faults may represent regional overprinting.

A reassessment of the geology reveals favourable geology for potential economic mineralisation. The potential lies in unidentified Tyndall Group lithologies which carry regional mineralisation in the Mount Read Volcanics as well as favourable structures that may represent growth faults.

Further work recommended to delineate potential targets includes geological mapping, lithogeochemistry, isotope studies and some geophysics.

1 INTRODUCTION

This report summarises a review carried out over the Lake Selina block of EL19/98 – Anthony during the period April to August 1999. Findings on previous exploration activities are summarised, the known geology is assessed and suggested work for further exploration is recommended.

The Lake Selina block forms the northern portion of EL19/98. Access is via vehicular track at the southern end of the licence, or by foot access across the dam wall at the north end of Lake Plimsoll. Access to the licence is generally difficult, mainly due to dense forest and overgrowth of grid lines. Early exploration work (1950s to 1980s) involved road cutting and establishment of a field camp. Later work (1980s to 1990s) entailed helicopter supported field activities. Most of the old exploration tracks have been cut off by the waters of Lake Plimsoll.

Review and reassessment of known geology is contained in the main body of the report. The attached appendices are a collation of previous exploration data and information, and are complete in so far as available data has been located and identified. Additional information has been either directory saved, downloaded into the Goldfields (Zeehan) database or digitised. This data management aspect of the review is not complete and ideally should be documented separately. Not all original data has been located, particularly for some of the surveys carried out in the early days of exploration. Some of the more recent exploration reports simply provide an analysis and assessment of exploration results and do not contain raw data.

2 LAND TENURE

The Lake Selina block comprises the northern portion of EL19/998 - Anthony . It is separate from Basin Lake (which makes up the bulk of EL19/98) and covers an area of 5km^2. The block is characterised by dense forest, poor outcrop and is difficult to access. The western side of the block (approximately 25% by area) is submerged under Lake Plimsoll, which was established in 1994 as part of the Anthony hydroelectric scheme. Location is shown in Figure 1.

Historical information pre 1950s is poorly documented. Post the 1950s several exploration licences have encompassed the Lake Selina area.

Contemporary coverage dates back to EL9/66 held by MLMRC for a considerable number of years. EL9/66 was explored initially by MLMRC, under JV as the Consolidated Syndicate and latterly as Gold Fields Exploration Pty Limited (GFPEL) (a subsidiary of RGC). Rationalisation of ground holdings by RGC and relinquishment requirements resulted in dropping of the Lake Selina ground by GFPEL in 1987.

Work in the Lake Selina area continued under EL103/87 – East Coast Range. Exploration was carried out initially by Billiton Australia (subsequently Acacia Minerals Pty Limited), and then by Aberfoyle Resources Limited under a JV arrangement formalised in 1991. Expansion of the JV to include Resolute Limited did not include any exploration activities in the Selina area. The ground was dropped as part of EL103/87 compulsory relinquishment in 1998.

Two other recent ELs adjacent to the block are of use in interpretation of the Selina area geology. EL5/85 – Lake Margaret was explored by Aberfoyle and saw work carried out to the north and south of the current Selina block. EL7/91 – Sticht Range was located to the east of the Selina area and was similarly explored by Aberfoyle.

The Lake Selina block lies within the Southwest Co[redacted]tion Area and thus any exploration work in the area will need to be referred to [redacted].

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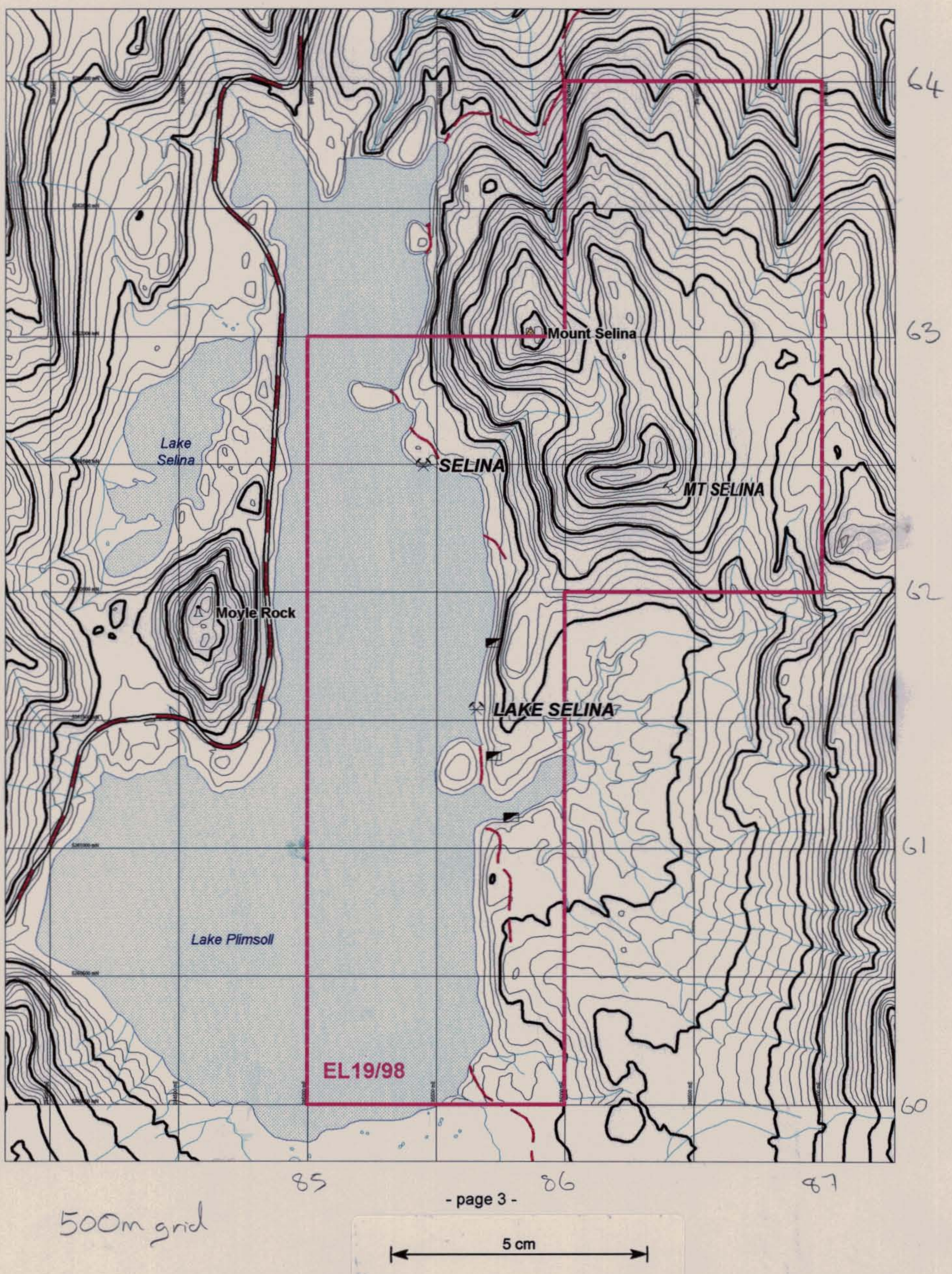
Figure 1

EL 19/98 - Lake Selina Area
Showing Topgrapraphy and Historical Workings



500m grid

5 cm

3 PREVIOUS EXPLORATION

Prior to the granting of EL9/66 work in the Selina area was variable, with erratic records and documentation of exploration activities. For the purposes of this report previous exploration detailed below is split into historical activities followed by a chronological summary by EL of contemporary exploration commencing in the late 1960s through to present time. Appendix VI contains a more comprehensive breakdown of the information listed in the chronological summary.

3.1 Historical Exploration Activities (pre 1970s)

1898	Smith visited the Dora workings, described exploration work and mineralisation.
1900s	Prospector activities at the turn of the century excavated adits and trenches between 5360000N and 5362000N (Lake Selina workings)
1903 (?)	MLMRC tested these workings but with discouraging results.
1938	MLMRC sampled the old Dora workings.
1939	Blake and Henderson report on Lake Dora copper deposits (Blake,F.,1939, "Report on Lake Dora Copper Deposits", Mines Department transcript report).
1954	Bradley refers briefly to the Lake Dora area as the type area for the Dora Conglomerate.
1956	Bradley comments on structure and mineralisation of the Dora area and the geological similarities to Red Hills. Possibly the western limb of an overturned anticline.
1957/85	RTAE carried out an aeromagnetic survey and ground exploration mostly in the Lake Dora – Michael tarn area. Work comprised gridding, mapping, soil geochemistry, ground magnetics, ground EM (Turam), self-potential and gravity profiling. An aeromagnetic high was identified immediately west Lake Dora, several soil anomalies delineated and a Turam anomaly located south of Walford Peak.
1958	Campana et.al. discuss the Dora region.
1964	Solomon identified quartz keratophyres in the Dora area, and regional anticlinal folding.

3.2 Chronological Summary of Exploration by EL

EL9/66

1969 - 1970EL9/66 Annual Report

Gridding: Road construction for access
Track cutting of Lake Dora –Lake Selina grid
Geology: Broad geology outlined with salient structural feature
Mineralisation: Associated with areas of strongest shearing
Geophysics: Ground magnetometry
Induced polarisation, combined IP-resistivity-SP
Anomalies A1 to A18 identified
Geochemistry: Soil and rock chip sampling, assayed for Cu Pb Zn
Drilling: LS1 completed (tested anomaly A1), petrographic descriptions
LS2 collared and in progress

1970 - 1971EL9/66 Annual Report

Gridding: Extension to existing Dora-Selina grid
Some road development
Geology: Mapping as per previous year.
Structure: Faulting; tight echelon synclinal structures with steep/overturned eastern limbs
Mineralisation: More strongly developed in zones of stronger shearing
Disseminated and veinlet py, minor cpy mag hem, trace sph gal mo
Geophysics: Ground magnetometry, IP pole-dipole array
Geochemistry: Soils Cu Pb Zn by AAS (ineffective due to glacial moraine)
Costean excavated on line 120N
Drilling: LS 2, LS 3, LS 4 completed and LS 5 in progress

1971 - 1972EL9/66 Annual Report

Geology: Aerial photography
Drilling: LS5 and LS6 completed

1972 - 1973EL9/66 Annual Report

Geology: Selina mineralisation lower in Cambrian than that at Mt Lyell
Geochemistry: Trace element study (Walshe) Hg vapour soil gas survey
Geophysics: Turair survey (North Selina)
Drill core petrophysics; susceptibility, conductivity, chargeability
Drilling: LS7 completed

1975 EL 9/66 A Review of the Area East of the Tyndall Range (Wells)

Geology: Pleistocene glacials and fluvioglacials, with glacial erosion

Cambrian Owen conglomerate, Jukes conglomerate, acid lavas and pyroclastics, granite to north (adamellite)
PreCambrian Sticht Range sequence conglomerate, quartzites, shales, dolomites quartzite
Structure: Anticlinal fold, faulting and shearing
Geophysics: Magnetics three broad anomalous areas (two within EL19/98)
Three types of IP – SP anomaly
Turair semi-airborne EM not suited to this area
Geochemistry: Background soil values 20 ppm Cu 50 ppm Pb 50 ppm Zn
Some correlation with IP anomalies, but depends on sample position
Drill holes: LS1 to LS7, drillhole logs with assay and survey data

1979 - 1980EL9/66 Annual Report

Geology: Reconnaissance of costeans on line 48N
Inspection of dumps at 124N/2900'W
Geochemistry: Rock chips assayed for Cu Pb Zn Ag Mo ±Co S Au Ba Mn Fe
Geophysics: Dighem II airborne EM
Gravity test survey (line 120N/3 200W-2000W) LS4
Drilling: Core re-assayed LS4, LS5 and LS6 for Ag Au Sn As Mo
Petrographic analyses LS5 and LS6 (Ag in tetrahedrite)

1980 - 1981EL9/66 Annual Report

Gridding: Selina grid extended
Geology: Mapping. Geophysical anomalies related to geology
Mineralisation: Identification and delineation of EPZ between 184N and 136N
EPZ mainly disseminated sulphides, WPZ mainly veinlets and patchy replacements in massive pink rhyolites, with magnetite common.
Geochemistry: Anomalous thresholds for soils: Cu 40ppm, Pb 450ppm, Zn 300ppm
Rock chip samples (from pits on lines 128N, 144N and 184N)
Geophysics: Bishop geophysics review
Gradient array IP, dipole-dipole IP, magnetics data re-interpreted
Ground EM over LS5
Drilling: Re-assay of core

1981 - 1982EL9/66 Annual Report

Gridding: Roadworks and grid extension
Geology: Mapping
Structure: Major NW-trending faults inferred from geophysical data and airphoto interpretation. Possible that EPZ and WPZ have been offset by these faults
Mineralisation: Potential strike extensions to mineralisation
Mineralisation related to granitic intrusions (Eastoe)
Geochemistry: Mt Selina Geochemical Anomaly Zone delineated, Pb-Zn-Ag soil anomaly 128N - 104N straddling the baseline; 4000ppm Pb, 1400

ppm Zn, 8 ppm Ag, 75 ppm Cu. Disseminated mag, stringers of hem, rare/ trace/ occasional disseminated py grains.
Rock chip samples; stream sediment sampling

Eastoe alteration: Study concluded Selina mineralisation was related to Cambrian Murchison granite and not suitable to massive sulphide formation

Geophysics: Gradient array IP, dipole-dipole IP (152N/2600'W),
Ground magnetics – total field 104N – 136N
Ground EM ("Genie") survey
Petrographic descriptions
Bishop reports

Drilling: LS8 completed

June 1983 EL9/66 Geological Review

Favourable considerations: Alteration and mineralisation
Ubiquitous presence of base metal sulphides

Unfavourable considerations: Size constraints on size of prospective zones
Low tenor of soil and drillcore geochemical results

Geology: Geology of MSAZ poorly constrained
MSAZ coincides with a break in IP and magnetic trends

Geochemistry: Stratiform linear zones, WPZ stockwork with no syngenetic mineralisation. EPZ of possible syngenetic origin with subordinate stockwork mineralisation, or pyritic schist being footwall to overlying syngenetic banded mineralisation (Kuroko analogy)
Minor values Cu, Pb, Zn, anomalous Ag, no Au, traces Mo
Pb isotopes (Gulson and Porritt)

Drilling: Best values - LS3 6.1m at 1% Pb
LS5 4.6m at 0.65% Zn 24g/t Ag
LS6 3.1m at 0.82% Cu
6.1m at 44g/t Ag
1.5m at 0.67% Pb
Petrography

Recommendations: Detailed mapping
(a) to place known mineralisation in its geological context
(b) to define horizons that may contain massive sulphides
Drill testing of Western Pyrite Zone
Eastern Pyrite Zone not known well enough to define targets

1983 - 1984EL9/66 Annual Report

Geology: Mapping of MSAZ, structural mapping

Target: VMS mineralisation

Drilling: Helicopter supported; LS9, LS10, LS11 and LS12 completed
LS615' at 0.09% Cu 57.2g/t Ag
25' at 0.11% Cu 16g/t Ag
LS9No significant assays recorded
LS10 23.0m at 0.01g/t Au 0.13% Cu 0.26% Zn 2.1g/t Ag
6.0m at 0.04g/t Au 0.44% Cu 0.22% Zn 3.5g/t Ag

LS11 No significant assays
(Sampled 107.0m - 361.2m and assayed for Au Ag Cu Pb Zn)
LS12 Hole not sampled

1984 - 1985EL9/66 Annual Report

Gridding:	Clearing and repegging, helicopter-supported
Geology:	Mapping Similarities between Kuroko-style massive sulphides and Selina
Geochemistry:	Rock chips
Geophysics:	UTEM survey to immediate south of EPZ
Drilling:	Recommended drill testing of geochemical targets

1985 - 1986EL9/66 Annual Report

Drilling:	LS 13 completed (helicopter-supported) No significant assay results Sirotem survey (LS 10 and LS 13)
Conclusions:	No additional exploration for VMS justified

1987 EL9/66 Relinquishment report

Selina area relinquished.

EL5/85 – Lake Margaret

1985 - 1986EL5/85 Annual Report

Geology: Recommends review of previous exploration data in conjunction with rock chip and/or wacker sampling for UTEM survey and subsequent drill testing.

1986 - 1987EL5/85Annual Report

Geology: Recommends a thorough compilation of all available data. Limited rock chip sampling to delineate ground for UTEM survey prior to drill testing.
Target: Volcanogenic massive sulphide gold

1989 - 1990EL5/85 Progress Report

Geology:	North Selina Prospect (outside and to north of EL19/98)
Pb isotope study:	Suggestive of 2 active hydrothermal systems

1993 EL5/85 Relinquishment Report

Recommended relinquishment of North and South Selina. Reviews work and known information;- geological setting, structure, alteration and mineralisation
Drilling: Drill holes LS8, LS11 and LS12 fall within North Selina block

Geochemistry:	Stream sediment Rock chip - base and precious metals
Lithophiles:	Dacitic to rhyolitic lava flows, volcaniclastic units returned highly variable Ti/Zr ratios
Granitic fluid study:	Elevation in Rb (>200ppm) & F (>5600ppm) suggest interaction between granitic fluids and EQPS
Pb isotopes:	Two groupings of data (a) Rosebery (b) Hellyer/Que River No firm conclusions on nature of hydrothermal events
Geophysics:	UTEM survey, no response attributable to massive sulphides

EL103/87 – East Coast Range

1989 EL103/87 Annual Report

Gridding:	Grid cut along AMG lines
Geology:	Field mapping and reconnaissance and compilation of previous work
Geophysics:	Ground magnetics (5358000N to 5364000N) CSMAT lines 5358000N to 5359200N, 5361200N to 5362000N TEM line 5359600N EM-37 transient electromagnetic survey in progress

1990 EL103/87 Annual Report

Gridding:	Grid extension
Geology:	Outcrop mapping
Structure:	Regional cleavage
Mineralisation:	Three separate phases; (a) disseminations (b) pressure shadows (c) x-cutting veins
Geochemistry:	Rock chips over EPZ
Geophysics:	EM-37 survey
Drilling:	Relogging of LS10 and LS13
Target:	Massive base metal sulphide mineralisation

Recommendations: Drill test EM anomalies

June 1991 EL103/87

JV between Aberfoyle Resources Limited and Billiton Australia, with Aberfoyle funding and managing exploration

1992 EL103/87 Annual Report

Geophysics:	DHEM survey down LS10
Drilling:	Extension to and completion of LS10; LS14 in progress

1993 EL103/87 Annual Report

Drilling: LS10 EM-37 and DHEM survey
LS14 completed – geology, geochemistry, no DHEM

Conclusions: Potential for improved grade and metal zonation to the north remains.

July 1997 EL103/87

JV between Resolute Limited – Aberfoyle Resources Ltd – Acacia Metal Pty Ltd. No work carried out in the Selina Block

1998 EL103/87 Final Report

Licence relinquished 21st April 1998.

AMIRA and CODES Research Projects

1986 -1988 AMIRA 84/P210 Gold and Silver Controls in VHMS (Hunns)

Methods: field mapping with additional structural interpretation
re-logging of drill core
petrography and XRF for both majors and minors
± isotope studies and fluid inclusion work
comparison with nearby mineralised systems (e.g. Red Hills)
multi element analyses

Geology:	Quaternary	moraine, scree, alluvium
	Ordovician	Owen Conglomerate, Dora Conglomerate (Jukes Breccia correlate)
	Cambrian	granitic intrusives, Selina volcaniclastics, Sticht Range Beds
	Precambrian	quartzites and quartz mica schists
Alteration minerals:		k-feldspar, chlorite, sericite, quartz, magnetite, pyrite, hematite, calcite dolomite, muscovite and epidote.
Alteration zones:		k-feldspar zone, chlorite zone, sericite/quartz zone
Paragenetic sequence:		paragenetic sequences determined from thin section work
Genesis:		deep granite intrusion with circulating hydrothermal fluids Kuroko style, zonation representing stockwork mineralisation
Comparison with VMS deposits:		
Speculative model:		basinal deposition, intrusion and mass flow volcanics, deformation and uplift, reactivation and mobilisation

1987 Lake Selina Prospect (Hunns) (CODES)

Geology: Lavas, volcaniclastics, rhyo-dacite intrusive porphyries, volcanic sediments
Structure: Synformal
Anthony Fault a controlling influence on granite intrusion
Devonian deformation/cleavage lower to middle greenschist facies
Alteration: Potassium feldspar zone, chlorite zone, sericite/quartz zone

Mineralisation: Related to Cambrian granite intrusion
Network of veins and disseminations
Concentrated in two linear zones EPZ and WPZ
MSAZ identified on soil responses
Three stage paragenetic sequence with three phases in the first stage
Styles: Copper associated with pyrite and magnetite
Lead and zinc associated with hydrothermal brecciation
Zinc and lead mineralisation in late stage x-cutting carbonate veining
Remobilised base metals associated with shearing (e.g. LS10)
Drillholes: LS5, LS6 and LS10 relogged
Geochemistry: Zn ratio not diagnostic
fluids at elevated temperatures (>250°C)
pH 3 to pH 5, $\log fO_2$ 33-40
S isotopes: 9.8‰ – 10.9‰ i.e. Cambrian
Magmatic origin/source (rather than seawater or meteoric water)
Pb isotopes: Similar to Que River and Rosebery
Genesis: Mass flow unit(s) in a narrow/restricted environment
Basinal uplift followed by rapid deposition of Owen beds
Devonian reactivation along the Anthony Fault

October 1995 AMIRA P291A "Cambrian Growth Faults" (White)

Identification of the Selina Fault, either normal or reverse.
Cambrian movement during Upper Tyndall time.

4 GRIDS

Essentially two grids cover the area:

- An imperial grid established by MLMRC, expanded and metricated by GFEPL
- An AMG grid established by Aberfoyle

Most of the grid lines are no longer visible.

MLMRC-GFPEL grid(s)

The imperial grid was established in the late 1960s/early 1970s. Three grids were established; Selina, Rolleston and Dora grids (referred to in some reports as the Dora-Selina grid). The system was set up orthogonal to the regional strike and is thus oblique to AMG. The present Lake Selina block in EL19/98 covers the former Selina and part of the Rolleston grids.

Lines were spaced 800ft apart and pegged at both 100ft and 50ft intervals. Work by GFPEL extended the established system using metric units. It is not clear when the change to metric measurements was made. GFPEL used a 20metre peg interval. However by the early 1980s exploration plans showed both imperial and metric measurements, and this annotation continued through to the relinquishment of EL9/66. The make-up of the grid as depicted on geological plans can be described as follows;

- measurements to the east of the baseline are metric
- "infill" lines are metric i.e. lines 108N, 116N, 124N and 132N
- west of the baseline measurements are imperial i.e. on lines 184N, 176N, 168N, 160N, 152N, 148N, 144N, 136N, 128N, 120N, 112N, 104N and 96N
- lines 88N to lines 62N are imperial and are characterised by little or no data (Rolleston grid)
- lines 56N, 48N and 40N are imperial (these lines are at the southern end of EL19/98 and were part of the Rolleston grid)

The Aberfoyle grid

The Aberfoyle grid was established in the late 1980s/early 1990s. The grid parallels AMG with east-west lines spaced at 400metre intervals and extended south of the present Selina block.

Figures 5 to 8 further on in the text show the MLMRC-GFEPL grid. As the Aberfoyle grid was along AMG, lines for this grid are not shown separately.

5 GEOLOGY

Early exploration assigned the Selina area to the CVCs. The Selina Volcanics were thought to be of similar provenance to the Lyell Schists, having similar alteration assemblages, form of mineralisation and rock types (i.e predominantly tuffs and lavas). Recognition of the Dora Conglomerate as Tyndall resulted in reappraisal and assignation of a large portion of the area to Tyndall age rock types. More recently the extent of the Eastern Sequence has been recognised/appreciated (and this review maps the bulk of the rocks as belonging to that sequence). However the potential for the presence of additional Tyndall lithotypes (and to host economic mineralisation) is still acknowledged.

Interpretation of the geology is based on re-logging of drill core and review of exploration and research reports. Geological plans are included Figures 2 (1: 30,000) (this chapter) and 20 (1: 5,000) (attachment), whilst drillhole sections showing the main rock types are included as Figures 9 to 19 (end of chapter 8 - Diamond Drilling).

5.1 Stratigraphy (Figures 2 and 20)

Quaternary	Glacials and fluvioglacials	
Cambrian	Denison Group:	Owen conglomerate
	Tyndall:	Dora conglomerate – Jukes Formation
	Selina volcanics:	lavas, porphyries, volcaniclastics, volcanic sediments, epiclastics
	Cambrian granite	
PreCambrian	Sticht Range Beds	

PreCambrian

Sticht Range Beds (Csrb)

Conglomerate and volcanic sediments, siltstones, quartzites and shales. Unconformable with underlying basement and conformable with the overlying Selina Volcanics. Exposed in the Sticht Range which contains the eastern boundary of the EL. Siltstones and shales point to activate sedimentation during deposition of the Selina epiclastics.

Cambrian

Epiclastics and volcaniclastics (Cev)

Mainly confined to the northern half of the EL, and make up a significant portion of the eastern limits of the EL. On the western side the unit is highly mixed with other units of the Selina Volcanics. Contain quartz, lithic and volcanic fragments, occasional pumice in a rhyodacitic rock mass. Polymict, sometimes quartz phyric, autobrecciated in places, jointed and blocky.

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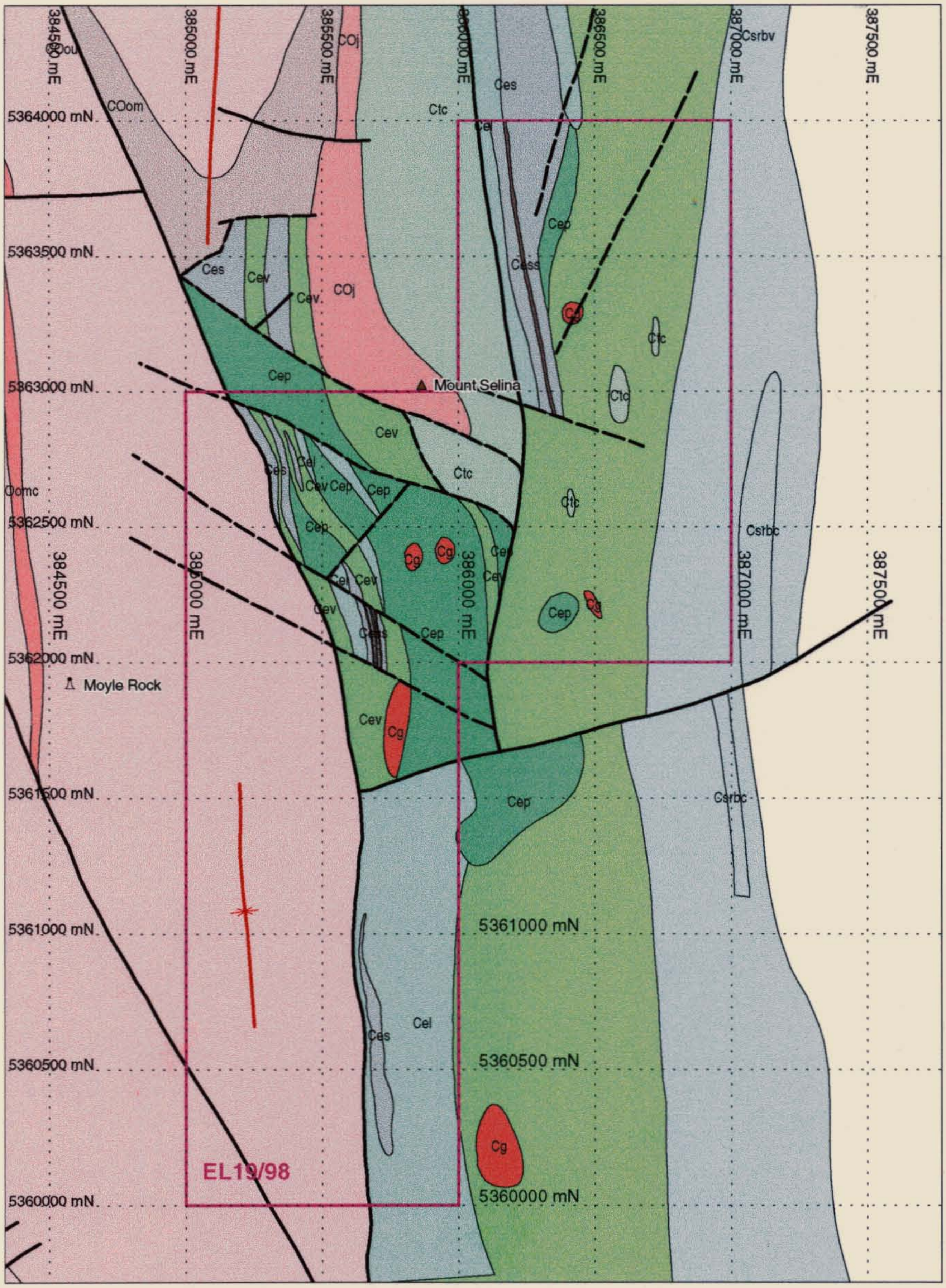
5 cm

Figure 2

Geology of the Lake Selina Area
Scale 1 : 20,000



Lavas – porphyritic (Cel) and quartz phyric intrusives (Cep)
Occur throughout the EL, usually as units that are characteristically gradational with adjacent volcanic units. Coarse grained, cryptocrystalline rhyolitic and brecciated porphyry. Cel is the dominant volcanic rock type in the southern part of the EL.

Siltstones and volcaniclastics (Ces), and shales (Cess)
Generally constrained by the lavas and volcaniclastics, a unit of fine grained volcanic sediments with bands of shale. Variable ash content. Sub angular quartz and feldspar crystals, lithic fragments and occasional pumice. Foliated and locally brecciated. Shales are very fine grained, black, siliceous, pyritic and finely laminated/banded.

Granite (Cg)
Small bodies which have not been intersected/exposed, although drillhole LS12 to the north west of the EL was completed in granitic rock. The Murchison Granite is of adamellite composition, extensively altered and usually has a sharp contact with the volcanic rocks.

Dora Conglomerate – Jukes Formation (COj and Ctc)
Upper Tyndall correlates that make up Mt Selina and the topographic high to the immediate south. Apparently unconformable with the volcanics, although the contact is not exposed. A massive polymict conglomerate – volcanic breccia that is poorly sorted and poorly bedded. Possibly a mass flow unit, pre-Owen and post granitic intrusion in age.

Denison Group – Owen Conglomerate COom and COou)
Distinctive siliciclastic pebble conglomerate, frequently haematitic, delineates the western boundary of the EL.

Quaternary
Moraine and glacial features such as scattered boulders, outwash and block and tail features that characterise the East Tyndall range. The Rolleston Moraine is a button grass plain that lies to the immediate south of Mt Selina

5.2 Structure (Figures 2 and 3)

Faulting and folding occur within the area (Figures 2, 3 and 20).

Faulting

The Anthony Fault (AF) is a dominant south – north-northwest trending feature that juxtaposes Owen conglomerate in the west alongside Selina volcanics to the east. The AF is a Cambrian structure that was reactivated during the Tabberabberan Orogeny. It also acted as a structural control on intrusion of the Murchison granite. The fault appears to have a variable rolling westerly dip and is somewhat gradational being absent in places as indicated by drill core evidence.

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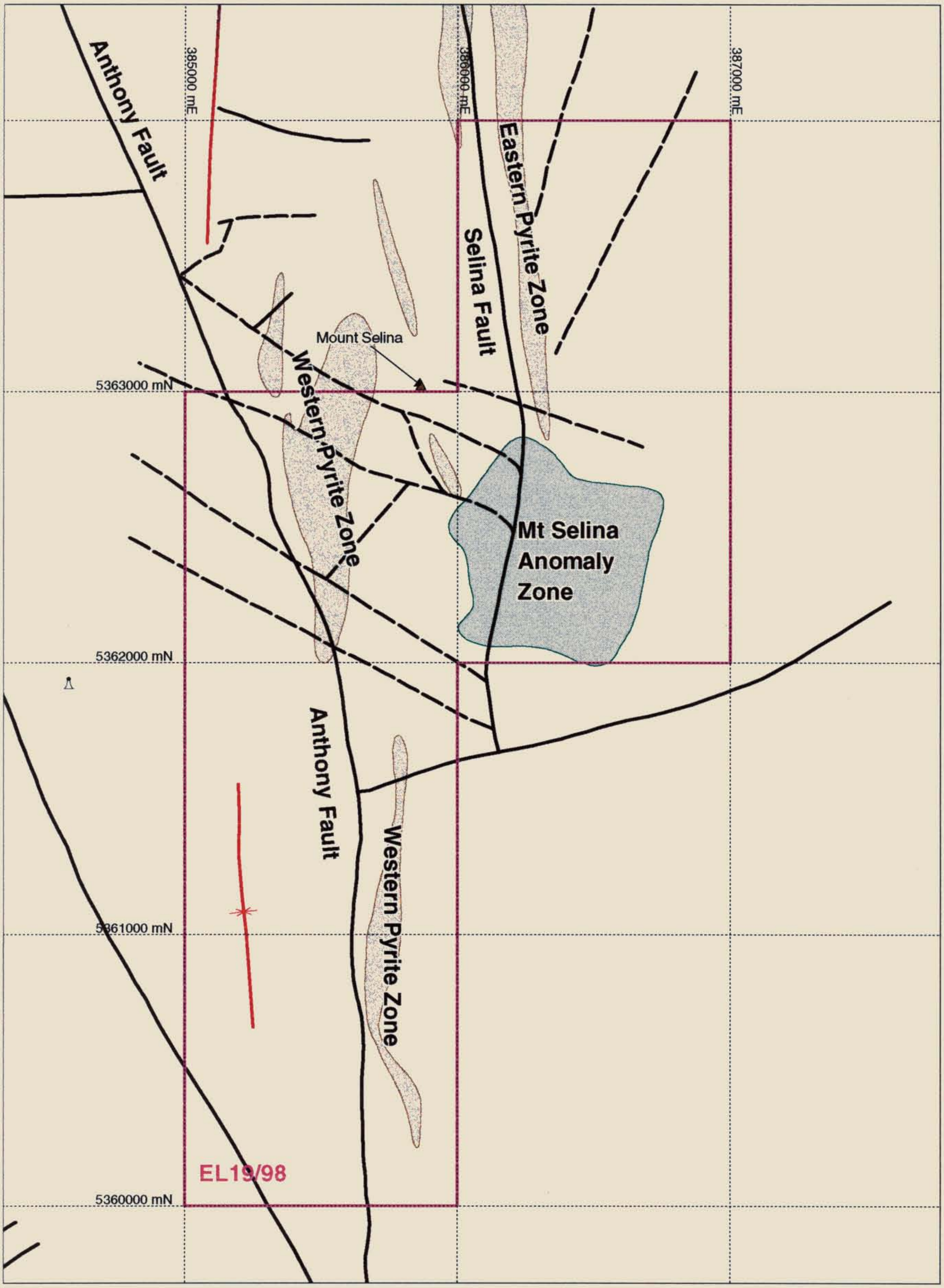
Figure 3

Selina Area
Showing Structural Trends and Mineralisation Zones



A second major fault is the Selina Fault which trends north – south on the east side of Mt Selina. This fault has been postulated as a growth fault (White, 1995 and Berry and Keele, 1993) and is evidenced by downthrown Dora Conglomerate lying next to Selina volcanics. The fault was not intersected in LS13 and thus has either a relatively shallow dip, or does not extend this far south. The fault may represent a shear which contains the eastern mineralised zone (EPZ).

On both a local and regional basis there is evidence for other east – west trending faults, particularly through the central part of the EL. Detailed evidence for some of these faults is sparse, their existence being determined on geological occurrences of rock types. Displacement of lithologies is inferred, potentially confirmed by the complex patterns shown by ground magnetic surveys. Within these fault zones there is potential for Tyndall age rock types and associated economic mineralisation.

Folding

Stratigraphic evidence suggests that the Selina volcanics represent the core of a north plunging anticline (Hutton, 1982), based on east – west facings in the field and directional facings in LS7 and LS8.

5.3 Alteration (Figure 4)

Alteration minerals include k-feldspar, chlorite, sericite, quartz, magnetite, pyrite, haematite, calcite and/or dolomite, muscovite and epidote. Three alteration zones have been identified by Hunns (1987). His alteration map is included as Figure 4.

Potassium feldspar zone
Reddish-pink K feldspar which forms an interlocking quartz mosaic with associated chlorite ±magnetite ±pyrite ± sericite. Clay and sericite are common.

Chlorite zone
Varies from pervasive to thin wispy chlorite, and where intense is often brecciated (notably hydrothermal brecciation). Some alteration of mafics.

Sericite-quartz zone
The largest of the three zones and characterised by pervasive sericite and quartz alteration, the latter as a groundmass phase. Occurs as narrow elongations between and within the other two zones.

Recent relogging noted the general widespread distribution of haematite throughout the drill core and is worth commenting upon. Similarly, alteration is most pronounced in areas of greater mineralisation and, in some respects, is not unlike the Mt Lyell mineral field.

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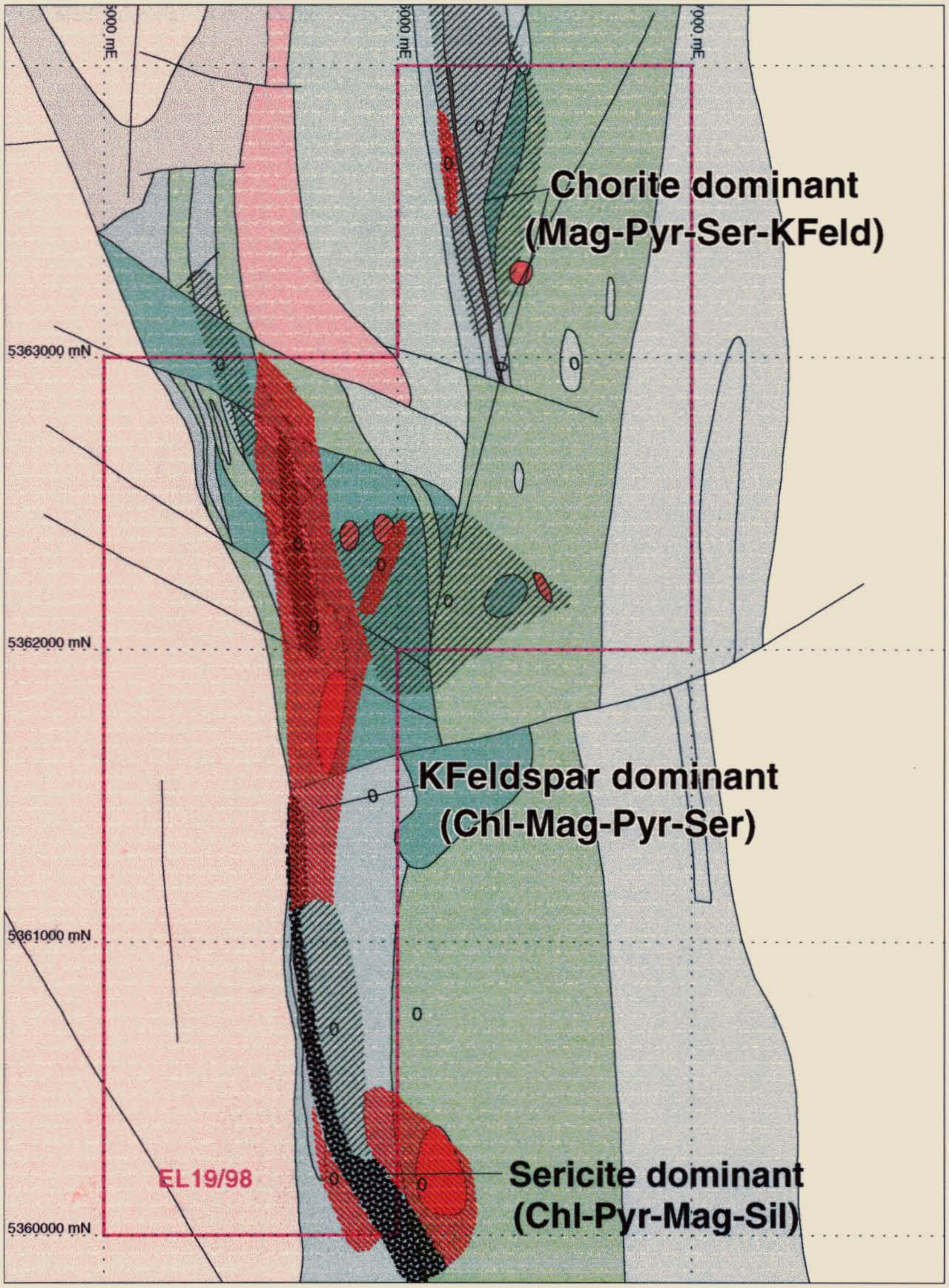
Figure 4

Selina Area
Alteration Map Showing Domination Alteration Assemblages
(after Hunns, 1987)



5 cm

5.4 Mineralisation (Figure 3)

Potential economic mineralisation is contained within three areas are of interest. Of these, two are linear zones of extensive pyrite mineralisation with coincident IP ± magnetic responses, known as the Eastern and Western Pyrite zones (EPZ and WPZ respectively). The third area is the Mt Selina Anomaly Zone. The trend and location of these zones is shown in Figure 3.

Western Pyrite Zone (WPZ)

Mineralisation occurs in similarly sheared volcanics and would appear to be distributed through a "spread" of rock types occuring in altered rhyolites/rhyodacites lavas/intrusives and volcaniclastics. It is characterised by replacement, disseminated and epigenetic veining of pyrite and magnetite, with almost non-existent Au, low levels of Cu, Pb and Zn, and weakly elevated Ag. The zone has coincident IP and magnetic anomalies although the pattern and shape of this appears to be slightly disrupted, possible due to or associated with displacement caused by faulting.

All the initial holes drilled in the early 1970s tested this zone (i.e. drillholes LS1 to LS7). Holes LS1, LS2 and LS3 tested the southern end of the zone whilst holes LS4 to LS7 tested the central portion of the zone. In this latter area there are significant differences in the mineralisation intersected between holes and this can be partly explained by both faulting and fading out of mineralised horizons. Mineralisation in the southern portion (i.e. that intersected by holes LS1 to LS3) appears to be subtly different in tenor (to that in the central portion), although further work is required to confirm this.

Extension of WPZ to the north of the EL was tested by drillhole LS12, which did not intersect any mineralisation. This coincided with the tailing off of surface IP responses and is disappointing as the location is potentially favourable for mineralised Tyndall horizon.

Eastern Pyrite Zone (EPZ)

The Eastern Pyrite Zone was identified in 1980. It occurs in sheared volcanics, volcaniclastics and volcanic sediments to the east of Mt Selina. The zone has a strong coincident IP response and elevated magnetics. Mineralisation occurs as massive and disseminated bands of pyrite. Considered to be syngenetic (Purvis *et.al.*, 1983) and stratabound (Hunns, 1987) with sediments acting as traps that encouraged sulphide precipitation. A shale horizon intersected in LS10 and LS14 is a probable cause of the IP response.

The mineralised zone would appear to be terminated at its southern extremity by an east-west trending fault, although evidence for this is sparse. Aberfoyle considered that their drillhole LS14 tested this zone which remains open and effectively untested to the north (in spite of LS8 which was collared just north of the current EL boundary) (Note: the zone extends north to line 284N which is well north of the EL boundary.)

Mt Selina Anomaly Zone (MSAZ)

MSAZ was identified through surface geochemistry in 1982. The geology within the zone is poorly known (primarily due to poor outcrop and dense forest cover), although mineralisation appears to be due sulphide disseminations in lavas, volcaniclastics and epiclastics, possibly adjacent to massive rhyodacite intrusives. The zone coincides with a break or drop off in IP and magnetic responses, and this may be faulted related. Anomalous Pb- Zn-Ag results that show a patchy distribution over different bedrock types are suggestive of a secondary hydrothermal origin rather than being syngenetic (Hutton, 1982, in Meares *et.al.*). A UTEM survey (1984/85) which covered the zone did not record any anomalous responses. Visible mineralisation consists of disseminated magnetite, veined haematite and rare pyrite (Hunns, 1987). LS13 was drilled to test this zone and did not intersect any mineralisation of note.

Styles of mineralisation

Several styles of mineralisation have been described/recognised (Hunns,1987, Purvis *et.al.*,1983)

- copper associated with pyrite and magnetite
- lead and zinc associated with hydrothermal brecciation
- zinc and lead in late stage cross-cutting carbonate veining
- remobilised base metals associated with shearing

Assay values are all generally low.

Paragenesis

Hunns (1987) has recognised several mineralising events, the early ones being of Cambrian age and the latter related to Devonian deformation and remobilisation.

a) mag - pyr ± cpy probably high fluid temp >= 300°C
b) sph ± cpy ± gal probably lower fluid temp < 250°C
c) sph ± cpy ± gal with associated qtz carbonate ± chl veins
d) remobilisation + recrystallisation of sph, cpy and gal during the Tabberabberan Orogeny

General Comment

Recognition of a paragenetic sequence is made difficult by strong overprinting and alteration. The detail listed above is based mainly on identification of mineral assemblages mainly through thin section work. The fine grained nature of the mineralisation and low distribution of metals complicates categorisation of style, both in the field and in hand specimen, although the relogging exercise confirmed at least two stages of pyrite provenance.

6 SURFACE GEOCHEMISTRY

Surface geochemistry exploration techniques have included;

- soil sampling
- rock chip sampling
- stream sediment sampling
- costeans

Data for all of the above (except for costean results) have been entered into the database.

Soil sampling

Several phases of soil sampling have been carried out. Most of the programmes entailed auguring and sampling of the different soil horizons whenever possible. Results for the early work (i.e. 1970s) have been difficult to locate. Data from work in the 1980s have been entered into the database.

Results from the Selina grid are mostly from the B+C horizons. Results from the Rolleston grid (i.e. lines 40N, 48N and 56N) are for both the A horizon and the B+C horizons. (Distinction of the two horizons over the Rolleston grid was necessary because of the extensive glacial cover.) The minus 80 mesh fraction was analysed for Cu, Pb, Zn, Ag, Mn and Co. Significant statistical work was done and anomalous thresholds for soils were determined as follows (Hutton, 1981):

- Selina grid - 40ppm Cu, 500ppm Pb and 200ppm Zn
- Rolleston grid - A horizon - 39ppm Cu, 770ppm Pb, 151ppm Zn
- Rolleston - B/C horizon – 8ppm Cu, 650ppm Pb, 175ppm Zn

These background values are significantly different to those quoted by Wells (1975) particularly for Pb (50ppm compared with 500ppm) and Zn (50ppm compared with 200ppm). Wells also notes some correlation between elevated soil assays and IP anomalies. In depth assessment of these results is worthy of follow up.

Soil sampling in the early 1980s first delineated the Mt Selina Anomaly Zone (which did not give any anomalous responses to earlier geophysical surveys). Anomalous and patchy distribution of Pb-Zn-Ag values delineated an area roughly 800 metres in diameter, centred on the baseline between lines 120N and 116N.

Rock chips

Extensive rock chip sampling has been constrained by poor outcrop. Generally all the licence holders for the different ELs carried out some rock chip sampling. Samples have been assayed for a variety of elements including Cu, Pb, Zn, Ag, Mn, ±Co, S, Au, Ba, Mo and Fe.

In 1980/81 pits were blasted for sampling purposes on line 128N (Pb-Zn-Ag anomalies) and on lines 144N and 184N (IP anomalies).

Rock chip work by Billiton over the EPZ identified zonation in association with alteration assemblages, and spot highs that corresponded to MSAZ (Creagh and Hungerford, 1990). Data interrogation was not carried out to confirm this.

Stream sediment sampling

A limited stream sediment sampling programme (1980s) returned background values only. Samples were analysed by three methods and assayed by AAS for Cu, Pb, Zn, Mn, Fe and Co.

Costeans and Old Workings

There are several costeans and old workings in the Lake Selina area. Their date and origins are poorly documented and thus one can only assume that they were not an exploration success.

The large costeans just outside the EL at its southern end (and located on the Rolleston grid) were sampled in 1979/80. Five samples returned maximum values of 180ppm Cu, 650ppm Pb, 270ppm Zn and 0.4%S, and all were <2ppm Ag. In the same year dumps near old workings were also sampled:

- dump at 96N/2900'W contained 0.4% Pb, 4ppm Ag and 0.2%S
- 2 samples from the dump near 124N/2900'W assayed 3.0%S and 9.0%S, 2ppm Ag

The report notes a close correlation between sulphur and cobalt, and indicating that the latter could be a useful detector of pyrite in soils. The complete results for sampling of these costeans have not been located and hence have not been entered into the database.

Some of the old historic workings were located in the course of field reconnaissance during this review. Detailed inspection was not practical due to their being either submerged by Lake Selina or under water at the shore's edge.

Other work

Walshe (1974) in his regional trace element study detected high Co in pyrite samples taken from Selina drill core (analysed for Co and Ni). His conclusions inferred the presence of Cu in mineralising fluids based on Cu-Co metallurgy.

Figure 5 is a composite plan showing grid lines and the MSAZ as outlined by soil sampling. IP anomalous zones are also shown.

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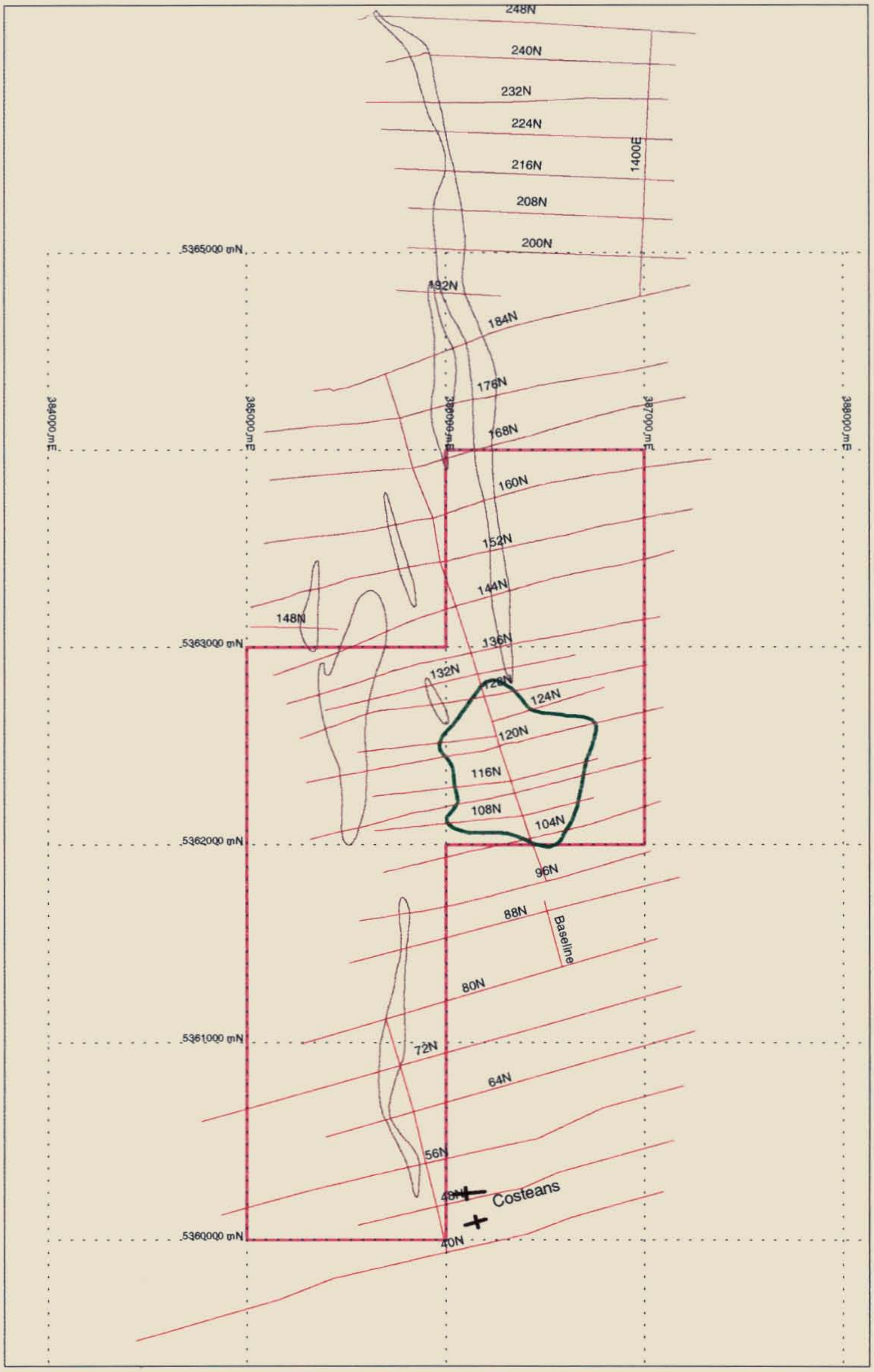
Figure 5 Selina Area Showing Grid Lines, Costeans and Geochemical Soil Anomaly (MSAZ in green) (with IP anomalies shown in brown)



5 cm

7 GEOPHYSICS

Geophysical applications have been a favoured exploration technique in the Lake Selina block, encouraged by the dense forest cover, difficult access and poor outcrop. Early work (1969/70) identified up to 18 anomalies (or anomalous trends/zones) and these have gradually been more clearly defined over the years. Data availability for the majority of these geophysical surveys is generally poor (possibly a reflection of their perceived lack of success). In the course of this current investigation not all of the geophysics has been reviewed (mainly due to data availability) and this is worth further pursuit. Wherever possible data has been located on plans or sections in relevant exploration reports, tanscribed into electronic format and downloaded into the database or digitised. Data collation from dipole-dipole pseudosections has not been carried out and this is recommended as part of any further work.

Surveys carried out include:

- Aeromagnetics (by RTEA – data not located)
- Ground magnetics using both vertical and total field measurements
- IP methods using pole-dipole, dipole-dipole and gradient array methods (and a combination of these) over several different exploration programmes
- Self-potential
- Gravity (test line only 1979/80)
- Electromagnetic methods including Turair (airborne), ground EM,"genie", Dighem II airborne EM, Sirotem, UTEM and EM-37
- CSAMT

The data for deep seated aeromagnetic anomalies shown on early plans has not been located, but probably emanates from the work of RTAE or from Mines Department surveys on the early 1950s. Wells' (1975) description of three types of anomaly (as identified from IP pole-dipole with concurrent resistivity and SP surveys) is still pertinent:

- resistive areas where the polarisable body is coincident with a magnetic body
- resistive areas not associated with any magnetic body
- areas associated with conductive and SP responses but not associated with any magnetics

Nearly all diamond drillholes have been surveyed (although raw survey data has generally not been located) and downhole profiles of the survey(s) included in relevant annual reports. In addition to these, petrophysical work has included susceptibility, conductivity and chargeability measurements on selected drill core.

To date the most successful methods have been IP and magnetics (Figures 4 and 5), both of which have highlighted coincident anomalies as well as delineating the two mineralised zones (EPZ and WPZ). Review reports are available for some of the surveys, although succinct summaries and conclusions are generally absent.

Conversely electromagnetic methods such as UTEM, Turair etc. have had limited success. Wells (1975) concludes that Turair semi-airborne EM type methods are not suited to this area, although DHEM in LS10 (1990s) indicated an off hole conductor (which was subsequently intersected by LS14).

Bishop carried out several reviews on the geophysical surveys in the 1980s (Dighem, EM, UTEM, Sirotem). Generally most of his recommendations appear to have been followed up, usually by further geophysical work and ultimately by drilling.

Geophysical data included in this report is as follows:

- IP survey 1982 (Appendix III and Figures 3 to 8)
- Ground magnetics - total field and vertical field (Appendix III and Figures 6 and 7)
- UTEM survey 1984/85 (Appendix III)

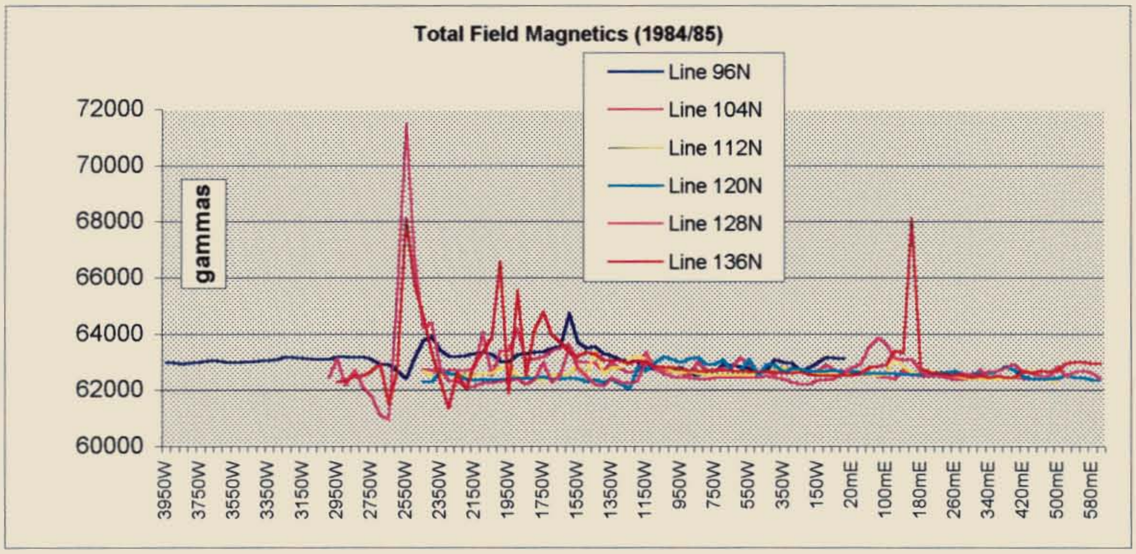
The data in Appendix II has been read from diagrams contained in some of the old exploration reports. Profiles have been drawn for each line. Generally the profiles all show some response over the zones of known mineralisation, although the profiles need to placed in a geological context. The profiles demonstrate the subtlety of some of the geophysical responses.

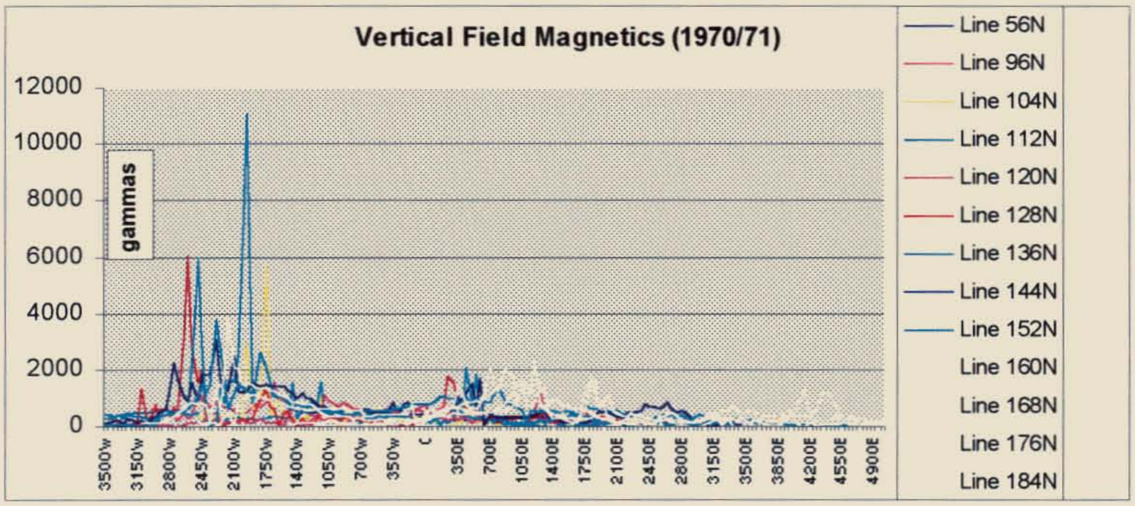
Composite profiles included in this chapter below do identify known anomalous trends. Magnetics clearly outline both the WPZ (both vertical and total fields) EPZ (vertical field), whilst UTEM channel 8 responses further highlight the MSAZ as delineated by soil sampling. Interestingly, UTEM gave no meaningful responses on channel 5. Application of these line profiles can be enhanced by and used to complement further geological interpretation.

Figures 6 and 7 are images of ground magnetics, Figure 6 representing earlier vertical field survey carried out with a McPhar M700 magnetometer, and Figure 7 representing total field measurements carried out in the 1980s. Reinterpretation and hand contouring of data in the 1980s indicating the magnetic responses to fairly complicated. Aberfoyle carried out a separate ground magnetics survey in the 1990s, data for which have not been located/reviewed.

To assist in identification of potential exploration targets the following work is recommended:

- Collation of dipole-dipole data from pseudosections
- Review and possible re-interpretation of CSAMT (and possibly EM also) surveys carried out by Aberfoyle
- Additionally, gravity work would be useful to isolated granite bodies with respect to potential targets


Total Field Magnetics (1984/85)
gammas
72000
70000
68000
66000
64000
62000
60000
3950W
3750W
3550W
3350W
3150W
2950W
2750W
2550W
2350W
2150W
1950W
1750W
1550W
1350W
1150W
950W
750W
550W
350W
150W
20mE
100mE
180mE
260mE
340mE
420mE
500mE
580mE
Line 96N
Line 104N
Line 112N
Line 120N
Line 128N
Line 136N


Vertical Field Magnetics (1970/71)
gammas
12000
10000
8000
6000
4000
2000
0
3500W
3150W
2800W
2450W
2100W
1750W
1400W
1050W
700W
350W
C
350E
700E
1050E
1400E
1750E
2100E
2450E
2800E
3150E
3500E
3850E
4200E
4550E
4900E
Line 56N
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Line 160N
Line 168N
Line 176N
Line 184N

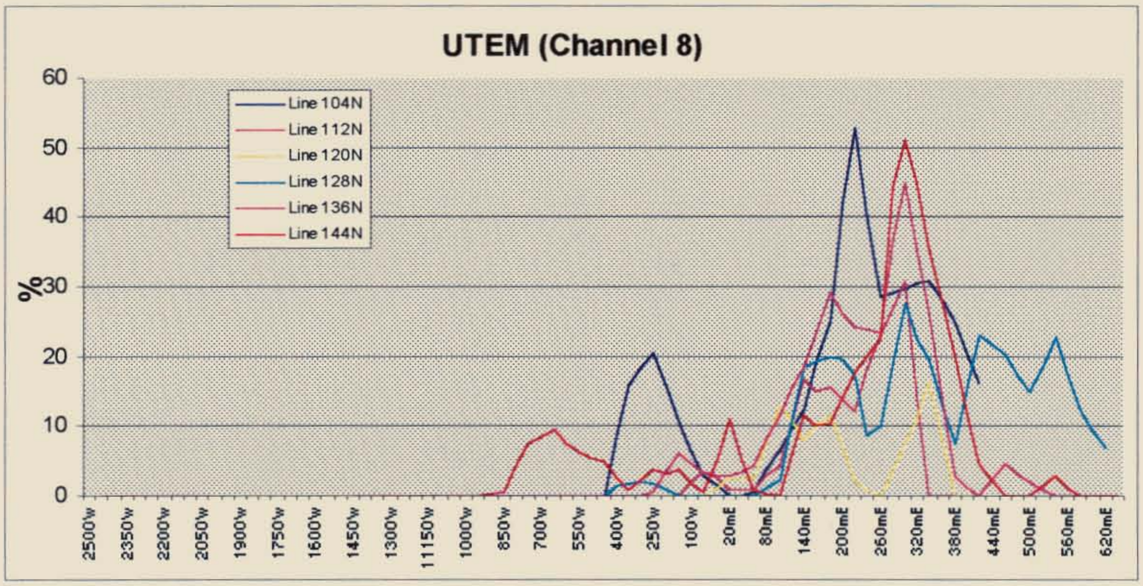
UTEM (Channel 8)
%
60
50
40
30
20
10
0
2500W
2350W
2200W
2050W
1900W
1750W
1600W
1450W
1300W
11150W
1000W
850W
700W
550W
400W
250W
100W
20mE
80mE
140mE
200mE
260mE
320mE
380mE
440mE
500mE
560mE
620mE
Line 104N
Line 112N
Line 120N
Line 128N
Line 136N
Line 144N

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Figure 6

Selina Area
Showing Ground Magnetics Images - Total Field
(with IP and Geochem Anomalies)

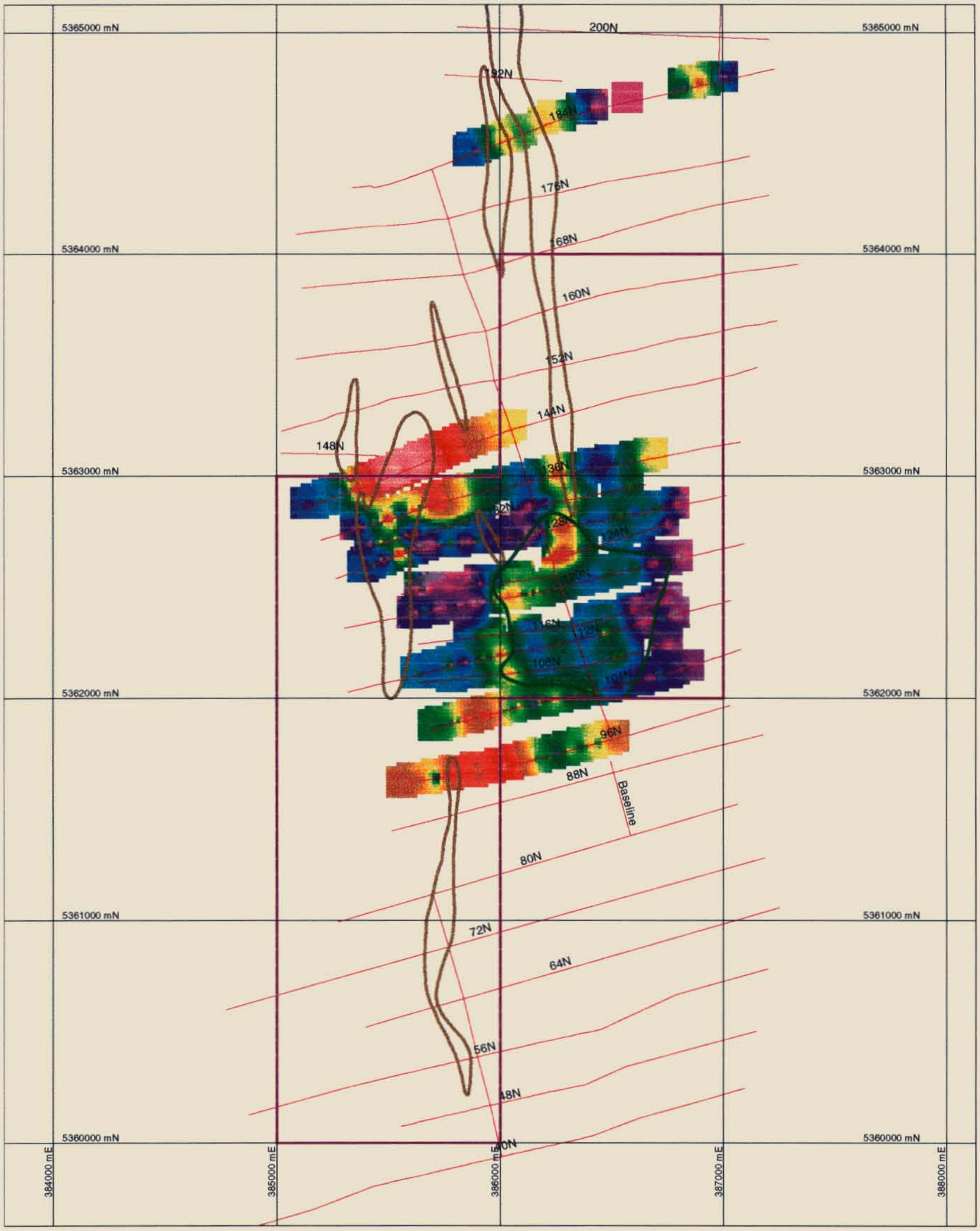

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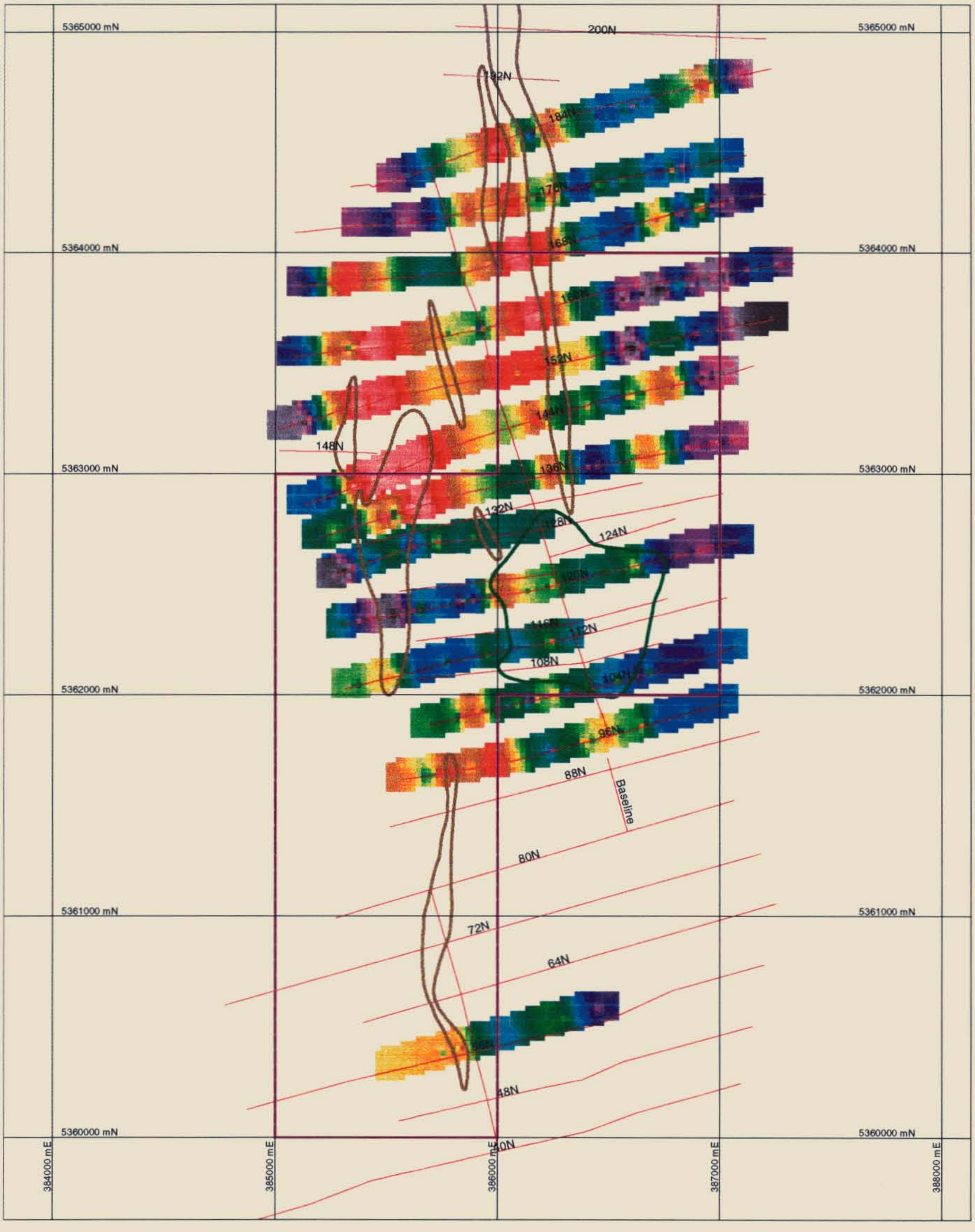
Figure 7

Selina Area
Showing Ground Magnetics Images - Vertical Field
(with IP and Geochem Anomalies)



8 DIAMOND DRILLING

A total of fourteen holes (LS1 to LS14) have been drilled in the Lake Selina area. Eleven of these fall within the current EL. In the course of this review those eleven holes were relogged. All core is stored at the MRT core yard at Mornington, Hobart. The core for the remaining three holes (LS8, LS11 and LS12) was not located (although time constraints would have precluded their relogging). It would have been useful to inspect core from holes LS8 and LS12 which were collared fairly close to the current EL boundary. Drillholes are summarised in Appendices I and II, and Table 8.1. Drillhole locations and their surface projections are shown in Figure 8.

Data from each drillhole have been entered into the database. Validation of data has been reasonably comprehensive, although robustness will be improved by further refinement. Physical results from historical downhole surveys have not been located and thus original data cannot be verified. Similarly original assay results have not been found. Some pulps from earlier sampling campaigns are stored in the Queenstown core shed and at a later date it will be useful to document and identify the same.

Graphic logs of the relogged drillholes are contained in Appendix II. Sections are included in Appendix I (Figures 9 to 19). The purpose of the relogging exercise was to get a "feel" for rock types (in the absence of good and readily accessible surface outcrop exposure) rather than carry out a comprehensive logging programme. Randomly selected samples were taken from each drillhole and these samples have been retained on site. Further work on them will assist in elucidating geology and lithogeochemistry.

8.1 Discussion of Drilling

Broadly the drillholes can be categorised into five areas:

- Holes drilled in the southern part of the EL
- Holes drilled towards the west and central part of the EL
- Holes drilled towards the northern part of the EL
- Holes drilled in the eastern part of the EL
- Holes outside the current EL

The drilling in each of these areas is discussed below. Drilling in the Lake Selina area was carried out over several programmes as follows;

- LS1 to LS drilled in the early 1970s by MLMRC
  - phase one LS1 to LS3
  - phase two LS4 to LS6
  - phase three LS7
- LS8 drilled in 1981 by GFEPL
- LS9 to LS12 drilled in the mid 1980s subsequent to recommendations made by the geological review team (Purvis *et.al.*)
- LS13 drilled in 1985
- Extension of LS10 and drilling of LS14 in 1992 by Aberfoyle

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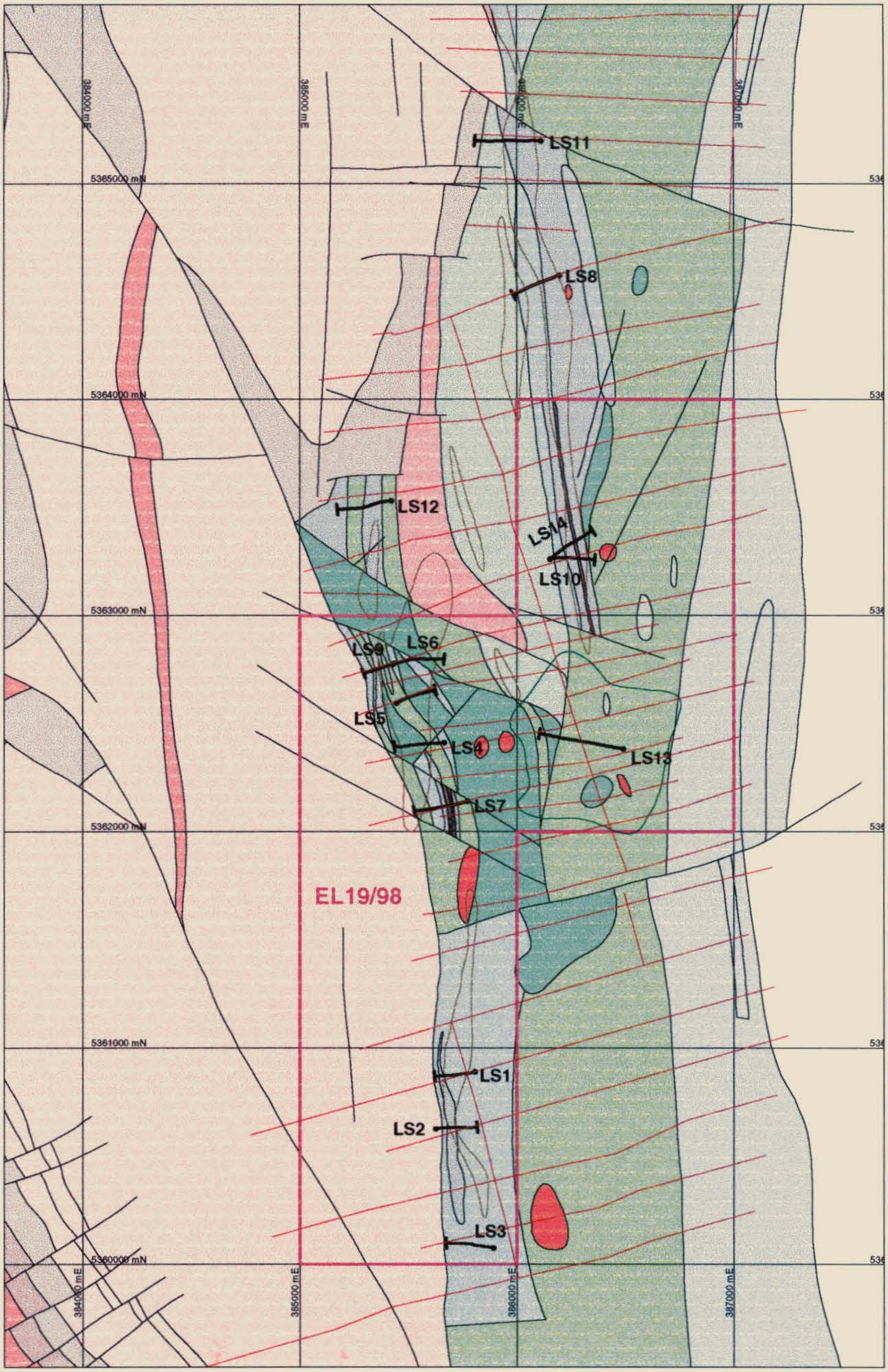
Figure 8

Selina Area Showing Drillhole Locations (with IP and Geochemical Anomalies)



5 cm

Table 8.1 Summary of Lake Selina Area Drillholes – Targets and Geology

Drillhole Number	Depth	Dates Drilled	Target	Geology	Comments
LS1	711 ft	Apr – Jun 1970	IP and magnetic anomalies, geochemical and geological anomalies	Mainly dacitic lavas, quartz ± feldspar phyric. Strong chl - hem alteration. Disseminated py, mag, ± cpy	Re-logged
LS2	776 ft	Jul 1970	Strong IP anomaly with non-coincident strong magnetic and weak geochemical anomalies	Collared in Owen conglomerate. Dacitic lavas, ± volcaniclastics. Strong chl –hem alteration	Re-logged
LS3	922 ft	Dec 1970	Southern extension to anomalous zone intersected in holes LS1 and LS2	Dacitic lavas, chl – sil –hem – ser alteration. Disseminated py, pervasive mag	Re-logged
LS4	1059 ft	Apr - May 1971	Southern end of a strong IP anomaly with a coincident resistivity low	Volcaniclastics, epiclastics and lavas. Sil- chl –ser alteration. Dissem py	Re-logged
LS5	902.5 ft	Jun – Jul 1971	Southern end continuation of strong IP anomaly with a coincident resistivity low	Rhyodacitic volcaniclastics and rhyolitic porphyries, chl – ser ±alb alteration. Disseminated py, mag	Re-logged several times
LS6	1000 ft	Jul – Sept 1971	Coincident magnetic and IP anomalies	Felsic lavas, ser – chl ± alb alteration. Disseminated py, ± pervasive mag	Re-logged several times
LS7	1347 ft	Dec – Jan 1972/73	IP anomaly at depth and deeper mineralisation in LS4, LS5 and LS6	Volcaniclastics and volcanic sediments, dacitic – rhyodacitic, strong chl alteration. Poor mineralisation	Re-logged
LS8	355.2 m	Sept 1981	Stratigraphic setting and extent of mineralisation in EPZ on line 184N	Mainly volcaniclastics. Fine disseminated py	Core not located
LS9	303.0 m	Jan – Feb 1984	Massive sulphides in volcaniclastic sediments above the stockwork mineralisation of WPZ	Lavas, volcaniclastics and volcanics, dacitic with distinct hem alteration.Scattered specks py ±cpy	Re-logged
LS10	388.5 m	Feb 1984 Mar 1992	IP anomaly in EPZ on line 144N	Lavas, volcaniclastic and volcanic sediments. Sil – hem –ser –chl alteration. Disseminated + veinlet py	Re-logged several times.
LS11	422.3 m	Feb 1984	IP anomaly in EPZ on line 208N	Volcaniclastics and autobrecciated lavas. Weak py	Core not located
LS12	330.0 m	Feb – Mar 1984	Possible northern extension of WPZ	Rhyodacitic volcaniclastics. Hem – chl ± alb alteration. No visible sulphide mineralisation	Core not located
LS13	502.6 m	Nov – Dec 1985	Geochemical zone between lines 116N and 120N along strike from LS10	Epiclastics, volcaniclastics and lavas, dacitic. Chl –car - ser alteration. Sparse py, scattered mag	Re-logged
LS14	349.5 m	Mar – Apr 1992	To intersect 50m above and 50m north of LS10 a coincident surface EM anomaly and DHEM response	Lavas, volcaniclastics and volcanic sediemnts. Strong chl alteration. Weak disseminated/veinlet py	Re-logged

Holes LS1, LS2 and LS3 – Southern part of EL

These holes were drilled in the early 1970s on IP ± coincidental magnetic targets (and were testing southern extension to the Western Pyrite Zone). Core consists mainly of heavily altered lavas, occasional volcaniclastics and weakly distributed sulphide mineralisation. LS3 was collared in Owen conglomerate. The Anthony Fault was not apparent in LS1 in spite of the hole terminating in Owen sandstone. Foliation is reasonably well developed and surface outcrop is somewhat analogous to schists of the Mt Lyell field.

LS3 is immediately west of two landmark surface costeans. The original date of excavations of these costeans is difficult to determine. However 5 samples in 1979/80 returned maximum values of 180ppm Cu, 650ppm Pb, 270ppm Zn and 0.4%S, and all were <2ppm Ag. The report notes a close correlation between sulphur and cobalt.

Core from these holes is in a reasonable to poor condition.

Holes LS4, LS5, LS6, LS7 and LS9 – West and Central part of EL

These holes mostly represent the second phase of the drilling campaign carried out in the early 1970s to test the strong IP anomaly which in places has coincident resistivity and/or magnetic responses. Drilling was essentially testing the Western Pyrite Zone. Generally the “full suite” of Selina Volcanics was intersected (i.e. lavas, porphyries, volcaniclastics, epiclastics and volcanic sediments) with associated strong alteration. Geological interpretation has been aided by invoking oblique and cross-cutting faults, some of which are apparent in the core. Metal intercepts in these holes were very variable and this variation is partly ascribed to the pattern of faulting.

LS7 was drilled to test deeper mineralisation, but returned disappointing results. LS6 and LS9 were drilled in opposite direction on the same section. Results were surprising in that rock types were notably different in both, assays in LS9 were all generally very low whilst those in LS6 were significantly anomalous (and resampled on several occasions). Results in LS4 and LS5 were also anomalous and core was resampled on several occasions.

Holes LS10 and LS14 – Northern part of the EL

These holes were drilled to test the Eastern Pyrite Zone, characterise by a strong linear IP anomaly. LS10 was drilled in 1984 (by GFEPL) and then extended in 1992 by Aberfoyle. Extension was based on target mineralisation postulated as a result of re-interpretation of a 1986 Sirotem survey. No additional mineralisation was intersected although an off hole conductor was indicated and this was subsequently drilled (LS14). EM work also indicated the presence of (presumably the same) sub-surface conductor. LS14 was drilled in 1993 and intersected pyrite mineralisation in the estimated conductor position, although metal tenor was not high.

Both these holes collared in the Upper Tyndall conglomerate and advanced into lavas, porphyries, volcanics and volcaniclastics of the EQPS. Correlation of the geology between holes is reasonably good.

LS13 – Eastern part of the EL

LS13 was drilled to test

- the surface geochemical anomaly that constitutes the Mt Selina Anomaly Zone
- southern extension to the IP anomaly associated with the EPZ

Assay results from this hole were all exceptionally low and have not really added any further information to explain the presence of the MSAZ. Rock types intersected were mainly epiclastics and volcaniclastics with minor lavas. Carbonate alteration in this core appears to be of more significance than elsewhere in the area. Mineralisation consists of sparse pyrite with scattered magnetite. The hole provided weak evidence for the Selina Fault (Berry and Keele, 1993, and White, 1995).

The poor mineralisation further indicates termination of the IP linear trend that demarcates the EPZ .

LS8, LS12 and LS11 – Holes drilled outside the current EL

Both LS8 and LS12 are just outside the EL boundary and thus of use in interpreting the local geology. LS12 did not contain any mineralisation and was completed in Murchison Granite. LS8 tested northwards continuation of the EPZ. The drillhole intersected finely disseminated pyrite mineralisation and was completed in crystal-rich lithic lithologies of possible Tyndall age.

LS11 was drilled to test continual northerly extension to the eastern IP anomaly and intersected volcaniclastics and autobrecciated lavas with weak pyrite mineralisation.

8.2 Discussion of Assay results

Mineralised core has been assayed for Cu, Pb and Zn (although not all holes were assayed). The early drillholes (i.e. those drilled in the 1970s) were not initially assayed for Au and Ag. Generally the later drillholes were. Subsequent re-sampling exercises resulted in some core being assayed for Au, Ag and other elements. Records and results for this subsequent work are patchy.

Generally the value of intercepts has been disappointing, particularly as expectations would have been reasonably high in line with the intense alteration and shearing that is present in some areas of the EL. However surface responses (geophysical and geochemical) are still somewhat enigmatic when compared with the downhole assay values, and although some drillholes are reported as having satisfactorily tested identified anomalies, scope remains for further investigation. The location and strength of some of the anomalous responses remains unresolved.

Intersections from individual drillholes are listed in Table 8.2.

Comments on drillhole sampling

Drillhole: LS1 (Figure 9, Appendix I)
Sample intervals: 75ft – 175ft, 265ft – 310ft
Elements: Cu, Pb, Zn, S (? and re-assayed for Au, Ag)
Comments: results from re-assay not identified

Drillhole: LS2 (Figure 10, Appendix I)
Sample intervals: 565ft - 776ft
Elements: Cu, Pb, Zn, S and re-assayed for Au, Ag
Comments: slightly anomalous Ag (re-assay)

Drillhole: LS3 (Figure 11, Appendix I)
Sample intervals: 210ft – 912ft,
Elements: Cu, Pb, Zn, S and re-assayed for Au, Ag
Comments: slightly anomalous Ag (re-assay)

Drillhole: LS4 (Figure 12, Appendix I)
Sample intervals: 413ft – 1059ft,
Elements: Cu, Pb, Zn, S and re-assayed for Au, Ag
Comments: re-assayed to assist in identifying additional targets in WPZ

Drillhole: LS5 (Figure 13, Appendix I)
Sample intervals: 208ft – 315ft, 445ft – 845ft
Elements: Cu, Pb, Zn, S, Au, Ag and re-assayed
Comments: re-assayed to assist in identifying additional targets in WPZ

Drillhole: LS6 (Figure 14, Appendix I)
Sample intervals: 130ft – 140ft, 210ft – 385ft, 625ft – 685ft, 740ft – 970ft and re-assayed
Elements: Cu, Pb, Zn, S, and re-assayed for Au, Ag
Comments: probably best mineralisation in the Selina drillholes and re-assayed to assist in identifying additional targets in WPZ

Drillhole: LS7 (Figure 15, Appendix I)
Sample intervals: 1200ft – 1265ft,
Elements: Cu, Pb, Zn, S
Comments: assays generally of low tenor (with respect to target location)

Drillhole: LS8 (Figure 16, Appendix I)
Sample intervals: 9.0m – 355.2m
Elements: Cu, Pb, Zn, Ag, Mn, Co, S, some fire assays for Au, Ag
Comments: all Cu assays <500ppm

Drillhole: LS9 (Figure 14, Appendix I)
Sample intervals: 193.2m – 275.2m
Elements: Cu, Pb, Zn, Ba, Au, Ag
Comments: all Cu assays <500ppm, all Au assays <0.01

Drillhole: LS10 (Figure 17, Appendix I)
Sample intervals: 34.4m – 300.4m (every other metre sampled)
302.5m – 388.5m (fillets over lithological/alteration intervals)
Elements: Cu, Pb, Zn, Au, Ag (34.4m – 300.4m)
Cu, Pb, Zn, Au, Ag, Ba, As, Cr, Zr, Ti (302.5m–388.5m)
Comments: elevated zinc values 223.4m-246.4m

Drillhole: LS11
Sample intervals: 107m –361m (2metre sample every four metres)
Elements: Cu, Pb, Zn, Au, Ag
Best intercepts: all Ag < 1ppm and Au <0.01ppm

Drillhole: LS12
Sample intervals: not sampled – no visible mineralisation
Comments: no mineralisation immediately associated with Murchison Granite

Drillhole: LS13 (Figure 18, Appendix I)
Sample intervals: 230m – 295m (1metre sample every other metre)
Elements: Cu, Pb, Zn, Au, Ag
Comments: all Cu <100ppm Au <0.005ppm, Ag <1ppm

Drillhole: LS14 (Figure 19, Appendix I)
Sample intervals: 0.0m – 349.5m (fillets over lithological/alteration intervals)
Elements: Cu, Pb, Zn, Au, Ag, As, Ba, Cr, Cr, Ti, plus oxides
Comments: off-hole conductor confirmed (indicated by DHEM in LS10)

Table 8.2 Summary of Drillhole Assay Results

Hole ID	From	To	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	S %	Comments
LS1	75ft	100ft			1800	100	280		
LS1	292ft	310ft			1050	175	625	2.16	
LS2	565ft	630ft			1750	115	375	0.86	
LS2	645ft	650ft	10						1980/81
LS2	660ft	680ft			1325	400	100	0.18	
LS3	255ft	290ft			2985	6685	1540	0.57	
LS3	345ft	350ft		11					1980/81
LS3	355	365			1950	5200	1650	0.45	
LS3	440ft	450ft			3700	850	1800	0.15	
LS4	413ft	1059ft			700			12.96	
LS4	413ft	430ft	0.2	3.4					1979/80
LS4	675ft	680ft	na	3					1979/80
LS4	720ft	730ft			1800		130	2.38	
LS4	755ft	790			1270		155	4.17	
LS4	1015ft	1040ft			2160		120	3.72	
LS5	208ft	315ft			500			10.1	
LS5	300	305			4600	200	280	4.34	
LS5	445ft	845ft			800			9.2	
LS5	655ft	675ft	0	9.3					1979/80
LS5	685ft	690ft	na	11					1979/80
LS5	700ft	710ft		11					1980/81
LS5	705ft	710ft	na	10					1979/80
LS5	715ft	720ft			2500				1980/81
LS5	715ft	765			2490	55	105	8.27	
LS5	720ft	750ft			3500			23.6	
LS5	735ft	750ft			4200				1980/81
LS5	780ft	820ft			1725	100	215	7.05	
LS5	805ft	815ft	na	10					1979/80
LS5	815ft	845ft	0	14.6					1979/80
LS5	835ft	845ft			2000	1250	6550	7.38	
LS6	215ft	385ft			700			5.2	
LS6	235ft	245ft	na	9.5					1979/80
LS6	245ft	260ft	<0.1	54.5	900				
LS6	330ft	340ft			1200	1550	355	1.62	
LS6	385ft	395ft			8200				1980/81
LS6	415ft	425ft		12					1980/81
LS6	625ft	685ft			400			4.0	
LS6	690ft	695ft		20		6700	3800		1980/81
LS6	740ft	972ft			500			7.5	
LS6	868ft	880			1250		125	4.78	
LS6	900ft	910ft			1350	250	1030	5.13	
LS7	1230ft	1250ft			1050			5.65	

Table 8.2 Summary of Drillhole Assay Results (cont'd)

Hole ID	From	To	Au g/t	Ag g/t	Cu ppm	Pb ppm	Zn ppm	S %	Comments
LS10	213.4m	214.4m			3160	120	870		
LS10	240.4m	258.4m	0.03		3450	95	1700		
LS10	240.4	246.4m	0.04	3.5	4400		2200		
LS10	223.4m	246.4m	0.01	2.1	1300		2600		
LS11	233m	253m			1700	20	300		
LS11	269m	301m			2750	15	105		
LS14	248.1m	255.3m	0.054	3	2250	23	855		

Notes:
i na = not assayed
ii date in the comments column indicates a re-sampling programme

9 ISOTOPES

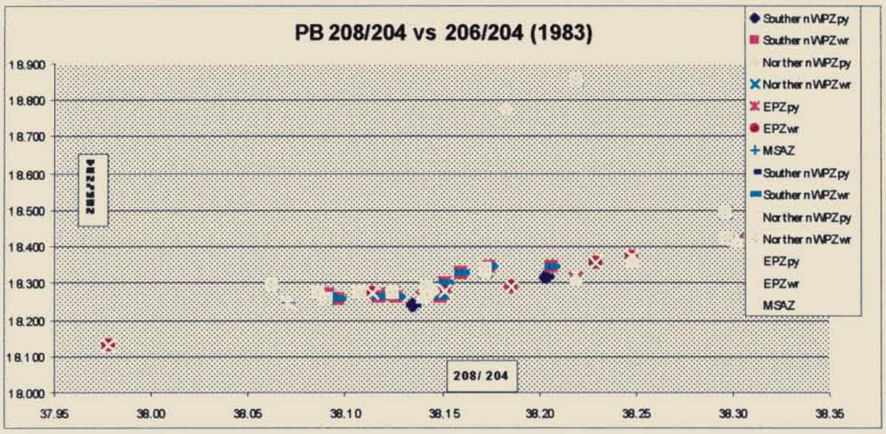
9.1 Lead

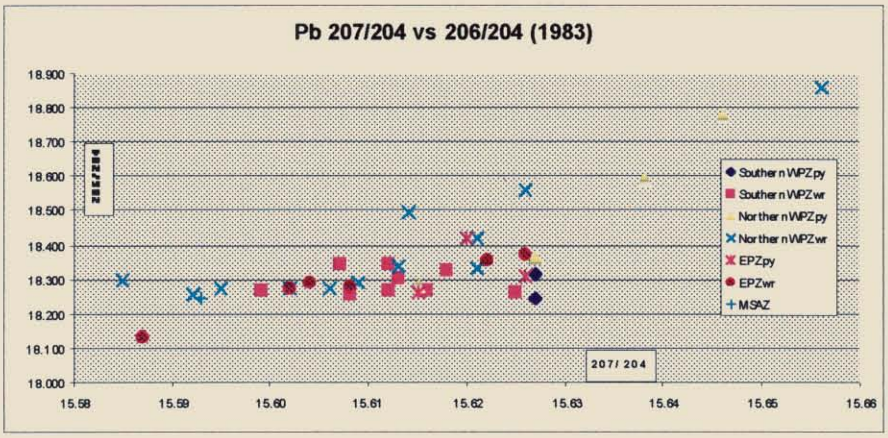
Two investigations have been reported:

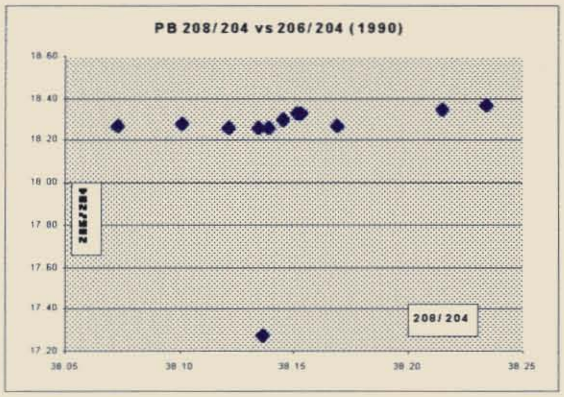
- Gulson and Porritt, (CSIRO) 1983 AMIRA 78/P97A 30 samples (EL9/66)
- Dean and Carr (CSIRO) 1990 undertaken for Aberfoyle EL5/85 over north Selina prospect 7 samples (10 samples total)

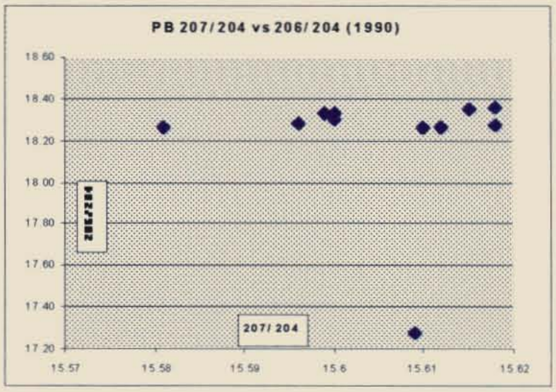
Generally there are two groupings of data with signatures being similar to Que River/Hellyer and Hercules/Rosebery, although the stockwork-type mineralisation shows markedly different signatures (Purvis *et.al.*, 1983). Results are generally favourable for potential massive sulphides, mainly in the EPZ and the southern end of WPZ. Dating has however provided no firm conclusions on hydrothermal events.

Charts are plotted below. Data are included as Appendix IV.









9.2 Sulphur

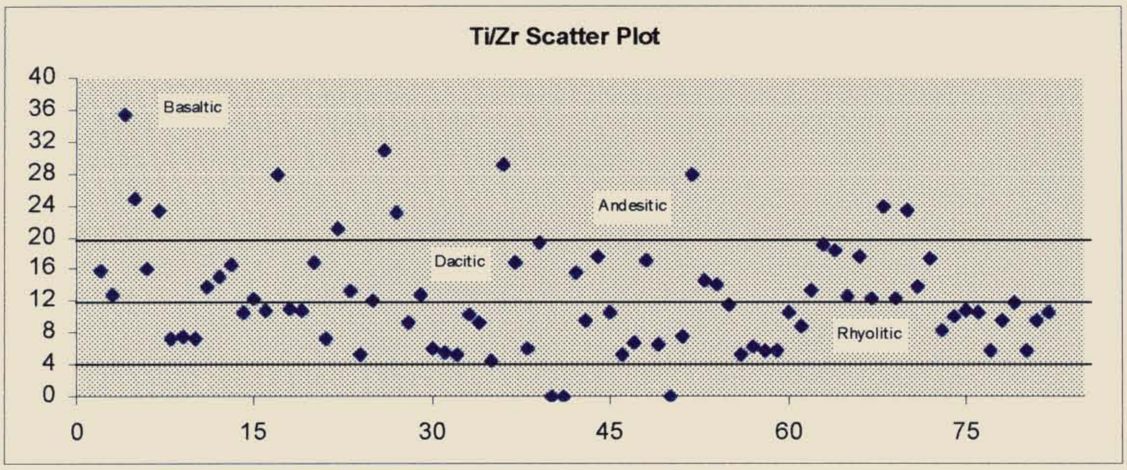
Evidence for sulphur isotope work is sparse. Records of only one study could be located and this dates back to the alteration study of Eastoe (1981).

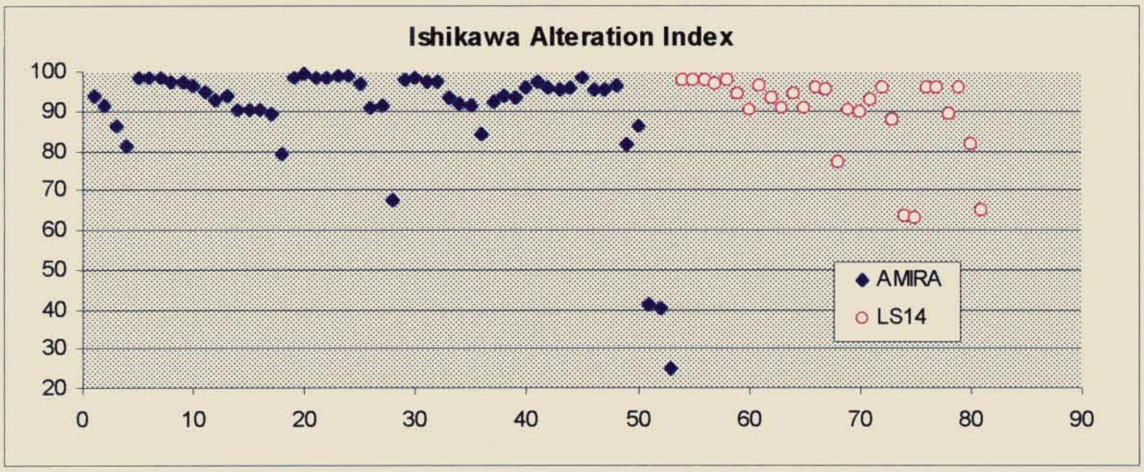
Generally the sulphur range of 9.8 ‰ to 10.9 ‰ is similar to that of the Murchison granite i.e. Cambrian in age. Suggestive of a magmatic origin with very little input (if any) from seawater or meteoric water into the mineralising fluids.

10 LITHOGEOCHEMISTRY

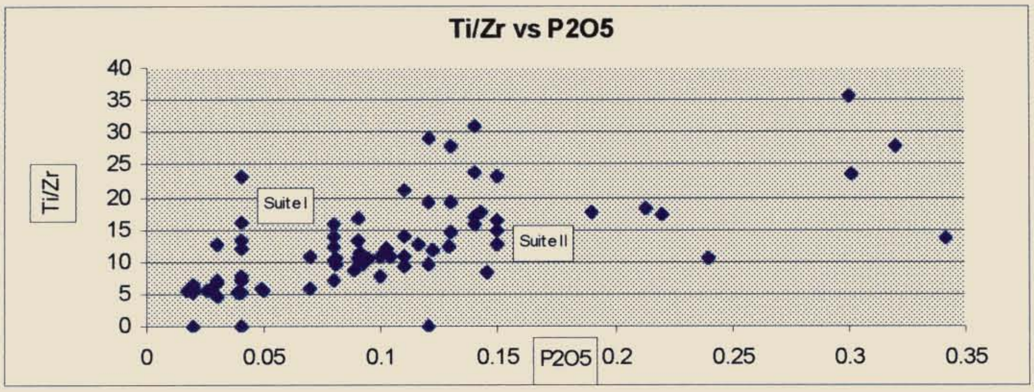
AMIRA project work (84/P210) and recent exploration by Aberfoyle (core grinds on LS14) involved whole rock, multi and trace element analyses. Full assessment and review of results has not been undertaken and is worth considering as follow up or extension to this report.

Results were briefly examined as part of this review. Plots showing relationships between immobile elements and the Ishikawa alteration index are shown below and included in Appendix V.





Samples were taken from drill core either as spot samples (AMIRA) or as core grinds over larger intervals (LS14). The samples analysed generally represent most of the rock types in the licence area. Plots show a preponderance of dacitic-rhyolitic lithologies (also seen in core logging) and extensive alteration is confirmed by the high AI values. Generally the Ti/Zr values confirm the dacite-rhyolite composition of lavas and volcanics, whilst volcaniclastics tend to return highly variable Ti/Zr ratios.



Suite I and suite II groups would appear to be present but are not clearly defined, (as shown by the Ti/Zr vs P2O5 plot) with a tendency for a broad spectrum between end members. Relationship between mineralisation and immobile elements was briefly examined. No firm conclusions were drawn and this work is worth further investigation.

Recommendations for further investigation include:

- relationship between mineralisation and alteration indices
- relationship between mineralisation and immobile elements
- alteration indices
- immobile element relationships
- distribution of major and minors
- correlation factors (if any) with and between Cu, Au and base metals

A granitic fluid study (Aberfoyle, EL5/85, 1993) suggest interaction between granitic fluids and EQPS rocks as evidenced by elevated Rb (>200ppm) and F (>600ppm)

11 GEOLOGICAL SETTING AND MODELS

Most recent work has targeted potential massive sulphide mineralisation. Earlier work focused on both the vicinity of granitic bodies and the characteristics of the volcanics themselves. Exploration has been directed by two main ideas for the origin of the mineralisation:

- Mineralisation related to deep granitic intrusions (Eastoe) with alteration a consequence of circulating hydrothermal fluids (MLMRC, GFEPL)
- Syngenetic stratabound sulphides with pyrite zones representing stockworked footwall mineralisation i..e. Kuroko style (Palaeozoic volcanic-hosted massive sulphide) similarities (Purvis *et.al.*) (MLMRC, GFEPL, Aberfoyle)

In reports reviewed the most comprehensive genetic conclusions were drawn up by Hunns (1987). He postulated the following model:

- infill of the "Selina Basin" with sedimentary rocks; bounded to the east by Precambrian Tyennan nucleus
- input of volcanics and epiclastics from a distant source, with overlap onto the Precambrian basement
- intrusions into the epiclastic sequence, rifting and down faulting along the Anthony Fault with associated intense shearing, mineralisation and alteration
- further uplift (Anthony Fault) with deposition of the Dora Conglomerate possibly as a mass flow unit
- deposition of Owen Conglomerate over the Selina Volcanics
- subsequent reactivation with intense deformation and folding, and associated remobilisation

More recently Creagh and Hungerford (1990) concluded that the increasing haematite content was indicative of a of shallow marine to sub-aerial oxidising environment during formation of the Selina volcanics.

Important in determining the deposit type is the relationship between the volcanics and the associated hydrothermal fluids, as well as the position of an exhalative seafloor setting. Pointers to the origin of the mineralisation need to take account of the following:

- precious metal values are exceptionally low for a VMS
- alteration patterns and assemblages are more akin to a porphyry system
- the Zn ratio is well below the accepted range for VMS
- the presence of granitic rocks is unusual for a VMS setting

Generally the combination of structure and stratigraphy (as well as intensity of alteration and distinctive assemblages) are favourable factors for unidentified mineralisation. However the presence of near surface VHMS style bodies would appear to be unlikely. Rather potential for epigenetic or Henty style mineralisation with some associated fault or structural control/influence would be worth testing, whilst larger sulphide bodies at depth have not yet been ruled out.

12 RECOMMENDATIONS

Although the Lake Selina area has been reasonably well explored the potential for undiscovered economic mineralisation remains. This potential is based on favourable stratigraphy, favourable structure that includes possible growth faults, and alteration patterns similar to other economic areas in the MRV, as well as the diverse styles of mineralisation recorded by previous workers.

There are currently no obvious targets for drill testing. The broad and subtle indicators outlined above require refinement and to this end the following are recommended.

- Geological mapping

Detailed geological mapping is recommended to place rocks in the current stratigraphic context and to delineate potential controlling structures. Detailed mapping has been carried on several previous occasions, but the work has never been fully completed and a base plan showing detailed field geology has not been located. Mapping could be complemented more thorough relogging of available drill core.

- Geophysics

Specific recommendations include collation of dipole-dipole data from pseudosections and relevant exploration reports. This will require some data entry followed up with interpretation (plan and section).

Aberfoyle carried out extensive CSAMT surveys over an area that encompassed Lake Selina. A review and re-interpretation of this work is recommended. At the same time it would probably be worthwhile reviewing EM survey data that was carried out at about the same time.

Additional geophysical survey work may be considered useful. However expense would need to weighed against benefit. Recommendations include magnetics, gravity and possibly work of a more regional nature such as radiometrics and landsat. Some of this data may already be available.

- Geochemistry

Full data interrogation is possible now that the majority of sample results have been entered into electronic format. Data analysis needs to be related to rock types and specific mineralised assemblages.

Although several drill core resampling exercises have been carried confirmation and validation of results has been difficult. It is recommended that some additional resampling be done to specifically analyse for Au and Ag. Any such resampling would need to be carefully related to rock types and alteration assemblages. This would be a relatively economic undertaking and should assist in delineating potential mineral-bearing horizons.

Some surface rock chip sampling would serve to confirm earlier results and this work could be tied in with the recommended geological mapping.

The exact location of samples analysed as part of AMIRA 84/P210 needs to be checked. Subsequent to this it may be worth doing additional whole rock analyses. This work would assist in determining elemental relationship between mineralisation, alteration and immobile elements, distribution patterns and any significant correlation factors (notably with Cu, Au and base metals).

Isotope investigations for sulphur and oxygen are recommended to constrain age relationships and to assist in determining sources and origins of mineralising fluids. This latter could possibly be linked in with appropriate AMIRA studies.

- Database documentation

A significant amount of information has been collated and compiled in the course of this review. Ongoing management recommends that full documentation be integrated into the database management system.

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Appendix I

Drillhole Data

Drillholes LS 1 to LS14

- **Collar data**
- **Sections**
  Figures 9 to 19
  (relogged drillholes showing geology and Cu assays)
- **Geology (codes)**
- **Survey data**
- **Assay results**

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EL 19/98 ANTHONY : SELINA AREA

Appendix I

Drillhole Data
Collar Data

Hole Id	LS1	LS2
Hole Type	Diamond Hole	Diamond Hole
Local Grid	Rolleston grid	Rolleston grid
Local East	100E	-800
Local north	72N	64
Local RL	1772	1650
AMG Grid	AMG84_55	AMG84_55
AMG East	385,805	385,625
AMG North	5,360,890	5,360,625
AMG RL	540	503
Azimuth/dip	255°/-45°	066°/-55°
Depth	711 ft	776 ft
Size (m): HQ(HX)		
HQ (HX)		
BQ (BX)	711 ft	776 ft
Geologist	KWells	KWells
Date started	9/04/70	July 1970
Date completed	18/06/70	? July 1970
Tenement	9/66	9/66
Target	To test IP - magnetic - geochem - geological anomaly on line 72N, 100E (Rolleston grid)	To test a strong IP anomaly with non-coincident strong magnetic and weak geochem anomalies
Rig	Minidrill F52	Minidrill F52
Company	Consolidated Syndicate	Consolidated Syndicate
Source	EL 9/66 1969/70 Annual Report pp 23-24. Report on Drilling Programme, Lake Selina Area, McKibben, December 1971	Report on diamond drilling programme, Lake Selina Area, McKibben, December 1971
Source (cont'd)	Review of area east of Tyndall Range, Wells, 1975. EL9/66 Annual Report 1979/80 Table 7 (p20)	Review of area east of Tyndall Range, Wells, 1975. EL9/66 Annual Report 1979/80 Table 7 and 8 (p20)
Comments	Considerably difficulties drilling this hole. Excessive dip &+ bearing variation. Survey to 360ft only.	

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Collar Data

Hole Id	LS3	LS4
Hole Type	Diamond Hole	Diamond Hole
Local Grid	Rolleston grid	Selina grid
Local East	-390	-2250
Local north	48	120
Local RL	1778	1687
AMG Grid	AMG84_55	AMG84_55
AMG East	385,890	385,664
AMG North	5,360,075	5,362,412
AMG RL	542	514
Azimuth/dip	282°/-57°	286°/-58°
Depth	922 ft	1059 ft
Size (m): HQ(HX)		
HQ (HX)		
BQ (BX)	922 ft	1059 ft
Geologist	KWells	J McKibben
Date started	8/12/70	11/04/71
Date completed	? December 1970	25/05/71
Tenement	9/66	9/66
Target	To test southern extension to anomalous zone intersected in holes 1 and 2	To test southern end of strong IP anomaly with a coincident resistivity low
Rig	Minidrill F52	Minidrill F52
Company	Consolidated Syndicate	Consolidated Syndicate
Source	Report on diamond drilling programme, Lake Selina Area, McKibben, December 1971	EL 9/66 1970/71 Annual Report Report on Drilling Programme, Lake Selina Area, McKibben, December 1971
Source (cont'd)	Review of area east of Tyndall Range, Wells, 1975.EL9/66 Annual Report 1979/80 Table 7 and 8 (p20)	Review of area east of Tyndall Range, Wells, 1975.EL9/66 Annual Report 1979/80 Table 7, 8 and 9 (p20)
Comments		Hole stopped (in mineralisation) at 1059ft due to drilling difficulties Hole re-sampled at a later date.

EL 19/98 ANTHONY : SELINA AREA

Appendix I

Drillhole Data
Collar Data

Hole Id	LS5	LS6
Hole Type	Diamond Hole	Diamond Hole
Local Grid	Selina grid	Selina grid
Local East	-2900	-2700
Local north	128	136
Local RL	1721	1749
AMG Grid	AMG84_55	AMG84_55
AMG East	385,443	385,434
AMG North	5,362,593	5,362,777
AMG RL	525	533
Azimuth/dip	062°/-55°	073°/-52.25°
Depth	902.5 ft	1000 ft
Size (m): HQ(HX)		
HQ (HX)		
BQ (BX)	902.5 ft	1000 ft
Geologist	J McKibben	Kwells/GJPurvis
Date started	3/06/71	26/07/71
Date completed	16/07/71	8/09/71
Tenement	9/66	9/66
Target	To test southern end continuation of strong IP anomaly with a coincident resistivity low	To test coincident magnetic and IP anomalies
Rig	Minidrill F52	Minidrill F52
Company	Consolidated Syndicate	Consolidated Syndicate
Source	EL 9/66 1971/72 Annual Report, map5. Report on Drilling Programme, Lake Selina Area, McKibben, December 1971	EL 9/66 1971/72 Annual Report, map 6. Report on Drilling Programme, Lake Selina Area, McKibben, December 1971. East Tyndall review, Wells, 1975
Source (cont'd)	Review of area east of Tyndall Range, Wells, 1975.EL9/66 Annual Report 1979/80 Table 7, 8 and 9 (p20)	EL9/66 Annual Report 1979/80 Table 7, 8 and 9 (p20) EL9/66 Annual Report 1983/84 (Appendix II)
Comments	Hole re-sampled at a later date.	Relogged in October 1983. Hole re-sampled at a later date.

Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Collar Data

Hole Id	LS7	LS8
Hole Type	Diamond Hole	Diamond Hole
Local Grid	Selina grid	Selina grid
Local East	-1990	386195
Local north	112	5364575
Local RL	1751	360
AMG Grid	AMG84_55	AMG84_55
AMG East	385,770	386,195
AMG North	5,362,140	5,364,575
AMG RL	534	360
Azimuth/dip	253°/-65.5°	250°/-60°
Depth	1347 ft	355.20
Size (m): HQ(HX)	780 ft	30
HQ (HX)	1347 ft	150
BQ (BX)		355.2
Geologist	KWells	HJHutton
Date started	1/12/72	14/09/81
Date completed	25/01/73	30/09/81
Tenement	9/66	9/66
Target	To test IP anomaly at depth and deeper mineralisation intersected in LS4, LS5 and LS6	To test stratigraphic setting and extent of mineralisation of Eastern Pyrite Zone on line 184N.
Rig	Minidrill F66C	Mindrill 10L
Company	Consolidated Syndicate	MLMRC/GODL/CGFA
Source	EL 9/66 Annual Report 1972/73	EL 9/66 1981/82 Annual Report Appendix E
Source (cont'd)	Review of area east of Tyndall Range, Wells, 1975.EL9/66 Annual Report 1980/81	
Comments	Hole re-sampled at a later date.	Petrography - EL 9/66 1981/82 Annual Report Appendix D

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Collar Data

Appendix I

Hole Id	LS9	LS10
Hole Type	Diamond Hole	Diamond Hole
Local Grid	Selina grid	Selina grid
Local East	385431	386152
Local north	5362775	5363260
Local RL	533	722
AMG Grid	AMG84_55	AMG84_55
AMG East	385,431	386,152
AMG North	5,362,775	5,363,260
AMG RL	533	722
Azimuth/dip	254°/-65°	077°/-50°
Depth	303.00	388.50
Size (m): HQ(HX)	2.8	2.0
HQ (HX)	42.0	15.0
BQ (BX)	303	302.5
Geologist	JGPurvis	AJCartwright
Date started	11/01/84	2/02/84
Date completed	2/02/84	24/02/84
Tenement	9/66	9/66
Target	Massive sulphide in volcaniclastic sediments above the stockwork mineralisation of the Western Pyrite Zone	To test IP anomaly in the EPZ line 144N. Extended to test EM37, DHEM and UTEM responses.
Rig	Minidrill F30	Minidrill F30
Company	GFEPL	GFEPL and Aberfoyle Res
Source	EL9/66 Annual Report 1983/84	EL9/66 Annual Report 1983/84
Source (cont'd)		EL103/87 Annual Report 1991/92 and 1992/93
Comments	3m HQ casing left in hole	2.0m HQ left in top of hole. Extended (and re-sampled) 86m by Aberfoyle in March 1991. Petrogrophy (Appendix)

598057

Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Collar Data

Hole Id	LS11	LS12
Hole Type	Diamond Hole	Diamond Hole
Local Grid	Selina grid	Selina grid
Local East	386110	385421
Local north	5365198	5363530
Local RL	396	496
AMG Grid	AMG84_55	AMG84_55
AMG East	386,110	385,421
AMG North	5,365,198	5,363,530
AMG RL	396	496
Azimuth/dip	278°/-50°	264°/-50°
Depth	422.30	330.00
Size (m): HQ(HX)	6	4.5
HQ (HX)	51	21
BQ (BX)	422.3	330
Geologist	AJCartwright	AJCartwright
Date started	6/02/84	16/02/84
Date completed	27/02/84	2/03/84
Tenement	9/66	9/66
Target	To test IP anomaly in Eastern Pyrite Zone on line 208N	To test for a possible northern extension to the Westren Pyrite Zone
Rig	Minidrill F30	Hydracore 28
Company	GFEPL	GFEPL
Source	EL9/66 Annual Report 1983/84	EL9/66 Annual Report 1983/84
Source (cont'd)		
Comments	Hole left open and making abundant water.	Plastic marker left in hole collar. Hole not sampled.

598058

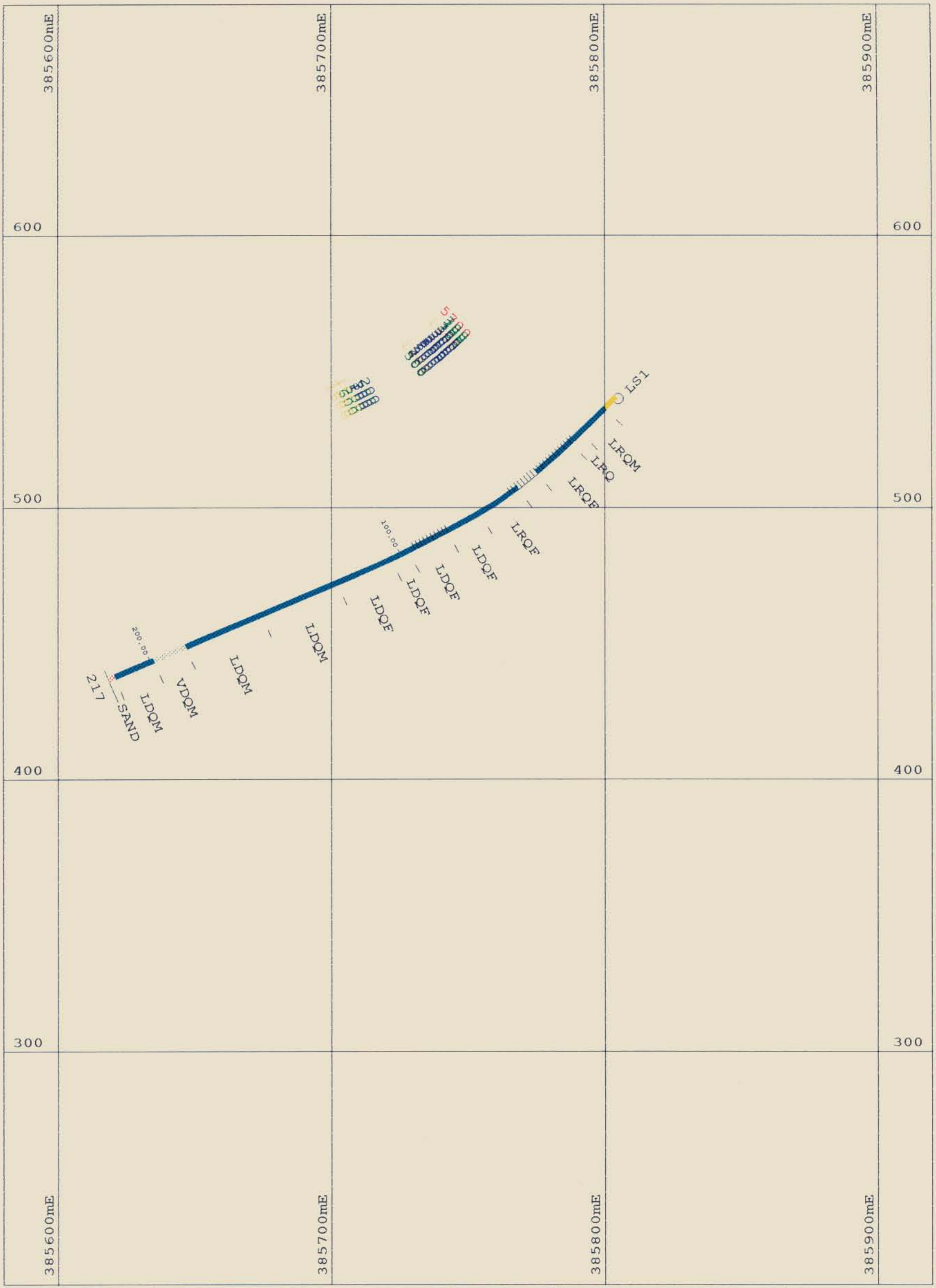
EL 19/98 ANTHONY : SELINA AREA

Appendix I

Drillhole Data
Collar Data

Hole Id	LS13	LS14
Hole Type	Diamond Hole	Diamond Hole
Local Grid	Selina grid	Aberfoyle grid
Local East	386489	386152
Local north	5362382	5363259
Local RL	694	722
AMG Grid	AMG84_55	AMG84_55
AMG East	386,489	386,152
AMG North	5,362,382	5,363,259
AMG RL	694	722
Azimuth/dip	283°/-50°	050°/-65°
Depth	502.60	349.50
Size (m): HQ(HX)	6	
HQ (HX)	45	
BQ (BX)	502.6	
Geologist	AJCartwright	S Richardson
Date started	12/11/85	13/03/92
Date completed	5/12/85	2/04/92
Tenement	9/66	103/87
Target	To test geochemical anomaly zone between lines 116N and 120N along strike from LS10	To intersect 50m above and 50m north of LS10 a coincident surface EM anomaly and DHEM response target
Rig		
Company	GFEPL	Aberfoyle Resources
Source	EL9/66 Annual Report 1985/86	EL 103/87 Annual report 1992/93, plate BL13 for downhole survey data
Source (cont'd)		
Comments	PVC pipe inserted to 502.6m (EoH)	

598059



Plotted with
MICROMINE
Resources S
Perth, Aust
Tel +61 8 9
Fax +61 8 9

Section along
5360890mN

Cu Values (ppm)	
<100	Black
100-500	Blue
500-1000	Green
1000-5000	Yellow
>5000	Red

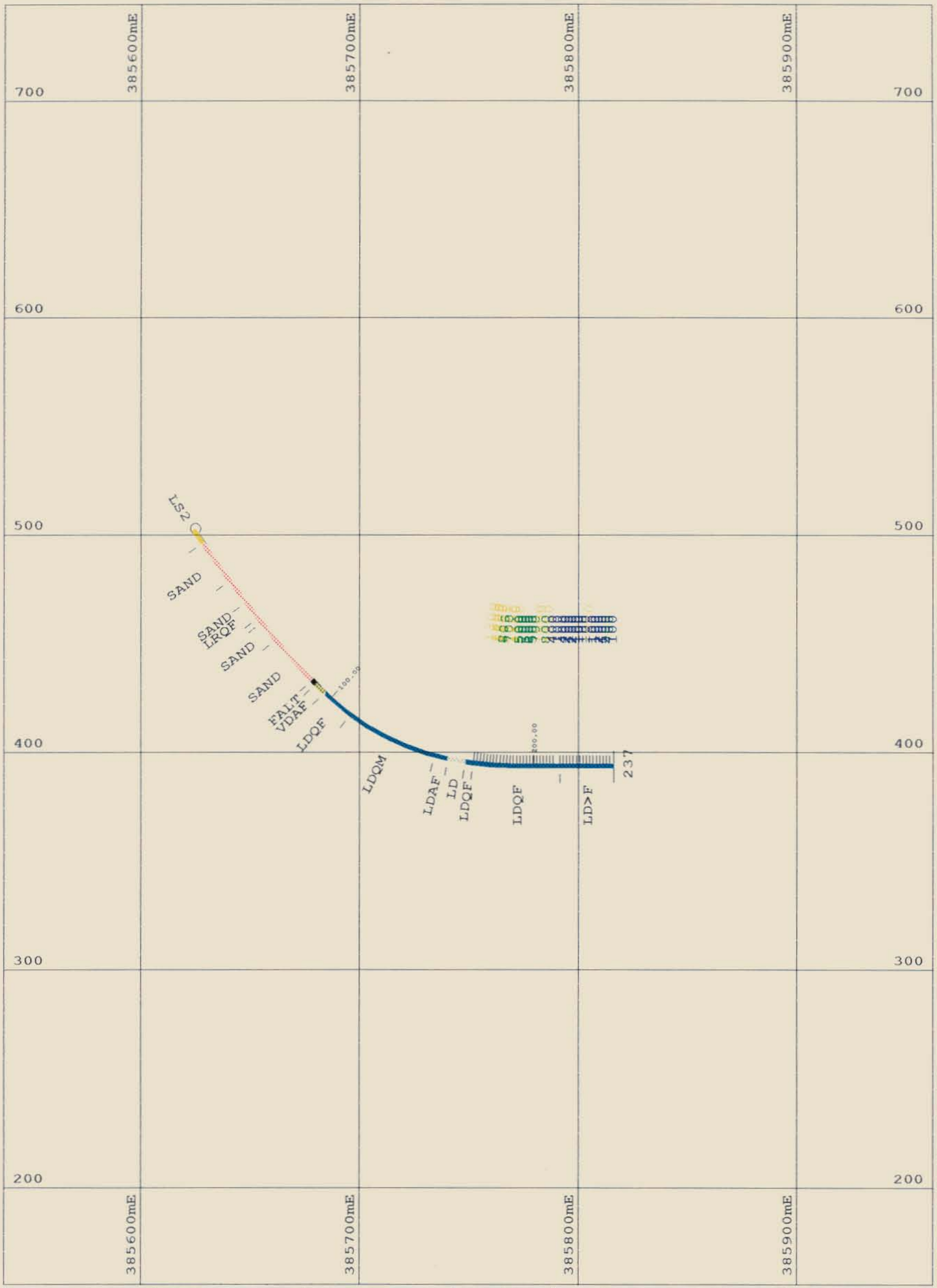
Scale 1:2000
DATE 12/2/99
SHEET 9 of
REF No 1
FILE FIGURE
0 50

LS1

Figure 9

5 cm

598060



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MICROMINE
Resources S
Perth, Aust
Tel +61 8 9
Fax +61 8 9

Section along
5360625mN

Cu Values	(ppm)
<100	Black
100-500	Blue
500-1000	Green
1000-5000	Yellow
>5000	Red

Scale 12/2/99 9 of
:2500 REF No FILE
1 FIGURE
DATE SHEET

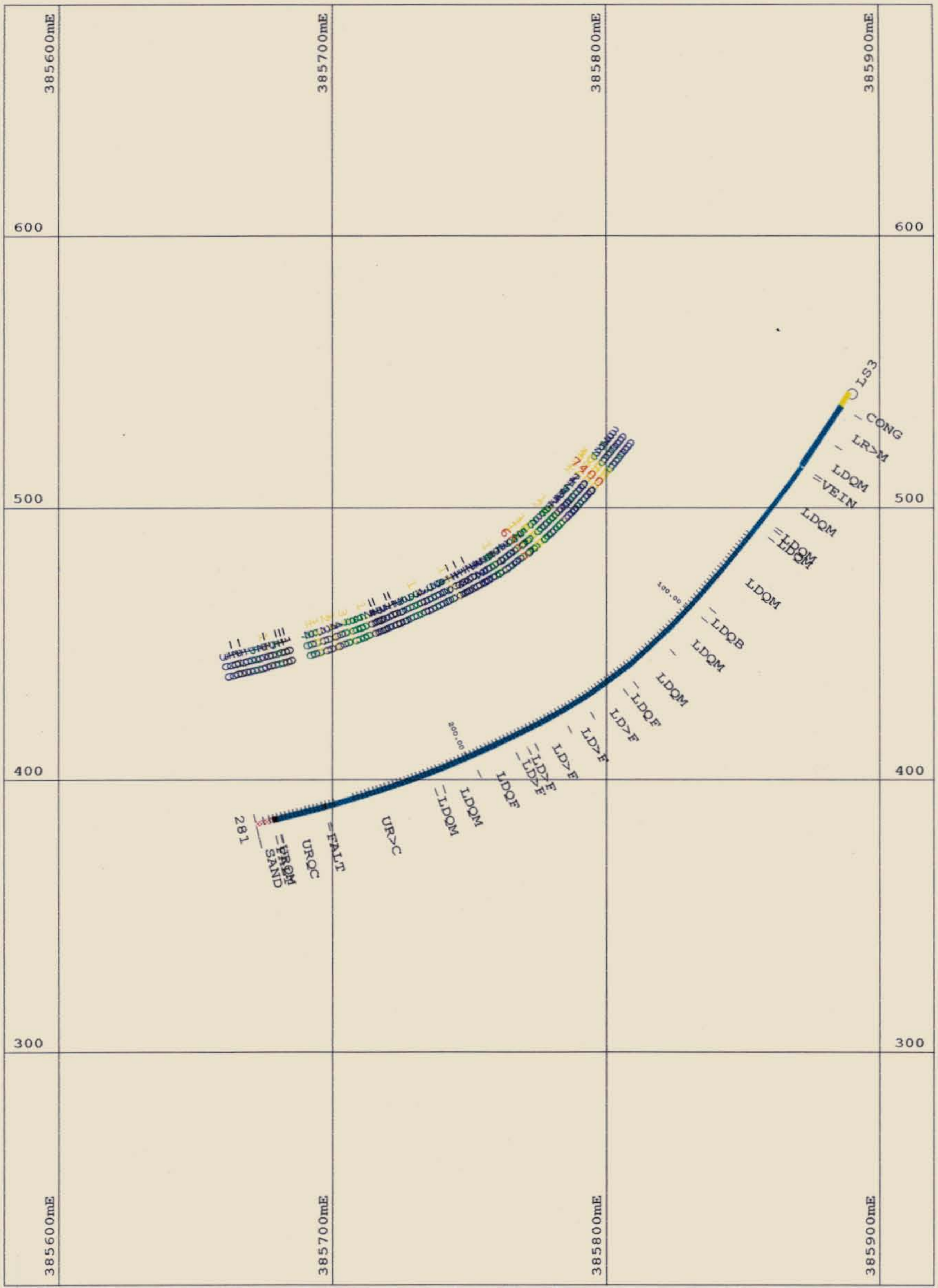
0 50m

LS2

Figure 10

5 cm

598061



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MICROMINE
Resources S
Perth, Aust
Tel +61 8 9
Fax +61 8 9

Section along
5360075mN

Cu Values (ppm)

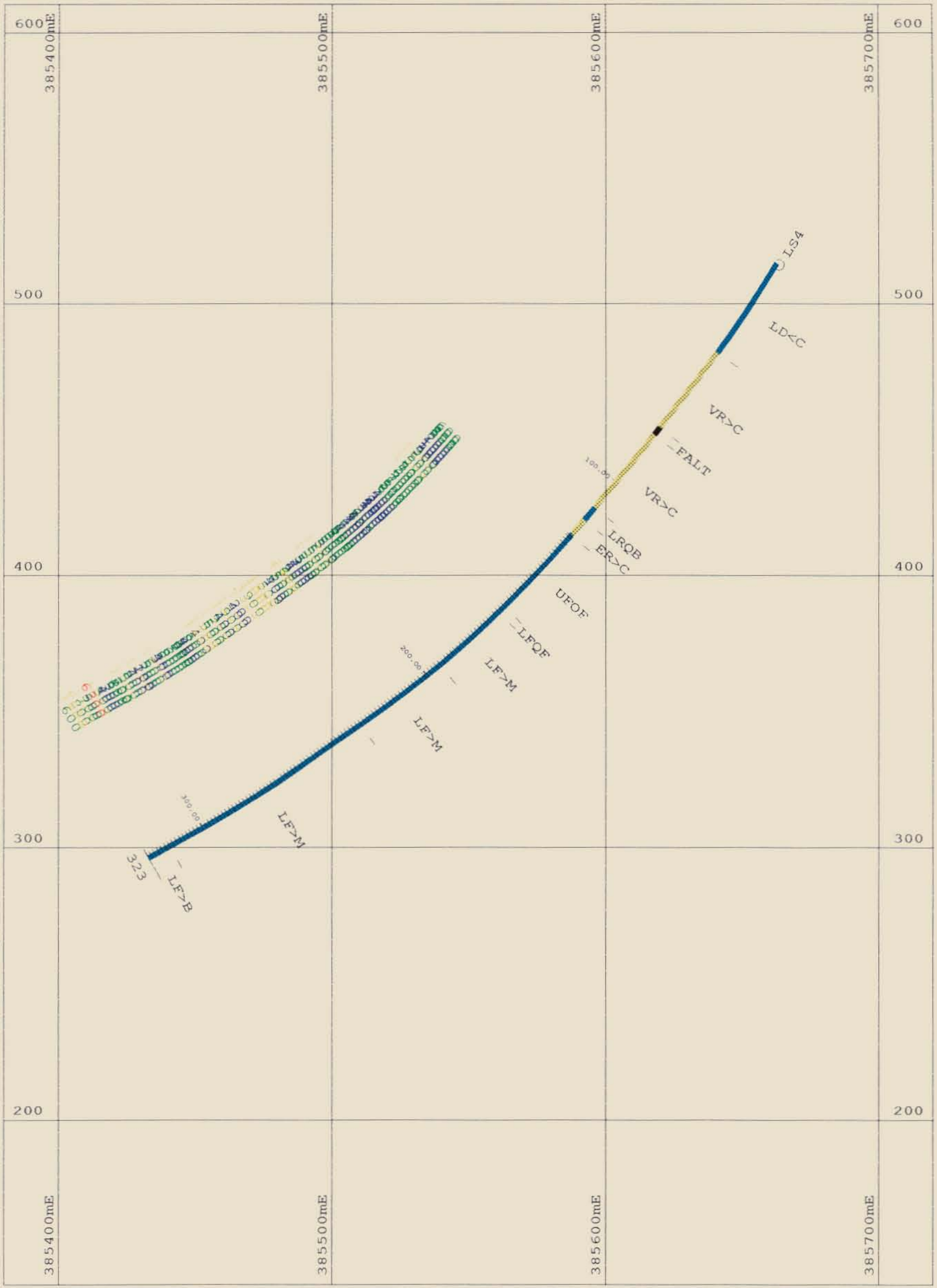
<100	Black
100-500	Blue
500-1000	Green
1000-5000	Yellow
>5000	Red

Scal 1:200 DATE 2/2/99 SHEET 9 of
REF No 1FI FILE GURE
0 50

LS3

Figure 11

5 cm



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MICROMINE
Resources S
Perth, Aust
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Fax +61 8 9

Section along
5362400mN

Cu Values (ppm)	
<100	Black
100-500	Blue
500-1000	Green
1000-5000	Yellow
>5000	Red

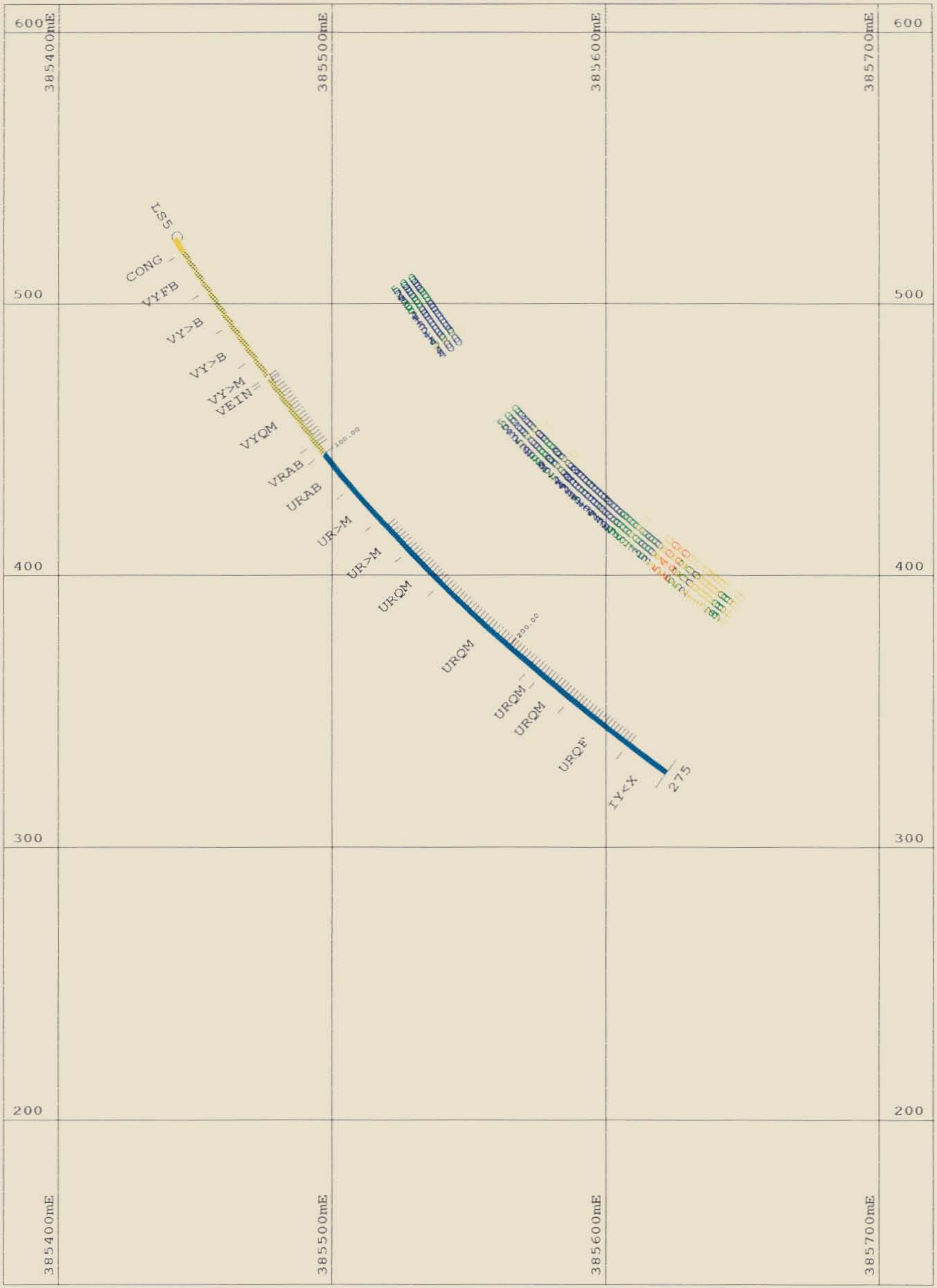
Scale DATE SHEET
12/2/99 of
:2000 REF No FILE
1 FIGURE
0 50

LS4

Figure 12

5 cm

598063



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MICROMINE
Resources S
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Fax +61 8 9

Section along
5362590mN

Cu Values (ppm)	
<100	Black
100-500	Blue
500-1000	Green
1000-5000	Yellow
>5000	Red

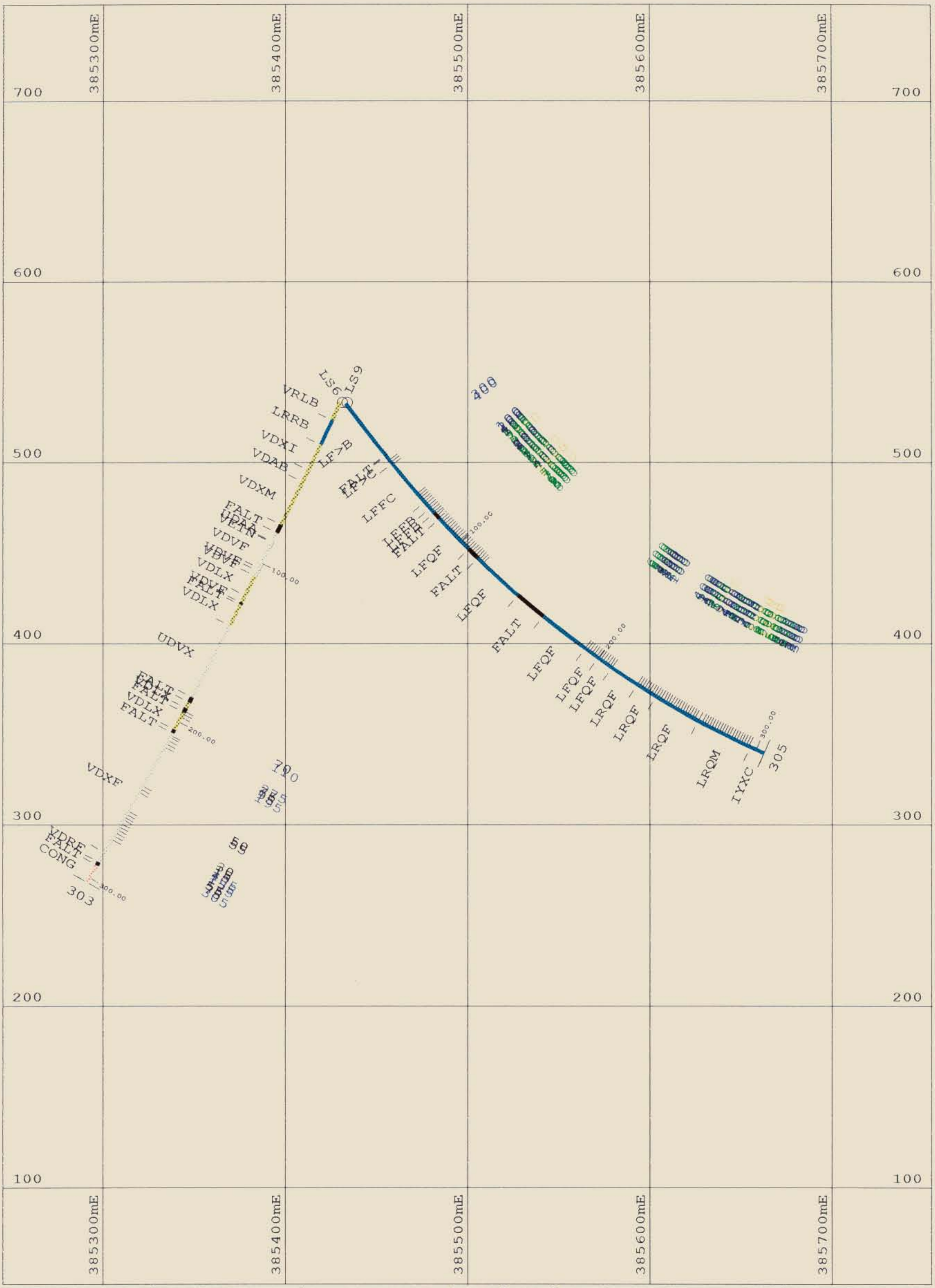
Scale 1:2000
DATE 12/2/99
SHEET 9 of 1
REF No FILE
FIGURE
0 50

LS5

Figure 13

5 cm

598064



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Resources S
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Fax +61 8 9

Section along
5362770mN

Cu Values (ppm)	
<100	Black
100-500	Blue
500-1000	Green
1000-5000	Yellow
>5000	Red

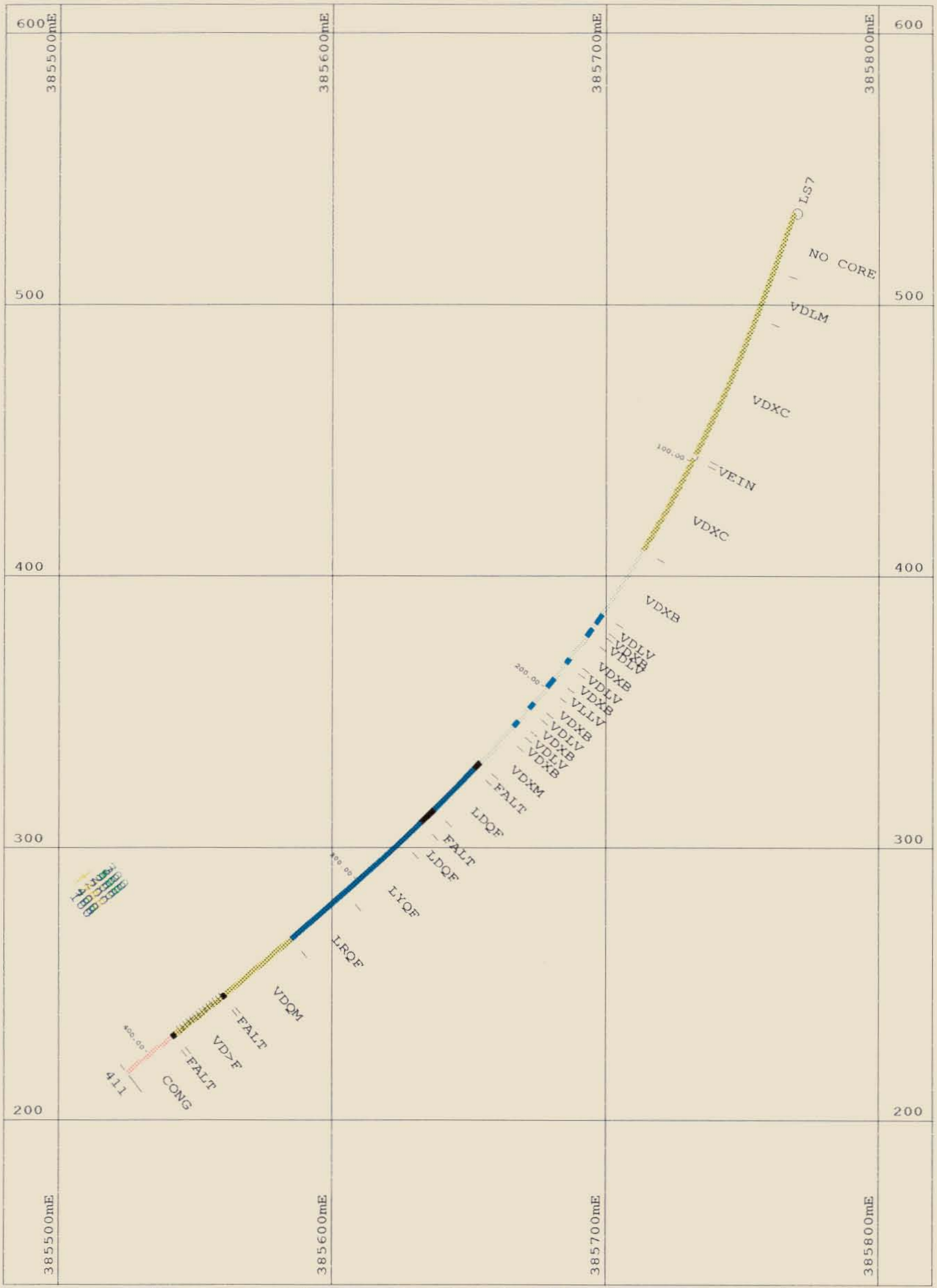
Scale 1:3000
DATE 2/2/99
SHEET 9 of
REF No 1
FILE FIGURE
0 50m

LS6 & LS9

Figure 14

5 cm

598065



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MICROMINE
Resources S
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Fax +61 8 9

Section along
5362140mN

Cu Values (ppm)	
<100	Black
100-500	Blue
500-1000	Green
1000-5000	Yellow
>5000	Red

Scale
:2000

DATE 2/2/99
SHEET 9 of
REF No 1
FILE FIGURE

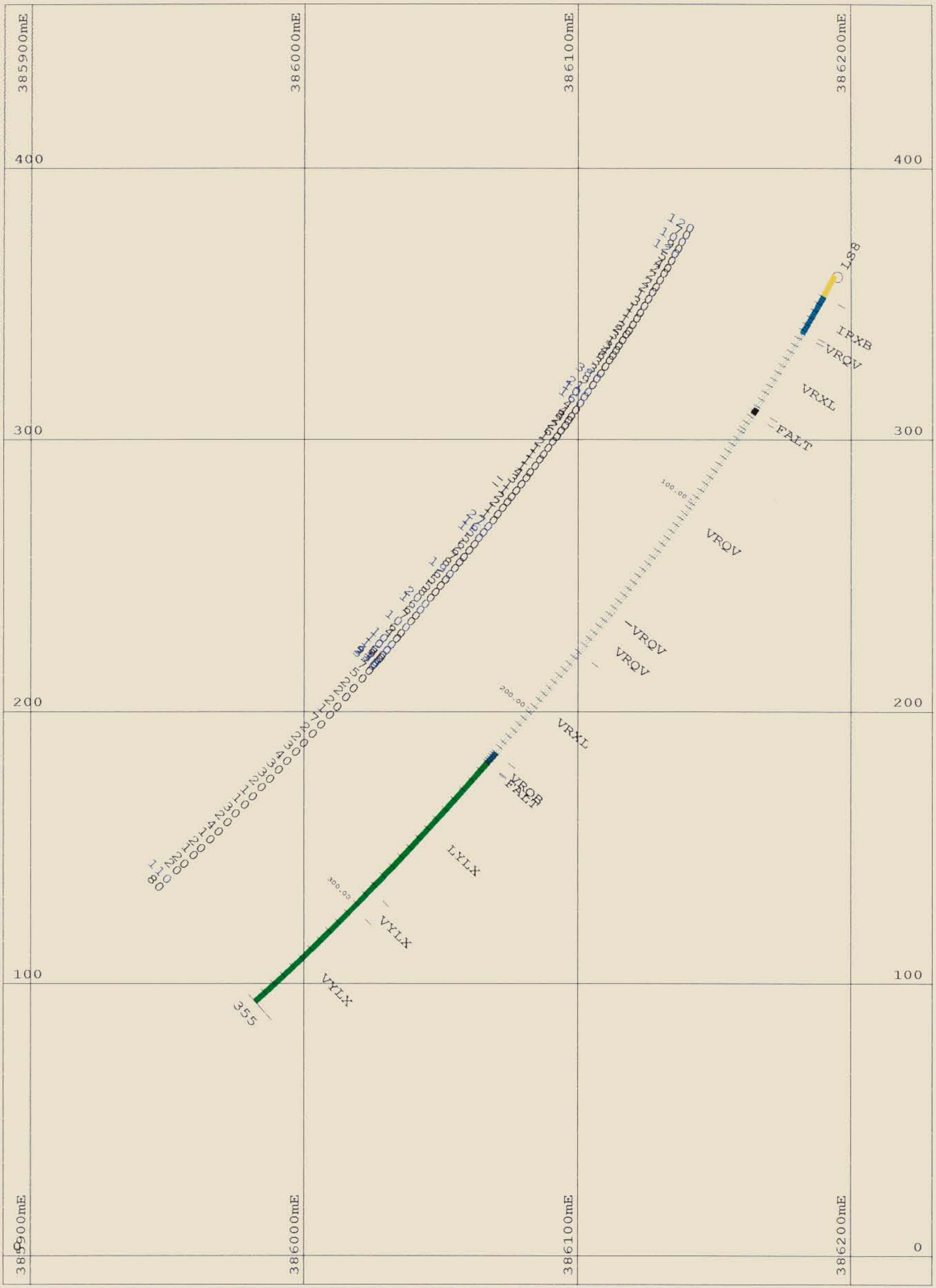
0 50

LS7

Figure 15

5 cm

598066



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Fax +61 8 9

Section along
5364575mN

Cu Values (ppm)	
<100	Black
100-500	Blue
500-1000	Green
1000-5000	Yellow
>5000	Red

Scal
:2000
DATE
2/2/99
SHEET
9 of
REF No
FILE
1FIGURE

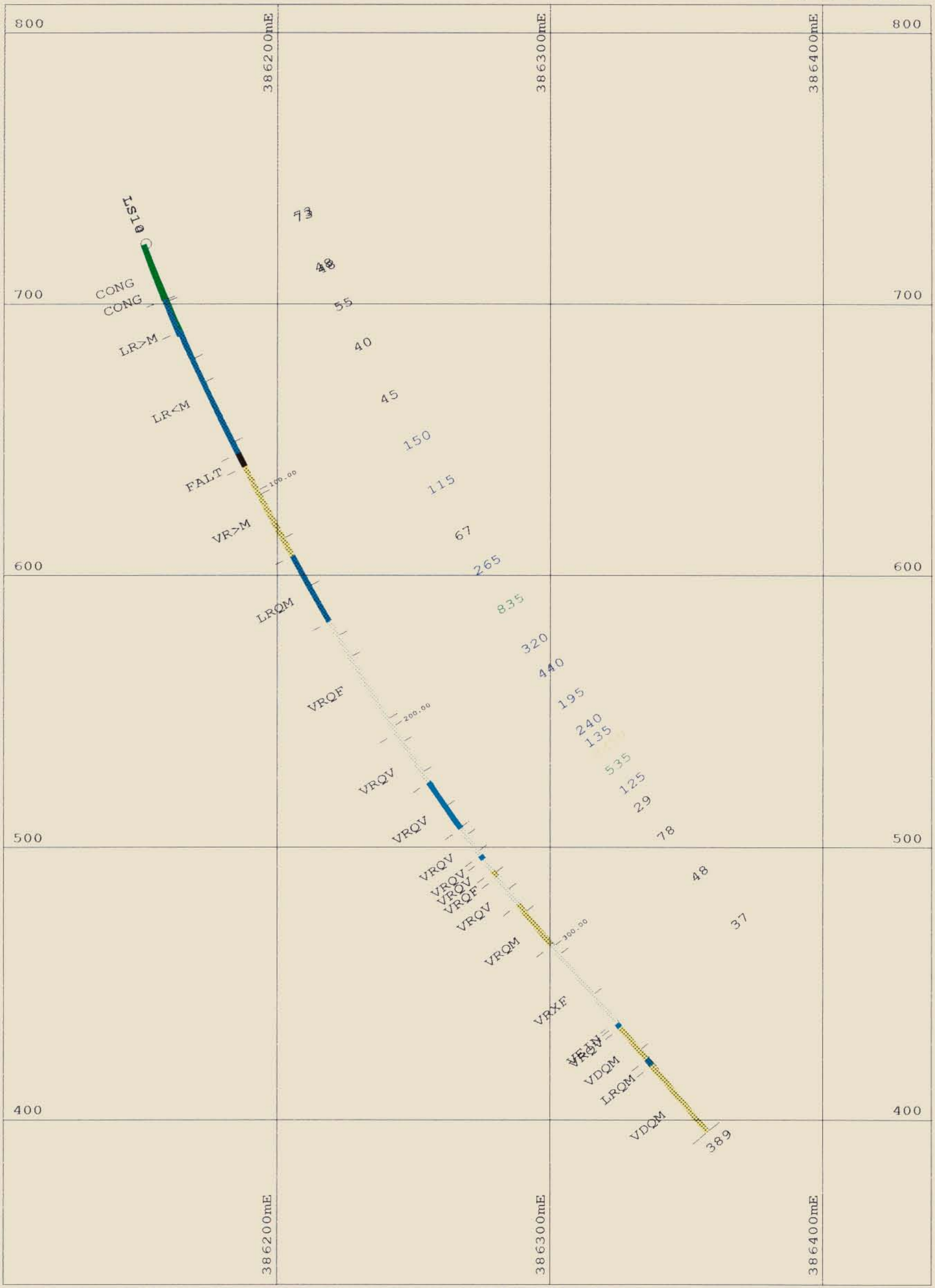
0 50

LS8

Figure 16

5 cm

598067



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MICROMINE
Resources So
Perth, Aust
Tel +61 8 9
Fax +61 8 9

Section along
53636260mN

Cu Values (ppm)	
<100	Black
100-500	Blue
500-1000	Green
1000-5000	Yellow
>5000	Red

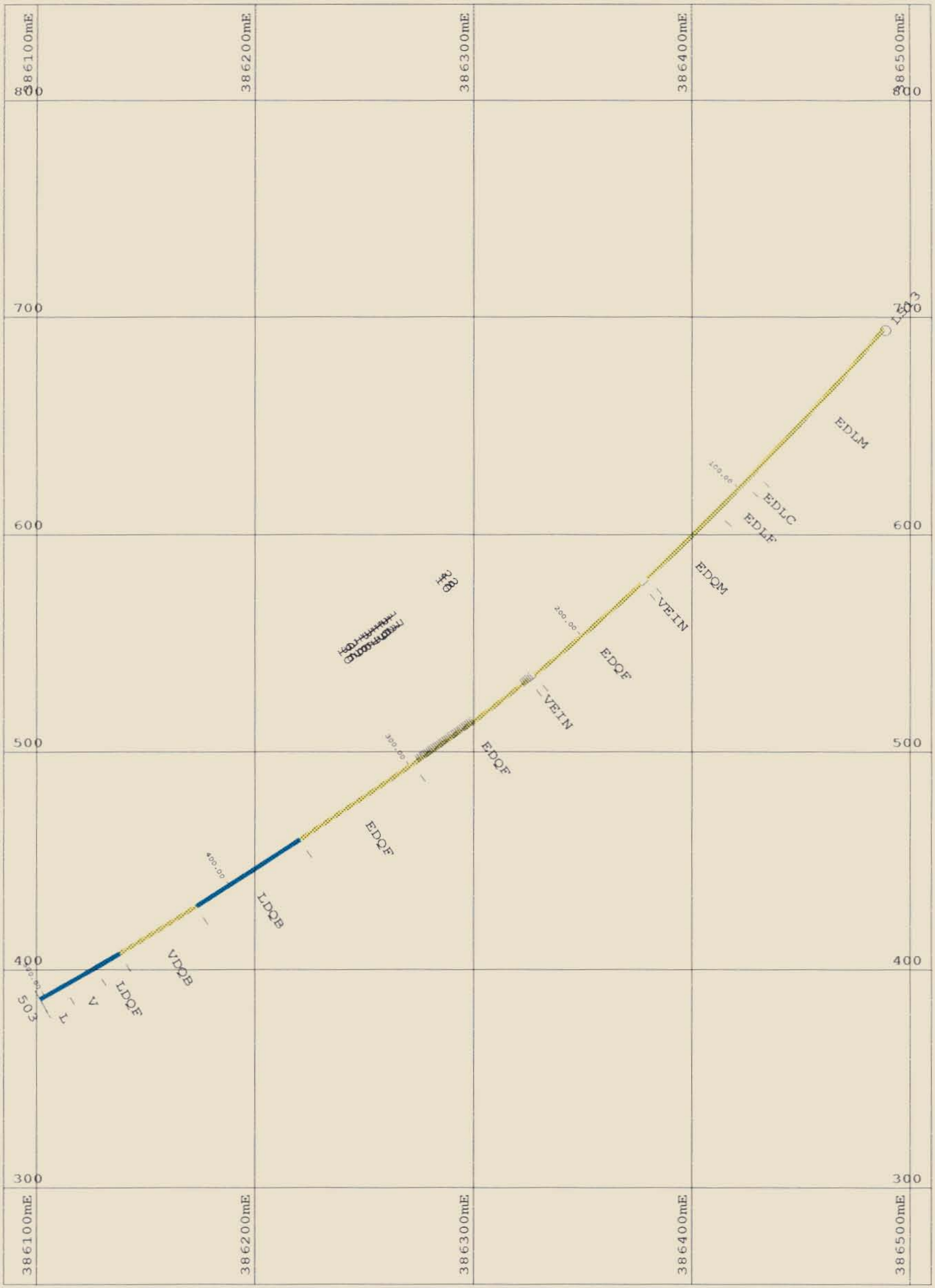
Scale 1:2000
DATE 2/2/99
SHEET 9 of
REF No 1
FILE FIGURE
0 50

LS10

Figure 17

5 cm

598068



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MICROMINE
Resources S
Perth, Aust
Tel +61 8 9
Fax +61 8 9

Section along
5362400mN

Cu Values (ppm)

<100	Black
100-500	Blue
500-1000	Green
1000-5000	Yellow
>5000	Red

Scale
:2500
DATE
12/2/99
SHEET
9 of
REF No
1
FILE
FIGURE

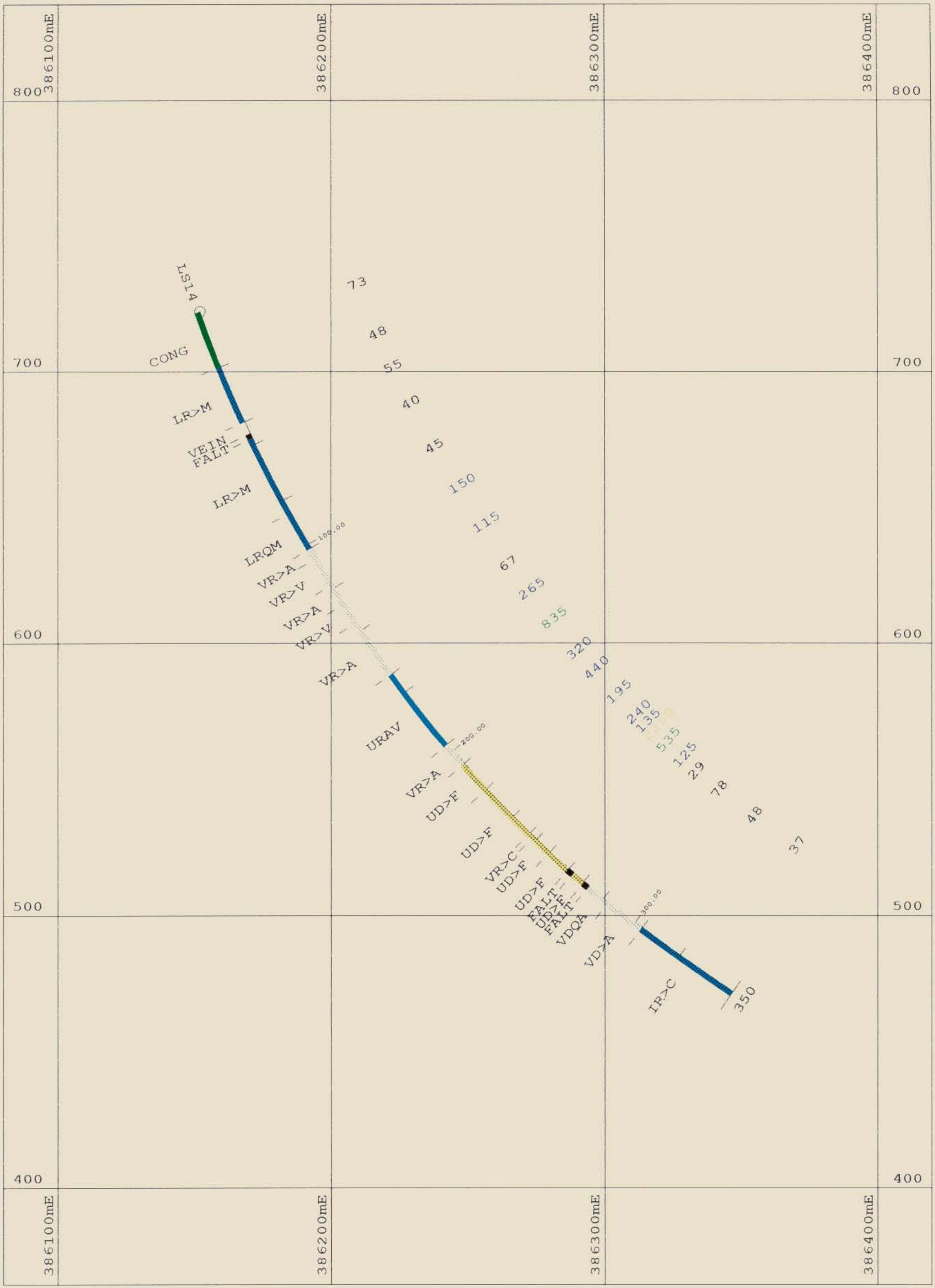
0 50m

LS13

Figure 18

5 cm

598069



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MICROMINE
Resources S
Perth, Aust
Tel +61 8 9
Fax +61 8 9

Section along
5363259mN

Cu Values (ppm)

<100	Black
100-500	Blue
500-1000	Green
1000-5000	Yellow
>5000	Red

Scale
:200

DATE
12/2/99

SHEET
9 of

REF No
1

FILE
FIGURE

LS14

Figure 19

5 cm

598070

Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Geology

Hole Id	Depth From (ft)	Depth To (ft)	Formation Code	Rock Code	Alteration Code
LS1	0	20	Q		
LS1	20	62	Cel	LRQM	OK3
LS1	62	80	Cel	LRQ	
LS1	80	135	Cel	LRQF	OH4
LS1	135	165	Cel	LRQF	OH3
LS1	165	220	Cel	LRQF	OQ6
LS1	220	265	Cel	LDQF	OQ8
LS1	265	318	Cel	LDQF	OQS7
LS1	318	341	Cel	LDQF	OH6
LS1	341	412	Cel	LDQF	QO5
LS1	412	511	Cel	LDQM	HQ6
LS1	511	610	Cel	LDQM	HQ8
LS1	610	652	Ces	VDQM	HQ7
LS1	652	703	Cel	LDQM	HQ8
LS1	703	711	Coou	SAND	H6
LS2	0	25	Q		
LS2	25	95	COou	SAND	Q4
LS2	95	174	COou	SAND	HQ4
LS2	174	207	Coou	SAND	HQ3
LS2	207	289	COou	SAND	HQ4
LS2	289	296		FALT	
LS2	296	315	Cev	VDAF	OH3
LS2	315	365	Cel	LDQF	OH6
LS2	365	506	Cel	LDQM	HO5
LS2	506	526	Cel	LDAF	OS7
LS2	526	553	Ces	LD	
LS2	553	564	Cel	LDQF	HO7
LS2	564	695	Cel	LDQF	OQ6
LS2	695	776	Cel	LD>F	OQ6
LS3	0	20	Q	CONG	
LS3	20	64	Cel	LR>M	LS6
LS3	64	106	Cel	LDQM	SO5
LS3	106	110		VEIN	
LS3	110	185	Cel	LDQM	SO5
LS3	185	189	Cel	LDQM	LQ7
LS3	189	200	Cel	LDQM	SO5
LS3	200	310	Cel	LDQM	OQ8
LS3	310	325	Cel	LDQB	OQ8
LS3	325	378	Cel	LDQM	OQ7
LS3	378	435	Cel	LDQM	OQ7
LS3	435	450	Cel	LDQF	OQ7
LS3	450	499	Cel	LD>F	OS7
LS3	499	531	Cel	LD>F	OM7
LS3	531	575	Cel	LD>F	OM7
LS3	575	585	Cel	LD>F	SQ6
LS3	585	600	Cel	LD>F	OM7
LS3	600	650	Cel	LDQF	SQ6
LS3	650	695	Cel	LDQM	SQ6

Geology

Hole Id	Depth From (ft)	Depth To (ft)	Formation Code	Rock Code	Alteration Code
LS3	695	705	Cel	LDQM	SQ8
LS3	705	835	Cel	UR>C	SQ7
LS3	835	838		FALT	
LS3	838	895	Cel	URQC	HS6
LS3	895	896	Cep	URQM	SQ6
LS3	896	902		FALT	
LS3	902	917	Cep	URQM	SQ6
LS3	917	922	Coom	SAND	
LS4	0	130	Cel	LD<C	QO3
LS4	130	244	Cev	VR>C	OQ2
LS4	244	255		FALT	
LS4	255	368	Cev	VR>C	OQ2
LS4	368	388	Cep	LRQB	Q3
LS4	388	412	Cev	ER>C	OQ2
LS4	412	530	Cep	UFOF	QS7
LS4	530	540	Cep	LFQF	QS7
LS4	540	635	Cep	LF>M	QO7
LS4	635	755	Cep	LF>M	QO7
LS4	755	1030	Cep	LF>M	QO7
LS4	1030	1059	Cep	LF>B	OQ7
LS5	0	20	Q	CONG	
LS5	20	76	Cev	VYFB	OQ7
LS5	76	128	Cev	VY>B	OQ7
LS5	128	179	Cev	VY>B	OQ7
LS5	179	208	Cev	VY>M	OQ7
LS5	208	212		VEIN	
LS5	212	310	Cev	VYQM	AQ6
LS5	310	327	Cev	VRAB	OQ8
LS5	327	381	Cep	URAB	OQ8
LS5	381	432	Cep	UR>M	MO8
LS5	432	485	Cep	UR>M	MO8
LS5	485	542	Cep	URQM	QO4
LS5	542	692	Cep	URQM	AQ6
LS5	692	708	Cep	URQM	AQ7
LS5	708	754	Cep	URQM	QA6
LS5	754	844	Cep	URQF	AQ7
LS5	844	902	Cel	IY<X	AC3
LS6	0	118	Cel	LF>B	HO7
LS6	118	119		FALT	
LS6	119	138	Cep	LF>C	SO8
LS6	138	230	Cel	LFFC	SO8
LS6	230	245	Cep	LFFB	SO7
LS6	245	257	Cep	LFFB	H$6
LS6	257	271		FALT	SO7
LS6	271	348	Cel	LFQF	OS7
LS6	348	372		FALT	
LS6	372	470	Cel	LFQF	OS7

Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Geology

Hole Id	Depth From (ft)	Depth To (ft)	Formation Code	Rock Code	Alteration Code
LS6	470	530		FALT	
LS6	530	625	Cel	LFQF	OQ8
LS6	625	654	Cel	LFQF	OM7
LS6	654	685	Cel	LFQF	QO7
LS6	685	740	Cep	LRQF	OA6
LS6	740	780	Cep	LRQF	O$7
LS6	780	868	Cep	LRQF	O$7
LS6	868	973	Cep	LRQM	OA6
LS6	973	1000	Cep	IYXC	A2
LS7	0	75	Cev	NO CORE	
LS7	75	136	Cev	VDLM	OQ3
LS7	136	318	Cev	VDXC	OQ2
LS7	318	324		VEIN	
LS7	324	451	Cev	VDXC	OQ2
LS7	451	543	Ces	VDXB	OQ3
LS7	543	558	Cess	VDLV	O6
LS7	558	564	Ces	VDXB	OS6
LS7	564	577	Cess	VDLV	O6
LS7	577	610	Ces	VDXB	OQ4
LS7	610	618	Cess	VDLV	OQ6
LS7	618	640	Ces	VDXB	OQ4
LS7	640	655	Cess	VLLV	OQ6
LS7	655	679	Ces	VDXB	QO5
LS7	679	689	Cess	VDLV	OQ6
LS7	689	708	Ces	VDXB	QO5
LS7	708	718	Cess	VDLV	OQ6
LS7	718	732	Ces	VDXB	QO5
LS7	732	777	Ces	VDXM	QO5
LS7	777	788		FALT	
LS7	788	857	Cep	LDQF	QO4
LS7	857	880		FALT	
LS7	880	912	Cep	LDQF	QO4
LS7	912	1005	Cel	LYQF	SO4
LS7	1005	1091	Cel	LRQF	SQ4
LS7	1091	1195	Cev	VDQM	OS4
LS7	1195	1200		FALT	
LS7	1200	1272	Cev	VD>F	OS7
LS7	1272	1278		FALT	
LS7	1278	1347	COou	CONG	HQ6

Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Geology

Hole Id	Depth From (m)	Depth To (m)	Formation Code	Rock Code	Alteration Code
LS8	0.00	8.80	Q		
LS8	8.80	23.60	Cep	IRXB	OS5
LS8	23.60	25.20	Cess	VRQV	OS7
LS8	25.20	58.00	Ces	VRXL	OS7
LS8	58.00	60.50		FALT	
LS8	60.50	151.40	Ces	VRQV	SO8
LS8	151.40	151.60	Cess	VRQV	OS8
LS8	151.60	171.40	Ces	VRQV	SO8
LS8	171.40	221.00	Ces	VRXL	SO8
LS8	221.00	225.90	Cel	VRQB	SO8
LS8	225.90	226.40		FALT	MP
LS8	226.40	292.20	Ctc	LYLX	OS8
LS8	292.20	302.00	Ctc	VYLX	SO8
LS8	302.00	355.20	Ctc	VYLX	SO8
LS9	0.00	11.20	Cev	VRLB	HO7
LS9	11.20	26.30	Cep	LRRB	HQ6
LS9	26.30	42.00	Cev	VDXI	OQ5
LS9	42.00	49.20	Cev	VDAB	HQ8
LS9	49.20	76.00	Cev	VDXM	OQ5
LS9	76.00	81.00		FALT	
LS9	81.00	86.60	Ces	UDAA	SO4
LS9	86.60	87.20		VEIN	
LS9	87.20	103.10	Ces	VDVF	HO5
LS9	103.10	104.70	Ces	VDVF	K8
LS9	104.70	108.00	Ces	VDVF	HO5
LS9	108.00	120.20	Cev	VDLX	OQ6
LS9	120.20	124.80	Cev	VDVF	HS8
LS9	124.80	126.00		FALT	
LS9	126.00	139.20	Cev	VDLX	OS5
LS9	139.20	184.60	Ces	UDVX	OQ4
LS9	184.60	187.80		FALT	
LS9	187.80	191.40	Cev	VDLX	OQ8
LS9	191.40	194.10		FALT	
LS9	194.40	205.00	Cev	VDLX	O7
LS9	205.00	207.20		FALT	
LS9	207.00	283.70	Ces	VDXF	OQ7
LS9	283.70	290.00	Ces	VDRF	CS5
LS9	290.00	292.00		FALT	
LS9	292.00	303.00	Coou	CONG	
LS10	0.00	34.80	Ctc	CONG	HL8
LS10	34.80	84.50	Cel	LR<M	HO6
LS10	84.50	90.00		FALT	HL5
LS10	90.00	127.20	Cev	VR>M	QS6
LS10	127.20	154.80	Cel	LRQM	QS5
LS10	154.80	202.50	Ces	VRQF	OQ4
LS10	202.50	224.20	Ces	VRQV	QO4
LS10	224.20	244.90	Cess	VRQV	QO4
LS10	244.90	257.10	Ces	VRQV	QS6

Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Geology

Hole Id	Depth From (m)	Depth To (m)	Formation Code	Rock Code	Alteration Code
LS10	257.10	259.00	Cess	VRQV	QO4
LS10	259.00	264.50	Ces	VRQV	QS6
LS10	264.50	267.10	Cev	VRQF	QS5
LS10	267.10	279.80	Ces	VRQV	QS6
LS10	279.80	299.00	Cev	VRQM	QO5
LS10	299.00	335.50	Ces	VRXF	QS5
LS10	335.50	336.60		VEIN	
LS10	336.60	338.50	Cess	VRQV	OQ6
LS10	338.50	353.60	Cev	VDQM	OQ7
LS10	353.60	356.50	Cep	LRQM	QH6
LS10	356.50	388.50	Cev	VDQM	OQ7
LS11	0.00	6.00	Q		
LS11	6.00	62.00	Cev	ER>	S
LS11	62.00	89.00	Cev	ERX>	SA
LS11	89.00	90.50		FALT	
LS11	90.50	107.00	Ces	LRAA	AH
LS11	107.00	326.60	Cep	VY	
LS11	326.60	364.00	Cev	VY	H
LS11	364.00	365.00		FALT	
LS11	365.00	422.30	Cev	VY	H
LS12	0.00	4.50	Q		
LS12	4.50	10.00	Ctc	VYAB	HL6
LS12	10.00	100.20	Cev	VYLB	HO6
LS12	100.20	122.60	Ces	VYLF	OH6
LS12	122.60	127.30	Ces	VYLF	H8
LS12	127.30	186.00	Cev	VYLV	SH6
LS12	186.00	200.00	Ces	VYLF	OH6
LS12	200.00	216.00		FALT	
LS12	216.00	248.80	Ces	VYAF	HQ6
LS12	248.80	277.00	Cg	IR>M	HA5
LS12	277.00	279.00		FALT	
LS12	279.00	330.00	Cg	IRQC	OS5
LS13	0.00	89.70	Cev	EDLM	LO4
LS13	89.70	96.60	Cev	EDLC	L8
LS13	96.60	115.00	Cev	EDLF	O3
LS13	115.00	159.60	Cev	EDQM	OC3
LS13	159.60	163.60		VEIN	
LS13	163.60	228.20	Cev	EDQF	OC4
LS13	228.20	231.90		VEIN	
LS13	231.90	298.00	Cev	EDQF	OC5
LS13	298.00	361.00	Cev	EDQF	OC4
LS13	361.00	418.00	Cep	LDQB	OS3
LS13	418.00	460.00	Cev	VDQB	OS3
LS13	460.00	473.00	Cep	LDQF	OS3
LS13	473.00	490.00	Cep	V	S3
LS13	490.00	502.60	Cep	L	S3

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Geology

Hole Id	Depth From (m)	Depth To (m)	Formation Code	Rock Code	Alteration Code
LS14	0.00	22.70	Ctc	CONG	HQ8
LS14	22.70	45.90	Cel	LR>M	HQ7
LS14	45.90	51.00		VEIN	
LS14	51.00	53.00		FALT	
LS14	53.00	85.60	Cel	LR>M	HQ7
LS14	85.60	101.80	Cel	LRQM	OQ8
LS14	101.80	106.30	Ces	VR>A	OQ7
LS14	106.30	118.50	Ces	VR>V	OQ7
LS14	118.50	127.40	Ces	VR>A	OQ7
LS14	127.40	136.40	Ces	VR>V	OQ7
LS14	136.40	161.10	Ces	VR>A	OQ7
LS14	161.10	196.60	Cess	URAV	OS5
LS14	196.60	206.70	Ces	VR>A	OS5
LS14	206.70	220.00	Cev	UD>F	SQ6
LS14	220.00	244.40	Cev	UD>F	SQ6
LS14	244.40	246.50	Cev	VR>C	SA4
LS14	246.50	255.30	Cev	UD>F	OQ5
LS14	255.30	265.40	Cev	UD>F	SQ6
LS14	265.40	268.00		FALT	
LS14	268.00	273.60	Cev	UD>F	SQ6
LS14	273.60	276.10		FALT	
LS14	276.10	286.40	Ces	VDQA	OQ5
LS14	286.40	303.50	Ces	VD>A	OQ6
LS14	303.50	349.50	Cep	IR>C	QA3

Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Survey Data

Hole Id	Depth (ft)	Local Azimuth (Mag)	Regional Azimuth AMG	Dip (°)
LS1	0	243	255	-45
LS1	69	242	254	-42
LS1	91	238	250	-42
LS1	114	251	263	-41
LS1	137	252	264	-40
LS1	160	252	264	-38
LS1	183	251	263	-36
LS1	206	252	264	-31
LS1	228	250	262	-29.5
LS1	251	251	263	-28
LS1	274	250	262	-27
LS1	297	250	262	-27
LS1	320	250	262	-27
LS1	343	251	263	-25
LS1	365	252	264	-24
LS1	388	256	268	-23.5
LS1	411	254	266	-23
LS2	0	54	66	-55
LS2	60	72	84	-53.5
LS2	80	73	85	-53.5
LS2	100	73	85	-53.5
LS2	120	73	85	-53
LS2	140	73	85	-53
LS2	160	74	86	-52
LS2	180	74	86	-52
LS2	200	75	87	-50
LS2	220	75	87	-49
LS2	240	75	87	-48.5
LS2	260	74	86	-48
LS2	280	74	86	-47
LS2	300	76	88	-45
LS2	320	76	88	-43.5
LS2	340	76	88	-41
LS2	360	77	89	-38
LS2	380	77	89	-35
LS2	400	78	90	-31
LS2	420	84	96	-27
LS2	440	78	90	-26
LS2	460	77	89	-23
LS2	480	77	89	-19.5
LS2	500	78	90	-16
LS2	520	78	90	-13
LS2	540	78	90	-10
LS2	560	78	90	-8
LS2	580	92	104	-5.5
LS2	600	75	87	-3.5
LS2	620	75	87	-1.5
LS2	640	76	88	-0.01
LS2	660	75	87	-0.01

Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Survey Data

Hole Id	Depth (ft)	Local Azimuth (Mag)	Regional Azimuth AMG	Dip (°)
LS2	680	74	86	-0.01
LS2	700	74	86	-0.01
LS3	0	270	282	-57
LS3	80	269	281	-56
LS3	100	270	282	-55
LS3	120	269	281	-54.5
LS3	140	268	280	-53.5
LS3	160	266	278	-52
LS3	180	266	278	-52
LS3	200	266	278	-52
LS3	220	266	278	-51
LS3	240	266	278	-51
LS3	260	266	278	-50
LS3	280	266	278	-49.5
LS3	300	265	277	-49
LS3	320	265	277	-48
LS3	340	264	276	-47
LS3	360	264	276	-45
LS3	380	263	275	-43
LS3	400	263	275	-42
LS3	420	262	274	-42
LS3	440	262	274	-37
LS3	460	282	294	-35
LS3	480	282	294	-33
LS3	500	282	294	-31
LS3	520	263	275	-30
LS3	540	262	274	-29
LS3	560	265	277	-28
LS3	580	262	274	-26
LS3	600	261	273	-26
LS3	620	261	273	-25
LS3	640	260	272	-24
LS3	660	260	272	-23.5
LS3	680	260	272	-23
LS3	700	260	272	-21
LS3	720	260	272	-20
LS3	740	258	270	-19
LS3	780	260	272	-18
LS3	800	259	271	-17
LS3	820	259	271	-16
LS3	840	259	271	-15
LS3	860	259	271	-14
LS3	880	258	270	-13.5
LS3	900	257	269	-14
LS3	920	257	269	-13
LS4	0	274	286	-58
LS4	15	248	260	-58
LS4	35	250	262	-58

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Survey Data

Hole Id	Depth (ft)	Local Azimuth (Mag)	Regional Azimuth AMG	Dip (°)
LS4	55	252	264	-57.5
LS4	75	254	266	-56
LS4	95	252	264	-55
LS4	115	254	266	-54
LS4	135	255	267	-53.5
LS4	155	255	267	-53
LS4	175	255	267	-53
LS4	195	255	267	-52
LS4	215	255	267	-52
LS4	235	256	268	-52
LS4	255	256	268	-52
LS4	275	256	268	-52
LS4	295	256	268	-51
LS4	320	255	267	-50.5
LS4	340	255	267	-50.5
LS4	360	254	266	-50
LS4	380	254	266	-50
LS4	400	255	267	-49
LS4	420	255	267	-48.5
LS4	440	255	267	-48
LS4	460	254	266	-47.5
LS4	480	254	266	-46.5
LS4	500	254	266	-46
LS4	520	252	264	-45
LS4	540	254	266	-44.5
LS4	560	252	264	-44
LS4	580	254	266	-42
LS4	600	252	264	-42
LS4	620	251	263	-40
LS4	640	250	262	-39
LS4	660	250	262	-38
LS4	680	250	262	-38
LS4	700	255	267	-37
LS4	720	250	262	-35
LS4	740	250	262	-35
LS4	760	249	261	-34
LS4	780	249	261	-34
LS4	800	249	261	-35
LS4	820	249	261	-35
LS4	840	249	261	-35
LS4	860	248	260	-34
LS4	880	248	260	-34
LS4	900	248	260	-32
LS4	920	248	260	-31.5
LS4	940	249	261	-31
LS4	960	251	263	-30
LS4	980	294	306	-29.5
LS4	1000	262	274	-29
LS4	1020	253	265	-29

Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Survey Data

Hole Id	Depth (ft)	Local Azimuth (Mag)	Regional Azimuth AMG	Dip (°)
LS5	0	62	62	-54.25
LS5	300	53	65	-51
LS5	320	51	63	-50.5
LS5	340	53	65	-50
LS5	360	66	78	-49
LS5	380	59	71	-48
LS5	400	66	78	-48
LS5	420	66	78	-47
LS5	440	71	83	-46.5
LS5	460	53	65	-46
LS5	480	56	68	-45
LS5	500	59	71	-45
LS5	520	61	73	-44
LS5	540	62	74	-44
LS5	560	62	74	-43
LS5	580	62	74	-43
LS5	600	63	75	-42
LS5	620	63	75	-41
LS5	640	64	76	-41
LS5	660	63	75	-40
LS5	680	69	81	-40
LS5	700	65	77	-40
LS5	720	64	76	-39.5
LS5	740	64	76	-39
LS5	760	64	76	-38.5
LS5	780	65	77	-38
LS5	800	63	75	-37.5
LS5	820	63	75	-37
LS5	840	63	75	-36.5
LS5	860	63	75	-36.5
LS5	880	63	75	-35.5
LS5	890	64	76	-35
LS6	0	61	73	-52.25
LS6	80	68	80	-51.5
LS6	100	67	79	-51.5
LS6	120	66	78	-51
LS6	140	63	75	-50
LS6	160	61	73	-50
LS6	200	62	74	-48.5
LS6	220	63	75	-48
LS6	240	61	73	-47.5
LS6	260	67	79	-47
LS6	280	68	80	-47
LS6	300	69	81	-46
LS6	320	66	78	-45
LS6	340	64	76	-45
LS6	360	67	79	-45
LS6	380	66	78	-44
LS6	400	71	83	-43.5

EL 19/98 ANTHONY : SELINA AREA

Appendix I

Drillhole Data
Survey Data

Hole Id	Depth (ft)	Local Azimuth (Mag)	Regional Azimuth AMG	Dip (°)
LS6	420	71	83	-43
LS6	440	71	83	-42
LS6	460	73	85	-41
LS6	480	71	83	-40
LS6	500	71	83	-40
LS6	520	72	84	-39
LS6	540	75	87	-38.5
LS6	560	69	81	-38
LS6	580	79	91	-37.5
LS6	600	80	92	-37
LS6	620	77	89	-37
LS6	640	86	98	-36
LS6	660	93	105	-35
LS6	680	84	96	-35
LS6	700	77	89	-34
LS6	720	78	90	-33.5
LS6	740	75	87	-33
LS6	760	67	79	-32.5
LS6	800	79	91	-31
LS6	820	79	91	-30
LS6	840	76	88	-29.5
LS6	860	78	90	-30
LS6	880	78	90	-28
LS6	900	78	90	-27
LS6	920	82	94	-26.5
LS6	940	76	88	-26
LS6	960	86	98	-25
LS6	980	85	97	-25
LS6	995	84	96	-24
LS7	0	241	253	-65.5
LS7	20	241	253	-70
LS7	40	243	255	-70
LS7	60	244	256	-70
LS7	80	244	256	-70
LS7	100	243	255	-69
LS7	120	243	255	-68.5
LS7	140	242	254	-68
LS7	160	242	254	-68
LS7	180	242	254	-67
LS7	200	242	254	-67
LS7	220	243	255	-66
LS7	240	243	255	-65
LS7	260	243	255	-64.5
LS7	280	243	255	-64
LS7	300	245	257	-63
LS7	320	245	257	-63
LS7	340	245	257	-63
LS7	360	245	257	-62
LS7	380	246	258	-61

Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Survey Data

Hole Id	Depth (ft)	Local Azimuth (Mag)	Regional Azimuth AMG	Dip (°)
LS7	400	246	258	-60
LS7	420	246	258	-59
LS7	440	245	257	-58.5
LS7	460	246	258	-58
LS7	480	246	258	-58
LS7	500	246	258	-57.5
LS7	520	246	258	-56
LS7	540	246	258	-55
LS7	560	246	258	-54
LS7	580	246	258	-53
LS7	600	245	257	-52
LS7	620	247	259	-51.5
LS7	640	248	260	-51.5
LS7	660	248	260	-50
LS7	680	248	260	-49
LS7	700	248	260	-48.5
LS7	720	248	260	-48
LS7	740	248	260	-47.5
LS7	760	248	260	-46.5
LS7	780	250	262	-46
LS7	789	250	262	-46
LS7	800	242	254	-45.5
LS7	820	247	259	-45
LS7	840	248	260	-45
LS7	860	249	261	-44
LS7	880	249	261	-44
LS7	900	248	260	-43.5
LS7	920	250	262	-43
LS7	940	250	262	-42.5
LS7	960	249	261	-42
LS7	980	249	261	-41.5
LS7	1000	250	262	-41
LS7	1020	250	262	-41
LS7	1040	250	262	-41
LS7	1060	250	262	-41
LS7	1080	250	262	-41
LS7	1100	250	262	-40.5
LS7	1120	250	262	-40
LS7	1140	250	262	-40
LS7	1160	250	262	-40
LS7	1180	250	262	-39
LS7	1200	250	262	-39
LS7	1220	250	262	-38.5
LS7	1240	250	262	-38
LS7	1260	250	262	-38

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Survey Data

Hole Id	Depth (m)	Local Azimuth (Mag)	Regional Azimuth AMG	Dip (°)
LS8	0.00	250	250	-60
LS8	115.00	249	249	-52
LS8	145.00	250	250	-50.5
LS8	175.00	248	248	-49
LS8	205.00	247	247	-48
LS8	235.00	246	246	-46.5
LS8	255.00	246	246	-45
LS8	265.00	245	245	-44.5
LS8	295.00	244	244	-43
LS8	325.00	243	243	-41
LS8	355.00	242	242	-38
LS9	0.00	254	254	-65
LS9	46.00	254	254	-63
LS9	78.00	255	255	-62
LS9	103.00	249	249	-62
LS9	148.00	250	250	-61
LS9	253.00	256	256	-59.5
LS9	302.00	249	249	-58
LS10	0.00	77	77	-68
LS10	56.00	82	82	-64.5
LS10	110.00	87	87	-62
LS10	161.00	92	92	-60
LS10	212.00	93	93	-57
LS10	299.00	95	95	-50
LS11	0.00	278	278	-50
LS11	72.00	268	268	-50
LS11	118.00	269	269	-47.5
LS11	180.00	273	273	-45
LS11	240.00	267	267	-42.5
LS11	300.00	268	268	-40
LS11	351.80	271	271	-38.5
LS11	421.00	274	274	-34
LS12	0.00	264	264	-50
LS12	49.00	263	263	-47.5
LS12	100.00	252	252	-41
LS12	151.00	247	247	-40
LS12	199.00	267	267	-38
LS12	250.00	266	266	-34.5
LS12	298.00	266	266	-30
LS12	328.00	266	266	-29
LS13	0.00	283	283	-50
LS13	40.00	279	279	-47.5
LS13	79.00	280	280	-46
LS13	118.00	281	281	-45
LS13	157.00	282	282	-42.5

598083

Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Survey Data

Hole Id	Depth (m)	Local Azimuth (Mag)	Regional Azimuth AMG	Dip (°)
LS13	196.00	280	280	-40
LS13	235.00	280	280	-38
LS13	274.00	279	279	-35
LS13	313.00	279	279	-33.5
LS13	352.00	279	279	-33.5
LS13	391.00	282	282	-32
LS13	430.00	283	283	-31.5
LS13	469.00	280	280	-30
LS13	502.00	279	279	-29
LS14	0.00	50	50	-65
LS14	50.00	51	51	-59
LS14	100.00	52	52	-53
LS14	150.00	53	53	-50
LS14	200.00	59	59	-45
LS14	250.00	61	61	-40
LS14	300.00	57	57	-32
LS14	345.00	58	58	-30

EL 19/98 ANTHONY : SELINA AREA

Appendix I

Drillhole Data
Assay Results

Sample No	Samp_ Type	Hole_ Id	Depth_ From (ft)	Depth_To (ft)	CU_A : ppm	AU : OZ	AG : OZ	PB_A: ppm	ZN_A: ppm	S %	CU_A : %	AU :OZ	AG : OZ	PB_A: %	ZN_A: %	FeS_2 %
LS1-001	?core	LS1	75	80	5700			100	400		0.57			0.01	0.04	
LS1-002	?core	LS1	80	85	700			100	400		0.07			0.01	0.04	
LS1-003	?core	LS1	85	90	700			300	300		0.07			0.03	0.03	
LS1-004	?core	LS1	90	95	700			200	200		0.07			0.02	0.02	
LS1-005	?core	LS1	95	100	1600			-100	100		0.16			<0.01	0.01	
LS1-006	?core	LS1	100	105	300				200		0.03				0.02	
LS1-007	?core	LS1	105	110	300				300		0.03				0.03	
LS1-008	?core	LS1	110	115	300				200		0.03				0.02	
LS1-009	?core	LS1	115	120	300				200		0.03				0.02	
LS1-010	?core	LS1	120	125	300				200		0.03				0.02	
LS1-011	?core	LS1	125	130	200				100		0.02				0.01	
LS1-012	?core	LS1	130	135	200				200		0.02				0.02	
LS1-013	?core	LS1	135	140	200				200		0.02				0.02	
LS1-014	?core	LS1	140	145	200				0		0.02				0	
LS1-015	?core	LS1	145	150	200				100		0.02				0.01	
LS1-016	?core	LS1	150	155	300				100		0.03				0.01	
LS1-017	?core	LS1	155	160	400				200		0.04				0.02	
LS1-018	?core	LS1	160	165	300				100		0.03				0.01	
LS1-019	?core	LS1	165	170	1200			3200	100		0.12			0.32	0.01	
LS1-020	?core	LS1	170	175	500			-100	200		0.05			<0.01	0.02	
LS1-021	?core	LS1	265	270	200			-100	200	3.42	0.02			<0.01	0.02	6.4
LS1-022	?core	LS1	270	275	600			-100	300	3.21	0.06			<0.01	0.03	6
LS1-023	?core	LS1	275	280	300			-100	100	3.79	0.03			<0.01	0.01	7.1
LS1-024	?core	LS1	280	285	100			-100	400	1.87	0.01			<0.01	0.04	3.5
LS1-025	?core	LS1	285	290	500			-100	300	2.83	0.05			<0.01	0.03	5.3
LS1-026	?core	LS1	290	295	1000			-100	300	1.60	0.1			<0.01	0.03	3
LS1-027	?core	LS1	295	300	600			100	300	1.66	0.06			0.01	0.03	3.1
LS1-028	?core	LS1	300	305	1000			300	400	3.79	0.1			0.03	0.04	7.1
LS1-029	?core	LS1	305	310	1600			300	1500	1.60	0.16			0.03	0.15	3
LS2-001	?core	LS2	565	570	1300			100	600	0	0.13			0.01	0.06	0
LS2-002	?core	LS2	570	575	1600			100	600	0.59	0.16			0.01	0.06	1.1
LS2-003	?core	LS2	575	580	2400			100	500	0.00	0.24			0.01	0.05	0
LS2-004	?core	LS2	580	585	2200			0	400	0.48	0.22			0	0.04	0.9
LS2-005	?core	LS2	585	590	800			100	500	1.02	0.08			0.01	0.05	1.9
LS2-006	?core	LS2	590	595	1200			0	100	0.00	0.12			0	0.01	0
LS2-007	?core	LS2	595	600	1500			100	100	0.00	0.15			0.01	0.01	0
LS2-008	?core	LS2	600	605	2100			500	700	0.80	0.21			0.05	0.07	1.5
LS2-009	?core	LS2	605	610	700			200	400	0.69	0.07			0.02	0.04	1.3
LS2-010	?core	LS2	610	615	1200			100	200	0.80	0.12			0.01	0.02	1.5
LS2-011	?core	LS2	615	620	4500			0	200	1.92	0.45			0	0.02	3.6
LS2-012	?core	LS2	620	625	2200			100	200	4.28	0.22			0.01	0.02	8
LS2-013	?core	LS2	625	630	1100			100	400	0.59	0.11			0.01	0.04	1.1
LS2-014	?core	LS2	630	635	500			100	500	0.00	0.05			0.01	0.05	0
LS2-015	?core	LS2	635	640	700			200	800	0.59	0.07			0.02	0.08	1.1
LS2-016	?core	LS2	640	645	500			300	1400	0.00	0.05			0.03	0.14	0
LS2-017	?core	LS2	645	650	800			400	3100	1.12	0.08			0.04	0.31	2.1
LS2-018	?core	LS2	650	655	500			200	1100	0.86	0.05			0.02	0.11	1.6
LS2-019	?core	LS2	655	660	700			100	700	0.43	0.07			0.01	0.07	0.8
LS2-020	?core	LS2	660	665	1500			300	600	0.21	0.15			0.03	0.06	0.4
LS2-021	?core	LS2	665	670	1500			500	1300	0.00	0.15			0.05	0.13	0
LS2-022	?core	LS2	670	675	800			200	1000	0.53	0.08			0.02	0.1	1
LS2-023	?core	LS2	675	680	1500			600	1100	0.00	0.15			0.06	0.11	0
LS2-024	?core	LS2	680	685	400			900	1400	0.00	0.04			0.09	0.14	0
LS2-025	?core	LS2	685	695	100			200	700	2.41	0.01			0.02	0.07	4.5
LS2-026	?core	LS2	695	700	400			100	600	0.43	0.04			0.01	0.06	0.8
LS2-027	?core	LS2	700	705	200			100	500	0.00	0.02			0.01	0.05	0
LS2-028	?core	LS2	705	710	100			100	300	0.00	0.01			0.01	0.03	0
LS2-029	?core	LS2	710	715	200			100	300	0.32	0.02			0.01	0.03	0.6
LS2-030	?core	LS2	715	720	100			100	200	0.00	0.01			0.01	0.02	0
LS2-031	?core	LS2	720	725	100			100	200	0.00	0.01			0.01	0.02	0
LS2-032	?core	LS2	725	730	100			100	300	0.00	0.01			0.01	0.03	0
LS2-033	?core	LS2	730	735	100			300	600	0.11	0.01			0.03	0.06	0.2
LS2-034	?core	LS2	735	740	1000			0	1500	0.50	0.1			0	0.15	0.94
LS2-035	?core	LS2	740	745	100			300	1600	0.10	0.01			0.03	0.16	0.19
LS2-036	?core	LS2	745	750	100			300	1500	0.20	0.01			0.03	0.15	0.37
LS2-037	?core	LS2	750	755	200			500	900	0.10	0.02			0.05	0.09	0.19
LS2-038	?core	LS2	755	760	100			100	200	0.20	0.01			0.01	0.02	0.37
LS2-039	?core	LS2	760	765	200			300	1000	0.40	0.02			0.03	0.1	0.75
LS2-040	?core	LS2	765	770	700			300	400	0.10	0.07			0.03	0.04	0.19
LS2-041	?core	LS2	770	776	100			100	1600	0.29	0.01			0.01	0.16	0.55

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Assay Results

Sample No	Samp_ Type	Hole_ Id	Depth_ From (ft)	Depth_To (ft)	CU_A : ppm	AU : OZ	AG : OZ	PB_A: ppm	ZN_A: ppm	S %	CU_A : %	AU :OZ	AG : OZ	PB_A: %	ZN_A: %	FeS$_2$ %
LS3-001	?core	LS3	210	215	300			400	1100	0.70	0.03			0.04	0.11	1.31
LS3-002	?core	LS3	215	220	300			1600	3100	0.40	0.03			0.16	0.31	0.75
LS3-003	?core	LS3	220	225	300			0	1600	0.80	0.03			0	0.16	1.5
LS3-004	?core	LS3	225	230	300			0	600	1.80	0.03			0	0.06	3.37
LS3-005	?core	LS3	230	235	300			0	700	1.00	0.03			0	0.07	1.87
LS3-006	?core	LS3	235	240	600			0	700	1.00	0.06			0	0.07	1.87
LS3-007	?core	LS3	240	245	200			0	800	0.20	0.02			0	0.08	0.37
LS3-008	?core	LS3	245	250	300			0	800	0.10	0.03			0	0.08	0.19
LS3-009	?core	LS3	250	255	600			0	1000	0.10	0.06			0	0.1	0.19
LS3-010	?core	LS3	255	260	4000			1900	1500	0.20	0.4			0.19	0.15	0.37
LS3-011	?core	LS3	260	265	1000			4900	1200	0.20	0.1			0.49	0.12	0.37
LS3-012	?core	LS3	265	270	1700			11600	2000	0.80	0.17			1.16	0.2	1.5
LS3-013	?core	LS3	270	275	3000			2500	1900	1.20	0.3			0.25	0.19	2.25
LS3-014	?core	LS3	275	280	7400			21300	1600	0.60	0.74			2.13	0.16	1.12
LS3-015	?core	LS3	280	285	2200			700	1300	0.50	0.22			0.07	0.13	0.94
LS3-016	?core	LS3	285	290	1600			3900	1300	0.50	0.16			0.39	0.13	0.94
LS3-017	?core	LS3	290	295	100			0	600	0.49	0.01			0	0.06	0.91
LS3-018	?core	LS3	295	300	200			8600	800	0.09	0.02			0.86	0.08	0.17
LS3-019	?core	LS3	300	305	100			0	1200	0.60	0.01			0	0.12	1.12
LS3-020	?core	LS3	305	310	200			1000	2000	0.26	0.02			0.1	0.2	0.49
LS3-021	?core	LS3	310	315	600			1200	1300	0.20	0.06			0.12	0.13	0.37
LS3-022	?core	LS3	315	320	400			1600	1600	0.10	0.04			0.16	0.16	0.19
LS3-023	?core	LS3	320	325	500			900	1800	0.00	0.05			0.09	0.18	0
LS3-024	?core	LS3	325	330	100			400	1000	0.40	0.01			0.04	0.1	0.75
LS3-025	?core	LS3	330	335	200			500	2100	0.40	0.02			0.05	0.21	0.75
LS3-026	?core	LS3	335	340	400			400	900	0.60	0.04			0.04	0.09	1.12
LS3-027	?core	LS3	340	345	200			500	600	0.60	0.02			0.05	0.06	1.12
LS3-028	?core	LS3	345	350	100			400	600	0.29	0.01			0.04	0.06	0.55
LS3-029	?core	LS3	350	355	200			400	400	0.50	0.02			0.04	0.04	0.94
LS3-030	?core	LS3	355	360	2600			300	1800	0.20	0.26			0.03	0.18	0.37
LS3-031	?core	LS3	360	365	1300			10100	1500	0.70	0.13			1.01	0.15	1.31
LS3-032	?core	LS3	365	370	900			200	700	1.20	0.09			0.02	0.07	2.25
LS3-033	?core	LS3	370	375	600			100	600	0.50	0.06			0.01	0.06	0.94
LS3-034	?core	LS3	375	380	800			0	800	0.40	0.08			0	0.08	0.75
LS3-035	?core	LS3	380	385	300			100	800	0.20	0.03			0.01	0.08	0.37
LS3-036	?core	LS3	385	390	500			0	1100	0.20	0.05			0	0.11	0.37
LS3-037	?core	LS3	390	395	600			200	400	0.20	0.06			0.02	0.04	0.37
LS3-038	?core	LS3	395	400	800			0	600	0.29	0.08			0	0.06	0.55
LS3-039	?core	LS3	400	405	1000			200	700	0.00	0.1			0.02	0.07	0
LS3-040	?core	LS3	405	410	1000			700	700	0.50	0.1			0.07	0.07	0.94
LS3-041	?core	LS3	410	415	500			200	1600	0.40	0.05			0.02	0.16	0.75
LS3-042	?core	LS3	415	420	1000			900	1300	0.29	0.1			0.09	0.13	0.55
LS3-043	?core	LS3	420	425	600			400	1700	0.50	0.06			0.04	0.17	0.94
LS3-044	?core	LS3	425	430	1000			400	1700	0.50	0.1			0.04	0.17	0.94
LS3-045	?core	LS3	430	435	500			700	1000	0.10	0.05			0.07	0.1	0.19
LS3-046	?core	LS3	435	440	200			1000	1800	0.10	0.02			0.1	0.18	0.19
LS3-047	?core	LS3	440	445	1400			800	1800	0.29	0.14			0.08	0.18	0.55
LS3-048	?core	LS3	445	450	6000			900	1800	0.00	0.6			0.09	0.18	0
LS3-049	?core	LS3	450	455	900			1600	1600	0.80	0.09			0.16	0.16	1.5
LS3-050	?core	LS3	455	460	100			600	800	0.40	0.01			0.06	0.08	0.75
LS3-051	?core	LS3	460	465	200			800	600	0.00	0.02			0.08	0.06	0
LS3-052	?core	LS3	465	470	200			1200	1200	0.70	0.02			0.12	0.12	1.31
LS3-053	?core	LS3	470	475	500			500	600	0.10	0.05			0.05	0.06	0.19
LS3-054	?core	LS3	475	480	200			100	900	0.29	0.02			0.01	0.09	0.55
LS3-055	?core	LS3	480	485	200			100	200	0.80	0.02			0.01	0.02	1.5
LS3-056	?core	LS3	485	490	200			300	1000	0.50	0.02			0.03	0.1	0.94
LS3-057	?core	LS3	490	495	100			500	400	0.00	0.01			0.05	0.04	0
LS3-058	?core	LS3	495	500	1100			300	1500	0.20	0.11			0.03	0.15	0.37
LS3-059	?core	LS3	500	505	500						0.05					
LS3-060	?core	LS3	505	510	500						0.05					
LS3-061	?core	LS3	510	515	400						0.04					
LS3-062	?core	LS3	515	520	400						0.04					
LS3-063	?core	LS3	520	525	120			110	240	0.05	0.012			0.011	0.024	0.1
LS3-064	?core	LS3	525	530	270			330	350	0.10	0.027			0.033	0.035	0.18
LS3-065	?core	LS3	530	535	130			410	380	0.20	0.013			0.041	0.038	0.37
LS3-066	?core	LS3	535	540	280			280	270	0.10	0.028			0.028	0.027	0.18
LS3-067	?core	LS3	540	545	-100			210	160	0.05	<0.01			0.021	0.016	0.1
LS3-068	?core	LS3	545	550	100			580	520	0.00	0.01			0.058	0.052	0
LS3-069	?core	LS3	550	555	120			330	980	0.00	0.012			0.033	0.098	0
LS3-070	?core	LS3	555	560	170			170	270	0.07	0.017			0.017	0.027	0.13

EL 19/98 ANTHONY : SELINA AREA

Appendix I

Drillhole Data

Assay Results

Sample No	Samp_ Type	Hole_ Id	Depth_ From (ft)	Depth_To (ft)	CU_A : ppm	AU : OZ	AG : OZ	PB_A: ppm	ZN_A: ppm	S %	CU_A : %	AU :OZ	AG : OZ	PB_A: %	ZN_A: %	FeS_2 %
LS3-071	?core	LS3	560	565	-100			390	830	0.00	<0.01			0.039	0.083	0
LS3-072	?core	LS3	565	570	100			350	920	0.00	0.01			0.035	0.092	0
LS3-073	?core	LS3	570	575	-100			1000	780	0.00	<0.01			0.1	0.078	0
LS3-074	?core	LS3	575	580	1660			290	270	0.78	0.166			0.029	0.027	1.46
LS3-075	?core	LS3	580	585	190			650	1500	1.40	0.019			0.065	0.15	2.62
LS3-076	?core	LS3	585	590	830			490	1200	0.40	0.083			0.049	0.12	0.75
LS3-077	?core	LS3	590	595	300			400	800	0.22	0.03			0.04	0.08	0.42
LS3-078	?core	LS3	595	600	200			-100	200	0.05	0.02			<0.01	0.02	0.09
LS3-079	?core	LS3	600	605	300			300	400	0.05	0.03			0.03	0.04	0.1
LS3-080	?core	LS3	605	610	700			200	200	0.15	0.07			0.02	0.02	0.28
LS3-081	?core	LS3	610	615	300			300	800	0.07	0.03			0.03	0.08	0.13
LS3-082	?core	LS3	615	620	400			1500	1500	0.03	0.04			0.15	0.15	0.05
LS3-083	?core	LS3	620	625	1000			900	1200	0.24	0.1			0.09	0.12	0.44
LS3-084	?core	LS3	625	630	300			1200	2000	0.12	0.03			0.12	0.2	0.22
LS3-085	?core	LS3	630	635	700			300	100	0.05	0.07			0.03	0.01	0.09
LS3-086	?core	LS3	635	640	900			200	100	0.03	0.09			0.02	0.01	0.05
LS3-087	?core	LS3	640	645	300			400	300	0.08	0.03			0.04	0.03	0.15
LS3-088	?core	LS3	645	650	500			500	100	0.07	0.05			0.05	0.01	0.13
LS3-089	?core	LS3	650	655	100			1700	2000	0.11	0.01			0.17	0.2	0.2
LS3-090	?core	LS3	655	660	200			100	400	0.16	0.02			0.01	0.04	0.3
LS3-091	?core	LS3	660	665	-100			100	300	0.11	<0.01			0.01	0.03	0.2
LS3-092	?core	LS3	665	670	-100			-100	100	0.05	<0.01			<0.01	0.01	0.1
LS3-093	?core	LS3	670	675	400			100	200	0.11	0.04			0.01	0.02	0.2
LS3-094	?core	LS3	675	680	300			-100	-100	0.11	0.03			<0.01	<0.01	0.2
LS3-095	?core	LS3	680	685	-100			-100	100	0.21	<0.01			<0.01	0.01	0.4
LS3-096	?core	LS3	685	690	-100			-100	-100	0.05	<0.01			<0.01	<0.01	0.1
LS3-097	?core	LS3	690	695	200			100	-100	0.11	0.02			0.01	<0.01	0.2
LS3-098	?core	LS3	695	700	400			-100	300	0.11	0.04			<0.01	0.03	0.2
LS3-099	?core	LS3	700	705	200			-100	500	0.32	0.02			<0.01	0.05	0.6
LS3-100	?core	LS3	705	710	1300			-100	300	0.43	0.13			<0.01	0.03	0.8
LS3-101	?core	LS3	710	715	600			-100	200	0.32	0.06			<0.01	0.02	0.6
LS3-102	?core	LS3	715	720	800			-100	200	1.50	0.08			<0.01	0.02	2.8
LS3-103	?core	LS3	720	725	700			-100	100	0.80	0.07			<0.01	0.01	1.5
LS3-104	?core	LS3	725	730	500			-100	100	0.21	0.05			<0.01	0.01	0.4
LS3-105	?core	LS3	730	735	800			100	300	0.80	0.08			0.01	0.03	1.5
LS3-106	?core	LS3	735	740	3100			-100	200	1.82	0.31			<0.01	0.02	3.4
LS3-107	?core	LS3	740	745	700			-100	300	0.11	0.07			<0.01	0.03	0.2
LS3-108	?core	LS3	745	750	400			-100	300	0.05	0.04			<0.01	0.03	0.1
LS3-109	?core	LS3	750	755	1100			-100	400	0.21	0.11			<0.01	0.04	0.4
LS3-110	?core	LS3	755	760	400			-100	100	0.05	0.04			<0.01	0.01	0.1
LS3-111	?core	LS3	760	765	2300			-100	500	0.21	0.23			<0.01	0.05	0.4
LS3-112	?core	LS3	765	770	200			-100	300	0.05	0.02			<0.01	0.03	0.1
LS3-113	?core	LS3	770	775	300			-100	100	0.05	0.03			<0.01	0.01	0.1
LS3-114	?core	LS3	775	780	1300			-100	600	0.05	0.13			<0.01	0.06	0.1
LS3-115	?core	LS3	780	785	800			-100	400	0.05	0.08			<0.01	0.04	0.1
LS3-116	?core	LS3	785	790	1700			-100	100	0.11	0.17			<0.01	0.01	0.2
LS3-117	?core	LS3	790	795	200			-100	100	0.05	0.02			<0.01	0.01	0.1
LS3-118	?core	LS3	795	800	700			-100	100	0.05	0.07			<0.01	0.01	0.1
LS3-119	?core	LS3	800	805						0.21						0.4
LS3-120	?core	LS3	805	810						0.21						0.4
LS3-121	?core	LS3	810	815						0.43						0.8
LS3-122	?core	LS3	815	820						0.21						0.4
LS3-123	?core	LS3	820	825						0.11						0.2
LS3-124	?core	LS3	825	830	-100			100	-100	0.02	<0.01			0.01	<0.01	0.04
LS3-125	?core	LS3	830	835	-100			-100	-100	0.02	<0.01			<0.01	<0.01	0.04
LS3-126	?core	LS3	835	840	-100			-100	-100	0.02	<0.01			<0.01	<0.01	0.04
LS3-127	?core	LS3	840	845	500			-100	-100	0.03	0.05			<0.01	<0.01	0.06
LS3-128	?core	LS3	845	850	200			-100	-100	0.04	0.02			<0.01	<0.01	0.08
LS3-129	?core	LS3	850	855	1500			-100	-100	0.05	0.15			<0.01	<0.01	0.1
LS3-130	?core	LS3	855	860	-100			400	100	-100	<0.01			0.04	0.01	<0.01
LS3-131	?core	LS3	860	865	200			400	300	-100	0.02			0.04	0.03	<0.01
LS3-132	?core	LS3	865	870	100			800	100	-100	0.01			0.08	0.01	<0.01
LS3-133	?core	LS3	870	875	500			400	-100	-100	0.05			0.04	<0.01	<0.01
LS3-134	?core	LS3	875	880	100			400	-100	-100	0.01			0.04	<0.01	<0.01
LS3-135	?core	LS3	880	885	100			400	-100	-100	0.01			0.04	<0.01	<0.01
LS3-136	?core	LS3	885	890	-100			200	-100	-100	<0.01			0.02	<0.01	<0.01
LS3-137	?core	LS3	890	895	200			600	100	-100	0.02			0.06	0.01	<0.01
LS3-138	?core	LS3	895	900	-100			400	200	-100	<0.01			0.04	0.02	<0.01
LS3-139	?core	LS3	900	905	100			400	300	-100	0.01			0.04	0.03	<0.01
LS3-140	?core	LS3	905	912	300			600	200	-100	0.03			0.06	0.02	<0.01

EL 19/98 ANTHONY : SELINA AREA

Appendix I

Drillhole Data
Assay Results

Sample No	Samp_ Type	Hole_ Id	Depth_ From (ft)	Depth_To (ft)	CU_A : ppm	AU : OZ	AG : OZ	PB_A: ppm	ZN_A: ppm	S %	CU_A : %	AU :OZ	AG : OZ	PB_A: %	ZN_A: %	FeS_2 %
LS4-001	?core	LS4	413	415	600			100	-100	7.53	0.06			0.01	<0.01	14.4
LS4-002	?core	LS4	415	420	600			150	-100	11.45	0.06			0.015	<0.01	21.9
LS4-003	?core	LS4	420	425	800			160	-100	11.92	0.08			0.016	<0.01	22.8
LS4-004	?core	LS4	425	430	500			160	-100	8.58	0.05			0.016	<0.01	16.4
LS4-005	?core	LS4	430	435	500			-100	-100	8.11	0.05			<0.01	<0.01	15.5
LS4-006	?core	LS4	435	440	200			-100	-100	10.93	0.02			<0.01	<0.01	20.9
LS4-007	?core	LS4	440	445	100			-100	-100	6.75	0.01			<0.01	<0.01	12.9
LS4-008	?core	LS4	445	450	100			-100	-100	7.32	0.01			<0.01	<0.01	14
LS4-009	?core	LS4	450	455	300			-100	-100	11.50	0.03			<0.01	<0.01	22
LS4-010	?core	LS4	455	460	300			-100	-100	9.31	0.03			<0.01	<0.01	17.8
LS4-011	?core	LS4	460	465	900			-100	-100	4.92	0.09			<0.01	<0.01	9.4
LS4-012	?core	LS4	465	470	1000			-100	-100	3.97	0.1			<0.01	<0.01	7.6
LS4-013	?core	LS4	470	475	500			-100	140	6.38	0.05			<0.01	0.014	12.2
LS4-014	?core	LS4	475	480	500			-100	160	4.39	0.05			<0.01	0.016	8.4
LS4-015	?core	LS4	480	485	1300			-100	100	6.43	0.13			<0.01	0.01	12.3
LS4-016	?core	LS4	485	490	500			-100	100	5.12	0.05			<0.01	0.01	9.8
LS4-017	?core	LS4	490	495	700			-100	-100	10.72	0.07			<0.01	<0.01	20.5
LS4-018	?core	LS4	495	500	500			-100	100	3.56	0.05			<0.01	0.01	6.8
LS4-019	?core	LS4	500	505	600					2.73	0.06					5.22
LS4-020	?core	LS4	505	510	700					16.99	0.07					32.5
LS4-021	?core	LS4	510	515	700					8.73	0.07					16.7
LS4-022	?core	LS4	515	520	500					10.09	0.05					19.3
LS4-023	?core	LS4	520	525	500					12.03	0.05					23
LS4-024	?core	LS4	525	530	500					12.60	0.05					24.1
LS4-025	?core	LS4	530	535	600					13.39	0.06					25.6
LS4-026	?core	LS4	535	540	500					12.81	0.05					24.5
LS4-027	?core	LS4	540	545	400			-100	-100	5.07	0.04			<0.01	<0.01	9.7
LS4-028	?core	LS4	545	550	300			-100	-100	5.75	0.03			<0.01	<0.01	11
LS4-029	?core	LS4	550	555	200			-100	-100	5.07	0.02			<0.01	<0.01	9.7
LS4-030	?core	LS4	555	560	200			-100	-100	4.65	0.02			<0.01	<0.01	8.9
LS4-031	?core	LS4	560	565	400			-100	-100	8.89	0.04			<0.01	<0.01	17
LS4-032	?core	LS4	565	570	100			-100	-100	5.60	0.01			<0.01	<0.01	10.7
LS4-033	?core	LS4	570	575	300			-100	-100	6.27	0.03			<0.01	<0.01	12
LS4-034	?core	LS4	575	580	300			-100	-100	11.29	0.03			<0.01	<0.01	21.6
LS4-035	?core	LS4	580	585	600			-100	-100	9.20	0.06			<0.01	<0.01	17.6
LS4-036	?core	LS4	585	590	600			-100	-100	9.31	0.06			<0.01	<0.01	17.8
LS4-037	?core	LS4	590	595	400			-100	-100	10.67	0.04			<0.01	<0.01	20.4
LS4-038	?core	LS4	595	600	400			-100	-100	11.14	0.04			<0.01	<0.01	21.3
LS4-039	?core	LS4	600	605	400			160	340	11.35	0.04			0.016	0.034	21.7
LS4-040	?core	LS4	605	610	600			100	180	11.40	0.06			0.01	0.018	21.8
LS4-041	?core	LS4	610	615	400			-100	-100	10.35	0.04			<0.01	<0.01	19.8
LS4-042	?core	LS4	615	620	500			-100	-100	13.33	0.05			<0.01	<0.01	25.5
LS4-043	?core	LS4	620	625	700			-100	-100	7.43	0.07			<0.01	<0.01	14.2
LS4-044	?core	LS4	625	630	500			-100	-100	7.43	0.05			<0.01	<0.01	14.2
LS4-045	?core	LS4	630	635	500			-100	-100	13.28	0.05			<0.01	<0.01	25.4
LS4-046	?core	LS4	635	640	500			-100	-100	8.05	0.05			<0.01	<0.01	15.4
LS4-047	?core	LS4	640	645	500			-100	-100	10.20	0.05			<0.01	<0.01	19.5
LS4-048	?core	LS4	645	650	500			-100	160	6.22	0.05			<0.01	0.016	11.9
LS4-049	?core	LS4	650	655	300			-100	-100	7.06	0.03			<0.01	<0.01	13.5
LS4-050	?core	LS4	655	659	500			-100	-100	6.17	0.05			<0.01	<0.01	11.8
LS4-051	?core	LS4	659	665	1200			-100	-100	7.48	0.12			<0.01	<0.01	14.3
LS4-052	?core	LS4	665	670	500			-100	-100	5.23	0.05			<0.01	<0.01	10
LS4-053	?core	LS4	670	675	500			-100	-100	7.69	0.05			<0.01	<0.01	14.7
LS4-054	?core	LS4	675	680	1300			-100	-100	5.12	0.13			<0.01	<0.01	9.8
LS4-055	?core	LS4	680	685	700			400	-100	5.18	0.07			0.04	<0.01	9.9
LS4-056	?core	LS4	685	690	500			-100	-100	6.22	0.05			<0.01	<0.01	11.9
LS4-057	?core	LS4	690	695	500			-100	170	7.84	0.05			<0.01	0.017	15
LS4-058	?core	LS4	695	700	300			-100	-100	5.07	0.03			<0.01	<0.01	9.7
LS4-059	?core	LS4	700	705	400			-100	-100	4.24	0.04			<0.01	<0.01	8.1
LS4-060	?core	LS4	705	710	400			-100	-100	2.88	0.04			<0.01	<0.01	5.5
LS4-061	?core	LS4	710	715	900			-100	100	3.03	0.09			<0.01	0.01	5.8
LS4-062	?core	LS4	715	720	600			-100	100	2.09	0.06			<0.01	0.01	4
LS4-063	?core	LS4	720	725	2400			-100	130	3.40	0.24			<0.01	0.013	6.5
LS4-064	?core	LS4	725	730	1200			-100	130	1.36	0.12			<0.01	0.013	2.6
LS4-065	?core	LS4	730	735	500			-100	-100	2.30	0.05			<0.01	<0.01	4.4
LS4-066	?core	LS4	735	740	600			-100	-100	4.34	0.06			<0.01	<0.01	8.3
LS4-067	?core	LS4	740	745	400			-100	130	5.18	0.04			<0.01	0.013	9.9
LS4-068	?core	LS4	745	750	0			-100	-100	7.53	0			<0.01	<0.01	14.4
LS4-069	?core	LS4	750	755	500			-100	-100	4.13	0.05			<0.01	<0.01	7.89
LS4-070	?core	LS4	755	760	1000			-100	-100	11.34	0.1			<0.01	<0.01	21.69

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Assay Results

Appendix I

Sample No	Samp_ Type	Hole_ Id	Depth_ From (ft)	Depth_To (ft)	CU_A : ppm	AU : OZ	AG : OZ	PB_A: ppm	ZN_A: ppm	S %	CU_A : %	AU :OZ	AG : OZ	PB_A: %	ZN_A: %	FeS_2 %
LS4-071	?core	LS4	760	765	1500			-100	200	5.39	0.15			<0.01	0.02	10.3
LS4-072	?core	LS4	765	770	1000			-100	160	2.73	0.1			<0.01	0.016	5.22
LS4-073	?core	LS4	770	775	1000			-100	150	2.23	0.1			<0.01	0.015	4.27
LS4-074	?core	LS4	775	780	900			-100	100	2.84	0.09			<0.01	0.01	5.43
LS4-075	?core	LS4	780	785	2300			-100	300	2.22	0.23			<0.01	0.03	4.25
LS4-076	?core	LS4	785	790	1200			100	180	2.44	0.12			0.01	0.018	4.66
LS4-077	?core	LS4	790	795	200			300	300	8.84	0.02			0.03	0.03	16.91
LS4-078	?core	LS4	795	800	400			-100	160	6.21	0.04			<0.01	0.016	11.88
LS4-079	?core	LS4	800	805	1100			-100	200	7.55	0.11			<0.01	0.02	14.44
LS4-080	?core	LS4	805	810	900			-100	100	5.33	0.09			<0.01	0.01	10.19
LS4-081	?core	LS4	810	815	1000			-100	190	8.44	0.1			<0.01	0.019	16.14
LS4-082	?core	LS4	815	820	400			-100	-100	7.12	0.04			<0.01	<0.01	13.62
LS4-083	?core	LS4	820	825	900			-100	140	5.78	0.09			<0.01	0.014	11.05
LS4-084	?core	LS4	825	830	1200			-100	140	8.71	0.12			<0.01	0.014	16.66
LS4-085	?core	LS4	830	835	500			-100	100	9.25	0.05			<0.01	0.01	17.68
LS4-086	?core	LS4	835	840	500			-100	160	5.51	0.05			<0.01	0.016	10.53
LS4-087	?core	LS4	840	845	1000			-100	250	5.03	0.1			<0.01	0.025	9.61
LS4-088	?core	LS4	845	850	1100			-100	300	5.44	0.11			<0.01	0.03	10.4
LS4-089	?core	LS4	850	855	400			-100	150	4.94	0.04			<0.01	0.015	9.44
LS4-090	?core	LS4	855	860	1400			-100	150	7.19	0.14			<0.01	0.015	13.75
LS4-091	?core	LS4	860	865	600			-100	100	6.37	0.06			<0.01	0.01	12.19
LS4-092	?core	LS4	865	870	800			-100	100	6.26	0.08			<0.01	0.01	11.97
LS4-093	?core	LS4	870	875	400			-100	160	6.31	0.04			<0.01	0.016	12.06
LS4-094	?core	LS4	875	880	300			-100	100	7.78	0.03			<0.01	0.01	14.87
LS4-095	?core	LS4	880	885	600			-100	100	6.55	0.06			<0.01	0.01	12.52
LS4-096	?core	LS4	885	890	500			-100	100	6.21	0.05			<0.01	0.01	11.88
LS4-097	?core	LS4	890	895	700			-100	100	3.43	0.07			<0.01	0.01	6.56
LS4-098	?core	LS4	895	900	500			150	140	3.24	0.05			0.015	0.014	6.2
LS4-099	?core	LS4	900	905	600			-100	180	3.82	0.06			<0.01	0.018	7.3
LS4-100	?core	LS4	905	910	800			-100	100	4.71	0.08			<0.01	0.01	9
LS4-101	?core	LS4	910	915	600			-100	300	7.79	0.06			<0.01	0.03	14.9
LS4-102	?core	LS4	915	920	400			260	180	7.06	0.04			0.026	0.018	13.5
LS4-103	?core	LS4	920	925	300			100	-100	6.27	0.03			0.01	<0.01	12
LS4-104	?core	LS4	925	930	1400			-100	140	5.75	0.14			<0.01	0.014	11
LS4-105	?core	LS4	930	935	600			-100	-100	6.95	0.06			<0.01	<0.01	13.3
LS4-106	?core	LS4	935	940	500			-100	-100	6.48	0.05			<0.01	<0.01	12.4
LS4-107	?core	LS4	940	945	700			100	200	5.18	0.07			0.01	0.02	9.9
LS4-108	?core	LS4	945	950	100			100	180	5.39	0.01			0.01	0.018	10.3
LS4-109	?core	LS4	950	955	200			200	100	8.31	0.02			0.02	0.01	15.9
LS4-110	?core	LS4	955	960	1000			100	200	8.00	0.1			0.01	0.02	15.3
LS4-111	?core	LS4	960	965	400			100	180	4.65	0.04			0.01	0.018	8.9
LS4-112	?core	LS4	965	970	800			-100	150	4.86	0.08			<0.01	0.015	9.3
LS4-113	?core	LS4	970	975	500			-100	100	4.44	0.05			<0.01	0.01	8.5
LS4-114	?core	LS4	975	980	1700			500	700	3.76	0.17			0.05	0.07	7.2
LS4-115	?core	LS4	980	985	600			-100	-100	3.50	0.06			<0.01	<0.01	6.7
LS4-116	?core	LS4	985	990	700			-100	-100	4.44	0.07			<0.01	<0.01	8.5
LS4-117	?core	LS4	990	995	600			100	-100	10.88	0.06			0.01	<0.01	20.8
LS4-118	?core	LS4	995	1000	900			100	-100	10.62	0.09			0.01	<0.01	20.3
LS4-119	?core	LS4	1000	1005	300			200	200	5.60	0.03			0.02	0.02	10.7
LS4-120	?core	LS4	1005	1010	400			100	200	3.24	0.04			0.01	0.02	6.2
LS4-121	?core	LS4	1010	1015	500			200	200	0.68	0.05			0.02	0.02	1.3
LS4-122	?core	LS4	1015	1020	1000			-100	100	1.52	0.1			<0.01	0.01	2.9
LS4-123	?core	LS4	1020	1025	6300			-100	200	6.80	0.63			<0.01	0.02	13
LS4-124	?core	LS4	1025	1030	500			-100	100	3.24	0.05			<0.01	0.01	6.2
LS4-125	?core	LS4	1030	1035	700			100	100	2.72	0.07			0.01	0.01	5.2
LS4-126	?core	LS4	1035	1040	2300			-100	100	4.34	0.23			<0.01	0.01	8.3
LS4-127	?core	LS4	1040	1045	800			-100	100	3.50	0.08			<0.01	0.01	6.7
LS4-128	?core	LS4	1045	1050	1000			-100	-100	4.92	0.1			<0.01	<0.01	9.4
LS4-129	?core	LS4	1050	1055	1100			-100	-100	2.46	0.11			<0.01	<0.01	4.7
LS4-130	?core	LS4	1055	1059	600			-100	-100	2.20	0.06			<0.01	<0.01	4.2
LS5-001	?core	LS5	208	212	500	0	0	100	140	9.15	0.05	0	0	0.01	0.014	17.5
LS5-002	?core	LS5	212	215	500	0	0	-100	100	6.17	0.05	0	0	<0.01	0.01	11.8
LS5-003	?core	LS5	215	220	200			-100	100	3.82	0.02			<0.01	0.01	7.3
LS5-004	?core	LS5	220	225	400			-100	-100	5.12	0.04			<0.01	<0.01	9.8
LS5-005	?core	LS5	225	230	300			-100	-100	3.45	0.03			<0.01	<0.01	6.6
LS5-006	?core	LS5	230	235	500			-100	160	3.24	0.05			<0.01	0.016	6.2
LS5-007	?core	LS5	235	240	600			-100	160	4.44	0.06			<0.01	0.016	8.5
LS5-008	?core	LS5	240	245	500			-100	120	3.82	0.05			<0.01	0.012	7.3
LS5-009	?core	LS5	245	250	500	0	0.02	-100	100	4.18	0.05	0	0.02	<0.01	0.01	8
LS5-010	?core	LS5	250	255	400	0	0.02	-100	140	6.01	0.04	0	0.02	<0.01	0.014	11.5

EL 19/98 ANTHONY : SELINA AREA

Appendix I

Drillhole Data
Assay Results

Sample No	Samp_ Type	Hole_ Id	Depth_ From (ft)	Depth_To (ft)	CU_A : ppm	AU : OZ	AG : OZ	PB_A: ppm	ZN_A: ppm	S %	CU_A : %	AU :OZ	AG : OZ	PB_A: %	ZN_A: %	FeS_2 %
LS5-011	?core	LS5	255	260	100			-100	-100	4.71	0.01			<0.01	<0.01	9
LS5-012	?core	LS5	260	265	100			-100	150	5.91	0.01			<0.01	0.015	11.3
LS5-013	?core	LS5	265	270	300			-100	100	3.56	0.03			<0.01	0.01	6.8
LS5-014	?core	LS5	270	275	300			-100	100	3.40	0.03			<0.01	0.01	6.5
LS5-015	?core	LS5	275	280	200			-100	-100	3.50	0.02			<0.01	<0.01	6.7
LS5-016	?core	LS5	280	285	100			-100	-100	4.08	0.01			<0.01	<0.01	7.8
LS5-017	?core	LS5	285	290	100			-100	-100	5.33	0.01			<0.01	<0.01	10.2
LS5-018	?core	LS5	290	295	400			-100	-100	4.39	0.04			<0.01	<0.01	8.4
LS5-019	?core	LS5	295	300	500	0	0.09	-100	100	5.23	0.05	0	0.09	<0.01	0.01	10
LS5-020	?core	LS5	300	305	4600	0	0.09	200	280	4.34	0.46	0	0.09	0.02	0.028	8.3
LS5-021	?core	LS5	305	310	400			-100	300	5.80	0.04			<0.01	0.03	11.1
LS5-022	?core	LS5	310	315	400			200	200	13.39	0.04			0.02	0.02	25.6
LS5-023	?core	LS5	445	450	500			-100	200	5.75	0.05			<0.01	0.02	11
LS5-024	?core	LS5	450	455	600			100	600	2.67	0.06			0.01	0.06	5.1
LS5-025	?core	LS5	455	460	200			-100	270	3.03	0.02			<0.01	0.027	5.8
LS5-026	?core	LS5	460	465	300			-100	270	1.93	0.03			<0.01	0.027	3.7
LS5-027	?core	LS5	465	470	300			-100	290	6.07	0.03			<0.01	0.029	11.6
LS5-028	?core	LS5	470	475	200			-100	360	6.43	0.02			<0.01	0.036	12.3
LS5-029	?core	LS5	475	480	500	0	0.13	-100	260	6.22	0.05	0	0.13	<0.01	0.026	11.9
LS5-030	?core	LS5	480	485	1000	0	0.13	3100	460	3.40	0.1	0	0.13	0.31	0.046	6.5
LS5-031	?core	LS5	485	490	300			800	400	3.66	0.03			0.08	0.04	7
LS5-032	?core	LS5	490	495	200			-100	1300	1.57	0.02			<0.01	0.13	3
LS5-033	?core	LS5	495	500	200			100	1000	2.09	0.02			0.01	0.1	4
LS5-034	?core	LS5	500	505	300			270	1100	3.14	0.03			0.027	0.11	6
LS5-035	?core	LS5	505	510	500			230	1900	2.93	0.05			0.023	0.19	5.6
LS5-036	?core	LS5	510	515	500			560	2200	2.98	0.05			0.056	0.22	5.7
LS5-037	?core	LS5	515	520	600			230	600	5.07	0.06			0.023	0.06	9.7
LS5-038	?core	LS5	520	525	400			560	240	2.77	0.04			0.056	0.024	5.3
LS5-039	?core	LS5	525	530	200	0	0.09	270	440	1.93	0.02	0	0.09	0.027	0.044	3.7
LS5-040	?core	LS5	530	535	600	0	0.09	-100	240	5.07	0.06	0	0.09	<0.01	0.024	9.7
LS5-041	?core	LS5	535	540	200			-100	100	2.98	0.02			<0.01	0.01	5.7
LS5-042	?core	LS5	540	545	1000			-100	140	2.77	0.1			<0.01	0.014	5.3
LS5-043	?core	LS5	545	550	500			-100	140	1.99	0.05			<0.01	0.014	3.8
LS5-044	?core	LS5	550	555	400			-100	-100	2.98	0.04			<0.01	<0.01	5.7
LS5-045	?core	LS5	555	560	100			-100	-100	3.50	0.01			<0.01	<0.01	6.7
LS5-046	?core	LS5	560	565	400			-100	-100	2.56	0.04			<0.01	<0.01	4.9
LS5-047	?core	LS5	565	570	300			-100	-100	6.95	0.03			<0.01	<0.01	13.3
LS5-048	?core	LS5	570	575	400			-100	100	4.86	0.04			<0.01	0.01	9.3
LS5-049	?core	LS5	575	580	400	0	0.03	-100	100	1.93	0.04	0	0.03	<0.01	0.01	3.7
LS5-050	?core	LS5	580	585	400	0	0.03	-100	140	2.82	0.04	0	0.03	<0.01	0.014	5.4
LS5-051	?core	LS5	585	590	100			-100	-100	3.14	0.01			<0.01	<0.01	6
LS5-052	?core	LS5	590	595	500			-100	-100	2.46	0.05			<0.01	<0.01	4.7
LS5-053	?core	LS5	595	600	200			-100	-100	3.19	0.02			<0.01	<0.01	6.1
LS5-054	?core	LS5	600	605	100			-100	-100	2.56	0.01			<0.01	<0.01	4.9
LS5-055	?core	LS5	605	610	100			-100	-100	2.72	0.01			<0.01	<0.01	5.2
LS5-056	?core	LS5	610	615	200			-100	100	1.99	0.02			<0.01	0.01	3.8
LS5-057	?core	LS5	615	620	400			150	1200	3.40	0.04			0.015	0.12	6.5
LS5-058	?core	LS5	620	625	700			300	400	5.12	0.07			0.03	0.04	9.8
LS5-059	?core	LS5	625	630	400	0	0.07	130	300	2.51	0.04	0	0.07	0.013	0.03	4.8
LS5-060	?core	LS5	630	635	400	0	0.07	-100	130	2.67	0.04	0	0.07	<0.01	0.013	5.1
LS5-061	?core	LS5	635	640	200			-100	-100	1.93	0.02			<0.01	<0.01	3.7
LS5-062	?core	LS5	640	645	200			-100	300	1.62	0.02			<0.01	0.03	3.1
LS5-063	?core	LS5	645	650	200			-100	-100	3.14	0.02			<0.01	<0.01	6
LS5-064	?core	LS5	650	655	900			-100	-100	3.35	0.09			<0.01	<0.01	6.4
LS5-065	?core	LS5	655	660	500			960	600	3.24	0.05			0.096	0.06	6.2
LS5-066	?core	LS5	660	665	700			760	350	3.35	0.07			0.076	0.035	6.4
LS5-067	?core	LS5	665	670	800			-100	280	4.13	0.08			<0.01	0.028	7.9
LS5-068	?core	LS5	670	675	500			-100	190	5.39	0.05			<0.01	0.019	10.3
LS5-069	?core	LS5	675	680	800	0	0.22	-100	150	5.49	0.08	0	0.22	<0.01	0.015	10.5
LS5-070	?core	LS5	680	685	1000	0	0.22	120	130	5.60	0.1	0	0.22	0.012	0.013	10.7
LS5-071	?core	LS5	685	690	700			400	250	4.81	0.07			0.04	0.025	9.2
LS5-072	?core	LS5	690	695	700			330	300	1.78	0.07			0.033	0.03	3.4
LS5-073	?core	LS5	695	700	300			170	100	1.73	0.03			0.017	0.01	3.3
LS5-074	?core	LS5	700	705	600			300	200	4.39	0.06			0.03	0.02	8.4
LS5-075	?core	LS5	705	710	500			1000	450	3.87	0.05			0.1	0.045	7.4
LS5-076	?core	LS5	710	715	300			-100	120	7.63	0.03			<0.01	0.012	14.6
LS5-077	?core	LS5	715	720	1900			-100	140	5.86	0.19			<0.01	0.014	11.2
LS5-078	?core	LS5	720	725	1400					10.62	0.14					20.3
LS5-079	?core	LS5	725	730	2100	0.01	0.08			12.71	0.21	0.01	0.08			24.3
LS5-080	?core	LS5	730	735	5400	0.01	0.08			5.44	0.54	0.01	0.08			10.4

598090

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Assay Results

Appendix I

Sample No	Samp_ Type	Hole_ Id	Depth_ From (ft)	Depth_To (ft)	CU_A : ppm	AU : OZ	AG : OZ	PB_A: ppm	ZN_A: ppm	S %	CU_A : %	AU :OZ	AG : OZ	PB_A %	ZN_A %	FeS$_2$ %
LS5-081	?core	LS5	735	740	2000					6.17	0.2					11.8
LS5-082	?core	LS5	740	745	1100					13.02	0.11					24.9
LS5-083	?core	LS5	745	750	6900					10.25	0.69					19.6
LS5-084	?core	LS5	750	755	600			-100	160	8.26	0.06			<0.01	0.016	15.8
LS5-085	?core	LS5	755	760	2000			100	-100	5.75	0.2			0.01	<0.01	11
LS5-086	?core	LS5	760	765	1500			120	120	4.60	0.15			0.012	0.012	8.8
LS5-087	?core	LS5	765	770	500	0	0.05	190	100	2.30	0.05	0	0.05	0.019	0.01	4.4
LS5-088	?core	LS5	770	775	1000	0	0.05	-100	-100	4.86	0.1	0	0.05	<0.01	<0.01	9.3
LS5-089	?core	LS5	775	780	200			-100	100	8.00	0.02			<0.01	0.01	15.3
LS5-090	?core	LS5	780	785	1800			170	-100	11.97	0.18			0.017	<0.01	22.9
LS5-091	?core	LS5	785	790	2000			-100	150	5.02	0.2			<0.01	0.015	9.6
LS5-092	?core	LS5	790	795	1500			-100	-100	3.61	0.15			<0.01	<0.01	6.9
LS5-093	?core	LS5	795	800	1000			-100	100	3.97	0.1			<0.01	0.01	7.6
LS5-094	?core	LS5	800	805	1000			-100	-100	5.28	0.1			<0.01	<0.01	10.1
LS5-095	?core	LS5	805	810	3000			140	200	12.60	0.3			0.014	0.02	24.1
LS5-096	?core	LS5	810	815	2000			300	200	8.47	0.2			0.03	0.02	16.2
LS5-097	?core	LS5	815	820	1500	0	0.27	200	1100	5.49	0.15	0	0.27	0.02	0.11	10.5
LS5-098	?core	LS5	820	825	700	0	0.27	170	1900	3.14	0.07	0	0.27	0.017	0.19	6
LS5-099	?core	LS5	825	830	900			140	2400	3.29	0.09			0.014	0.24	6.3
LS5-100	?core	LS5	830	835	900			400	6400	5.12	0.09			0.04	0.64	9.8
LS5-101	?core	LS5	835	840	2200	0	1	1600	8000	7.48	0.22	0	1	0.16	0.8	14.3
LS5-102	?core	LS5	840	845	1800	0	1	900	5100	7.27	0.18	0	1	0.09	0.51	13.9
LS6-001	?core	LS6	130	135	300			280	500	1.88	0.03			0.028	0.05	3.6
LS6-002	?core	LS6	135	140	400			-100	130	3.87	0.04			<0.01	0.013	7.4
LS6-003	?core	LS6	210	215	100			-100	180	0.00	0.01			<0.01	0.018	0
LS6-004	?core	LS6	215	220	200			-100	140	1.83	0.02			<0.01	0.014	3.5
LS6-005	?core	LS6	220	225	400			-100	170	0.78	0.04			<0.01	0.017	1.5
LS6-006	?core	LS6	225	230	100			-100	160	1.41	0.01			<0.01	0.016	2.7
LS6-007	?core	LS6	230	235	500			100	100	1.36	0.05			0.01	0.01	2.6
LS6-008	?core	LS6	235	240	500			180	190	3.09	0.05			0.018	0.019	5.9
LS6-009	?core	LS6	240	245	700			200	170	0.68	0.07			0.02	0.017	1.3
LS6-010	?core	LS6	245	250	1100			1100	180	16.89	0.11			0.11	0.018	32.3
LS6-011	?core	LS6	250	255	900			700	200	13.44	0.09			0.07	0.02	25.7
LS6-012	?core	LS6	255	260	800			300	-100	7.90	0.08			0.03	<0.01	15.1
LS6-013	?core	LS6	260	264	200			-100	100	2.72	0.02			<0.01	0.01	5.2
LS6-014	?core	LS6	264	270	200			-100	200	4.34	0.02			<0.01	0.02	8.3
LS6-015	?core	LS6	270	275	300			-100	100	0.31	0.03			<0.01	0.01	0.6
LS6-016	?core	LS6	275	280	600			700	200	0.73	0.06			0.07	0.02	1.4
LS6-017	?core	LS6	280	285	500			160	200	1.36	0.05			0.016	0.02	2.6
LS6-018	?core	LS6	285	290	800			100	200	0.78	0.08			0.01	0.02	1.5
LS6-019	?core	LS6	290	295	100			-100	200	0.47	0.01			<0.01	0.02	0.9
LS6-020	?core	LS6	295	300	700			-100	260	3.97	0.07			<0.01	0.026	7.6
LS6-021	?core	LS6	300	305	600			150	400	1.15	0.06			0.015	0.04	2.2
LS6-022	?core	LS6	305	310	600			100	360	0.63	0.06			0.01	0.036	1.2
LS6-023	?core	LS6	310	315	1200			-100	200	3.40	0.12			<0.01	0.02	6.5
LS6-024	?core	LS6	315	320	600			150	140	0.21	0.06			0.015	0.014	0.4
LS6-025	?core	LS6	320	325	400			160	200	0.21	0.04			0.016	0.02	0.4
LS6-026	?core	LS6	325	330	700			-100	400	1.20	0.07			<0.01	0.04	2.3
LS6-027	?core	LS6	330	335	1100			-100	260	1.62	0.11			<0.01	0.026	3.1
LS6-028	?core	LS6	335	340	1300			3100	450	1.62	0.13			0.31	0.045	3.1
LS6-029	?core	LS6	340	345	700			200	100	2.04	0.07			0.02	0.01	3.9
LS6-030	?core	LS6	345	350	700			-100	150	2.82	0.07			<0.01	0.015	5.4
LS6-031	?core	LS6	350	355	700			150	200	0.42	0.07			0.015	0.02	0.8
LS6-032	?core	LS6	355	360	1100			400	200	1.25	0.11			0.04	0.02	2.4
LS6-033	?core	LS6	360	365	600			200	200	0.89	0.06			0.02	0.02	1.7
LS6-034	?core	LS6	365	370	900			100	200	0.73	0.09			0.01	0.02	1.4
LS6-035	?core	LS6	370	375	800			-100	150	1.10	0.08			<0.01	0.015	2.1
LS6-036	?core	LS6	375	380	500			200	100	0.89	0.05			0.02	0.01	1.7
LS6-037	?core	LS6	380	385	800			100	100	10.41	0.08			0.01	0.01	19.9
LS6-038	?core	LS6	625	630	600			-100	140	2.72	0.06			<0.01	0.014	5.2
LS6-039	?core	LS6	630	635	600			-100	140	0.52	0.06			<0.01	0.014	1
LS6-040	?core	LS6	635	640	600			100	160	1.10	0.06			0.01	0.016	2.1
LS6-041	?core	LS6	640	645	500			-100	200	1.31	0.05			<0.01	0.02	2.5
LS6-042	?core	LS6	645	650	400			-100	160	1.36	0.04			<0.01	0.016	2.6
LS6-043	?core	LS6	650	655	300			-100	200	1.31	0.03			<0.01	0.02	2.5
LS6-044	?core	LS6	655	660	800			-100	200	4.76	0.08			<0.01	0.02	9.1
LS6-045	?core	LS6	660	665	100			100	200	0.99	0.01			0.01	0.02	1.9
LS6-046	?core	LS6	665	670	300			-100	100	2.30	0.03			<0.01	0.01	4.4
LS6-047	?core	LS6	670	675	200			-100	200	0.68	0.02			<0.01	0.02	1.3
LS6-048	?core	LS6	675	680	500			-100	200	3.50	0.05			<0.01	0.02	6.7

Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Assay Results

Sample No	Samp_ Type	Hole_ Id	Depth_ From (ft)	Depth_To (ft)	CU_A : ppm	AU : OZ	AG : OZ	PB_A: ppm	ZN_A: ppm	S %	CU_A : %	AU :OZ	AG : OZ	PB_A: %	ZN_A: %	FeS_2 %
LS6-049	?core	LS6	680	685	100			160	250	2.09	0.01			0.016	0.025	4
LS6-050	?core	LS6	740	745	400			-100	260	5.18	0.04			<0.01	0.026	9.9
LS6-051	?core	LS6	745	750	500			-100	200	5.07	0.05			<0.01	0.02	9.7
LS6-052	?core	LS6	750	755	100			-100	200	7.16	0.01			<0.01	0.02	13.7
LS6-053	?core	LS6	755	760	100			-100	300	6.27	0.01			<0.01	0.03	12
LS6-054	?core	LS6	760	765	400			-100	300	2.20	0.04			<0.01	0.03	4.2
LS6-055	?core	LS6	765	770	400			-100	150	2.20	0.04			<0.01	0.015	4.2
LS6-056	?core	LS6	770	775	900			100	300	8.11	0.09			0.01	0.03	15.5
LS6-057	?core	LS6	775	780	700			400	500	8.11	0.07			0.04	0.05	15.5
LS6-058	?core	LS6	780	785	500			-100	300	2.25	0.05			<0.01	0.03	4.3
LS6-059	?core	LS6	785	790	100			-100	260	2.14	0.01			<0.01	0.026	4.1
LS6-060	?core	LS6	790	795	500			-100	250	3.71	0.05			<0.01	0.025	7.1
LS6-061	?core	LS6	795	800	1200			-100	250	2.67	0.12			<0.01	0.025	5.1
LS6-062	?core	LS6	800	805	200			-100	300	2.77	0.02			<0.01	0.03	5.3
LS6-063	?core	LS6	805	810	400			-100	300	1.46	0.04			<0.01	0.03	2.8
LS6-064	?core	LS6	810	815	100			-100	300	2.72	0.01			<0.01	0.03	5.2
LS6-065	?core	LS6	815	820	300			800	800	2.30	0.03			0.08	0.08	4.4
LS6-066	?core	LS6	820	825	300			500	350	1.99	0.03			0.05	0.035	3.8
LS6-067	?core	LS6	825	830	500			-100	300	2.30	0.05			<0.01	0.03	4.4
LS6-068	?core	LS6	830	835	600			240	1900	4.08	0.06			0.024	0.19	7.8
LS6-069	?core	LS6	835	840	400			540	2300	2.98	0.04			0.054	0.23	5.7
LS6-070	?core	LS6	840	845	300			300	800	3.09	0.03			0.03	0.08	5.9
LS6-071	?core	LS6	845	850	700			140	240	4.76	0.07			0.014	0.024	9.1
LS6-072	?core	LS6	850	855	400			150	300	4.34	0.04			0.015	0.03	8.3
LS6-073	?core	LS6	855	860	400			200	500	4.34	0.04			0.02	0.05	8.3
LS6-074	?core	LS6	860	868	800			-100	200	9.46	0.08			<0.01	0.02	18.1
LS6-075	?core	LS6	868	875	1000			-100	150	5.12	0.1			<0.01	0.015	9.8
LS6-076	?core	LS6	875	880	1500			-100	100	4.44	0.15			<0.01	0.01	8.5
LS6-077	?core	LS6	880	885	600			-100	100	2.14	0.06			<0.01	0.01	4.1
LS6-078	?core	LS6	885	890	900			100	300	3.03	0.09			0.01	0.03	5.8
LS6-079	?core	LS6	890	895	900			100	300	3.03	0.09			0.01	0.03	5.8
LS6-080	?core	LS6	895	900	900			200	1200	2.82	0.09			0.02	0.12	5.4
LS6-081	?core	LS6	900	905	1100			300	1600	5.28	0.11			0.03	0.16	10.1
LS6-082	?core	LS6	905	910	1600			200	460	4.97	0.16			0.02	0.046	9.5
LS6-083	?core	LS6	910	915	500			150	200	4.60	0.05			0.015	0.02	8.8
LS6-084	?core	LS6	915	920	900			800	6300	6.95	0.09			0.08	0.63	13.3
LS6-085	?core	LS6	920	925	600			1100	4100	2.61	0.06			0.11	0.41	5
LS6-086	?core	LS6	925	930	800			200	400	5.75	0.08			0.02	0.04	11
LS6-087	?core	LS6	930	935	200			100	300	7.06	0.02			0.01	0.03	13.5
LS6-088	?core	LS6	935	940	500			-100	250	1.62	0.05			<0.01	0.025	3.1
LS6-089	?core	LS6	940	945	300			100	200	3.82	0.03			0.01	0.02	7.3
LS6-090	?core	LS6	945	950	700			-100	100	4.92	0.07			<0.01	0.01	9.4
LS6-091	?core	LS6	950	955	500			-100	160	3.71	0.05			<0.01	0.016	7.1
LS6-092	?core	LS6	955	960	200			-100	300	0.47	0.02			<0.01	0.03	0.9
LS6-093	?core	LS6	960	965	200			-100	200	0.42	0.02			<0.01	0.02	0.8
LS6-094	?core	LS6	965	970	300			-100	100	0.21	0.03			<0.01	0.01	0.4
LS7-001	?core	LS7	1200	1205	700					5.39	0.07					10.3
LS7-002	?core	LS7	1205	1210	300					6.38	0.03					12.2
LS7-003	?core	LS7	1210	1215	600					5.18	0.06					9.9
LS7-004	?core	LS7	1215	1220	500					2.93	0.05					5.6
LS7-005	?core	LS7	1220	1225	900					4.13	0.09					7.9
LS7-006	?core	LS7	1225	1230	200					5.28	0.02					10.1
LS7-007	?core	LS7	1230	1235	1300					7.22	0.13					13.8
LS7-008	?core	LS7	1235	1240	200					4.71	0.02					9
LS7-009	?core	LS7	1240	1245	1400					4.29	0.14					8.2
LS7-010	?core	LS7	1245	1250	1300					6.38	0.13					12.2
LS7-011	?core	LS7	1250	1255	400					6.27	0.04					12
LS7-012	?core	LS7	1255	1260	700					7.95	0.07					15.2
LS7-013	?core	LS7	1260	1265	100					8.16	0.01					15.6

Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Assay Results

Sample No	Samp_ Type	Hole_Id	Depth_ From (m)	Depth _To (m)	AU_G :	AG_A : ppm	AG_ G: ppm	CU_A : ppm	MN_A : ppm	CO_A : ppm	PB_A : ppm	ZN_A : ppm	S_A: ppm	S_A:
LS8-001	?Halfcore	LS8	9.0	12.0		-2		120	890	80	60	160	5000	0.5
LS8-002	?Halfcore	LS8	12.0	15.0		-2		70	960	60	40	300	3000	0.3
LS8-003	?Halfcore	LS8	15.0	18.0		-2		100	1600	90	200	770	4000	0.4
LS8-004	?Halfcore	LS8	18.0	21.0		-2		90	2000	250	840	2500	8000	0.8
LS8-005	?Halfcore	LS8	21.0	23.6		-2		120	2000	20	100	3500	13000	1.3
LS8-006	?Halfcore	LS8	23.6	27.0		-2		50	1500	-10	10	270	-1000	-0.1
LS8-007	?Halfcore	LS8	27.0	30.0		-2		40	1500	-10	-10	90	1000	0.1
LS8-008	?Halfcore	LS8	30.0	33.0		-2		20	1300	-10	-10	70	-1000	-0.1
LS8-009	?Halfcore	LS8	33.0	36.0		-2		20	1800	-10	-10	50	-1000	-0.1
LS8-010	?Halfcore	LS8	36.0	39.0		-2		20	1400	-10	-10	50	-1000	-0.1
LS8-011	?Halfcore	LS8	39.0	42.0		-2		20	1500	-10	-10	40	-1000	-0.1
LS8-012	?Halfcore	LS8	42.0	45.0		-2		10	1400	-10	-10	50	-1000	-0.1
LS8-013	?Halfcore	LS8	45.0	48.0		-2		30	1400	-10	-10	40	-1000	-0.1
LS8-014	?Halfcore	LS8	48.0	51.0		-2		10	1600	-10	-10	40	-1000	-0.1
LS8-015	?Halfcore	LS8	51.0	54.0		-2		10	1900	-10	-10	40	-1000	-0.1
LS8-016	?Halfcore	LS8	54.0	57.0		-2		10	1400	-10	-10	60	1000	0.1
LS8-017	?Halfcore	LS8	57.0	59.2		-2		20	1200	-10	-10	50	-1000	-0.1
LS8-018	?Halfcore	LS8	59.2	61.5		-2		20	1100	-10	-10	50	-1000	-0.1
LS8-019	?Halfcore	LS8	61.5	64.2		-2		30	1100	-10	-10	40	1000	0.1
LS8-020	?Halfcore	LS8	64.2	66.8		-2		10	1300	-10	-10	50	-1000	-0.1
LS8-021	?Halfcore	LS8	66.8	68.2		-2		30	1700	-10	-10	60	-1000	-0.1
LS8-022	?Halfcore	LS8	68.2	71.2		-2		40	1700	-10	-10	40	1000	0.1
LS8-023	?Halfcore	LS8	71.2	74.0		-2		60	1400	-10	-10	40	-1000	-0.1
LS8-024	?Halfcore	LS8	74.0	77.0		-2		30	1000	-10	-10	40	-1000	-0.1
LS8-025	?Halfcore	LS8	77.0	80.0		-2		30	1000	-10	-10	40	-1000	-0.1
LS8-026	?Halfcore	LS8	80.0	83.0		-2		380	910	-10	-10	50	-1000	-0.1
LS8-027	?Halfcore	LS8	83.0	86.0		-2		90	930	-10	-10	50	1000	0.1
LS8-028	?Halfcore	LS8	86.0	89.0		-2		210	1080	-10	-10	40	-1000	-0.1
LS8-029	?Halfcore	LS8	89.0	92.0		-2		100	1000	-10	-10	30	-1000	-0.1
LS8-030	?Halfcore	LS8	92.0	95.0		-2		160	1310	-10	-10	40	-1000	-0.1
LS8-031	?Halfcore	LS8	95.0	98.0		-2		40	1220	-10	-10	30	-1000	-0.1
LS8-032	?Halfcore	LS8	98.0	101.0		-2		40	1060	-10	-10	40	-1000	-0.1
LS8-033	?Halfcore	LS8	101.0	103.0		-2		80	1020	-10	-10	40	-1000	-0.1
LS8-034	?Halfcore	LS8	103.0	105.6		-2		20	970	-10	-10	40	2000	0.2
LS8-035	?Halfcore	LS8	105.6	108.0		-2		20	690	-10	-10	30	1000	0.1
LS8-036	?Halfcore	LS8	108.0	111.0		-2		60	1020	-10	20	60	-1000	-0.1
LS8-037	?Halfcore	LS8	111.0	114.0		-2		10	880	-10	20	50	1000	0.1
LS8-038	?Halfcore	LS8	114.0	117.0		-2		20	900	-10	20	60	-1000	-0.1
LS8-039	?Halfcore	LS8	117.0	120.0		-2		10	940	-10	10	40	1000	0.1
LS8-040	?Halfcore	LS8	120.0	123.0		-2		10	880	-10	20	70	1000	0.1
LS8-041	?Halfcore	LS8	123.0	126.0		-2		10	840	-10	230	100	-1000	-0.1
LS8-042	?Halfcore	LS8	126.0	129.0		-2		10	920	-10	30	60	1000	0.1
LS8-043	?Halfcore	LS8	129.0	132.0		-2		40	1080	-10	70	90	2000	0.2
LS8-044	?Halfcore	LS8	132.0	135.0		-2		30	1030	-10	10	60	-1000	-0.1
LS8-045	?Halfcore	LS8	135.0	138.0		-2		-10	960	-10	-10	60	-1000	-0.1
LS8-046	?Halfcore	LS8	138.0	141.0		-2		-10	1040	-10	-10	80	1000	0.1
LS8-047	?Halfcore	LS8	141.0	144.0		-2		20	1120	-10	-10	60	-1000	-0.1
LS8-048	?Halfcore	LS8	144.0	147.0		-2		20	900	-10	-10	60	-1000	-0.1
LS8-049	?Halfcore	LS8	147.0	150.0		-2		10	740	-10	10	60	-1000	-0.1
LS8-050	?Halfcore	LS8	150.0	153.0		-2		10	1180	-10	10	70	1000	0.1
LS8-051	?Halfcore	LS8	153.0	156.0		-2		270	900	-10	20	60	-1000	-0.1
LS8-052	?Halfcore	LS8	156.0	159.0		-2		160	770	-10	70	90	-1000	-0.1
LS8-053	?Halfcore	LS8	159.0	162.0		-2		150	680	-10	30	110	-1000	-0.1
LS8-054	?Halfcore	LS8	162.0	165.0		-2		50	660	-10	20	80	-1000	-0.1
LS8-055	?Halfcore	LS8	165.0	168.0		-2		60	790	-10	10	50	-1000	-0.1
LS8-056	?Halfcore	LS8	168.0	171.4		-2		60	1010	-10	20	90	1000	0.1
LS8-057	?Halfcore	LS8	171.4	174.0		-2		70	1840	10	60	220	-1000	-0.1
LS8-058	?Halfcore	LS8	174.0	177.0		-2		80	1830	10	40	180	-1000	-0.1
LS8-059	?Halfcore	LS8	177.0	180.0		-2		190	1730	10	260	220	2000	0.2
LS8-060	?Halfcore	LS8	180.0	183.0		-2		60	2150	10	90	190	3000	0.3
LS8-061	?Halfcore	LS8	183.0	186.0		-2		50	2150	10	100	210	2000	0.2
LS8-062	?Halfcore	LS8	186.0	189.0		-2		50	1760	10	50	160	1000	0.1

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Assay Results

Sample No	Samp_ Type	Hole_I d	Depth_ From (m)	Depth _To (m)	AU_G :	AG_A : ppm	AG_ G: ppm	CU_A : ppm	MN_A : ppm	CO_A : ppm	PB_A : ppm	ZN_A : ppm	S_A: ppm	S_A:
LS8-063	?Halfcore	LS8	189.0	192.0		-2		80	1950	10	30	140	1000	0.1
LS8-064	?Halfcore	LS8	192.0	195.0		-2		200	1770	10	30	150	3000	0.3
LS8-065	?Halfcore	LS8	195.0	198.0		-2		160	2400	-10	30	200	-1000	-0.1
LS8-066	?Halfcore	LS8	198.0	201.0		-2		60	1800	-10	70	200	1000	0.1
LS8-067	?Halfcore	LS8	201.0	204.0		-2		70	1800	-10	20	170	2000	0.2
LS8-068	?Halfcore	LS8	204.0	207.0		-2		100	1800	10	20	220	2000	0.2
LS8-069	?Halfcore	LS8	207.0	210.0		-2		60	2250	-10	30	220	-1000	-0.1
LS8-070	?Halfcore	LS8	210.0	213.0		-2		40	2270	-10	50	260	2000	0.2
LS8-071	?Halfcore	LS8	213.0	216.0		-2		100	1350	-10	20	190	2000	0.2
LS8-072	?Halfcore	LS8	216.0	218.5		-2		100	1500	-10	30	240	-1000	-0.1
LS8-073	?Halfcore	LS8	218.5	221.0		-2		160	1350	30	40	270	7000	0.7
LS8-074	?½ & ¼ cc	LS8	221.0	222.0	0.2	-2	-0	70	1120	10	20	130	6000	0.6
LS8-075	?½ & ¼ cc	LS8	222.0	223.0	0.1	-2	-0	90	700	30	40	130	31000	3.1
LS8-076	?Halfcore	LS8	223.0	224.0		-2		410	560	460	180	560	77000	7.7
LS8-077	?Halfcore	LS8	224.0	225.0		-2		230	60	310	220	620	78000	7.8
LS8-078	?Halfcore	LS8	225.0	226.0		-2		370	160	820	1150	1400	#####	13.3
LS8-079	?Halfcore	LS8	226.0	230.0		-2		70	1200	40	100	320	8000	0.8
LS8-080	?½ & ¼ cc	LS8	230.0	235.0	0.1	-2	-0.01	50	1400	70	120	370	12000	1.2
LS8-081	?½ & ¼ cc	LS8	235.0	240.0	0.1	-2	-0.01	20	1400	-10	40	250	2000	0.2
LS8-082	?½ & ¼ cc	LS8	240.0	245.0		-2	-0.01	20	960	60	100	200	4000	0.4
LS8-083	?½ & ¼ cc	LS8	245.0	250.0		-2	-0.01	20	730	-10	40	150	-1000	-0.1
LS8-084	?½ & ¼ cc	LS8	250.0	255.0	0.2	-2	-0.01	10	860	-10	20	170	2000	0.2
LS8-085	?½ & ¼ cc	LS8	255.0	260.0	0.2	-2	-0.01	70	1300	-10	180	270	2000	0.2
LS8-086	?½ & ¼ cc	LS8	260.0	265.0		-2	-0.01	20	1550	-10	200	220	2000	0.2
LS8-087	?½ & ¼ cc	LS8	265.0	270.0		-2	-0.01	20	800	-10	60	160	2000	0.2
LS8-088	?½ & ¼ cc	LS8	270.0	275.0		-2	-0.01	30	1200	90	340	250	9000	0.9
LS8-089	?½ & ¼ cc	LS8	275.0	280.0		-2	-0.01	40	1100	20	120	210	3000	0.3
LS8-090	?½ & ¼ cc	LS8	280.0	285.0		-2	-0.01	30	970	100	140	180	10000	1
LS8-091	?½ & ¼ cc	LS8	285.0	290.0		-2	-0.01	30	1300	20	380	360	4000	0.4
LS8-092	?½ & ¼ cc	LS8	290.0	295.0	0.3	-2	-0.01	20	1000	-10	220	200	1000	0.1
LS8-093	?½ & ¼ cc	LS8	295.0	300.0	0.3	-2	-0.01	10	450	-10	40	70	1000	0.1
LS8-094	?½ & ¼ cc	LS8	300.0	305.0		-2	-0.01	10	560	-10	220	90	1000	0.1
LS8-095	?½ & ¼ cc	LS8	305.0	310.0		-2	-0.01	30	580	-10	140	100	3000	0.3
LS8-096	?½ & ¼ cc	LS8	310.0	315.0		-2	-0.01	20	610	20	380	140	3000	0.3
LS8-097	?½ & ¼ cc	LS8	315.0	320.0		-2	-0.01	40	760	-10	260	110	2000	0.2
LS8-098	?½ & ¼ cc	LS8	320.0	325.0		-2	-0.01	10	540	-10	60	120	1000	0.1
LS8-099	?½ & ¼ cc	LS8	325.0	330.0		-2	-0.01	20	1200	50	80	220	5000	0.5
LS8-100	?½ & ¼ cc	LS8	330.0	335.0	0.4	-2	-0.01	10	1070	100	120	200	2000	0.2
LS8-101	?½ & ¼ cc	LS8	335.0	340.0	0.4	-2	-0.01	20	1400	10	400	260	2000	0.2
LS8-102	?½ & ¼ cc	LS8	340.0	345.0	0.9	-2	-0.01	20	920	20	460	150	2000	0.2
LS8-103	?½ & ¼ cc	LS8	345.0	350.0	0.9	-2	-0.01	110	1300	30	920	280	4000	0.4
LS8-104	?½ & ¼ cc	LS8	350.0	355.2	0.9	-2	-0.01	80	1300	-10	120	380	-1000	-0.1

EL 19/98 ANTHONY : SELINA AREA

Appendix I

Drillhole Data

Assay Results

Sample No	Samp_Type	Hole_Id	Depth_ From (m)	Depth_ To (m)	AU_G: ppm	AG_A: ppm	CU_A: ppm	PB_A: ppm	ZN_A: ppm	BA-A ppm
12478	Halfcore	LS9	193.2	195	-0.01	-1	70	290	150	910
12479	Halfcore	LS9	195	197	-0.01	-1	110	110	120	1140
12780	Halfcore	LS9	197	199	-0.01	-1	15	20	110	1170
12781	Halfcore	LS9	199	201	-0.01	1	245	50	450	1490
12482	Halfcore	LS9	208.65	209.75	-0.01	3	275	140	170	420
12483	Halfcore	LS9	209.75	212	-0.01	-1	75	20	300	1190
12484	Halfcore	LS9	212	214	-0.01	-1	95	60	230	1440
12485	Halfcore	LS9	214	216	-0.01	-1	195	40	220	1030
12486	Halfcore	LS9	241	243	-0.01	-1	50	60	210	2230
12487	Halfcore	LS9	243	245	-0.01	1	55	60	220	2000
12488	Halfcore	LS9	257	259	-0.01	3	30	40	210	790
12489	Halfcore	LS9	259	261	-0.01	1	15	30	220	1000
12490	Halfcore	LS9	261	262.5	-0.01	1	15	100	240	690
12491	Halfcore	LS9	262.5	265	-0.01	5	405	100	300	1730
12492	Halfcore	LS9	265	267	-0.01	2	135	40	310	190
12493	Halfcore	LS9	267	269	-0.01	3	175	40	200	1690
12494	Halfcore	LS9	269	271	-0.01	-1	55	60	170	590
12495	Halfcore	LS9	271	273	-0.01	1	75	100	220	500
12496	Halfcore	LS9	273	275.2	-0.01	3	305	160	490	410
12715	Halfcore	LS10	34.4	36.4	-0.01	-1	25	30	70	
12716	Halfcore	LS10	40.4	42.4	-0.01	1	25	40	50	
12717	Halfcore	LS10	46.4	48.4	-0.01	1	15	-10	60	
12718	Halfcore	LS10	52.4	54.5	-0.01	1	15	-10	170	
12719	Halfcore	LS10	58.4	60.4	-0.01	1	25	70	60	
12720	Halfcore	LS10	64.4	66.4	-0.01	-1	10	10	30	
12721	Halfcore	LS10	70.4	72.4	-0.01	-1	-10	-10	40	
12722	Halfcore	LS10	76.4	78.4	-0.01	1	10	30	30	
12723	Halfcore	LS10	82.4	84.4	-0.01	-1	5	20	20	
12724	Halfcore	LS10	88.4	90.4	-0.01	-1	-10	-10	40	
12725	Halfcore	LS10	94.4	96.4	-0.01	-1	-10	-10	40	
12726	Halfcore	LS10	100.4	102.4	-0.01	1	-10	-10	30	
12727	Halfcore	LS10	106.4	108.4	-0.01	-1	5	20	20	
12728	Halfcore	LS10	112.4	114.4	-0.01	-1	15	-10	50	
12729	Halfcore	LS10	118.4	120.4	-0.01	-1	20	-10	60	
12730	Halfcore	LS10	124.4	126.4	-0.01	1	20	20	90	
12731	Halfcore	LS10	202.3	203.4	-0.01	1	70	80	770	
12732	Halfcore	LS10	203.4	204.4	-0.01	1	10	120	1220	
12733	Halfcore	LS10	204.4	205.4	-0.01	-1	30	120	950	
12734	Halfcore	LS10	205.4	206.4	-0.01	1	30	240	950	
12735	Halfcore	LS10	206.4	207.4	-0.01	1	30	40	1080	
12736	Halfcore	LS10	207.4	208.4	-0.01	1	20	90	380	
12737	Halfcore	LS10	208.4	209.4	-0.01	2	145	90	1030	
12738	Halfcore	LS10	209.4	210.4	-0.01	-1	70	120	480	
12739	Halfcore	LS10	210.4	211.4	-0.01	1	40	140	820	
12740	Halfcore	LS10	211.4	212.4	-0.01	2	195	150	1920	
12741	Halfcore	LS10	212.4	213.4	-0.01	1	160	110	2170	
12742	Halfcore	LS10	213.4	214.4	0.21	2	3160	120	870	
12743	Halfcore	LS10	214.4	215.4	-0.01	2	170	160	1230	
12744	Halfcore	LS10	215.4	216.4	-0.01	1	170	110	1860	
12745	Halfcore	LS10	216.4	217.4	-0.01	1	45	100	1790	
12746	Halfcore	LS10	217.4	218.4	-0.01	1	60	-10	450	
12747	Halfcore	LS10	218.4	219.4	-0.01	2	200	120	4620	
12748	Halfcore	LS10	219.4	220.4	-0.01	3	840	180	2930	
12749	Halfcore	LS10	220.4	221.4	-0.01	1	105	60	470	
12750	Halfcore	LS10	221.4	222.4	-0.01	1	180	130	1110	

EL 19/98 ANTHONY : SELINA AREA

Appendix I

Drillhole Data
Assay Results

Sample No	Samp_Type	Hole_Id	Depth_ From (m)	Depth_ To (m)	AU_G: ppm	AG_A: ppm	CU_A: ppm	PB_A: ppm	ZN_A: ppm	BA-A ppm
12751	Halfcore	LS10	222.4	223.4	-0.01	1	200	50	500	
12752	Halfcore	LS10	223.4	224.4	-0.01	2	150	100	2070	
12753	Halfcore	LS10	224.4	225.4	-0.01	3	245	240	2010	
12754	Halfcore	LS10	225.4	226.4	-0.01	1	150	130	1160	
12755	Halfcore	LS10	226.4	227.4	-0.01	1	120	100	1160	
12756	Halfcore	LS10	227.4	228.4	-0.01	1	40	140	2360	
12757	Halfcore	LS10	228.4	229.4	-0.01	1	115	230	4580	
12758	Halfcore	LS10	229.4	230.4	-0.01	1	355	190	1380	
12759	Halfcore	LS10	230.4	231.4	-0.01	1	250	180	1060	
12760	Halfcore	LS10	231.4	232.4	-0.01	1	130	310	2500	
12761	Halfcore	LS10	232.4	233.4	-0.01	1	75	240	2820	
12762	Halfcore	LS10	233.4	234.4	-0.01	1	270	980	10600	
12763	Halfcore	LS10	234.4	235.4	-0.01	2	105	670	4720	
12764	Halfcore	LS10	235.4	236.4	-0.01	2	255	470	3950	
12765	Halfcore	LS10	236.4	237.4	-0.01	3	255	190	2060	
12766	Halfcore	LS10	237.4	238.4	-0.01	2	255	90	1390	
12767	Halfcore	LS10	238.4	239.4	-0.01	3	140	70	1040	
12768	Halfcore	LS10	239.4	240.4	-0.01	2	780	80	1250	
12769	Halfcore	LS10	240.4	241.4	0.02	4	4780	50	1660	
12770	Halfcore	LS10	241.4	242.4	-0.01	4	5260	60	1340	
12771	Halfcore	LS10	242.4	243.4	-0.01	2	4810	100	1310	
12772	Halfcore	LS10	243.4	244.4	0.07	5	7200	260	4760	
12773	Halfcore	LS10	244.4	245.4	0.09	4	2450	210	2750	
12774	Halfcore	LS10	245.4	246.4	0.06	2	1810	50	1100	
12775	Halfcore	LS10	250.4	252.4	-0.01	1	220	10	150	
12776	Halfcore	LS10	256.4	258.4	-0.01	2	1060	20	540	
12777	Halfcore	LS10	262.4	264.4	-0.01	-1	460	20	190	
12778	Halfcore	LS10	268.4	270.4	-0.01	1	50	-10	40	
12779	Halfcore	LS10	274.4	276.4	-0.01	-1	50	20	140	
12780	Halfcore	LS10	280.4	282.4	-0.01	-1	100	30	550	
12781	Halfcore	LS10	286.4	288.4	0.02	-1	115	180	510	
12782	Halfcore	LS10	292.4	294.4	-0.01	-1	305	70	530	
12783	Halfcore	LS10	298.4	300.4	-0.01	-1	295	10	180	
T12784	Halfcore	LS11	107	109	-0.01	-1	310	-10	60	
T12785	Halfcore	LS11	113	115	-0.01	-1	60	-10	20	
T12786	Halfcore	LS11	119	121	-0.01	-1	580	-10	40	
T12787	Halfcore	LS11	125	127	-0.01	-1	25	-10	30	
T12788	Halfcore	LS11	131	133	-0.01	-1	25	-10	20	
T12789	Halfcore	LS11	137	139	-0.01	-1	50	-10	50	
T12790	Halfcore	LS11	143	145	-0.01	-1	60	-10	80	
T12791	Halfcore	LS11	149	151	-0.01	-1	50	-10	60	
T12792	Halfcore	LS11	155	157	-0.01	-1	55	-10	40	
T12793	Halfcore	LS11	161	163	-0.01	-1	295	-10	110	
T12794	Halfcore	LS11	167	169	-0.01	-1	195	-10	70	
T12795	Halfcore	LS11	173	175	-0.01	-1	65	-10	60	
T12796	Halfcore	LS11	179	181	-0.01	-1	410	-10	90	
T12797	Halfcore	LS11	185	187	-0.01	-1	270	-10	120	
T12798	Halfcore	LS11	191	193	-0.01	-1	90	-10	160	
T12799	Halfcore	LS11	197	199	-0.01	-1	240	-10	160	
T12800	Halfcore	LS11	203	205	-0.01	-1	60	-10	100	
T12801	Halfcore	LS11	209	211	-0.01	1	260	20	60	
T12802	Halfcore	LS11	215	217	-0.01	-1	40	10	140	
T12803	Halfcore	LS11	221	223	-0.01	-1	70	-10	80	
T12804	Halfcore	LS11	227	229	-0.01	-1	120	-10	40	
T12805	Halfcore	LS11	233	235	-0.01	2	3300	-10	120	

EL 19/98 ANTHONY : SELINA AREA

Appendix I

Drillhole Data
Assay Results

Sample No	Samp_Type	Hole_Id	Depth_ From (m)	Depth_ To (m)	AU_G: ppm	AG_A: ppm	CU_A: ppm	PB_A: ppm	ZN_A: ppm	BA-A ppm
T12806	Halfcore	LS11	239	241	-0.01	1	1150	30	70	
T12807	Halfcore	LS11	245	247	-0.01	-1	880	-10	50	
T12808	Halfcore	LS11	251	253	-0.01	1	1470	60	970	
T12809	Halfcore	LS11	257	259	-0.01	2	950	790	340	
T12810	Halfcore	LS11	263	265	-0.01	-1	760	-10	120	
T12811	Halfcore	LS11	269	271	-0.01	-1	1550	20	110	
T12812	Halfcore	LS11	275	277	-0.01	-1	1290	10	110	
T12813	Halfcore	LS11	281	283	-0.01	-1	2320	10	70	
T12814	Halfcore	LS11	287	289	-0.01	-1	2590	30	100	
T12815	Halfcore	LS11	293	295	-0.01	-1	7500	-10	140	
T12816	Halfcore	LS11	299	301	-0.01	-1	1250	30	90	
T12817	Halfcore	LS11	305	307	-0.01	-1	340	30	80	
T12818	Halfcore	LS11	311	313	0.15	-1	250	20	190	
T12819	Halfcore	LS11	317	319	-0.01	-1	400	120	1320	
T12820	Halfcore	LS11	323	325	-0.01	-1	140	10	470	
T12821	Halfcore	LS11	329	331	-0.01	-1	400	70	900	
T12822	Halfcore	LS11	335	337	-0.01	-1	130	70	1000	
T12823	Halfcore	LS11	341	343	-0.01	-1	170	50	320	
T12824	Halfcore	LS11	347	349	-0.01	-1	170	20	80	
T12825	Halfcore	LS11	353	355	-0.01	-1	150	-10	70	
T12826	Halfcore	LS11	359	361	-0.01	-1	60	-10	180	
T2298	Halfcore	LS13	230	231	-0.005	-1	22	78	760	
T2299	Halfcore	LS13	232	233	-0.005	-1	12	90	330	
T2300	Halfcore	LS13	234	235	-0.005	-1	10	90	425	
T886	Halfcore	LS13	236	236	-0.005	-1	11	125	690	
T888	Halfcore	LS13	238	239	-0.005	-1	10	54	275	
T889	Halfcore	LS13	240	241	-0.005	-1	11	130	460	
T890	Halfcore	LS13	242	243	-0.005	-1	14	280	510	
T891	Halfcore	LS13	244	245	-0.005	-1	10	86	320	
T892	Halfcore	LS13	246	247	-0.005	16	46	660	770	
T893	Halfcore	LS13	248	249	-0.005	1	13	60	225	
T894	Halfcore	LS13	250	251	-0.005	-1	12	42	220	
T895	Halfcore	LS13	252	253	-0.005	-1	10	32	275	
T896	Halfcore	LS13	254	255	-0.005	-1	12	48	270	
T897	Halfcore	LS13	256	257	-0.005	-1	12	74	325	
T898	Halfcore	LS13	258	259	-0.005	1	25	295	1000	
T899	Halfcore	LS13	260	261	-0.005	-1	11	88	345	
T900	Halfcore	LS13	262	263	-0.005	-1	20	120	340	
T3901	Halfcore	LS13	264	265	-0.005	-1	17	245	310	
T3902	Halfcore	LS13	266	267	-0.005	-1	17	400	250	
T3903	Halfcore	LS13	268	269	-0.005	1	12	720	88	
T3904	Halfcore	LS13	270	271	-0.005	2	22	520	48000	
T3905	Halfcore	LS13	272	273	-0.005	-1	10	100	1440	
T3906	Halfcore	LS13	274	275	-0.005	-1	19	68	415	
T3907	Halfcore	LS13	276	277	-0.005	1	13	1440	390	
T3908	Halfcore	LS13	278	279	-0.005	-1	11	135	260	
T3909	Halfcore	LS13	280	281	-0.005	2	37	1100	1760	
T3910	Halfcore	LS13	282	283	-0.005	-1	16	250	530	
T3911	Halfcore	LS13	284	285	-0.005	-1	16	550	500	
T3912	Halfcore	LS13	286	287	-0.005	-1	8	120	260	
T3913	Halfcore	LS13	288	289	-0.005	2	39	2880	2340	
T3914	Halfcore	LS13	290	291	-0.005	1	62	880	1880	
T3915	Halfcore	LS13	292	293	-0.005	1	36	730	2000	
T3916	Halfcore	LS13	294	295	-0.005	-1	10	110	210	

EL 19/98 ANTHONY : SELINA AREA

Appendix I

Drillhole Data
Assay Results

Sample No	Samp_Type	Hole_Id	Depth_From (m)	Depth_To (m)	Cu GA101 DL 4ppm	Pb GA101 DL 5ppm	Zn GA101 DL 4ppm	Ag GA101 DL 2ppm (0.5ppm LS10)	Au GG309 DL 0.008 ppm	Au GG309 DL 0.008 ppm	Ba GX401 DL 10ppm	As GX401 DL 2ppm
565680	Coregrind	LS14	0.0	22.7	73	66	460	-2	0.011		1450	40
565681	Coregrind	LS14	22.7	45.9	48	77	125	-2	-0.008		1600	40
565682	Coregrind	LS14	45.9	55.5	55	34	91	2	-0.008		2550	55
565683	Coregrind	LS14	55.5	80.0	40	26	100	-2	-0.008		2250	25
565684	Coregrind	LS14	80.0	101.8	45	15	180	-2	-0.008		1250	20
565685	Coregrind	LS14	101.8	120.0	150	77	495	3	-0.008		1350	12
565686	Coregrind	LS14	120.0	140.0	115	355	1450	2	-0.008		1250	9
565687	Coregrind	LS14	140.0	161.1	67	74	490	-2	-0.008		920	35
565688	Coregrind	LS14	161.1	170.1	265	370	2400	3	0.029		390	140
565689	Coregrind	LS14	170.1	196.6	835	240	2400	-2	0.04		280	190
565690	Coregrind	LS14	196.6	206.7	320	37	410	-2	0.013		540	50
565691	Coregrind	LS14	206.7	220.0	440	20	265	-2	0.021	0.021	660	50
565692	Coregrind	LS14	220.0	235.1	195	22	170	-2	0.028		710	35
565693	Coregrind	LS14	235.1	244.5	240	50	485	5	0.018		950	50
565694	Coregrind	LS14	244.5	248.1	135	17	155	-2	0.028		2700	40
565695	Coregrind	LS14	248.1	255.3	2250	23	855	3	0.054		600	70
565696	Coregrind	LS14	255.3	265.4	535	18	88	-2	0.018		460	35
565697	Coregrind	LS14	265.4	273.1	125	25	245	-2	0.027		1000	30
565698	Coregrind	LS14	273.1	283.7	29	135	220	-2	-0.008	-0.008	730	8
565699	Coregrind	LS14	283.7	303.7	78	405	665	-2	-0.008		1500	11
565700	Coregrind	LS14	303.7	323.0	48	125	150	-2	-0.008	-0.008	1200	7
565701	Coregrind	LS14	323.0	349.5	37	205	285	-2	-0.008	-0.008	1750	6
623795	Petrological	LS14	63.0	63.1	6	5	47	-2	-0.008		2350	8
623796	Petrological	LS14	130.8	130.9	11	34	455	-2	-0.008		1150	17
623797	Petrological	LS14	218.0	218.1	93	38	1500	-2	-0.008	-0.008	1150	14
623798	Petrological	LS14	266.5	266.6	105	8	205	-2	-0.008		1050	7
623799	Petrological	LS14	300.7	300.8	39	260	375	-2	-0.008		2200	-2
623800	Petrological	LS14	310.8	310.9	19	73	98	-2	-0.008		1100	4
623801	Standard	LS14			130	210	2250	-2	-0.008	-0.008	1050	20
565839	coregrind	LS10	302.5	307.6	480	15	100	-0.5	0.035		601	35
565840	coregrind	LS10	307.6	313.06	3950	45	175	2.5	0.065		1233	34
565841	coregrind	LS10	313.06	315.5	6250	10	350	3.5	0.08		370	49
565842	coregrind	LS10	315.5	319.5	650	10	85	-0.5	0.04		883	37
565843	coregrind	LS10	319.5	324.68	135	25	90	-0.5	0.025		588	16
565844	coregrind	LS10	324.68	330.5	160	30	105	-0.5	-0.008		589	12
565845	coregrind	LS10	330.5	336.46	135	115	85	-0.5	0.015		855	5
565846	coregrind	LS10	336.46	345	110	140	400	-0.5	-0.008		998	9
565847	coregrind	LS10	345	355	200	140	340	-0.5	0.01	0.01	2068	8
565848	coregrind	LS10	355	365	40	45	250	-0.5	-0.008		1394	5
565849	coregrind	LS10	365	375	40	20	230	-0.5	-0.008	-0.008	1091	2
565850	coregrind	LS10	375	388.5	60	700	335	-0.5	-0.008		1048	5
565851	standard				110	190	2150	-0.5	-0.008		1130	14

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Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Assay Results

Sample No	Cr GX401 DL 5ppm	Zr GX401 DL 5ppm	Ti GX401 DL 50ppm (LS10)	Ti OX408 DL 0.005% (LS14)	Al2O3 OX408 DL 0.005%	SiO2 OX408 DL 0.1%	TiO2 OX408 DL 0.01%	Fe2O3 OX408 DL 0.01%	MnO OX408 DL 0.01%	CaO OX408 DL 0.01%	K2O OX408 DL 0.01%	MgO OX408 DL 0.01%
565680	16	240	2750	0.275	12.6	70.2	0.46	6.61	0.51	0.04	6.32	0.81
565681	-5	190	1020	0.102	11.63	73.2	0.17	6.53	0.04	0.01	6.71	0.28
565682	9	190	1170	0.117	11.7	72	0.2	6.62	0.03	0.01	7.97	0.2
565683	6	190	1080	0.108	12.21	75	0.18	3.06	0.05	0.01	7.99	0.26
565684	-5	200	1140	0.114	11.81	75.6	0.19	4.04	0.12	0.02	6.03	0.4
565685	16	270	2880	0.288	14.27	66.9	0.48	6.87	0.38	0.31	6.6	1.13
565686	9	320	2800	0.28	14.11	66.1	0.47	6.47	0.77	0.54	5.62	1.61
565687	12	240	3170	0.317	14.22	65.4	0.53	8.47	0.68	0.17	4.51	1.81
565688	35	160	3080	0.308	14.48	60.3	0.51	14.48	0.37	0.17	2.63	2.26
565689	110	140	2580	0.258	12.02	63.4	0.43	14.15	0.46	0.27	1.65	2.76
565690	40	190	2420	0.242	12.55	63.4	0.4	12.47	0.14	0.13	2.99	1.9
565691	20	180	3170	0.317	14.11	64	0.53	10.48	0.16	0.26	3.88	1.6
565692	10	240	2920	0.292	13.81	65	0.49	9.74	0.09	0.13	4.28	0.99
565693	20	160	3860	0.386	15.4	56.9	0.64	14.22	0.36	0.19	3.65	3.1
565694	17	210	2590	0.259	13.92	58	0.43	13.64	0.08	0.29	4.11	0.58
565695	17	120	2790	0.279	12.3	49.1	0.47	21.8	0.17	0.34	3.53	1.05
565696	14	200	2780	0.278	12.46	59.2	0.46	14.07	0.03	0.43	4.13	0.37
565697	18	190	3330	0.333	14.21	61.1	0.55	11.96	0.1	0.29	4.62	1.08
565698	9	450	3770	0.377	14.43	69	0.63	5.44	0.24	0.18	5.17	1.3
565699	18	260	2620	0.262	13.9	64.1	0.44	8.46	0.35	0.83	6.22	1.72
565700	6	250	2690	0.269	14.67	65.1	0.45	3.97	0.25	2.61	6.5	1.25
565701	8	240	2540	0.254	14.17	64.9	0.42	3.64	0.22	3.23	7.09	0.89
623795	-5	210	1180	0.118	12.97	73.5	0.2	3.64	0.03	0.01	8.26	0.29
623796	15	280	2690	0.269	14.42	66.1	0.45	8.03	0.27	0.11	5.08	1.86
623797	25	250	2920	0.292	13.91	63.3	0.49	11.03	0.29	0.47	2.99	2.93
623798	10	310	1850	0.185	12.19	70.6	0.3	8.18	0.17	0.05	3.62	1.18
623799	17	250	2370	0.237	12.71	64.4	0.4	8.35	0.41	1.48	6.46	1.57
623800	9	250	2640	0.264	14.33	66.3	0.44	4.09	0.19	2.53	6.58	0.9
623801	880	85	2740	0.274	15.16	51.6	0.46	9.85	0.9	3.86	1.29	7.59
565839	6	258	1464									
565840	15	209	1482									
565841	14	114	991									
565842	24	154	2288									
565843	21	138	2688									
565844	16	233	2423									
565845	5	294	2109									
565846	23	174	2640									
565847	25	182	2383									
565848	18	200	2552									
565849	24	186	2727									
565850		233	2295									
565851	92	80	2357									

Appendix I

EL 19/98 ANTHONY : SELINA AREA
Drillhole Data
Assay Results

Sample No	P2O5 OX408 DL 0.005%	S OX408 DL 0.01%	LOI OX408 DL 0.01%	Na2O OX408 DL 0.05%	Total
565680	0.091	-0.01	2.03	0.11	99.78
565681	0.039	0.04	1.4	0.14	100.21
565682	0.028	0.07	1.01	0.18	99.97
565683	0.026	0.04	1.12	0.25	100.22
565684	0.02	0.02	1.53	0.11	99.9
565685	0.081	0.07	2.46	0.14	99.69
565686	0.089	0.38	3.24	0.25	99.65
565687	0.09	0.35	3.54	0.06	99.86
565688	0.13	0.7	3.66	0.18	99.85
565689	0.213	1.28	4.23	0.16	101
565690	0.116	3.1	5.19	0.15	102.51
565691	0.143	2.91	5.07	0.28	103.44
565692	0.102	3.01	5.6	0.1	103.34
565693	0.14	2.93	5.34	0.12	103.01
565694	0.129	4.22	7.82	1.09	104.29
565695	0.301	4.59	10.21	0.15	104.03
565696	0.341	3.62	8.44	0.08	103.69
565697	0.22	3.48	5.62	0.14	103.37
565698	0.145	0.36	2.92	0.11	99.91
565699	0.094	0.28	3.02	0.26	99.7
565700	0.104	0.12	3.31	1.79	100.08
565701	0.095	0.24	3.51	1.46	99.84
623795	0.017	0.01	1.06	0.36	100.29
623796	0.092	0.15	3.03	0.18	99.82
623797	0.122	0.69	3.95	0.25	100.46
623798	0.049	0.45	2.72	0.16	99.68
623799	0.081	0.26	3.22	0.28	99.57
623800	0.095	0.01	3.36	1.52	100.32
623801	0.203	0.07	5.18	3.71	99.82
565839					
565840					
565841					
565842					
565843					
565844					
565845					
565846					
565847					
565848					
565849					
565850					
565851					

Appendix II

Graphic Logs

LS1
LS2
LS3
LS4
LS5
LS6
LS7
LS9
LS10
LS13
LS14

GOLDFIELDS EXPLORATION (ZEEHAN) - ROCK CODES

TYPE
U - Volcanic (general)
V - Volcaniclastic
E - Epiclastic
L - Lava
I - Intrusive

COMPOSITION
R - Rhyolite
Y - Rhyodacite
D - Dacite
A - Andesite
B - Basaltic
F - Felsic
M - Mafic
U - Ultramafic

CRYSTAL TYPE
X - Crystal rich
A - Aphyric
F - Feldspar phyric
< - Feldspar - quartz phyric
> - Quartz - feldspar phyric
Q - Quartz phyric
H - Hornblende phyric
P - Pyroxene phyric
B - Biotite phyric
V - Vitric / glassy
L - Lithic rich
R - Reworked, commonly with Carbonate matrix

OTHERS
TILL - Glacial moraine
CLAY - Glacial clays
SILT - Black pyritic siltstone
FALT - Fault
CARB - Massive Carbonate
CBBX - Carbonate breccia
VEIN - Vein
GWAC - Greywacke
CONG - Siliciclastic Conglomerate
SAND - Siliciclastic Sandstone
XXXX/YYYY - Interbedded units

GRAINSIZE
B - Breccia
C - Coarse
M - Medium (Sandy)
F - Fine (Silty)
V - Very fine (Shaley)
A - Ashy
/ - Undifferentiated
X - Crystal Rich
P - Pumiceous

ALTERATION
P - Pyrite
$ - Mineralised
Q - Quartz
O - Chlorite
C - Carbonate
H - Hematite
S - Sericite
K - K feldspar
A - Albite
E - Epidote
F - Fuchsite
M - Magnetite
L - Limonite

N - Scale
1 - Very Weak
3 - Weak
5 - Moderate
7 - Strong
9 - Intense

eg. AOC7
Strong albite-chlorite-carbonate alteration
(albite>chlorite>carbonate, albite = 7)

RGC EXPLORATION PTY LTD

DRILL HOLE No LS1 598102

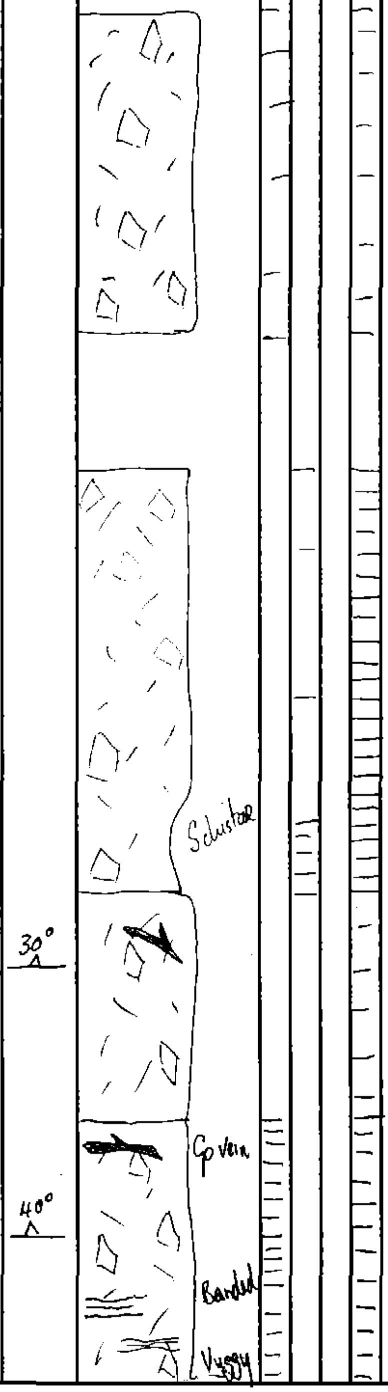
SHEET 1 **OF** 4

———	Bedding
⊔	Cleavage
—▲—	Foliation
∿∿	Fault, Shear
▵▵	Breccia
▩	Broken core
░	Disseminated
■	Massive
▨	Pervasive
↘	Narrow vein
*	Visible gold

PROJECT : EL 19/98 ANTHONY
PROSPECT : SELINA
DATE : 12.07.99
LOGGED BY : W. GODSALL

ft

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL. SER. PY. CHL	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
10						No CORE			
20 30 40 50 60						20 Qtz phyric ? lava Greenish, pinkish grey, m.gr, weakly porphyritic, weathered, ?rhyolitic, hornblende xtls, locally kaolinised. Tends to be massive but heavily broken/jointed Slickensides along joint planes	Cel	LRQM	OKQ3
70						62 Patches where chlorite alteration becomes more intense.			
						No CORE			
80 90 100 110 120 130						80 Qtz phyric ? lava ?rhyolitic. M.gr-f.gr. Pervasive chlorite alteration with blebs of magnetite and patches of haematite. Trace specks sulphides (mostly py, ± cp) significantly less obvious than recorded in original log.	Cel	LRQF	OHM4
140 150 160			30°			135 F.gr., qtz phyric, ?rhyolitic, lava Gradational contacts. Pervasive chlorite. Patches of haematite. ?Jasper veinlets. Weakly foliated Occasional magnetite	Cel	LRQF	OH3
170 180 190 200			40°			165 169 Qtz phyric, ± felsp phyric, lava ?Rhyolitic. Pervasive chlorite alteration, siliceous, patches of haematite. Weakly foliated. Trace specks pyrite. Blebs magnetite	Cel	LRQF	OQH6



REMARKS

RGC EXPLORATION PTY LTD

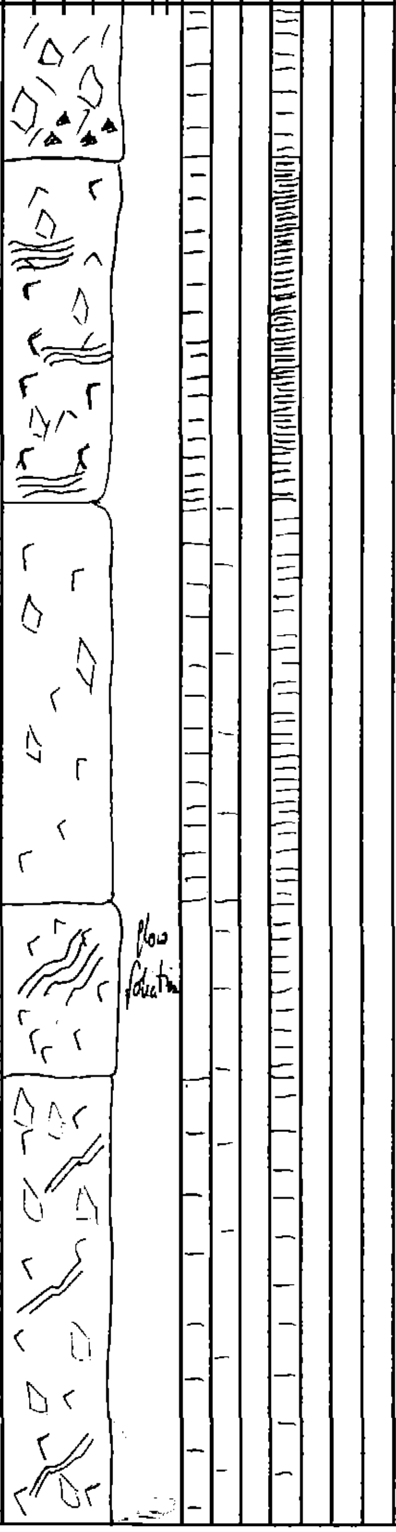
DRILL HOLE No LS 1

SHEET 2 **OF** 4

- ── Bedding
- └┘ Cleavage
- ─▲─ Foliation
- ∿∿ Fault, Shear
- Breccia
- ▩ Broken core
- ▨ Disseminated
- ■ Massive
- ▧ Pervasive
- Narrow vein
- * Visible gold

PROJECT :	EL 19/98 ANTHONY
PROSPECT :	SELINA
DATE :	12.07.99
LOGGED BY :	W. GODSALL

ft



HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
210 220			40	Qtz phyric lava weakly brecciated	Cel	LRQF	OQH6
230 240 250 260			45	220 Qtz phyric ?lava with white-translucent qtz. ?Dacitic F.gr. Locally banded and foliated. Strong pervasive chlorite altration. Disseminations and blebs sulphides - mostly py ±cp, sometimes aligned along foliation. Weakly pervasive haematite. Occasional magnetite	Cel	LDQF	OQH8
270 280 290 300 310			45°	265 Foliated, ?dacitic lava. Weakly qtz phyric. F.gr. Pervasive chlorite alteration, ± sericitic alteration. Blebs and disseminations of py, ± cp. Po in original log. Foliated	Cel	LDQF	OQHS7
320 330			50°	318 Massive, f.gr., banded, ?lava ?Dacitic and weakly porphyritic. Blebs and disseminations py cp Blebs magnetite, usually associated with sulphides	Cel	LDQF	OHP6
340 350 360 370 380 390 400			60° 80°	341 F.gr. foliated, banded in places, tending to be massive, ? lava. ?Dacitic and weakly porphyritic Qtz phyric, Moderate chlorite alteration, siliceous and possibly weakly sericitic. Local pervasive magnetite. Occasionally fragmental Disseminations and veinlets of Py ±cp, frequently along foliation	Cel	LDQF	QOH5

REMARKS

RGC EXPLORATION PTY LTD

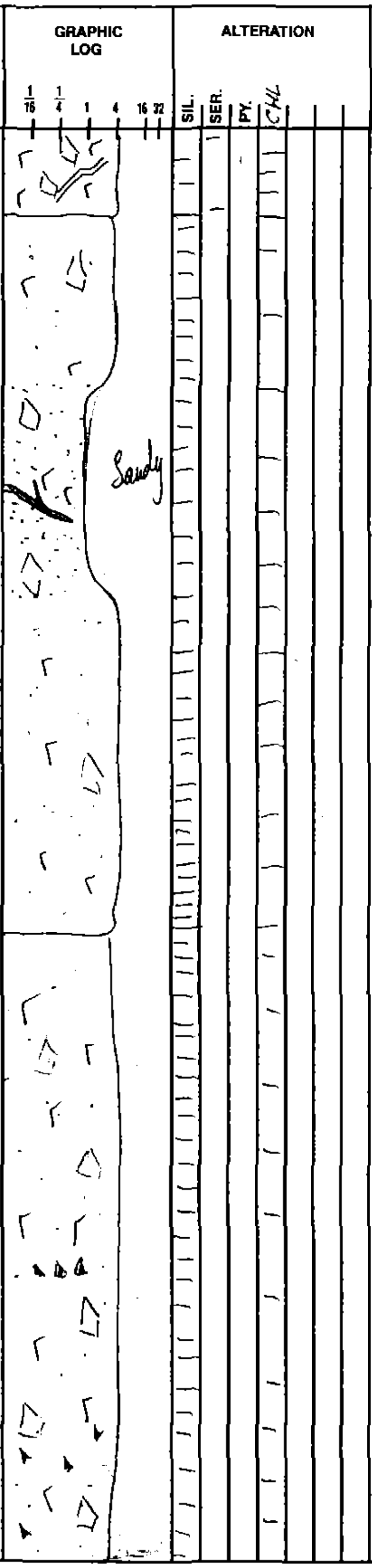
DRILL HOLE No LS1

SHEET 3 **OF** 4

PROJECT	: EL 19/98 ANTHONY
PROSPECT	: SELINA
DATE	: 12.07.99
LOGGED BY	: W. GODSALL

——	Bedding	░	Disseminated
⊔	Cleavage	■	Massive
—▲—	Foliation	▨	Pervasive
∿∿	Fault, Shear	⟋	Narrow vein
▵▿	Breccia	*	Visible gold
▩	Broken core		

ft



HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.
410			
420			70°
430			
440			
450			
460			
470			
480			
490			
500			70
510			
520			
530			
540			
550			
560			
570			
580			
590			75°
600			

GEOLOGY NOTES

?Lava
Steep foliation

412

Haematitic qtz phyric ?lava M.gr-c.gr, siliceous and sandy in places. ?Dacitic? Qtz fragmental, imparts a volcaniclastic appearance in places. Locally brecciated Foliated (schistose). Weak chlorite alteration tends to be dominated by chlorite. Foliation is generally well developed with a faint alignment of qtz clasts along the foliation

511

Haematitic ?lava, qtz phyric, fragmental and bedded/stratified in places M.gr-c.gr, sandy and siliceous. ?Dacitic
Very strongly haematitic, weakly chloritic
Well developed foliation.
Distinctive qtz clasts often fragmental.
Locally brecciated

SUMMARY	ROCK	ALTERATION
Cel	LDQF	QOH5
Cel	LDQM	HQO6
Cel	LDQM	HQO8

REMARKS

RGC EXPLORATION PTY LTD

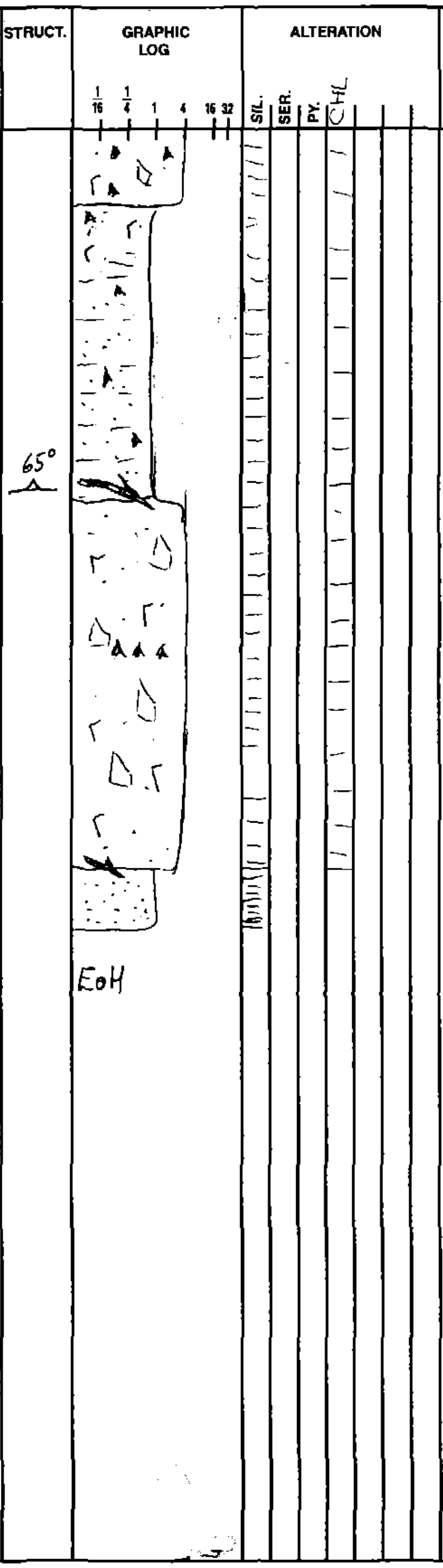
DRILL HOLE No LS 1

SHEET 4 **OF** 4

——	Bedding
⊔	Cleavage
—▲—	Foliation
∿∿	Fault, Shear
▽△▽	Breccia
▩	Broken core
▨	Disseminated
■	Massive
▨	Pervasive
↘	Narrow vein
*	Visible gold

PROJECT :	EL 19/98 ANTHONY
PROSPECT :	SELINA
DATE :	12.07.99
LOGGED BY :	W. GODSALL

ft



HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
				Haematitic lava	Cel	LDQM	HQ08
610				610 ? Volcanic haematitic sandstone Gradational contacts, almost a transitional unit. Qtz phyric Alteration is strongly haematitic and weakly chloritic Siliceous	Ces	VDQM	HQ07
620							
630							
640							
650			65°				
				652 Haematitic ?lava. Qtz phyric ?Dacitic. Fragmental, some lithics where locally brecciated Foliated	Cel	LDQM	HQ08
660							
670							
680							
690							
700							
				703 Foliated haematitic sandstone	Cow	SAND	H6
710				711 Siliciclastic. C.gr with small qtz "pebbles". Possibly Owen			

REMARKS

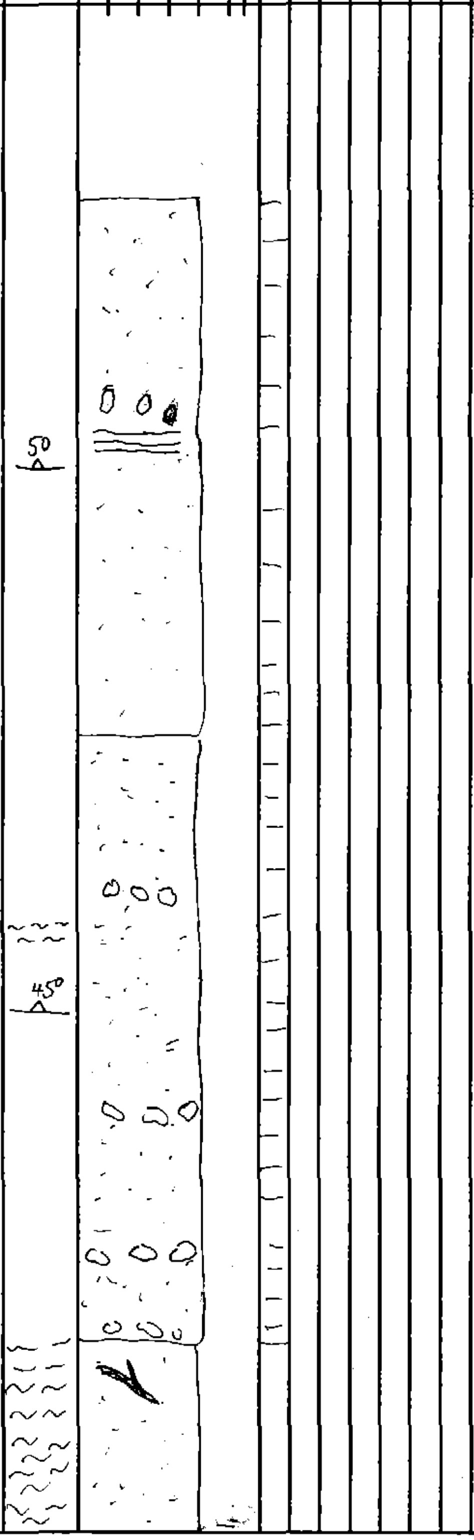
RGC EXPLORATION PTY LTD

DRILL HOLE No LS 2

SHEET 1 **OF** 4

—	Bedding	▒	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
∿	Fault, Shear	↘	Narrow vein
△	Breccia	*	Visible gold
▩	Broken core		

PROJECT : EL 19/98 ANTHONY
PROSPECT : SELINA
DATE : 13.07.99
LOGGED BY : W. GODSALL



HOLE DEPTH ft	SAMPLE No PREFIX	ASSAY RESULTS	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
10			No CORE			
20						
30			25 Siliclastic sandstone White, m.gr., massive, brittle			
40						
50						
60						
70				COou	SAND	Q4
80						
90						
100			95 Haematitic siliclastic sandstone and conglomerate. C.gr. grits Haematite imparts distinctive purple colour			
110						
120						
130						
140						
150				COou	SAND	HQ4
160						
170						
180			174 Sheared/faulted sandstone			
190				COou	SAND	HQ3
200						

REMARKS

598106

RGC EXPLORATION PTY LTD

DRILL HOLE No LS2

SHEET 2 **OF** 4

Bedding	▨ **Disseminated**
Cleavage	■ **Massive**
Foliation	▨ **Pervasive**
Fault, Shear	**Narrow vein**
Breccia	* **Visible gold**
▩ **Broken core**	

PROJECT : EL 19/98 ANTHONY

PROSPECT : SELINA

DATE : 13.07.99

LOGGED BY : N. GODSALL

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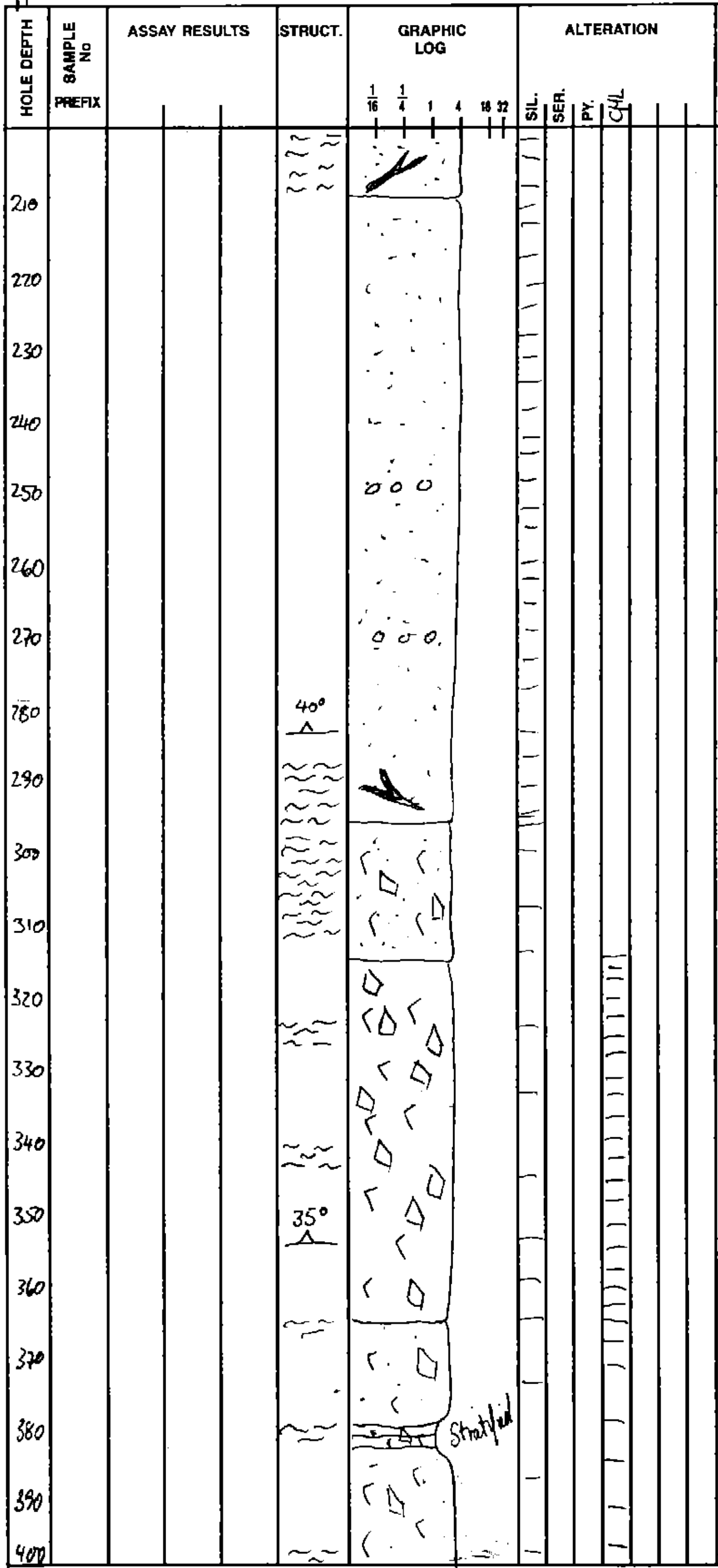


GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
Sheared sandstone	COou	SAND	HQ3
209 Haematitic siliclastic sandstone, locally conglomeratic. Generally m gr - f.gr, slightly massive	COou	SAND	HQ4
289		FALT	
296 Sheared ? volcaniclastic. Foliated. Gradational unit.	Cev	VDAF	OH3
315 Qtz phyric ? lava Dark greenish grey, f gr, ? dacitic and weakly qtz phyric. Strong chlorite alteration grading into moderate haematite alteration. Weakly foliated.	Cel	LDQF	OH6
365 Haematitic qtz phyric ? lava 379 383 Weakly qtz phyric, ? dacitic, possible occasional fds phyric, m.gr, foliated and sheared Occasionally fragmental	Cel	LDQM	HO5

REMARKS

598107

RGC EXPLORATION PTY LTD

DRILL HOLE No LS2

SHEET 3 **OF** 4

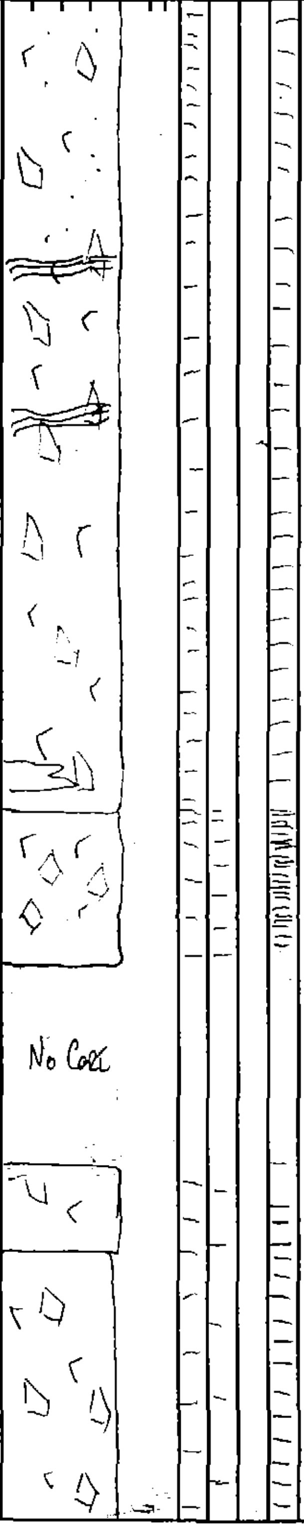
── Bedding	▒ Disseminated
└┘ Cleavage	■ Massive
─▲─ Foliation	▨ Pervasive
〰 Fault, Shear	↘ Narrow vein
▽△ Breccia	* Visible gold
▩ Broken core	

PROJECT : EL 19/98 ANTHONY

PROSPECT : SELINA

DATE : 13.07.99

LOGGED BY : W. GODSALL



HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG (1/16, 1/4, 1, 4, 16, 32)	ALTERATION (SIL., SER., PY., CHL.)	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
			40°			Haematitic qtz phyric lava			
410									
420									
430									
440									
450									
460									
470			40°				Col	LDGM	H05
480			〰						
490			〰						
500									
510			40°			506 Altered ? lava Chlorite and sericite altered, f gr. siliceous and foliated. Original textures destroyed (by alteration). ? Dacitic	Col	LDAF	QSQ7
520						526			
530									
540				No Core		No CORE Altered ? lava Weakly qtz phyric, strong haematite alteration with subordinate chlorite and very weak sericite alteration	? Ces		
550			55°			553			
560						564	Col	LDQF	H07
570						Qtz phyric lava Strongly chlorite altered, ? dacitic in composition, and strongly developed foliation. Weakly siliceous, haematitic and sericitic.			
580									
590			60°				Col	LDQF	QQSH6
600									

REMARKS

598108

RGC EXPLORATION PTY LTD

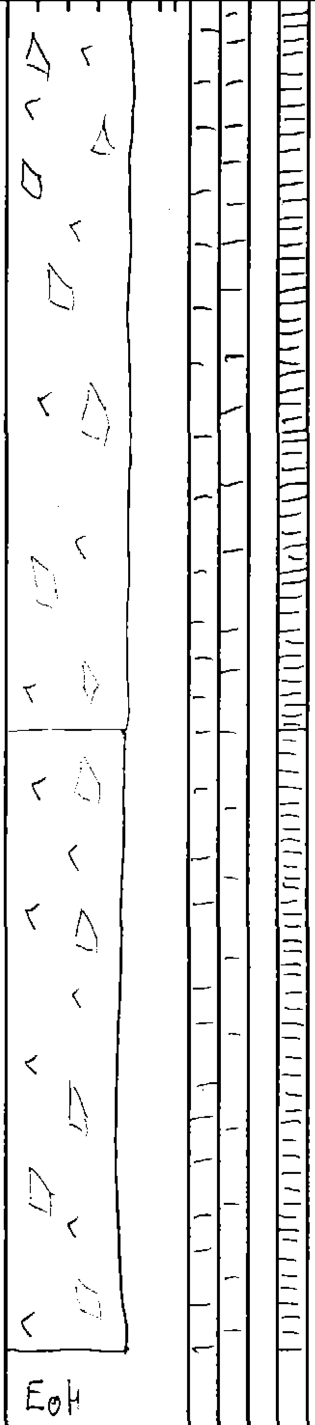
DRILL HOLE No LS2

SHEET 4 **OF** 4

PROJECT	: EL 19/98 ANTHONY
PROSPECT	: SELINA
DATE	: 13.07.99
LOGGED BY	: N. GODSALL

- ——— Bedding
- └┘ Cleavage
- —▲— Foliation
- ∿∿ Fault, Shear
- ⁂ Breccia
- ▩ Broken core
- ▤ Disseminated
- ■ Massive
- ▨ Pervasive
- ↘ Narrow vein
- * Visible gold

ft



HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL. SER. PY. CHL.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
610						Qtz phyric lava Pervasive chlorite with blebs/patches of magnetite. Specks and disseminations of sulphides - py ± cp.	Cel	LDQF	OQSH6
620									
630									
640			70° ▲						
650									
660									
670									
680			85° ▲						
690									
						695 Qtz - fdsp phyric lava Dark green f gr, strongly altered with destruction of original textures. Chloritic, sericitic, and weakly haematitic No obvious magnetite Disseminations and stringers of sulphides mainly py, ± cp. Occasional ?malachite staining Foliation not as well developed as in overlying unit.	Cel	LD>F	OQS6
700									
710									
720									
730			65° ▲						
740									
750									
760									
770									
						776			

REMARKS

598109

RGC EXPLORATION PTY LTD

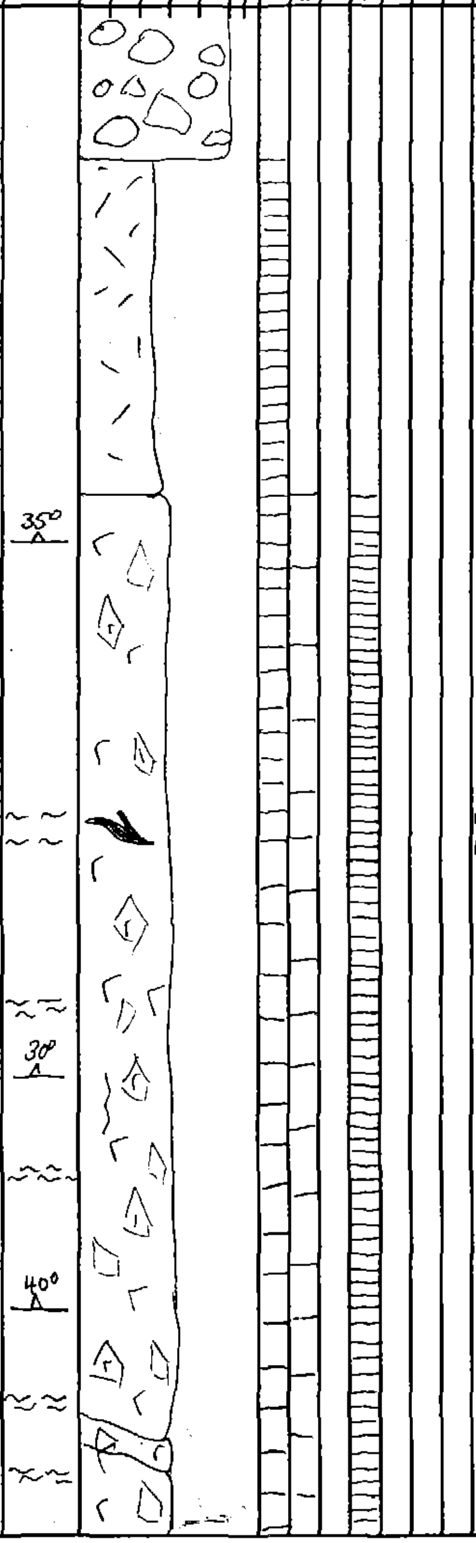
DRILL HOLE No LS3

SHEET 1 **OF** 5

PROJECT	: EL 19/98 ANTHONY
PROSPECT	: SELINA
DATE	: 11.06.99 and 16.07.99
LOGGED BY	: W. GODSALL

—	Bedding	▨	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
~~	Fault, Shear	➘	Narrow vein
△	Breccia	*	Visible gold
▩	Broken core		

ft



HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL. SER. PY. CHL	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
10						Owen conglomerate rubble Unconsolidated rounded pebbles, purple and haematitic, siliciclastic	Q	CONG	
20, 30, 40, 50, 60						20 Limonitic ? lava Qtz and fldspar phyric. C.gr - m.gr Leached, weathered and limonitic, pitted ? Rhyolitic Siliceous	Cel	LR7M	LS6
70, 80, 90, 100			35°			64 Qtz phyric lava Qtz phyric, porphyritic, with angular qtz clasts. Locally feldspathic. Leached and pitted. ? Dacitic ? Sheared Strong chloritic alteration, weak sericite, siliceous Weakly developed foliation		LDQM	OQS5
110						106 110 Qtz vein with carbonate and strong dark green chlorite		VEIN	08
120, 130, 140, 150, 160, 170, 180			30°, 40°			No visible mineralisation, possibly leached out where limonitic	Cel	LDQM	OQS5
190						185 189 Limonitic			← L6
200						200			OQS5

REMARKS Core in reasonable condition. Depth markers difficult to read. Minor mixing/displacement of core

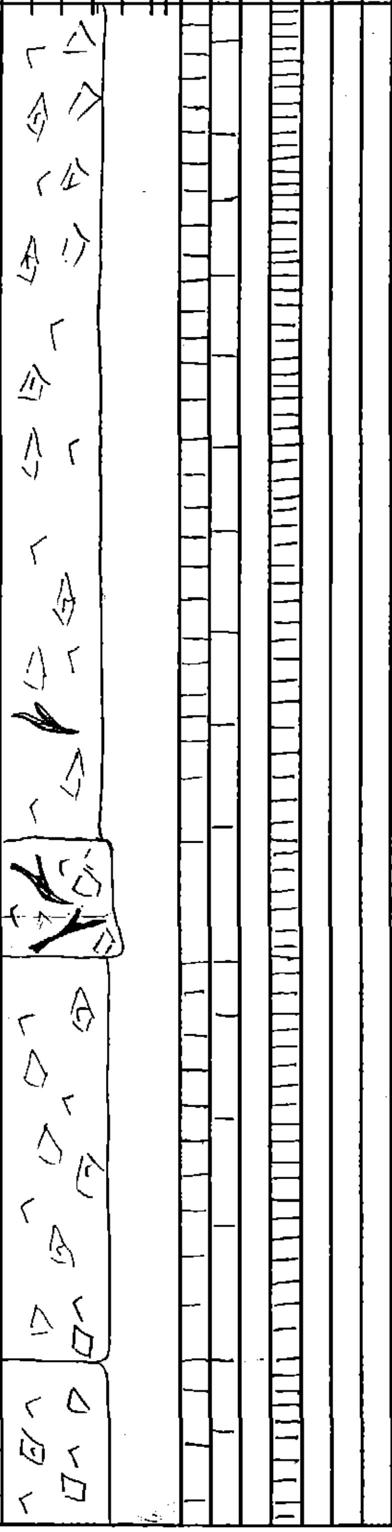
RGC EXPLORATION PTY LTD

DRILL HOLE No LS3

SHEET 2 OF 5

— Bedding
⊔ Cleavage
▲ Foliation
∿ Fault, Shear
▵ Breccia
▩ Broken core
▨ Disseminated
■ Massive
▨ Pervasive
⟋ Narrow vein
* Visible gold

PROJECT : EL 19/98 ANTHONY
PROSPECT : SELINA
DATE : 11.06.99 and 16.07.99
LOGGED BY : W. GODSALL



HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
						Qtz phyric lava			
210						Green, m.gr, qtz phyric, porphyritic with angular qtz clasts ?Dacitic.			
220			40° ▲			Leached and pitted, possibly vesicular. Moderately sheared with a poorly			
230						developed schistosity/foliation. Strong chlorite alteration, siliceous			
240						and sericitic. Trace scattered specks py, ± cp,			
250			∿			occasional as slivers/veinlets and blebby.			
260			45° ▲			261 Limonitic	Cel	LDQM	OQS8
270									
280									
290						Irregular veinlets pink qtz			
300			45° ▲						
310						310 Veined, slightly brecciated qtz phyric lava. Host essentially the same as above unit.	Cel	LDQB	OQ8
320						325 Local cockscomb structure			
330						Qtz phyric lava			
340						Same as above, possibly more sheared ?Dacitic.			
350			∿			Green, m.gr, qtz phyric, possibly vesicular, porphyritic with angular and fractured qtz clasts	Cel	LDQM	OQS7
360			45° ▲ ∿			Weak foliation Strong chlorite alteration, siliceous,			
370			∿			weakly sericitic Trace specks py			
380						378 Qtz phyric lava			
390						Same as above but with occasional limonitic coatings along joint planes and fracture surfaces	Cel	LDQM	OQL7
400									

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No LS3

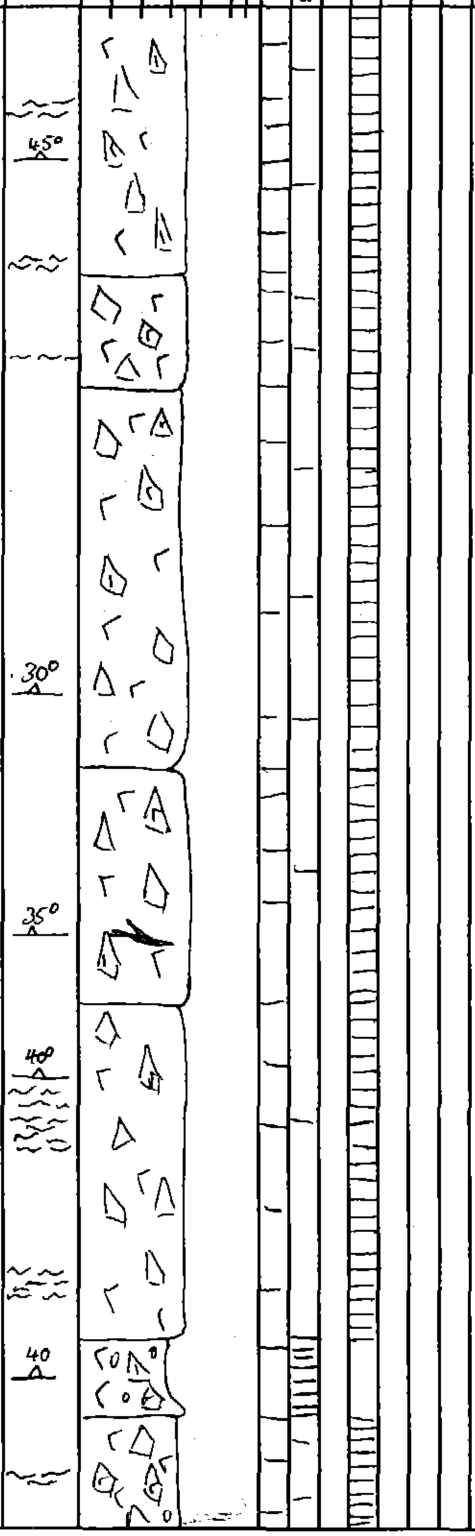
SHEET 3 OF 5

—	Bedding
⊔	Cleavage
▲	Foliation
~	Fault, Shear
▽△	Breccia
▩	Broken core
░	Disseminated
■	Massive
▨	Pervasive
↘	Narrow vein
*	Visible gold

PROJECT : EL 19/98 ANTHONY
PROSPECT : SELINA
DATE : 11.06.99 and 16.07.99
LOGGED BY : W. GODSALL

ft

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
410 420 430			45°	Qtz phyric lava	Cel	LDQM	OQL7
440 450				435 Qtz phyric lava Dark green strongly chlorite altered, qtz phyric, ? dacitic. Weakly foliated Blebs and slivers subhedral py 450	Cel	LDQF	OQS7
460 470 480 490			30°	Qtz fdsp phyric lava Dark green, m.gr.-f.gr., porphyritic, ? dacitic, slightly massive and weakly foliated. Fdsp phenocrysts as reddish clasts, often fractured. Strong chlorite alteration, siliceous and weakly sericitic. Weak albitisation. Slivers, blebs and specks of magnetite. Trace specks py.	Cel	LD>F	OQMA7
500 510 520			35°	500 Qtz fdsp phyric lava As above but with slightly increased magnetite content, becoming more pervasive	Cel	LD>F	OMQA7
530 540 550 560 570			40°	531 Qtz fdsp phyric lava Blackish green, f.g., ? dacitic, gradational, with limonitic coatings along joint and fracture surfaces. Weakly foliated Strong chlorite alteration, siliceous, weak sericite, almost pervasive magnetite Trace specks py	Cel	LD>F	OMQA7
580			40	575 As above, but with stronger limonite and predominant sericite alteration	Cel	LD>F	SQL6
590 600				585 Qtz fdsp phyric lava Strong chlorite alteration. Pervasive magnetite 600	Cel	LD>F	OMQ7



REMARKS

RGC EXPLORATION PTY LTD

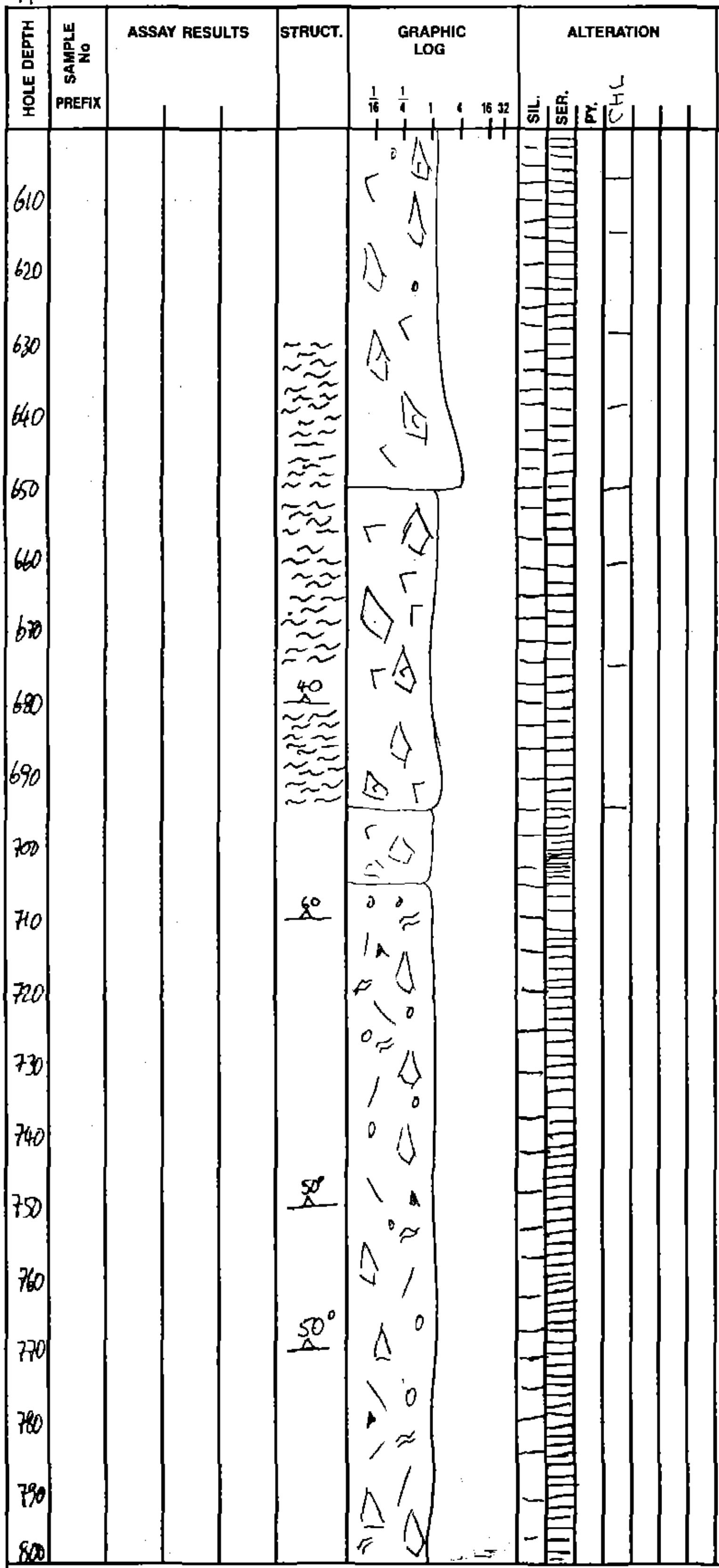
DRILL HOLE No LS3

SHEET 4 **OF** 5

PROJECT	: EL 19/98 ANTHONY
PROSPECT	: SELINA
DATE	: 11.06.99 and 16.07.99
LOGGED BY	: W. GODSALL

——	Bedding	▨	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
〰	Fault, Shear	↘	Narrow vein
△	Breccia	*	Visible gold
▩	Broken core		

ft



	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
	Qtz phyric lava Light grey, m.gr, ? dacite, porphyritic. Strong sericite alteration, moderate to weak chlorite alteration Strong/prominent limonitic content. Weakly haematitic. leached and pitted - possibly vesicular No visible mineralisation (limonite may be after sulphides) Sheared/faulted and heavily broken	Cel	LDQF	SQL 6
650	core			
	Qtz phyric lava Same as above but purplish in colour and with a significantly greater haematite content and less limonite staining No visible mineralisation. Sheared/faulted and broken core	Cel	LDQM	SQH6
695	As above, but buff colour and intensely sericitised	Cel	LDQM	SQ8
705	Qtz fdsp phyric volcanics Light purplish grey, m.gr - c.gr, gradational with preceding units Pitted/vesicular, with lithic and pumice fragments. ? Rhyolitic Intense sericitisation and haematitic alteration. Weakly magnetic. Weak foliation. No visible mineralisation. (These volcanics very similar to the overlying lavas and may simply the same unit which has undergone continued alteration)	Cep	VR>C	SQHM7

REMARKS Form and distribution of magnetite similar to Mt. Lyell field (Prince Lyell deposit)

RGC EXPLORATION PTY LTD

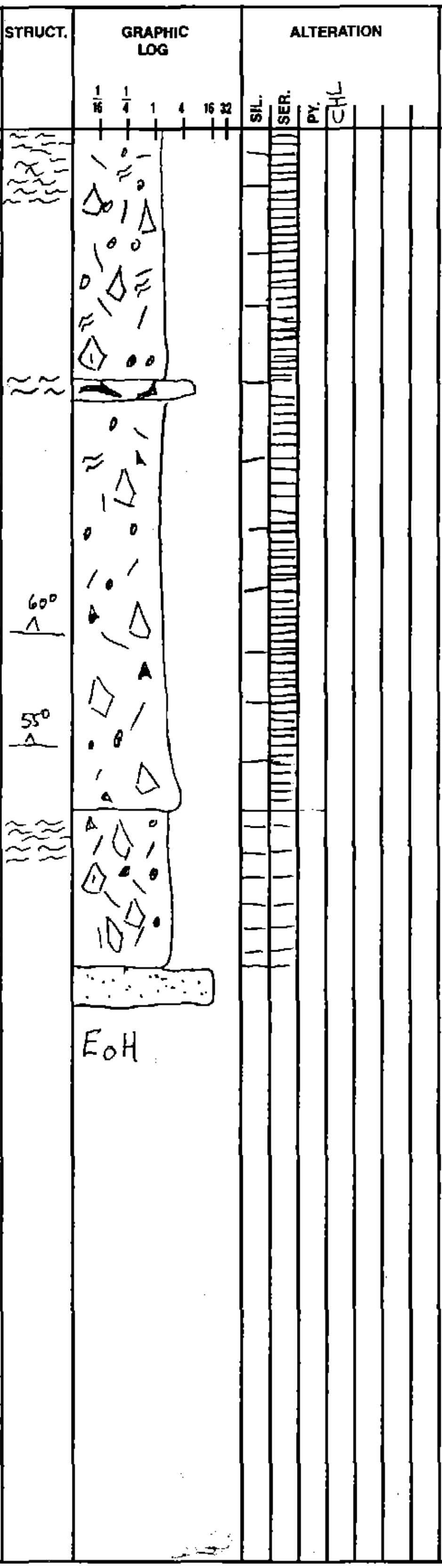
DRILL HOLE No LS3

SHEET 5 **OF** 5

—	Bedding	▨	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
〰	Fault, Shear	↘	Narrow vein
▵	Breccia	*	Visible gold
▩	Broken core		

PROJECT	: EL 19/98 ANTHONY
PROSPECT	: SELINA
DATE	: 11.06.99 and 16.07.99
LOGGED BY	: W. GODSALL

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION | GEOLOGY NOTES | SUMMARY



HOLE DEPTH	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
ft 810 820 830	Qtz fdsp phyric volcanics	Cgp	UR>C	SQH7
	835 838		VEN	
840 850 860 870 880 890	Haematitic volcanics Pink haematitic, m gr - c gr, porphyritic, qtz phyric, ? rhyolitic, volcanic, possible lithic fragments. Weakly foliated. Weakly fdspar phyric. Strong sericite alteration No visible mineralisation	Cgp	URQC	HS7
900 910	895 Similar to above but with less haematite. ? Rhyolitic ? Reworked ? Siliceous, sericitic and porphyritic. No visible mineralisation. Local limonite staining along fracture surfaces. ? Haematite alteration front at 900' ?	?Cgp	URQM	SQH6
920	917 922	Ccm	SAND	
	Recrystalised sandstone White massive, m gr, faint haematite tinge. Limonite coatings along fracture surfaces			

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No LS 4

SHEET 1 **OF** 3

—	Bedding	▒	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
〰	Fault, Shear	↘	Narrow vein
△	Breccia	*	Visible gold
▩	Broken core		

PROJECT : EL 19/98 - ANTHONY

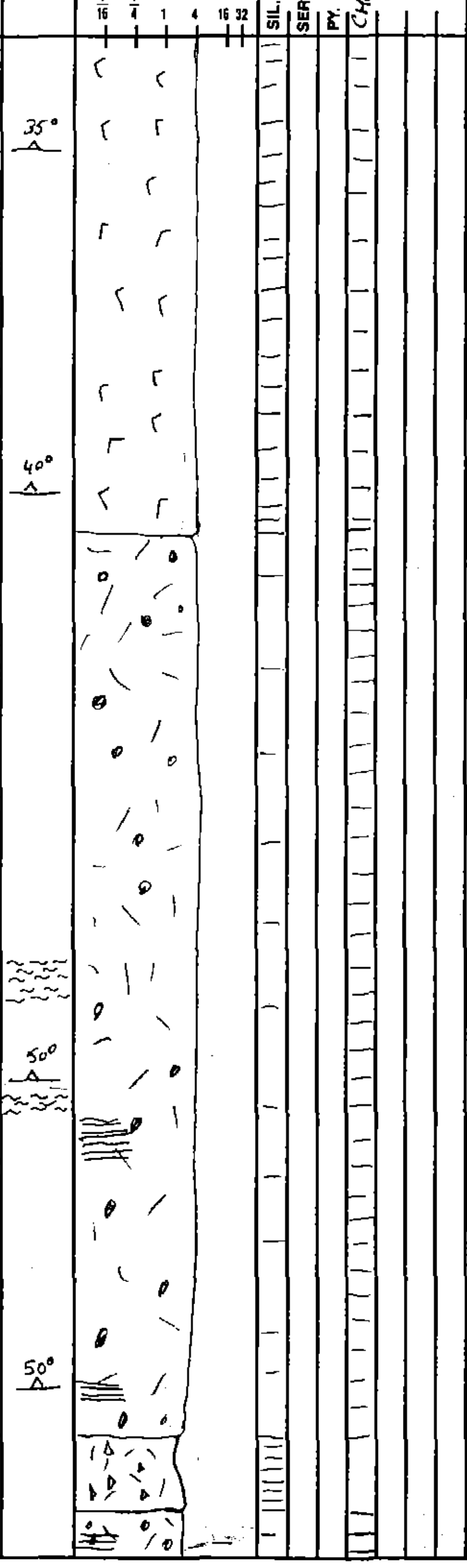
PROSPECT : SELINA

DATE : 17 JUNE 1999

LOGGED BY : W. GODSALL

ft

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION SIL. SER. PY. CHL
20					
40					
60					
80					
100					
120					
140					
160					
180					
200					
220					
240					
260					
280					
300					
320					
340					
360					
380					
400					



	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
	Porphyritic Lava Light grey, muddy brown in places, coarse to medium grained, fdsp - qtz phyric, ? dacitic, massive, weakly weathered with limonitic stainings along joint and fracture surfaces. Siliceous, weak chlorite alteration, local weak albitisation	Cel	LD<C	QOA3
130'	Volcaniclastics? rhyolitic? Greyish reddish brown, massive, dense, with qtz, fdspar and lithic fragments. Non-vesicular clasts/fragments generally sub rounded and non-angular Darker variety/units may represent local mud-rich environments Generally weak alteration, mainly chlorite, some albite and locally siliceous	Cev	VR>C	OQ2
144 255			FALT	
	Epidote along joint planes (slickensided) Local limonite staining along joints and fractures	Cev	VR>C	OQ2
368'	? Lava - weakly brecciated Rhyolitic (?), porphyritic, qtz phyric	Cep	LRQB	Q3
388'	Reddish brown.	Cev	← ER	← OG

REMARKS Core in reasonable condition. Depth markers generally legible.

RGC EXPLORATION PTY LTD

DRILL HOLE No LS4

SHEET 2 **OF** 3

——	Bedding
⊔	Cleavage
—▲—	Foliation
∿∿	Fault, Shear
△▽△	Breccia
▩	Broken core
▒	Disseminated
■	Massive
▨	Pervasive
➘	Narrow vein
*	Visible gold

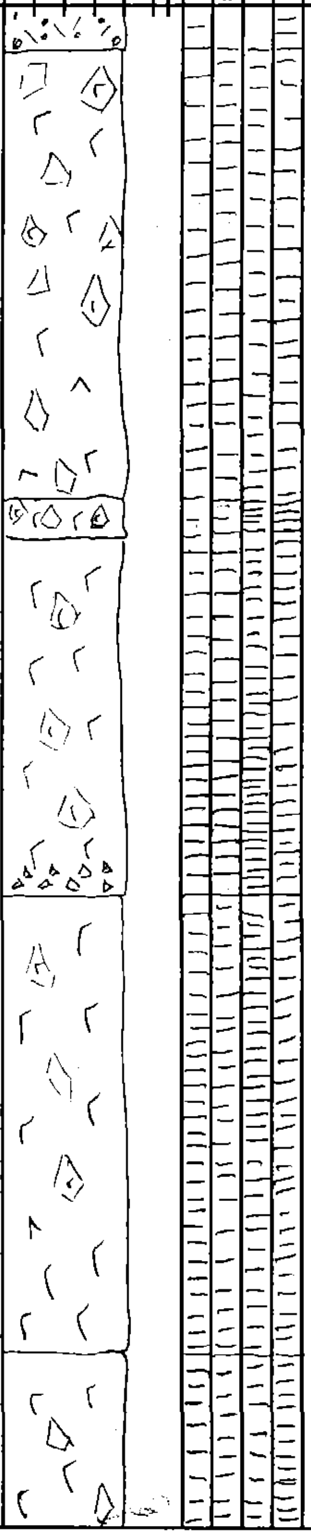
PROJECT : EL 19/98 - ANTHONY

PROSPECT : SELINA

DATE : 17 JUNE 1999

LOGGED BY : W. GODSALL

ft



HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
				412 Epiclastics	Cv	← Ei	← C
420				Felsic volcanics ?lava? Light grey, medium/fine grained, massive, foliated, ?dacitic lava/volcanics. Qtz phyric Sheared siliceous and altered to sericite and chlorite ±albite Disseminations and blebs py ±cp throughout	Cep	ULFQF	QOS7
440			55° ▲				
460							
480							
500			60° ▲				
520							
				530 Felsic lava	Cep	LFQF	QOS7
540				540 Felsic ?lava? Highly altered volcanic Light grey, medium grained, massive, foliated, qtz-feldspar phyric, ?dacitic. Siliceous, sericitic, chloritic and locally albitic (patches) Disseminated py. Occasional rhodolit	Cep	LF>M	QOS7
			50° ▲				
560							
580							
600							
620			45° ▲				
				635 Brecciated			
640				Felsic ?lava Similar to above - i.e. highly altered volcanics Massive, foliated, weakly porphyritic, ?dacitic. Siliceous, sericitic, chloritic and albitic. Disseminated py ±cp, local veinlets	Cep	LF>M	QOS7
660			40° ▲				
680							
700							
720			35° ▲				
740							
				755			
760				Felsic ?lava Similar to above - ie highly altered volcanics, but with imperceptible increase in pervasive chlorite	Cep	LF>M	QOS7
780			45° ▲				
800							

REMARKS Alteration similar to Mt Lyell, although schistosity is not as well developed (as at Mt Lyell)

RGC EXPLORATION PTY LTD

DRILL HOLE No LS4

SHEET 3 **OF** 3

—	Bedding	▨	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
〰	Fault, Shear	↘	Narrow vein
▲	Breccia	*	Visible gold
▩	Broken core		

PROJECT : EL 19/98 - ANTHONY

PROSPECT : SELINA

DATE : 17 JUNE 1999

LOGGED BY : W. GODSALL

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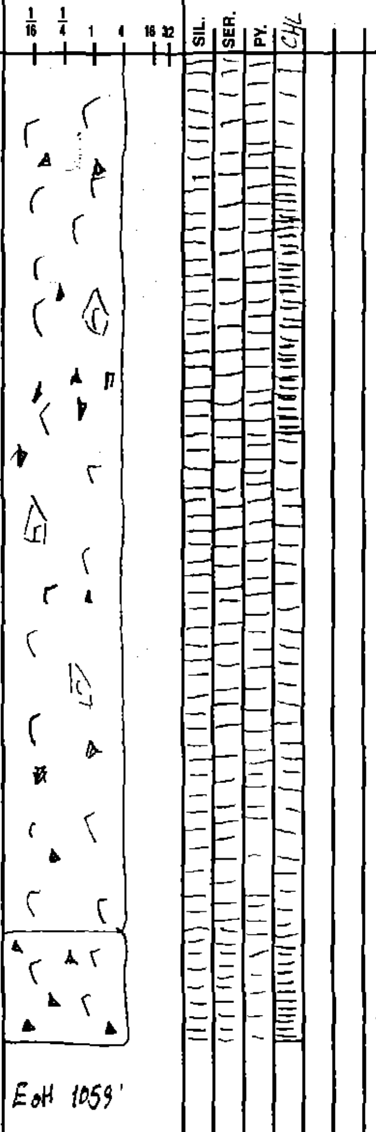
HOLE DEPTH | **SAMPLE No** PREFIX | **ASSAY RESULTS** | **STRUCT.** | **GRAPHIC LOG** | **ALTERATION** | **GEOLOGY NOTES** | **SUMMARY**



HOLE DEPTH	STRUCT.
820	
840	
860	
880	
900	
920	40° ▲
940	
960	
980	
1000	35° ▲
1020	
1040	
1060	

Felsic ?lava
Highly altered volcanics
Massive, foliated, ?dacitic.
Siliceous, chloritic, sericitic
and albitic
Locally brecciated - obscures foliation
Patches/blebs/stringers of sulphide
(py ± cp)

SUMMARY: Cep | LF>M | QOS7

1030

1059'

Felsic ?lava
Similar to above, i.e. highly altered volcanics, but darker greenish in colour due to increased chlorite content.
Brecciated - obscures foliation
Siliceous, sericitic, albitic
Blebs/stringers py, occasional cp

SUMMARY: Ceb | LF>B | OQS7

REMARKS Hole stopped/completed in sulphide (pyrite) mineralisation.

RGC EXPLORATION PTY LTD

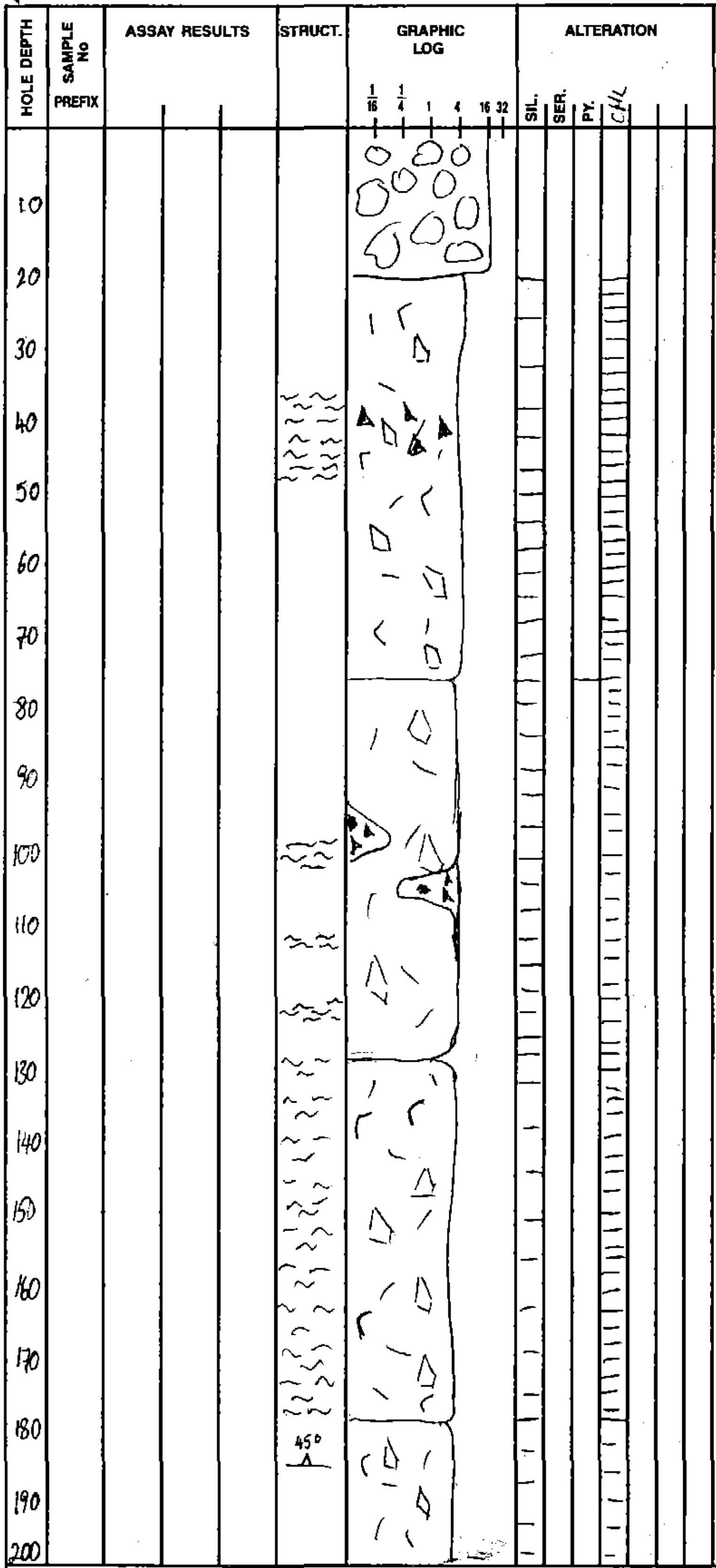
DRILL HOLE No LS 5

SHEET 1 **OF** 5

—	Bedding	▒	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
∼∼	Fault, Shear	⤷	Narrow vein
▲▲	Breccia	*	Visible gold
▩	Broken core		

PROJECT	: EL 19/98 ANTHONY
PROSPECT	: SELINA
DATE	: 14.07.99
LOGGED BY	: W. GODSALL

ft



	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
	Massive purple conglomerate. (may have been caught up in soil cover r glacials)	Q	CONG	
20	Massive volcaniclastics Grey, m gr, partially weathered at depth (61'-75½') with prominent limonitic staining. Possibly faulted. Siliceous, ? fdspar phyric, ? dacitic/rhyolitic, and strongly chlorite altered. Blebs py (? ± cp) with malar csc straining.	Cev	VYFB	OQ7
76	Massive volcaniclastics Grey, m gr - f gr., lava, similar to preceeding unit. Siliceous. Strong chlorite alteration. Some weak albite alteration (?). Weakly qtz phyric, ± fdspar phyric. Jointed and blocky, locally faulted/brecciated. Occasional py speck from 100'	Cev	VY>B	OQA7
128	Massive acid volcaniclastics Faulted and heavy broken core Same as preceeding unit. May be a fault zone Occasional massive py, patches magnetite	Cev	VY>B	OQ7
179	Volcaniclastics similar to above Siliceous, strongly chlorite altered. Patches magnetite, occasional py veinlet, blebs and dissemination	Cev	VY>M	QO6

REMARKS Vein at 128'-129' in original log not readily identified - may have been completely sampled.

RGC EXPLORATION PTY LTD

DRILL HOLE No LS5

SHEET 2 **OF** 5

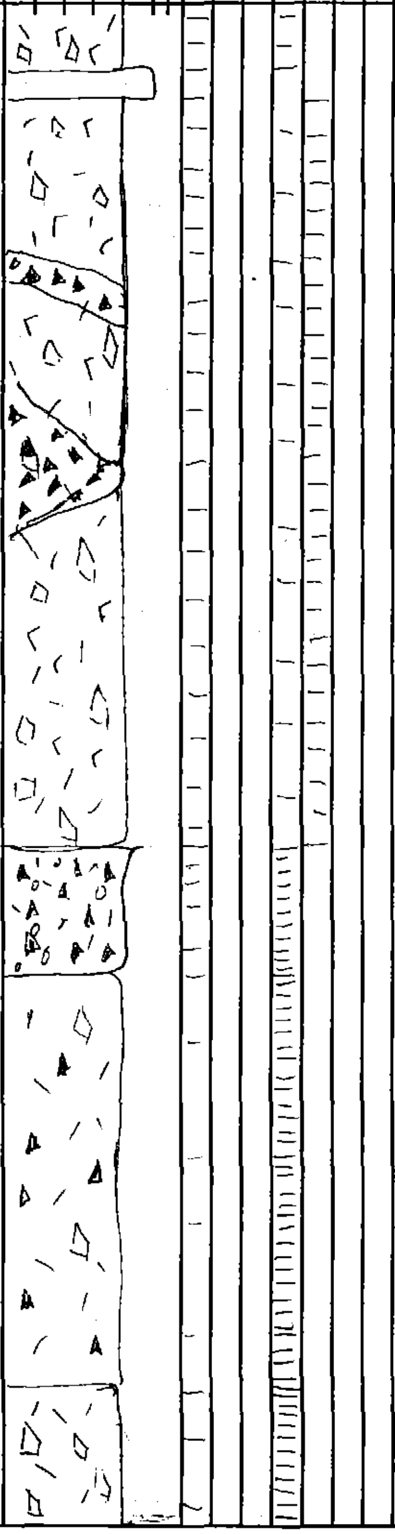
PROJECT :	EL 19/98 ANTHONY
PROSPECT :	SELINA
DATE :	14.07.99
LOGGED BY :	W. GODSALL

- —— Bedding
- ⊔ Cleavage
- —▲— Foliation
- ∿∿ Fault, Shear
- ▵▵ Breccia
- ▩ Broken core
- ▨ Disseminated
- ■ Massive
- ▨ Pervasive
- ↘ Narrow vein
- * Visible gold

ft

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG 1/16 1/4 1 4 16 32 | ALTERATION SIL. SER. PY. CHL ALB | GEOLOGY NOTES | SUMMARY ROCK ALTERATION

210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400



HOLE DEPTH	STRUCT.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
		Volcaniclastics Weakly foliated	Cev	VY>M	QQ6
208 212		Magnetite vein in original log - possible entire vein sampled.		VEIN	
	45° (270)	Volcaniclastics Grey, massive, m.gr, qtz phyric, ± fdsp phyric, dacitic - rhyolitic, locally brecciated Prominent albite alteration as large blebs and lumps. Weak chlorite alteration. Weak/moderately siliceous. Jointed Blebs and disseminations of py, euhedral and granular, sometimes mosaic. Blebs and disseminations of magnetite, sometimes massive Possible apatite blebs	Cev	VYQM	AQOM6
315	∿∿ (320)	Volcaniclastic breccia Strongly chloritised ?rhyolitic, with interstitial, subhedral py.	Cep	VRAB	OQ8
327		Brecciated volcanics Broken and variably brecciated, ?aphyric, ?rhyolitic, and fragmental. Strong chlorite alteration. Blebs, patches and disseminations of interstitial py - possibly 2 phases. Disseminated magnetite	Cep	VRAB	QQM8
381		Volcanics Qtz-fdsp phyric, m.gr - f.gr, with strong chlorite alteration. ?Rhyolitic Very sparse py mineralisation.	Cep	VR>M	MQ8

25
446
488
510
522
42
720
776
844½
902

REMARKS

598119

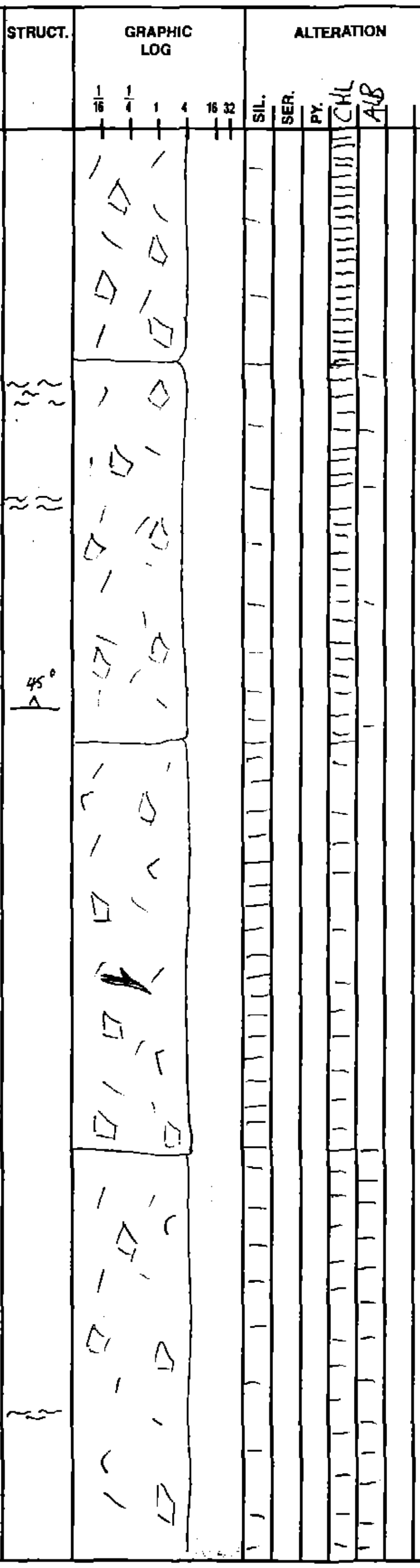
RGC EXPLORATION PTY LTD

DRILL HOLE No LS5

SHEET 3 **OF** 5

— Bedding	▨ Disseminated
⊔ Cleavage	■ Massive
▲ Foliation	▨ Pervasive
∿∿ Fault, Shear	↘ Narrow vein
▵ Breccia	* Visible gold
▩ Broken core	

PROJECT	: EL 19/98 ANTHONY
PROSPECT	: SELINA
DATE	: 14.07.99
LOGGED BY	: W. GODSALL



ft

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
410 420 430						Volcanics Blebs, disseminations and veinlets of magnetite	Cep	VR>M	MOB
440 450 460 470 480			45°			432 Volcanics Siliceous and gradational with above unit but with decreased magnetite content, with magnetite occuring as fine blebs and disseminations. Blebs and stringers of py, particularly from about 445', ± cp ?Rhyolitic Weak foliation	Cep	MR>M	OMA6
490 500 510 520 530 540						485 Volcanics Qtz phyric, ?rhyolitic, m gr-f gr, siliceous, with weak chlorite alteration and occasional blebs albite alteration Blebs and stringers py, ± cp	Cep	MRQM	QO4
550 560 570 580 590 600						542 Volcanics Grey massive, uniform volcaniclastic with gradational contacts ?Rhyolitic, m.gr, qtz phyric, with prominent albite and weaker chlorite alteration. Jointed, often sub// to CA. Py mineralisation as blebs, stringers and dissemination, although	Cep	MRQM	AQ06

REMARKS

RGC EXPLORATION PTY LTD

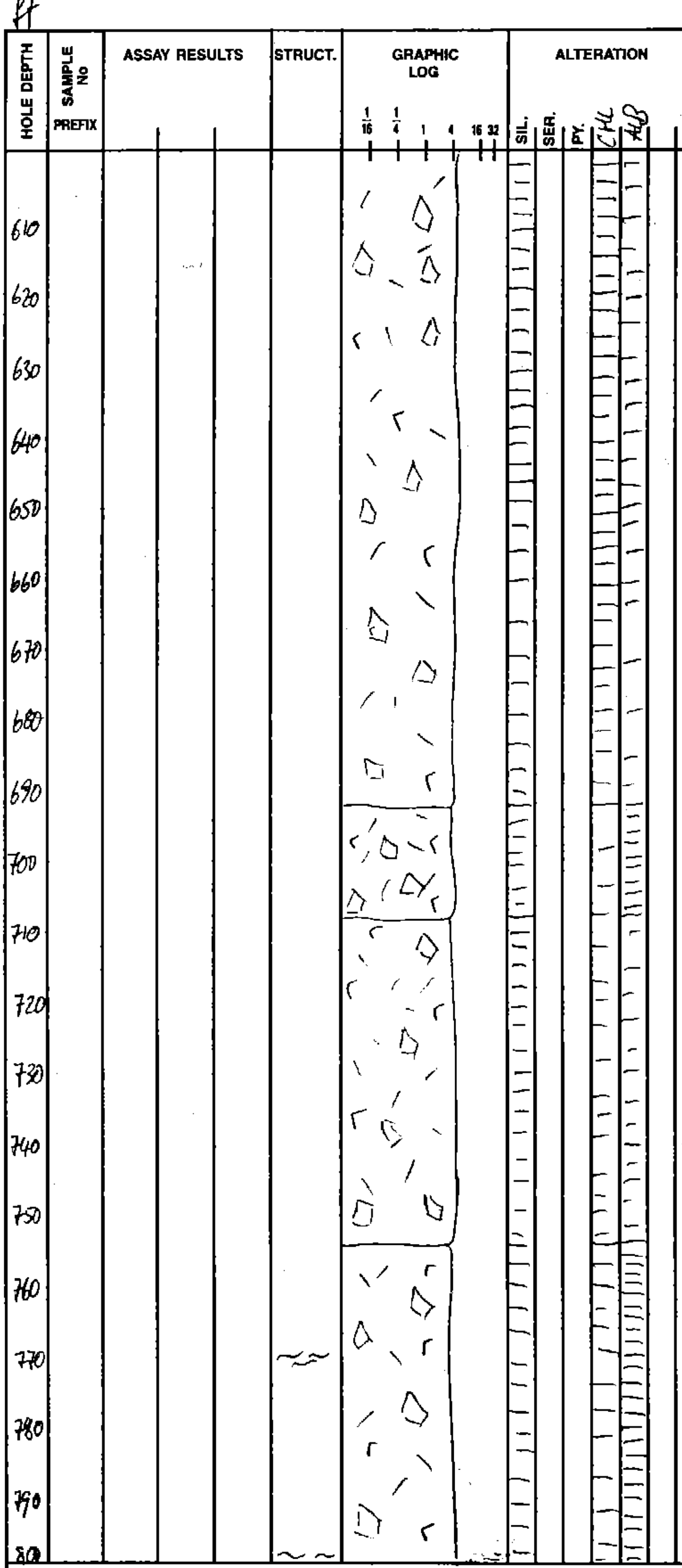
DRILL HOLE No LS 5

SHEET 4 **OF** 5

Legend			
—	Bedding	▨	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
〰	Fault, Shear	↘	Narrow vein
▵	Breccia	*	Visible gold
▩	Broken core		

PROJECT :	EL 19/98 ANTHONY
PROSPECT :	SELINA
DATE :	14.07.99
LOGGED BY :	W. GODSALL

HOLE DEPTH | **SAMPLE No PREFIX** | **ASSAY RESULTS** | **STRUCT.** | **GRAPHIC LOG** | **ALTERATION** SIL. SER. PY. CHL AB



	GEOLOGY NOTES	**SUMMARY**	**ROCK**	**ALTERATION**
	Volcanics generally low visible mineralisation. ±cp specks. Occasional specks magnetite	Cep	URQM	AQ06
692	Volcanic unit similar to the above but with increased albite alteration and increased silica	Cep	URQM	AQ07
708	Volcanics ? Rhyolitic volcanics, similar to above but with greater visible sulphide mineralisation. Blebs, patches and disseminations of euhedral py, ± cp. Slight decrease in visible albite	Cep	URQM	QAC6
754	Volcanics Light pinkish grey, m.gr - f gr, ? rhyolotic, qtz phyric (weak), similar to above units - gradational contacts. Massive. Jointed Strong albite alteration, siliceous, weaker chlorite alteration. Destruction of original textures.	Cep	URQF	AQ07

REMARKS

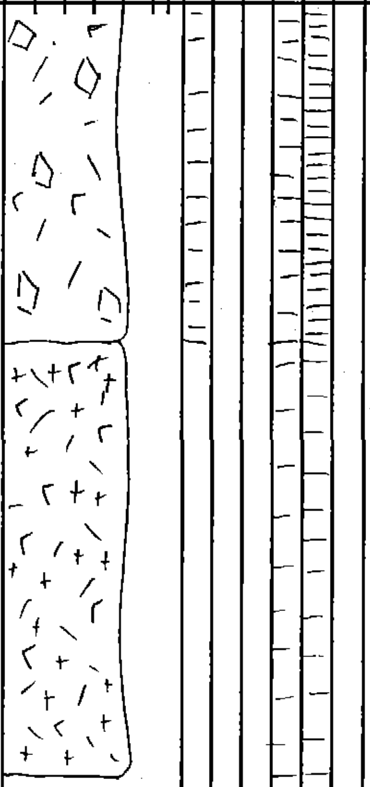
RGC EXPLORATION PTY LTD

DRILL HOLE No LS5

SHEET 5 **OF** 5

—	Bedding	▨	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
〰	Fault, Shear	↘	Narrow vein
△	Breccia	*	Visible gold
▩	Broken core		

PROJECT : EL 19/98 ANTHONY
PROSPECT : SELINA
DATE : 14.07.99
LOGGED BY : W. GODSALL



EoH

HOLE DEPTH ft	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
810 820 830 840				Volcanics Local carbonate veining at stringers notably at 785' Blebs, patches, diseminations py ± cp Occasional magnetite bleb.	Cep	URQF	AQ07
850 860 870 880 890 900			〰	844 Granite porphyry Massive, mottled, fdspar-qtz, hornblende phyric, rhyolitic-dacitic, xtls in f.gr. groundmass. Pink feldspar. Weak alteration : albite, chlorite Trace specks py 901	Cel	IYLX	AC3

REMARKS EoH at 901 ft differs to original log (records EoH at 902' 2")

598122

RGC EXPLORATION PTY LTD

DRILL HOLE No LS 6

SHEET 1 **OF** 3

—	Bedding	▨	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
∿	Fault, Shear	↘	Narrow vein
△	Breccia	* ′	Visible gold
▩	Broken core		

PROJECT : EL 19/98 - ANTHONY

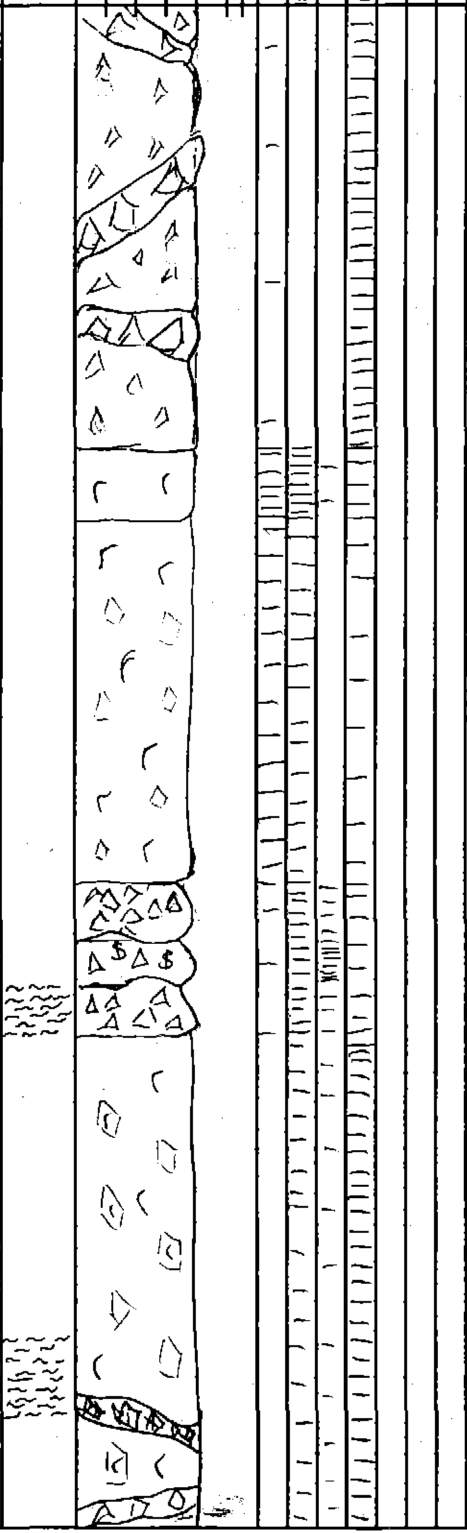
PROSPECT : SELINA

DATE : 16 JUNE 1999

LOGGED BY : W. GODSALL

ft

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG (1/16, 1/4, 1, 4, 16, 32) | ALTERATION (SIL., SER., PY., CHL.) | GEOLOGY NOTES | SUMMARY (ROCK, ALTERATION)



20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400

Brecciated felsic lava.
Brick red to brownish greenish grey, coarse grained, porphyritic, grading from qtz phyric to feldspar phyric. Brecciation enhanced by haematitic alteration. Matrix of similar texture/composition as clasts. Chlorite alteration obscured by haematite alteration. Some albite alteration. Matrix supported.

118′ ? Tectonic veining

137½′ Felsic lava ?dacitic ?
Weakly foliated, whitish to greenish grey, c.gr., patchy haematite. Sericitic, siliceous, chloritic and weak albitisation. Locally brecciated with patchy haematite. Weak magnetite. Occasional py speck/bleb.

Felsic lava
Internally brecciated, massive, weakly porphyritic. ? Felspar phyric
230 Heavily altered: sericite, chlorite,
245 siliceous, lesser albite and haematitic. Blebs magnetite
257

271′ Brecciated felsic lava
Interstitial py, locally heavily disseminated.
Sericitised and chloritised matrix

Felsic lava ? dacitic ?
Dark greenish grey, fine grained, uniform texture, porphyritic, quartz phyric, locally bx.
348 Core generally heavily broken.
Strong chlorite alteration. Weakly
372 silicified, albitised and sericitised.
Minor py, scattered magnetite

	ROCK	ALTERATION
Cel	LF>B	HOA7
Cep	LF>C	SOQH8
Cel	LFFC	SOQH8
Cep	LFFB	SOH7 H$6
	FALT	SOH7
Cel	LFQF	OSA7
	F	
	FALT	
	LFQF	

REMARKS Core in variable condition (poor - moderate). Depth markers not all in correct position. Lithological units of Purvis (relog 1983) followed reasonably closely.

RGC EXPLORATION PTY LTD

DRILL HOLE No LS6

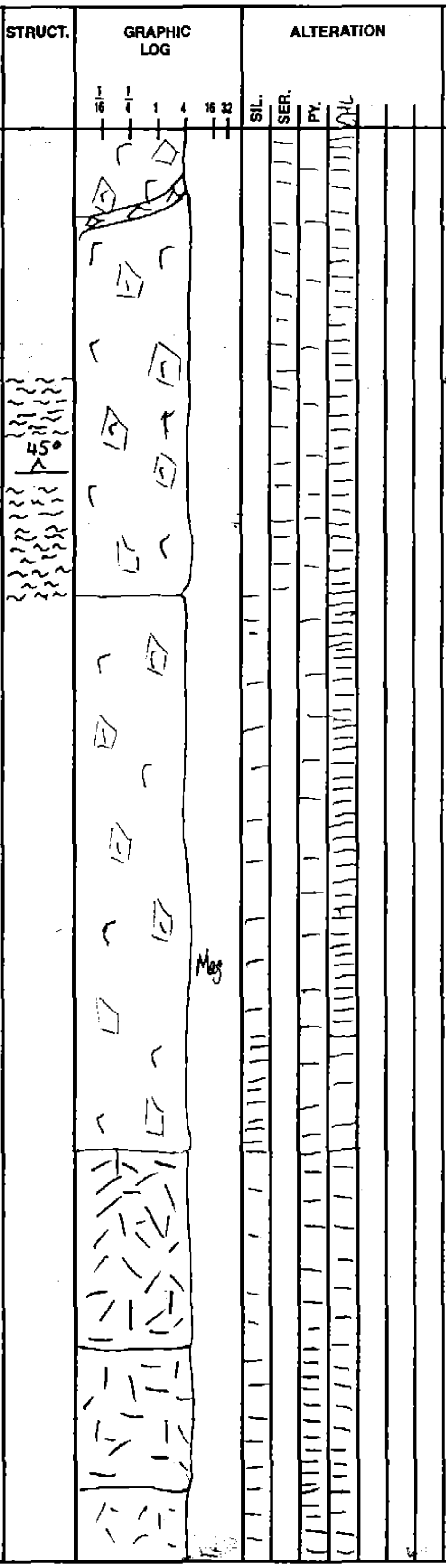
SHEET 2 **OF** 3

PROJECT	: EL 19/98 ANTHONY
PROSPECT	: SELINA
DATE	: 16 JUNE 1999
LOGGED BY	: W. GODSALL

⎯	Bedding	▨	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
〰	Fault, Shear	↘	Narrow vein
△	Breccia	*	Visible gold
▩	Broken core		

ft

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION



420, 440, 460, 480, 500, 520, 540, 560, 580, 600, 620, 640, 660, 680, 700, 720, 740, 760, 780, 800

HOLE DEPTH (ft)	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
to 470	Felsic lava Gradational lower contact	Cel	LFQF	0SA7'
470			FALT	
530	Weakly feldspar phyric Felsic lava ? dacitic Greenish grey/black, f.gr, characteristically "flecked" with white rounded-elongate qtz in a chlorite-rich matrix. Unit characterised by anomalous magnetite content (>2% throughout) Blebs/patches globular sulphide (py) Destruction of original textures	Cel	LFQF	0QM8
625				M07
654				Q0A7 ? al
685	Rhyolitic lava Qtz phyric - characteristic flecks Chlorite and albite altered Disseminated and blebby pyrite	Cep	LRQF	QA6
740	Rhyolitic lava As above but with increased pyrite	Cep	LRQF	0A6
780	Pyritic lavas ? rhyolitic ?	Cep	LRQF	0Q7

REMARKS Similarities to Mt Lyell :: (a) magnetite form and distribution (b) disseminated sulphide mineralisation (c) possibly same of the rock types (d) destruction of original textures by alteration

598124

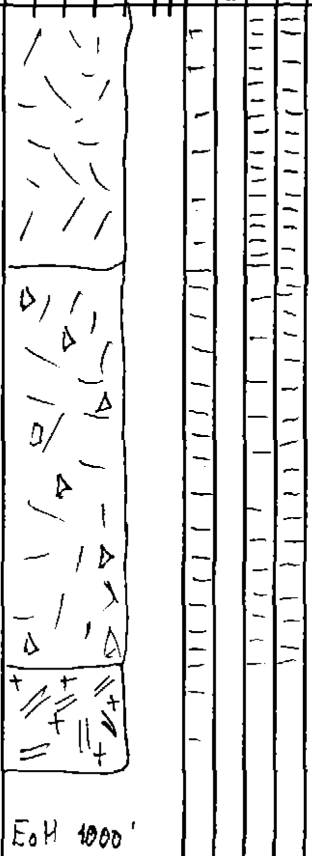
RGC EXPLORATION PTY LTD

DRILL HOLE No LS6

SHEET 3 **OF** 3

PROJECT	: EL 19/98- ANTHONY
PROSPECT	: SELINA
DATE	: 16 JUNE 1999
LOGGED BY	: W. GODSALL

——	Bedding	░	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
〰	Fault, Shear	↘	Narrow vein
△	Breccia	*	Visible gold
▩	Broken core		



HOLE DEPTH ft	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
820 840 860						Highly chlorite altered, rhyolitic (?) lavas Weak haematite alteration. Some albite alteration Blebs and disseminations of pyrite, tending to be massive	Cep	LRQF	0Q7
880 900 920 940 960						868 Dark greenish black, haematitic ?rhyolitic lavas. Chlorite and albite alteration. Decrease in visible sulphide mineralisation, ^basically Local carbonate veinlets Some internal brecciation (local) and "mottled" appearance Minor magnetite (pervasive)	Cep	LRQM	OAH6
980 1000						973 ? Intrusive Coarse, porphyritic, ? rhyolitic Weak albite alteration. No visible mineralisation. 1000	Cep	IYXG	A2

REMARKS

598125

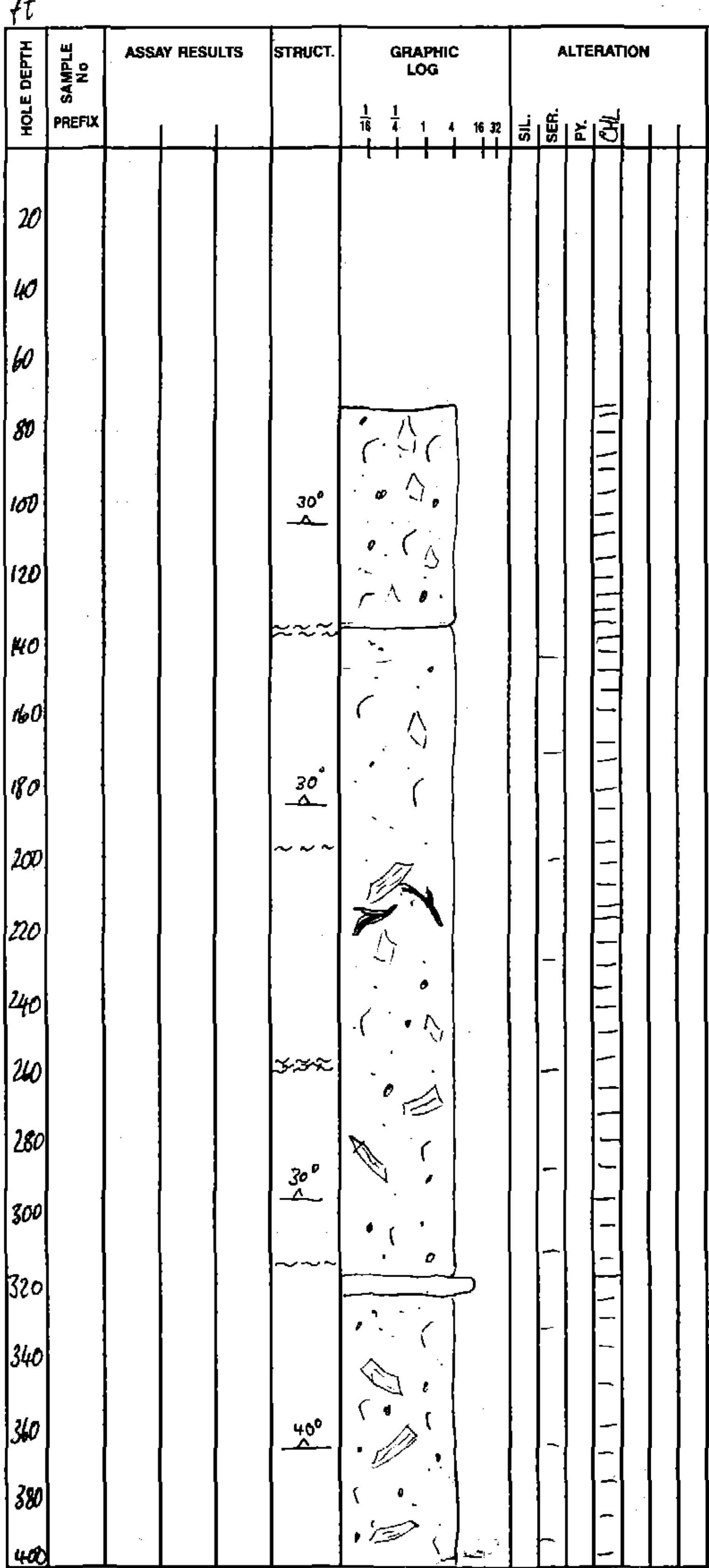
RGC EXPLORATION PTY LTD

DRILL HOLE No LS 7

SHEET 1 **OF** 4

———	Bedding
⊔	Cleavage
—▲—	Foliation
∿∿	*Fault, Shear*
▵▵	Breccia
▩	Broken core
░	Disseminated
■	Massive
▨	Pervasive
⟋	Narrow vein
*	Visible gold

PROJECT	:	EL 19/98 - ANTHONY
PROSPECT	:	SELINA
DATE	:	18 JUNE 1999
LOGGED BY	:	W. GODSALL



GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
No core			
75 Volcaniclastics Light grey - brownish grey, massive. Qtz clasts and lithic fragments in a chloritic groundmass. Qtz stringers/veinlets and lenses. Faulted basal contact. No visible mineralisation 136	Cev	VDLM	OQ3
Volcaniclastics Similar to above but becoming coarser grained, and crystal rich Sub angular clasts and lithic fragments. Occasional mud intraclast. Some haematitic clasts Qtz-CO3 veining Matrix predominantly chlorite, minor/local sericite and albite ?dacitic? Poorly developed schistosity Occasional speck pyrite, anhedral	Cev	VDXC	OQS2
318 324 Quartz carbonate vein		VEIN	
Volcaniclastics Continuation of the same massive unit. Intraclasts possibly becoming more prominent. Steepening in schistosity Haematite less common to almost absent. ?Dacitic Very occasional pyrite speck	Cev	VDXC	OQS2

REMARKS

598126

RGC EXPLORATION PTY LTD

DRILL HOLE No LS7

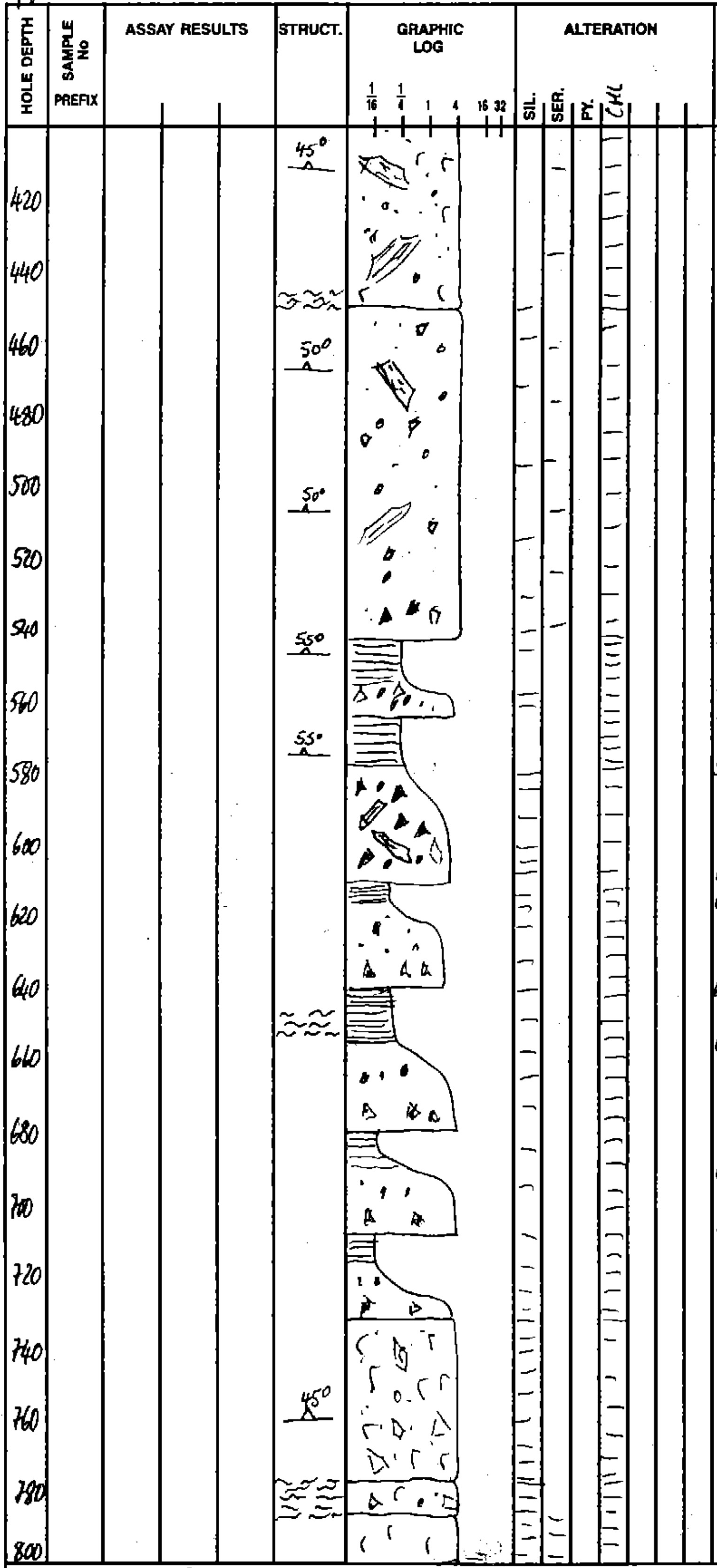
SHEET 2 OF 4

Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT : EL 19/98 - ANTHONY
PROSPECT : SELINA
DATE : 18 JUNE 1999
LOGGED BY : W GODSALL

ft

HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION | GEOLOGY NOTES | SUMMARY



Volcaniclastics

Faulted basal contact

451' Volcaniclastics weakly brecciated
Similar to above but with increased lithic fragments. ?Dacitic
Massive, brownish grey, some haematitic fragments. Alignment along foliation. Weakly siliceous.
Trace pyrite specks

543' Shale
greenish black, f gr, chloritic, weakly laminated. Scattered pyrite

558'

564' Volcanic Breccia
Lithics and mudstone intraclasts.
Weak alignment along foliation
Scattered pyrite specks

577'

610' Shale
Black, v.f.gr., gradational contacts
Siliceous. Irregular qtz stringers.
Scattered pyrite specks

618'

640' Brecciated Volcaniclastic
Gradational contacts Irregular lithic fragments. Siliceous

659'

679' Alternating sequence of volcanic
689' shales/mudstones schists and
weakly brecciated volcaniclastics
708'
718' Poor mineralisation - trace scattered pyrite specks

732 Qtz-haematite vein at basal contact

Volcaniclastic
Xtl-rich, qtz clasts, minor lithics
Siliceous, ? Dacitic ?
Occasional pyrite speck

777

788 ?Lava

SUMMARY	ROCK	ALTERATION
Qev	VDXC	OQS2
Ces	VDXB	OQS3
Cess	VDLV	O6
Ces		
Cess	VDLV	O6
Ces	VDXB	OQ4
Cess	VDLV	OO6
Ces	VDXB	OQ4
Cess	VDLV	OQ6
Ces	VDXB	QO5
Cess	VDLV	OQ6
Ces	VDXB	QO5
Cess	VDLV	OQ6
	VDXB	QO5
Ces	VDXM	OQ5
	FALT	
Cep	LDGF	OQB4

VL
C

REMARKS Core tray 610' - 620' incorrect. Should be 610' ≈ 627' ∴ remainder of core logged to allow for this error.

RGC EXPLORATION PTY LTD

DRILL HOLE No LS7

SHEET 3 OF 4

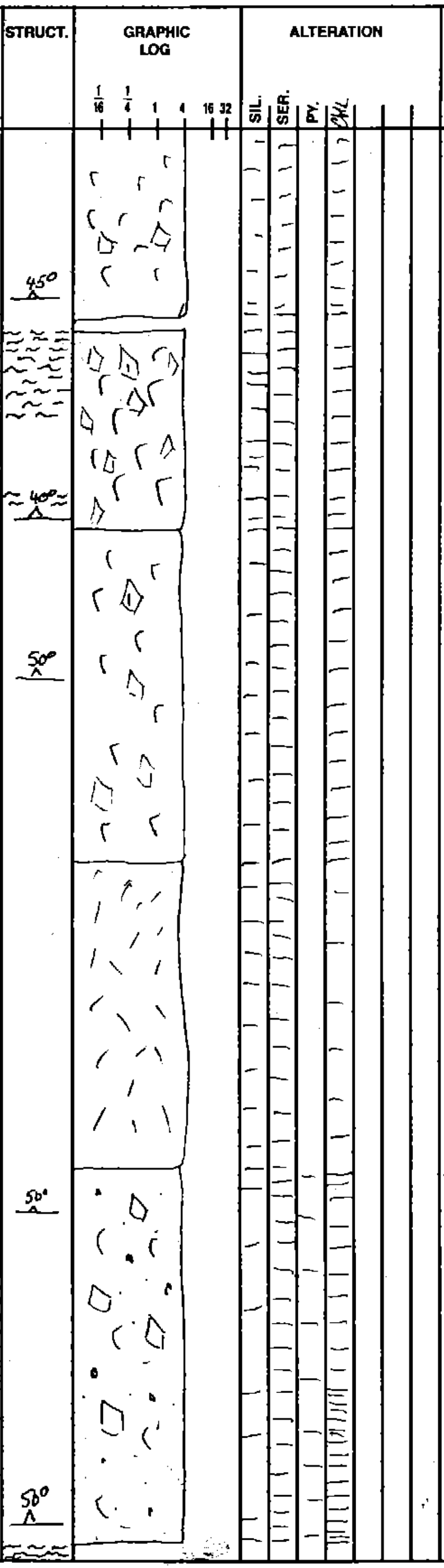
Bedding	Disseminated
Cleavage	Massive
Foliation	Pervasive
Fault, Shear	Narrow vein
Breccia	* Visible gold
Broken core	

PROJECT :	EL 19/98 - ANTHONY
PROSPECT :	SELINA
DATE :	18 JUNE 1998
LOGGED BY :	W. GODSALL

ft

HOLE DEPTH
820
840
860
880
900
920
940
960
980
1000
1020
1040
1060
1080
1100
1120
1140
1160
1180
1200

SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION



	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
	?Lava Qtz phyric, ?dacitic lava. Moderate chlorite alteration, weakly sericitic. Siliceous. Weakly foliated Trace pyrite	Cep	LDQF	QOS4
855' 857	NO CORE			
	Faulted ?Lava. Core v. broken		FALT	
880	Greenish grey, f gr. qtz phyric, ?dacitic. Siliceous, chloritic and sericitic Trace pyrite	Cep	LDQF	QOS4
912'	Lava Light pinkish grey, porphyritic, f gr. acid lava. ?Dacitic, ?possibly rhyodacite. Qtz phyric Chlorite and sericite altered. Fine disseminated pyrite in the groundmass	Cel	LYQF	SOQ4
1005'	Rhyolitic Lava Pink, porphyritic f. gr. crystalline Qtz phyric, haematitic. Very sparse visible sulphides	Cel	LRQF	SQO4
1091	Volcaniclastics Crystal-rich with lithic frags in a medium grained sericitic and chloritic groundmass which becomes dominantly chloritic below 1150'. ?Dacitic? Blebs and specks/dissemination of sulphides - mainly pyrite ± cp	Cev	VBQM	OSQb
1195' 1200			FALT	

REMARKS

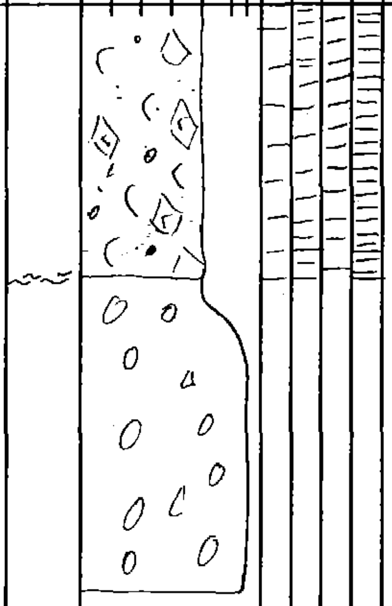
RGC EXPLORATION PTY LTD

DRILL HOLE No LS 7

SHEET 4 **OF** 4

— Bedding	▒ Disseminated
⊔ Cleavage	■ Massive
▲ Foliation	▨ Pervasive
∿ Fault, Shear	Narrow vein
Breccia	* Visible gold
▩ Broken core	

PROJECT : EL 19/98
PROSPECT : SELINA
DATE : 18 JUNE 1999
LOGGED BY : W GODSALL



EoH 1247'

HOLE DEPTH ft	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG ($\frac{1}{16}$ $\frac{1}{4}$ 1 4 16 32)	ALTERATION (SIL. SER. PY. CHL)	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
1220 1240 1260						? Altered ?? Lava Greenish grey, f.gr., qtz-fdspar phyric with occasional [fragments] clasts of lithics/lavas. Locally haematitic ?Dacitic? Altered to sericite, chlorite and siliceous. 1272 1278 Blebs and veinlets of sulphides, mostly "massive" pyrite, ± cp	Col ?Cv ??Cs	VD>F	OSQ6
							FAULT		
1280 1300 1320 1340 1350						Conglomerate Purple, coarse, siliciclastic, sandy matrix. Haematitic. Faulted contact with volcanics 1247'	COou	CONG	HQ6

REMARKS 1200' - 1265' core heavily sampled, only quarter core fragments remaining.

RGC EXPLORATION PTY LTD

DRILL HOLE No LS9

SHEET 1 **OF** 4

- —— Bedding
- ⌴ Cleavage
- —▲— Foliation
- ∿∿ Fault, Shear
- ▵▿ Breccia
- ▩ Broken core
- ░ Disseminated
- ■ Massive
- ▨ Pervasive
- ↘ Narrow vein
- * Visible gold

PROJECT	: EL 19/98 ANTHONY
PROSPECT	: SELINA
DATE	: 15 07 99
LOGGED BY	: W GODSALL

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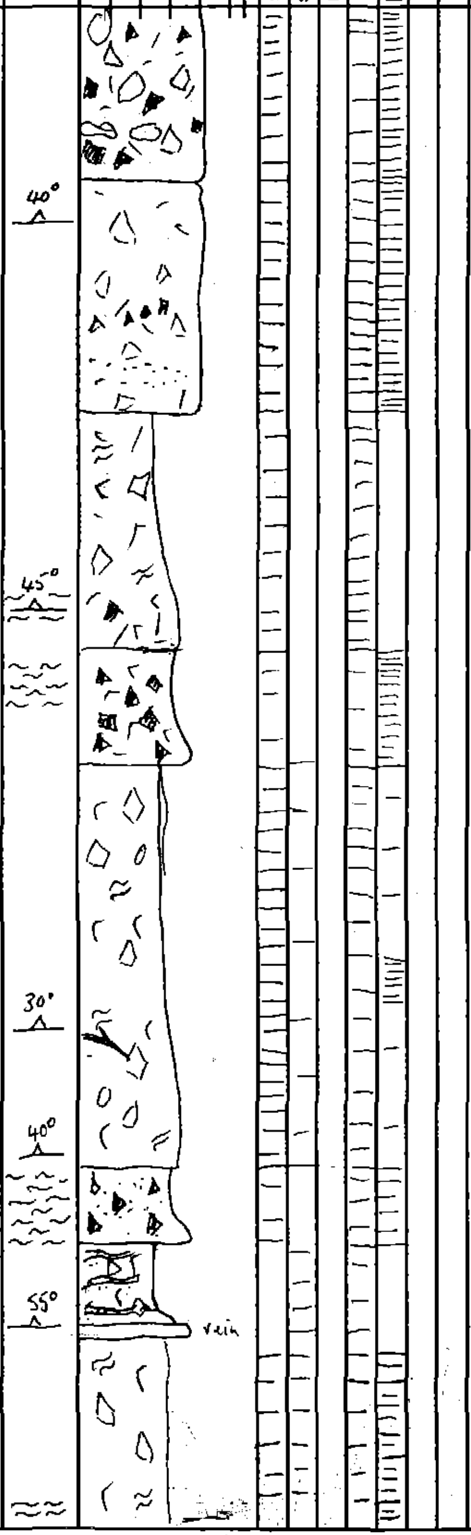
HOLE DEPTH | SAMPLE No PREFIX | ASSAY RESULTS | STRUCT. | GRAPHIC LOG | ALTERATION (SIL. SER. PY. CHL HEM)



HOLE DEPTH	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
	Volcaniclastic breccia Red-green, massive, matrix supported angular lithic volcanic clasts. ?Rhyolitic Strong haematite alteration, moderate chlorite alteration, minor silicification	Cev	VRLB	HOQ7
11.2	?Brecciated lava Orange-red and grey-green, m.gr, massive, qtz and fdsp phyric, ?rhyolitic, brecciated Strong haematite-limonite alteration, chloritic and siliceous. Possibly some reworking	Cep	LRRB	HQ06
26.3	Volcaniclastic sediments Subrounded qtz clasts, lithic clasts, shards and pumice. Matrix supported, ?dacitic, Limonite staining along joints. Moderate chlorite alteration	Cev	VDXI	OQ5
42.0	Volcanic breccia Matrix supported, ?dacitic, with strong haematite alteration	Cev	VDAB	HQ8
49.2	Volcaniclastics Greenish purplish grey, m.gr, matrix supported, ?dacitic ??andesitic??, sub rounded qtz clasts, lithics, shards and pumice fragments. Moderate to strong chlorite alteration, weak haematite alteration, siliceous, some sericite. Late metamorphic veining Trace scattered py, ± cp	Cev	VDXM	OQSH5
76.0	Volcanic Breccia / fault zone		FALT	
81.0	Volcanic sediments Brown, f.gr, ?dacitic. Weak sericite and chlorite alteration	Ces	VDAA	SO4
86.6 87.2	Volcaniclastic sediment Purplish grey, mgr-f.gr, ~~matrix~~ supported, ?dacitic ??andesitic Subrounded qtz clasts, ~~fdsp~~, ~~lithics~~	Ces	VDVF	HOQS5

Hole depth scale: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100

REMARKS

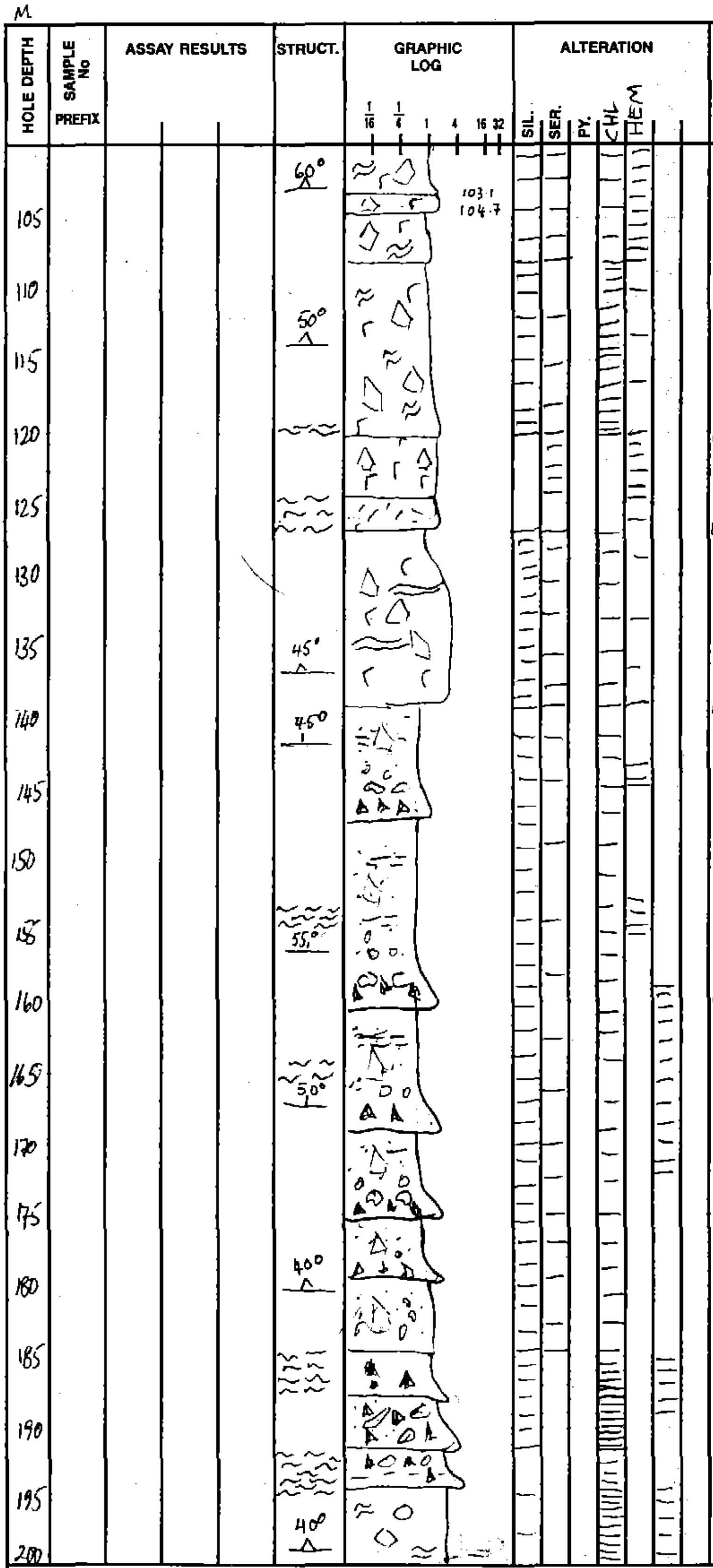
RGC EXPLORATION PTY LTD

DRILL HOLE No LS 9

SHEET 2 OF 4

——	Bedding
⊔	Cleavage
▲	Foliation
〰	Fault, Shear
▽△▽	Breccia
▩	Broken core
▨	Disseminated
■	Massive
▨	Pervasive
↘	Narrow vein
*	Visible gold

PROJECT	: EL 19/98 ANTHONY
PROSPECT	: SELINA
DATE	: 15.07.99
LOGGED BY	: W. GODSALL



GEOLOGY NOTES

Volcaniclastics
+ pumice fragments. Moderate-strong haematite alteration, chloritic, sericitic. Strong K-fdspar alteration (orange)

108.0 103.7m – 104.7m with specks/blebs py

Volcaniclastics
Greenish grey, m.gr., siliceous similar to above with less haematite alteration and coarse grained. Trace specks py

120.2 Occasional blebs, bands magnetite.

Volcaniclastics

124.8 Strong haematite alteration

126.0 Fault – clay lined and limonitic

Volcaniclastics
grey, f.gr, lithic clasts, qtz + fdsp x'ls. Foliated. Occasional large foliated fragment. ? Dacitic. Siliceous,

139.2 chloritic + sericitic alteration, occasionally haematitic.

Volcanic sediments

147.5 Sequence of finer grained volcanic sediments (mudstones, siltstones etc) locally brecciated and conglomeratic. Abundant qtz xtls, lithics variably

159.5 Siliceous, chlorite and sericite alteration with variable haematitic alteration. Magnetite at the base. Bedding frequently disrupted

168.5

175.5

178.5

184.6

187.8 Volcanic breccia
strongly chloritic altered and haematitic. Blebs and slivers

191.4 of py + cp

194.1 Volcaniclastic
Disseminations, stringers/veinlets py + cp

SUMMARY

	ROCK	ALTERATION
Ces	VDFV	KS
Cev	VDLX	OQSH6
Cev	VDVF	HS8
	FALT	
Cev	VDLX	QSQH5
Ces	UDVX	OQSH4
	FALT	
Cev		
	FALT	
Cev	VDLX	O74

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VI
O

REMARKS

598131

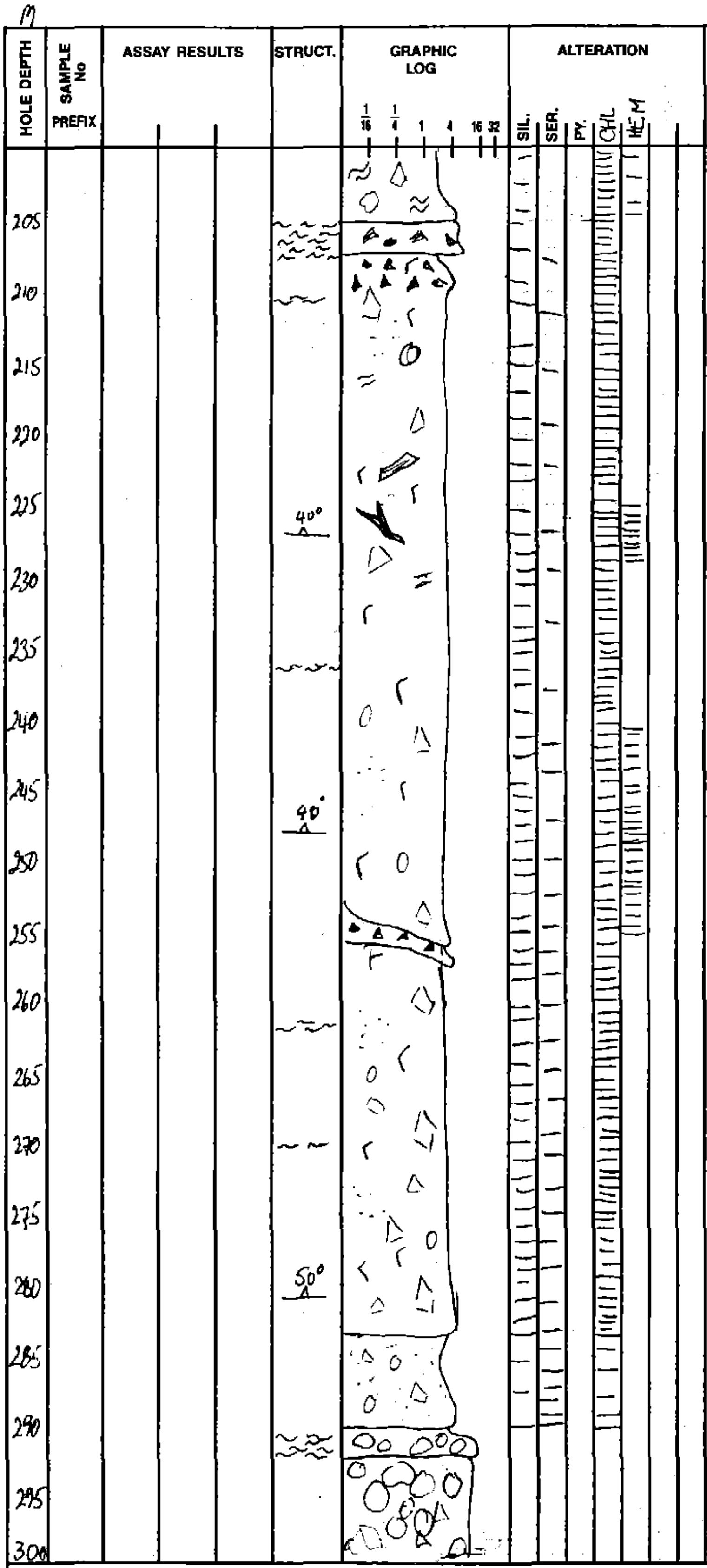
RGC EXPLORATION PTY LTD

DRILL HOLE No LS9

SHEET 3 **OF** 4

PROJECT :	EL 19/98 ANTHONY
PROSPECT :	SELINA
DATE :	15.07.99
LOGGED BY :	W. GODSALL

—	Bedding
⊔	Cleavage
▲	Foliation
〰	Fault, Shear
▵	Breccia
▩	Broken core
▒	Disseminated
■	Massive
▨	Pervasive
↘	Narrow vein
*	Visible gold



GEOLOGY NOTES

Volcaniclastic
Pervasive magnetite

205.0

207.2

Volcaniclastics

Strongly chlorite-altered sequence of volcaniclastic ?? sediments. Sub angular qtz and fldsp xtls, lithic fragments, occasional pumice fragment. M.gr - f.gr, no bedding (? totally obscured by alteration) foliated, and locally brecciated. Occasional reworked ? intraclast ? Dacitic? Strong chlorite alteration, weakly siliceous, sericitic, and variable haematite with pervasive magnetite which becomes massive in places

Blebs, disseminations and stringers/veinlets of py and cp Anhedral/subhedral and blebby py - ? possibly two generations. Weak/poor foliation.

Irregular carbonate veining from 269m to base of unit

283.7 Volcaniclastic
Similar to above but with greater $CO_3^=$ content, developed foliation and less chlorite alteration. Locally brecciated, possibly reworked. No visible mineralisation

290.0

292.0

Conglomerate

SUMMARY

	ROCK	ALTERATION
Cov	VDLX	07
	FALT	
Ces	VDXF	OQS7
Ces	VDRF	CS05
	FALT	
COOW	CONG	

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No LS9

SHEET 4 **OF** 4

— Bedding
⊔ Cleavage
▲ Foliation
〰 Fault, Shear
▵ Breccia
▨ Broken core
░ Disseminated
■ Massive
▨ Pervasive
↘ Narrow vein
* Visible gold

PROJECT : EL 19/98 ANTHONY
PROSPECT : SELINA
DATE : 15.07.99
LOGGED BY : W. GODSALL

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HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION SIL. SER. PY.	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
				OΔ°O		Conglomerate 303 Quartz pebble conglomerate, sub rounded clasts and pebbles. Distinctive white colouration. Smaller and less significant (volumetrically) haematitic clasts. Brittle and broken. Massive and hard. Towards EoH clasts become sub angular.	CONG	CONG	
305				EoH					

REMARKS

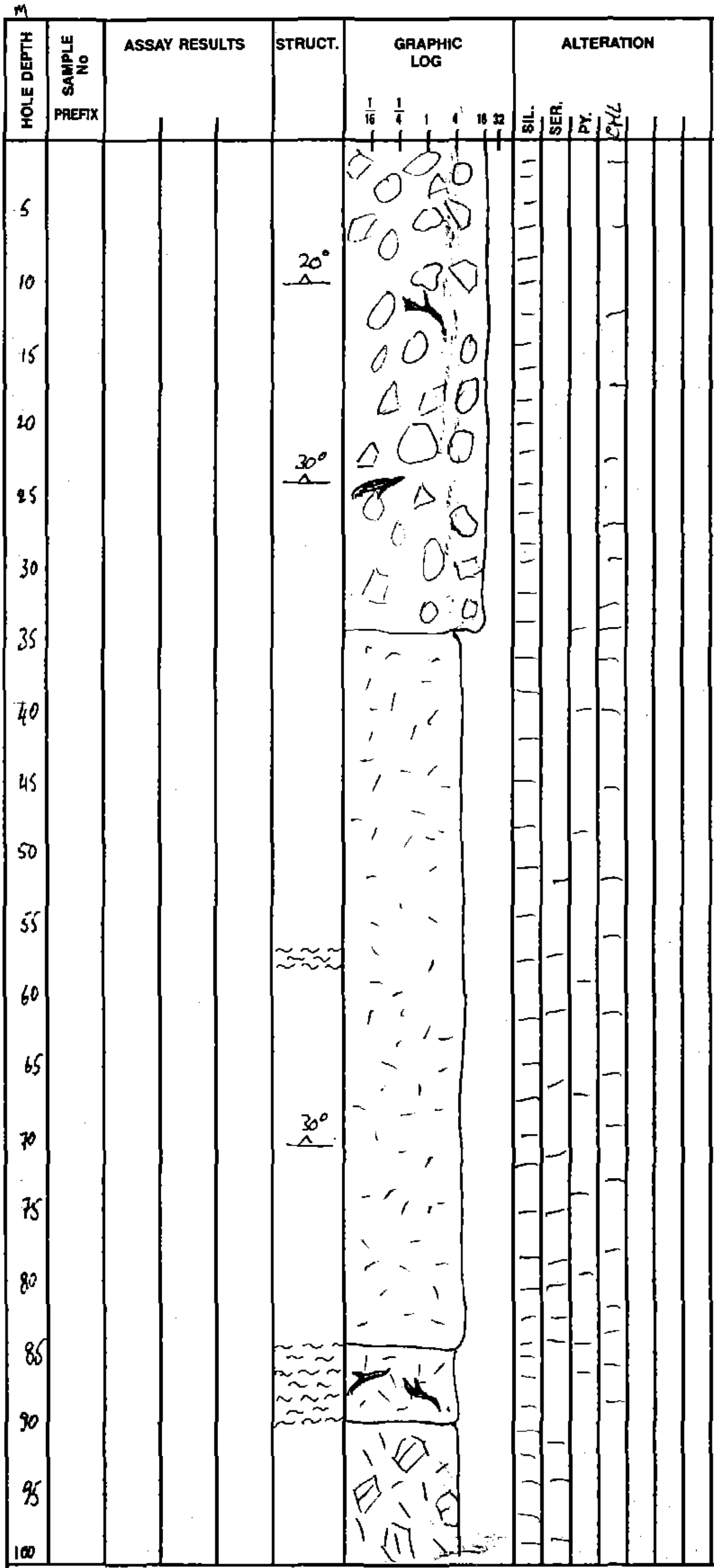
RGC EXPLORATION PTY LTD

DRILL HOLE No LS 10

SHEET 1 **OF** 4

- — Bedding
- ⊔ Cleavage
- ▲ Foliation
- ∿ Fault, Shear
- ▵ Breccia
- ▩ Broken core
- ▒ Disseminated
- ■ Massive
- ▨ Pervasive
- Narrow vein
- * Visible gold

PROJECT :	EL 19/98 - ANTHONY
PROSPECT :	SELINA
DATE :	16 JUNE 1999
LOGGED BY :	W. GODSALL



GEOLOGY NOTES

Haematitic Conglomerate

Purple-pink-greenish grey, pebble conglomerate. Sub rounded to angular clasts, poorly sorted and matrix supported. Clasts dominantly ?PE quartzites and volcanics. Foliated matrix.

Strongly haematitic, weathered and limonitic to approx 15m, locally clasts magnetic.

Chloritic and siliceous matrix

34.8 Irregularly veined throught (qtz-Kspar -albite-haematite-chlorite)

Rhyolitic lavas

Base moderately/weakly porphyritic rhyolitic lavas.

Qtz-feldspar phyric becoming fdsp ± qtz phyric

Strong haematite alteration, becoming siliceous and sericitic. Variable chloritic alteration throughout.

Scattered and irregular qtz veining which tends to be haematite and albite rich.

F.gr. disseminated py.

Some jointing sub// CA

84.5 Veined rhyolitic lava similar to above, with limonitic staining.

90.0

Rhyolitic volcaniclastics

SUMMARY	ROCK	ALTERATION
Ctc	CONG	HLQQ8
Cel (? Cep)	LR<M	HOQ6
Cep	VEIN	HL5
Cev	VRXM	QSH6

REMARKS Drilled and logged by GFEPL 1984 (Cartwright)

Relogged by Billiton 1990 (Creagh)

598134

RGC EXPLORATION PTY LTD

DRILL HOLE No LS10

SHEET 2 **OF** 4

—	Bedding	░	Disseminated
└┘	Cleavage	■	Massive
—▲—	Foliation	▨	Pervasive
∿∿	Fault, Shear	⟍	Narrow vein
▵▵	Breccia	*	Visible gold
▩	Broken core		

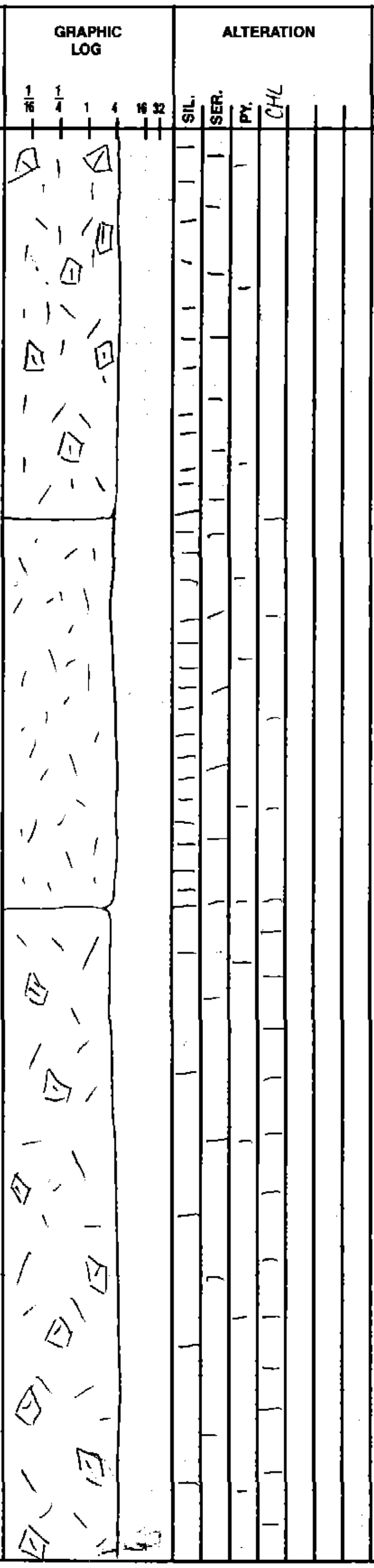
PROJECT : EL 19/98 - ANTHONY

PROSPECT : SELINA

DATE : 16 JUNE 1999

LOGGED BY : W GODSALL

HOLE DEPTH M	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.
105			35°
110			
115			
120			
125			
130			30°
135			
140			
145			
150			
155			40°
160			
165			
170			
175			
180			
185			
190			35°
195			
200			



HOLE DEPTH	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
	Rhyolitic Volcaniclastics Purplish grey, m.gr, porphyritic, qtz-fdsp phyric. Alteration strongly siliceous and sericitic, with lesser haematite which imparts distinctive purple colouration. Haematite tends to decrease down the unit. Foliated. Possible weak (?replaced) bedding. Trace pyrite	Cev	VR>M	QSH6
127.2	Rhyolitic Lava Grey, f.gr., massive, porphyritic Qtz phyric with distinctive sub angular clasts slightly elongated along foliation. Siliceous and sericitic. Weak chlorite alteration. Trace fine pyrite	Cel (? Cep)	LRQM	QS5
154.8	Rhyolitic Volcaniclastics Medium to fine grained, massive, qtz phyric, minor lithic fragments. Variable moderate - weak - moderate chlorite alteration. Weak silicification and sericitisation. Irregular veining Trace /scattered specks pyrite	Cep/Cev	VRQF	OQS4

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No LS10

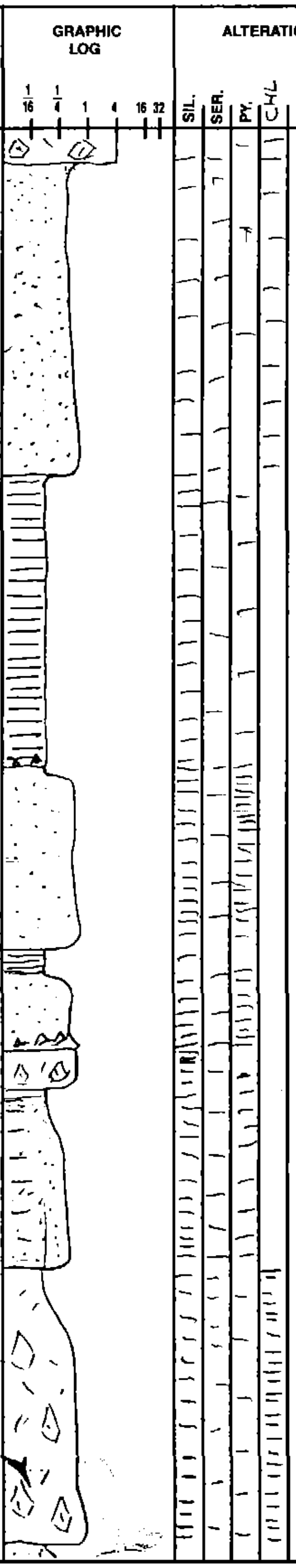
SHEET 3 **OF** 4

PROJECT	: EL 19/98- ANTHONY
PROSPECT	: SELINA
DATE	: 16/17 JUNE 1999
LOGGED BY	: W.GODSALL

——	Bedding	▒	Disseminated
⊔	Cleavage	■	Massive
—▲—	Foliation	▨	Pervasive
∿∿	Fault, Shear	↘	Narrow vein
△▽	Breccia	*	Visible gold
▩	Broken core		

M

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.
205			40° ▲
210			
215			
220			35° ▲
225			
230			
235			
240			40° ▲
245			
250			30° ▲
255			
260			
265			
270			40° ▲
275			
280			
285			
290			
295			45° ▲
300			



GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
Rhyolitic Volcaniclastics		VRQF	↙ C
202.5 Sandstone Very fine grained, thinly ?bedded, greenish grey, qtz-rich, ?rhyolitic or ?dacitic, with minor lithic fragments. Weak/moderate siliceous, chlorite sericite alteration Trace scattered pyrite	Ces	VRQV	QOS4
224.2 Shale Gradational upper contact. Very fine grained blackish grey shale Siliceous, sericitic, finely laminated. Weak disseminated pyrite	Cess	VRQV	QOS4
244.9 Sandstone (Chert) Cream-brownish white, very fine grained siliceous. Foliated/schistose. Disseminated pyrite	Ces	VRQV	QS6
257.1 Shales	Cess	VRQF	QC
259.0 Sandstone (chert) Altered volcaniclastic sandstone	Ces	VRQV	QS6
264.5 Rhyolitic volcaniclastic	Cev	← VF	← Q
267.1 Sandstone Transitional/gradational volcaniclastic sandstone. Siliceous. Cream/khaki Scattered pyrite euhedra	Ces	VRQV	QS6
279.8 Rhyolitic Volcaniclastic Greenish grey, fine grained, foliated. Siliceous and chloritic. Weakly sericitic. Scattered disseminated pyrite	Cev	VRQM	QOS5
299 Volcaniclastic Sandstone			

REMARKS Some mixing/displacement of core from approx 219m to 246m. Contact depths assumed from re-log of 1990

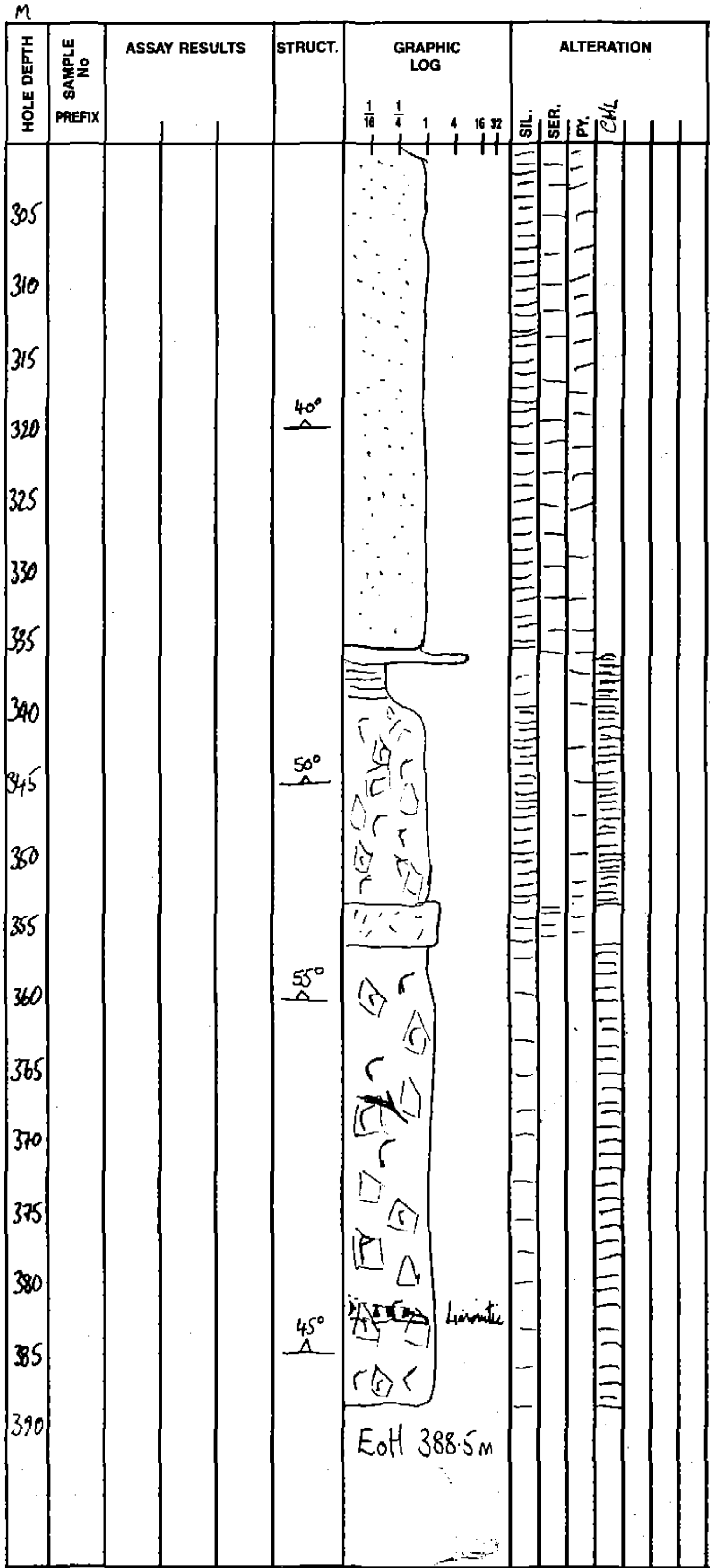
RGC EXPLORATION PTY LTD

DRILL HOLE No LS 10

SHEET 4 OF 4

PROJECT	: EL 19/98 - ANTHONY
PROSPECT	: SELINA
DATE	: 17 JUNE 1999
LOGGED BY	: W. GODSALL

— Bedding	▒ Disseminated
⊔ Cleavage	■ Massive
▲ Foliation	▨ Pervasive
〰 Fault, Shear	⟋ Narrow vein
▵ Breccia	* Visible gold
▩ Broken core	



GEOLOGY NOTES

Volcaniclastic Sandstone

Cream - light grey - pinkish, f.gr, crystalline, qtz - fdspar clastic, foliated. Some lithic fragments. Siliceous and sericitic

Disseminated pyrite tending to sub// foliation

335.5 Qtz-CO$_3$ veining with dark green/black
336.6 chlorite clots
338.5

Shale band - gradational and volcaniclastic

Volcaniclastic

Blackish green m.gr. qtz phyric ?dacitic. Pervasive chlorite alteration
353.6 Siliceous. Specks/blebs pyrite

356.5 ?Rhyolitic ? lava ?
Pinkish grey, m/f gr, haematitic, qtz phyric with irregular veinlets and fragments of vein qtz. Siliceous, haematitic, albitic sericitic.
Scattered blebs py ?cp

Volcaniclastic

Blackish greenish grey, m gr, ?dacitic, qtz ± fdsp phyric

Foliated. Irregular lava clasts.

Strong pervasive chlorite alteration, siliceous. ?Albitisation of lava clasts.

388.5 Locally banded
Trace specks pyrite

SUMMARY

	ROCK	ALTERATION
Ces	VRXF	QS5
Cess	VEIN ←	←
Cev	VDQM	OQ7
Cap	←	←
Cev	VDQM	OQA7

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No LS 13

SHEET 1 **OF** 3

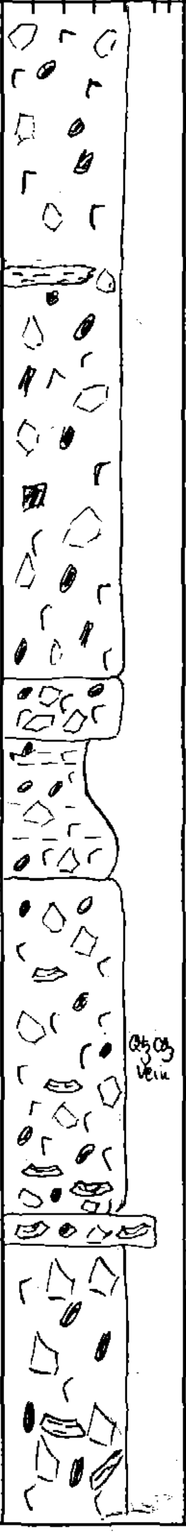
—	Bedding
⊔	Cleavage
▲	Foliation
∿∿	Fault, Shear
▵▵	Breccia
▩	Broken core
░	Disseminated
■	Massive
▨	Pervasive
↘	Narrow vein
*	Visible gold

PROJECT : EL 19/98 - ANTHONY

PROSPECT : SELINA

DATE : 15 JUNE 1999

LOGGED BY : W. GODSALL



HOLE DEPTH (M)	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION SIL. SER. PY. CHL	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
10						Polymict epiclastics Greyish green, medium grained, weathered and limonitic, ?dacitic Weakly foliated, Locally pitted. Limonitic coatings along joint planes.			
20			40°						
30									
40						Irregular silty band			
50									
60									
70			35°				Cev	EDLM	LO4
80									
90						89.7m Heavily limonitic epiclastics ?Dacitic. Weathered, rubbly and broken. Qtz-albite veining. Irregular thin bands of finer sediment.	Cev	EDLC	L8
100						96.6m			
110			35°				Cev	EDLF	O3
120			35°			115m Dark greenish grey, medium to fine grained epiclastics/silty sediments Foliated. Weak chlorite alteration Locally conglomeratic. Gradational contacts. Wispy foliation Occasional sulphide specks (?py)			
130									
140			35°	Qtz CO3 vein		137.6			
150							Cev	EDQM	OCS3
160						159.6m 162.6m Blackish greenish grey, medium grained polymict, qtz phyric ?dacitic conglomeratic epiclastics. Chlorite and carbonate altered, with weak sericite alteration Occasional sulphide specks (?py)		VEIN	
170									
180			35°						
190			∿∿			Qtz-CO3-albite veining in conglomeratic epiclastics	Cev	EDQF	OCS4
200						Polymict epiclastics			

REMARKS

598138

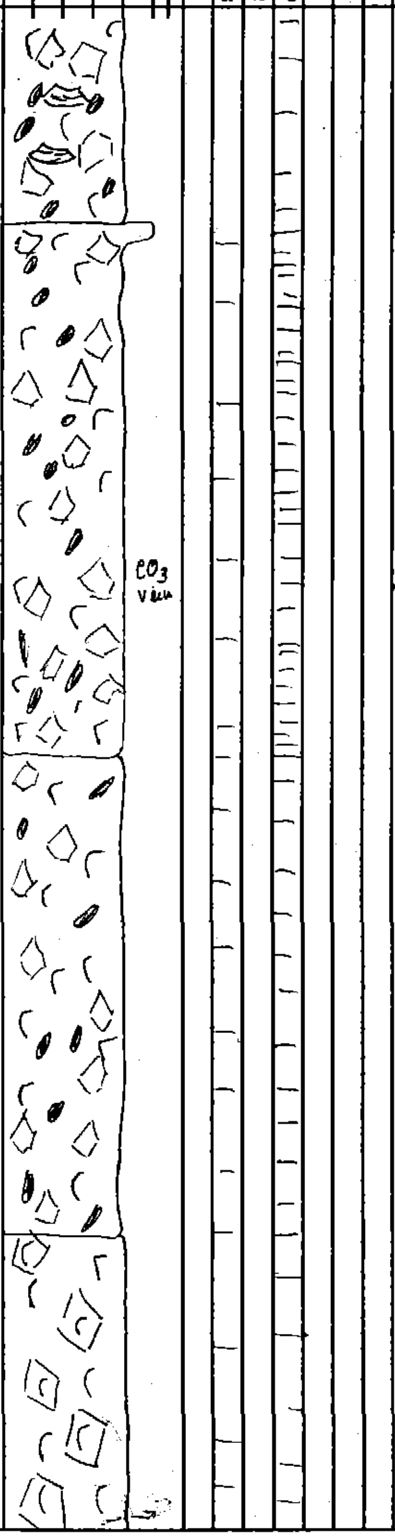
RGC EXPLORATION PTY LTD

DRILL HOLE No LS 13

SHEET 2 **OF** 3

——	Bedding	░	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
〰	Fault, Shear	↘	Narrow vein
△	Breccia	*	Visible gold
▩	Broken core		

PROJECT :	EL 19/98 - ANTHONY
PROSPECT :	SELINA
DATE :	15 JUNE 1999
LOGGED BY :	W. GODSALL



HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
210			50° ▲			Polymict epiclastics. Qtz phyric. ?Dacitic. Chlorite alteration (mod) Carbonate alteration, tends to increase down unit. Weak sericite alteration ?ga at 214.5m			
220							Cev	EDQF	OCS4
230						228.2m 231.9m Qtz-CO_3 ± albite veining. X-cutting epiclastics. Black chlorite. Rose quartz.		VEIN	
240									
250			50° ▲			Dark greenish blackish grey epiclastics. Qtz phyric, ?dacitic, and medium to fine grained. Strong chlorite alteration. Locally weakly sericitic Minor carbonate alteration. Weak specks sulphides. 275.5 Scattered and disseminated magnetite. Gradational contacts			
260									
270									
280				CO_3 vein			Cev	EDQF	OCS5
290									
300						298m			
310						Polymict qtz phyric epiclastics. Moderate chlorite alteration. Distinctive carbonate veinlets and alteration. Weak sericite alteration. Weakly foliated No obvious/visible sulphides. Occasional magnetite			
320			50° ▲						
330									
340									
350							Cev	EDQF	OCS4
360						361m (Note: 360.3m - 361.0m NO CORE)			
370						Porphyritic, qtz phyric ?dacitic lava. Autobrecciated. Felsic. Chlorite-altered matrix. Weak sericite alteration Gradational volcaniclastic units			
380			55° ▲						
390							Cfv	LDQB	OS3
400									

REMARKS

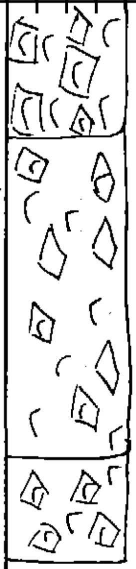
RGC EXPLORATION PTY LTD

DRILL HOLE No LS13

SHEET 3 **OF** 3

— Bedding	▒ Disseminated
⊔ Cleavage	■ Massive
▲ Foliation	▨ Pervasive
∿ Fault, Shear	Narrow vein
▽△ Breccia	* Visible gold
▩ Broken core	

PROJECT	: EL 19/98 - ANTHONY
PROSPECT	: SELINA
DATE	: 15 JUNE 1999
LOGGED BY	: W GODSALL

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG 1/16 1/4 1 4 16 32	ALTERATION			GEOLOGY NOTES	SUMMARY		
					SIL.	SER.	PY.			ROCK	ALTERATION
410								Porphyritic, qtz phyric lava. Felsic	Cep	LDQB	0S3
								418m From approx 418m magnetite content becomes more dominant with volcaniclastics becoming more distinct (intercalations) Autobrecciated.			
420			55°								
430											
								437m Pink haematitic volcaniclastics			
440								442m			
450									Cev	VDQB	OSC3
460								460m Autobrecciated felsic lava	Cev	LBQF	OSC3
470			60°								
								473.5m			
480								473.5m – 502.6m No Core			
490											
500											
				EoH 502.6m							

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No LS 14

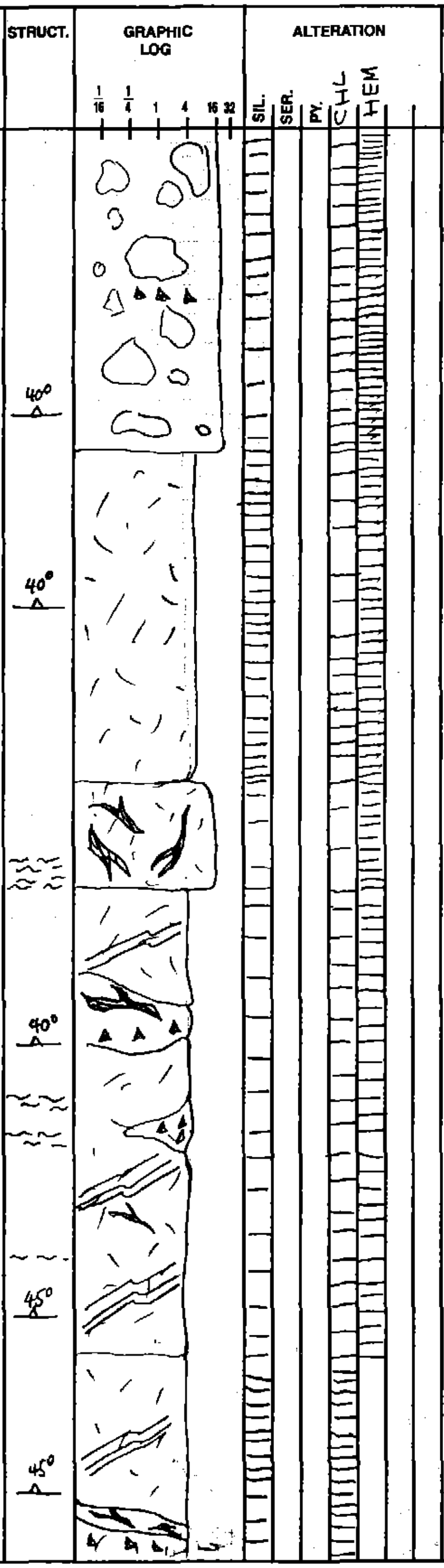
SHEET 1 **OF** 4

— Bedding
⊔ Cleavage
▲ Foliation
∿ Fault, Shear
Breccia
▩ Broken core
Disseminated
■ Massive
▨ Pervasive
Narrow vein
* Visible gold

PROJECT : EL 19/98 ANTHONY
PROSPECT : SELINA
DATE : 16.07.99
LOGGED BY : W. GODSALL

HOLE DEPTH (M): 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100

SAMPLE No PREFIX | **ASSAY RESULTS**



	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
	Haematitic conglomerate Purplish reddish grey, massive, pebble conglomerate. Sub angular clasts, matrix supported, poorly sorted clasts. Foliated matrix Strongly haematitic. Siliceous. Locally vuggy and weathered	Ctc	CONG	HQ08
22.7	Rhyolitic lavas Massive, greyish reddish purple, m.gr - c.gr, weakly porphyritic and quartz phyric. Cut by irregular wispy qtz albite veining. Strong haematite alteration, siliceous minor chlorite alteration	Cel (Cep)	LR>M	HQ07
45.9	Veined and faulted rhyolitic lava Similar to above but with strong		VEIN	
51.0 53.0	qtz albite veining, jaspar		FALT	
	Rhyolitic lava Similar to above	Cel (Cep)	LR>M	HQ06
61.8	Massive, greyish purple, m.gr - c.gr, qtz - fdsp phyric, porphyritic, and flow banded. Foliated. Pervasive haematite alteration, siliceous, subordinate chlorite alteration. Locally veined and weakly brecciated			
85.6	Rhyolitic lavas Similar to above with almost total absence of haematitic content. Strong chlorite alteration. Dark brown, porphyritic, flow foliation, with localised qtz ± albite veining.	Cel	LRQM	OQ8

REMARKS

RGC EXPLORATION PTY LTD

───	Bedding	▒	Disseminated
⊔	Cleavage	■	Massive
─▲─	Foliation	▨	Pervasive
〰	Fault, Shear	➘	Narrow vein
▵▵	Breccia	*	Visible gold
▩	Broken core		

DRILL HOLE No LS 14

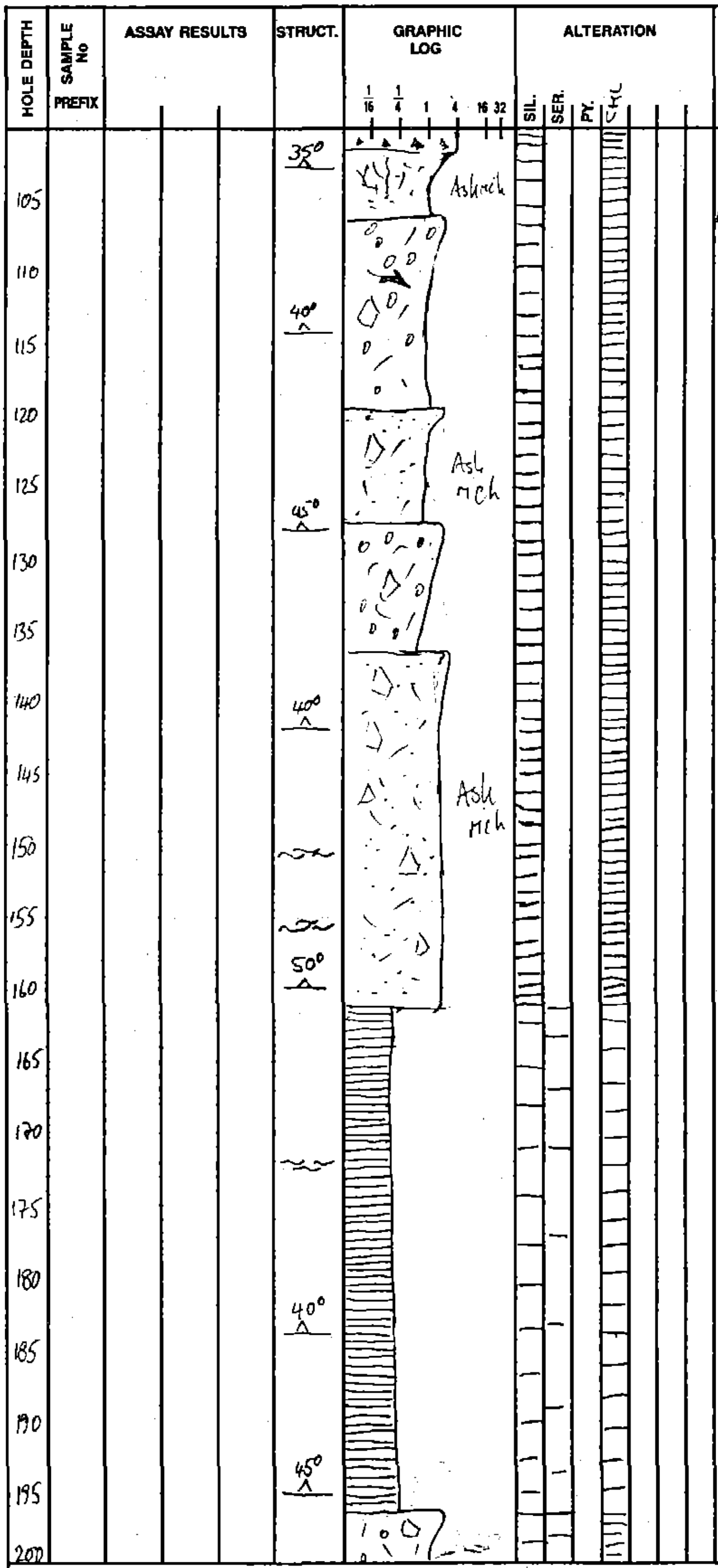
SHEET 2 OF

PROJECT : EL 19/98 ANTHONY

PROSPECT : SELINA

DATE : 16.07.99

LOGGED BY : W. GODSALL



	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
101.8	Sharp contact Volcaniclastics	Ces	VR>A	
106.3	A sequence of mixed ash-rich and ash-poor rhyolitic volcaniclastics. Massive, qtz and fdsp phyric, weakly foliated with fine lapilli and pumice fragments	Ces	VR>V	
118.5	Strong chlorite alteration tends to be obscured by the ash-rich units. Siliceous and foliated.	Ces	VR>A	
127.4	Trace specks and occasional slivers of euhedral pyrite	Ces	VR>V	
136.4	Weathered and vuggy	Ces	VR>A	OQ7
161.1	Shale Greenish grey to black, very fine grained. Siliceous, sericitic and chloritic. Moderately sharp contacts. Blebs and disseminations py, generally along cleavage.	Css	VRAV	OSQ5
196.6	Volcaniclastics	Ces	VR>A	OSQ5

REMARKS

598142

RGC EXPLORATION PTY LTD

DRILL HOLE No LS14

SHEET 3 **OF** 4

—	Bedding	░	Disseminated
⊔	Cleavage	■	Massive
▲	Foliation	▨	Pervasive
〰	Fault, Shear	↘	Narrow vein
△▽	Breccia	*	Visible gold
▩	Broken core		

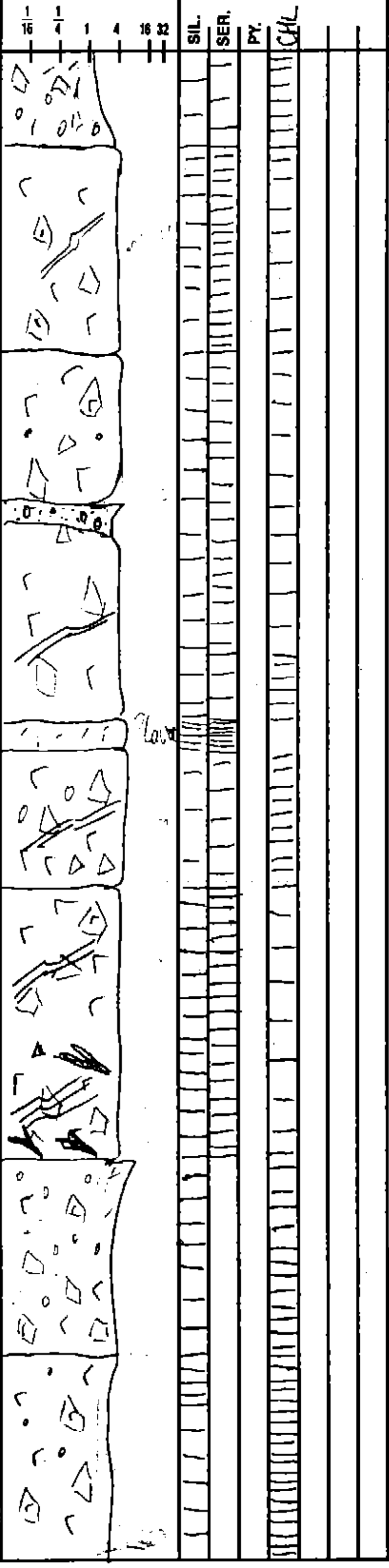
PROJECT : EL 19/98 ANTHONY

PROSPECT : SELINA

DATE : 16.07.99

LOGGED BY : W. GODSALL

HOLE DEPTH (M)	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.
205			45° ▲
210			
215			45° ▲
220			
225			
230			40° ▲
235			
240			
245			
250			45° ▲
255			
260			
265			〰
270			45 ▲ 〰
275			〰
280			〰
285			
290			〰 40 ▲
295			
300			



GEOLOGY NOTES

Volcaniclastic
Greenish, yellowish grey, ash-rich, ?rhyolitic
volcaniclastic. Siliceous, chlorite and
206.7 sericite alteration. Qtz phyric
Trace specks py.

Altered volcanics
Yellowish grey, f.gr, crystalline and
siliceous sericite altered volcanics.
Scattered blebs subhedral pyrite.
220.0 ?Dacitic, Foliated

Altered volcanics
Similar to above with chlorite
230.9 becoming more noticeably subordinate
231.3 to sericite, but increasing basally.
Scattered py along cleavage.

244.4
246.5 Rhyolitic volcaniclastic

Altered volcanics
As above with chlorite alteration
becoming dominant.
255.3

Altered volcanics
Grey, f.gr, qtz-fdsp phyric,
?dacitic, foliated.
265.4 Similar to above units, with strong
268.0 sericite alteration
Scattered specks/stringers subhedral
273.6 pyrite
276.1 Volcaniclastic

Ash-rich, qtz phyric, lapilli,
m.gr., brownish green grey, pitted
and leached Weakly foliated.
Heavily broken/faulted
286.4 Volcaniclastic

Gradational with above unit but with
less prominent ash content.
Greenish grey, f.gr - m.gr, qtz phyric,
lapilli, ?dacitic. Faintly foliated
Occasional specks py

SUMMARY	ROCK	ALTERATION
Cev	VR>A	0SQ5
Cev	UD>F	SQ06
Cev	UD>F	SQ06
Cev	VF	S
Cev	UD>F	0QS5
Cev	UD>F	SQ06
	FALT	
Cev	UD>F	SQ06
	FALT	
Cev	VDQA	0QL5
Cev	VD>A	0G6

REMARKS

RGC EXPLORATION PTY LTD

DRILL HOLE No LS14

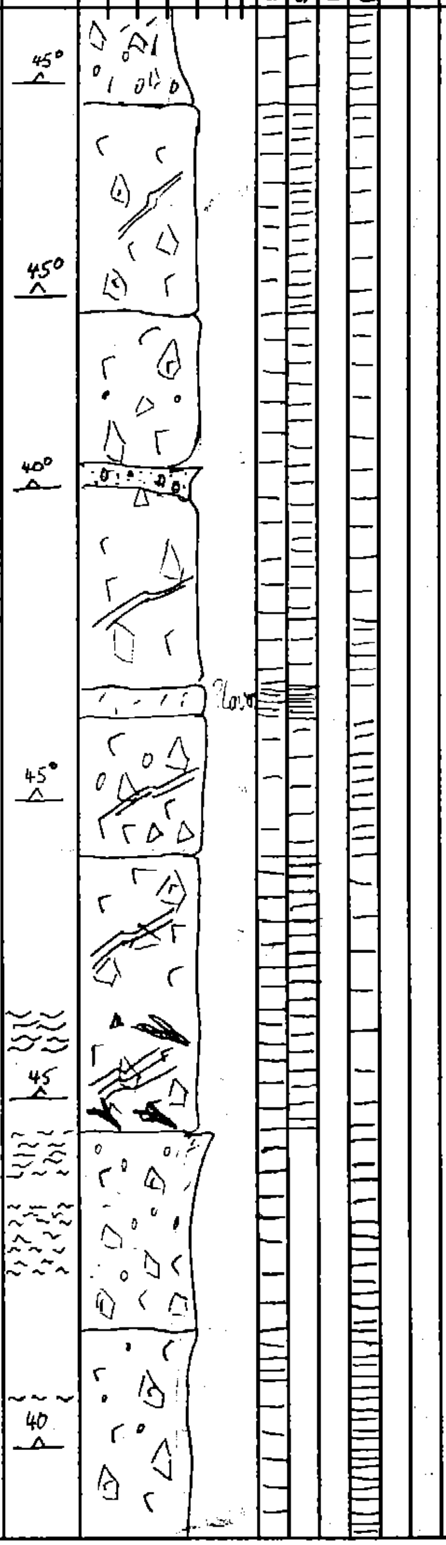
SHEET 3 **OF** 4

─	Bedding
⊔	Cleavage
▲	Foliation
∿∿	Fault, Shear
▵▿	Breccia
▨	Broken core
▒	Disseminated
■	Massive
▨	Pervasive
↘	Narrow vein
*	Visible gold

PROJECT	:	EL 19/98 ANTHONY
PROSPECT	:	SELINA
DATE	:	16.07.99
LOGGED BY	:	W. GODSALL

M

HOLE DEPTH	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION
205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300					



GEOLOGY NOTES

Volcaniclastic
Greenish, yellowish grey, ash-rich, ?rhyolitic volcaniclastic. Siliceous, chlorite and
206.7 sericite alteration. Qtz phyric.
Trace specks py.

Altered volcanics
Yellowish grey, f.gr, crystalline and siliceous, sericite altered volcanics.
Scattered blebs subhedral pyrite.
220.0 ?Dacitic, Foliated

Altered volcanics
Similar to above with chlorite
230.9 becoming more noticeably subordinate
231.3 to sericite, but increasing basally.
Scattered py along cleavage.

244.4 Rhyolitic volcaniclastic
246.5 Altered volcanics
As above with chlorite alteration becoming dominant.
255.3

Altered volcanics
Grey, f.gr, qtz-fdsp phyric, ?dacitic, foliated.
265.4 Similar to above units, with strong
268.0 sericite alteration
Scattered specks/stringers subhedral
273.6 pyrite
276.1 Volcaniclastic
Ash-rich, qtz phyric, lapilli, m.gr., brownish green grey, pitted and leached. Weakly foliated.
Heavily broken/faulted.
286.4 Volcaniclastic
Gradational with above unit but with less prominent ash content.
Greenish grey, f.gr - m.gr, qtz phyric, lapilli, ?dacitic. Faintly foliated.
Occasional specks py

SUMMARY	ROCK	ALTERATION
Ces	VR>A	QSQ5
Cev	UD>F	SQ06
Cev	UD>F	SQ06
Cev		VI S
Cev	UD>F	QQS5
Cev	UD>F	SQ06
	FALT	
Cev	UD>F	SQ06
	FALT	
Ces	VDQA	QQL5
Ces	VD>A	QQ6

REMARKS

598144

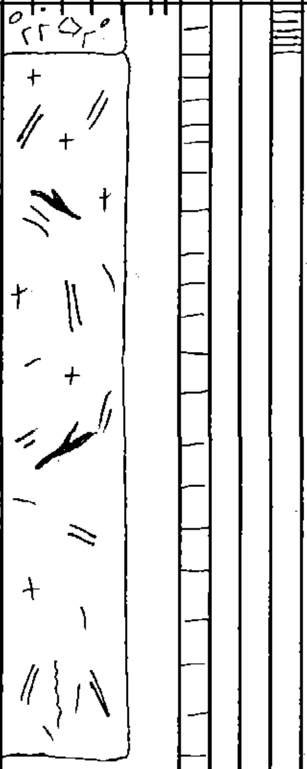
RGC EXPLORATION PTY LTD

DRILL HOLE No LS 14

SHEET 4 **OF** 4

PROJECT	: EL 19/98 ANTHONY
PROSPECT	: SELINA
DATE	: 16.07.99
LOGGED BY	: W GODSALL

— Bedding	▨ Disseminated
⊔ Cleavage	■ Massive
▲ Foliation	▨ Pervasive
〰 Fault, Shear	Narrow vein
Breccia	* Visible gold
▩ Broken core	



HOLE DEPTH (m)	SAMPLE No PREFIX	ASSAY RESULTS	STRUCT.	GRAPHIC LOG	ALTERATION	GEOLOGY NOTES	SUMMARY	ROCK	ALTERATION
						303 5	Gos	VDA	OAb
305						Quartz porphyry Pinkish orange grey, c gr - m gr, crystalline, porphyritic, qtz phyric rhyolitic, granular and mosaic in places, internally shattered / fractured, lithic fragments. Massive. Weak albite alteration. Faint foliation Trace isolated specks py. Occasional qtz ± carbonate vein.			
310			40°						
315									
320									
325									
330							Cep	IR>C	QA3
335									
340									
345									
350			45°	EoH		349.5			

REMARKS

598145

598146

Appendix III

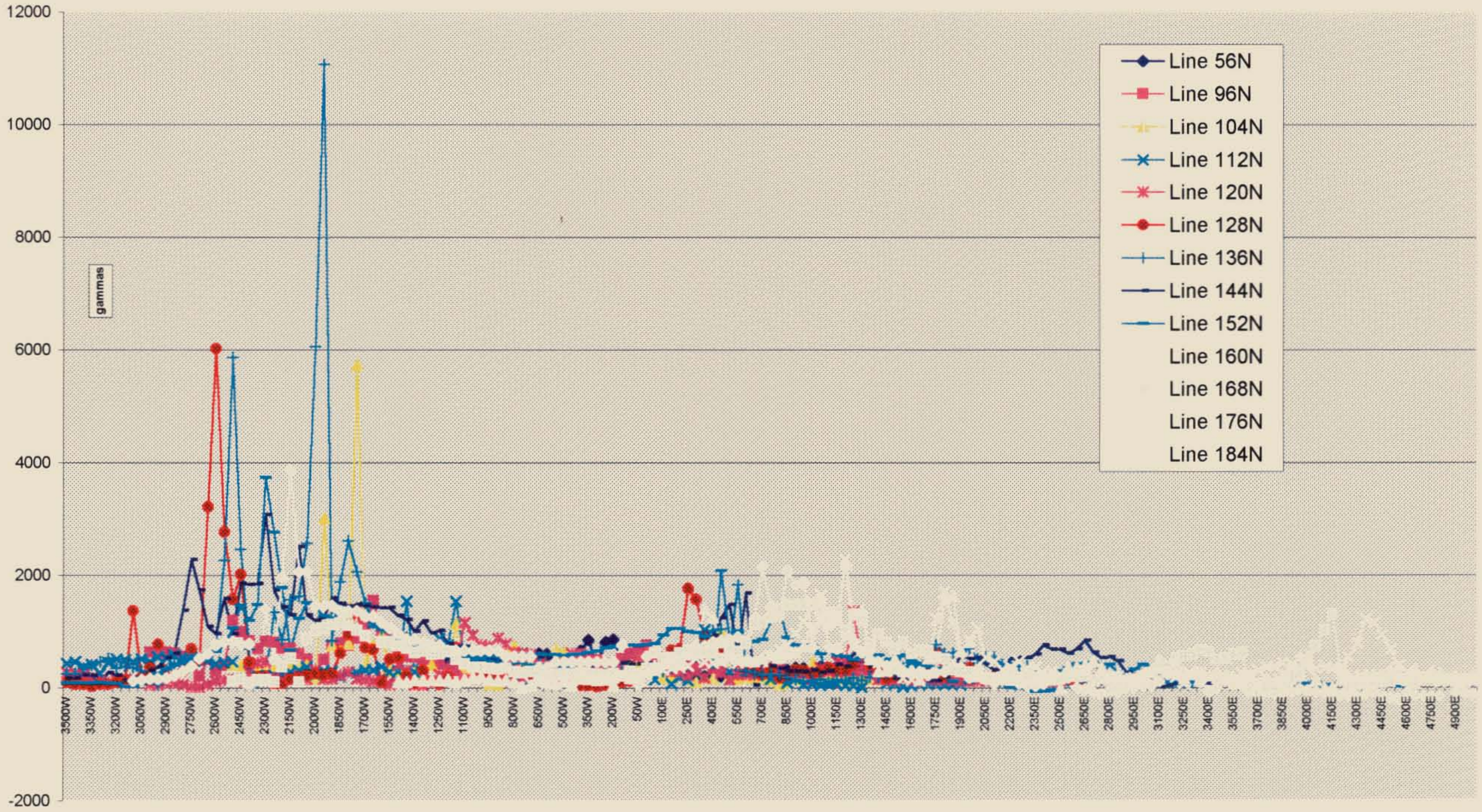
Geophysics

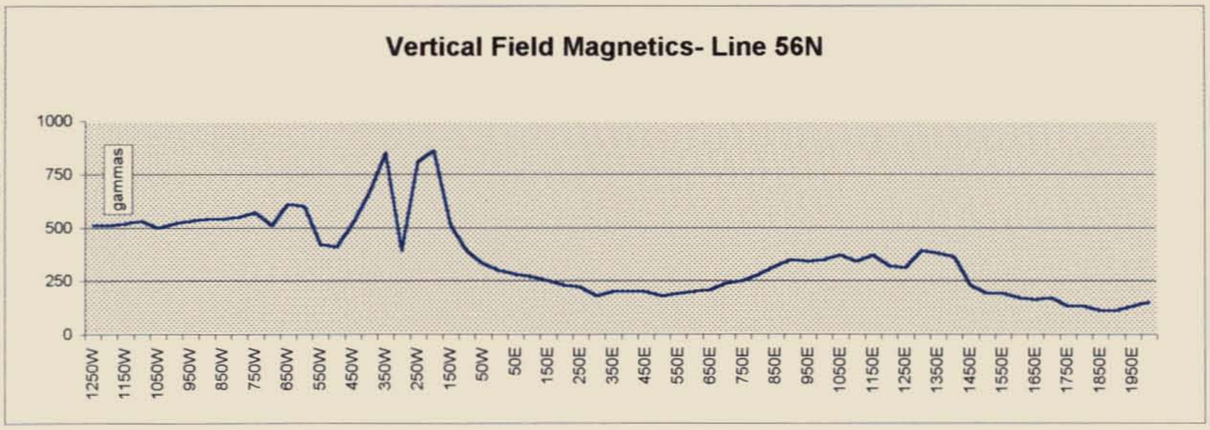
Line profiles:

Ground magnetics – Vertical Field (1970/71)
Ground magnetics – Total Field (1984/85)
IP Gradient Array (1981/82)
UTEM (984/85)

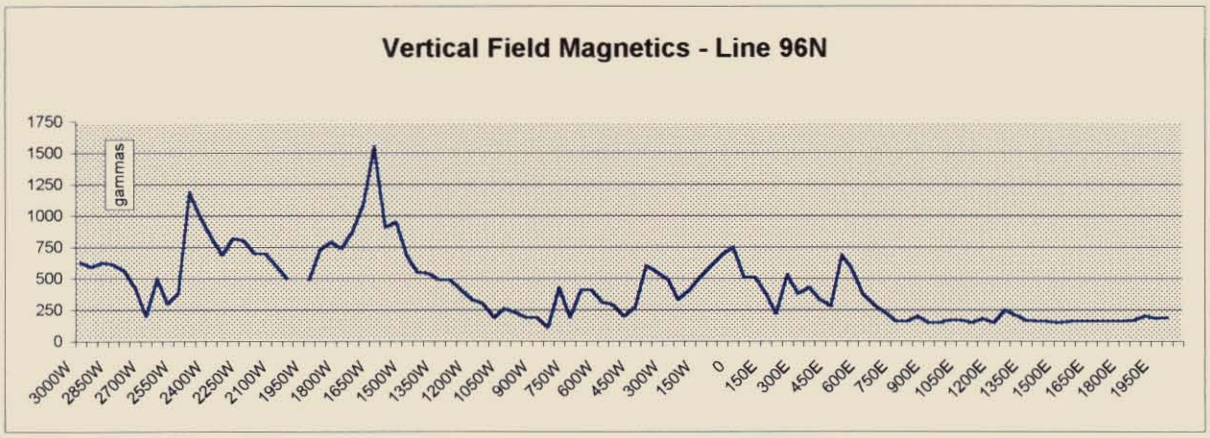
EL 19/98 ANTHONY : SELINA AREA

Vertical Field Magnetics

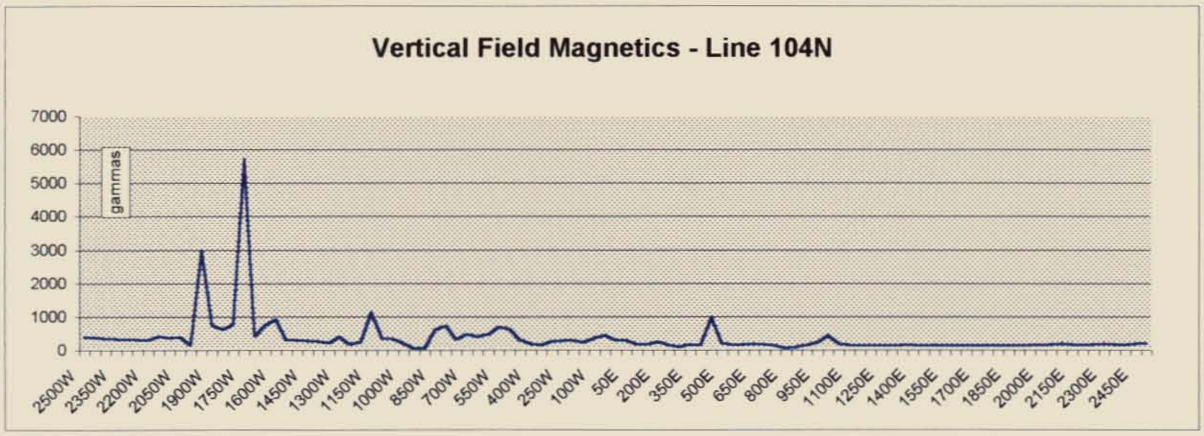




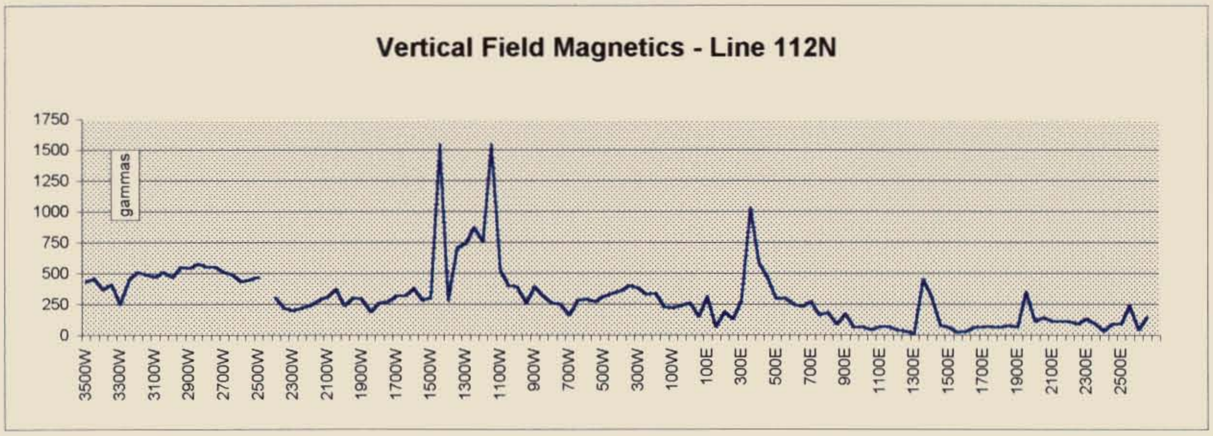
Vertical Field Magnetics- Line 56N



Vertical Field Magnetics - Line 96N



Vertical Field Magnetics - Line 104N



Vertical Field Magnetics - Line 112N

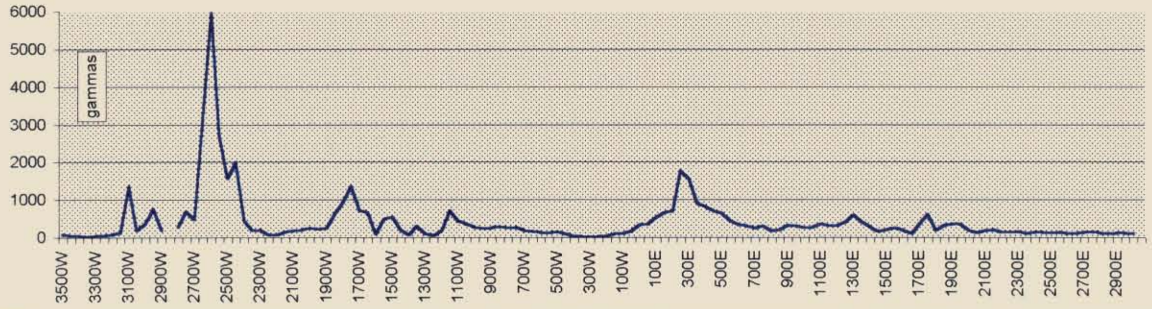
EL19/98 ANTHONY : SELINA AREA

Appendix III

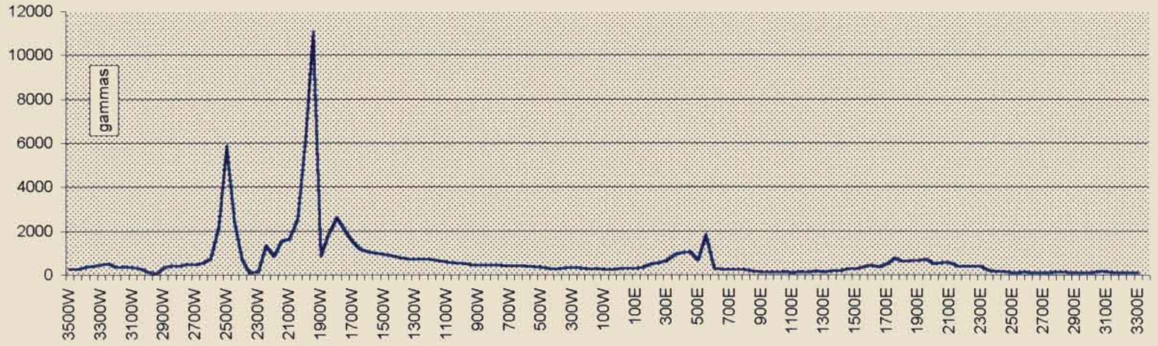
598149

Vertical Field Magnetics - Line 120N

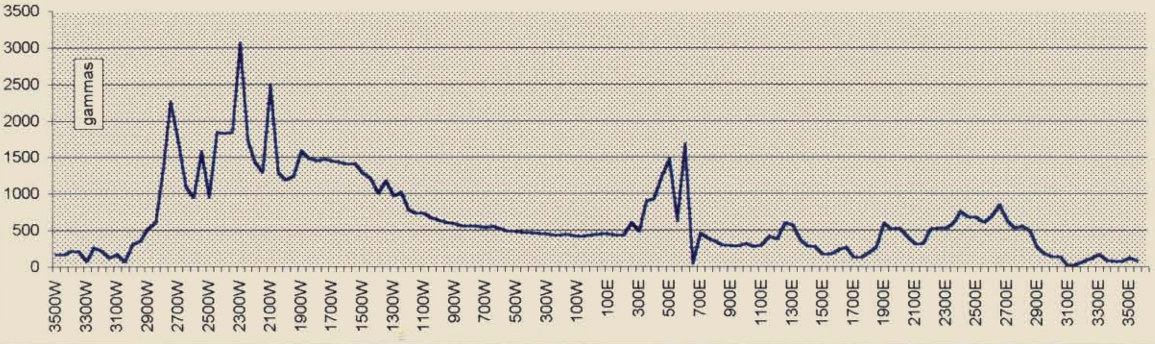
Vertical Field Magnetics - Line 128N



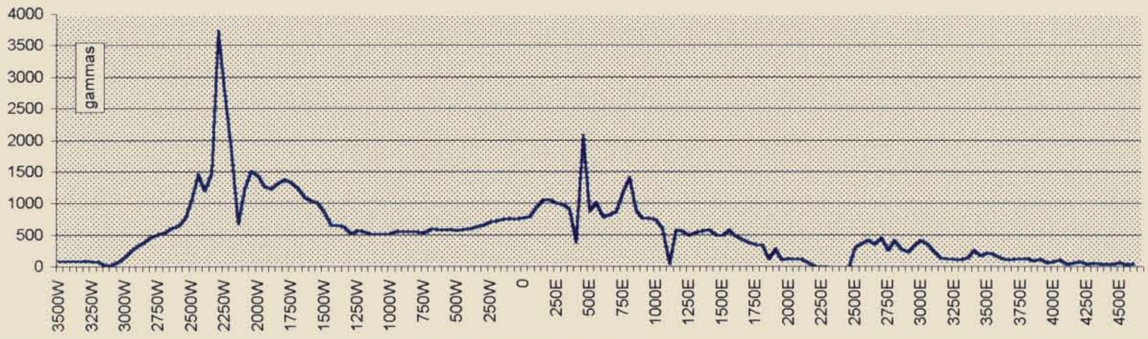
Vertical Field Magnetics - Line 136N

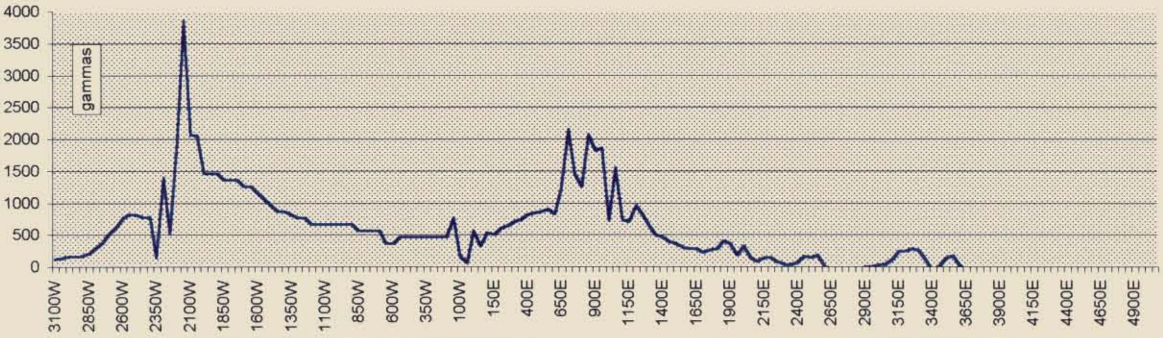


Vertical Field Magnetics - Line 144N

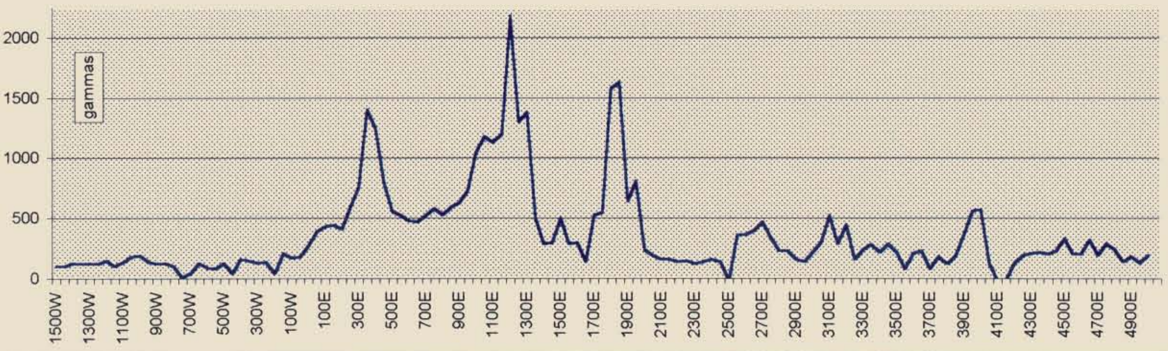


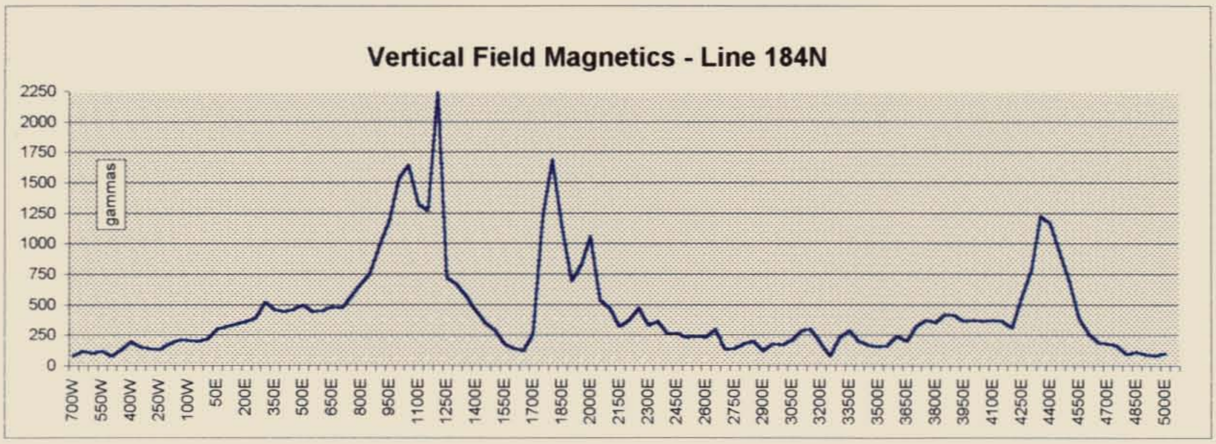
598150


Vertical Field Magnetics - Line 152N


Vertical Field Magnetics - Line 160N

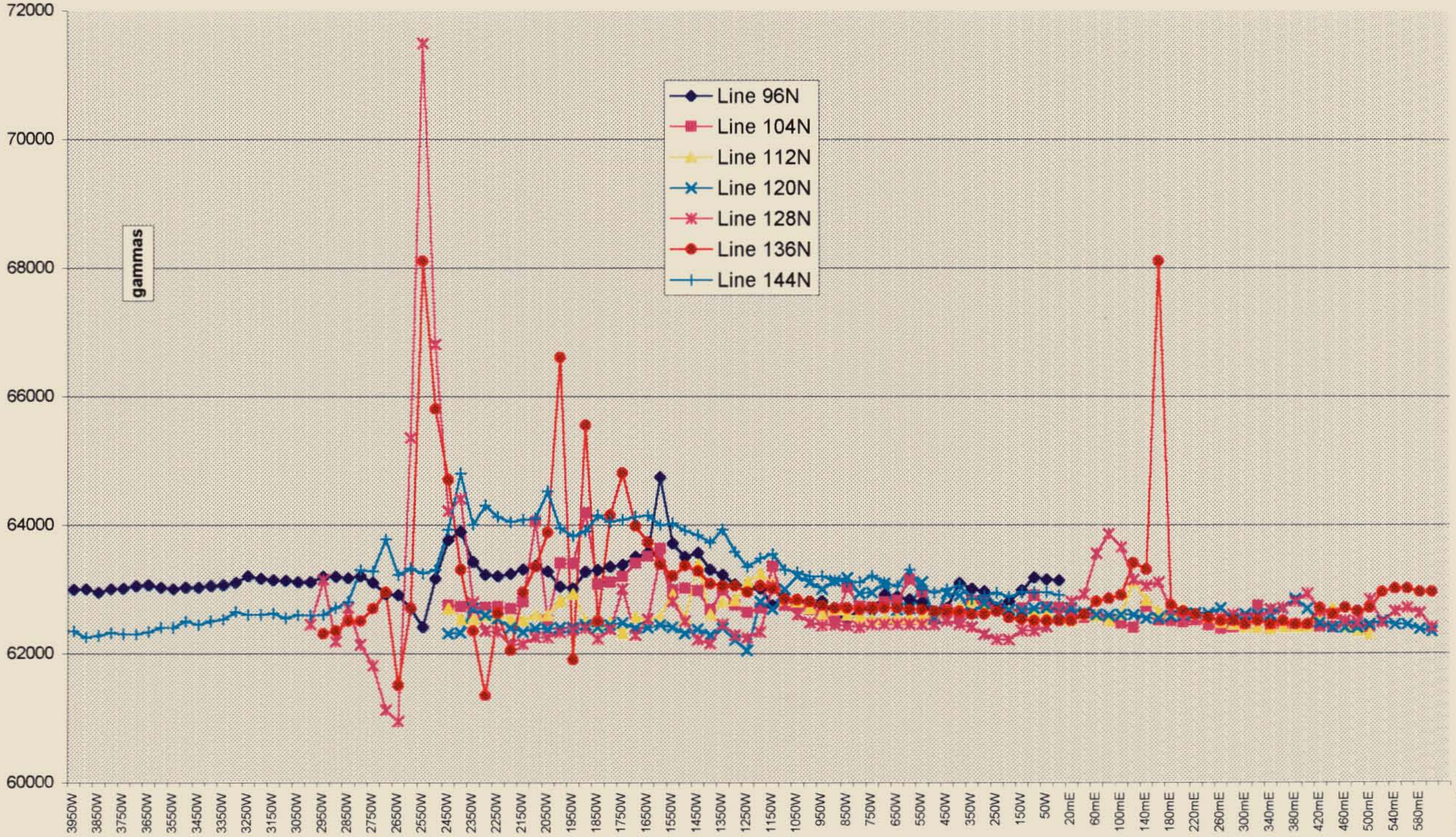

Vertical Field Magnetics - Line 168N


Vertical Field Magnetics - Line 176N


Vertical Field Magnetics - Line 184N

EL 19/98 ANTHONY : SELINA AREA

Total Field Magnetics



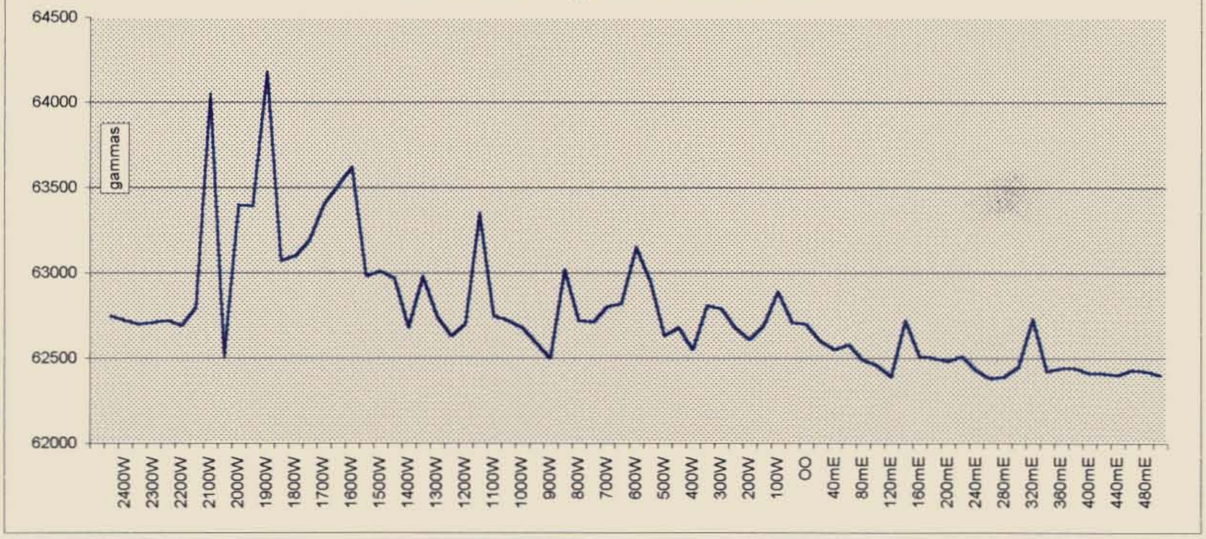
EL19/98 ANTHONY : SELINA AREA

Appendix III

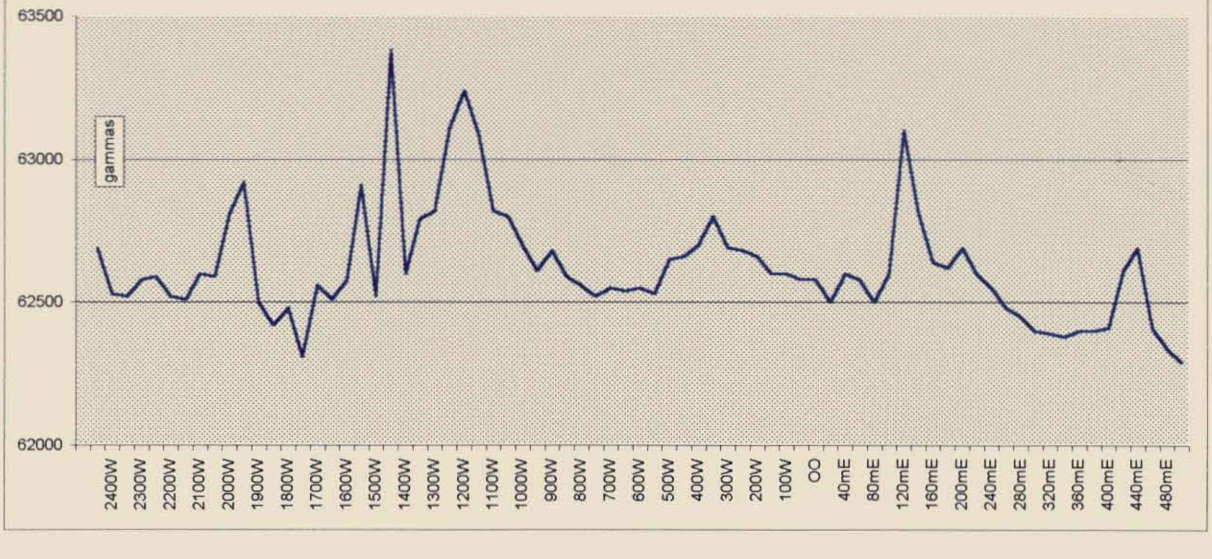
598153

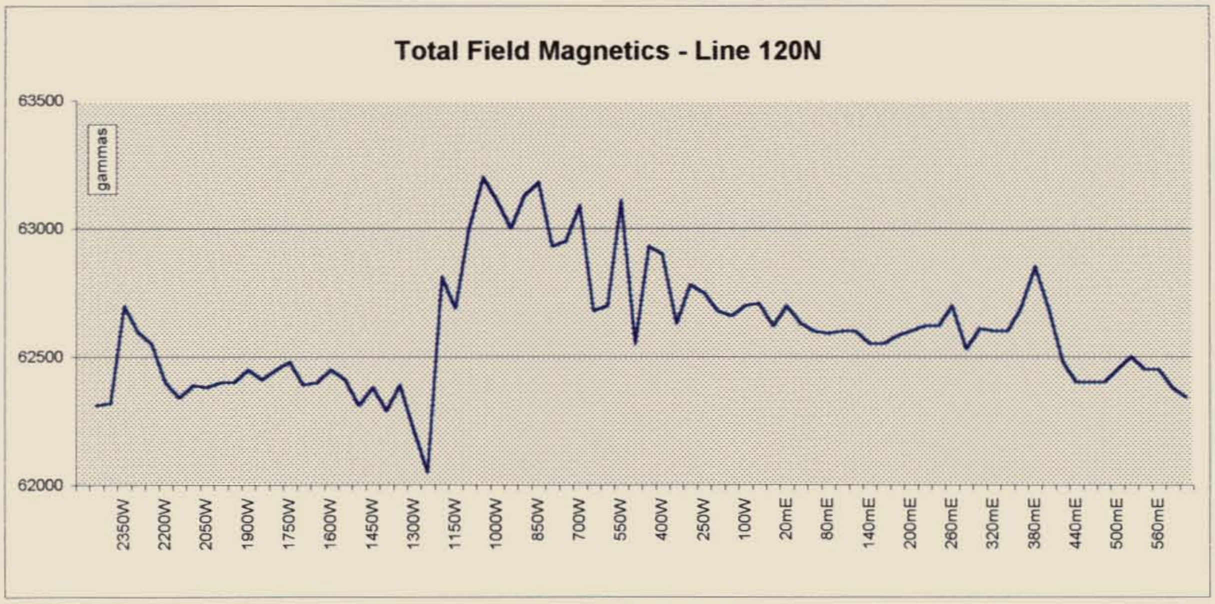
Total Field Magnetics - Line 96N

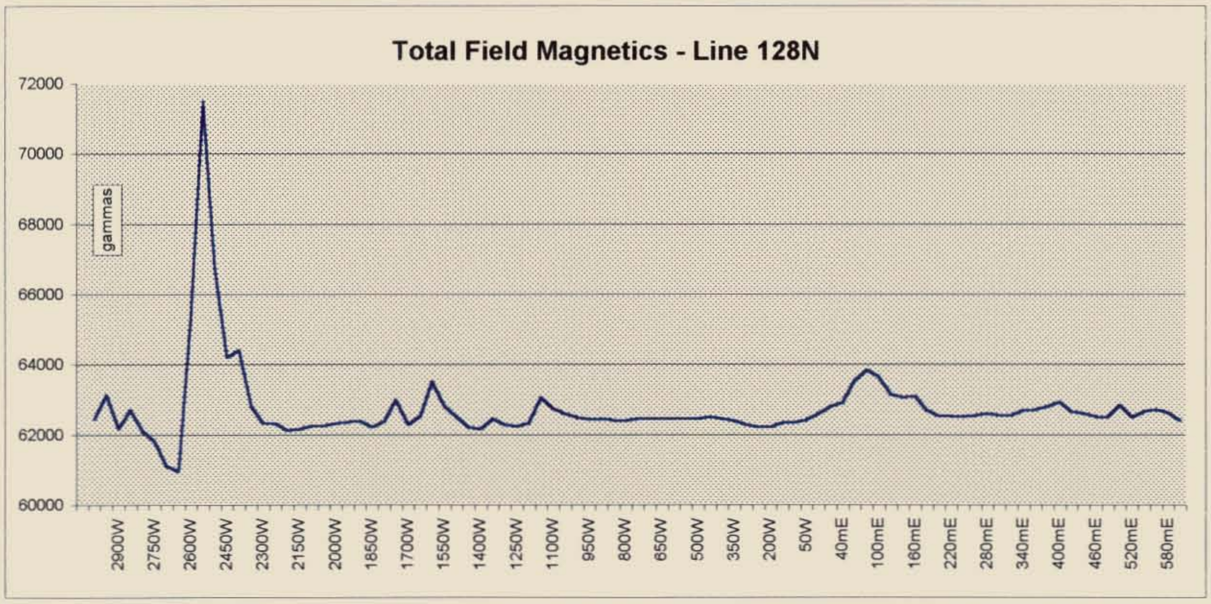
Total Field Magnetics - Line 104N

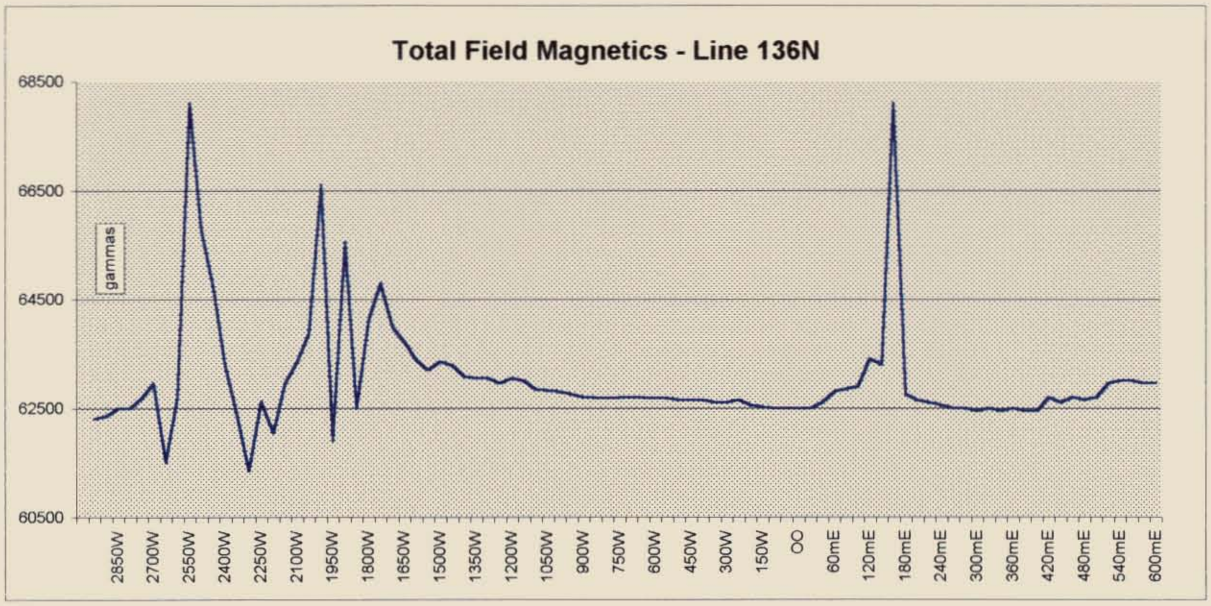


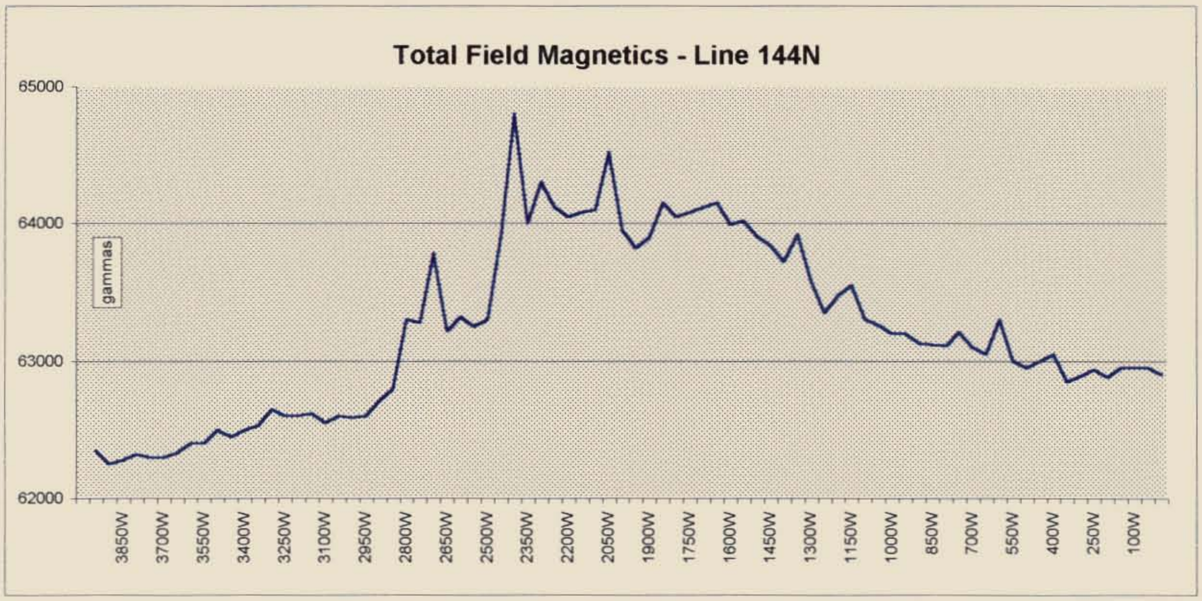
Total Field Magnetics - Line 112N




Total Field Magnetics - Line 120N


Total Field Magnetics - Line 128N

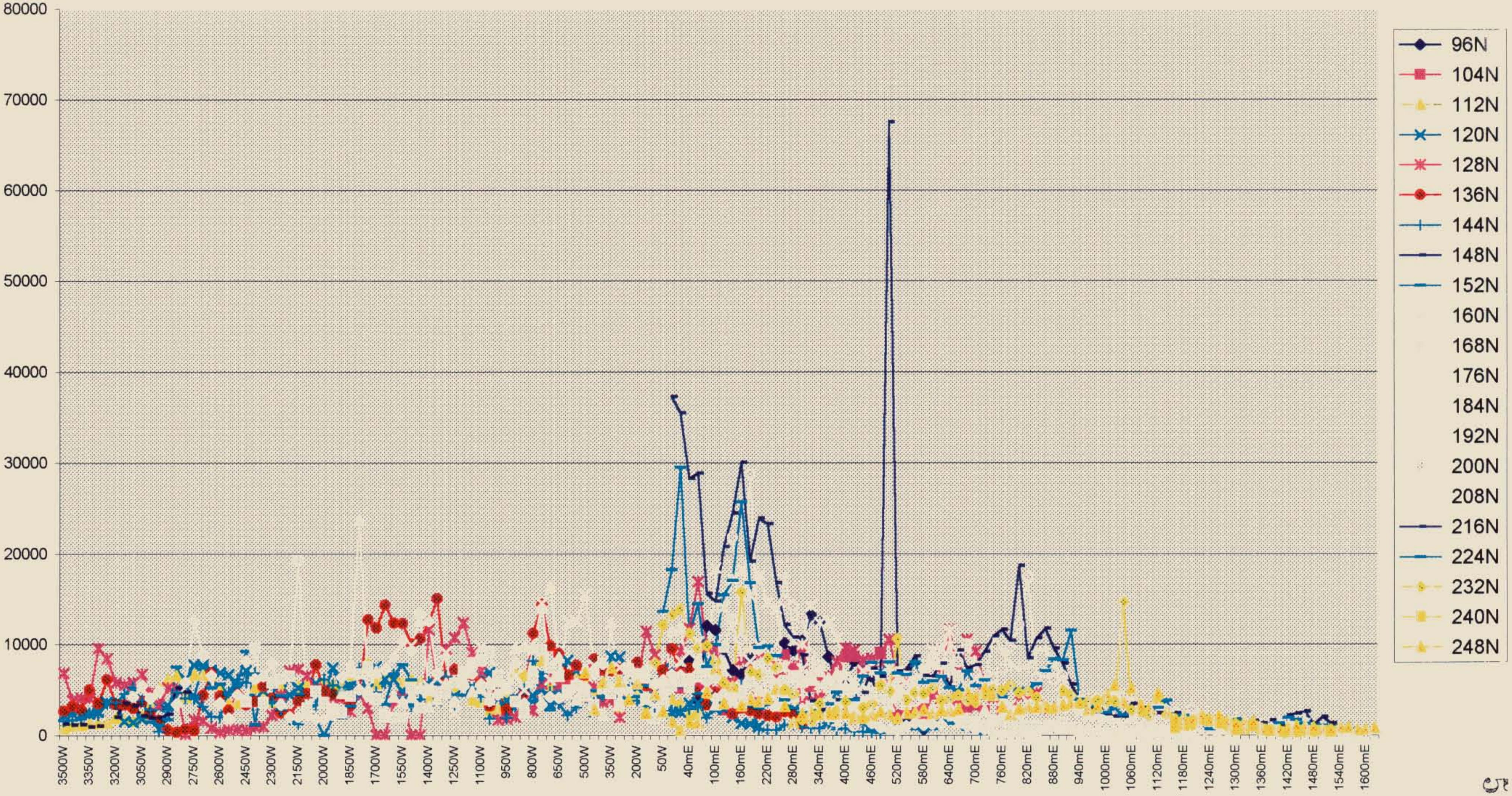

Total Field Magnetics - Line 136N



Total Field Magnetics - Line 144N

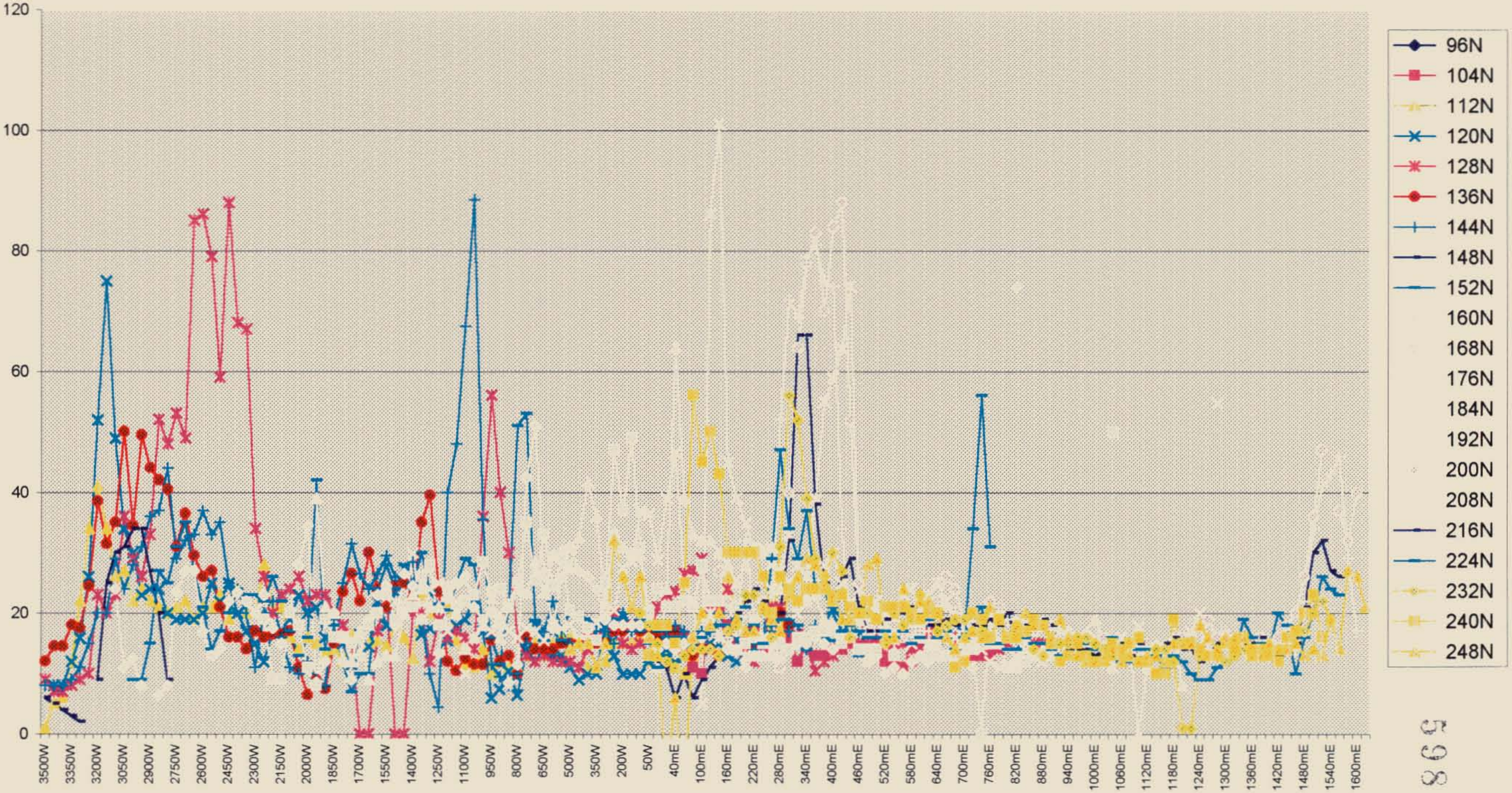
EL 19/98 ANTHONY : SELINA AREA

Gradient Array IP : Resistivity

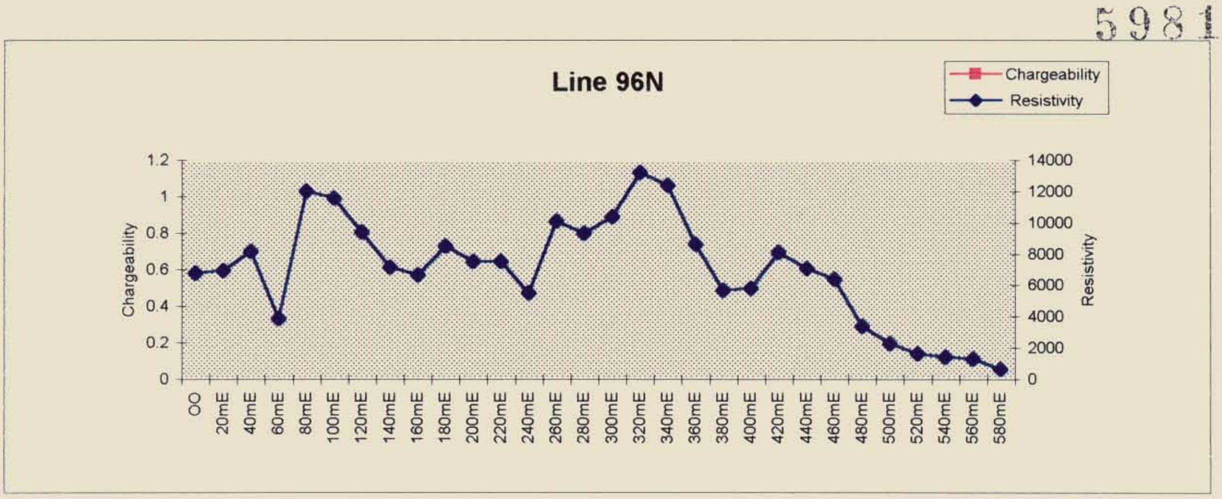


EL 19/98 ANTHONY : SELINA AREA

Gradient Array IP : Chargeability



598157


Line 96N
Chargeability
Resistivity
Chargeability
0
0.2
0.4
0.6
0.8
1
1.2
Resistivity
0
2000
4000
6000
8000
10000
12000
14000
OO
20mE
40mE
60mE
80mE
100mE
120mE
140mE
160mE
180mE
200mE
220mE
240mE
260mE
280mE
300mE
320mE
340mE
360mE
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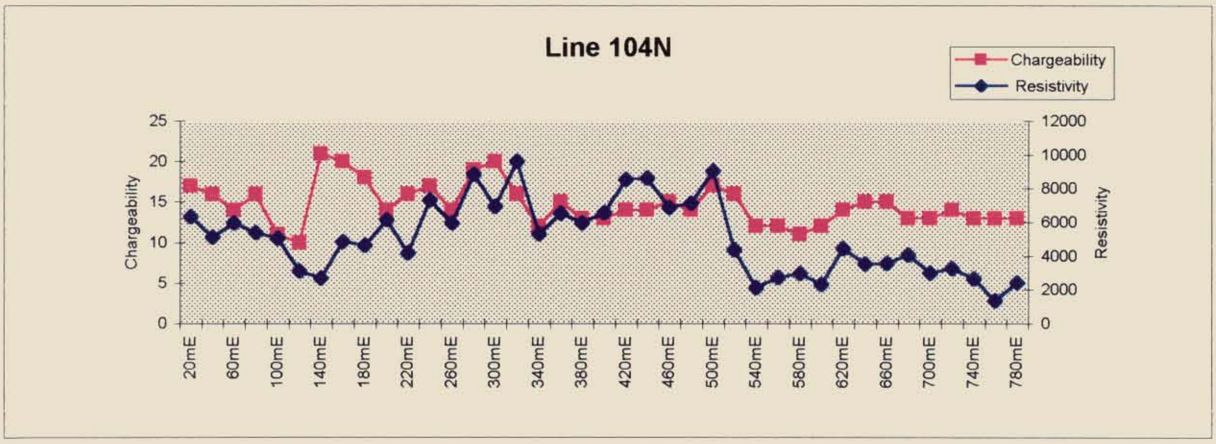
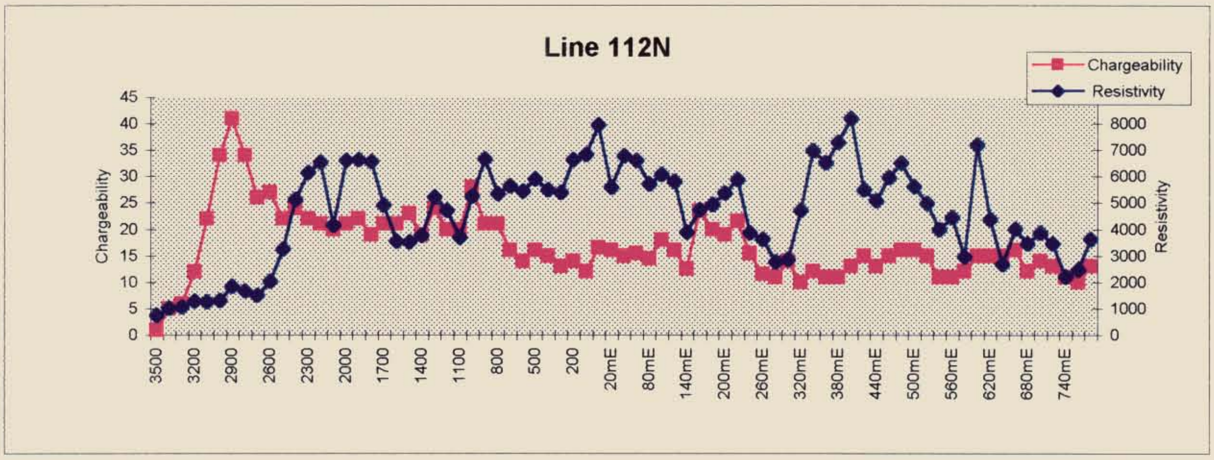
500mE
520mE
540mE
560mE
580mE


Line 104N
Chargeability
Resistivity
Chargeability
0
5
10
15
20
25
Resistivity
0
2000
4000
6000
8000
10000
12000
20mE
60mE
100mE
140mE
180mE
220mE
260mE
300mE
340mE
380mE
420mE
460mE
500mE
540mE
580mE
620mE
660mE
700mE
740mE
780mE


Line 112N
Chargeability
Resistivity
Chargeability
0
5
10
15
20
25
30
35
40
45
Resistivity
0
1000
2000
3000
4000
5000
6000
7000
8000
3500
3200
2900
2600
2300
2000
1700
1400
1100
800
500
200
20mE
80mE
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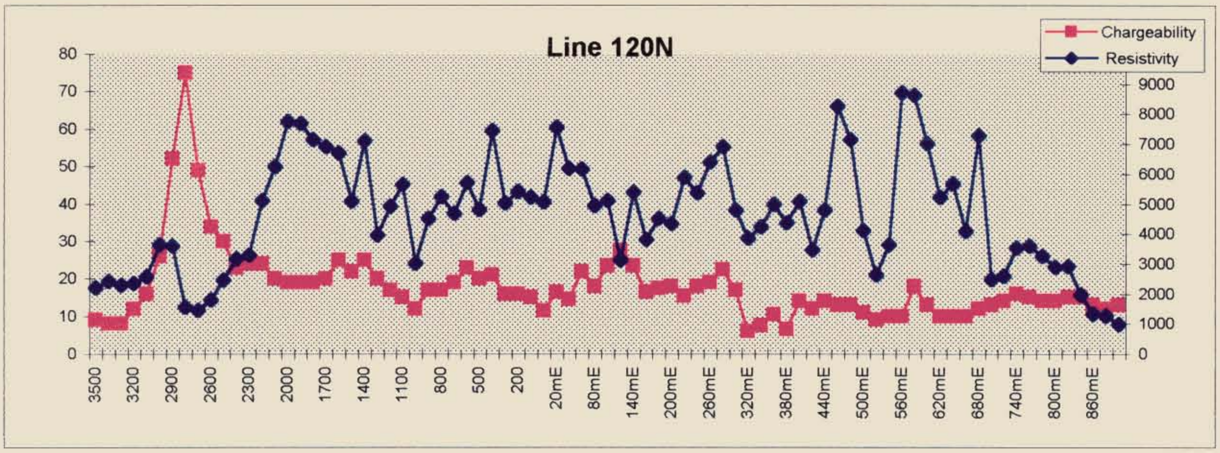
620mE
680mE
740mE


Line 120N
Chargeability
Resistivity
0
10
20
30
40
50
60
70
80
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
3500
3200
2900
2600
2300
2000
1700
1400
1100
800
500
200
20mE
80mE
140mE
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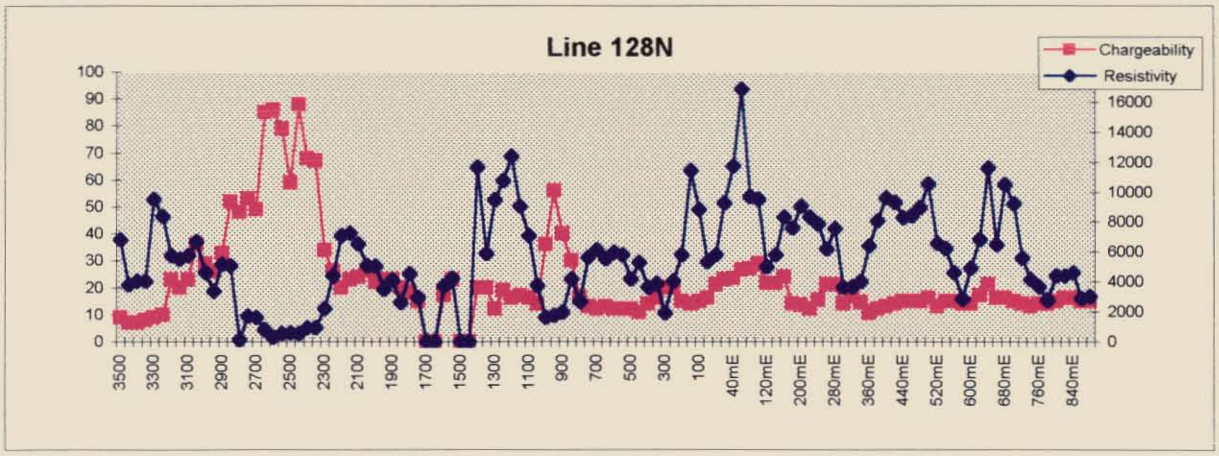
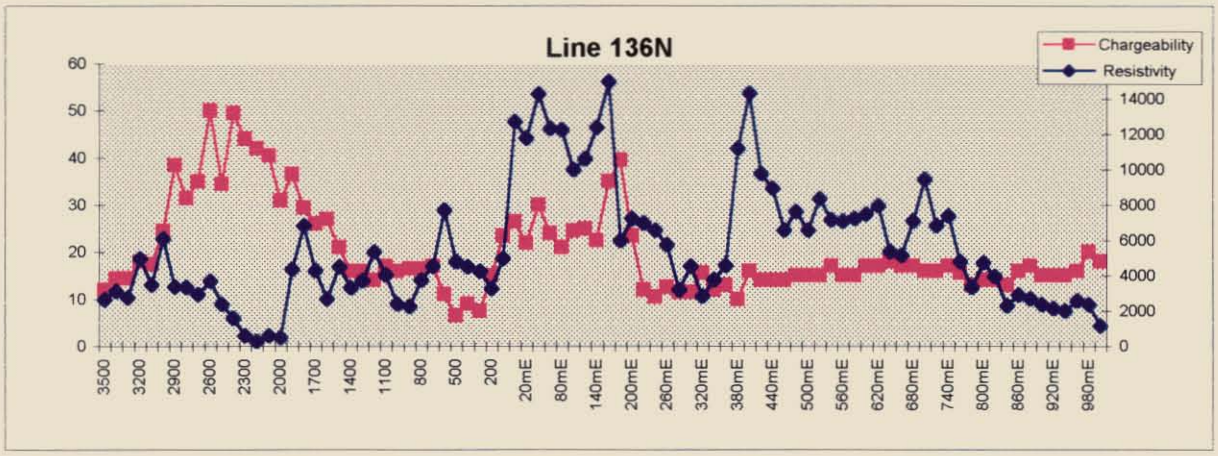
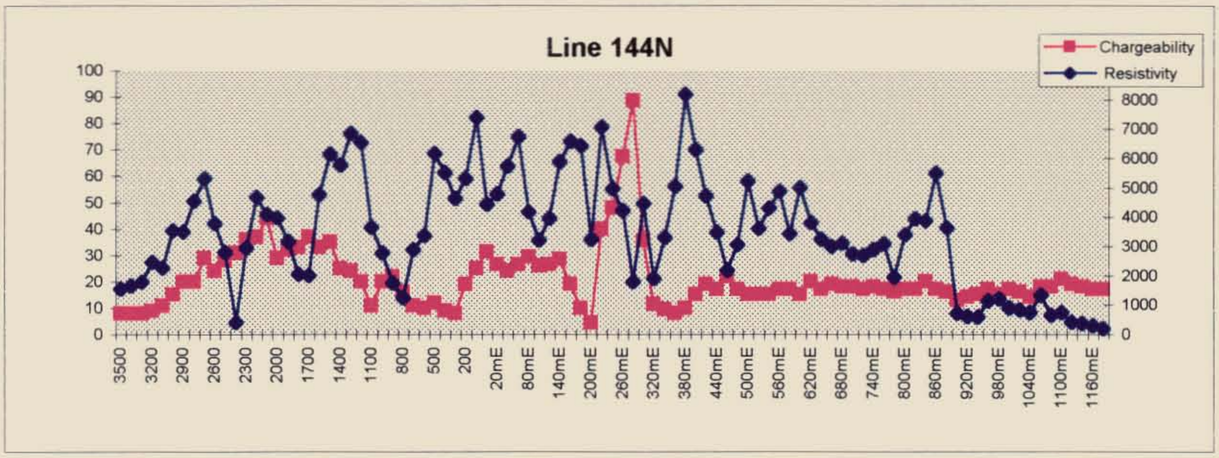
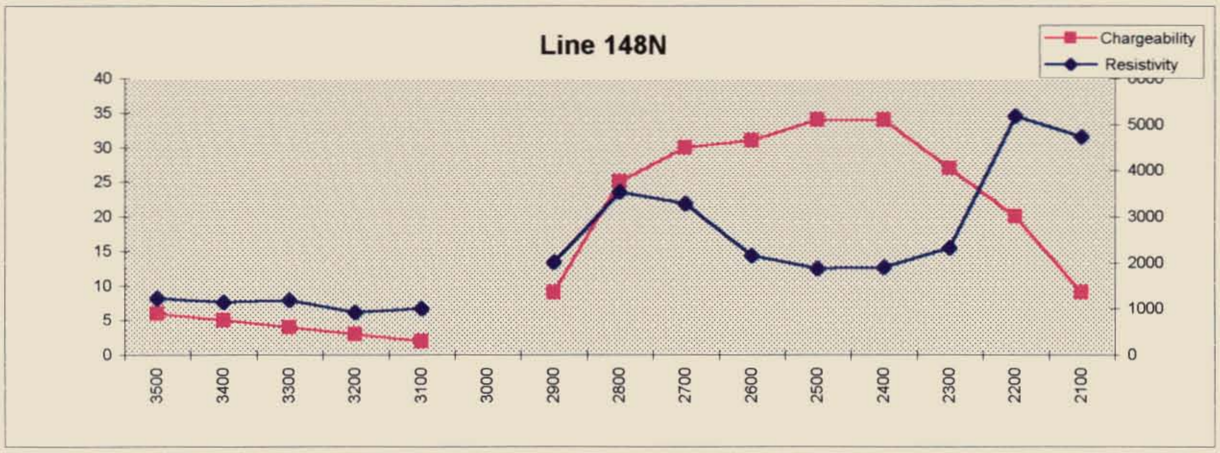
740mE
800mE
860mE


Line 128N

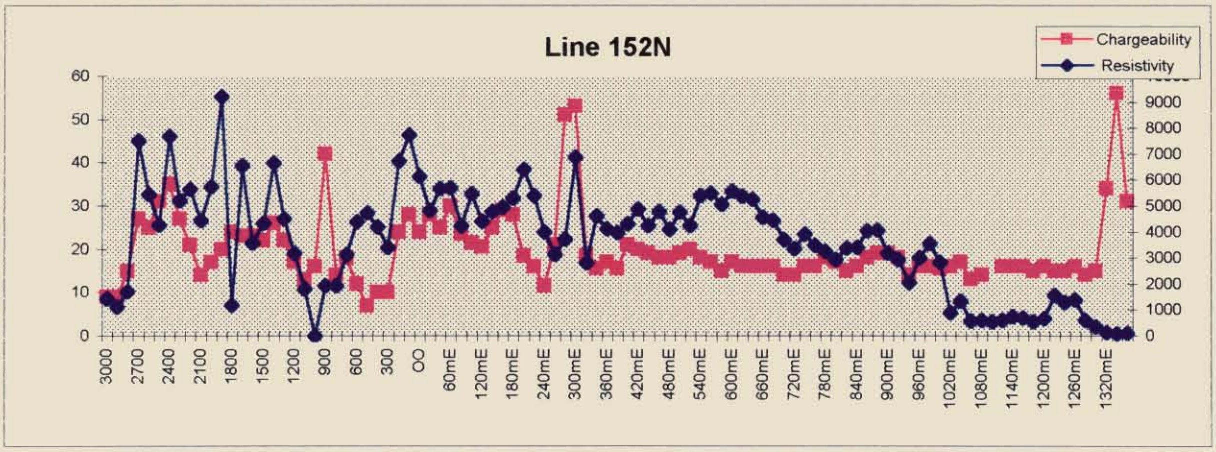

Line 136N

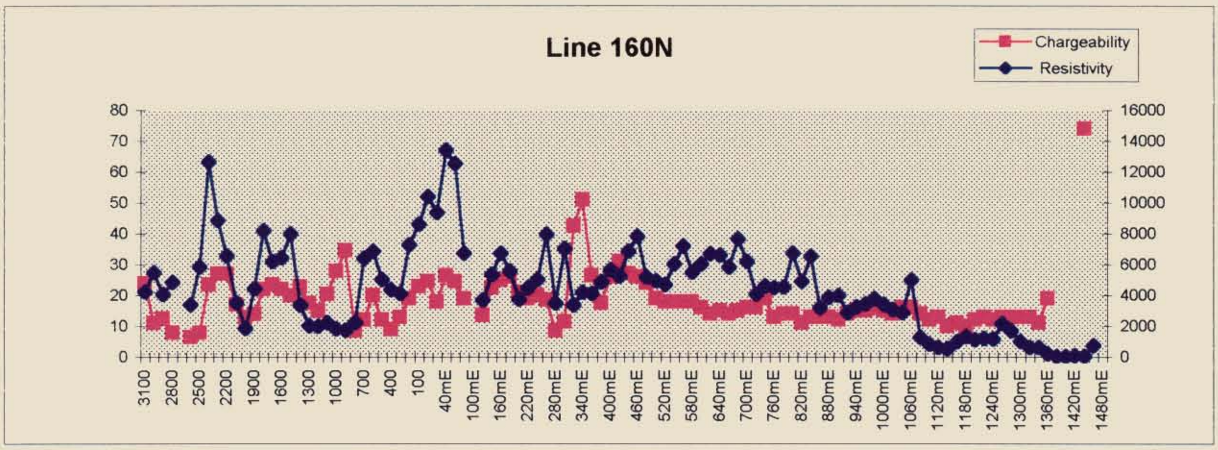

Line 144N

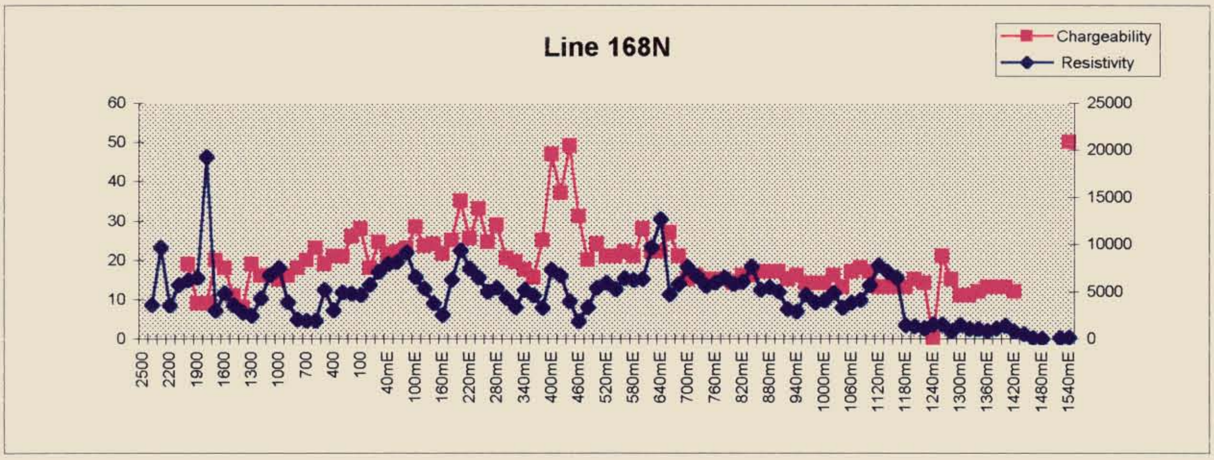

Line 148N

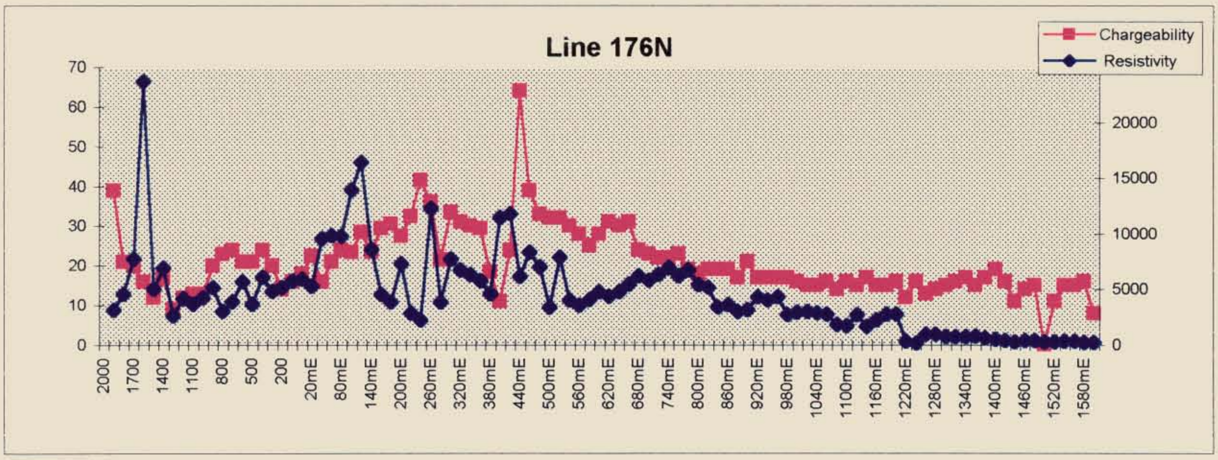
EL19/98 ANTHONY : SELINA AREA

Appendix III

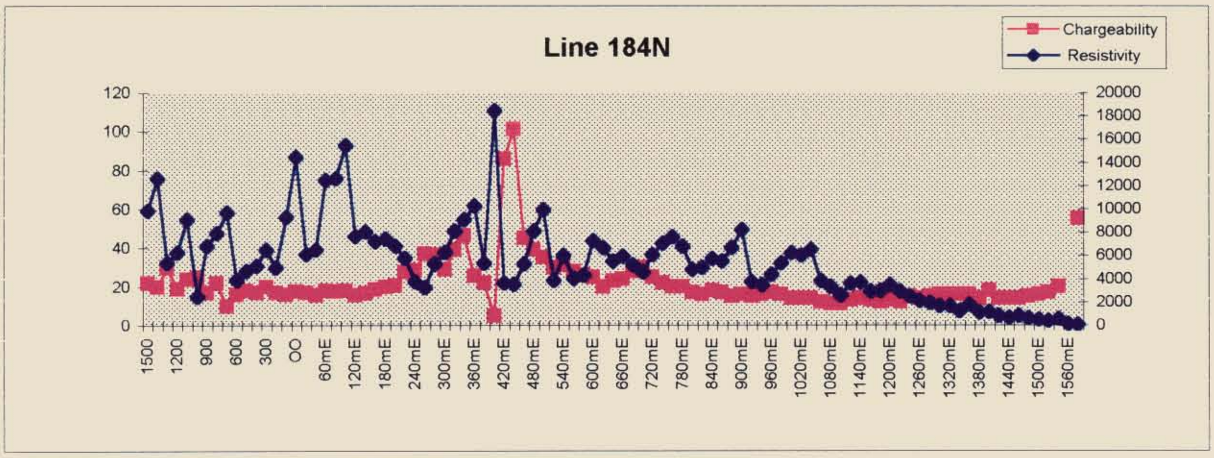

Line 152N


Line 160N


Line 168N


Line 176N

598161


Line 184N
Chargeability
Resistivity
0
20
40
60
80
100
120
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
20000
1500
1200
900
600
300
OO
60mE
120mE
180mE
240mE
300mE
360mE
420mE
480mE
540mE
600mE
660mE
720mE
780mE
840mE
900mE
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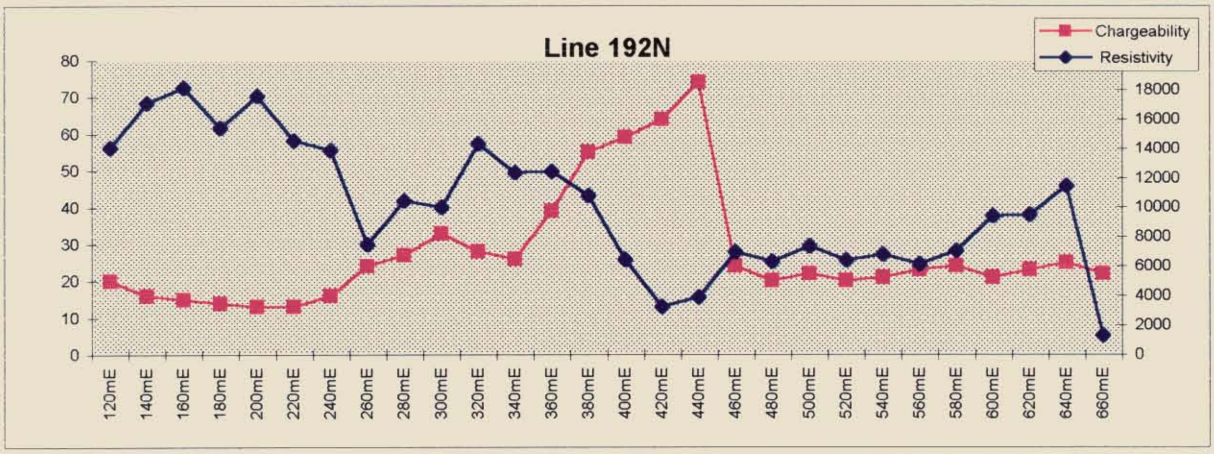
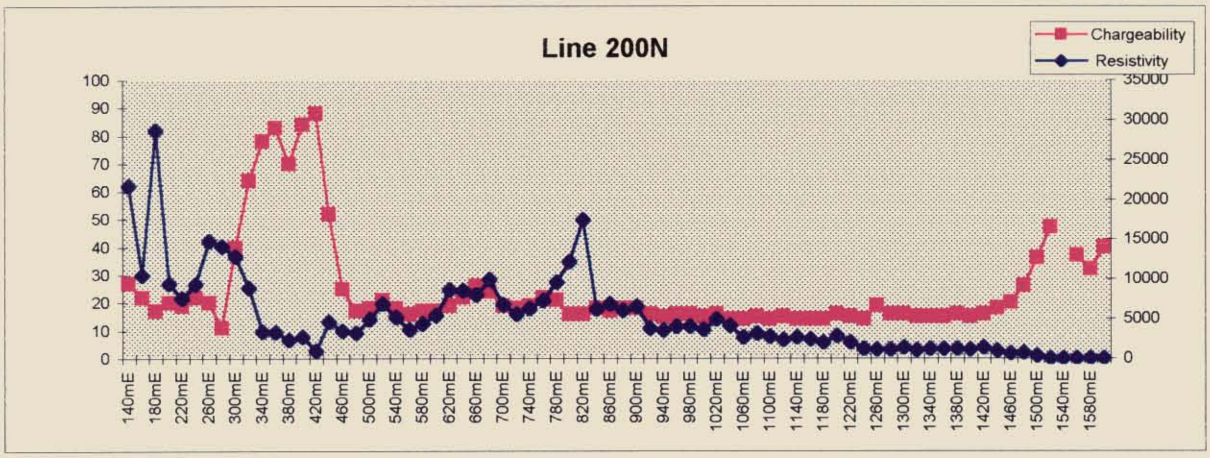
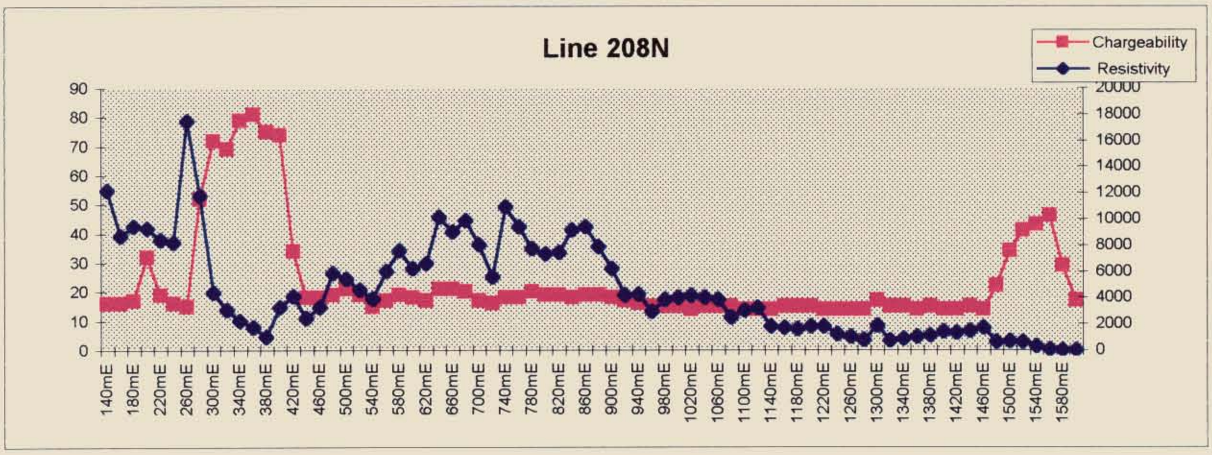
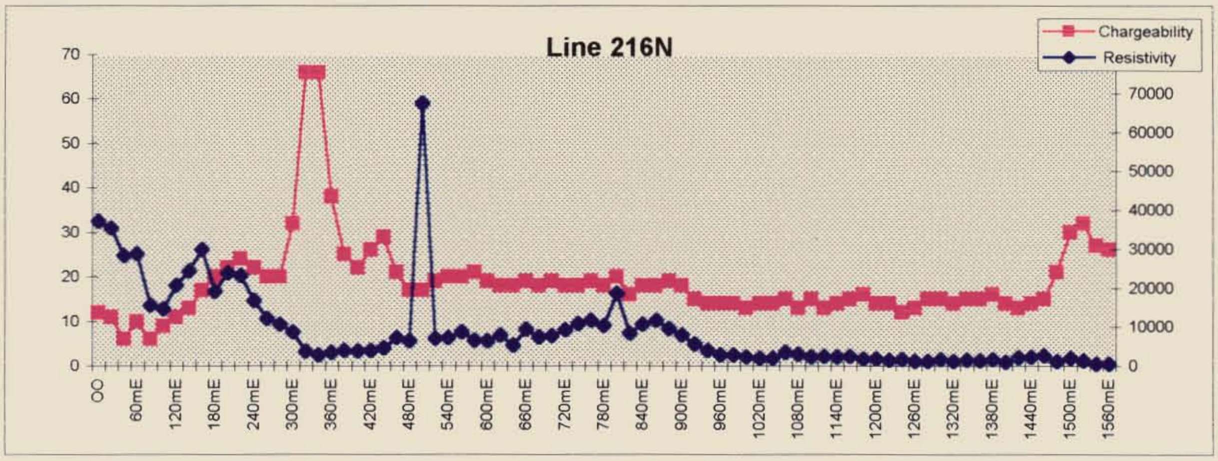
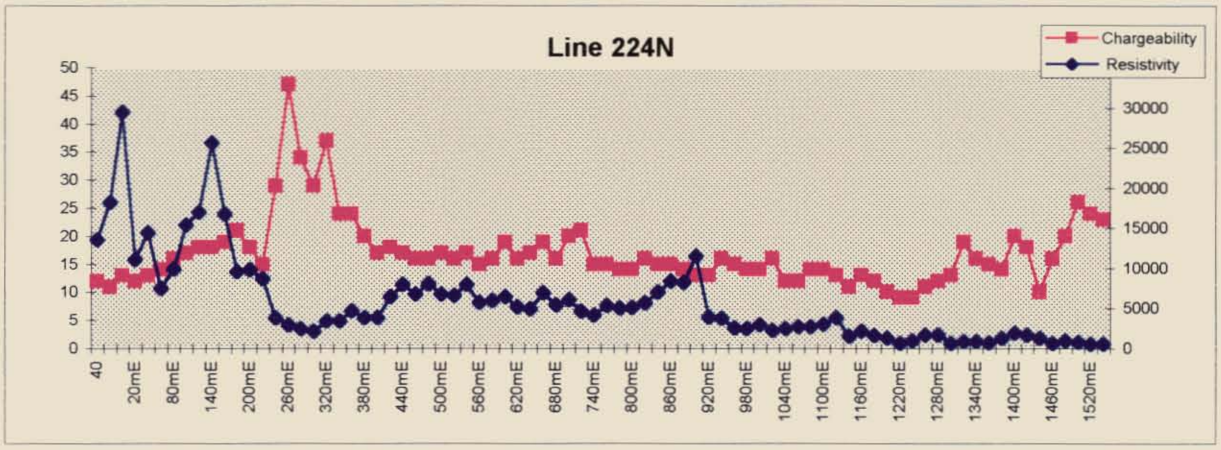
1440mE
1500mE
1560mE


Line 192N
Chargeability
Resistivity
0
10
20
30
40
50
60
70
80
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
120mE
140mE
160mE
180mE
200mE
220mE
240mE
260mE
280mE
300mE
320mE
340mE
360mE
380mE
400mE
420mE
440mE
460mE
480mE
500mE
520mE
540mE
560mE
580mE
600mE
620mE
640mE
660mE


Line 200N
Chargeability
Resistivity
0
10
20
30
40
50
60
70
80
90
100
0
5000
10000
15000
20000
25000
30000
35000
140mE
180mE
220mE
260mE
300mE
340mE
380mE
420mE
460mE
500mE
540mE
580mE
620mE
660mE
700mE
740mE
780mE
820mE
860mE
900mE
940mE
980mE
1020mE
1060mE
1100mE
1140mE
1180mE
1220mE
1260mE
1300mE
1340mE
1380mE
1420mE
1460mE
1500mE
1540mE
1580mE


Line 208N
Chargeability
Resistivity
0
10
20
30
40
50
60
70
80
90
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
20000
140mE
180mE
220mE
260mE
300mE
340mE
380mE
420mE
460mE
500mE
540mE
580mE
620mE
660mE
700mE
740mE
780mE
820mE
860mE
900mE
940mE
980mE
1020mE
1060mE
1100mE
1140mE
1180mE
1220mE
1260mE
1300mE
1340mE
1380mE
1420mE
1460mE
1500mE
1540mE
1580mE


Line 216N
Chargeability
Resistivity
0
10
20
30
40
50
60
70
0
10000
20000
30000
40000
50000
60000
70000
OO
60mE
120mE
180mE
240mE
300mE
360mE
420mE
480mE
540mE
600mE
660mE
720mE
780mE
840mE
900mE
960mE
1020mE
1080mE
1140mE
1200mE
1260mE
1320mE
1380mE
1440mE
1500mE
1560mE


Line 224N
Chargeability
Resistivity
0
5
10
15
20
25
30
35
40
45
50
0
5000
10000
15000
20000
25000
30000
40
20mE
80mE
140mE
200mE
260mE
320mE
380mE
440mE
500mE
560mE
620mE
680mE
740mE
800mE
860mE
920mE
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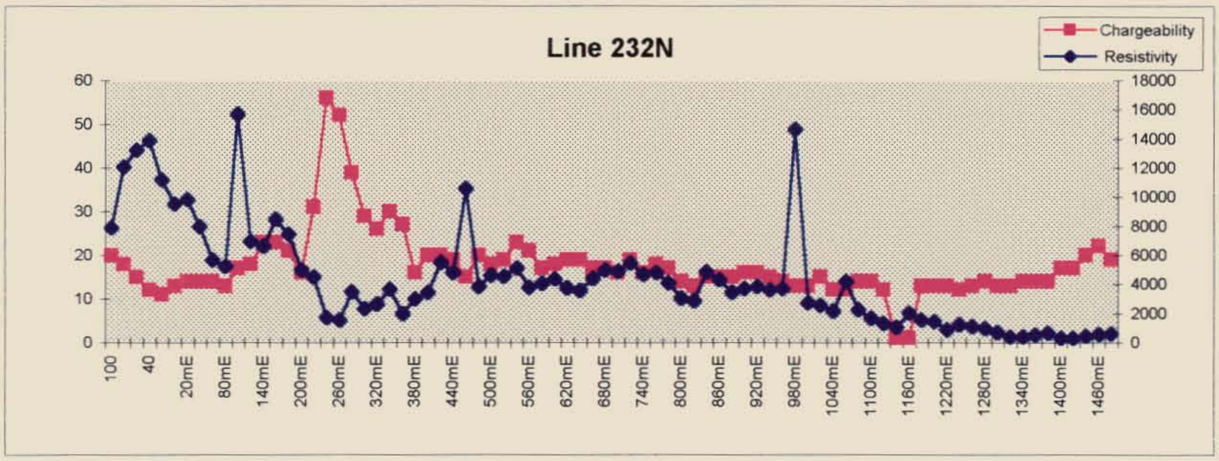
1340mE
1400mE
1460mE
1520mE


Line 232N
Chargeability
Resistivity
0
10
20
30
40
50
60
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
100
40
20mE
80mE
140mE
200mE
260mE
320mE
380mE
440mE
500mE
560mE
620mE
680mE
740mE
800mE
860mE
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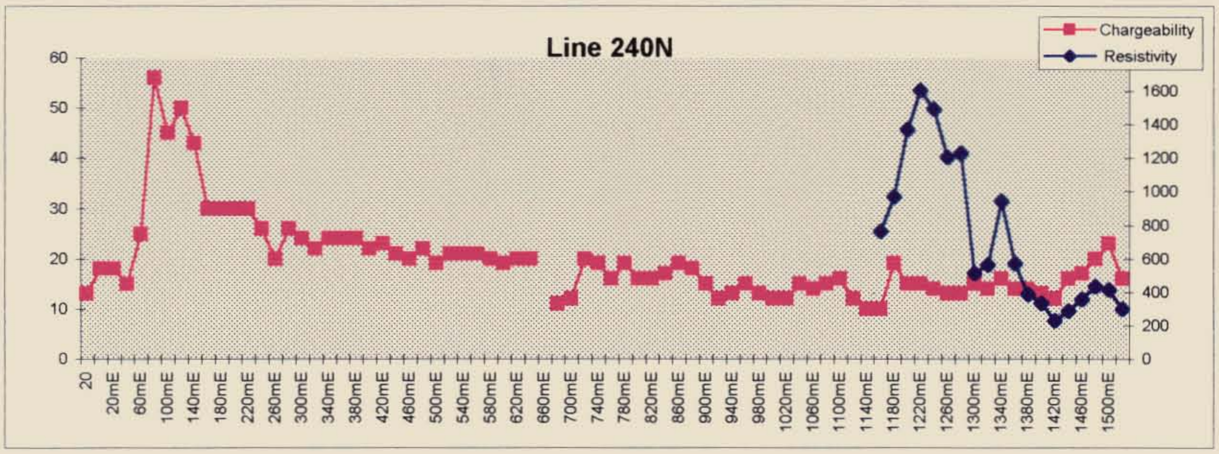
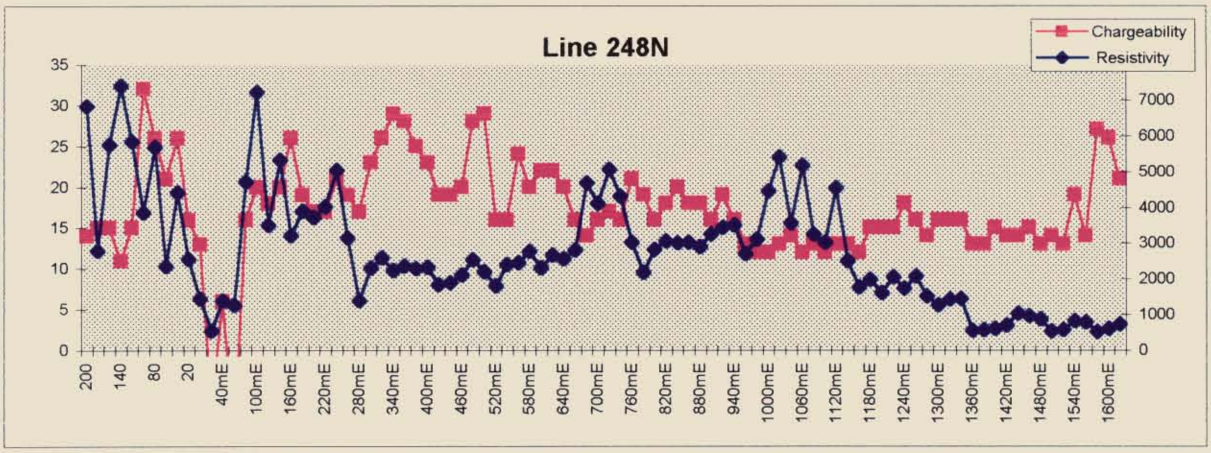
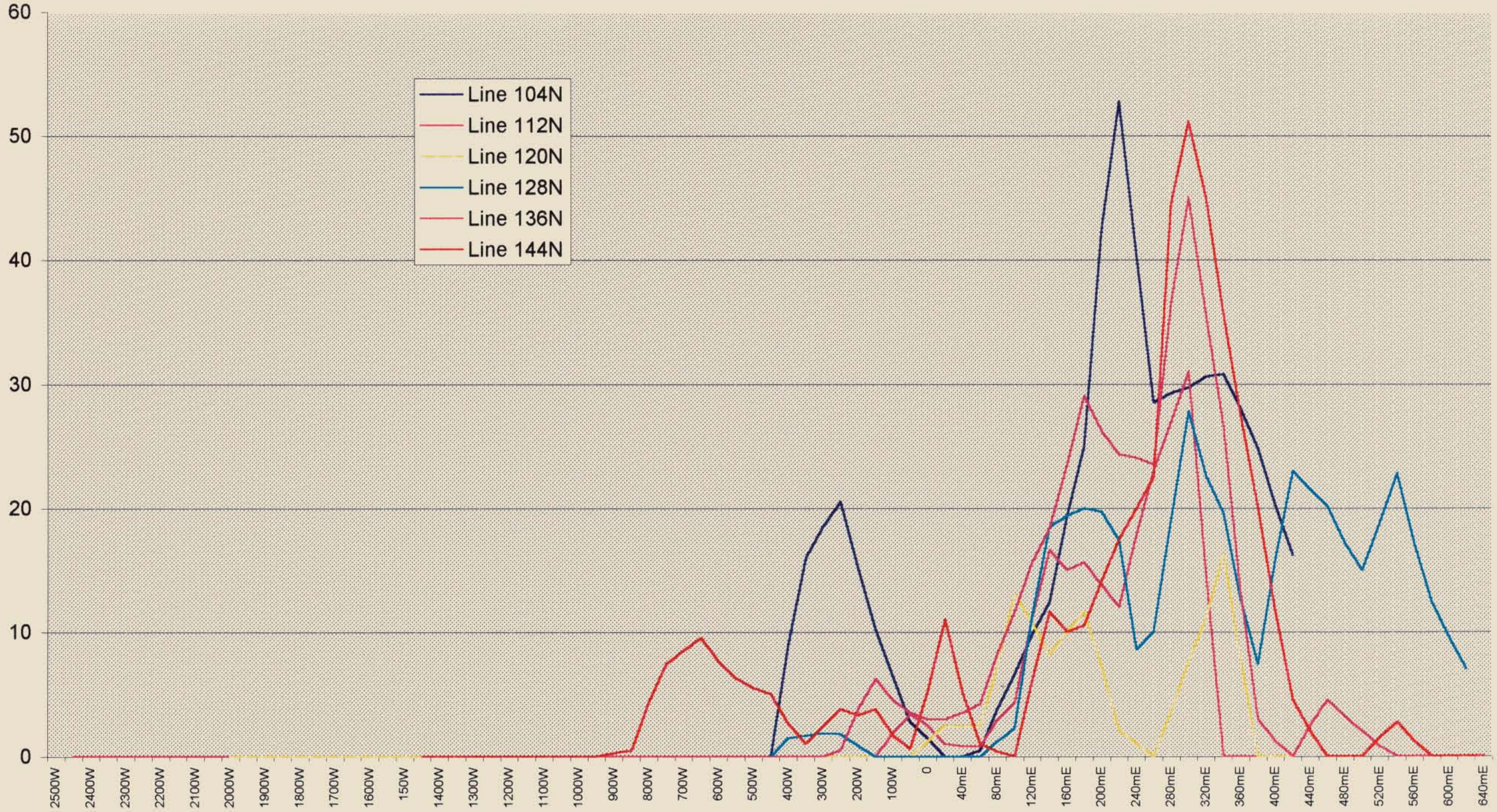
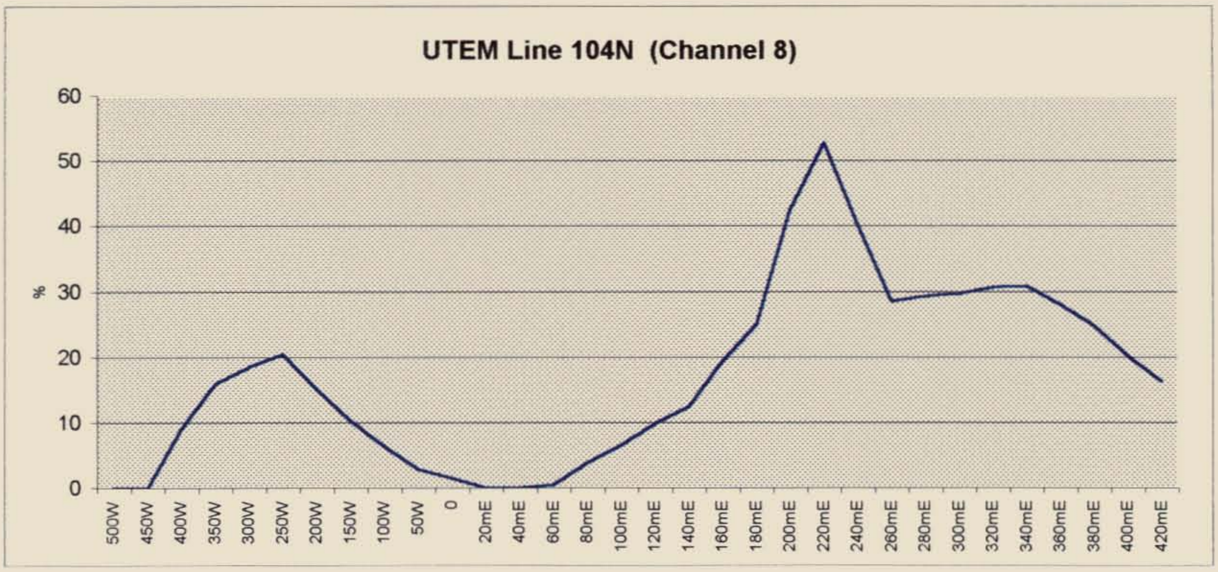
1340mE
1400mE
1460mE


Line 240N
Chargeability
Resistivity
0
10
20
30
40
50
60
0
200
400
600
800
1000
1200
1400
1600
20
20mE
60mE
100mE
140mE
180mE
220mE
260mE
300mE
340mE
380mE
420mE
460mE
500mE
540mE
580mE
620mE
660mE
700mE
740mE
780mE
820mE
860mE
900mE
940mE
980mE
1020mE
1060mE
1100mE
1140mE
1180mE
1220mE
1260mE
1300mE
1340mE
1380mE
1420mE
1460mE
1500mE

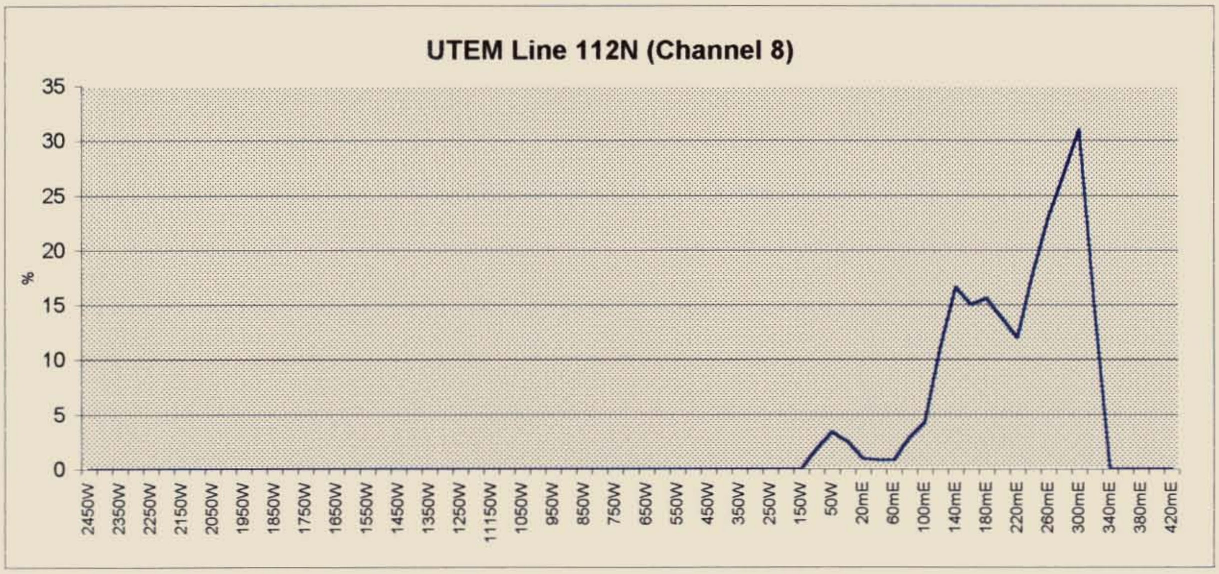

Line 248N
Chargeability
Resistivity
35
30
25
20
15
10
5
0
7000
6000
5000
4000
3000
2000
1000
0
200
140
80
20
40mE
100mE
160mE
220mE
280mE
340mE
400mE
460mE
520mE
580mE
640mE
700mE
760mE
820mE
880mE
940mE
1000mE
1060mE
1120mE
1180mE
1240mE
1300mE
1360mE
1420mE
1480mE
1540mE
1600mE

UTEM Channel 8

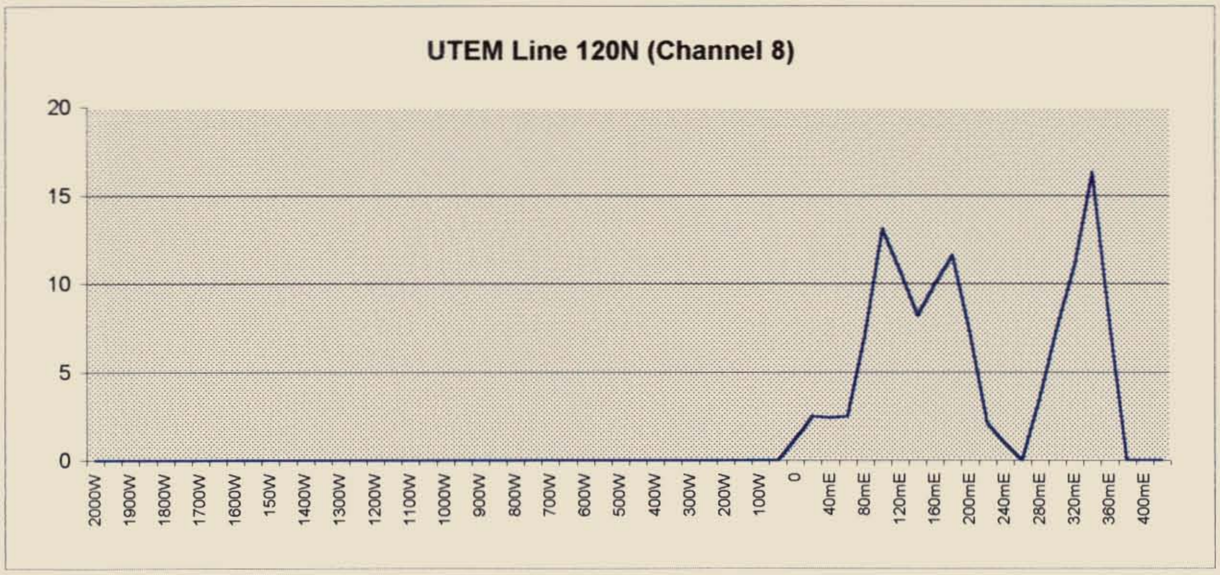




UTEM Line 104N (Channel 8)

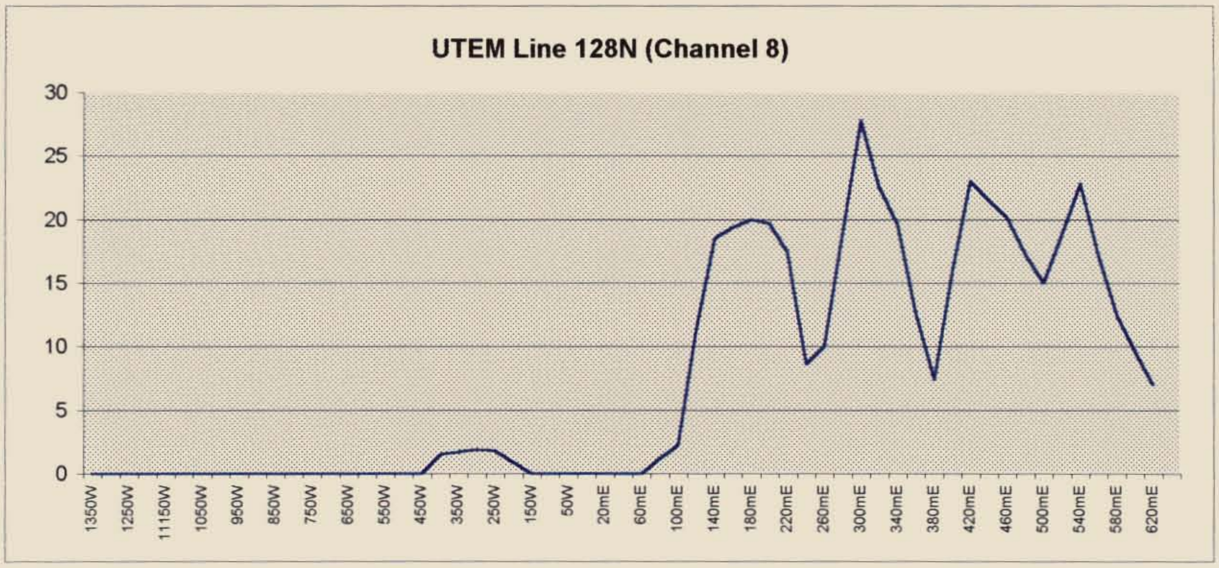


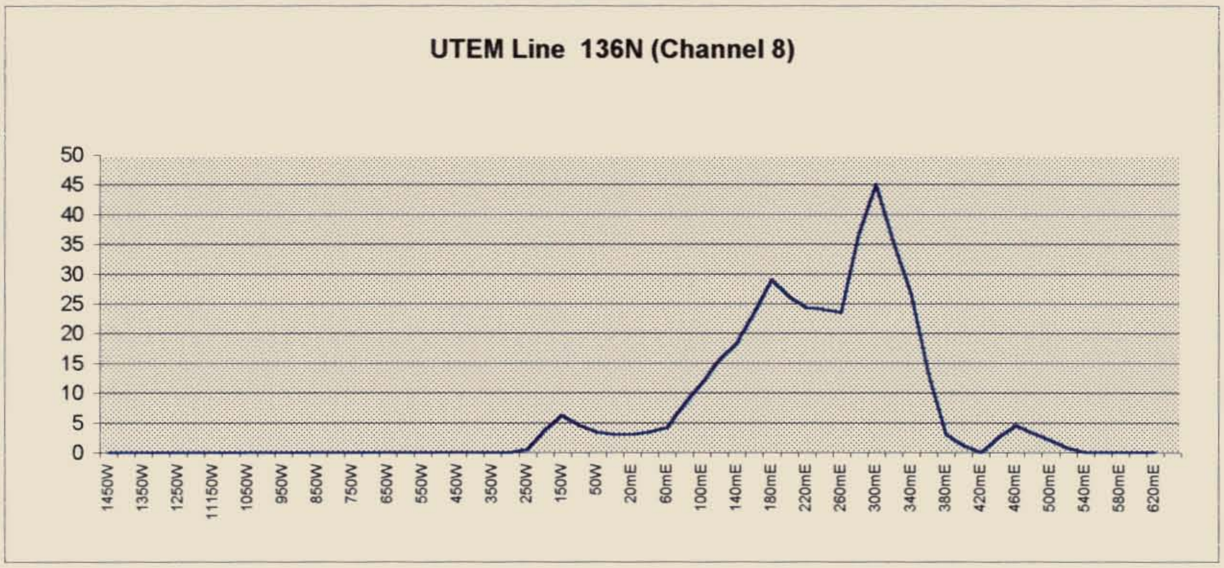
UTEM Line 112N (Channel 8)



UTEM Line 120N (Channel 8)

598166


UTEM Line 128N (Channel 8)
30
25
20
15
10
5
0
1350W
1250W
11150W
1050W
950W
850W
750W
650W
550W
450W
350W
250W
150W
50W
20mE
60mE
100mE
140mE
180mE
220mE
260mE
300mE
340mE
380mE
420mE
460mE
500mE
540mE
580mE
620mE


UTEM Line 136N (Channel 8)
50
45
40
35
30
25
20
15
10
5
0
1450W
1350W
1250W
11150W
1050W
950W
850W
750W
650W
550W
450W
350W
250W
150W
50W
20mE
60mE
100mE
140mE
180mE
220mE
260mE
300mE
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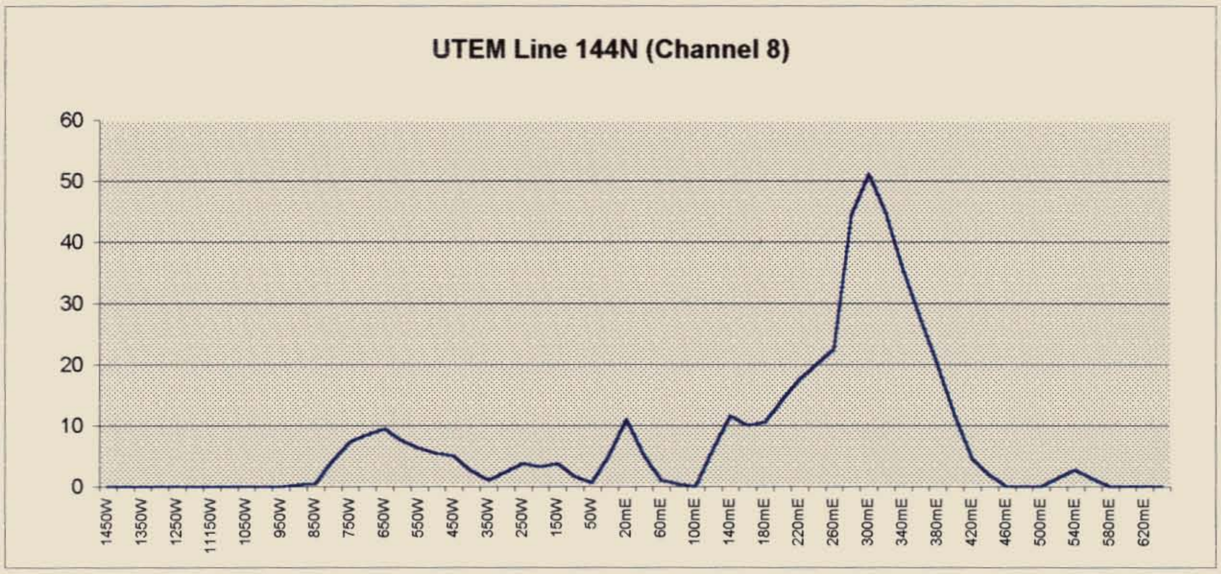
380mE
420mE
460mE
500mE
540mE
580mE
620mE


UTEM Line 144N (Channel 8)
60
50
40
30
20
10
0
1450W
1350W
1250W
11150W
1050W
950W
850W
750W
650W
550W
450W
350W
250W
150W
50W
20mE
60mE
100mE
140mE
180mE
220mE
260mE
300mE
340mE
380mE
420mE
460mE
500mE
540mE
580mE
620mE

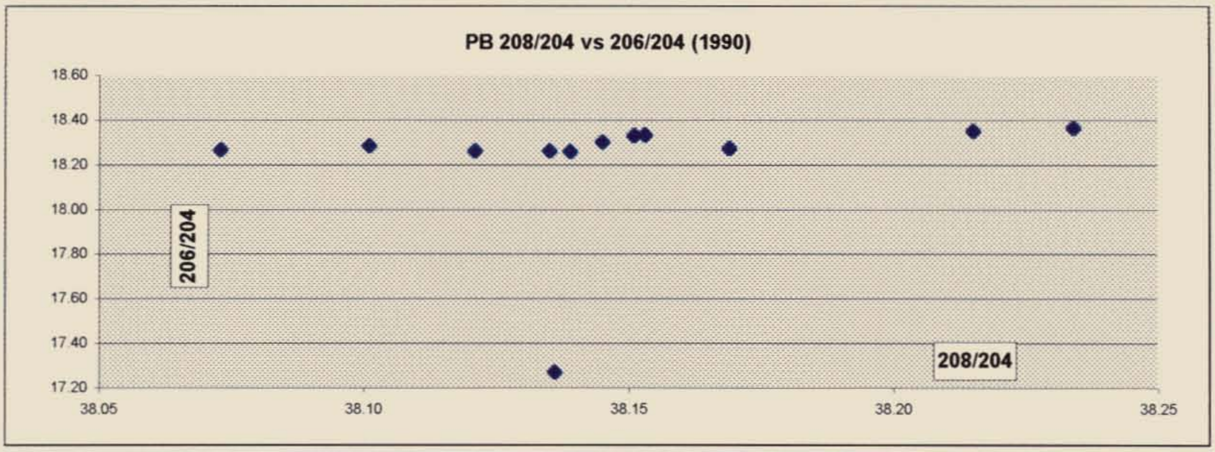
Appendix IV

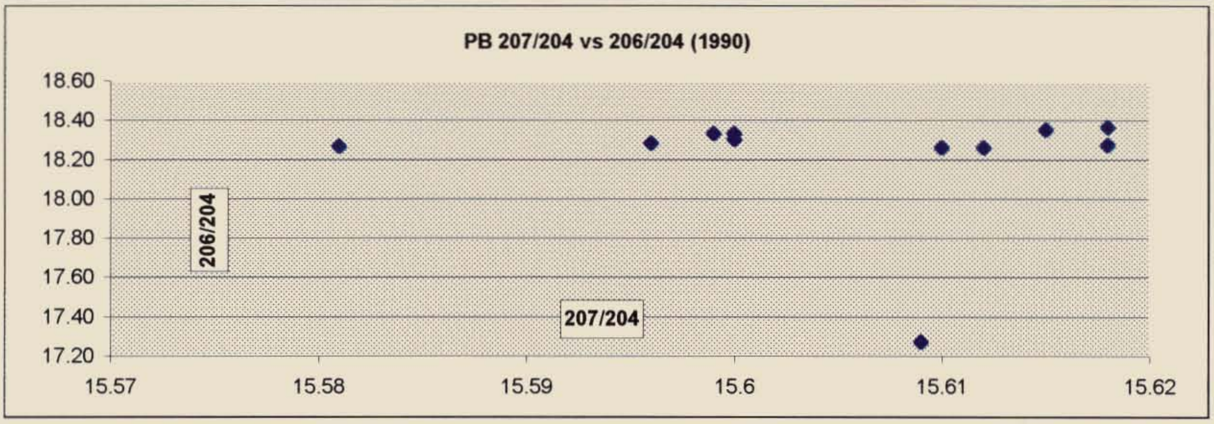
Pb Isotopes
Data and Charts

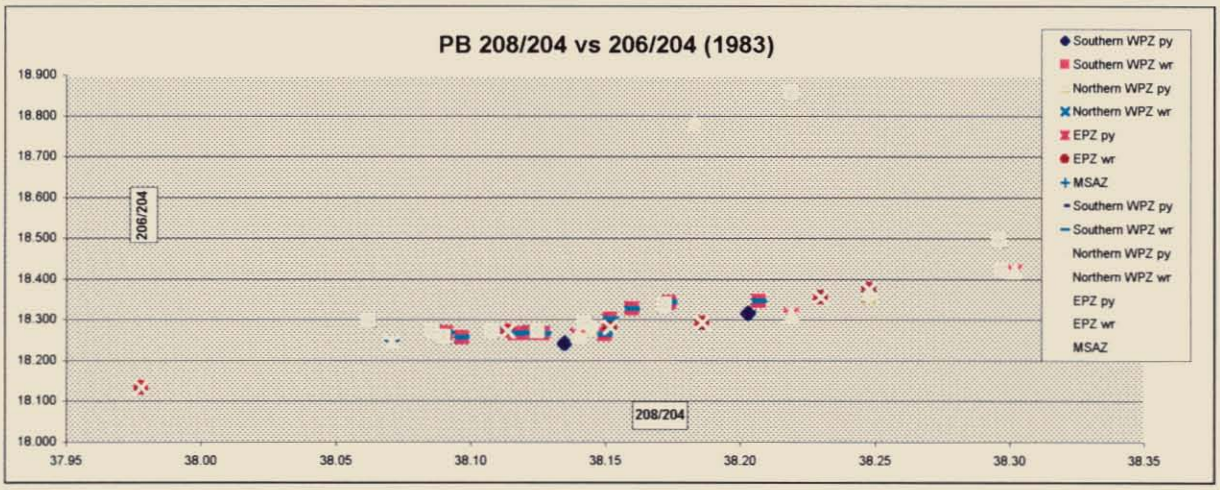
EL 19/98 ANTHONY : SELINA AREA
Lead Isotope Data

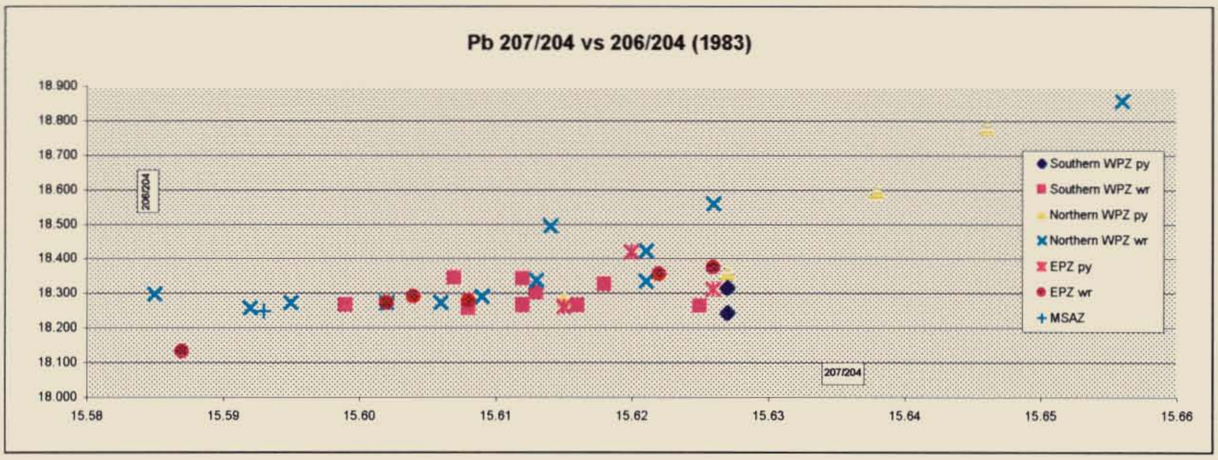
Appendix IV

598168









EL 19/98 ANTHONY : SELINA AREA

Appendix IV

Lead Isotope Data

Sample_ID	Area	Date	208/206	207/206	206/204	207/204	208/204	Pb ppm
27347	EPZ	1983	2.0872	0.8534	18.311	15.626	38.219	10
27393	EPZ	1983	2.0886	0.8551	18.261	15.615	38.140	10
27397	Southern WPZ	1983	2.0857	0.8532	18.316	15.627	38.203	1000
27398	Southern WPZ	1983	2.0904	0.8566	18.243	15.627	38.135	190
27399	Northern WPZ	1983	2.1042	0.8411	18.592	15.638	39.121	10
27400	Northern WPZ	1983	2.0867	0.8542	18.280	15.615	38.145	1700
27401	Northern WPZ	1983	2.0332	0.8331	18.780	15.646	38.183	420
27402	Northern WPZ	1983	2.0833	0.8512	18.360	15.627	38.248	3400
27403	EPZ	1983	2.0794	0.8480	18.419	15.620	38.302	2260
27347	EPZ	1983	2.0876	0.8531	18.292	15.604	38.186	50
27384	MSAZ	1983	2.0863	0.8545	18.248	15.593	38.071	1900
27393	EPZ	1983	2.0945	0.8596	18.133	15.587	37.978	20
27397	Southern WPZ	1983	2.0845	0.8531	18.302	15.613	38.152	390
27398	Southern WPZ	1983	2.0826	0.8507	18.346	15.607	38.207	20
27399	Northern WPZ	1983	2.1414	0.8419	18.561	15.626	39.747	20
27400	Northern WPZ	1983	2.0865	0.8541	18.272	15.606	38.125	850
27401	Northern WPZ	1983	2.0267	0.8302	18.858	15.656	38.219	550
27402	Northern WPZ	1983	2.0788	0.8479	18.423	15.621	38.297	1700
27403	EPZ	1983	2.0827	0.8511	18.356	15.622	38.230	3900
LS2_600	Southern WPZ	1983	2.0822	0.8522	18.327	15.618	38.160	500
LS2_665	Southern WPZ	1983	2.0868	0.8546	18.268	15.612	38.122	500
LS2_680	Southern WPZ	1983	2.0873	0.8549	18.266	15.616	38.127	900
LS3_265	Southern WPZ	1983	2.0851	0.8539	18.268	15.599	38.091	11600
LS3_275	Southern WPZ	1983	2.0868	0.8547	18.266	15.612	38.117	21300
LS3_360	Southern WPZ	1983	2.0811	0.8511	18.343	15.612	38.174	10100
LS4_790	Northern WPZ	1983	2.0705	0.8442	18.496	15.614	38.296	300
LS4_975	Northern WPZ	1983	2.0800	0.8517	18.299	15.585	38.062	500
LS5_480	Northern WPZ	1983	2.0844	0.8535	18.272	15.595	38.086	3100
LS5_655	Northern WPZ	1983	2.0819	0.8520	18.335	15.621	38.172	960
LS5_835	Northern WPZ	1983	2.0856	0.8539	18.272	15.602	38.108	1600
LS6_275	Northern WPZ	1983	2.0816	0.8514	18.338	15.613	38.172	700
LS6_915	Northern WPZ	1983	2.0852	0.8533	18.292	15.609	38.142	800
LS6_920	Northern WPZ	1983	2.0862	0.8540	18.258	15.592	38.090	1100
LS8_68.9	EPZ	1983	2.0859	0.8539	18.272	15.602	38.114	840
LS8_225	EPZ	1983	2.0815	0.8504	18.375	15.626	38.248	1150
LS8_345	EPZ	1983	2.0870	0.8538	18.281	15.608	38.152	920
2590	Southern WPZ	1983	2.0888	0.8555	18.264	15.625	38.150	
2591	Southern WPZ	1983	2.0867	0.8549	18.257	15.608	38.097	
2592			2.0885	0.8553	18.255	15.614	38.126	
482710	Selina	1990	2.0825	0.8509	18.351	15.615	38.215	153
482729	Selina	1990	2.0843	0.853	18.267	15.581	38.073	278
482749	Selina	1990	2.087	0.8542	17.273	15.609	38.136	181
482790	Selina	1990	2.0841	0.8523	18.303	15.6	38.145	330
482957	Selina	1990	2.0876	0.8549	18.261	15.612	38.121	1600
482957/RLD	Selina	1990	2.0882	0.8549	18.262	15.612	38.135	1600
482972	Selina	1990	2.081	0.8509	18.334	15.6	38.153	175
482972R	Selina	1990	2.0811	0.8509	18.332	15.599	38.151	178
482986	Selina	1990	2.0887	0.8547	18.274	15.618	38.169	510
564351		1990	2.0887	0.8549	18.26	15.61	38.139	400
564459		1990	2.0724	0.8483	18.285	15.596	38.101	172
564464		1990	2.082	0.8504	18.364	15.618	38.234	250

RLD = reload of same dissolution, R = repeat analysis

1983 = Source: Geology review EL9/66 June 1983, Table 1 (p30), Appendix A

1990 = Source: EL5/85 report for year ened 20 October 1990, Appendix IV, Table 2

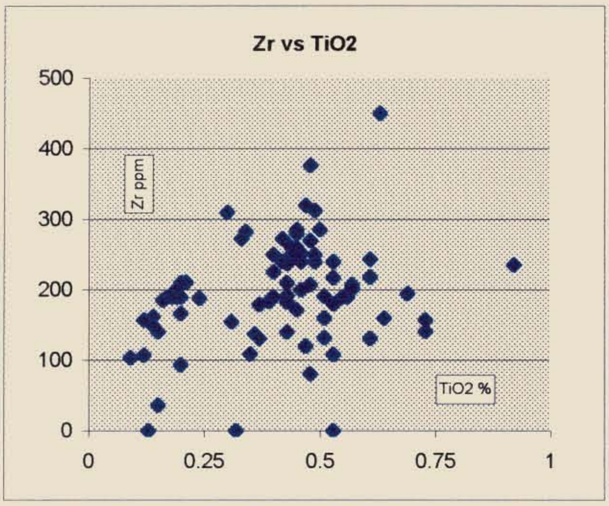
Appendix V

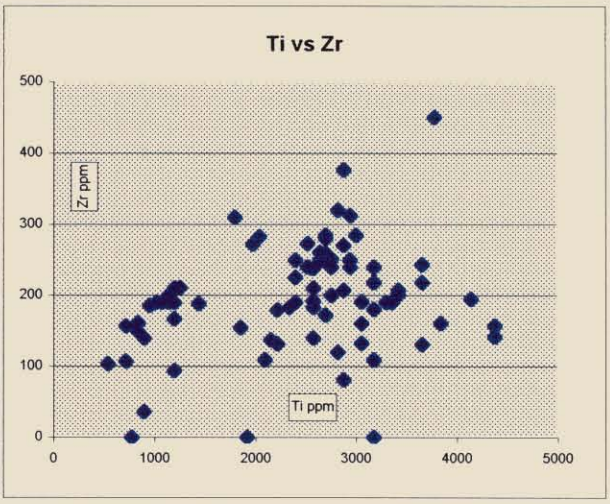
Lithogeochemistry Data and Charts

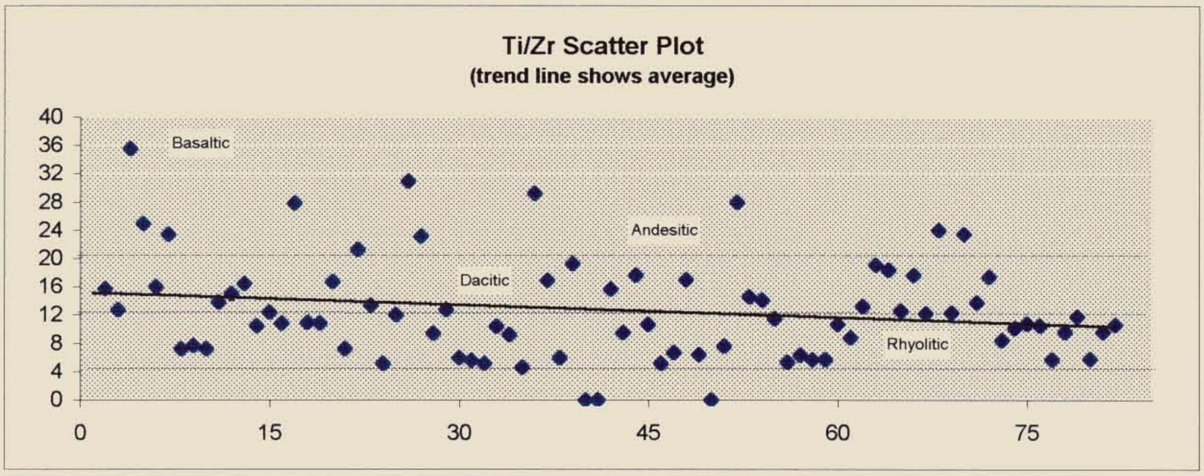
EL 19/98 ANTHONY : SELINA AREA
Lithogeochemistry Data and Charts

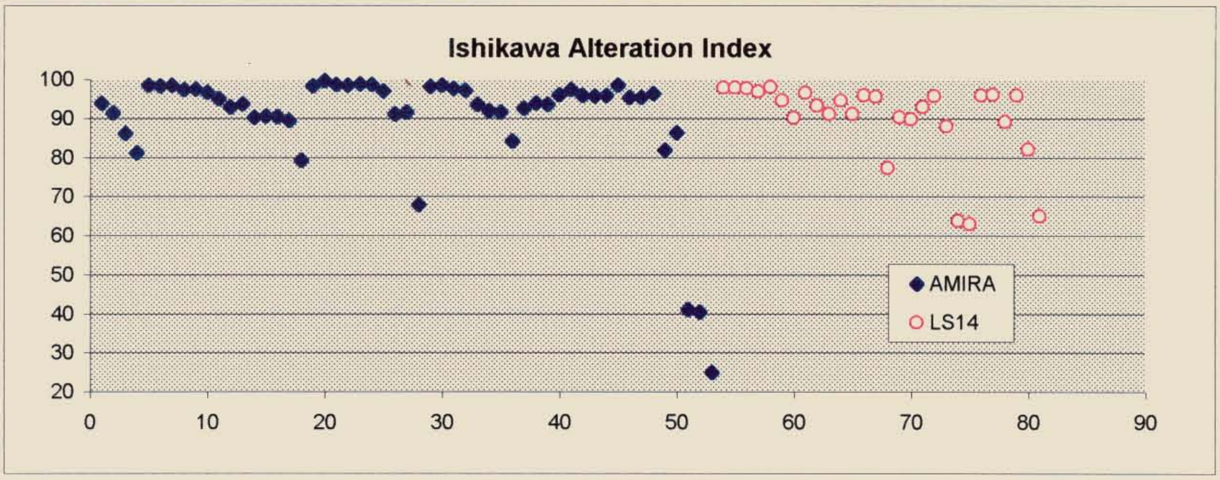
Appendix V

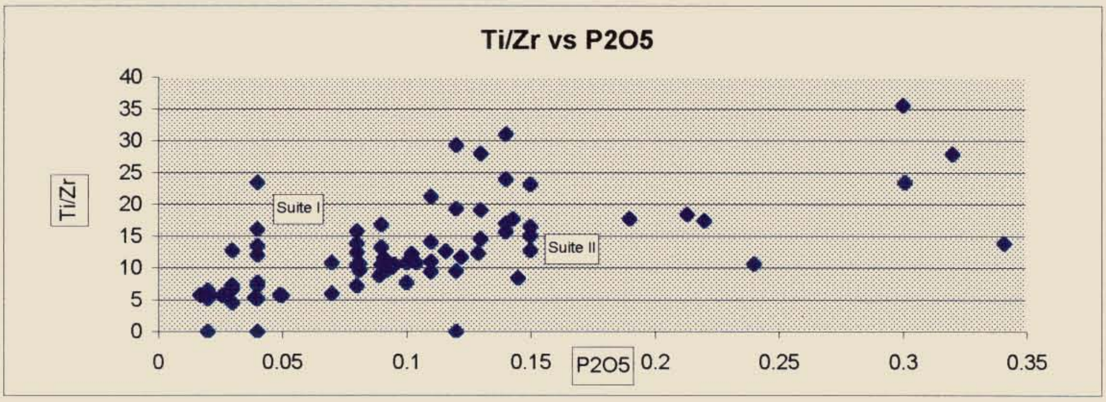
598171







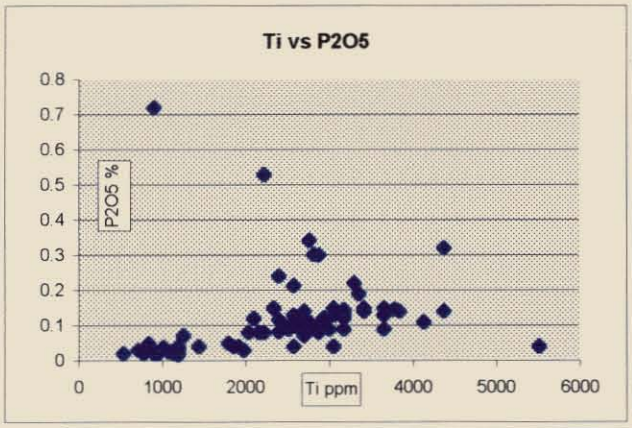


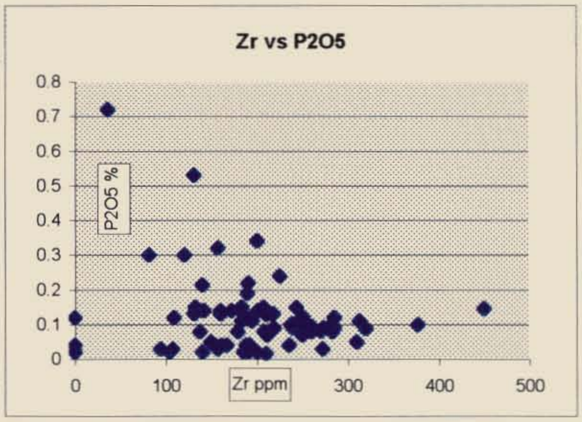


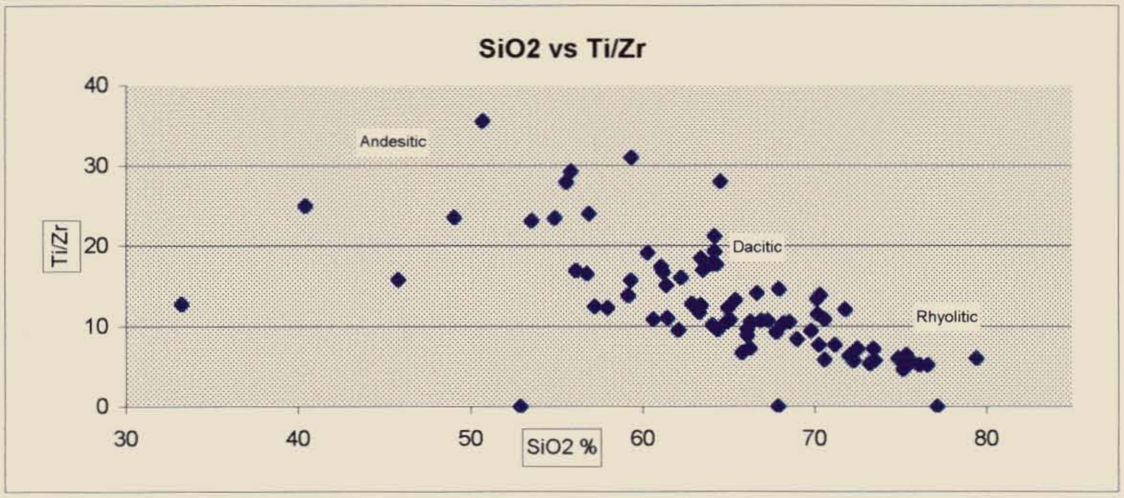
EL 19/98 ANTHONY : SELINA AREA
Lithogeochemistry Data and Charts

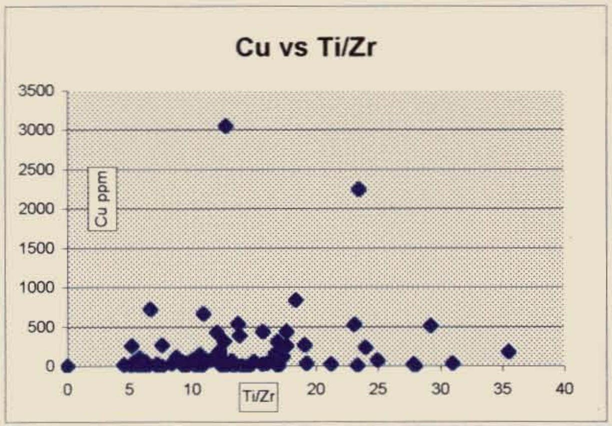
Appendix V

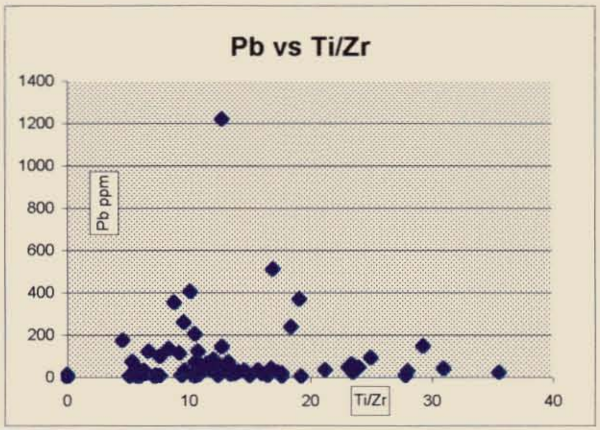
598172

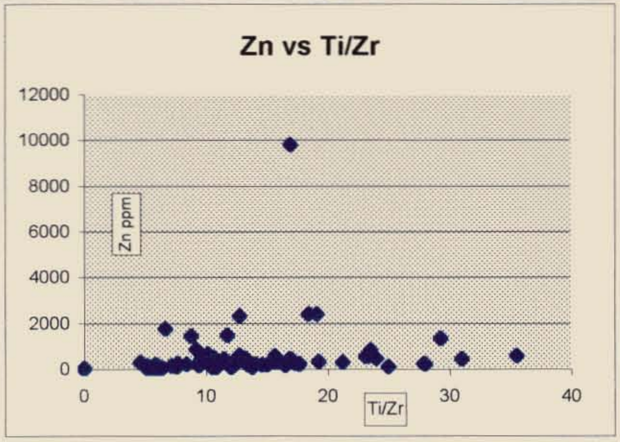

Ti vs P2O5


Zr vs P2O5


SiO2 vs Ti/Zr


Cu vs Ti/Zr


Pb vs Ti/Zr


Zn vs Ti/Zr

RCHEM-ID	FIELDNO	AMGE	AMGN	AI	K2O	MGO	NA2O	CAO	SIO2
100519	110194	385430	5362780	93.86	1.47	2.35	0.14	0.11	45.83
100520	110205	385430	5362780	91.40	0.05	2.5	0.17	0.07	33.26
100521	110227	385430	5362780	86.22	3.56	3.01	0.21	0.84	50.72
100522	110241	385430	5362780	81.24	4.16	0.82	0.2	0.95	40.45
100523	T03667	385430	5362780	98.59	6.36	1.31	0.1	0.01	62.26
100524	T03673	385430	5362780	98.41	4.22	3.23	0.1	0.02	54.91
100525	T03677	385430	5362780	98.51	6.95	0.98	0.1	0.02	66.25
100526	T03686	385430	5362780	97.38	3.25	1.95	0.1	0.04	70.25
100527	T03689	385430	5362780	97.59	5.08	1	0.1	0.05	73.44
100528	T03691	385430	5362780	96.68	4.31	0.93	0.1	0.08	70.34
100529	T03697	385430	5362780	95.08	3.59	2.01	0.1	0.19	61.39
100530	T03699	385430	5362780	92.84	6.3	2.13	0.1	0.55	56.79
100531	T04005	385430	5362780	93.81	3.94	1.82	0.2	0.18	68.52
100532	T04009	385430	5362780	90.29	1.49	3.44	0.2	0.33	57.23
100533	T04011	385430	5362780	90.56	7.74	1.09	0.1	0.82	60.66
100534	T04017	385430	5362780	90.39	7.07	2.62	0.1	0.93	55.59
100535	T04024	385430	5362780	89.54	5.08	1.6	0.26	0.52	61.47
100536	T04028	385430	5362780	79.26	6.02	1.05	1.2	0.65	70.61
100537	T04067	385430	5362780	98.43	5.37	1.53	0.1	0.01	61.2
100538	T04068	385430	5362780	99.66	5.21	0.68	0.01	0.01	72.5
100539	T04069	385430	5362780	98.66	6.04	2.07	0.1	0.01	64.21
100540	T04070	385430	5362780	98.49	6.46	1.38	0.1	0.02	70.14
100541	T04071	385430	5362780	98.78	8.72	0.22	0.1	0.01	75.43
100542	T04072	386150	5363260	98.75	8.37	0.29	0.1	0.01	71.8
100543	T04073	386150	5363260	97.10	5.77	3.6	0.1	0.18	59.37
100544	T04076	386150	5363260	91.09	4.52	3.45	0.1	0.68	53.59
100545	T04078	386150	5363260	91.53	5.76	1.37	0.1	0.56	69.8
100546	T04082	386150	5363260	67.82	4.25	2.2	0.1	2.96	62.9
100547	T04083	386150	5363260	98.23	5.78	0.31	0.1	0.01	74.87
100548	T04084	386150	5363260	98.53	7.3	0.06	0.1	0.01	72.28
100549	T04085	386150	5363260	97.67	4.68	0.35	0.1	0.02	76.57
100550	T04086	386150	5363260	97.24	6.77	0.63	0.1	0.11	68.2
100551	T04087	386150	5363260	93.56	5.31	0.94	0.2	0.23	67.78
100552	T04088	386150	5363260	91.89	7.73	0.2	0.1	0.6	75.17
100553	T04089	386150	5363260	91.61	1.86	2.18	0.1	0.27	55.87
100554	T04091	385415	5363525	84.19	0.89	3.21	0.1	0.67	56.14
100555	T04092	385415	5363525	92.66	3.36	0.3	0.2	0.09	79.44
100556	T04093	385415	5363525	93.88	3.27	0.26	0.1	0.13	64.19
100557	T04094	385415	5363525	93.55	3.08	1.85	0.1	0.24	52.94
100558	T04095	385415	5363525	96.12	3.77	0.19	0.1	0.06	67.92
100559	T04123	385415	5363525	97.45	8.07	1.09	0.1	0.14	59.33
100560	T04124	385415	5363525	95.81	4.36	1.13	0.1	0.14	62.1
100561	T04125	385415	5363525	95.69	6.54	2.35	0.1	0.3	64.3
100562	T04126	385415	5363525	95.86	9.25	0.93	0.1	0.34	67.3
100563	T04127	385415	5363525	98.45	7.39	0.21	0.1	0.02	76.09
100564	T04128	385415	5363525	95.45	2.41	0.95	0.1	0.06	65.8
100565	T04129	385415	5363525	95.43	4.61	1.66	0.1	0.2	63.54
100566	T04130	385415	5363525	96.38	7.67	0.32	0.25	0.05	75.34
100567	T04131	385415	5363525	81.89	6.43	0.4	0.82	0.69	77.13
100568	T04135	385415	5363525	86.28	6.05	0.93	0.6	0.51	71.2
100569	T04136	385415	5363525	41.02	2.42	2.42	2.65	4.31	64.53
100570	T04137	385415	5363525	40.40	2.53	1.93	3.11	3.47	67.93
100298	LS12/A	385421	5363530	24.87	0.66	1.79	6.54	0.86	66.67
		From (m)	To (m)						
565680	LS14	0.0	22.7	97.94	6.32	0.81	0.11	0.04	70.2
565681	LS14	22.7	45.9	97.90	6.71	0.28	0.14	0.01	73.2
565682	LS14	45.9	55.5	97.73	7.97	0.2	0.18	0.01	72
565683	LS14	55.5	80.0	96.94	7.99	0.26	0.25	0.01	75
565684	LS14	80.0	101.8	98.02	6.03	0.4	0.11	0.02	75.6
565685	LS14	101.8	120.0	94.50	6.6	1.13	0.14	0.31	66.9
565686	LS14	120.0	140.0	90.15	5.62	1.61	0.25	0.54	66.1
565687	LS14	140.0	161.1	96.49	4.51	1.81	0.06	0.17	65.4

EL 19/98 ANTHONY : SELINA AREA
Lithogeochemistry Data and Charts

RCHEM-ID	FIELDNO	AMGE	AMGN	AI	K2O	MGO	NA2O	CAO	SIO2
		From (m)	To (m)						
565688	LS14	161.1	170.1	93.32	2.63	2.26	0.18	0.17	60.3
565689	LS14	170.1	196.6	91.12	1.65	2.76	0.16	0.27	63.4
565690	LS14	196.6	206.7	94.58	2.99	1.9	0.15	0.13	63.4
565691	LS14	206.7	220.0	91.03	3.88	1.6	0.28	0.26	64
565692	LS14	220.0	235.1	95.82	4.28	0.99	0.1	0.13	65
565693	LS14	235.1	244.5	95.61	3.65	3.1	0.12	0.19	56.9
565694	LS14	244.5	248.1	77.27	4.11	0.58	1.09	0.29	58
565695	LS14	248.1	255.3	90.34	3.53	1.05	0.15	0.34	49.1
565696	LS14	255.3	265.4	89.82	4.13	0.37	0.08	0.43	59.2
565697	LS14	265.4	273.1	92.99	4.62	1.08	0.14	0.29	61.1
565698	LS14	273.1	283.7	95.71	5.17	1.3	0.11	0.18	69
565699	LS14	283.7	303.7	87.93	6.22	1.72	0.26	0.83	64.1
565700	LS14	303.7	323.0	63.79	6.5	1.25	1.79	2.61	65.1
565701	LS14	323.0	349.5	62.98	7.09	0.89	1.46	3.23	64.9
623795	LS14	63.0	63.1	95.85	8.26	0.29	0.36	0.01	73.5
623796	LS14	130.8	130.9	95.99	5.08	1.86	0.18	0.11	66.1
623797	LS14	218.0	218.1	89.16	2.99	2.93	0.25	0.47	63.3
623798	LS14	266.5	266.6	95.81	3.62	1.18	0.16	0.05	70.6
623799	LS14	300.7	300.8	82.02	6.46	1.57	0.28	1.48	64.4
623800	LS14	310.8	310.9	64.87	6.58	0.9	1.52	2.53	66.3

AI = (K2O+MgO) / (K2O+MgO+Na2O+CaO)

EL 19/98 ANTHONY : SELINA AREA
Lithogeochemistry Data and Charts

RCHEM-ID	FIELDNO	FE2O3TOT	TIO2	Ti (calc)	ZR	P2O5	CU	PB	ZN
100519	110194	35.94	0.36	2158.20	137	0.08	436	34	301
100520	110205	54.69	0.2	1199.00	94	0.03	3055	1220	2330
100521	110227	19.11	0.48	2877.60	81	0.3	178	24	592
100522	110241	29.5	0.15	899.25	36	0.72	74	95	110
100523	T03667	12.06	0.51	3057.45	190.6	0.04	35.3	19.4	354.8
100524	T03673	17.23	0.92	5515.39	235.7	0.04	4.9	62.3	600.3
100525	T03677	8.83	0.33	1978.35	272.5	0.03	6.8	12.8	133
100526	T03686	8.93	0.24	1438.80	188	0.04	266.7	100	263
100527	T03689	5.24	0.2	1199.00	166.6	0.04	6	5	168
100528	T03691	6.22	0.48	2877.60	207.6	0.08	392.5	24	169
100529	T03697	15.7	0.61	3656.95	243.2	0.15	56.1	10.4	200.2
100530	T03699	18.51	0.57	3417.15	207	0.15	91.4	10.4	157.7
100531	T04005	8.02	0.5	2997.50	285.1	0.09	5.1	5.8	186
100532	T04009	19.78	0.37	2218.15	178.9	0.08	9.8	10	390.6
100533	T04011	10.05	0.45	2697.75	249.4	0.07	3.3	11	79
100534	T04017	13.8	0.73	4376.35	157	0.32	20.8	10	263
100535	T04024	11.9	0.46	2757.70	251.5	0.11	666.8	26.1	145
100536	T04028	3.56	0.43	2577.85	237.7	0.1	6.3	17.9	80.4
100537	T04067	12.38	0.61	3656.95	218.2	0.09	163.4	42	416.4
100538	T04068	5.15	0.34	2038.30	283.1	0.08	21.2	4	132
100539	T04069	7.41	0.69	4136.55	194.8	0.11	23.9	36	311
100540	T04070	4.94	0.43	2577.85	192	0.04	0.4	16	209
100541	T04071	2.14	0.14	839.30	161.4	0.04	13.8	11.6	40
100542	T04072	3.28	0.31	1858.45	154.2	0.04	434.4	83.7	84
100543	T04073	11.68	0.73	4376.35	141.2	0.14	30.4	42	440
100544	T04076	18.86	0.51	3057.45	132.2	0.15	533.1	47.8	564
100545	T04078	6.35	0.49	2937.55	312.5	0.11	2.4	11	182
100546	T04082	5.88	0.39	2338.05	183.3	0.15	6.8	145	624
100547	T04083	3.94	0.19	1139.05	190.1	0.02	6	28.8	186
100548	T04084	8.01	0.14	839.30	148.9	0.05	41.3	43.9	38
100549	T04085	3.53	0.16	959.20	185.6	0.02	9	6.8	181
100550	T04086	6.27	0.45	2697.75	259.9	0.08	2.5	8	503
100551	T04087	6.07	0.42	2517.90	272.9	0.09	56.4	116	867
100552	T04088	1.17	0.12	719.40	157	0.03	12.7	176.8	320
100553	T04089	20.27	0.53	3177.35	108.6	0.12	511.6	148.4	1354
100554	T04091	19.29	0.37	2218.15	131.1	0.53	311.8	513	9800
100555	T04092	2.01	0.21	1258.95	211.1	0.07	34.9	3.7	10
100556	T04093	12.84	0.35	2098.25	108.9	0.12	34.3	5.8	331.5
100557	T04094	18.69	0.53	3177.35	0	0.12	0	0	0
100558	T04095	9.33	0.32	1918.40	0	0.04	0	0	0
100559	T04123	15.54	0.45	2697.75	172.1	0.14	24.5	32.5	580
100560	T04124	15.9	0.45	2697.75	285.1	0.12	3.3	8	309.4
100561	T04125	7.32	0.56	3357.20	189.8	0.19	262.9	6.3	216
100562	T04126	7.25	0.4	2398.00	225.2	0.24	1.4	25.5	233
100563	T04127	2.74	0.09	539.55	103.7	0.02	262.9	8	77
100564	T04128	15.54	0.12	719.40	107.6	0.03	727.6	123.8	1754
100565	T04129	11.82	0.57	3417.15	201	0.14	0.9	32.4	456.4
100566	T04130	2.48	0.15	899.25	139.9	0.02	0.8	18.9	66
100567	T04131	1.31	0.13	779.35	0	0.02	3.2	15.1	52
100568	T04135	4.29	0.48	2877.60	376.8	0.1	1	9.5	121
100569	T04136	5.81	0.61	3656.95	130.6	0.13	2	30.9	220.8
100570	T04137	4.6	0.53	3177.35	217.7	0.13	3.2	32	197.7
100298	LS12/A	5.21	0.43	2577.85	183	0.11	2	28	220
565680	LS14	6.61	0.46	2757.70	240	0.091	73	66	460
565681	LS14	6.53	0.17	1019.15	190	0.039	48	77	125
565682	LS14	6.62	0.2	1199.00	190	0.028	55	34	91
565683	LS14	3.06	0.18	1079.10	190	0.026	40	26	100
565684	LS14	4.04	0.19	1139.05	200	0.02	45	15	180
565685	LS14	6.87	0.48	2877.60	270	0.081	150	77	495
565686	LS14	6.47	0.47	2817.65	320	0.089	115	355	1450
565687	LS14	8.47	0.53	3177.35	240	0.09	67	74	490

EL 19/98 ANTHONY : SELINA AREA
Lithogeochemistry Data and Charts

RCHEM-ID	FIELDNO	FE2O3TOT	TIO2	Ti (calc)	ZR	P2O5	CU	PB	ZN
565688	LS14	14.48	0.51	3057.45	160	0.13	265	370	2400
565689	LS14	14.15	0.43	2577.85	140	0.213	835	240	2400
565690	LS14	12.47	0.4	2398.00	190	0.116	320	37	410
565691	LS14	10.48	0.53	3177.35	180	0.143	440	20	265
565692	LS14	9.74	0.49	2937.55	240	0.102	195	22	170
565693	LS14	14.22	0.64	3836.80	160	0.14	240	50	485
565694	LS14	13.64	0.43	2577.85	210	0.129	135	17	155
565695	LS14	21.8	0.47	2817.65	120	0.301	2250	23	855
565696	LS14	14.07	0.46	2757.70	200	0.341	535	18	88
565697	LS14	11.96	0.55	3297.25	190	0.22	125	25	245
565698	LS14	5.44	0.63	3776.85	450	0.145	29	135	220
565699	LS14	8.46	0.44	2637.80	260	0.094	78	405	665
565700	LS14	3.97	0.45	2697.75	250	0.104	48	125	150
565701	LS14	3.64	0.42	2517.90	240	0.095	37	205	285
623795	LS14	3.64	0.2	1199.00	210	0.017	6	5	47
623796	LS14	8.03	0.45	2697.75	280	0.092	11	34	455
623797	LS14	11.03	0.49	2937.55	250	0.122	93	38	1500
623798	LS14	8.18	0.3	1798.50	310	0.049	105	8	205
623799	LS14	8.35	0.4	2398.00	250	0.081	39	260	375
623800	LS14	4.09	0.44	2637.80	250	0.095	19	73	98

Appendix VI

Literature Review

Summaries of Exploration and Research Reports

EL 19/98 — Anthony Appendix VI

Selina Area - Summaries of Exploration and Research Reports

(EL 9/66, EL5/85, EL103/87, EL7/91, AMIRA reports)

1966 - 1967 EL9/66 Annual Report TCR 67-475 Elms
Work carried out does not cover Selina area - more to west over Henty area.

1967 - 1968 EL9/66 Annual Report TCR 68-527 Newnham
Work carried out does not cover Selina area - more to west over Henty area. Briefly reports on previous exploration by RTZ 1956-59 (report published 1960 - Compana and King) which identified four areas of interest: (a) White Spur (b) Gooseneck (Red Hills) (c) Mt Tyndall (d) Lake Dora.

1968 - 1969 EL9/66 Annual Report TCR 69-569 Newnham
Work carried mostly in the Henty area. Work proposed includes grid establishment over the Lake Selina and Lake Dora areas (Selina and Dora grids respectively). Some general observations (geological) of the Selina - Dora area makes reference to old reports on Lake Selina and Lake Dora mines, which are of "...limited use." [Blake,F., 1939 "Report on Lake Dora Copper Deposits" Mines Dept transcript report]. Section on previous work refers to MLMRC having mineral rights to Lake Dora area in 1938 (and Red Hills in 1907).

1969 - 1970 EL9/66 Annual Report TCR 70-654 Newnham

Lake Dora - Lake Selina area

Road construction and track cutting: Roads constructed for access and tracks cut for geol exploration. Road and track constituted a significant volume of year's work.

Geological mapping Historical

1898	Smith visited the Dora workings. Describes exploration work and mineralisation.
1938	MLMRC sampled old Dora workings
1939	Blake and Henderson (Tas Dept Mines) brief report on lake Dora Copper deposits
1954	Bradley refers briefly to Lake Dora area - type arc for Dora conglomerate
1956	Bradley structure and mineralisation of Dora area. Similarity to Red Hills. Western limb of an overturned anticlinal structure
1958	Rio Tinto some work over old Dora workings. Turam anomaly (south of Walford Peak)
1958	Compana et al. discuss the Dora region
1964	Solomon quartz keratophyre in Dora region Anticlinal folding

Rock units:	Quarternary	glacial cover
	Ordovician	Owen conglomerate
	Cambro Ordovician	? Jukes conglomerate
		Indefinite age shales and sandstones
	PreCambrian	quartzites, black schists

Structure
Folding evident in the conglomerate but not in the underlying volcanics (steep westerly dip)
Faulting: major fault trending 320°, lateral displacement, vertical movement. Geophysics suggests several E-W trending faults. Shearing in MRV, planes parallel to fold axes

Mineralisation: Restricted to volcanics in areas of strongest shearing. Disseminated and veinlet pyrite. Less abundant cp, ga, sp. Hm and mt in the schists.

Geophysics Over lines 144S to 88N i.e from Lake Dora in the south to the southern part of the Selina area - (*this is just inside EL19/98 - southern boundary between 32N and 48N*)

Ground magnetometry
Induced polarisation
Combined IP - resistivity - self-potential survey carried out by CGG (Nov 1969 - Feb 1970)
Several anomalies identified (labelled A1 through to A18)
Anomalies A1, possibly A2, A3 and possibly A4 fall within EL19/98

Geochemistry Along lines 144S to 88N (i.e. *just inside EL19/98*)

soil and rock chip
assayed for Cu Pb Zn by AAS
weak correlation between anomalous zones and geophysical anomalies

old Lake Selina adit located near grid line 80N (approximately 250m north LS1)

Drilling - testing of IP anomaly A1
Composite anomaly west of base line extending between 56N and 80N (ie *southern part of EL19/98*)

LS1 collared on line 72N 100' east of base line. Completed. Experienced considerable difficulty, some bad ground, some minor mineralisation, but significant py to account for the IP anomaly.
LS2 commenced early July 1970 (i.e. at end of reporting period) drilled 800' to south of LS1 and aimed to test non-coincident IP and magnetic anomalies associated with a geochem anomaly.

Comment: these two holes were put in very quickly based on amount of work done during the year. It is possible that earlier work was not fully reported in the preceding EL9/66 Annual Report(s). Alternatively RTAE magnetics may have been used to identify targets??!!

Proposed work: Reconnaissance north of Lake Selina
Detailed follow-up of identified anomalies

Appendix 3 - petrographic description of 14 core samples between 25' and 340' (LS1)

1970 - 1971 EL9/66 Annual Report TCR 71-786 McKibben

Lake Selina - Lake Rolleston areas

Road construction and track cutting: Some road development. Minor extension to existing grid.

Geology: Mapping as per previous year.
Structure: Faulting
Folding tight echelon synclinal structures with steep/overturned eastern limbs
Mineralisation: More strongly developed in zones of stronger shearing
Disseminated and veinlet py, minor cp mt hm, trace sp ga mo
Geophysics: Ground magnetometry
IP pole-dipole array — anomalous
Anomaly A1 transgresses the contact between volcanics and Jukes breccia, with possible underlying volcanics. Anomalies identified for further (drill) testing
Geochemistry: Soils Cu Pb Zn by AAS
Ineffective due to glacial moraine
Costean excavated on line 120N

Diamond drilling: Testing anomaly A1. LS2,LS3 + LS4 holes completed;. LS5 in progress

LS2 drilled on line 64N;

565' - 695'	65'	at 0.175%Cu 1.6%FeS_2 0.01%Pb 0.04%Zn

LS3 drilled on line 48N, mineralised intercepts:

260' - 290'	30'	at 0.28% Cu
355' - 360'	10'	at 0.20% Cu
440' - 450'	10'	at 0.37% Cu
265' - 280'	15'	at 1.18% Pb
210' - 500'	290'	at 0.80% FeS_2

LS4 drilled on line 120N (comparison drawn with Cape Horn and West Lyell in hole LS4)

413' - 1059'	646'	at 0.07%Cu	12.96% FeS_2

LS5 drilled on line 128N in progress at end of reporting period

208' - 315'	107'	at 0.05%Cu	10.10% FeS_2
445' - 845'	400'	at 0.08%Cu	9.2% FeS_2

1971 - 1972 EL9/66 Annual Report TCR 72-882 McKibben

Drilling - testing of anomaly A1
LS5 completed collared 128N/2800W

720' - 750'	30'	at 0.35%Cu	23.6% FeS_2
208' - 315'	107'	at 0.05%Cu	10.1% FeS_2
445' - 845'	400'	at 0.08%Cu	9.2% FeS_2

LS6 completed collared at 136N/2700W

215' - 385'	170'	at 0.07%Cu	5.2% FeS_2
625' - 685'	60'	at 0.04%Cu	4.0% FeS_2
740' - 972'	323'	at 0.05%Cu	7.5% FeS_2

Zone of strong pyrite mineralisation 1200' long by 500' wide

Aerial photography

Proposed work: Geochemistry (trace elements — Walshe)
± drilling
mapping and petrography

1971 EL9/66 Report on Drilling Programme TCR 73-934 McKibben

Drill holes LS1 to LS6. Report summarises each hole. Does not include logs. Includes sections.

1972 - 1973 EL9/66 Annual Report TCR 73-970 Wells

Drilling - testing of IP anomaly A1
LS7 collared at 112N/1990W on 1/12/72. "Disappointing results"
Selina mineralisation lower in Cambrian than that at Mt Lyell

Note: conclusion states rock type at end of LS5 and LS6 as being a Cambrian granite (pp 10)

Petrophysics (core) and geophysics
Data results as Appendix 1 Table 1 (includes Cape Horn holes tested)
Susceptibility, conductivity, chargeability
Turair survey (North Selina) — airborne electromagnetic. Several anomalous EM responses, but conductors all weak. Objectives of survey not really achieved

Geochemistry
Trace element study (Walshe), correlation of Co and Ni values at Selina with those at Prince Lyell

LS4	560 ppm Co (540'-960')	39 ppm Ni
LS5	1565 ppm Co	79 ppm Ni
LS6	1710 ppm Co	152 ppm Ni

Hg vapour soil gas survey

Proposed work: Reinterpretation of geophysics data
Proton magnetometer survey
Mineralogical investigation (Walshe)

1973 - 1974 EL9/66 Annual Report TCR 73-970 Wells
No work in Selina area

1974 Trace Element Studies TCR 74-1041 Walshe

Assays for Co and Ni drill holes LS4, LS5 and LS6
High Co in pyrite in Selina samples. High Co indicates Cu present in mineralising fluids.

1975 A Review of the Area East of the Tyndall Range Wells

Summary of exploration
1958 Rio Tinto investigated around Lake Dora, Turam anomaly south of Walford peak
1969/70 Consolidated Syndicate, geophysical grid and geological mapping, drilling
1970/71 extension of mapping and geophysics, geochemistry and drilling
1971/72 drilling
1972/73 completion of drilling, trace element study (Walshe)

Geology	Pleistocene	glacials and fluvioglacials, with glacial erosion
	Cambrian	Owen conglomerate Jukes conglomerate acid lavas and pyroclastics, granite to north (adamellite)
	PreCambrian	Sticht Range sequence conglomerate, quartzites, shales, dolomites quartzite

Anticlinal fold
Faulting and shearing

Geophysics Magnetics three broad anomalous areas identified, of which two within EL19/98
IP pole-dipole with concurrent resistivity and SP; three types of anomaly

- resistive areas where polarisable body coincident with magnetic body
- resistive areas not associated with any magnetic body
- associated with conductive + SP responses but not associated with any magnetics

Turair semi-airborne EM not really suited to this area

Geochemistry Soil data reinterpreted
Background values 20 ppm Cu 50 ppm Pb 50 ppm Zn
Some correlation with IP anomalies, but depends on sample position

Anomalies Anomalies discussed and categorised

Drill holes Logs for each drill hole LS1 to LS7, with assay and survey data

1976 - 1977 EL9/66 Annual Report Walter and Brophy

No work in Selina area

1977 - 1978 EL9/66 Annual Report Stevens-Hoare

No work in the Selina area. Discusses review of Wells (1975).

1978 - 1979 EL9/66 Annual Report Walter

No work in Selina area

1979 - 1980 EL9/66 Annual Report TCR 81-1519 Meares, Walter and Hutton

Reviews/summarises results from recent exploration work. LS4, LS5 and LS6 reassayed for Ag, Au, Mo, As and Sn. Petrographic determination of Ag-bearing minerals. 15 rock chip samples. Dighem II airborne EM. Gravity test survey.

Previous work
1930s MLMRC sampled old workings
1957/58 RTAE detection of aeromag high immediately west of lake Dora (most of RTAE carried out in Lake Dora - Michael tarn area); soil geochem identified 7 anomalous zones (altho' results suspect)

(Lake Dora area); ground mag and Turam ground EM - inferred line of faulting - self potential and gravity
1969/73 MLMRC tabulation (Table 6) of work in Selina area; stream sediment, soils, Hg vapour, trace element (Walshe Co-Ni); ground mag, IP with categorisation of three types of anomalies (a) py-mg-po (b) disseminated sulphides (c) graphite in black shales, all with conformable N-S trend; SP and Turair; drilling (holes tabulated in Table 7) generally strong alteration but limited/insignificant Cu-Pb-Zn.

Geology:	Reconnaissance of costeans on line 48N, inspect of old dumps 124N/2800'W
Geochemistry:	8 rock chips from Selina area Assayed for Cu Pb Zn Ag Mo ±Co S Au Ba Mn Fe Close correlation between S and Co (??? !!!)
Geophysics:	Dighem II airborne EM over Selina area identified 3 weak conductors Gravity survey (line 120N/3 200W-2000W) broad highs approximate to py in LS4
Drilling	Core (re)assayed LS4, LS5 and LS6 for Ag Au Sn As Mo (No results in the report) Generally assay values considered not significant Ag increases northwards Petrographic analyses on core from LS5 and LS 6 (Ag in tetrahedrite)

1980 - 1981 EL9/66 Annual Report TCR 81-1660 Meares, Hutton, Komyshan

Most of activity during this period focused on the Selina grid. Bishop geophysics review. Grid cutting, additional geophysics, reassaying of core

Geology
Minor mapping. (Shown on Figure 27 - not seen) Paucity of outcrop. Structure poorly known. Mineralisation in Eastern and Western Pyrite Zones (EPZ and WPZ)
Stratigraphy: Owen Conglomerate
Jukes Formation
CVC
Lower Cambrian sediments

Lower Cambrian sediments
Derived from and unconformable with underlying PreCambrian quartzites and schists of Tyennan Block. May be correlates of Success Creek Gp. Black shales associated with Dighem anomalies. Considered unprospective. Westerly dip 70° - 80°, with some moderate easterly dips due to local folding.

Central Volcanic Sequence
Feldspar phyric rocks. Some interbedded quartz phyric units. Western half comprises massive lavas, intrusives and ash-fall tuffs, probably formed near a volcanic centre and possibly sub-aerial. Eastern half characterised by abundant epiclastics suggestive of sub aqueous deposition in a shallow trough (between the volcanic arc and PC Tyennan Block to the east).

Jukes Formation
Massive coarse haematitic volcaniclastic conglomerate. Contact nature with Owen Conglomertae is not clear. Two N-S trending ridges either side of the baseline (from 136N to 168N). Western ridge is fault truncated at 136N. Correlated with the Dora Conglomerate.

Owen Conglomerate
Siliciclastic conglomerate in faulted contact with the volcanics. Westerly dip 30°-50°

Structure
Poorly known. Outcrop pattern and photo interp identified several E-W faults. Major NNW fault inferred through the swamp area (i.e. Lake Plimsoll). Possible north plunging syncline represented by Jukes Form't core.

Mineralisation
EPZ identified/discovered this year between 184N and 136N. EPZ mainly disseminated sulphides.
WPZ mainly veinlets and patchy replacements in massive pink rhyolites, with magnetite being common.

Geochemistry
Soil sampling; significant Pb-Zn-Ag anomaly 128N - 104N straddling the baseline 4000ppm Pb, 1400 ppm Zn, 8 ppm Ag, 75 ppm Cu. Anomalous thresholds for soils: Cu 40ppm, Pb 450ppm, Zn 300ppm.
Rock chip samples taken from from pits blasted on lines 128N, 144N and 184N over IP or Pb-Zn-Ag anomalies.
Geochemical data included as Appendix F

Geophysics
Gradient array IP identified resistivity and chargeability highs. Data included as Appendix G. Two pyrite zones identified on chargeability plan.
Dipole-dipole IP - lines 184N, 144N and 120N. Data included in Appendix E and G. Line 184N - sharp contact between mineralisation and unmineralised rock; line 144N - possible mineralisation gets weaker at depth; line 120N - response not fully accounted for (geologically).
Magnetics - smoothing and contouring of data (no new surveys) - anomalies thought to be due to magnetite veins Two major anomalies identified: lines 136N-184N north of WPZ, lines 152N-184N coincident with eastern flank of Jukes Form't.
Ground EM (over LS5)

Drilling
Reassay of core continued (for Cu Pb Zn Ag S Co). Results in Table 5 (p 27) and intervals in Table 30 / Appendix E:-

LS2	645' - 650'	1.5m	10g/t Ag
LS3	345' - 350'	1.5m	11g/t Ag
LS5	700' - 710'	3.0m	11g/tAg
	715' - 720'	1.5m	0.25% Cu
	735' - 750'	4.6m	0.42% Cu
LS6	385' - 395'	3.0m	0.82% Cu
	415' - 425'	3.0m	12g/t Ag
	690' - 695'	1.5m	0.67% Pb, 0.38% Zn, 20g/t Ag

Good conclusions:
Sub massive pyrite between 136N/180E and 184N/450E
Strong Pb-Zn-Ag soil anomaly between lines 128N and 104N - further detailed work recommended
Eastern pyrite zone identified
Western pyrite zone closed off to north by gradient array IP
Two minor IP anomalies at 128N/950'W and 152N/850'W - unexplained
Magnetic anomalies along eastern contact of Jukes Formation and north of western pyrite zone
Dighem anomalies associated with Lower Cambrian black shales

1981 - 1982 EL9/66 Annual Report TCR 82-1791 Meares, Purvis, Hutton, Komyshan

Selina in this report separated from Dora. Selina extended from lines 96N to line 248N (*northern limit of EL19/98 approx between lines 168N and 176N*).

Investigation of known anomalies
Roadworks, mapping, geochem, geophysics, drilling

Geology:	Quaternary	moraine, alluvium, scree
	Ordovician	Owen conglomerate
	Cambro-ordovician	Jukes formation

	Dora conglomerate correlate
Cambrian	granitic intrusions
	CVC
Lower Cambrian	Success Creek group correlates
PreCambrian	quartzite, quartz-mica schist (Sticht range)

PreCambrian quartzite (Sticht Range)

Recorded by previous mapping (McKibben 1972, Map 10)

Lower Cambrian sediments (Success Creek correlates)

Sequence of pebble conglomerate, quartz sandstone, siltstone and black shale, unconformable on PreCambrian qtzt. Gradational contact with overlying volcanics.

CVC

Felsic pyroclastics and rhyolitic lavas, all qtz phyric. Tenuous distinction between lithological units. local disseminated mt and/or hm. Pervasive chl - ser alteration with exception of some massive rhyolitic lavas (too impermeable for hydrothermal solutions).

Granite - two types of intrusion;

C.gr. adamellite to qtz monzonite, granoblastic (similar to Murchison granite). Probably deep origin.
Porphyritic microgranite to microgranodiorite with qtz/fdspar/biotite phenocrysts. Probably shallow.
(Reference to two HEC hole north of Quinn creek)

Dora Conglomerate correlate

C.gr. polymict, well rounded clasts (volcanics and granite), qtz pebbles, elongate shale clasts. Matrix of tuffaceous grit, lithic fragments, occasional ?pumice. Distinguish from Jukes Form'n by abundance of qtz pebbles, paucity of hm, poor sorting. May be conformable with JF.

Jukes Formation (JF)

Volcaniclastic conglomerate. Deep maroon (hm matrix) elongate clasts, strong foliation.

Owen Conglomerate

Pink to white siliceous conglomerate and qtz sandstone.

Structure

Major NW-trending faults inferred from geophysical data and airphoto interpretation. Possible that east and west pyrite zones have been offset by these faults

Mineralisation

Potential strike extensions to mineralisation. Eastoe: mineralisation related to granitic intrusions, seafloor volcanics interface, similar setting to Rosebery-Hercules

Mt Selina Geochemical Anomaly Zone

Disseminated mt and stringers of hm (may be altered from mt). Rare - trace - occasional disseminated py grains. Pb-Zn not identified (but disseminated Pb-Zn seen by Review Team, 1983). Figure 16 is an anomaly compilation plan.

Geochemistry

Soils - some Pb-Zn-Ag anomalies that cut across rock types, suggestive of a secondary hydrothermal event (rather than syngenetic). Soil results plotted on Fig 17 (but not otherwise tabulated) with statistical plots/graphs included. Soil threshold (anomalous) values are shown in Table 10 i.e. Cu 40pppm, Pb 500ppm, Zn 200ppm
Rock chips Cu Pb Zn Ag S Co Mn (all AAS) ± Ag Au (FA). Close association between soil and rock chip assays. Results shown and tabulated on Figure 26. Significant results listed in Table 10
Stream sediment Cu Pb Zn Mn Co Fe Results tabulated on Figure 26 Three asssay methods: -80# perchloric/nitric acid total digestion; -80# HCl cold extraction; -10#+-80# hydroxylamine-HCl oxide (Mn and Fe) digestion.

Geophysics

Gradient array IP detected some chargeability highs, notably continuation of EPZ (192N-248N)
Dipole-dipole IP to test for depth extension to surface mineralisation (152N/2600'W)
Ground magnetics - total field - some anomalies - magnetics pattern lines 104N-136N much more complex than originally thought (1970-71 fluxgate survey). Truncation and offset of NW-trending

faults. Anomalous magnetic highs underlie by volcanic rocks containing mt (dissem and/or veinlets). No direct relationship between pyrite and magnetic response.
Ground EM ("Genie") known mineralisation (152N/793mW) produced weak responses. No response from WPZ on line 128N (cf response in 1980-81 with Max-Min system) "Genie" will not detect very poor conductors.

Drilling
LS8 completed.
Entire hole assayed for Cu Pb Zn Ag S Mn Co ± Ag - Au. No significant assay results.
Downhole IP. Several chargeability anomalies corespond with pyritic zones in altered tuffs (no significant resistivity lows produced)
Mag sus on core Some responses due to mt veinlets and grains (below 226m)
Line 184N surface geophysical anomalies satisfactorily tested by this hole.

Conclusions: EPZ extended north from line 184N to 248N
MSAZ better defined by in-fill lines 132N - 108N
No (or limited) potential for economic mineralisation
No justification for further work

[Eastoe alteration project pp68]
Appendix D - petrographic descriptions

1982 - 1983 EL9/66 Annual Report Purvis, FitzGerald, Komyshan
No work in Selina area.

June 1983 EL9/66 Geological Review TCR 83-1995 Purvis, Jones, FitzGerald, Poltock

Favourable considerations - strong and extensive alteration and mineralisation (*ergo* potential for larger orebodies to have been hydrothermally generated). Ubiquitous presence of base metal sulphides.
Unfavourable considerations - geological and geophysical restrictions on size of prospective zones, low tenor of soil and drillcore geochemical results.
Possible that mineralisation unrelated to volcanics, but rather to intrusion of nearby Murchison granite (Cambrian). Mineralisation setting volcanogenic. WPZ is a stockwork related to a margin of a highly altered rhyolite lava complex. Mt Selina Anomaly Zone some best surface base metal indications but seems to lack geophysical anomalies. The area is covered by moraine - what lies at depth? (*Outside EL19/98.*)

Recommends detailed geological mapping
- (a) to place known mineralisation in its geological context
- (b) to define horizons that may contain massive sulphides

Recommends drill testing of Western Pyrite Zone (3 holes → 750 metres drilling)
Eastern Pyrite Zone not known well enough to define targets

Appendix A – Lead isotope investigation (CSIRO) (Gulson and Porritt)
Appendix B – petrography

Geology
Selina Volcanic belt extends from Murchison Granite to rhyolitic lavas around Lake Dora. Gross facing is to the west. Underlain by Cambrian sediments in turn unconformable over PreCambrian basement. Relationship with the Murchison Granite is unclear. Rhyolitic lavas suggest granite coeval with volcanism.
Selina Volcanics are quartz and felspar phyric rhyolites and dacites, lavas, epiclastics and volcaniclastics. The quartz phyric nature makes them distinctive. To the west their contact with Upper Owen lithologies is conformable (LS1, 2 3 and 7) suggestive that they are younger than the CVC.

Mineralisation

Mineralisation is concentrated in two linear zones (EPZ and WPZ) both essentially stratiform (*no – stratabound – see Hunns, 1987*) occurring in steeply dipping highly altered lavas and volcaniclastics. WPZ stockwork with no syngenetic mineralisation. EPZ possibly syngenetic with suboedinate stockwork mineralisation.

Minor values Cu, Pb, Zn, anomalous Ag, no Au, and persistent traces Mo

Best values	LS3	6.1m @ 1% Pb
	LS5	4.6m @ 0.65% Zn 24g/t Ag
	LS6	3.1m @ 0.82% Cu
		6.1m @ 44g/t Ag
		1.5m @ 0.67% Pb

Geology of MSAZ poorly known, although mineralisation appears to be due to disseminations in the lavas and volcaniclastics associated with faulted contact(s). MSAZ coincides with a break in IP and magnetic trends *(?reason?).*

Pb Isotopes (Gulson and Porritt, AMIRA 78/P97A)

- Generally favourable signatures give cause for optimism re potential massive sulphides
- Stockwork mineralisation does not show markedly different signatures. Results are a signature for the mineralising system as a whole
- Radiogenic signatures possibly due to the U content (wrt to Pb)
- Geologically, radiogenic samples no different although they do occur in schists (i.e. rocks deformed subsequent to alteration and mineralisation)
- Results from southern end of WPZ favourable, those from northern end not as good/consistent but still favourable
- Results from EPZ favourable

Potential - WPZ
Delineated by strong coincident IP and magnetic anomalies
Drill holes LS1 to LS7
Stockwork type mineralisation, submarine conditions with lavas extruded proximal to a volcanic vent
Stockwork characterised by intense brecciation, silicification, chloritisation, pyritisation and potassic alteration. Local intense sericite alteration. Common quartz-chlorite veining.
Kuroko similarities (no details enumerated)
Untested areas in the northern part of WPZ
(reference to Bishop IP anomaly S1)
At southern end a strong IP anomaly (survey 1981) between LS2 and LS3 remains untested.

Potential - EPZ
Much less well understood
Strong IP anomaly and generally coincident magnetics
One drill hole LS8
General environment of deposition submarine, although setting not well understood
Altered siliceous pyritic sediment
Very subdued base metal geochemistry
Possibly either (a) replacement/stockwork footwall type with pyritic schist being the host horizon
Or (b) pyritic schist being footwall to overlying syngenetic banded mineralisation (analogous to Kuroko style)

1983 - 1984 EL9/66 Annual Report TCR 84-2137 Roberts and Cartwright

Mapping programmes; (a) Mt Selina anomaly zone (not completed) (b) structural mapping Selina - Red Hills, structures in OC important as indicated by results in RH17. Mapping shown in Figure 10 (*similar to Figure 3 in Review Report*)

Drilling - helicopter-supported programme
Target: VMS. Pyrite zones thought to be stockworked footwall mineralisation
LS9, LS10, LS11 and LS12 completed. LS6 relogged.

LS10 and LS11 drilled EPZ: both testing chargeability anomalies and LS10 also testing relatively high rock chip geochem
LS9 and LS12 drilled WPZ: LS9 tested IP response and LS12 designed to test northern extension (to WPZ) and investigate possible structural controls.

LS6	245' - 260'	15'	at 0.09% Cu	57.2g/t Ag		
	900' - 925'	25'	at 0.11% Cu	16g/t Ag		
LS9	No significant assays recorded					
LS10	223.4m - 246.4m	23.0m	at 0.01g/t Au	0.13% Cu	0.26% Zn	2.1g/t Ag
	240.4m - 246.4m	6.0m	at 0.04g/t Au	0.44% Cu	0.22% Zn	3.5g/t Ag
LS11	No significant assays Sampled from 107.0m - 361.2m over 6.0m intervals and assayed for Au Ag Cu Pb Zn					
LS12	Hole not sampled					

1984 - 1985 EL9/66 Annual Report TCR 85-2459 FitzGerald and Pease

Work completed:- helicopter-supported. Gridding - clearing and repegging. Geological mapping, surface geochemistry, and geophysics.

Introduction

- Selina one of most intensively explored part of EL
- most previous work focused on EPZ and WPZ (strongly altered sulphidic volcanics)
- drilling largely directed by geophysics, particularly IP results
- surface geochem anomaly (MSAZ) outlined in 1981/82: max values 24g/tAg, 0.4%Pb, 1.35%Zn
- potential similarity to Kuroko style massive deposits (LS10) notable Cu Pb Zn Ag over broadly altered epiclastics, with the only significant Au recorded at Selina i.e. 1m at 0.21g/tAu)

Geology

Sticht Range Beds:

Sedimentary sequence, unconformably over PC basement. May be Middle to Upper Cambrian (rather than correlates of Success Creek Form't (Lower Cambrian)).

Selina Volacanics (SF):

Dacitic lavas - elongate "dome-like" complex along a N-S axis. Brecciated (autobrecciation) with intercalated volcaniclastics. Pervasive sil-chl-hem alteration. Stockwork veining of qtz-chl-mag-hem. Grades outwards (east and west) Into volcaniclastics with abundant lithic lava clasts.
Volcaniclastics - linear belts on the margins (east and west) of the dome complex. Grade outwards from coarse unsorted volcanics to finer sediments. Alteration mineralisation represents southern extension to EPZ. Western boundary in faulted contact with Owen Conglomerate.

Dora Conglomerate / Jukes Breccia (DC/TJB):

Breccio-conglomerates unconformable over SF. Forms topographic highs. Division not real as no contact relationships evidenced in the field. Thick sequence (>500m?) thins rapidly towards the margins - possible deposition in a shallow elongate trough (over the lava dome complex).

Geochemistry
25 rock chip samples assayed for Cu Pb Zn Ag Au Ba W As and Bi (Results in Appendix I)
Results shown on contour plans
Anomalies delineated in the volcaniclastic-epiclastic sequence to the east of the dacitic lava dome complex. i.e. EPZ area Cu anomalies towards north with maximum of 1675ppm on line 144N. Ag-Pb-Zn anomalies lie further east (>500m away from lava dome) and strongest further south between lines 120N and 108N, with maximum rock chip values 3370ppm Pb, 6700ppm Zn and 24ppm Ag
Western sequence has much lower metal values. Minor Cu in soils and relatively high Ba in rock chips (5000ppm)

DC/JB returned subdued geochemical responses. Two local anomalies on lines 128N and 104N, in similar geological setting (i.e. strongly chl-hem altered volcaniclastics)

UTEM Survey (104N-144N)
Disappointing results with no well defined responses
Five weak responses related to major lithological contacts
Results DO NOT reduce prospectivity of the area. Although any potential massive sulphide body probably at a depth greater than 60-80 metres

Conclusions/Recommendations	Similarities between Kuroka style massive sulphides and Selina Recommend drill testing of geochemical targets

1984 EL9/66 Area Retention and Work Programme proposal TCR 84-2138 Roberts
Proposal for Selina; geological mapping and small ground EM survey (towards Lake Rolleston)
Positives for Selina include; (a) intense alteration (b) basinal rocks in EPZ and WPZ (c) possible correlation of WPZ with Mt Lyell

1985 - 1986 EL9/66 Annual Report TCR 86-2566 FitzGerald

Work programme and budget proposal Reviews work/geology and outlines proposed drilling.

Introduction
- Selina geology characterised by two extensive linear belts of strongly altered sulphidic volcanics (EPZ and WPZ)
- hosted by an elongate belt of MRV (felsic lavas, pyroclastics and epiclastics) with overlying haematitic conglomerates
- several periods of glaciation
- MSAZ lies at southern end of EPZ. It lies over a sequence of dacitic lavas and volcaniclastics and is possibly analogous to Kuroko style massive sulphide setting

Drilling - helicopter-supported
LS13 completed. Collar position selected on accessibility and amount of site preparation.
Drilled to test for VMS beneath Mt Selina Anomaly zone. Geochem anomalies on lines 116N and 120N strongest Pb-Zn-Ag responses, centre of MSAZ, and could herald sphalerite-rich sulphides (sp poor conductor ⇒ negligible UTEM response) at depth. Intersected some small base metal veinlets which account for the surface anomaly
Downhole EM Sirotem on both LS10 and LS13 - no significant off-hole conductors indicated (Bishop)

LS13 No significant assay results
Maximum values (weakly mineralised epiclastics): 2800 ppm Pb, 4.80% Zn, 16 ppm Ag

No additional exploration for VHMS justified

1985 - 1986 EL5/85 Annual Report TCR 86-2586 Sheppard (CRAE)

Selina and Dora areas:
Identified as requiring complete review of all previous exploration data in conjunction with rock chip and/or wacker sampling for UTEM survey and subsequent drill testing.

1986 - 1987 EL9/66 Annual Report TCR ?? FitzGerald
No work in Selina area

1986 - 1987 EL5/85Annual Report TCR 87-2705 Funnell (CRAE)

Selina area:

Recommends a thorough compilation of all available data. Target volcanogenic massive sulphide gold. Limited rock chip sampling proposed to assist in delineating areas for UTEM surveys prior to drill testing.

(UTEM survey carried out over Dora prospect during this period)

April 1986 AMIRA 84/P210 Gold and Silver Controls in VHMS Hunns

Lake Selina Project Outline

Lake Selina field extends from Lake Rolleston to the southern foothills of Mt Murchison. Bounded to the east by the Sticht Range Beds, a Cambrian sedimentary sequence of quartz sandstone, pebble conglomerate and black shales. Unconformable over Precambrian basement quartzites. The Selina volcanics consists of dacitic lavas and linear belts of volcaniclastic rock types.. These volcanics are in turn overlain by Dora Conglomerate and/or Jukes Breccia - evidenced by clasts of volcanic origin in a tuffaceous matrix.

Method of research:
- field mapping with additional structural interpretation
- re-logging of drill core
- petrography and XRF for both majors and minors
- ± isotope studies and fluid inclusion work
- comparison with nearby mineralised systems (e.g. Red Hills)

November 1986 AMIRA 84/P210 Gold and Silver Controls in VHMS Hunns

Work Completed

Major lithological units:

Quaternary	moraine, scree, alluvium
Ordovician	Owen Conglomerate
	Dora Conglomerate (Jukes Breccia correlate)
Cambrian	granitic intrusives
	Selina volcaniclastics
	Sticht Range Beds
Precambrian	quartzites and quartz mica schists

Method:
- field mapping (10 weeks)
- re-logging of drill core
- contouring of magnetic data
- petrography
- multi element analyses

Results and Discussion

Hydrothermal alteration (not a zonation as such, more areas where particular assemblage dominant)
Extensive alteration has destroyed the original rock fabric. Major alteration minerals are k-feldspar, chlorite, sericite, quartz, magnetite, pyrite, hematite, calcite and/or dolomite, muscovite and epidote. Three broad alteration zones recognised;
k-feldspar zone - an elongate zone on the western margin of the prospect. Varies from total replacement to minor veining. Overprinting in parts results in a brecciated appearance. Sericite and clay common.
chlorite zone - two major and two minor zones. Varies from entire chlorite assemblage to pervasive to wisps along foliation. Some hydrothermal brecciation. Chlorite alteration of mafic minerals common.
sericite/quartz zone - the largest alteration zone and which occurs as narrow elongations between and within the k-feldspar and chlorite alteration zones. Original texture destroyed.
Pyrite

Most common sulphide phase and which occurs as massive veins, narrow veinlets/stockworks, aggregations and fine disseminations. Tends to be associated with magnetite and/or chlorite. Generally crystalline and euhedral.

Magnetite

Occurs as massive veins, veinlets or fine disseminations. Can be replaced by martite and hematite.

Hematite

Replacement product. Most prominent along or near contact between Selina Volcaniclastics and the Owen Conglomerate.

Alteration logs (logs in Hunns thesis)

LS6 - western pyrite zone

LS10 - eastern pyrite zone

Veining

Several vein assemblages, most common being qtz - chlorite ± fdspar ± carbonate.

Mineralisation

Base metal values very low; Cu 10 - 7200 ppm, Pb 10 - 1150 ppm, Zn 10 - 10,600 ppm. Sphalerite associated with qtz, chlorite carbonate veins. Galena occurs alone or as discrete blebs (veins or breccia matrix). Chalcopyrite is remobilised, either associated with pyrite or by itself. Silver anomalous (e.g. LS5 and LS6). Gold is absent. Trace/occasional molybdenite. Malachite coatings on outcrops near old workings.

Structure

Bedding not noted in the field. West facing indicated in drill core. Westerly dip in Sticht Range sedimentary sequence. Two dominant cleavages trending NNW and dipping steeply to west and east impart a strong schistosity on the volcaniclastics.

Hutton (1972) inferred a north plunging syncline and postulated several NW trending faults (geophysics and airphotos).

The Anthony Fault is considered to be a major NNW trending fault that forms the contact between Owen to the west and volcaniclastics to the east. Similarly a NW trending fault has been postulated between the Sticht Range Beds and the underlying Precambrian basement.

Granitic and Quartz Porphyry intrusives

Two intrusive types found in both outcrop and drill core:

- coarse adamellite to quartz monzonite with granoblastic texture (similar to Murchison granite)
- porphyritic microgranite with phenocrysts in a fine grained groundmass

Models

- * mineralisation related to deep granite intrusion in the volcanic pile with alteration a result of circulating hydrothermal fluids (Eastoe)
- * similarities to Kuroko style deposits with the pyrite zones representing stockwork footwall mineralisation (Purvis et.al.)

Broad zonation within the alteration system can be identified/inferred across the Lake Selina prospect.

Comparison with VMS deposits

differences include:	precious metal values extensive and intense magnetite and k-spar alteration alteration pattern Zn number presence of granitic rocks

Speculative model

⇒ infill of the "Selina Basin" with sedimentary rocks; bounded to the east by Precambrian Tyennan nucleus

⇒ input of volcanics and epiclastics from a distant source, with overlap onto the Precambrian basement

⇒ intrusions into the epiclastic sequence, rifting and down faulting along the Anthony Fault with associated intense shearing, mineralisation and alteration

⇒ further uplift (Anthony Fault) with deposition of the Dora Conglomerate possibly as a mass flow unit

⇒ deposition of Owen Conglomerate over the Selina Volcanics

⇒ subsequent reactivation with intense deformation and folding, and associated remobilisation

1987 EL9/66 Relinquishment report TCR 87-2675 FitzGerald

Selina area to be relinquished.

1987 EL5/85 Data Review Von Strokirch CRAE

Document not located

August 1987 AMIRA 84/P210 Gold and Silver Controls in VHMS Hunns

Summary

Summarises work done, mostly covered in preceding report. Additional points of interest:

◆ structure is poorly understood
◆ paragenetic sequences determined from thin section work
a) mag - pyr ± cpy probably high fluid temp >= 300°C
b) sph ± cpy ± gal probably lower fluid temp < 250°C
c) sph ± cpy ± gal with associated qtz carbonate ± chl veins
d) remobilisation and recrystalisation of sph, cpy and gal during the Tabberabberan orogeny
◆ additional alteration assemblages of silica - k-spar ± pyr and silica-pyr both of which occur in the chlorite zone
⇒ further work to include isotope studies (sulphur, oxygen and hydrogen) and ongoing petrographic work

1987 Lake Selina Prospect (Masters qualifying thesis) CODES Hunns

Summary

- "Barren" mineralised hydrothermal system. Mineralisation related to Cambrian Granite intrusion and is concentrated in two linear zones (EPZ + WPZ); hosted in the Selina Volcanics (SF), a sequence of volcaniclastics, lavas, intrusive rhyo-dacite porphyries and crystal tuffs that have been strongly deformed and folded into a synformal structure. The Anthony Fault (AF) a controlling influence in the intrusion of the Murchison Granite (MG) (Late Cambrian) into the volcanics.
- Overall mineralisation is a network of veins and disseminations, being predominantly disseminated and x-cutting pyrite, magnetite and minor chalcopyrite. Best intersection is 6m @ 0.04 g/t Au and 0.22% Zn. Probably precipitated at temperatures >= 300°C. Minor sphalerite and galena probably related to lower temperature (<=250°C) hydrothermal fluids. Magnetite and pyrite mineralisation appear to be associated with chlorite alteration.
- Major alteration phases are potassium feldspar, chlorite, sericite, silica and carbonate. Three broad zones based on the dominant mineral phase recognised:
- Alteration: Potassium feldspar dominant zone, chlorite dominant zone, sericite/quartz dominant zone
- The AF was reactivated during the Tabberabberan Orogeny, with Owen Conglomerate down faulted and SF up-faulted. Sulphides (re)-mobilised and deposited in the pressure fringes of pyrite grains.
- Sulphur isotope values indicate fluids of Cambrian age (i.e. derived from MG). Low mineralisation (and paucity of base and precious metals) attributed to fluids of high temperature magmatic origin and undersaturated with respect to Cu, Pb, Zn, Ag and Au.

Geology

Sticht Range Beds

Poorly bedded siliceous conglomerates, siltstones and black shales. Unconformable with PreCambrian basement, and conformable with overlying SF. Predominantly white quartz clasts derived from PreCambrian quartzite to the east.

Epiclastics

Difficult to distinguish from pyroclastics – only where reworking of fragments is obvious can epiclastics be confidently identified. Vary from epiclastics with quartz only and minor lithic fragments to those with elongate volcanic fragments. Active sedimentation (shales and siltstones) current during deposition of epiclastics. Rhyolitic to dacitic-andesitic in composition. Some grading. Some pumice fragments. Strongly quartz phyric in places.

Lavas

Minor phase in the Selina area. Contact relationships not clearly defined. Destruction of primary textures through alteration and deformation (LS1, LS8)

Crystal tuffs

Massive, jointed, f.gr., gradational bedding, ± feldspar crystals. Brecciated and infilled with specular haematite. Rare relict myrmekitic texture (→ contemporary granite erosion). (LS6, 1S9, LS12)

Granitic intrusives (Murchison Granite)

C.gr., adamellite, extensively altered (k-fdspar, chlorite, sericite). Sharp contact with SF. (LS12)

Rhyo-dacite intrusives

Massive, quartz feldspar, biotite/hornblende, altered, slickensided, cryptocrystalline silicified groundmass. Sharp contact with SF. Post alteration and mineralisation. (LS1, LS5, LS6, LS11)

Selina Conglomerate (= Jukes Formation = Dora Conglomerate)

Caps Mt Selina and adjacent topographic high to the immediate south. Approximately 200 metres thick. Unconformable over SF, although contact not exposed. Massive, poorly sorted, poorly bedded, polymict conglomerate with angular clasts. Occasional "tuffaceous" beds. A mass flow unit deposited in an elongate narrow basin under sub-aerial to shallow marine conditions. Pre Owen and post granitic intrusion in age. Onset of deposition initiated by late Cambrian – early Ordovician tectonics. (LS10)

Quaternary

Extensive glaciation 18,800 ±500 BP (Kiernan, 1980). Glacial features include the Rolleston Moraine (button grass plain immediately south of Mt Selina), fluted moraines, block and tail features, scattered glacial boulders and glacial outwash material.

Structure

- Core of a north plunging syncline (Hutton, 1982) based on stratigraphic evidence, E-W foliation in the field and facings in LS7 and LS8. Interpretation made difficult by lack of outcrop such that contact relationships not readily mappable, extent of alteration and the degree of deformation.
- Two mylonites mapped; the first related to the AF and the second related to the sheared Eastern Pyrite Zone (not shown on any maps/plans).
- The AF displaces Owen Conglomerate against SF. During the Tabberabberan Orogeny (Devonian) the SF were synclinally folded around the structurally inert rhyo-dacite intrusive and MG. The AF was probably reactivated during the Tabberabberan and presumably acted as a structural control on the intrusion of the MG. The latter parallels the strike of the AF.
- Growth pressure fringes and sulphide remobilisation associated with tectonic movement and possibly some reactivation during the Tabberabberan.

Alteration

Alteration minerals: Potassium feldspar, chlorite, sericite, silica, carbonate

Potassium feldspar zone: Reddish-pink k-fdsp forms an interlocking quartz mosaic which imparts a "brecciated" appearance. The fdsp is frequently replaced by dark green cryptocrystalline chlorite ±pyrite ±magnetite.

Chlorite zone: Occurs in a variety of modes: entire alteration (to chlorite), pervasive chlorite alteration, or thin wispy chlorite alteration. Intense chloritisation is often brecciated in appearance. The chlorite alteration phase is the dominant infilling where the volcanics have been hydrothermal brecciated.

Sericite/quartz zone: The largest area of alteration. Characterised by pervasive sericite and quartz alteration, the latter usually as a cryptocrystalline phase in the groundmass (possibly due to silicate breakdown during alteration and digenesis).

Mineralisation

Western Pyrite Zone: Extends from line 40N to 160N, (*line 40N approx southern limit to EL19/98*) and may extend beneath the glacial cover. Characterised by replacement, disseminated and epigenetic veining of pyrite and magnetite. Au almost non-existent. Low levels Cu, Pb and Zn. Slightly elevated Ag. Occurs within the rhyo-dacitic intrusive and flanking volcaniclastics. Shape difficult to map exactly due to lack of surface exposure and spacing between drill holes. Coincident IP and magnetic anomalies.

Eastern Pyrite Zone: Extends from lines 136N to 284N (*i.e. beyond EL boundary*). Occurs in schist unit that is highly sheared. Schists identified in LS8 and LS10. Strong coincident IP and magnetic anomalies. Mineralisation occurs as massive and disseminated bands of pyrite. Best grades in the prospect occur in LS10: 0.04 g/t Au, 3.5 g/t Ag, 0.44% Cu and 0.22% Zn. Syngenetic (Purvis *et.al.* 1983). Stratabound (not stratiform) (Hunns). Sediments would have acted as a geochemical trap that caused sulphide precipitation.

Mt Selina Anomaly Zone (MSAZ): Soil and bedrock geochemical anomaly in altered volcaniclastics and epiclastics adjacent to massive rhyo-dacite intrusives. Maximum values; 24 g/t Ag, 0.4% Pb and 1.35% Zn. Visible mineralisation consists of disseminated magnetite and veined haematite (?after magnetite?) with rare pyrite. Lack of both IP and UTEM response in this area. Possible that the anomaly related to diffusion of hydrothermal fluids along contact between intrusives and volcaniclastics.

Sulphides:	py; cpy, sp, ga; cov (after cpy), arsenopyrite, pyrrhotite, digenite, molybdenite
Oxides:	mt, hm, rutile
General:	calcite veins replaced by sp

Paragenesis

Stage	Assemblage	Provenance
1	Magnetite, pyrite mineralisation ± chalcopyrite + chlorite as veins and/or disseminations.	Related to the intrusion of the MG T° of formation => 300°
1a	Pyrite mineralisation in the silica, sericite, chlorite pyritic schists intersected in LS10.	Related to the intrusion of the MG T° of formation =< 300°
1b	Sphalerite, chalcopyrite, galena	Related to the intrusion of the MG T° of formation => 300°
2	Sphalerite +chalcopyrite ±galena mineralisation associated with quartz, carbonate ±chlorite veins.	Later than 1, and maybe related to the waning of the hydrothermal system.
3	Remobilisation and recrystallisation of sp, cpy and ga during the Tabberabberan Orogeny.	Related to Devonian deformation.

Drill Holes

LS5 - WPZ

Rock types: glacial overburden
chlorite altered dacitic-andesitic volcaniclastic
variably brecciated and chlorite altered silicified, k-fdspar, pyritic volcanic
quartz, fdspar altered volcanic

Alteration: massive x-cutting magnetite and pyrite veins
chlorite, pyrite, magnetite replacing earlier k-fdspar alteration
chlorite, ±pyrite, ±magnetite replacing earlier silica alteration
silica, pyrite replacing earlier k-fdspar alteration
carbonate alteration, as replacement knots or as vein fillings in breccias

Massive pyrite and magnetite mineralisation associated with high temperature fluids derived from underlying granite.

LS6 - WPZ

Rock types: crystal lithic volcaniclastic breccia
felsic, quartz phyric, lithic tuffaceous volcaniclastics
felsic volcaniclastics, tuffaceous sediments
rhyo-dacite porphyry intrusive

Alteration: sericite, k-fdspar, ±chlorite
k-fdspar, ±magnetite, ±pyrite
sericite, k-fdspar
silica, chlorite, k-fdspar, ±magnetite, ±pyrite
chlorite, pyrite, magnetite

Three apparent styles of mineralisation; Cu associated with pyrite and magnetite
Pb mineralisation in breccias
Pb and Zn associated with quartz-carbonate veins

LS10 - EPZ

Rock types: Selina Conglomerate (= Dora Conglomerate = Jukes Formation)
rhyo-dacite intrusive + rhyolitic to andesitic epiclastics, brecciated and x-cut by qv
rhyolitic epiclastics with possible pumiceous fragments
siliceous, sericitic, chloritic, pyritic schists
siliceous, sericitic, chloritic, pyritic shales, cherts and epiclastics

Alteration: haematite and silica
chlorite, k-fdspar, magnetite
sericite, chlorite, ±haematite
sericite, silica, pyrite, ±chlorite

Rock type 4 and 5 have been strongly deformed and sheared. Mineralisation shows extensive pressure fringes growing off pyrite grains, indicative of either remobilisation or that mineralisation is primary and related to deformation.

Geochemistry

Zinc Ratio

No characteristic Zn ratio histogram (for either EPZ, WPZ or all data). Lead isotope signature (Gulson and Porritt, 1987) indicates Cambrian age rather than Devonian. Possible that hydrothermal fluids were undersaturated wrt Pb and Zn and temperature of the system was too high to deposit sufficient Pb and Zn (i.e. T° > 300° C), or that temp was fluctuating too much to allow metal deposition.

Metal Transport

Hydrothermal fluids at elevated temperatures (>250°C) favour transportation via chloride complexes.
Sericite and k-fdspar restrict pH to range between pH 3 to pH 5.
fO_2 conditions determined by presence of magnetite and pyrite i.e. log fO_2 33-40.
The fluid path (which explains the association of pyrite and magnetite with little or limited chalcopyrite and sphalerite) does not cross the gold solubility curve, indicating that gold was being neither precipitated nor dissolved. This accounts for the lack of gold in the Selina Prospect. (Fig 6.10a, 6.10b)

Discussion;

Chlorite alteration is generally centred along rhyo-dacite intrusive and epiclastic contacts (*is this valid?*) i.e. these contacts acted as a pathway for hydrothermal fluids and hence alteration and mineralisation are post-formation (of the SF), therefore epigenetic in origin. Hydrothermal fluids considered to be associated with the MG intrusion, with the sheared siliceous schist (of EPZ) being a geochemical trap → thus stratabound and not stratiform.

Styles of mineralisation;

- Copper associated with pyrite and magnetite
- Lead and zinc associated with hydrothermal brecciation
- Zinc and lead mineralisation in late stage x-cutting carbonate veining
- Remobilised base metals associated with shearing (e.g. LS10)

Devonian deformation and cleavage development attained lower to middle greenschist facies metamorphism (Eastoe *et.al* 1987)

Isotopes

Sulphur in the range 9.8‰ – 10.9‰ similar to that of the MG (Eastoe, 1981) i.e. Cambrian in age. Suggestion of a magmatic origin with little if any input from seawater or meteoric water into the mineralising fluids.

Lead – isotopically similar to Que River and Rosebery Lack of mineralisation thought to be due to boiling of hydrothermal fluids before reaching seawater/rock interface due to limited water depth (Gulson, 1986). Requirement of a large heat source (Drummond, 1981). Similar lead isotopic signature to lead-poor pyritic copper-rich deposits (e.g. Golden Grove)(Gulson, 1986). (Note: no Pb isotope work done specifically for this (or AMIRA) project.)

Conclusions

Genesis: Granite related porphyry style mineralisation: Epigenetic. Traces (??) molybdenite. Alteration patterns and assemblages. Absence of precious metals.

Barren nature of Selina prospect:

- Undersaturated (wrt base and precious metals) hydrothermal fluids

- MG essentially a dry granite
- Known size of the MG – too small for development of substantial convection cell, or any such cell of a short duration (*this is conjecture!!*)
- limited leaching potential of the volcanics by the granite

General:

- Sub-aerial to shallow marine basin, fault controlled to the west (AF).
- Intrusion of the MG along the AF in late Cambrian.
- Mineralisation centred along rhyo-dacite intrusive – epiclastic contacts.
- Mineralising fluids magmatic in origin (S isotopes) derived from MG.
- Three broad alteration zones.
- Weak zonation of mineralisation.
- Sulphide and oxide mineralisation explained by a drop in hydrothermal fluid temperature with a constant fO_2.
- Fluid path paralleled the solubility curve for gold.
- Fluids undersaturated wrt to base metals.
- Deposition of the Selina Conglomerate occurred as a mass flow unit in a narrow basin with associated uplift of the PreCambrian basement and accompanied or followed by rapid deposition of the Owen Conglomerate.
- Tabberabberan reactivation of AF resulted in down faulting of the Owen Conglomerate and uplift of the SF, accompanying sulphide remobilisation and deposition in quartz and carbonate pressure fringes.

August 1988 AMIRA 84/P210 Gold and Silver Controls in VHMS Hunns

Final report
Final report does not contain any chapter specific to Lake Selina. However does contain chapters on gold distribution, exploration implications and exploration models (see attached models 1 to 5), plus some whole rock analyses.

1989 - 1990 EL5/85 Progress Report TCR 90-3190 Noonan (Aberfoyle)

Work done in the North Selina Prospect. This prospect located to north of Mt Selina
i.e. *outside and to north of EL19/98 (although information may impinge slightly on EL19/98)*
Stream sediment and rock chip samples
Also Pb isotope work - suggests two Cambrian hydrothermal systems may have been active in the area.

Geology Quaternary
    Camro-Ordovician
    Cambrian Sticht Range beds
        Tyndall Group
        Intrusives
    PreCambrian
Alteration - two phases: Pervasive kspar-mt±qtz-epidote-tourmaline
    Later chl-py, chl-mt, qtz-chl alteration and veining that cuts the first phase
Mineralisation: Pervasive and vein mt
    Pyrite disseminated and as veins, overprints mt, but also contemporaneous
    Minor cp po ga cov
Structure: Two minor fault structures
    Moderate to strong NW-SE cleavage
Geochemistry: Stream sediment
    R/chips 41 samples assayed Cu Pb Zn Ag Au As Ba ±Cr Zr Ti Y ±K_2O Na_2O CaO
        base metal analyses - 2 distinctly anomalous outcrops
        precious metals
        lithophile elements
        alteration index
        granitic fluid study

Pb isotopes — suggestive of 2 active hydrothermal systems

Appendix V North Selina Sampling results - NOT in the extract
Appendix IV Pb Isotope Study CSIRO (Carr and Dean)

1989 EL103/87 Annual Report TCR 89-2929 Creagh, Hungerford (Billiton)

Report covers first 12 months of tenure (i.e. EL9/66 relinquished late 1987, EL103/87 granted early 1988). EL granted to Shell Company of Australia (Billiton).

Lake Selina block encompasses Mt Selina - Mt Rolleston
Work done; gridding, ground magnetics, CSAMT, field mapping, compilation of previous exploration

Previous exploration

Early 1900	Lake Selina workings (adits and trenches) between 360000N and 362000N
1903-39	MLMRC tested these Cu deposits but with discouraging results.
1957	RTAE aeromagnetic survey (no ground surveys).
1969-75	Consolidated Syndicate systematic exploration; gridding, mapping, soils, geochemistry, geophysics (pole-dipole IP and SP, Turair EM) and drilling (LS1 to LS7). Concluded that mineralisation in WPZ similar to Mt Lyell.
1979-80	Gold Fields. Dighem survey identified/confirmed EPZ. Drilled (LS8 - 1981/82).
1981	Eastoe alteration study concluded Selina mineralisation was related to Cambrian Murchison granite and not suitable to massive sulphide formation
1984	Drill holes LS9 to LS12 completed.
1985	UTEM survey to immediate south of EPZ. Drilled by LS13 (1986).
1986	Downhole Sirotem on LS10 and LS13

Gridding: 24kms with 400m spacing; 10km access lines

Mapping: from 361600N to 364000N. West of 385600E outcrop almost non-existent.

Geology:
Sequence of rhyolitic to dacitic volcanics, epiclastics and sediments of Tyndall Group shallow dippping (30°) to the east of west. Overlain by Dora Conglomerate, either as a syncline or fault-bounded basin. Sticht Range beds (resemble Newton Creek Sandstone) syndepositional with or overlie the Dora Conglomerate.
EPZ and WPZ lie within the Tyndall Group. Both zones occur in north-south trending zones of intense shearing. This shearing parallel to regional foliation attributed to Middle Devonian Tabberabberan Orogeny. Thin section studies (LS6) suggest base metal sulphides emplacement syntectonic (deposits within pressure shadows of deformed pyrite grains) or post-tectonic (quartz-carbonate veins cross cutting regional foliation) to Tabberabberan Orogeny.
i.e. structurally controlled epigenetic disseminated sulphide system.
Pb isotopes similar ^{206}Pb/^{204}Pb to other MRV Cambrian massive sulphide deposits. Suggestive of Devonian remobilisation of sulphides along preferentially selected structural zones. Pb isotope work by Billiton suggests the Murchison granite NOT the source of the sulphides.
Highly prospective volcanics in a submarine environment, potential for VMS.

Geophysics:
Ground mag line 358000N to 364000N, 10.6 line kms, 10m station spacing, 400m line spacing
Profiles shown as figs 4 + 5. Indicate a strong magnetic source beneath Mt Selina (?Cambrian granite?) Generally coincident with EPZ. Zone has been drilled by LS10 and LS8. Shallow mag anomalies in vicinity of WPZ (has also been drill tested). Results define strong chl-mag-py alteration associated with linear N-S pyrite zones. Correlation between magnetics and gravity data (ex Mines Dept).
CSAMT lines 358000-359200, 361200-362000N, 80m E-dipoles 9 frequencies

Covered WPZ and not EPZ. No clear conductor. Lines surveyed show similar features: (i) a major lithological contact along western side of the EL (300m west of the mapped Ordovician/Cambrian contact (Anthony Fault)) (ii) a strong transition zone between near and far fields

TEM	line 359600N surveyed but data quality exceptionally poor
TEM	EM-37 survey in progress

Recommendations: Further geophysics and follow up drill testing.

1990 EL5/85 Relinquishment report TCR 90-3176 Noonan (Aberfoyle)

Lake Selina area (i.e. *west and north of EL19/98*) recommended for relinquishment.
This does not include the North Selina area

1990 EL103/87 Annual Report TCR 90-3104 Creagh, Hungerford (Billiton)

Exploration philosophy to locate massive base metal sulphide mineralisation.

Summary
EM 37 survey (profiles - Appendix 3), extension to grid lines and mapping, rock chip sampling (Appendix 4), relogging of LS10 (Appendix 1) and LS13 (Appendix 2). Geological mapping - good coverage over northern part of block, southern part being obscured by glacial moraine and scree. Work tended to concentrate on the EPZ - notably rock chip sampling. Structural interpretation complicated by postulated faults. EM 37 transient electromagnetic survey intended to detail previous CSAMT anomalies. The EM 37 survey confirmed previously identified weak, shallow conductors not magnetically correlatable and with long strike length (> 4km). Conductors coincident with both EPZ and WPZ.

Geology
Southerly extension to WPZ possibly identified by outcrop mapping at 386180E on line 359600N.
Grid extension at 200-metre line spacing constructed over EPZ. New geological features not previously recognised/acknowledged. Steep/vertical easterly dip with no obvious facing criteria. EPZ coincident with the Dora Conglomerate. East of this is a f.gr. rhyolitic lava, at its base haematitically altered, passing into black shales that are interbedded with felsic volcaniclastics that are strongly chlorite and pyrite altered. East of the shale horizon siliceous-sericitic-pyritic ?cherts (brecciated along their margins) occur in outcrop and at depth in LS10. To the east of EPZ is a thick sequence of volcanics (volcaniclastics, epiclastics and minor lavas).
Three separate phases of mineralisation; (a) lineated disseminated pyrite (b) syntectonic (Tabberabberan) sulphides deposited in pressure shadows of deformed pyrite grains (c) narrow quartz-carbonate veins cross-cutting regional foliation and containing py, cp, ga and sp. Pb isotopes suggest a Cambrian source (i.e. remobilisation).
Structure;
Regional cleavage has a N-S trend and near vertical dip. Intense foliation along western margin of Dora Conglomerate with increased veining density is suggestive of faulting along this margin. Contact relationships are scarce. Possible synclinal structure in the Tyndall as outlined by the Dora Conglomerate.

Geophysics
EM 37 Transient Electromagnetic
Intended to detail CSAMT anomalies. Large fixed transmitter loops and mobile coil to measure vertical component. EM confirmed weak, shallow conductors with no magnetic correlation and a strike length > 4 kms. Strongest response on line 5360800N (drill hole LS1) although EM source related to glacials (glacials approx.75metres thick), possibly as a clay-filled paleo-channel and/or an obscured fault.
Other weak conductors are also coincident with both EPZ and WPZ.
Predict more (pyritic) mineralisation beyond the end of LS10.

Geochemistry

Detailed rock chip over EPZ to test EM 37 anomalies.
Appendix 4 Assayed for: Au Ag Cu Pb Zn Fe Mn As Ba Distinct zonation with association alteration assemblage. Spot highs correspond to Mt Selina Anomalous Zone. Increasing haematite indicative of an oxidising environment, shallow marine to sub-aerial during deposition of the Selina volcanics.

Recommendations: Drill test EM anomalies

1990 - 1991 EL5/85 Progress Report TCR 91-3308 Richardson (Aberfoyle)

Work carried out in the North Selina area (i.e. *to west and north of EL19/98*)

Previous exploration - no work done by CRAE

Geophysics:
Three loop 21 line km UTEM survey
No responses attributable to massive sulphides
Strong off line response indicates indicator to the east (Sticht Range beds)
?graphitic phyllites
?depth >250m

1990 - 1991 EL103/87 Report to 30 October 1990 TCR 91-3244 Randell (Billiton)

Drill targets in the Lake Selina block are discussed. Otherwise all of work confined to Basin Lake block of the EL. This consisted of CSAMT, downhole EM, and lithogeochemistry.

June 1991 **EL103/87** Aberfoyle-Billiton JV Aberfoyle funds & manages exploration

1992 EL7/91 Annual Report TCR 92-3392 Sharpe (Aberfoyle)

(Comment: EL 7/91 - Sticht Range located immediately west of Selina area.)

A weak EM conductor in the northern part of the EL (east and north of relevant Selina area) was identified as being due to carbonaceous phyllites associated with the Sticht Range beds. EL recommended for relinquishment.

1992 EL103/87 Annual Report TCR 92-3345 Richardson (Aberfoyle)

Summary: Work relevant to Selina includes DHEM survey + extension to LS10, and commencement of drill hole LS14.

LS10 - target pyritic mineralisation/zone beyond end of hole based on reinterpretation of 1986 TEM (Sirotem) survey. Hole extended by 86m to 388.5m. No conductive body intersected.
Disseminated and stringer pyrite (1-2%).
12 core grind samples assayed for Cu Pb Zn Ag Au Ba As Cr Zr Ti
Cu locally anomalous; 7.9m @ 0.4% Cu
Ti/Zr confirm felsic nature of host rocks
DHEM confirmed presence of off-hole conductor about 50metre above the hole

LS14
Drilled to 80metres and in progress at end of reporting period.

1993 EL5/85 Relinquishment Report TCR 93-3524 Sharpe (Aberfoyle)

North and South Selina - no targets identified and recommends area to be relinquished.

Reviews work and known information
Geological setting
Previous exploration - drill holes LS8, LS11 and LS12 fall within North Selina block

Structure, alteration and mineralisation

Geochemistry	stream sediment rock chip - base and precious metals, lithophiles, granitic fluid study lithophiles - indicate several dacitic to rhyolitic lava flows, volcaniclastic units returned highly variable Ti/Zr ratios granitic fluid study - ?? VHMS hydrothermal or granitic hydrothermal ?? Elevation in Rb (>200ppm) and F (>5600ppm) suggest interaction between granitic fluids and EQPS
Pb isotopes:	two groupings of data (a) Rosebery ellipse (b) Hellyer/Que River ellipse. No firm conclusions on nature of hydrothermal events
Geophysics:	UTEM survey (January 1991), no response attributable to massive sulphides

1993 EL103/87 Annual Report TCR 93-3420 Richardson (Aberfoyle)

Most of report dedicated to LS14

LS10
EM37 survey and DHEM data indicated a potential conductor;
63200N/86300E 75-100m to top (i.e. below surface)
63600N/86325E 175-200m to top
64000N/86350E >250m to top
Extension of LS10 by 86m to 388.5m intersected silica-sericite-pyrite alteration. A three loop DHEM confirmed a conductor about 50m above LS10.

LS14
Drilled to a depth of 349.5m, 13th March 1992 - 2nd April 1992.

LS14 Geology:
Stratigraphy similar to LS10. Collared in Tyndall Group rocks and passing into Eastern Sequence lithologies. Eastern boundary of EPZ is faulted. Petrology (appended) by Tony Crawford.
Mineralisation in EPZ occurs as fine disseminations and veins of mainly pyrite with local minor chalcopyrite. Mineralisation occurs in the approximate conductor position and inferred to be the source of the EM anomaly.
Petrography - volcaniclastic texture thought to be due to shearing and domainal alteration, and thus the only true clastic rocks in the EPZ sub-basin are a shale horizon and its adjacent fine volcanogenic sediments.

LS14 Geochemistry:
22 core grind samples assayed for whole rock, trace and multi elements.
Nothing really obvious except for mobility assumed to be associated with hydrothermal alteration.

LS14 DHEM:
No survey undertaken - mineralisation intersected in the approximate position of the EM target position. (*Comment: worth reconsidering DHEM in LS14??*)

Conclusions: Potential for improved grade and metal zonation to the north remains.

1993 EL103/87 Partial relinquishment Report TCR 93-3423 Richardson (Aberfoyle)

Reviews/summarises exploration results on both Lake Selina and Basin Lake blocks (also drilling on latter).
Note: This report tends to detail those areas that are to be relinquished. Difficult to determine/locate information/details (especially geological mapping) over that part of Lake Selina to be retained.

Previous exploration:

1900s	Prospector activity at turn of century
1969-72	MLMRC systematic exploration, identification of WPZ and drilling LS1 - LS7

1979	Gold Fields Dighem survey resulted in identification of EPZ through subsequent mapping, IP survey and drilling of LS8 (1981/82)
1980s	Gold Fields UTEM survey, drilling LS9 - LS13 (1984 - 1986)
1987	Selina block relinquished by Gold Fields

Work completed

Geology:
Sticht Range beds to the east
Eastern Sequence conformable over the Sticht Range beds, previously correlated with Tyndall Group, then given a separate designation (by Mines Dept.), and inferred to interfinger to the west with CVC.
Major NNW trending fault (Anthony Fault) is the western boundary of the Eastern Sequence. West of the fault OC is overlain by Pleistocene glacials and Quaternary alluvium.
Two major zones of alteration and mineralisation - EPZ and WPZ.

Ground magnetics:
10.6 line km survey undertaken in 1988.
Linear magnetic anomaly coincident with IP anomaly (latter from Gold Fields work). May be southern extension to EPZ.

CSAMT:
Survey in 1988. Only one genuine bedrock conductor in area to be relinquished at 358000N/385600E (along strike form a conductive zone in the area to be retained).

EM37:
Survey in 1989 to detail anomalies outlined by CSAMT survey.
Possible that carbonaceous phyllites of the Sticht range beds are strong conductors. Considered to be source of the eastern response on lines 1200N-2000N.

1994 EL103/87 Annual Report TCR 94-3552 Sharpe (Aberfoyle)
No work on Lake Selina block (although' still part of EL). Work on Basin Lake block included helimag (+ radiometrics) survey, whole rock and REE geochemistry.

October 1995 AMIRA P291A "Cambrian Growth Faults" White
(Extracted from: Fourth report for AMIRA P291A: Faulting and Mineralisation in Western Tasmania)

Introduction Four areas were selected for study:
- ⇒ Moxon Saddle - Henty area
- ⇒ Northern Anthony road - Murchison area
- ⇒ Hanging Rock area
- ⇒ Anthony River area

Anthony River Area

Wedge-shaped body of Tyndall Group volcaniclastic conglomerate and sandstone facies. Tyndall Group facies correlate with the Upper Tyndall. Fault bounded to the south. Comprises a cross-cutting ESE striking (sub vertical?) contact, at a high angle to bedding in the Tyndall rocks, with older eastern quartz-phyric sequence exposed to the south. Probably represents a Devonian fault as it trends subparallel to other Devonian structures in the area. A Cambrian normal/transfer fault may have existed at this location prior to Devonian reactivation.

Tyndall wedge passes into siliciclastic Middle Owen to the west. Boundary is probably semi-conformable to disconformable. Further north this contact is exposed as an irregular erosional contact in the Anthony Power Tunnel. i.e. an erosional (parallel) disconformity.

Eastern contact to the EQPS is interpreted as a fault contact (the Selina Fault - SF). Strong shearing and intense pyrite-chlorite alteration has been mapped. This contact was exposed as a shear zone in the HEC tunnel and required concrete lining for support. Probably represents a Cambrian growth fault with west side down. Possibly reactivated during the Devonian - intense regional cleavage subparallel to the fault attitude.

Tyndall facies wedge out or thin to the north possibly due to (1) primary lateral thickness controlled by basin architecture, (2) effect of the west-bounding disconformity, or (3) east bounding Selina Fault displacing part of the Tyndall during Devonian reactivation. Option 1 is most likely as the overlying OC also thins to the north.

Tyndall Group comprises polymict volcaniclastic conglomerate and pebbly sandstone. Grainsize ranges from cobble/boulder clast-supported to coarse sandstone, with sandy matrix-supported pebble/cobble volcaniclastic sandstone. Beds thick to very thick and massive , in places showing diffuse planar stratification. Poorly sorted, clasts vary considerably in size and shape, comprising quartz-feldspar porphyritic clasts, granitic clasts, undifferentiated hematite altered clasts, minor sedimentary intraclasts, metamorphic Precambrian-derived quartzite, feldspar-ferromagnesian porphyritic clasts. Matrix is medium to very coarse sand comprising quartz and lithics. Devonian regional cleavage has created a “false” alignment of clasts. Close to the SF clasts have become attenuated and flattened.

Provenance of the Tyndall Group and Structural Model

Presence of granitic clasts implies proximity to source, suggestive of an eroding granite shedding debris into a basin across a normal fault scarp margin. A Cambrian east-west transfer may have existed near the southern margin.

Abundance of quartz-feldspar phyric volcanics similar to EQPS to the west. Consistent with an easterly provenance. There is evidence for a pre Upper Tyndall Cambrian deformation event.

A normal growth fault model requires substantial uplift to contribute rounded granite clasts. Hpidiomorphic granular texture indicates granite emplacement (into EQPS) at considerable depth below surface (several kilometres). Exposure to subsequent aerial erosion would have required considerable uplift.

Alternatively SF was a reverse fault involving substantial upward movement of the eastern block. Bedding attitudes do not support this suggestion.

Summary

Geological evidence for Cambrian movement on the SF during Upper Tyndall time. Interpreted as a normal fault (Berry and Keele, 1993) along the contact with EQPS sequence in this area. A southern bounding possible transfer fault may have constrained Tyndall deposition into a small fault-bounded basin. Reverse movement on the fault (east block up) is another possiblity.

1995 EL103/87 Annual Report TCR 95-3716 Lewis (Aberfoyle)
No work on Lake Selina block. Work on Basin Lake block and Tyndall Creek area (north part of the prospect). Includes a tabulated summary of previous exploration, wacker sampling and geophysics.

Note: Flooding of Lake Plimsoll planned for 1994. Hence Selina block less accessible after this event. Possible reason for activities being focused on Basin lake block, although not actually stated in the report.

1996 EL103/87 Annual Report TCR 96-3855 Richardson (Aberfoyle)
No work on Selina block. Work on Langdon Pyrite Zone/Prospect.

1997 EL103/87 Annual Report TCR 97-3990 Hicks (Aberfoyle)
No work on Selina block. Work on Langdon Pyrite Zone (includes drilling).

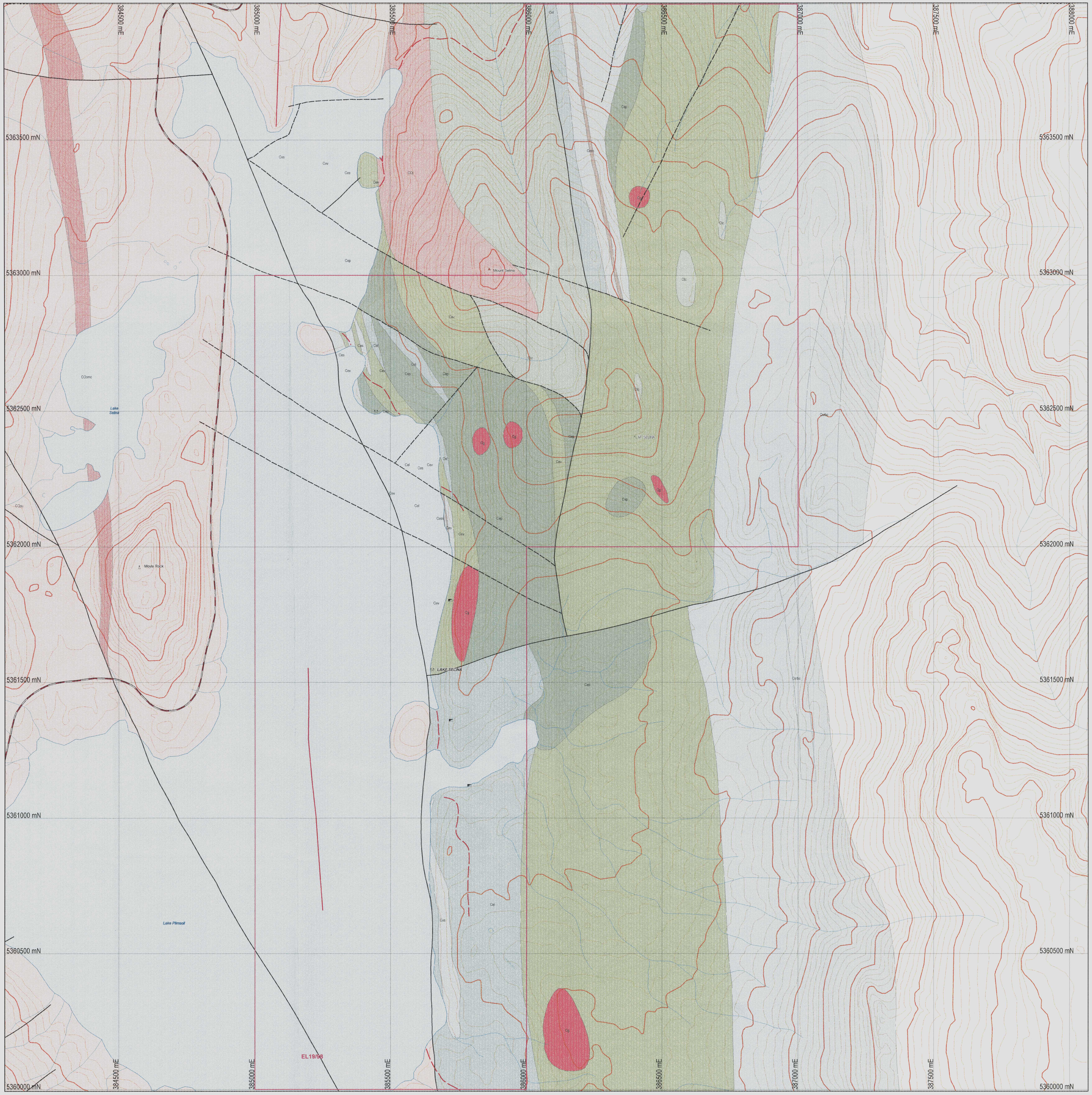
July 1997 EL103/87 JV Resolute Limited - Aberfoyle Resources Ltd - Acacia Metal Pty Ltd

1998 EL103/87 Final Report TCR 98-4175 McDonald and Ikstrums (Resolute)
No work on Selina block. All work carried out on basin lake block, includes Leech Hill drilling. Reviews and summarises work relevant to Basin Lake.

Exploration philosophy:

Trace Henty-Comstock horizon through the EL. Time-stratigraphy horizon thought to represent time in MRV history for formation of Henty and Mt Lyell deposits. Principally formed by VHMS type hydrothermal fluids exhalative to the seafloor.
Shallow marine fossils (Lynchford Member, Comstock formation limestones)
Undiscovered large massive sulphide deposits probably at a depth >200metres.
Au in syn-volcanic structures should have associated soil anomaly and/or IP chargeability anomaly at short dipole spacings.

1998 EL103/87 Final Report TCR 98-4175 McDonald and Ikstrums (Resolute)
Licence relinquished 21st April 1998
Report does not mention/refer to Selina block (?? design or accident ??). It does mention/refer to Basin Lake block, Bradshaw's Road, Leech Hill and the Pyrite Corner Fault.



Cev	Eastern sequence. Mainly volcaniclastic rocks
Ctc	Mainly volcaniclastic conglomerate with minor siltstone and volcaniclastic sandstone.
Cep	Quartz - feldspar phyric lava/intrusive
COj	Volcaniclastic breccia and conglomerate with minor sandstone, locally developed at contact with underlying volcanic rocks. May be partly equivalant to Ctc.
Cess	Eastern sequence. Mainly shales
Ces	Eastern sequence. Mainly siltstone & volcaniclastic rocks
COoug	Upper Owen correlates in Tyndall Range - Mt Murchison area. Predominately pink sandstone and granule - pebble conglomerate, includes granule - pebble conglomerate (COouc) & grey sandstone and conglomerate (COoug).
COou	Upper Owen correlates in Tyndall Range - Mt Murchison area. Predominately pink sandstone & granite - pebble conglomerate, includes granule - pebble conglomerate (COouc) & grey sandstone and conglomerate (COoug).
Cg	Granite
Csrb	Quartz - rich sandstone & granule rich pebble conglomerate with interbedded siltstone; trace fossils in some beds. Sticht Range Beds of Lake Beatrice area. Includes pebble - cobble conglomerate (Csrbc) and volcaniclastic sediments (Csrbv)
Cel	Porphyritic lava
COomcs	Mainly pink to cream coloured, thickly bedded pebble-cobble to cobble-boulder conglomerate. Includes a loer unit of interbedded conglomerate & sandstones (COomcs)
COom	Mainly pink to cream coloured, thickly bedded pebble-cobble to cobble-boulder conglomerate. Includes a lower unit of interbedded conglomerate & sandstones (COomcs).
COonsh	Mainly thinly bedded siltstone, quartzitic sandstone & pebbly sandstone with bands of pebble conglomerate - Newton Creek Sandstone.
COon	Mainly thinly bedded quartzitic sandstone & pebbly sandstone with bands of pebble conglomerate - Newton Creek Sandstone.
COomc	Mainly pale pink to cream coloured, thickly bedded pebble-cobble to cobble-boulder conglomerate
Csrbc	Pebble - cobble conglomerate. Sticht Range Beds
Csrbv	Volcaniclastic sediments - Sticht Range Beds
Ccl	Mainly felsic felspar phyric lava and intrusives; massive to flow banded or autobrecciated, with rare colmnar jointing
Ccvl	Mainly felsic feldspar phyric lava & intrusives; massive to flow banded or autobrecciated, with rare columnar jointing
Ccs	Units of bedded siltstone, sandstone, tuff & agglomerate
COol	Mainly white to pale conglomerate & pebbly sandstone. Includes - COolg, COolc, COols, COolsh, COolsc and COolv

Geological boundary, accurate
Geological boundary, inferred
Fold feature
Fault, position accurate
Inferred Fault
Concealed Fault

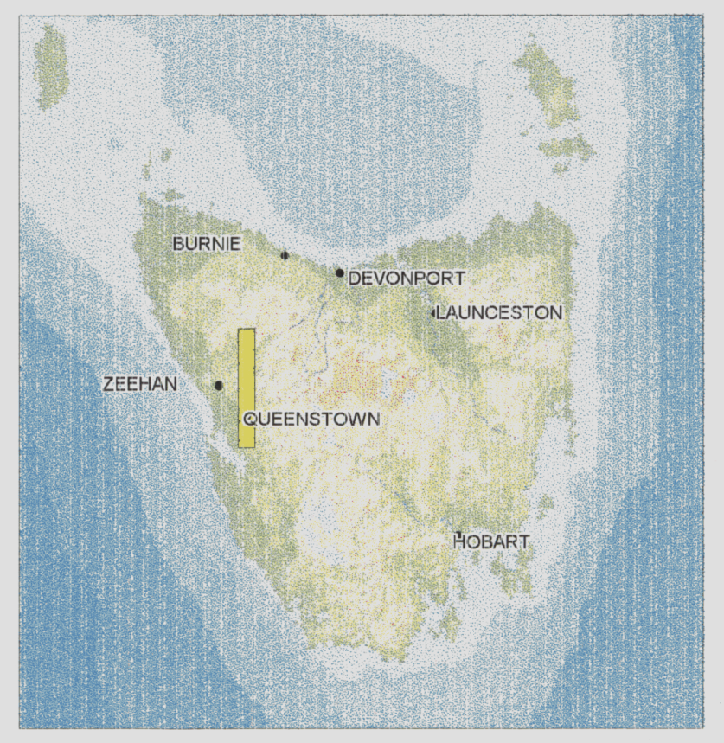
Major Mine site
Mineral Deposit
Abandoned Minesite
Prospect
Mineral Occurrence

Built up populated area
Homestead (Pastoral)
Building
Railway Station
Beacon, Lighthouse
Airport or Aerodrome
Bridge
Road tunnel
Monument, Statue, Cross
Landmark Object

Named Relief Feature
Mountain or mountain range
Pass
Cliff, Escarpment, Breakaway
Sand Ridge or Sand Dunes
Spur, Spur line
Rock
Plateau
Valley
Gully, Gap

Cave, Cavern
Island
Point
Pool, Pond, Waterhole, Rockhole
Swamp
Waterfall
Dam
Spring
Ford
Marina, Mooring Pen, Port

Highway
Secondary Road
Minor Road
Vehicle Track
Runway
Landing Ground
Powerline
Contour line
Watercourse
Perennial Lake



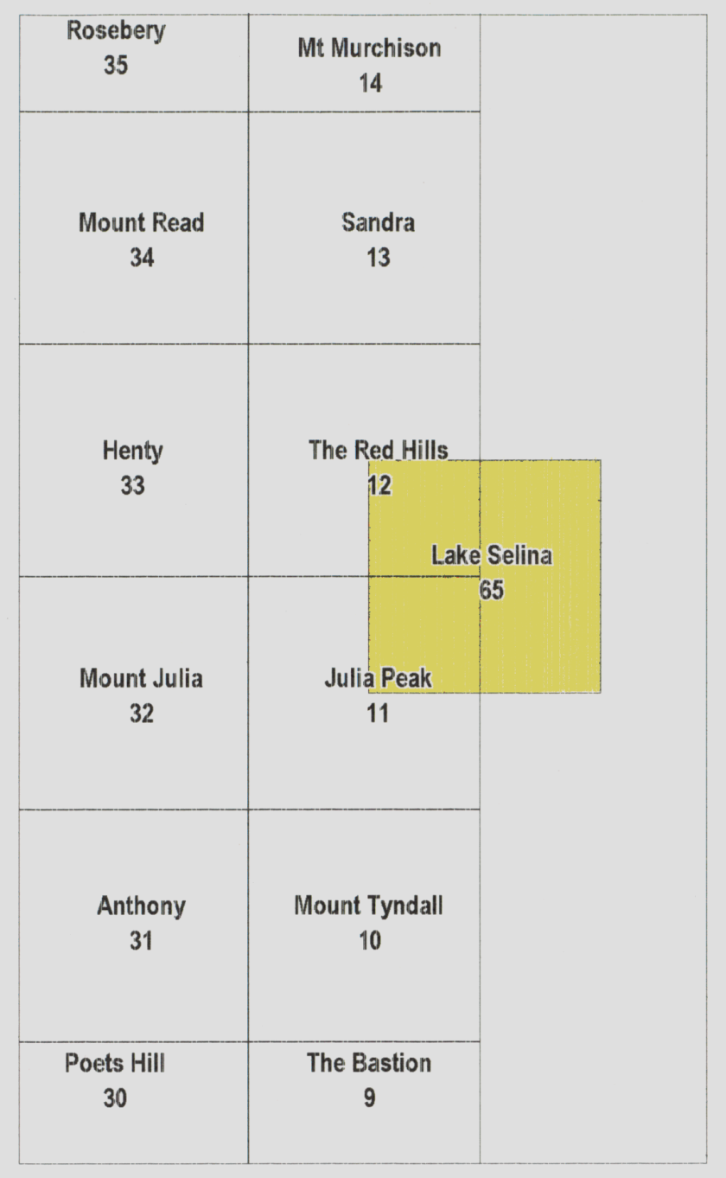
0 250 500 1000

Scale 1 : 5 000

Distances in Metres
Major Contour Interval 50m
Minor Contour Interval 10m
AMG Zone 55

5 cm

1 : 5 000 Sheet Index



GOLDFIELDS EXPLORATION
ACN 063 813 932
Cnr Main & Gellibrand St Zeehan TAS. 7469 ph: (03) 6471 6444

Mt Read Volcanics Belt
Tasmania

Figure 20
SHEET 65
Lake Selina

GEOLOGICAL INTERPRETATION

Workspace Path: i: \ draft \ mapinfo \ basemet \ bm_tas \ 2301 \ 5K \ SHEET33 \ SH33_GEOL5K.WOR

Page Setup: A0 and landscape

Date: October 1997

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Annual Report Part 2 - A Review of Exploration over the Lake Selina Area - EL 19/98
Goldfields Exploration Pty Ltd*
Godsall, W. EL19/98