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CRA EXPLORATION PTY. LIMITED

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MELBA FLATS EL 43/92, TASMANIA

ANNUAL REPORT FOR THE PERIOD ENDING 16 TH APRIL, 1994

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1. SUMMARY

CRA Exploration Pty. Limited (CRAE) is exploring the Zeehan area for a range of commodities in various stratigraphic/structural settings. Valid targets include Ni-Cu-PGE mineralisation in ultramafic bodies, stratiform-stratabound Zn-Pb shale hosted mineralisation in the Proterozoic Oonah Formation, carbonated-hosted shale mineralisation in the Ordovician Gordon Limestone and skarn-type mineralisation peripheral to the Heemskirk Granite.

Work completed on the Melba Flats EL 43/92 in the first year of tenure commenced with a small fixed wing airborne TEM (QUESTEM) survey. The purpose of this survey was to identify conductors to focus ground exploration for massive Cu Ni sulphide mineralisation. Unfortunately very high background resistivities, higher than normal flying height (due to topographic variations) and the resulting excessive movement in the towed receiver resulted in poor quality data.

The most prominent response observed in the QUESTEM data was a 2 km strike length anomaly approximately 400 - 700 m east of the Cu Ni workings. A review of previous exploration and follow up exploration by CRAE has indicated that the conductor correlates to a 50 m wide carbonaceous black shale unit which hosts the McKimmie and Lead Blocks Pb mines. Poor conductors are associated with the known massive sulphide pods (chalcopyrite, pentlandite, pyrrhotite, millerite, and pyrite) at Nickel Reward, Vaudeau and North Cuni. A 300 m moderate conductor was interpreted to extend SE of Nickel Reward.

Two detail grids were cut totalling 27.8 line km over the Nickel Reward-Vaudeau and North Cuni-Genets Winze shafts. The purpose of these grids was to facilitate geophysical surveys (magnetics and fixed loop TEM) and auger soil sampling. To date 128 soil samples have been collected. The maximum assays returned were 1737 ppm Cu, 964 ppm Ni, 1338 ppm Pb and 407 ppm Zn.

A total of 60 rock chip samples were taken mainly around the old Cu Ni mines and from the Serpentine Hill Ultramafic Complex. The most significant assays returned came from massive and disseminated sulphide samples collected from the North Cuni shaft. These included 31.30% Cu, 2.90% Ni, 7.26 ppm Pt, 8.59 ppm Pd and 2.20 ppm Au. Nine rock chip samples where sent in for petrology.

2. INTRODUCTION

Exploration licence 43/92 Melba Flats encompassing an area of 16 km^2, was granted on the 16th of April 1993 for an initial tenure of one year (Plan Tv 675). The tenement lies approximately seven km to the NE of Zeehan and straddles the Murchison Highway and the Emu Bay Railway. The area consists of low lying swamps and is mainly covered by low scrub with some rain forest in the northern portion of EL.

The focus of CRA Exploration Pty. Limited (CRAE) in the Melba Flats EL is for high grade Cu Ni deposits associated with the Cuni (or Five Mile) massive sulphide pods. These pods are related to a series of northerly trending Cambrian pyroxinite and gabroic sill/dykes over a 2 km strike length that intrude a succession of Late-Mid Cambrian volcaniclastic lithic and quartz wacke with interbedded siltstone and shale. These sediments are regarded as equivalents to the Rosebery Group (Brown, 1991).

Massive Cu Ni mineralisation generally occur along the footwall contact of the pyroxinite dykes (Nickel Reward, Vaudeau, South Cuni and North Cuni) or within the underlying sediments (Nickel Reward). In the eastern portion of the EL, these sediments have been overthrusted by the Cambrian Serpentinite Hill Ultramafic Complex (Brown 1992; Plan Tv 680).

In addition to high grade the Cu Ni target, there may be potential for larger tonnage low grade disseminated Cu Ni mineralisation within the mafic/ultramafic bodies. Further, the massive sulphide pods are also prospective for PGE and Au mineralisation. Significant Pb Zn mineralisation hosted within black shale occur to the east (Lead Blocks & M^{c}Kimmie) and west of the Cu Ni mineralisation trend.

Recognition of highly mineralised Cu Ni zones in mafic/ultramafic intrusives and adjacent sediments warrant follow up work given the potential for an economic massive sulphide resource close to existing infrastructure.

During the period under review, CRAE has a statutory obligation to expend $80,000 during the first two years. This report detail all exploration activities conducted within EL 43/92 by CRAE during 1993/4.

3. CONCLUSIONS

Robinson (1959) indicated that the known lodes appeared to pinch out at approximately 30 m depth based on the decreasing width and strike length indicated by mine workings and drilling. A majority of the drilling targeted at the Cu Ni lodes consisted of shallow holes rarely exceeding 30 m. No geological explanation has been given to account the surficial nature of the lodes. It is possible that thin near vertical shoots of ore (which would be difficult to intersect with drilling) exist to depth.

With over 100 years of prospecting in the area it is difficult to reason that undiscovered lodes exist at surface, along or parallel the Cu Ni trend. It is therefore concluded that any significant massive sulphide mineralisation in the area would have to occur at depth. To that end CRAE is undertaking detailed fixed loop TEM surveys in the areas of known mineralisation to delineate good conductors at depths greater than previous electrical methods. In addition, the surveys are to be extended to east (i.e. closer to the Serpentine Hill Ultramafic Complex) to identify any parallel massive sulphide lodes.

The TEM surveys will be conducted over the areas of most significant known mineralisation (Nickel Reward-Vaudeau and North Cuni-Genet's Winze). The results of these surveys will be compared to previous EM data to determine the effectiveness of the new surveys. At time of writing, ground TEM (PROTEM) and magnetic surveys were underway.

The mineralised gabbro north of North Cuni appears to have an appreciable gravity anomaly. Grid based gravity surveys will be considered.

4. RECOMMENDATIONS

A full review of the previous exploration activities is to continue. It is envisaged that this information (particularly the SP anomalies) will be incorporated with the results of surface geochemical sampling, ground magnetics and TEM surveys to produce a list of targets worthy of drill testing. Drill testing of these anomalies is expected to be completed during 1994.

5. REGIONAL GEOLOGY

Zeehan and its surrounding districts have seen almost continuous sedimentation, igneous activity and deformation from the Late Proterozoic to the Quaternary. Consequently the picture of the geological evolution is complex. The regional geology is summarised on Plan Tv 628.

The Rocky Cape Association forms the basement in NW Tasmania. This association is not represented on the Zeehan 1:63,360 (inch to mile) sheet. In late Precambrian (~ 700 Ma), a shallow basin was forming in the stretched intracratonic area between the Rocky Cape and the Tyennan Block. Coarse clastic sediments (conglomerate and sandstone) of the Forest Conglomerate, Donaldson Formation and the base of the Timbs Group were deposited. As the intracratonic basin deepened

turbidite sequences of interbedded sands and silts of upper Donaldson Formation, Timbs Group and Oonah Formation were laid down.

As the rift phase drew to a close, sag phase Black River Dolomite, Savage Dolomite, ?Timbs Group magnesite horizons, and Success Creek Group limestone were deposited. Rift tholeiites and associated sediments of the Smithton Volcanics, Bernafai Volcanics, Timbs Group and Crimson Creek Formation erupted within the basin.

During the mid to late Cambrian, an arc-continent collision caused overthrusting of ultramafic-mafic rocks and related sediments, possibly from a subduction complex some distance east of the Tyennan Block. The gabbro and basalts between Trial Harbour and Zeehan are of boninitic composition - present understandings of basalt chemistry require that these boninites derive from a fore-arc wedge (Brown and Jenner, 1989).

Post-collision extension tectonics then produced troughs into which the Dundas Group sediments and Mount Read Volcanics were deposited. A local metamorphic event dated at 500 Ma (Penguin Orogeny), possibly contemporaneous with eruption of the MRV, affected the rift sediments in the area of the present-day Arthur Lineament. This event probably affected the formations over a broader area than seen today.

Latest Cambrian to Ordovician times saw tectonic uplift of the Tyennan Block. Rapid stripping of this nucleus produced the coarse clastics of the Owen Conglomerate and correlates. As the rate of erosion slowed, sequences became finer (e.g. Moina Sandstone). Finally, in a short period of quiescence, limestone of the Gordon Group was deposited.

A second phase of uplift introduced sands and silts into a shallow marine environment to form the Eldon Group. This event took place from the early Silurian until the early Devonian, at the beginning of the Tabberabberan Orogeny. This was followed by a period of thrusting, possibly induced by compressive stresses caused by the rising plutons of the Heemskirk, Meredith and Housetop Granites.

To the NW of the granites, this compression thrust imbricate slices of the Timbs Group over one another to produce the rapid, apparently quantum jumps in metamorphic grade seen in the Arthur Lineament. To the south, the Tenth Legion Thrust is the clearest evidence of the early Devonian thrust event (Findlay and Brown, 1992). Other thrusts are likely to have developed, perhaps along the Little Henty and Firewood Siding Faults. Continued Tabberabberan deformation folded the Zeehan Basin formations about NNW trending axes.

Terrestrial sedimentation continued in the Permian. Jurassic dolerite sills intruded the Zeehan area. Tertiary basalts flooded much of NW Tasmania, with remnants preserved near Granville Harbour.

Tertiary and Quaternary erosion and deposition continue to modify the ancient land surface.

6. MINERALISATION

Several periods, styles and commodities of mineralisation are recognised in the Zeehan area. In summary these are:

PERIOD	STYLE	EXAMPLE
Proterozoic	Stratiform syn-depositional pyrite in black shale.	Oonah Fm
Cambrian	Stratiform? magmatic Cu Ni PGE-sulphides in ultramafics	Cuni
Ordovician	Stratabound sphalerite-galena in limestone.	Oceana
Devonian	Discordant lode/vein-style pyrite-galena-sphalerite	Spray, Comstock
Devonian	Stratabound replacement cassiterite-pyrrhotite in carbonates	Renison Bell
Devonian	Skarn magnetite (+sphalerite-cassiterite)	Saint Dizier
Devonian	Skarn pyrrhotite (+sphalerite-galena)	Sylvester

Stratiform syngenetic sulphides in Proterozoic black shale was CRAE's principal focus in the Zeehan area prior to 1993. To date, no economic occurrences of base-metals in this deposit type are known in Tasmania. Gross similarities can be drawn between Zeehan and the Mt Isa and Lawn Hill areas, and on that basis some potential exists for discovery of another Century-type deposit.

The Cuni **Cu Ni mineralisation**, which occurs sporadically as magmatic segregations within or adjacent to ultramafic sill/dykes over a 2 km strike length. Although the size of the deposits are quiet small, the grade of individual occurrences are impressive. The massive sulphide lenses are generally less than 50 m long and of the order of 1 m wide, with several percent Ni and Cu (Blissett, 1962).

Williams (1958) noted two types of Ni ore at Cuni which he concluded belong to different phases of the same mineralisation with segregation taking place at depth before emplacement. The two types of ore observed are:

- Ni as pentlandite (Ni_2FeS_3) and violarite (NiS_2) associated with pyrrhotite to 20% pyrite and chalcopyrite. Found at North Cuni, South Cuni and Vaudeau.

- Ni as millerite (NiS) intergrown with chalcopyrite and 25 - 60% pyrite. Found as high grade deposit at Nickel Reward & Devereaux and low grade at North Cuni.

Significant amounts of argentiferous galena and sphalerite were extracted from North Cuni (Robinson, 1959) and South Cuni (Taylor & Blake, 1952). The Pb Zn mineralisation is thought to be related to the discordant lode style deposit at Lead Blocks approximately 700 m to the east.

Along with Cu and Ni, the Cuni lodes may contain significant PGE and Au. At Devereaux the lode reportedly contained 3.1-4.9 ppm Pt, 0.6-1.2 ppm Au and 34.2-43.5 ppm Ag (Taylor & Burger, 1952).

Secondary Ni mineralisation has also been observed within the Serpentine Hill Ultramafic Complex, 600 - 800 m to the east (Tv 680). The primary source is unknown but thought to be related to the Cuni deposits (Brown 1991).

Stratabound Pb-Zn in limestone is exemplified by the Oceana deposit where Amoco outlined a resource of 4 Mt @ 19.4% Pb, 4% Zn and 106 ppm Ag (Taylor and Mathison, 1990). Mineralisation is described as syndiagenetic replacement, broadly equivalent to Irish-type deposits. Indications of other stratabound carbonate-hosted Pb-Zn mineralisation is recorded in Amoco-EZ diamond drilling from Myrtle and Grieves prospects. Despite intensive but fruitless exploration by Amoco-EZ, the Gordon Limestone still holds potential for base-metal discoveries.

Historically it has been the **discordant lode/vein-style Pb-Ag** mineralisation of the Zeehan and Dundas fields that have dominated interest. Lode-style mineralisation at Zeehan is usually hosted within graphitic shears within the Oonah or Crimson Creek Formations and is thought to be related to late stage hydrothermal introduction associated with the emplacement of Devonian granites.

Within the Melba Flats EL, a number of such deposits (Lead Blocks, M^{c}Kimmie, Duke of York and an unnamed mine in the NE corner of the North Cuni grid) occur within or adjacent to black shale units. These units occur as apart of Cambrian sequence thought to be an equivalent to the Rosebery Group (Brown, 1991). Total recorded production from the Lead Blocks mine is 2180 t @ 65.1% Pb & ~1700 ppm Ag. At M^{c}Kimmie 56 t @ 53.8% Pb & ~1700 ppm Ag were extracted (after Blissett, 1962).

Discordant lode and vein-style Pb-Ag deposits are high grade, but narrow (typically 0.3m) and with short strike and depth extent (usually less than 100m). In the context of modern large-scale mining practices, it is unlikely that such a target could be of economic interest on its own.

In the last 20 years or so, **stratabound replacement-style Sn** deposits have been given considerable attention. West Tasmania is well endowed with these deposits, which include Renison Bell, Queen Hill, Mt Bischoff and Cleveland. At Renison Bell, most ore (42 Mt @ 1.1% Sn) occurs as massive

pyrrhotite replacement of carbonate horizons, although a substantial quantity of ore occurs within the Federal-Bassett feeder zone. Source of the mineralisation is believed to be from Sn-rich fluids emanating from the underlying Devonian granite.

Magnetite skarn deposits such as Saint Dizier and Tenth legion have formed in carbonate lithologies adjacent to the Heemskirk Granite. St Dizier contains 5 Mt @ 0.5% Sn, whilst the skarn at Tenth Legion contains low percent levels of Zn as sphalerite.

Zinc mineralisation in a **pyrrhotite skarn** within Oonah Fm carbonates was discovered by RGC at Sylvester prospect, west of Zeehan in 1992. Resources are estimated to be 6 Mt @ 5.5% Zn, 3.3% Pb and 40 ppm Ag. The sphalerite is reported to be very high in Fe (around 18% Fe) which substantially lowers the quality of this style of mineralisation.

The best reference for brief descriptions of all deposits of the Zeehan field, although somewhat dated now, is Blissett (1962). Early Geological Survey bulletins from between 1890 and 1910 are important historical references. A new 1:50000 geological map of the Zeehan quadrangle is soon to be published.

7. PREVIOUS EXPLORATION BY COMPETITORS

Cu and Ni mineralisation was discovered in the Melba Creek area in 1893. A detailed history of the exploration with the Melba Flats EL area is detailed in Taylor & Burger (1952) and Ellis (1987). A good summary of mining lease activity up to 1961 is given in Brown (1992).

In the period from 1962 to 1973, the area was explored by EZ as EL 2/62. During that time geochemical sampling, geophysical surveys (ground magnetics and TURAM) and drilling were undertaken over the Cu Ni lodes. CSR held the exploration licence (15/76) over the Cuni field from 1976 to 1987, although little attention was paid to the Cu Ni mineralisation. From 1987 to 1992 an 11 km^2 area incorporating the Cuni field was exempt from Mining Act as SR 1987 No 216.

In total, 7400 t grading 7 - 11% Ni and 4 - 14% Cu were extracted from the various loads (Blissett, 1962). From north to south the Cu Ni lodes are summarised with their maximum known dimensions in Table I (after Blake, 1952; Taylor & Burger; 1952 and Robinson, 1959).

Devereaux	?	0.5	22.9	Although Blissett (1962) states that the intrusive at Devereaux lode has been displaced westwards by the Nevada Fault, it may represent a sub parallel dyke system. In difference to the other lodes, the strike of the lode is SE. No production records. Two samples of the ore assayed (max.) 6.6% Ni, 18.1% Cu, 4.9 ppm Pt, 1.2 ppm Au and 43.5 ppm Ag. Drilling in 1956 suggested little potential for an economic deposit. Not visited by CRAE to date.

Table I. Summary of Cu Ni lodes within Melba Flats EL 43/92

The major period of mining at Cuni ceased around 1914 due to the commencement of War I in which the demand for Cu and Ni sharply decreased and the effort required to dewater the mines. Water was reported to be flowing into the Vaudeau Shaft at a rate of over 11,000 ℓ per hour (Taylor & Burger, 1952).

DRILLING

A review of the literature has indicated that 66 diamond holes were drilled by previous explorers targeting the Cuni mineralisation. An additionally 25 holes were drilled on other targets within the present Melba Flats EL. An incomplete list of the previous drilling is presented in Appendix I.

In spite of the relatively large number of holes drilled into the Cu Ni lodes, very few of the holes were drilled below 30 m true depth and thus the lenses may not be adequately tested. In addition, a majority of the drilling suffered from poor core recovery (Horvath, 1957 & Burton, 1970). In all likelihood, only the massively mineralised portions of core were assayed and thus the results of these holes may be excluding a substantial disseminated Cu Ni resource.

GEOPHYSICS

Various geophysical surveys have been employed by previous explorers in the Melba Flats area. A good summary of previous work is supplied in Appendix I of Ellis (1987). A summary of the work completed with relevance to the massive Cu Ni lodes is presented below.

MAGNETICS

Ground magnetics surveys have been completed over the Cu Ni lodes with varying results. Edge and Laby (1931) and Keunecke (1953) reported that the basic rocks failed to give a magnetic response due to their low magnetic susceptibility or due to destruction of magnetic minerals as a result of weathering. Burton (1970) indicated that small magnetic responses were attributed to the intrusives. Unfortunately this data was presented as crude histograms along profiles.

CSR routinely collected ground magnetic data along their cut lines but these lines were predominately oriented N/S and the station spacing was 20 m. In 1985 CSR flew a fixed wing magnetic survey over the area at 100 m E/W lines at 70 m clearance (Ellis, 1986). The Cu Ni lodes failed to be delineated by the survey.

ELECTRICAL METHODS

The contrast between the conductive lodes and country rock at Cuni has lead previous explorers to utilise ground electrical techniques (SP, equipotential, AC potential ratio and TURAM) for the detection of Cu Ni massive sulphides. A good summary of the electrical geophysical work is presented in Brown (1991). Elsewhere in the EL, CSR routinely conducted VLF surveys over their cut lines.

In passing it should be noted that with the exception of North Cuni and Genet's Winze where some near surface ore remain, the known Cu Ni lodes gave subtle negative anomalies whilst pyritic and graphitic black shale and pyritised shear zones gave anomalies in the order of -200 to -600 mV. It is suspected that this relates to the SP surveys were undertaken after a majority of ore above the water table was extracted.

GRAVITY

During 1988 three gravity traverses were completed over the Cu Ni mineralised trend by the Tasmanian Mines Department (Tv 631). The data although not published, is available for purchase and is presented as raw and Bouguer corrected data with density of 2.67 g/cc. Anomalies of up to 0.6 mgal were observed over the North Cuni traverse between 366140 - 366310E and 366400 - 366560E. The eastern anomaly appears to be coincident with a topographic feature and thus requires further examination. The western anomaly is broadly coincident with a portion of the mineralised gabbro.

Minor anomalies are observed on the South Cuni and Vaudeau traverses.

8. EXPLORATION BY CRAE

8.1 AIRBORNE TEM/MAGNETICS SURVEY Plans Tv 546-53

In an effort to focus ground exploration on massive Cu Ni sulphide bodies, a small airborne EM survey was proposed to be flown over the EL. The relatively flat terrain within the Melba Creek Valley facilitated a helicopter borne survey. Unfortunately due to the unavailability of helicopter based systems, World Geoscience Corporation Limited (Aerodata) were contracted to fly the Melba Flats fixed wing airborne TEM (QUESTEM) survey

Modelling of thin vertical filaments indicated that the QUESTEM system flown at optimal flying height (120 m) with flight line spacing of 100 m would detect near surface massive sulphide bodies (Appendix II). An initial flight line direction of 070° was chosen but had to be modified to incorporate line flown at 160° due to topographic and safety limitations. The Melba Flats airborne TEM survey consisted of 304 line km. A copy of the Logistic Report an the locations of EM anomalies selected by Aerodata's in house programs are presented in Appendix II.

High background resistivities, higher than normal flying height (due to topographic variations) and the resulting excessive movement in the towed receiver resulted in poor quality data.

The most prominent response observed in the QUESTEM data was a 2 km strike length approximately 400 - 700 m east of the Cu Ni workings. A review of previous exploration and follow up exploration by CRAE has indicated that the conductor correlates to a 50 m wide carbonaceous black shale which host the Lead Blocks and M^{c}Kimmie Pb Ag mineralisation. Poor conductors are associated with the known massive sulphide pods at Nickel Reward, Vaudeau and North Cuni. A possible 300 m moderate conductor was interpreted to extend SE of Nickel Reward. This conductor appears to be coincident with a SP anomaly identified to be due to pyritic black shale by Horvath & O'Connor (1958).

8.2 GROUND BASED EXPLORATION

As a result of the lack of good airborne TEM targets, initial exploration by CRAE is being concentrated over the largest known Cu Ni workings within the EL over the Nickel Reward - Vaudeau area (with southern extensions) and the North Cuni - Genet's Winze area. Although small portions of previous exploration grids were able to be delineated from colour 1:10,000 scale air photos, recovery of these lines was difficult. A decision was made to cut two new grids (50 m line spacing) over the areas of interest. Line cutting was completed in early January 1994.

Mapping of topographical and cultural features over the Nickel Reward - Vaudeau grid was completed in March 1994 and is presented on plan Tv 674. A preliminary version of a similar map of the North Cuni grid is prepared on Tv 676

SOIL SAMPLING

Auger soil sampling by EZ had indicated that meaningful trends could be delineated by soil auger sampling in spite of swampy conditions (Hackett, 1968: Burton, 1970). This data was presented as hand drawn contour maps of Ni, Cu, Zn and Pb with a maximum of three contour intervals. Discussions with EZ indicated that the original data was probably destroyed.

CRAE decided to collected soil auger samples over selected lines to integrate with other data sets. A total of 129 soil auger samples were collected during the reporting period along cut lines and on a semi regional basis (Plan Tv 677. Samples weighing greater than 200 g were sent to Analabs where they were dried, crushed, pulverised and analysed for Ag Co Cr Cu Fe Ni Pb Zn by GA140 (0.3 g aqua regia/perchloric acid digest - AAS). Although the aqua regia/perchloric acid digest was not strong enough to dissolve chromite, Cr was routinely assayed for in addition to the base metal elements so as to be able to differentiate between sediments and gabbroic lithologies.

Magnetic susceptibility of the samples were also measured with a Exploranium KT-5 meter in the field. Sample ledgers and laboratory reports are included in Appendix III.

NICKEL REWARD-VAUDEAU GRID Figures 1-4

The highest assays of 1737 ppm Cu 792 ppm Ni and 229 ppm Cr were attributed to a soil sample taken out of an old costean adjacent to the Vaudeau mine (sample 3911709). Elsewhere within the grid, a possible mineralised zone occurs near 366280E 5365950N with a maximum of 364 ppm Cu, 519 ppm Ni & 2725 ppm Cr with elevated Co (55 ppm).

Anomalous Cr assays (1127 ppm) returned from either side of the Vaudeau workings on 5366150N appear to be associated with black shale although this is not readily understandable. A review of the literature indicates that highly anomalous Pb assays returned from the eastern end of 5366150N are probably associated with the M^{c}Kimmie Pb mine (Goudie & Hallof, 1970). The exact location of the old Pb mine relative to the CRAE grid has not been determined as yet but is estimated to lie within 200m of the NE corner of the grid (Tv 677).

NORTH CUNI GRID Figures 5-7

A zone mineralised gabbro was identified in the North Cuni grid near 366300E 5367700N which returned a maximum of 423 ppm Cu, 964 ppm Ni, 1338 ppm Pb, 407 ppm Zn, 769 ppm Cr and 38 ppm Co. This area is associated with a number of costeans was tested by diamond drill hole EM3 in 1953 which encountered 4.6 m @ 1.1% Ni and 0.82% Cu (Appendix I; Horvath, 1957) and is coincident with a 0.6 mgal anomaly (see below).

It is important to note that a reconnaissance C horizon soil sample (3911714) taken approximately 15 m from the North Cuni Shaft returned elevated Pb (835 ppm), Zn (223 ppm) and Cr (334 ppm). Cu and Ni were assays were not anomalous (69 ppm and 82 ppm respectively).

ROCK CHIP SAMPLING Plan Tv 677

During the reporting period, 60 outcrop and subcrop/float rock chip grab samples were collected as part of a reconnaissance rock chip geochemical sampling program. These samples were collected by three CRAE geologists during different periods during the last 12 months. As a result, elements assayed, methods and laboratories used were not standard for the samples collected. Sample ledgers and laboratory reports are included in Appendix IV.

GENET'S WINZE

The maximum assays returned from weathered massive sulphide float with secondary Cu minerals was 26.5% Cu, 0.90% Ni, 6.13 ppm Pd, 3.06 ppm Pt and 59 ppm Ag.

NORTH CUNI SHAFT

Spectacular assays of 31.3% Cu, 8.59 ppm Pd 7.26 ppm, Pt, 2.2 ppm Au, 221 ppm Ag and 0.27% Ni were returned from massive sulphide float adjacent to the North Cuni shaft (samples 3911705 & 706). Sample 3911705 has magnetic susceptibility of 11,900 x 10^{-5} SI (indicating at least 10% monoclinic pyrrhotite) and represents the only magnetic sample collected from the Cuni field.

The highest Ni result of 2.90% (2.65% Cu) was returned from a coarse grained gabbro sample with fine grained disseminated sulphides. This lends support to the suggestion that significant disseminated Ni mineralisation may exist with the Cuni deposits.

In addition, anomalous Ni (2.19%) was reported from samples of brecciated gabbro with quartz and galena veins. These samples also returned a maximum of 22.7% Pb, 17.5% Zn and 2.51% Cu.

VAUDEAU SHAFT

Assays of 7.21% Cu and 8.94% Ni were returned from massive sulphide float around the Vaudeau shaft. Of the 13 samples collected of gabbro with disseminated sulphides, the highest assays returned were 0.97% Ni and 1.12% Cu, although the mean was significantly lower (0.26% Ni and 0.26% Cu).

NICKEL REWARD SHAFT

Assays from three samples of a soft dark fine grained rock (presumed to be pyroxinite) returned up to 2.26% Ni and 1.66% Cu and 0.5 ppm Au.

LEAD BLOCKS

Three samples taken from the Lead Blocks Mullock heap returned a maximum of 2.19% Zn, 1.50% Pb and 33 ppm Ag.

SERPENTINE HILL

A total of 10 rock chip samples were taken from Serpentine Hill with the highest Ni assay of 0.14%. This is consistent with values (42.4 m @ 0.16%) returned by the Montana Silver Lead drill hole M23 drilled into the Serpentine Hill Ultramafic Complex in 1957 (Appendix I; Horvath, 1957). Similar assays were reported for ultramafic rocks encountered in Tasmanian Mines Department drill holes SH1 - 6 (Brown, 1991) drilled into the SHUC.

Nine rock chips were selected for petrological description. Samples were sent to Martin Gole and R.N. England for transmitted and reflected light thin section preparation and description. Petrological reports of returned samples are included in Appendix V.

GROUND MAGNETICS Plan Tv 678-79

A detailed ground magnetic survey totalling 9.0 line km was completed over the Nickel Reward-Vaudeau grid using GEM Overhauser GSM-19 magnetometers with the data collected at 5 m spacing. The purpose of the survey was determine if the known massive sulphide lenses and the basic intrusives could be delineated from the sediments and secondly to identify other possible lenses.

The large amount of discarded iron surrounding the Nickel Reward and Vaudeau working made the identification of a magnetic response difficult. In spite of the cultural noise, the data suggests that the massive sulphide lodes are non magnetic as indicated by previous surveys (refer to section 7). This is also supported by the low tenor of magnetic susceptibilities measures of soil and rock chip samples (Appendices II & III). Identification of possible other pyrrhotite associated massive sulphide bodies was marred by cultural sources (railway, fences and discarded iron). The significance of a coincident soil Cr and magnetic anomaly at 366250E 5366150N is not known.

It is hoped that the ground magnetic coverage over the North Cuni grid (in progress) will be able to delineate the North Cuni lens by virtue of its greater reported pyrrhotite content (Williams, 1958).

GRAVITY Plan Tv 631 & Figure 8

The locations of the 1988 Tasmanian Mines Department gravity traverses were located. A 0.6 mgal anomaly observed over the North Cuni traverse between 366140 - 366310E was broadly coincident with a soil geochemistry anomaly thought to represent a mineralised gabbro.

9. ENVIRONMENT AND REHABILITATION

Following approval from the Mineral Resources Tasmania 27.8 line km of line cutting were completed around the Nickel Reward - Vaudeau and North Cuni - Genet's Winze workings. In addition, the Melba Creek crossing at Vaudeau was reconstructed. No rehabilitation has been required to date.

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KEYWORDS

Tasmania, Cambrian, Ultramafic, Copper, Nickel, PGE, Gold, Geochemical sampling, Petrology, Airborne Geophysics, Magnetics, TEM

LOCATION

Queenstown	SK55-05	1:250,000
Pieman	7914	1:100,000
Zeehan	7914-S	1:50,000
Dundas	3636	1:25,000

LIST OF DPOs

71516, 71540, 77352, 77354	(rock)
77353, 77355	(soil)
71541, 77351	(petrology)

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Tv 680	Melba Flats EL 43/92	Geology Map	1:10,000
Tv 628	Melba Flats EL 43/92	Regional Geology	1:100,000
Tv 631	Melba Flats EL 43/92	Gravity Contours - Bouguer Density 2.67g/cc	1:10,000
Tv 549	Melba Flats	Airborne Geophysical Survey Flight Path Map	1:10,000
Tv 551	Melba Flats	Airborne Geophysical Survey Stacked EM 1 Profiles	1:10,000
Tv 550	Melba Flats	Airborne Geophysical Survey Stacked EM 5 Profiles	1:10,000
Tv 548	Melba Flats	Airborne Geophysical Survey Stacked EM 8 Profiles	1:10,000
Tv 546	Melba Flats	Airborne Geophysical Survey Preliminary EM Anomalies	1:10,000

Tv 547	Melba Flats	Airborne Geophysical Survey First Vertical Derivative Profiles	1:10,000
Tv 552	Melba Flats	Airborne Geophysical Survey Magnetic Intensity Contours	1:10,000
Tv 674	Melba Flats EL 43/92	Nickel Reward-Vaudeau Grid	1:2,500
Tv 676	Melba Flats EL 43/92	North Cuni Grid	1:5,000
Tv 677	Melba Flats EL 43/92	Soil/Rock Chip Sample Location Plan	1:10,000
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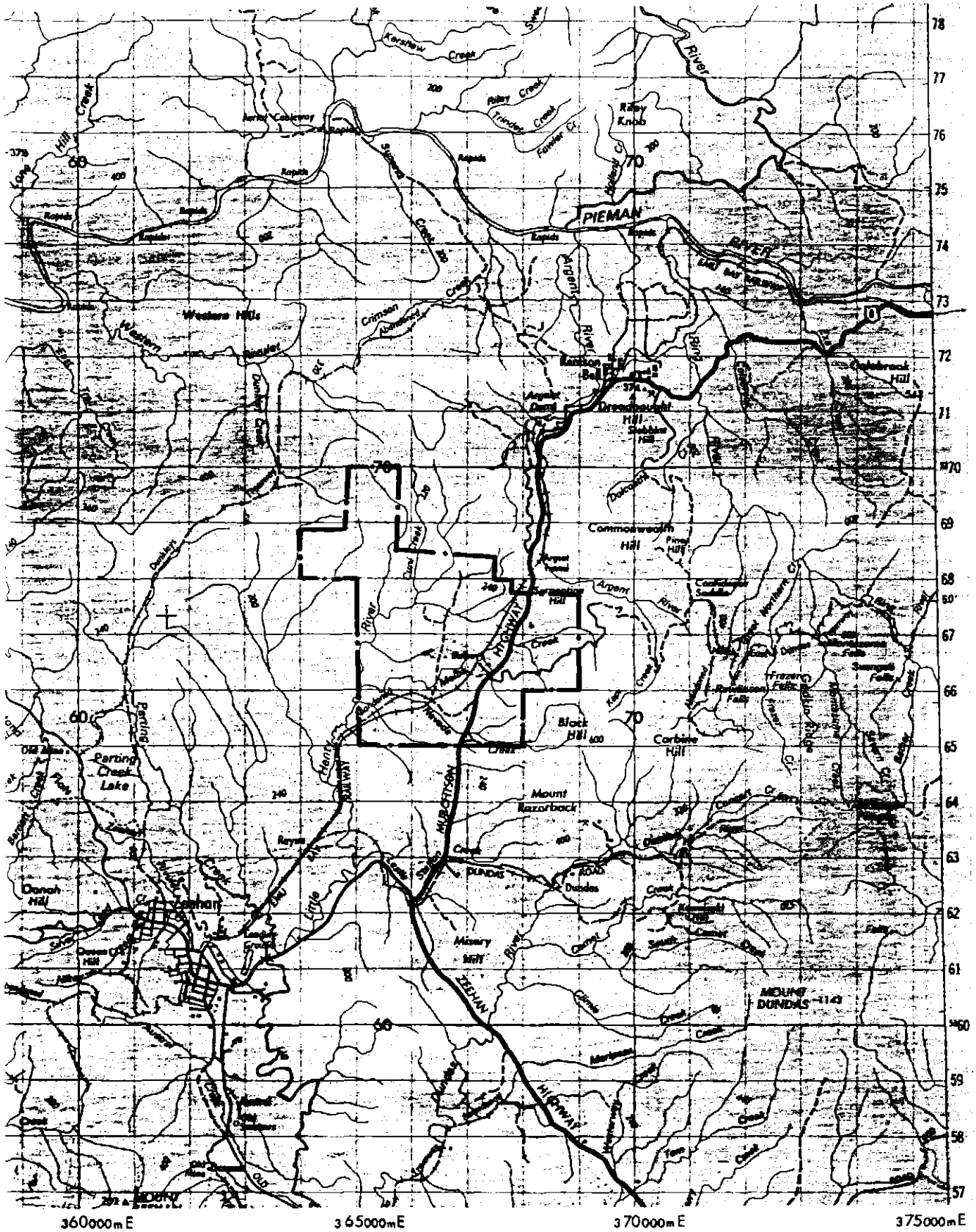


928020

0 1 2 3 4 5km

5 cm

CRA EXPLORATION PTY. LIMITED

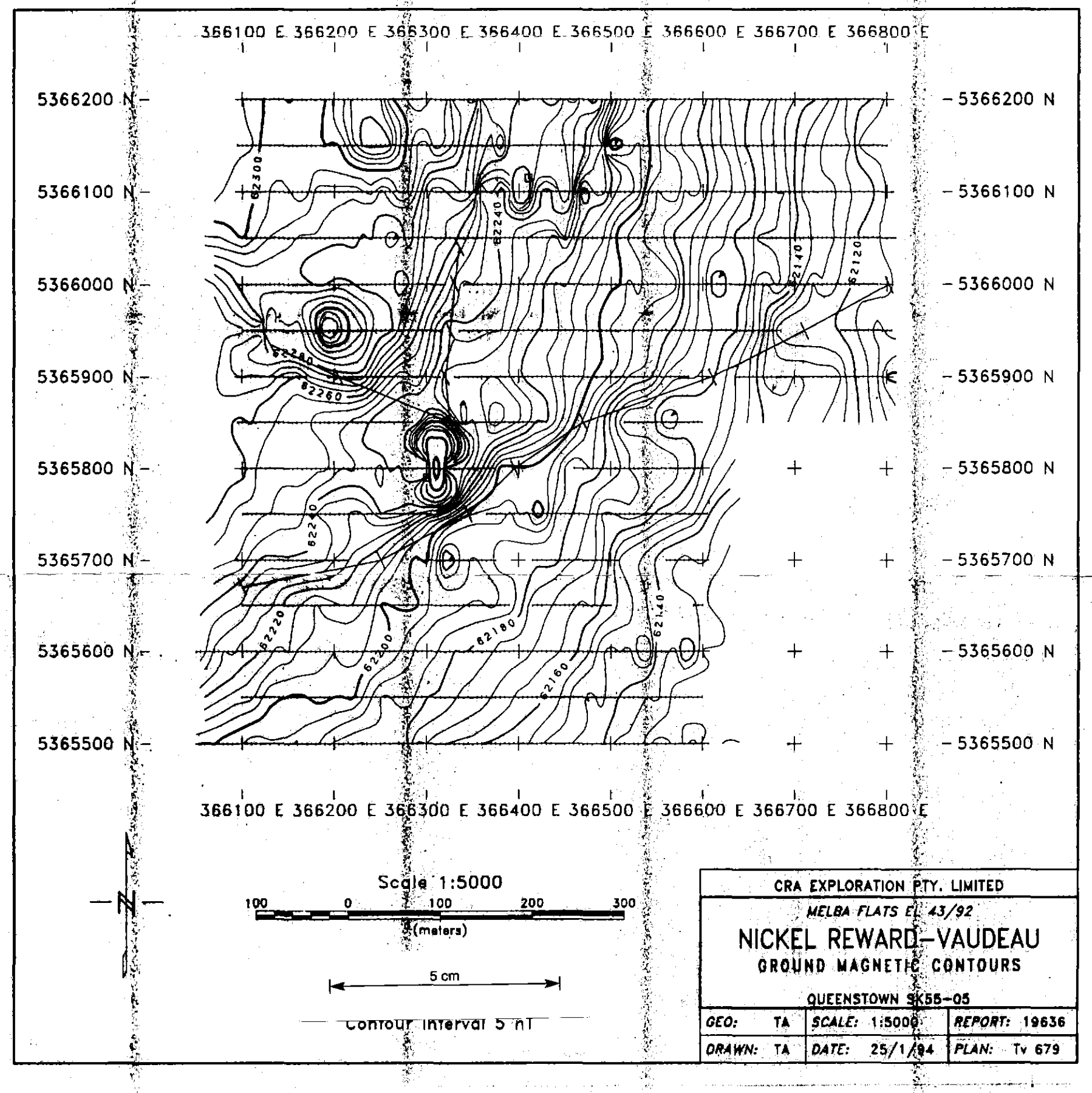
MELBA FLATS EL 43/92

LOCATION PLAN

Ref.: SK55 - 5	Scale: 1: 100 000
Author: T.Aravanis	Report No.: 19636
Drawn: A.Jelen MAR'94	Plan No.: Tv 675

9280 21

Tv 679



CRA EXPLORATION PTY. LIMITED

MELBA FLATS EL 43/92

NICKEL REWARD–VAUDEAU

GROUND MAGNETIC CONTOURS

QUEENSTOWN SK55-05

GEO: TA	*SCALE:* 1:5000	*REPORT:* 19636
DRAWN: TA	*DATE:* 25/1/94	*PLAN:* Tv 679

145°19' 145°20' 145°21' 145°22' 145°23' 145°24' 145°25' 145°26'

5369000 5368000 5367000 5366000 5365000 5364000 5363000

41°50' 41°51' 41°52'

360000 361000 362000 363000 364000 365000 366000 367000 368000 369000 370000

AIRBORNE SURVEY SPECIFICATIONS

AIRCRAFT	BRITTEN NORMAN TRISLANDER.
MAGNETOMETER	SPLIT BEAM CESIUM SCINTREX V201. RESOLUTION 0.01 nanoTeslas. CYCLE RATE: 0.5 seconds.
ELECTROMAGNETIC SYSTEM	SAMPLE INTERVAL: 30 metres. QUESTEM time domain EM TRANSMITTER BASE FREQUENCY: 75.0 Hz CYCLE RATE: 0.25 seconds SAMPLE INTERVAL: 15 metres RECEIVER horizontal axis coil in towed bird MERN WINDOW DELAY TIMES (msec) 0.3509 0.4550 0.5592 0.6634 0.8196 1.0280 1.2363 1.4967 1.7050 1.9655 2.2780 2.7467 3.2675 3.7884 4.2050
DATA ACQUISITION	11 CHANNEL RMS GR33R CHART RECORDER. PICODAS PDRS 1000 ACQUISITION SYSTEM
FLIGHT LINE SPACING	TRAVERSE LINES: 100 metres. TIE LINES: metres.
FLIGHT LINE DIRECTION	TRAVERSE LINES: 070 - 250 degrees. TIE LINES: 150 - 330 degrees.
SURVEY HEIGHT	MEAN TERRAIN CLEARANCE - 150 metres.
NAVIGATION	RSI/TEC GPS satellite positioning

DATA PROCESSING

5 fiducial interval
40 fiducial interval

LEGEND

QUESTEM PEAK RESPONSE SYMBOLS

	SURFICIAL	UP-DIP	BEDROCK	POOR	CULTURE
	✳	✳	✳	✳	■
	✦	✦	✦	✦	1 channel
	✦	✦	✦	✦	2 channel
	✦	✦	✦	✦	3 channel
	✦	✦	✦	✦	4 channel
	✦	✦	✦	✦	5 channel
	✦	✦	✦	✦	6 channel
	✳	✳	✳	✳	7 channel
	◆	◆	◆	◆	8 channel
	◆	◆	◆	◆	9 channel
	◆	◆	◆	◆	10 channel
	◆	◆	◆	◆	11 channel
	◆	◆	◆	◆	12 channel

LEGEND

QUESTEM PEAK RESPONSE SYMBOLS

Anomaly Letter — Apparent Conductivity - Width (siemens)
e.g. B 213
Poorly Defined Response — Channel 4 Amplitude (ppm)

CRA EXPLORATION PTY LIMITED
MELBA FLATS - TASMANIA
AIRBORNE GEOPHYSICAL SURVEY
PRELIMINARY EM ANOMALY

Scale 1:10 000

200 0 200 400 600 800 1000 metres

AUSTRALIAN MAP GRID

Surveyed and compiled by AERODATA HOLDINGS LIMITED
April 1993
Job No. 1935

AERODATA

SHEET LAYOUT

3435 TRIPL	3635 OCEANA	3835 TYNDALL
3436 HEEMSKRK	3636 CRADRS	3836 SELINA
3437 STRINGER	3637 ROSEBURY	3837 TULLAH

GRID NORTH
TRUE NORTH
MAGNETIC NORTH

North point relationships are shown for the centre of the map. Magnetic north is true for 1980.

GRID/MAGNETIC ANGLE 13°19'E
GRID CONVERGENCE -1°5'E.45°
SECULAR VARIATION 0°2'46" east per year

928022

5 cm

94-3554

CRA EXPLORATION PTY. LIMITED		
MELBA FLATS		
AIRBORNE GEOPHYSICAL SURVEY		
PRELIMINARY EM ANOMALY		
QUEENSTOWN SK55-05		
AERODATA	SCALE: 1:10000	REPORT: 1963G
JOB No.: 1935	DATE: 21/06/93	PLAN: Tv 546

145°19' 145°20' 145°21' 145°22' 145°23' 145°24' 145°25' 145°26'

5369000 5368000 5367000 5366000 5365000 5364000 5363000

41°50' 41°51' 41°52'

360000 361000 362000 363000 364000 365000 366000 367000 368000 369000 370000

AIRBORNE SURVEY SPECIFICATIONS

AIRCRAFT	BRITTEN NORMAN TRISLANDER.
MAGNETOMETER	SPUT BEAM CESIUM SCINTREX V201. RESOLUTION 0.01 nanoTeslas. CYCLE RATE: 0.5 seconds. SAMPLE INTERVAL: 30 metres.
ELECTROMAGNETIC SYSTEM	QUESTEM time domain EM TRANSMITTER BASE FREQUENCY: 75.0 Hz CYCLE RATE: 0.25 seconds SAMPLE INTERVAL: 15 metres RECEIVER horizontal axis coil in towed bird MEAN WINDOW DELAY TIMES (msec) 0.3509 0.4550 0.5592 0.6634 0.8196 1.0280 1.2363 1.4967 1.7050 1.9655 2.2780 2.7467 3.2675 3.7884 4.2050
DATA ACQUISITION	11 CHANNEL RMS DR35R CHART RECORDER. PICODAS PDAS 1000 ACQUISITION SYSTEM
FLIGHT LINE SPACING	TRAVERSE LINES: 100 metres. TIE LINES: metres.
FLIGHT LINE DIRECTION	TRAVERSE LINES: 070 - 250 degrees. TIE LINES: 150 - 330 degrees.
SURVEY HEIGHT NAVIGATION	MEAN TERRAIN CLEARANCE - 150 metres. ASHTEC GPS satelite positioning

DATA PROCESSING

BASE: 0.0 nT/m
VERTICAL SCALE: 0.1 (nT/m)/cm
The magnetic data have been corrected for regional gradient by subtraction of I.G.R.F. model 1990 and secular variation model 1990-1995.
Diurnal magnetic variations have been removed.
System parallax has been removed.
Microlevelling has been applied.

CRA EXPLORATION PTY LIMITED
MELBA FLATS - TASMANIA
AIRBORNE GEOPHYSICAL SURVEY
STACKED 1st VD PROFILES

Scale 1:10 000

200 0 200 400 600 800 1000 metres

AUSTRALIAN MAP GRID

Surveyed and compiled by AERODATA HOLDINGS LIMITED
April 1993
Job No. 1936

AERODATA

SHEET LAYOUT

3435 TRIPL	3435 OCONNI	3435 TYNDALL
3436 HEEMSKRK	3436 [illegible]ORS	3436 SELINA
3437 STRINGER	3437 ROSEBURY	3437 TULLAH

GRID NORTH
TRUE NORTH
MAGNETIC NORTH

North point relationships are shown for the centre of the map. Magnetic north is true for 1980.

GRID/MAGNETIC ANGLE 13°10'E
GRID CONVERGENCE -1°51'E 40"
SECULAR VARIATION 0°12'40" east per year

928023

5 cm

94-3554

CRA EXPLORATION PTY. LIMITED

MELBA FLATS

AIRBORNE GEOPHYSICAL SURVEY

STACKED 1st VD PROFILES

QUEENSTOWN SK55-05

AERODATA	SCALE: 1:10000	REPORT: 19636
JOB No.: 1995	DATE: 21/06/93	PLAN: Tv 547

145°19' 145°20' 145°21' 145°22' 145°23' 145°24' 145°25' 145°26'

5382000 5383000 5384000 5385000 5386000 5387000 5388000 5389000

41°50' 41°51' 41°52'

360000 361000 362000 363000 364000 365000 366000 367000 368000 369000 370000

AIRBORNE SURVEY SPECIFICATIONS

AIRCRAFT	BRITTEN NORMAN TRISLANDER.
MAGNETOMETER	SPLIT BEAM CESIUM SCINTREX V201. RESOLUTION 0.01 nanoTeslas. CYCLE RATE: 0.5 seconds. SAMPLE INTERVAL: 30 metres.
ELECTROMAGNETIC SYSTEM	QUESTEM time domain EM TRANSMITTER BASE FREQUENCY: 75.0 Hz CYCLE RATE: 0.25 seconds SAMPLE INTERVAL: 15 metres RECEIVER horizontal axis coil in towed bird MEAN WINDOW DELAY TIMES (msec) 0.3609 0.4550 0.5592 0.6834 0.8196 1.0280 1.2363 1.4967 1.7050 1.9655 2.2760 2.7467 3.2675 3.7884 4.2050
DATA ACQUISITION	11 CHANNEL RMS GR33R CHART RECORDER. PICODAS PDRS 1000 ACQUISITION SYSTEM
FLIGHT LINE SPACING	TRAVERSE LINES: 100 metres. TIE LINES: metres.
FLIGHT LINE DIRECTION	TRAVERSE LINES: 070 - 250 degrees. TIE LINES: 150 - 330 degrees.
SURVEY HEIGHT	MEAN TERRAIN CLEARANCE - 150 metres.
NAVIGATION	ASHTEC GPS satellite positioning

DATA PROCESSING

emB BASE: 0.0 ppm
emB VERTICAL SCALE: 400 ppm/cm
Data has been drift corrected.
System parallax has been removed.

CRA EXPLORATION PTY LIMITED
MELBA FLATS - TASMANIA
AIRBORNE GEOPHYSICAL SURVEY
STACKED emB PROFILES

Scale 1:10 000

200 0 200 400 600 800 1000 metres

AUSTRALIAN MAP GRID

Surveyed and compiled by AERODATA HOLDINGS LIMITED
April 1993
Job No. 1935

AERODATA

SHEET LAYOUT

3435 TRAIL	3435 OCEANA	3835 TYNDALL
3436 HEEMSKIRK	3836 MELBA FLATS	3836 SELINA
3437 STRINGER	3637 ROSEBURY	3937 TULLAH

North point relationships are shown for the centre of the map.
Magnetic north is true for 1990.

GRID-MAGNETIC ANGLE 13°19'03"
GRID CONVERGENCE -1°05.45'
SECULAR VARIATION 0°2'40" east per year

928024

5 cm

94-3554

CRA EXPLORATION PTY. LIMITED

MELBA FLATS

AIRBORNE GEOPHYSICAL SURVEY

STACKED emB PROFILES

QUEENSTOWN SK55-05

AERODATA	SCALE: 1:10000	REPORT: 19636
JOB No.: 1935	DATE: 21/06/93	PLAN: Tv 548

145°19' 145°20' 145°21' 145°22' 145°23' 145°24' 145°25' 145°26'

5368000 5366000 5364000 5362000

41°30' 41°32'

360000 361000 362000 363000 364000 365000 366000 367000 368000 369000 370000

AIRBORNE SURVEY SPECIFICATIONS

AIRCRAFT	BRITTEN NORMAN TRISLANDER.
MAGNETOMETER	SPLIT BEAM CESIUM SCINTREX V201. RESOLUTION 0.01 nanoTeslas. CYCLE RATE: 0.5 seconds. SAMPLE INTERVAL: 30 metres.
ELECTROMAGNETIC SYSTEM	QUESTEM time domain EM TRANSMITTER BASE FREQUENCY: 75.0 Hz CYCLE RATE: 0.25 seconds SAMPLE INTERVAL: 15 metres RECEIVER horizontal axis coil in towed bird MEAN WINDOW DELAY TIMES (msec) 0.3609 0.4550 0.5592 0.6834 0.8196 1.0280 1.2363 1.4967 1.7050 1.9655 2.2760 2.7467 3.2675 3.7984 4.2050
DATA ACQUISITION	11 CHANNEL RMS GR33R CHART RECORDER. PICODAS PDAS 1000 ACQUISITION SYSTEM
FLIGHT LINE SPACING	TRAVERSE LINES: 100 metres. TIE LINES: metres.
FLIGHT LINE DIRECTION	TRAVERSE LINES: 070 - 250 degrees. TIE LINES: 150 - 330 degrees.
SURVEY HEIGHT NAVIGATION	MEAN TERRAIN CLEARANCE - 150 metres. ASHTEC GPS satellite positioning

DATA PROCESSING

emS BASE: 0.0 ppm
emS VERTICAL SCALE: 400 ppm/cm
Data has been drift corrected.
System parallax has been removed.

CRA EXPLORATION PTY LIMITED
MELBA FLATS - TASMANIA
AIRBORNE GEOPHYSICAL SURVEY
STACKED emS PROFILES

Scale 1:10 000

200 0 200 400 600 800 1000 metres

AUSTRALIAN MAP GRID

Surveyed and compiled by AERODATA HOLDINGS LIMITED
April 1993
Job No. 1936

AERODATA

SHEET LAYOUT

	360000	380000	400000
5380000	3435 TARL	3436 OCEANA	3436 TYNDALL
5370000	3436 HEEMSKIRK	3436 MELBA FLATS	3436 SELINA
5360000	3437 STRINGER	3437 ROSEBURY	3437 TULLAH
5350000			

GRID NORTH
TRUE NORTH
MAGNETIC NORTH

North point relationships are shown for the centre of the map. Magnetic north is true for 1980.

GRID/MAGNETIC ANGLE 13°19'E
GRID CONVERGENCE -1°15'E 45'
SECULAR VARIATION 0°2'45" east per year

928025

5 cm

94-3554

CRA EXPLORATION PTY. LIMITED

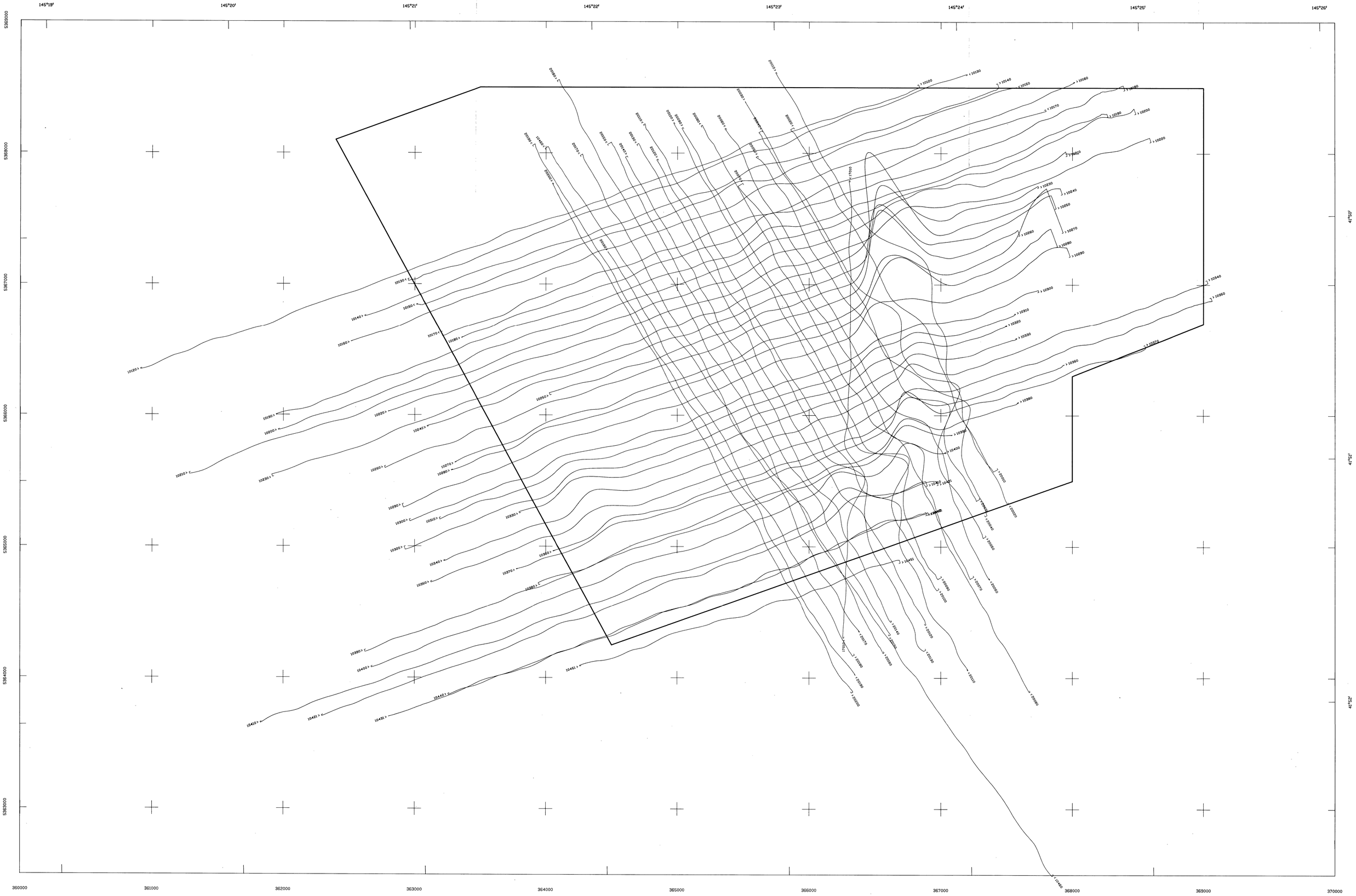
MELBA FLATS

AIRBORNE GEOPHYSICAL SURVEY

STACKED emS PROFILES

QUEENSTOWN SK55-05

AERODATA	SCALE: 1:10000	REPORT: **19636**
JOB No.: 1935	DATE: 21/06/93	PLAN: **Tv 550**



AIRBORNE SURVEY SPECIFICATIONS

AIRCRAFT	BRITTEN NORMAN TRISLANDER.
MAGNETOMETER	SPLIT BEAM CESIUM SCINTREX V201. RESOLUTION 0.01 nanoTeslas.
	CYCLE RATE: 0.5 seconds.
	SAMPLE INTERVAL: 30 metres.
ELECTROMAGNETIC SYSTEM	QUESTEM time domain EM
	TRANSMITTER BASE FREQUENCY: 75.0 Hz
	CYCLE RATE: 0.25 seconds
	SAMPLE INTERVAL: 15 metres
	RECEIVER horizontal coils coil in towed bird
	MEAN WINDOW DELAY TIMES (msec)
	0.3509 0.4550 0.5552 0.6634 0.8196
	1.0280 1.2363 1.4957 1.7050 1.9655
	2.2780 2.7467 3.2675 3.7884 4.2050
DATA ACQUISITION	11 CHANNEL RMS GR33R CHART RECORDER.
	PICODAS PDAS 1000 ACQUISITION SYSTEM
FLIGHT LINE SPACING	TRAVERSE LINES: 100 metres.
	TIE LINES: metres.
FLIGHT LINE DIRECTION	TRAVERSE LINES: 070 - 250 degrees.
	TIE LINES: 150 - 330 degrees.
SURVEY HEIGHT	MEAN TERRAIN CLEARANCE - 150 metres.
NAVIGATION	ASHTEC GPS satellite positioning

DATA PROCESSING

emi BASE: 0.0 ppm
emi VERTICAL SCALE: 400 ppm/cm
Data has been drift corrected.
System parallax has been removed.

CRA EXPLORATION PTY LIMITED
MELBA FLATS - TASMANIA
AIRBORNE GEOPHYSICAL SURVEY
STACKED emi PROFILES

Scale 1:10 000

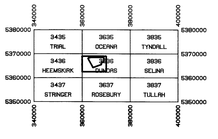
200 0 200 400 600 800 1000 metres

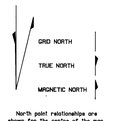
AUSTRALIAN MAP GRID

Surveyed and compiled by AERODATA HOLDINGS LIMITED
April 1993
Job No. 1335

AERODATA

SHEET LAYOUT





North point relationships are shown for the centre of the map. Magnetic north is true for 1980.

GRID/MAGNETIC ANGLE 13°15'0"
GRID CONVERGENCE -1°5'6.42"
SECULAR VARIATION 0°2'48" east per year

928026

5 cm

94-3554

CRA EXPLORATION PTY. LIMITED		
MELBA FLATS		
AIRBORNE GEOPHYSICAL SURVEY		
STACKED emi PROFILES		
QUEENSTOWN SK55-05		
AERODATA	SCALE: 1:10000	REPORT: 19636
JOB No.: 1335	DATE: 21/06/93	PLAN: Tv 551

145°19' 145°20' 145°21' 145°22' 145°23' 145°24' 145°25' 145°26'

5363000 5366000 5367000 5366000 5365000 5364000 5363000

41°50' 41°51' 41°52'

360000 361000 362000 363000 364000 365000 366000 367000 368000 369000 370000

AIRBORNE SURVEY SPECIFICATIONS

AIRCRAFT	BRITTEN NORMAN TRISLANDER.
MAGNETOMETER	SPLIT BEAM CESIUM SCINTREX V201. RESOLUTION 0.01 nanoTeslas. CYCLE RATE: 0.5 seconds. SAMPLE INTERVAL: 30 metres.
ELECTROMAGNETIC SYSTEM	QUESTEM time domain EM TRANSMITTER BASE FREQUENCY: 75.0 Hz CYCLE RATE: 0.25 seconds SAMPLE INTERVAL: 15 metres RECEIVER horizontal axis coil in towed bird MEAN WINDOW DELAY TIMES (msec) 0.3509 0.4550 0.5592 0.6834 0.8196 1.0280 1.2363 1.4967 1.7050 1.9655 2.2780 2.7467 3.2675 3.7884 4.2050
DATA ACQUISITION	11 CHANNEL RMS GR33R CHART RECORDER. PICODAS PDAS 1000 ACQUISITION SYSTEM
FLIGHT LINE SPACING	TRAVERSE LINES: 100 metres. TIE LINES: metres.
FLIGHT LINE DIRECTION	TRAVERSE LINES: 070 - 250 degrees. TIE LINES: 150 - 330 degrees.
SURVEY HEIGHT NAVIGATION	MEAN TERRAIN CLEARANCE - 150 metres. ASHTEC GPS satellite positioning

DATA PROCESSING

CONTOUR INTERVAL: 2 nanoTeslas
GRID CELL SIZE: 30 metres
The magnetic data have been corrected for regional gradient by subtraction of I.G.R.F. model 1990 and secular variation model 1990-1995.
Diurnal magnetic variations have been removed.
System parallax has been removed.
Microlevelling has been applied.

CRA EXPLORATION PTY LIMITED
MELBA FLATS - TASMANIA
AIRBORNE GEOPHYSICAL SURVEY
MAGNETIC INTENSITY CONTOURS

Scale 1:10 000

200 0 200 400 600 800 1000 metres

AUSTRALIAN MAP GRID

Surveyed and compiled by AERODATA HOLDINGS LIMITED
April 1993
Job No. 1335

AERODATA

SHEET LAYOUT

3435 TRAIL	3636 COOPAH	3835 TYNDALL
3436 HEEMSKIRK	3636 MELBA FLATS	3836 BELMAR
3437 STRINGER	3637 ROSEBURY	3837 TULLAH

GRID NORTH
TRUE NORTH
MAGNETIC NORTH

North point relationships are shown for the centre of the map.
Magnetic north is true for 1990.

GRID/MAGNETIC ANGLE 13°19'0"E
GRID CONVERGENCE -1°53'4.4"E
SECULAR VARIATION 0°2'46" east per year

928027

6 cm

94-3554

CRA EXPLORATION PTY. LIMITED		
MELBA FLATS		
AIRBORNE GEOPHYSICAL SURVEY		
MAGNETIC INTENSITY CONTOURS		
QUEENSTOWN SK55-05		
AERODATA	SCALE: 1:10000	REPORT: 1963G
JOB No.: 1335	DATE: 21/06/93	PLAN: Tv 552

145°19' 145°20' 145°21' 145°22' 145°23' 145°24' 145°25' 145°26'

5388000 5384000 5381000 5387000 5386000 5385000 5383000

41°50' 41°51' 41°52'

360000 361000 362000 363000 364000 365000 366000 367000 368000 369000 370000

AIRBORNE SURVEY SPECIFICATIONS

AIRCRAFT	BRITTEN NORMAN TRISLANDER.
MAGNETOMETER	SPLIT BEAM CESIUM SCINTREX V201. RESOLUTION 0.01 nanoTeslas. CYCLE RATE:- 0.5 seconds. SAMPLE INTERVAL:- 30 metres.
ELECTROMAGNETIC SYSTEM	QUESTEM time domain EM TRANSMITTER BASE FREQUENCY:- 75.0 Hz CYCLE RATE:- 0.25 seconds SAMPLE INTERVAL:- 15 metres RECEIVER horizontal axis coil in towed bird MEAN WINDOW DELAY TIMES (msec) 0.3509 0.4450 0.5532 0.6834 0.8196 1.0280 1.2363 1.4967 1.7050 1.9655 2.2780 2.7467 3.2675 3.7884 4.2050
DATA ACQUISITION	11 CHANNEL RMS GR33R CHART RECORDER. PICODAS PDAS 1000 ACQUISITION SYSTEM
FLIGHT LINE SPACING	TRAVERSE LINES:- 100 metres. TIE LINES:- metres.
FLIGHT LINE DIRECTION	TRAVERSE LINES:- 070 - 250 degrees. TIE LINES:- 150 - 330 degrees.
SURVEY HEIGHT NAVIGATION	MEAN TERRAIN CLEARANCE - 150 metres. ASHTEC GPS satellite positioning

DATA PROCESSING

5 fiducial interval
40 fiducial interval

CRA EXPLORATION PTY LIMITED
MELBA FLATS - TASMANIA
AIRBORNE GEOPHYSICAL SURVEY
FLIGHT PATH

Scale 1:10 000

200 0 200 400 600 800 1000 metres

AUSTRALIAN MAP GRID

Surveyed and compiled by AERODATA HOLDINGS LIMITED
April 1993
Job No. 1335

AERODATA

SHEET LAYOUT

3435 TRAIL	3436 OCEANA	3436 TYNDALL
3436 HEEMSKIRK	3437 MELBA FLATS	3437 SELINA
3437 STRINGER	3437 ROSEBURY	3437 TULLAH

GRID NORTH
TRUE NORTH
MAGNETIC NORTH

North point relationships are shown for the centre of the map. Magnetic north is true for 1990.

GRID/MAGNETIC ANGLE 13°19'E
GRID CONVERGENCE -1°10.4E
SECULAR VARIATION 0°2'48" east per year

928028

5 cm

94-3554

CRA EXPLORATION PTY. LIMITED	
MELBA FLATS	
AIRBORNE GEOPHYSICAL SURVEY	
FLIGHT PATH	
QUEENSTOWN SK55-05	
AERODATA	SCALE:- 1:10000 / REPORT:-
JOB No.:- 1335	DATE:- 21/06/93 / PLAN:- Tv 553

T-Q Tertiary, Quaternary

P-J Permo-Carboniferous beds and Jurassic dolerite

+ + Devonian granite

S-D Siluro-Devonian Eldon Group

Ogl Ordovician Gordon Gp Limestone

Upper Cambrian-Lower Ordovician Owen Conglomerate and correlates

Middle - Upper Cambrian Dundas Gp

Quartzwacke sequence at Farrell Rivulet

Mafic volcanics

Ultramafic-mafic complexes & gabbros

Crimson Creek Formation

Success Creek Group

Precambrian

0 5 Km

Lake Pieman

RENISON BELL

Colebrook Hill

5370

Serpentine Hill

CUNI

ROSEBERY FAULT

Moores Pimple

DUNDAS

ZEEHAN

Misery Hill

Mt Dundas

5360

McIvor Hill

LITTLE HENTY FAULT

FIREWOOD SIDING FAULT

Professor Range

HENTY BRIDGE

STH. HENTY FAULT

5350

Henty R.

The Sisters

WESTERN SEQUENCE

SOUTHERN OCEAN

350

360

370

5 cm

CRA EXPLORATION PTY. LIMITED

ZEEHAN PROJECT

REGIONAL GEOLOGY

Ref.: SK55-5	Scale: 1:100 000
Author: RGP	Report No.: 19636
Drawn: RGP	Plan No.: Tv628

363000 E 363500 E 364000 E 364500 E 365000 E 365500 E 366000 E 366500 E 367000 E 367500 E 368000 E 368500 E 369000 E 369500 E

5370500 N
5370000 N
5369500 N
5369000 N
5368500 N
5368000 N
5367500 N
5367000 N
5366500 N
5366000 N
5365500 N
5365000 N
5364500 N

NORTH CUNI GRAVITY TRAVERSE

North Cuni Grid

SOUTH CUNI GRAVITY TRAVERSE

VAUDEAU GRAVITY TRAVERSE

Nickel Reward–Vaudeau Grid

928030

5 cm

Contour interval 0.2 mgals

× Gravity station

Scale 1:10000

100 0 100 200 300 400 500 600 (meters)

94-3554

CRA EXPLORATION PTY. LIMITED

MELBA FLATS EL 43/92

GRAVITY CONTOURS

BOUGUER DENSITY 2.67 g/cc

QUEENSTOWN SK 55-05

GEO:	TA	*SCALE:*	1:10000	*REPORT:*	19636
DRAWN:	TA	*DATE:*	29.3.1994	*PLAN:*	Tv 631

94-3554

928031

Blowfly (approx)

Mosquito

MELBA CREEK

3528459-61
3184280-85
3911746
3911754-56
3308019-21
3911751,52
Vaudeau
3911753
3184279

5 366 200N
5 366 100N
5 366 000N
5 365 900N
5 365 800N
5 365 700N
5 365 600N
5 365 500N

Melba Siding

NEVADA CREEK

Old NE Dundas Tramway

3184293
3184292
3184294

Cleared Area

3528456-8

Nickel Reward

Picnic Ground

Cleared Area

Old Scout Camp

Cleared Area

To Zeehan

Emu Bay Railway (Disused)

To Zeehan

To Murchison Highway

5 cm

365 700E
365 800E
366 900E
366 000E
366 100E
366 200E
366 300E
366 400E
366 500E
366 600E
366 700E
366 800E

Limit of Swamp
Creeks
Tracks
Disused Tracks
Vaudeau — Shafts
Costean

Based on ground traverses, and airphoto interpretation with additional information from Blisset (1962; Plate 17).

AMG North
Mag. North

0 50 100 150 200
metres

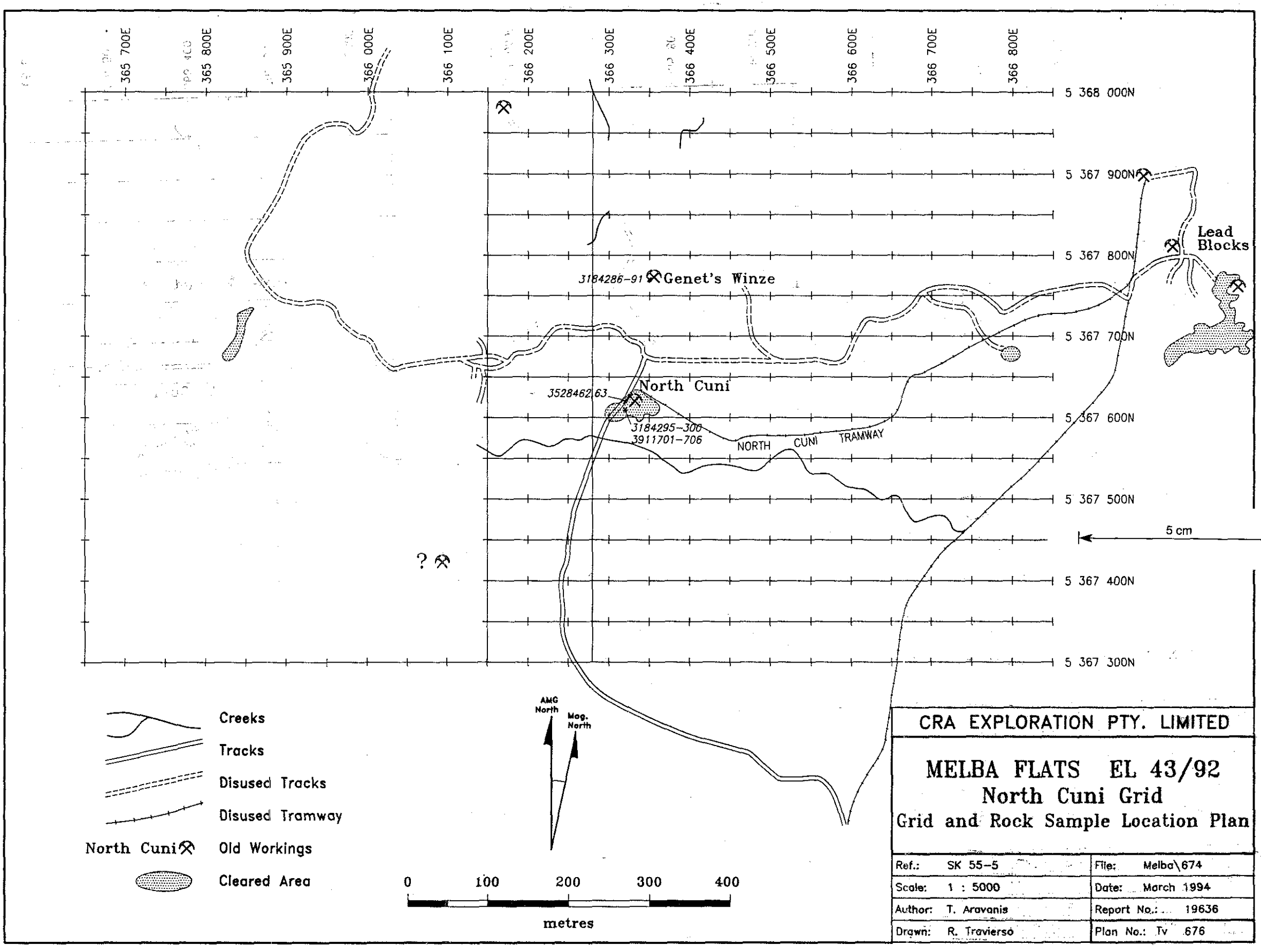
CRA EXPLORATION PTY. LIMITED

MELBA FLATS EL 43/92

Nickel Reward–Vaudeau Grid

Grid and Rock Sample Location Plan

Ref.:	SK 55-5	File:	Melba\674
Scale:	1 : 2500	Date:	March 1994
Author:	T. Aravanis	Report No.:	19636
Drawn:	R. Travierso	Plan No.:	Tv 674



CRA EXPLORATION PTY. LIMITED

MELBA FLATS EL 43/92
North Cuni Grid
Grid and Rock Sample Location Plan

Ref.: SK 55-5	File: Melba\674
Scale: 1 : 5000	Date: March 1994
Author: T. Aravanis	Report No.: 19636
Drawn: R. Traviersó	Plan No.: Tv 676

366000 E 366500 E 367000 E 367500 E 368000 E

5368000 N — 5368000 N

Pb

GENET'S WINZE
CuNi

NORTH CUNI
CuNi

Pb + 3528464-66

PbAg LEAD BLOCKS

SERPENTINE HILL Asbestos)
(Approx)

+ 3528477

3313769 +

+ 3528476

5367500 N — 5367500 N

NORTH CUNI GRID
for more detail refer to Tv 676

3528475 +

3528474 +

3528473 +

3528472 +

3528471 +

3528470 +

5367000 N — 5367000 N

SOUTH CUNI (approx)
CuNi

5366500 N — 5366500 N

Pb DUKE OF YORK
(Approx)

MOSQUITO
CuNi

McKIMMIE Pb
(Approx)

5 cm

VAUDEAU
CuNi

5366000 N — 5366000 N

928033

NICKEL REWARD
CuNi

NICKEL REWARD-VAUDEAU GRID
for more detail refer to Tv 674

5365500 N — 5365500 N

366000 E 366500 E 367000 E 367500 E 368000

94-3554

Scale 1:10000

100 0 100 200 300 400 500 600
(meters)

CuNi
VAUDEAU Old Workings & Commodity
+ Rock Chip Sample Location
· Soil Sample Location

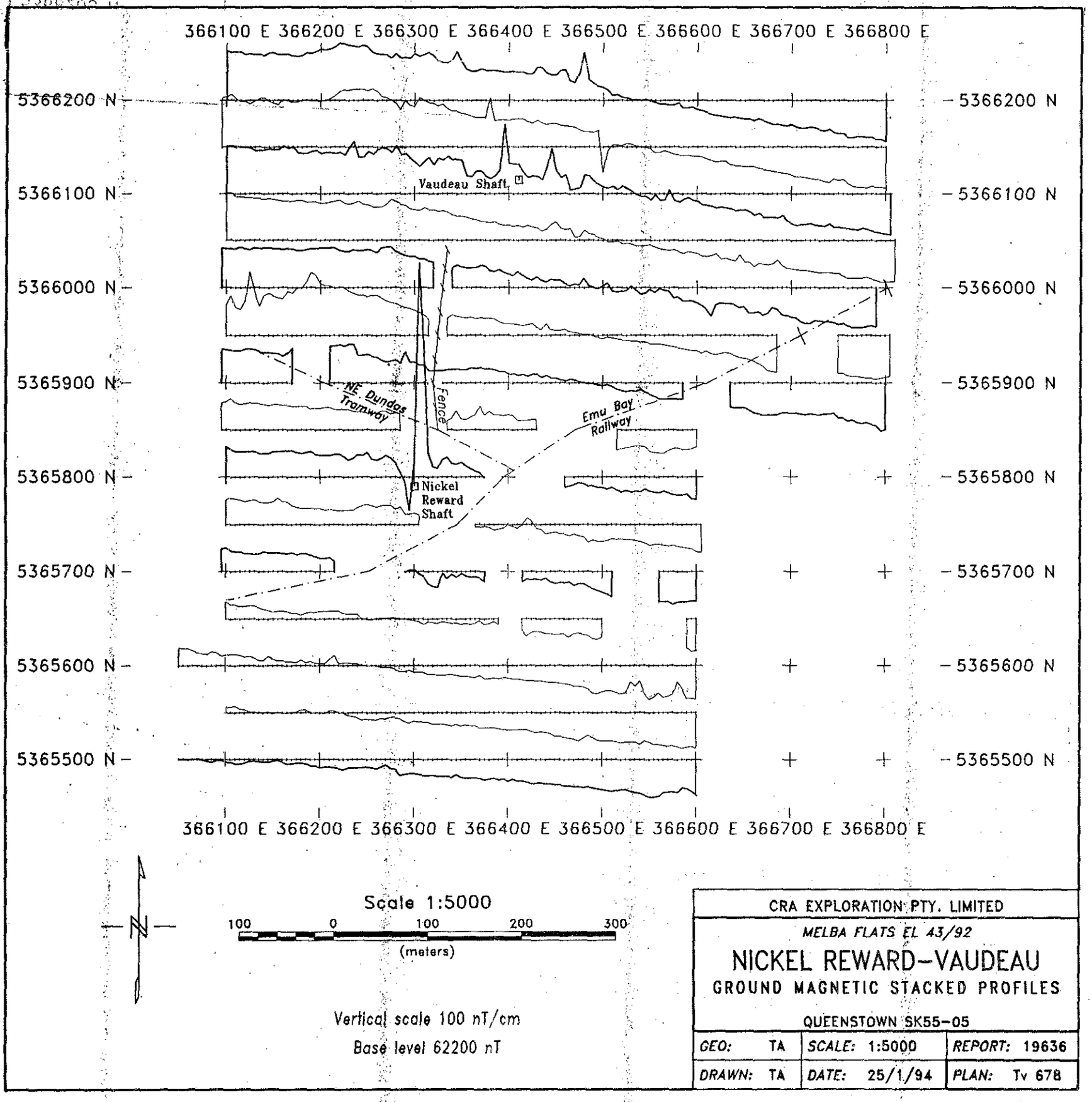
CRA EXPLORATION PTY. LIMITED

MELBA FLATS EL 43/92

ROCK CHIP AND SOIL SAMPLE
LOCATION PLAN

QUEENSTOWN SK55-05

GEO:	TA	*SCALE:*	1:10000	*REPORT:*	19636
DRAWN:	TA	*DATE:*	25/1/94	*PLAN:*	Tv 677



Scale 1:5000

100 0 100 200 300

(meters)

Vertical scale 100 nT/cm

Base level 62200 nT

CRA EXPLORATION PTY. LIMITED

MELBA FLATS EL 43/92

NICKEL REWARD–VAUDEAU

GROUND MAGNETIC STACKED PROFILES

QUEENSTOWN SK55-05

GEO:	TA	*SCALE:*	1:5000	*REPORT:*	19636
DRAWN:	TA	*DATE:*	25/1/94	*PLAN:*	Tv 678

5 cm

928034

94-3554

REFERENCE

STRATIGRAPHY

Cainozoic	Qra	Marsh and swamp deposits; alluvium; river gravels; talus.
Devonian	Db	Bell Shale (Siltstone).
	Df	Florence Quartzite (Sandstone).
Silurian	Sac	Austral Creek Siltstone (Siltstone)
	Sk	Keel Quartzite (Sandstone).
	Sa	Amber Slate (Siltstone).
	Sc	Crotty Quartzite (Dominantly sandstone with minor siltstone).
Middle Cambrian	€db	Brewery Junction Formation (Interbedded siltstone, sandstone and conglomerate).
	€dra	Razorback Conglomerate (Dominantly chert deriver, interbedded conglomerate, pebbly sandstone and sandstone).
	€dh	Hodge Slate (Interbedded siltstone and mudstone with minor sandstone).
	€dre	Red Lead Conglomerate (Poorly-sorted, volcaniclastic, polymic conglomerate).
Cambrian (?)	€vs	Interbedded black mudstone, red siltstone, grey Volcaniclastic (andesitic) lithicwacke and quartz wacke.
Eocambrian	€cc	Crimson Creek Formation (Volcaniclastic [basaltic] lithicwacke, siltstone and mudstone with intercolated tholeiitic basalt flows).
	€sru	Success Creek group (Dominantly Siltstone).
	€sd	Success Creek group (Dominantly Sandstone).

IGNEOUS ROCKS

Devonian (?)	Dgq	Red and white massive quartz bodies.
Cambrian (?)	€g	Subophitic textured gabbroic rocks.
Cambrian	€sb	Basalt, commonly with pillows and individual flows graded from coarse-grained bases to fine-grained tops.
	€sg	Massive and multiply-intrusive two-pyroxene, granular textured gabbro
	€spg	Serpentinised peridotite with intrusive gabbro.
	€sp	Serpentinised, orthopyroxene-rich, peridotite.
	€so	Serpentinised, olivine-rich, peridotite.
	€ss	Undifferentiated, massive and foliated, serpentinite.

Geological boundary, approximate.

Faulted Boundary, approximate.

Bedding, facing known, unknown.

Foliation, undifferentiated, vertical.

Blowfly — Abandoned mine or working.

Geology after Brown 1991 and ZEEHAN 1:50,000 Geological Map (unpublished).

5 370 000mN
5 369 000mN
5 368 000mN
5 367 000mN
5 366 000mN
5 365 000mN
364 000mE
365 000mE
366 000mE
367 000mE
368 000mE
369 000mE

Genet's Winze
North Cuni
South Cuni
Blowfly
Mosquito
Vaudeau
Nickel Reward
Deveraux
Lead Blocks
Serpentine Hill
McKimmie
Melba Siding
RIVER
HENTY
LITTLE
MELBA
Emu
Boy
Railway
HIGHWAY
MURCHISON
NEVADA
CREEK
MELBA FLATS

AMG North
Mag North
12 1°
5 cm
0 200 400 600 800
metres

CRA EXPLORATION PTY. LIMITED

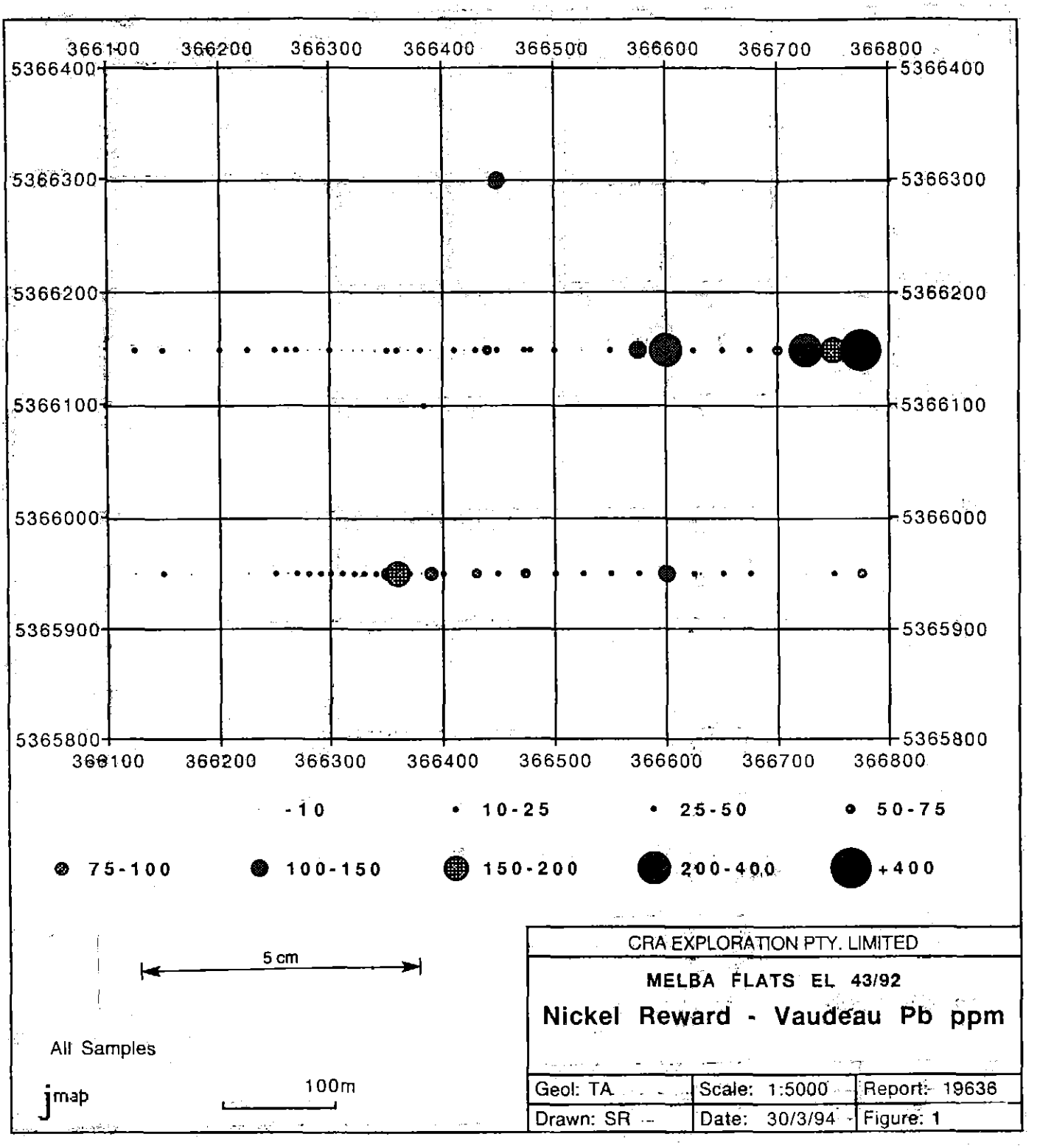
MELBA FLATS EL 43/92

GEOLOGICAL MAP

94-3554

Ref.	SK 55-05	File	Melba\680
Scale	1 10,000	Date	April 1994
Author	T. Aravanis	Report No.:	19636
Drawn.	R Travierso	Plan No. Tv	680

928035



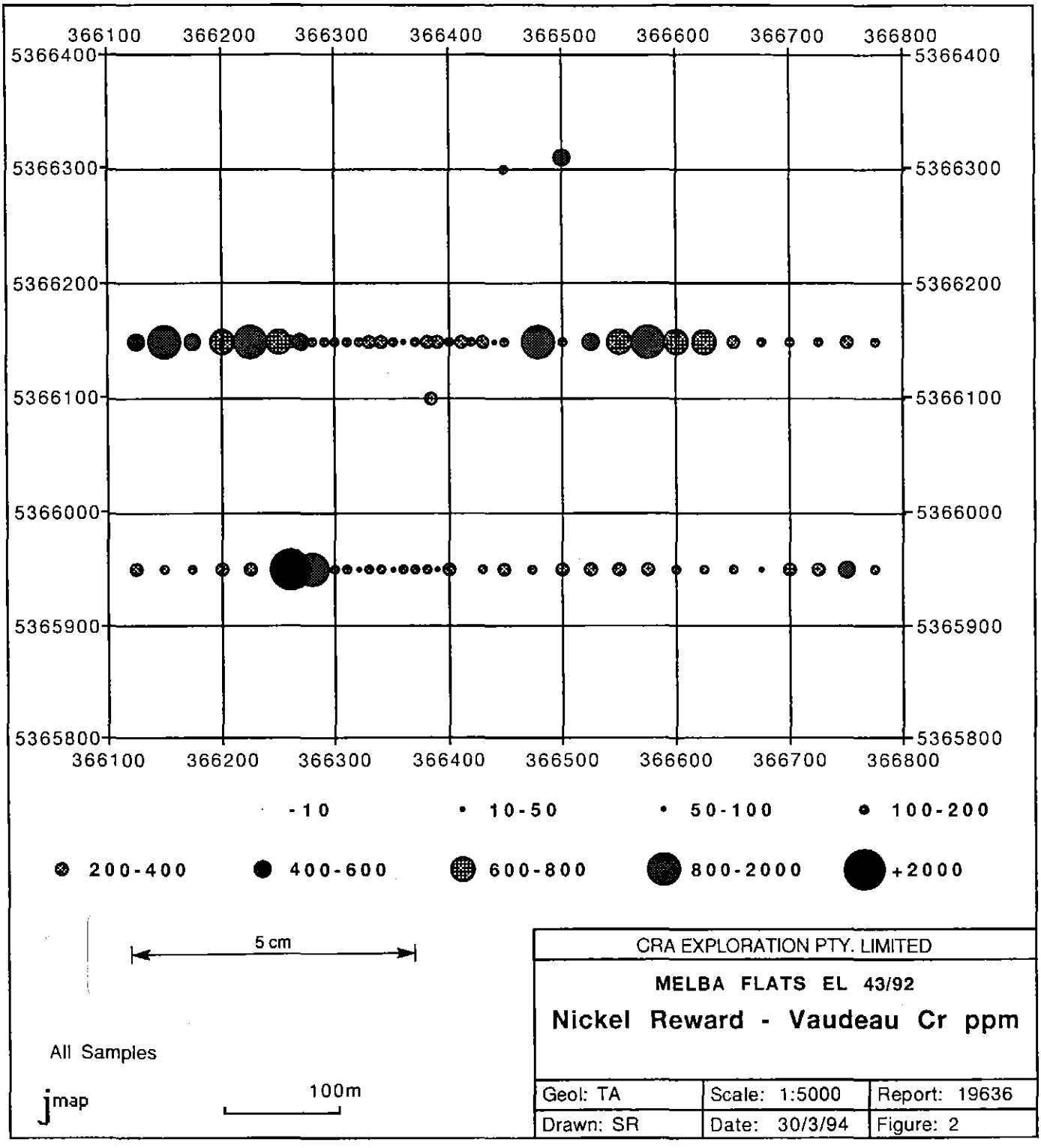
CRA EXPLORATION PTY. LIMITED

MELBA FLATS EL 43/92

Nickel Reward - Vaudeau Pb ppm

Geol: TA	Scale: 1:5000	Report: 19636
Drawn: SR	Date: 30/3/94	Figure: 1

928036



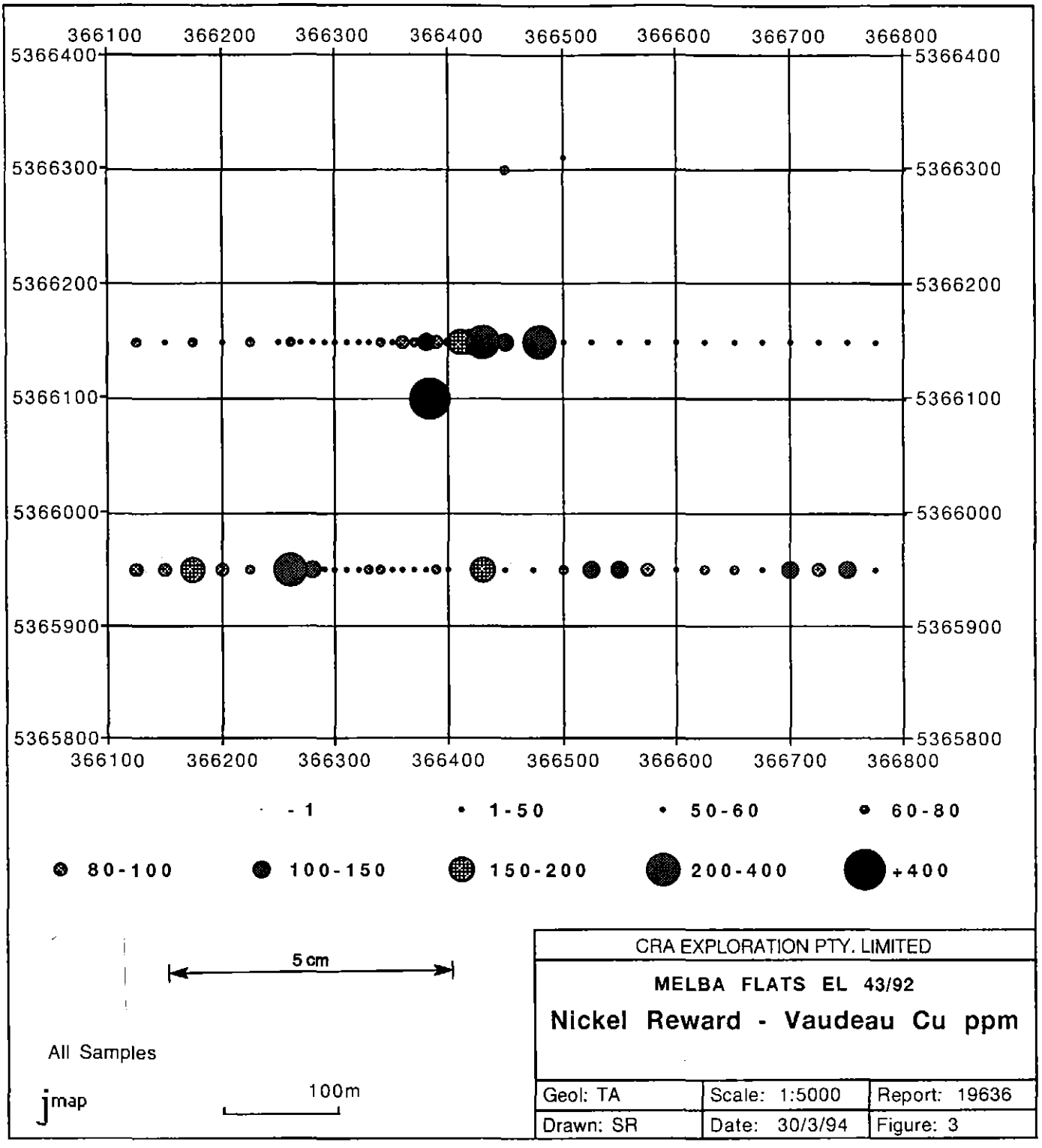
CRA EXPLORATION PTY. LIMITED

MELBA FLATS EL 43/92

Nickel Reward - Vaudeau Cr ppm

Geol: TA	Scale: 1:5000	Report: 19636
Drawn: SR	Date: 30/3/94	Figure: 2

928037



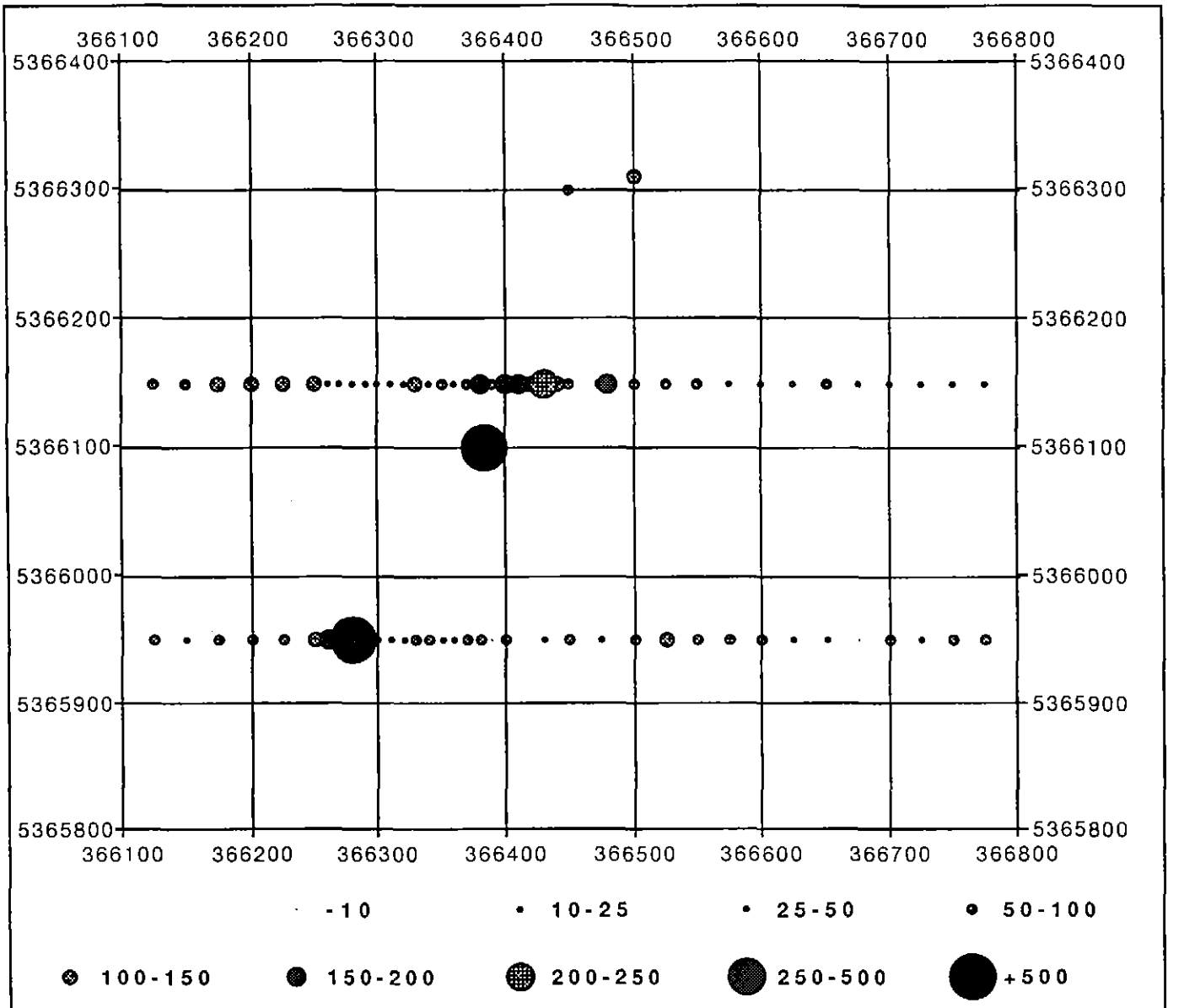
CRA EXPLORATION PTY. LIMITED

MELBA FLATS EL 43/92

Nickel Reward - Vaudeau Cu ppm

Geol: TA	Scale: 1:5000	Report: 19636
Drawn: SR	Date: 30/3/94	Figure: 3

928038



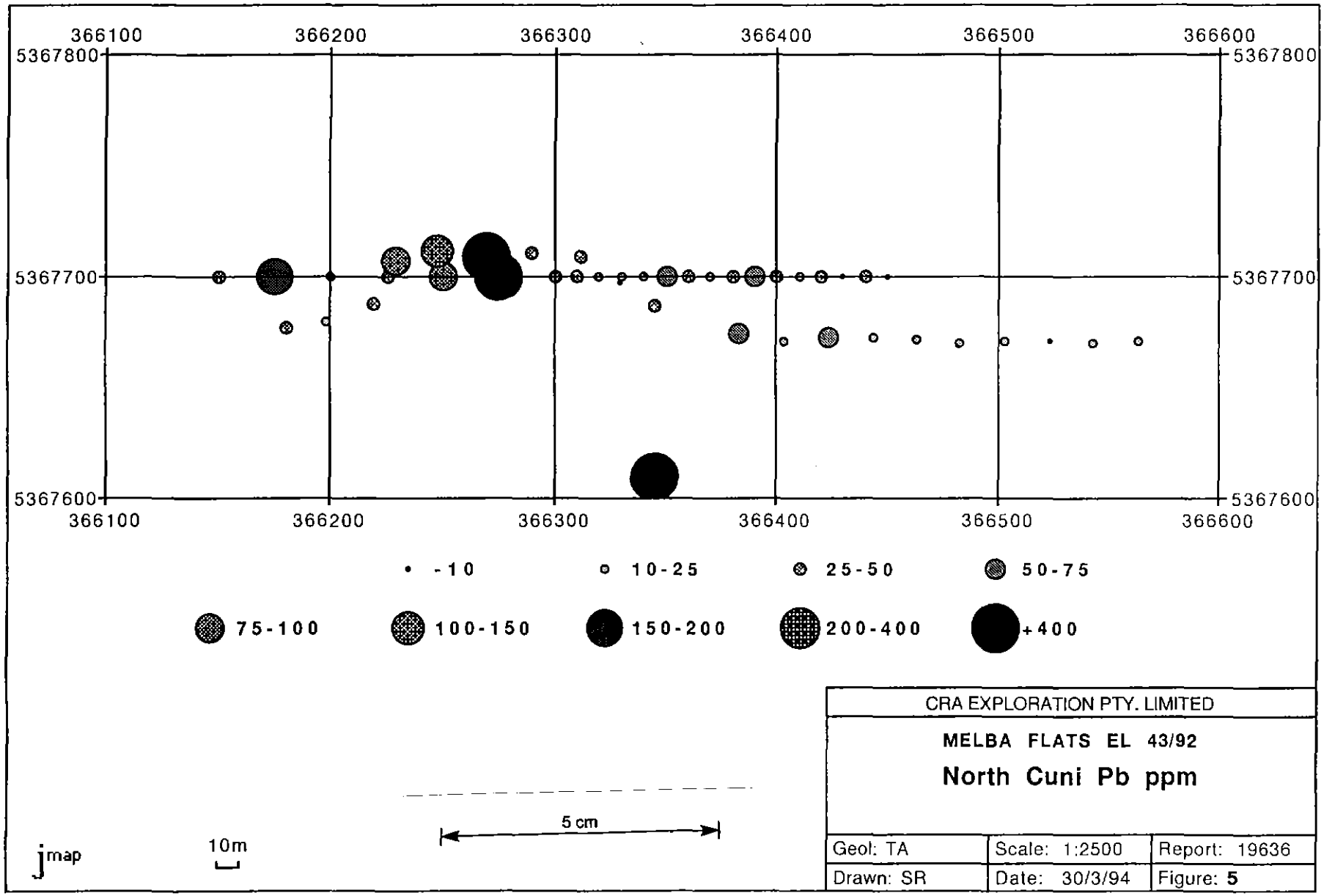
CRA EXPLORATION PTY. LIMITED

MELBA FLATS EL 43/92

Nickel Reward - Vaudeau Ni ppm

Geol: TA	Scale: 1:5000	Report: 19636
Drawn: SR	Date: 30/3/94	Figure: 4

928039

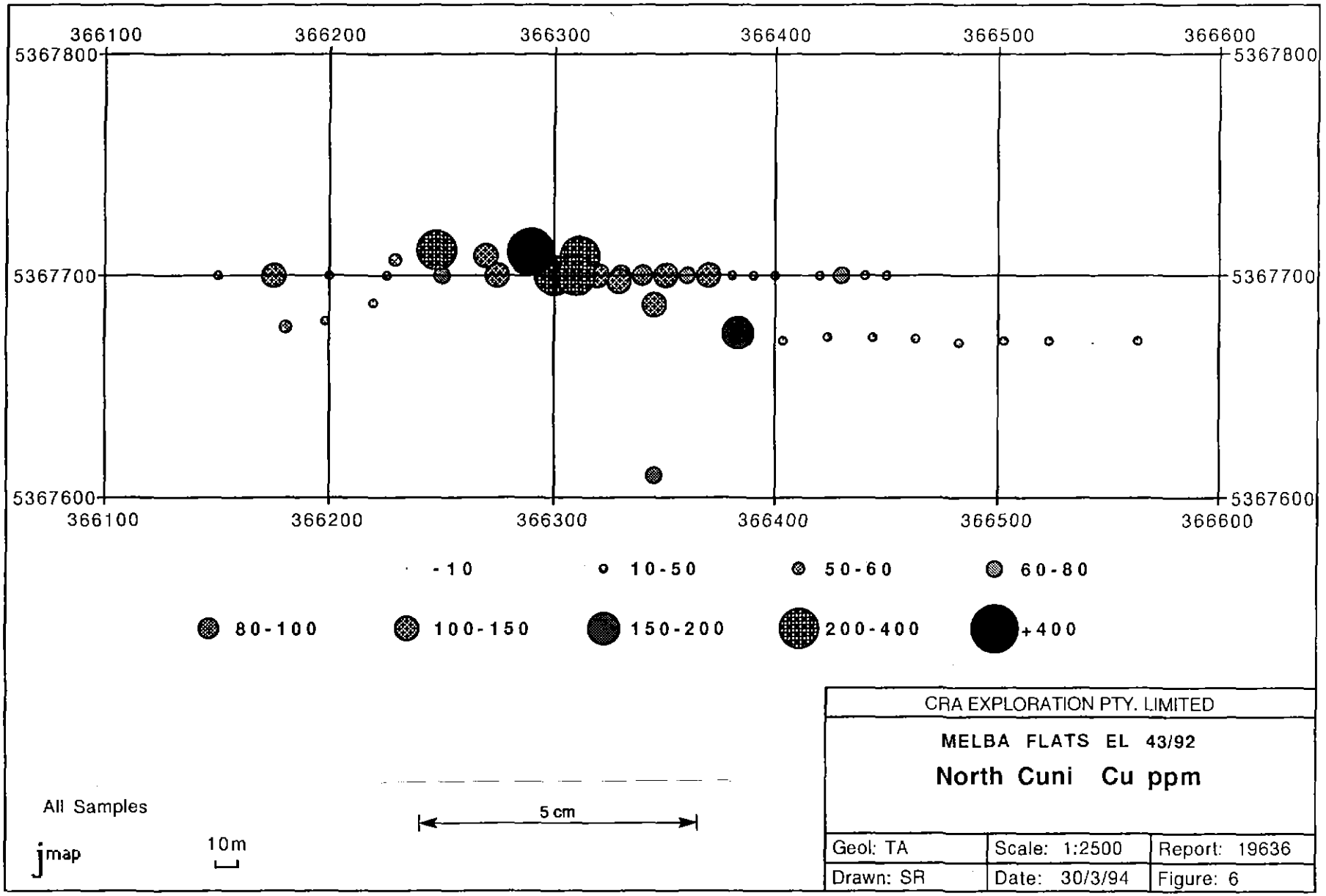


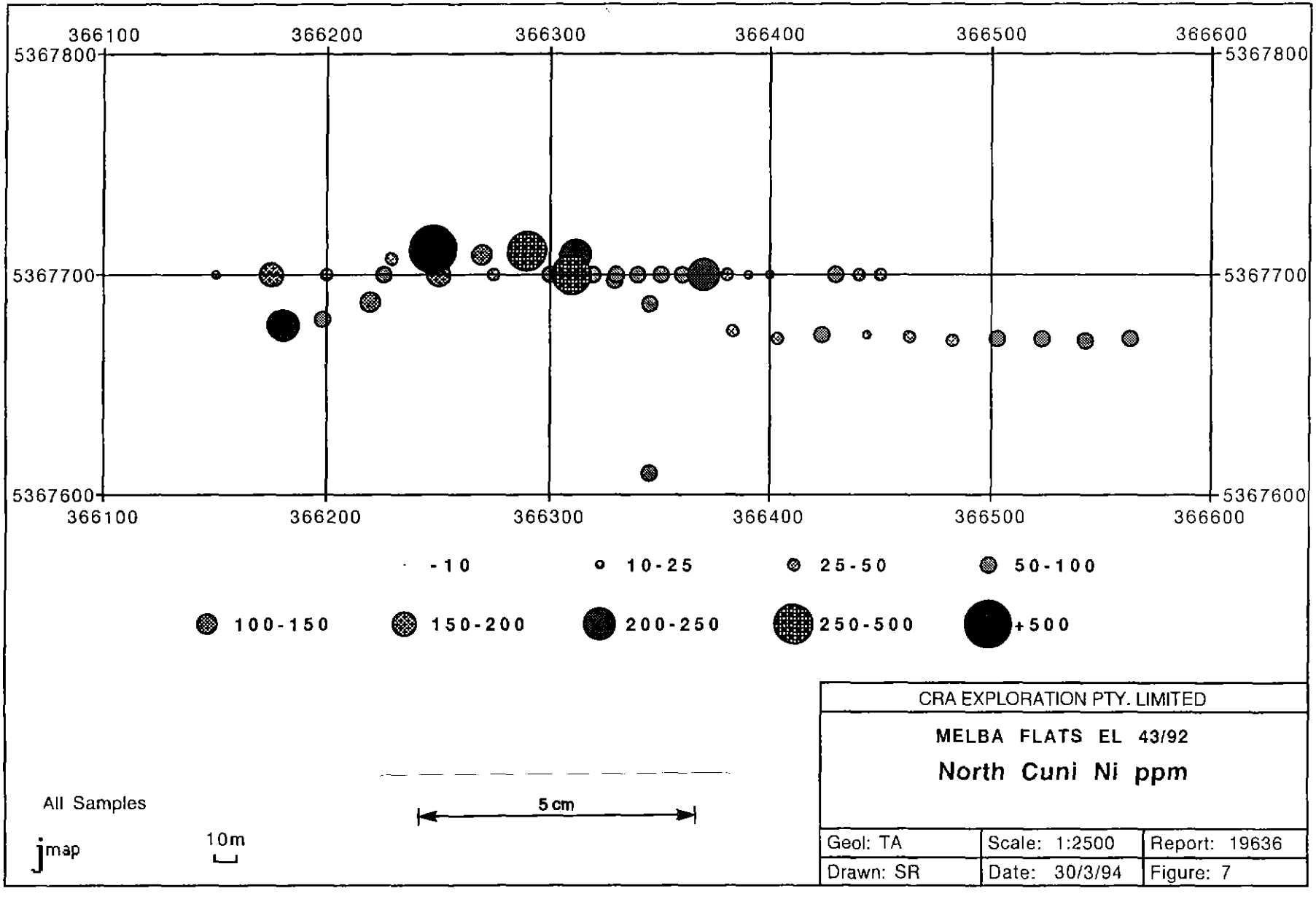
CRA EXPLORATION PTY. LIMITED

MELBA FLATS EL 43/92

North Cuni Pb ppm

Geol: TA	Scale: 1:2500	Report: 19636
Drawn: SR	Date: 30/3/94	Figure: **5**


366100
366200
366300
366400
366500
366600
5367800
5367700
5367600
-10
10-50
50-60
60-80
80-100
100-150
150-200
200-400
+400
All Samples
jmap
10m
5 cm
CRA EXPLORATION PTY. LIMITED
MELBA FLATS EL 43/92
North Cuni Cu ppm
Geol: TA
Scale: 1:2500
Report: 19636
Drawn: SR
Date: 30/3/94
Figure: 6



CRA EXPLORATION PTY. LIMITED		
MELBA FLATS EL 43/92		
North Cuni Ni ppm		
Geol: TA	Scale: 1:2500	Report: 19636
Drawn: SR	Date: 30/3/94	Figure: 7

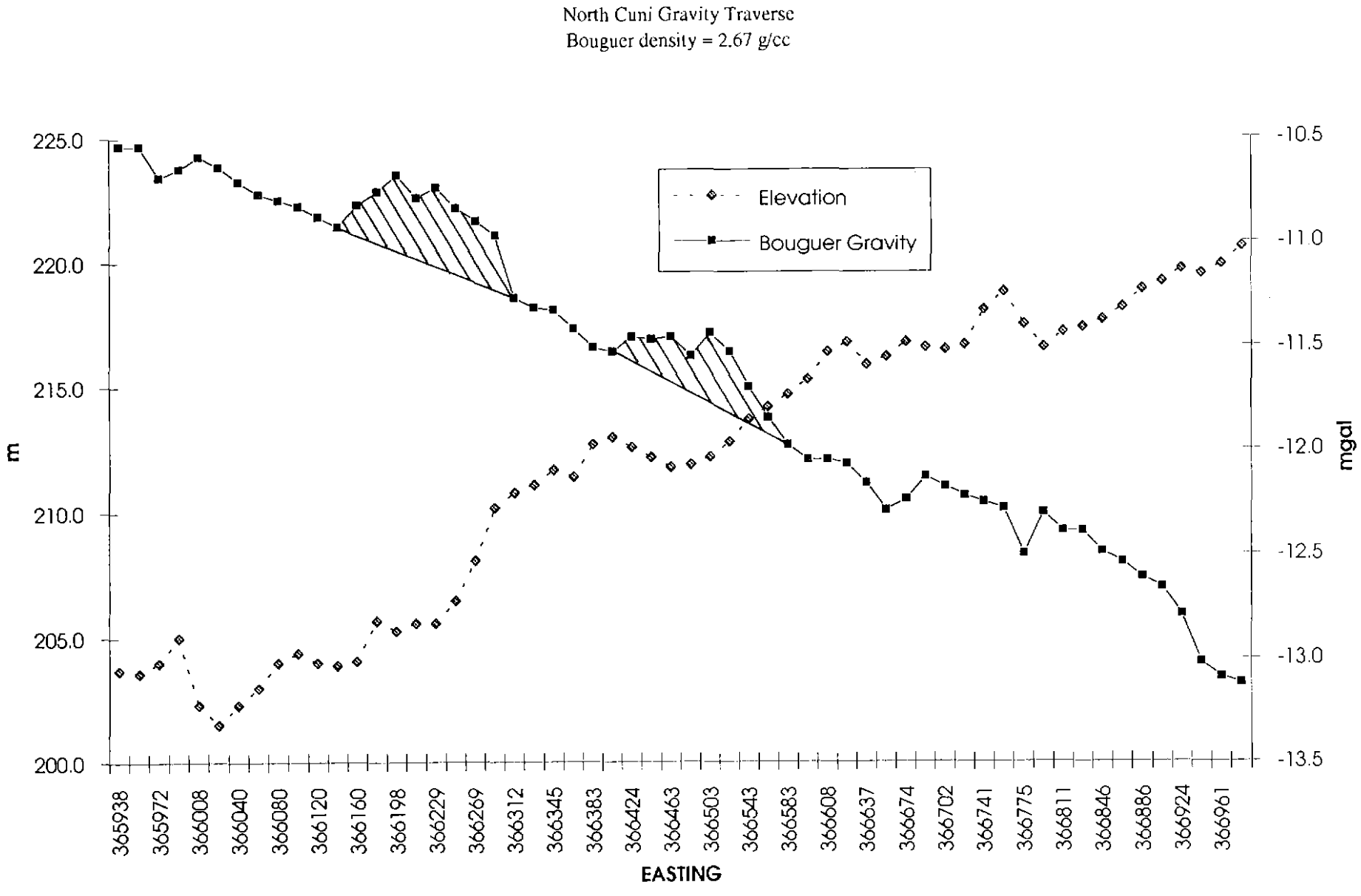


Figure 8

These profiles are reproduced from data supplied by the Tasmanian Mines Department

APPENDIX I

SUMMARY OF PREVIOUS DRILLING

928045

MELBA FLATS EL 43/92 - SUMMARY OF PREVIOUS DRILLING ON Cu Ni TARGETS

HOLE	LOCATION	BY	DATE	TOTAL DEPTH		INC	MAG AZIM	ORE						GABBRO/DYKE				COMMENTS	REFERENCE
								DEPTH	WIDTH	DEPTH	WIDTH	Ni	Cu	DEPTH	WIDTH	DEPTH	WIDTH		
				feet	m	deg	deg	feet	feet	m	m	%	%	feet	feet	m	m		
No.1	VAUDEAU	?	1914	?	?			50	10	15.2	3.0	?	?	?	?	?	?		Blake, 1952
No.2	VAUDEAU	?	1914	?	?			100	1	30.5	0.3	?	?	?	?	?	?		Blake, 1952
No.3	VAUDEAU	?	1914	200	61.0				NIL		NIL			?	?	?	?		Blake, 1952
No.4	VAUDEAU	?	1914	?	?				NIL		NIL			?	?	?	?		Blake, 1952
No.5	VAUDEAU	?	1914	?	?				NIL		NIL			?	?	?	?		Blake, 1952
DH1	SOUTH CUNI	TMD	1930	102	31.1				NIL		NIL			?	?	?	?		Blake, 1952
DH2	GENETS WINZE	TMD	1930	100	30.5	-45	314	72	3	21.9	0.9	6.0	2.6	40	32	12.2	9.8	Disseminated ore not assayed	Horvath, 1957
DH3	GENETS WINZE	TMD	1930	107	32.6	-45	315	?	?	?	?	3-6	3.0	56	47	17.1	14.3	In complete records	Horvath, 1957
DH4	GENETS WINZE	TMD	1930	156	47.5	-45	314	140.5	3.5	42.8	1.1	10.1	5.5	?	?	?	?	Disseminated ore not assayed	Horvath, 1957
DH5	N SOUTH CUNI	TMD	1930	149	45.4	-90			NIL		NIL			?	?	?	?		Burton, 1970
DH6	N SOUTH CUNI	TMD	1930	144	43.9	-90						TRACE		?	?	?	?		Burton, 1970
DH7	SOUTH CUNI	TMD	1930	156	47.5				NIL		NIL			?	?	?	?		Blake, 1952
DH8	SOUTH CUNI	TMD	1930	176	53.6				NIL		NIL			?	?	?	?		Blake, 1952
DH9	GENETS WINZE	TMD	1939	346	105.5	-65	349		NIL		NIL			195	3	59.4	0.9		Horvath, 1957
														210	31	64.0	9.4		
DH10	GENETS WINZE	TMD	1939	180	54.9	-90			NIL		NIL			159	8	48.5	2.4		Horvath, 1957
DH11	VAUDEAU	TMD	1939-40	?	?							TRACE		?	?	?	?		Blake, 1952
DH12	MOSQUITO	TMD	1939-40	?	?				NIL		NIL			?	?	?	?	Gabbro	Blake, 1952
DH13	BLOWFLY	TMD	1939-40	?	?			?						?	?	?	?		Blake, 1952
DH14	MOSQUITO	TMD	1939-40	?	?				NIL		NIL			?	?	?	?	Gabbro	Blake, 1952
DH15	VAUDEAU	TMD	1939-40	?	?				NIL		NIL			?	?	?	?		Blake, 1952
DH16	BLOWFLY	TMD	1939-40	?	?			?						?	?	?	?		Blake, 1952
DH17	VAUDEAU	TMD	1939-40	?	?				NIL		NIL			?	?	?	?		Blake, 1952
EM1	GENETS WINZE	EM	1953	120	36.6	-45	330	70	9	21.3	2.7	1.72	0.10	47	30	14.3	9.1	Core loss in dyke	Horvath, 1957
EM2	GENETS WINZE	EM	1953	120	36.6	-50	270	66	4	20.1	1.2	0.50	0.70	44	37	13.4	11.3	Very poor core recovery	Horvath, 1957
								79	2	24.1	0.6	1.00	0.70						
EM3	GENETS WINZE	EM	1953	120	36.6	-45	270	70	15	21.3	4.6	1.48	1.50	57	31	17.4	9.4		Horvath, 1957
EM4	NORTH CUNI	EM	1953	140	42.7	-45	270	118	3	36.0	0.9	0.57	0.30	109	14	33.2	4.3		Horvath, 1957
EM5	NORTH CUNI	EM	1953	65	19.8	-45	270		NIL					N/A		N/A		Not completed?	Robinson, 1959
M6	GENETS WINZE	MSL	1955	157	47.9	-45	317	123	11	37.5	3.4	0.74	1.14	115	26	35.1	7.9	Disseminated ore	Horvath, 1957
								136	3	41.5	0.9	9.70	4.30					Massive ore	
M7	GENETS WINZE	MSL	1956	186	56.7	-90			NIL		NIL				NIL		NIL		Horvath, 1957
M8	GENETS WINZE	MSL	1956	118	36.0	-50	312	80	9	24.4	2.7	TRACE		68	37	20.7	11.3		Horvath, 1957
								89	7	27.1	2.1	0.92	0.95						
								96	4	29.3	1.2	TRACE							
M9	GENETS WINZE	MSL	1956	285	86.9	-55	319					TRACE		259	26	78.9	7.9		Horvath, 1957
M10	DEVEREAUX	MSL	1956	132	40.2	-50	225	97	18	29.6	5.5	0.33	0.24	95	27	29.0	8.2		Horvath, 1957
M11	DEVEREAUX	MSL	1956	143	43.6	-45	256	105	5	32.0	1.5	2.00	0.33	105	12	32.0	3.7	Massive ore at 105-108'	Horvath, 1957
								155.5	20	47.4	6.1	0.15	0.05	119	24	36.3	7.3	Disseminated	

MELBA FLATS EL 43/92 - SUMMARY OF PREVIOUS DRILLING ON Cu Ni TARGETS

HOLE	LOCATION	BY	DATE	TOTAL DEPTH		INC	MAG AZIM	ORE						GABBRO/DYKE				COMMENTS	REFERENCE
				feet	m	deg	deg	DEPTH feet	WIDTH feet	DEPTH m	WIDTH m	Ni %	Cu %	DEPTH feet	WIDTH feet	DEPTH m	WIDTH m		
M12	DEVEREAUX	MSL	1956	118	36.0	-45	40	62	12	18.9	3.7	0.29	0.18	61	14	18.6	4.3		Horvath, 1957
								74	1	22.6	0.3	2.02	1.15						
M13	NICKEL REWARD	MSL	1956	142	43.3	-45	232	28	26	8.5	7.9	10.00	2.94	11	43	3.4	13.1		Horvath, 1957
M14	NICKEL REWARD	MSL	1957	132	40.2	-45	232		NIL		NIL				NIL		NIL	Intersected fault zone	Horvath, 1957
M15	NICKEL REWARD	MSL	1957	132	40.2	-45	52	30	4	9.1	1.2	3.61	0.84	30	17	9.1	5.2	Disseminated ore	Horvath, 1957
								34	8	10.4	2.4	11.67	2.75					Massive ore	
								42	5	12.8	1.5	2.13	2.69					Disseminated ore	
M16	NICKEL REWARD	MSL	1957	65	19.8	-55	55		NIL		NIL			42	4	12.8	1.2		Horvath, 1957
M17	NICKEL REWARD	MSL	1957	20	6.1	-45	52		NIL		NIL			0	20	0.0	6.1		Robinson, 1959
M17	NICKEL REWARD	MSL	1957	15	4.6	-45	52		NIL		NIL			0	15	0.0	4.6		Robinson, 1959
M17A	NICKEL REWARD	MSL	1957	95	29.0	-60	10		NIL		NIL			0	95	0.0	29.0		Robinson, 1959
M18	NICKEL REWARD	MSL	1957	87	26.5	-45	10	53	11	16.2	3.4	1.44	1.71	53	11	16.2	3.4		Horvath, 1957
M19	NICKEL REWARD	MSL	1957	85	25.9	-65	10	48	10	14.6	3.0	2.25	3.14	45	14	13.7	4.3		Horvath, 1957
M20	NICKEL REWARD	MSL	1957	105	32.0	-45	10	?	6	?	1.8	0.49	0.42	0	22	0.0	6.7		Robinson, 1959
M22	NICKEL REWARD	MSL	1957	33	10.1	-45	10		NIL		NIL			0	33	0.0	10.1		Robinson, 1959
MFP109	NORTH CUNI	EZ	1965	441	134.4	-65	?	210	12	64.0	3.7	0.44	0.44	?	?	?	?		Burton, 1970
MFP110	GENETS	EZ	1965	259	78.9	-45	?	70	10	21.3	3.0	4.30	2.70	?	?	?	?		Burton, 1970
MFP111	GENETS	EZ	1965	465	141.7	-45	?	100	6	30.5	1.8	0.34	0.64	?	?	?	?		Burton, 1970
MFP112	SOUTH CUNI	EZ	1965	?	?	?	?	?	?			?	?	?	?	?	?		Anon, 1969
MFP113	SOUTH CUNI	EZ	1965	?	?	?	?	?	?			?	?	?	?	?	?		Anon, 1969
MFP114	NICKEL REWARD	EZ	1965-66	?	?	?	?	?	?			?	?	?	?	?	?		Anon, 1969
MFP118	NICKEL REWARD	EZ	1965-66	?	?	?	?	?	?			?	?	?	?	?	?		Anon, 1969
MFP120	NICKEL REWARD	EZ	1965-66	?	?	?	?	?	?			?	?	?	?	?	?		Anon, 1969
MFP122	NICKEL REWARD	EZ	1965-66	?	?	?	?	?	?			?	?	?	?	?	?		Anon, 1969
MFP126	GENETS	EZ	1968	131	39.9	-40	?	70	4	21.3	1.2	0.62	0.88	?	?	?	?		Burton, 1970
MFP127	GENETS	EZ	1968	400	121.9	-50	?		NIL		NIL			256	123	78.0	37.5		Burton, 1970
MFP128	GENETS	EZ	1968	167	50.9	-30	?	70	11	21.3	3.4	1.02	0.46	?	?	?	?		Burton, 1970
MFP129	GENETS	EZ	1968	211	64.3	-60	?		NIL		NIL			?	?	?	?	Unmin gabbro	Burton, 1970
MFP130	GENETS	EZ	1968	324	98.8	-48	?		NIL		NIL			?	?	?	?	Western gabbro	Burton, 1970
MFP131	GENETS	EZ	1968	289	88.1	-30	?		NIL		NIL			?	?	?	?	Western gabbro	Burton, 1970
MFP132	GENETS	EZ	1968	228	69.5	-60	?	140	13	42.7	4.0	0.41	0.56	?	?	?	?		Burton, 1970
MFP173	GENETS	EZ	1973	102	31.1	-45	?	?	9	?	2.7	0.94	0.76	?	?	?	?		Burton, 1973
MFP174	GENETS	EZ	1973	135	41.1	-45	?		NIL		NIL			?	?	?	?	Unmin gabbro	Burton, 1973
MFP175	GENETS	EZ	1973	147	44.8	-70	?		NIL		NIL			?	?	?	?	Unmin gabbro	Burton, 1973
MFP176	GENETS	EZ	1973	185	56.4	-45	?		NIL		NIL			?	?	?	?	Unmin gabbro	Burton, 1973
MFP177	GENETS	EZ	1973	250	76.2	-45	?		NIL		NIL			?	?	?	?	Unmin gabbro	Burton, 1973
			TOTAL	8165	2489														

TMD - Tasmanian Mines Department EM - Eagle Metals MSL - Montana Silver Lead EZ - Electrolytic Zinc

928047

MELBA FLATS EL 43/92 - SUMMARY OF PREVIOUS DRILLING ON TARGETS OTHER THAN CUNI

HOLE	LOCATION	E	N	BY	DATE	DEPTH	DIP	AZIM MAG	AZIM AMG	Pb	Zn	Cu	Ni	Ag	Sn	COMMENTS	REFERENCE
						m		deg	deg	%	%	%	%	ppm	ppm		
M23	SERPENTINE HILL UC	?	?	MSL	1957	51.8 170	-45	262					0.16			Between Nickel Reward & Murchison Hwy.	Horvath, 1957
MFP106	DUKE OF YORK	?	?	EZ	1965?	?	?	?	?	?	?	?	?	?	?		Goudie, 1970
MFP108	DUKE OF YORK	?	?	EZ	1965?	?	?	?	?	?	?	?	?	?	?		Goudie, 1970
L1	LEAD BLOCKS	?	?	EZ	?	?	-90	-	-	?	?	?	?	?	?		Ellis, 1987
L2	LEAD BLOCKS	?	?	EZ	?	?	-90	-	-	?	?	?	?	?	?		Ellis, 1987
L3	LEAD BLOCKS	?	?	EZ	?	?	-90	-	-	?	?	?	?	?	?		Ellis, 1987
L4	LEAD BLOCKS	?	?	EZ	?	?	-90	-	-	?	?	?	?	?	?		Ellis, 1987
L5	LEAD BLOCKS	?	?	EZ	?	?	-90	-	-	?	?	?	?	?	?		Ellis, 1987
L6	LEAD BLOCKS	?	?	EZ	?	?	-90	-	-	?	?	?	?	?	?		Ellis, 1987
L7	LEAD BLOCKS	?	?	EZ	?	?	-90	-	-	?	?	?	?	?	?		Ellis, 1987
L8	LEAD BLOCKS	?	?	EZ	?	?	-90	-	-	?	?	?	?	?	?		Ellis, 1987
L9	LEAD BLOCKS	?	?	EZ	?	?	-90	-	-	?	?	?	?	?	?		Ellis, 1987
CG1	LEAD BLOCKS	367380	5367480	CSR	1981	356.6	-45	277	288	1.35	24.7	0.15	-	71	565	Intersected dolerite	Macnamara, 1981
CG2	LEAD BLOCKS			CSR	1981	440.0	-46.5	290	301	4.76	5.40	0.05	-	129	115		Macnamara, 1981
CG3	SOUTH NEVADA	365156	5365200	CSR		331.0	-50	195	206							On mag anomaly	Ellis, 1986
CG4	W OF BLOWFLY	364925	5366550	CSR		226.0	-50	79	90							On mag anomaly	Ellis, 1986
CG5	W OF NORTH CUNI	365775	5367730	CSR		256.0	-50	235	246							On mag anomaly	Ellis, 1986
CG6	DUNDAS ROAD	365775	5367730	CSR		256.0	-50	235	246							On mag anomaly	Ellis, 1986
CG7	PINE PLANTATION	365775	5367730	CSR		256.0	-50	235	246							On mag anomaly	Ellis, 1986
SH1	SERPENTINE HILL UC	367149	5366780	TMD		671.5	-90		0								Brown, 1991
SH2	SERPENTINE HILL UC	367850	5366199	TMD		150.0	-90		0								Brown, 1991
SH3	SERPENTINE HILL UC	367914	5367011	TMD		140.0	-90		0								Brown, 1991
SH4	SERPENTINE HILL UC	368298	5367516	TMD		101.5	-60		270								Brown, 1991
SH5	SERPENTINE HILL UC	368289	5367464	TMD		101.5	-60		270								Brown, 1991
SH6	SERPENTINE HILL UC	368281	5367416	TMD		101.5	-60		270								Brown, 1991

MSL - Montana Silver Lead
EZ - Electrolytic Zinc
TMD - Tasmanian Mines Department

APPENDIX II
QUESTEM AIRBORNE GEOPHYSICAL SURVEY LOGISTICS REPORT
&
LOCATIONS OF PRELIMINARY EM ANOMALIES

Attention: Theo Aravanis	Date: 18 Feb 1993
Company: CRA	Fax: (03) 4841375

Transmission of: 3 pages including this one.

From: Andrew DUNCAN, World Geoscience Corporation Ltd.,
17 Emerald Tce., West Perth, Western Australia, Australia 6005
Phone: (+619) 322 1799 Fax: (+619) 481 0709

Subject: Airborne EM Tasmania

MESSAGE/INSTRUCTIONS TO ADDRESSEE:

Theo,

Following are the results of the PLATE modelling. We had trouble modelling the result of flying along a line offset from the centre of the body so have made some inferences by using models of various depths of burial (with the aircraft flying straight over the top) to simulate moving the aircraft away to the side.

A 50 metre x 50 metre vertical body of conductance 80 S was modelled. The profiles displayed are for our earliest channel - we call it channel 0 - its centre is some 190 µsecs in time after the transmitter pulse is switched off. The profiles plotted are as a function of distance perpendicular to strike of the body. The aircraft is flying in the direction of *increasing* distance on the plot. The target sits at position = 0 metres as indicated by the dotted line.

If the aircraft was flying a line which crossed the along-strike extension of the body at a distance of some 100 metres from the centre of the body then this would be approximately equivalent to flying straight over the top of the body being buried at a distance of approximately 40 metres. The model responds above the background noise level on this early channel for the 40 metre depth, so I would say that you would be able to see this particular target on a line which was 100 metres offset.

However, the model that I have used is perhaps not truly representative of your situation. For example, if you had a target with less conductance or more conductance you would not get quite as large a response. The modelled conductance of 80 S gives approximately the peak response you can expect for this size of body - any more conductive and you become subject to the inductive limit.

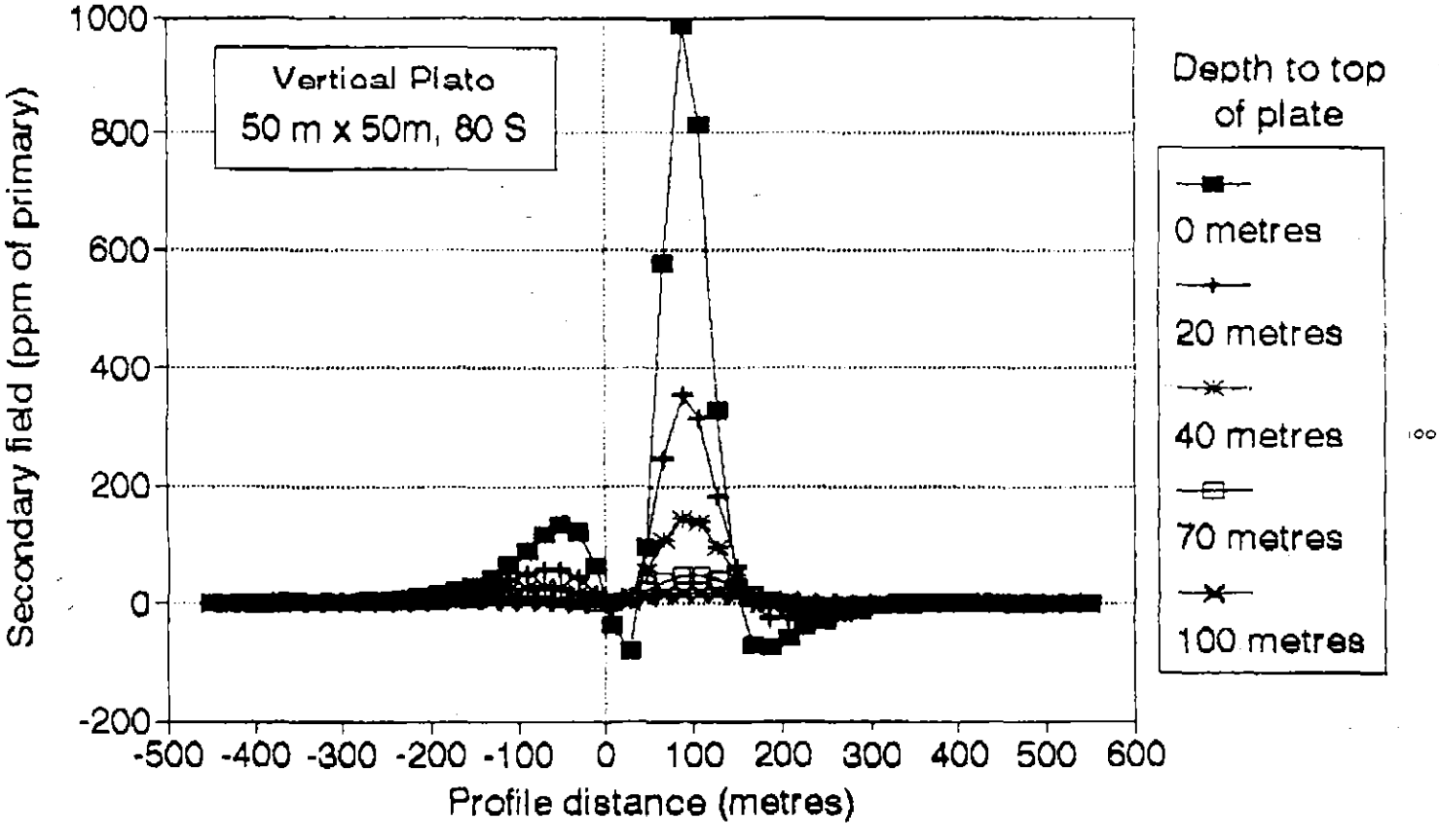
In summary, the signals generated by the target are not huge (because of the target's size) and to detect these targets on two or more lines you may need quite tight line spacing. I will call you in a short while and suggest that we fly a grid at 100 metres and then re-fly interesting bits of the survey in the opposite direction or at an offset of approximately 50 metres to give some control on the interpretation.

Best regards,

Andrew Duncan

Plate Modelling, Questem 75 Hz System

Channel 0 (190 usec) profiles



CRA EXPLORATION
MELBA FLATS, TASMANIA

QUESTEM AIRBORNE GEOPHYSICAL SURVEY
LOGISTICS REPORT
JOB #1335

Data acquired and processed by

WORLD GEOSCIENCE CORPORATION LIMITED
65 Brockway Rd,
Floreat, 6014

TELEPHONE: (619) 383-7833
FACSIMILE: (619) 383-7166

CRA EXPLORATION
MELBA FLATS, QUEENSTOWN, TASMANIA
LOGISTICS REPORT

CONTENTS

1. LOGISTICS

1.1 OPERATING BASE

The operating base was from the Launceston airstrip, Tasmania

1.2 FLIGHT SUMMARY

Flying for Job 1335 was carried out between 4th and 11th April, 1993.

1.3 AIRCRAFT DETAILS

Survey Aircraft	-	Britten Norman Trislander
Registration	-	VH-NKW

1.4 FIELD CREW

Mike Nelson	-	Pilot / Crew Leader
Euan Clarke	-	Geophysicist
Darryl Curley	-	Operator / Technician

2. SURVEY DETAILS

2.1 LINE DETAILS

A full list of lines flown is included in the Appendix.

Line Numbers	Orientation	Approx. Line Spacing
10120 - 10460	070°	100m
20010 - 20200	160°	100m
17010	180°	

2.2 NAVIGATION

Navigation was by Ashtech GPS satellite positioning. An Ashtech receiver collected base station information for post flight differential corrections.

2.3 FLIGHT PATH RECOVERY

Flight path recovery was confirmed on-site using Aerodata post flight processing software.

2.4 ALTIMETERS

i) Sperry AA-100 Radar Altimeter, 0-610 metre range.

ii) Aerodata Barometric using a SemSym LX 1603 sensor - operating range 0-30 psi.

2.5 AIRCRAFT MAGNETOMETER

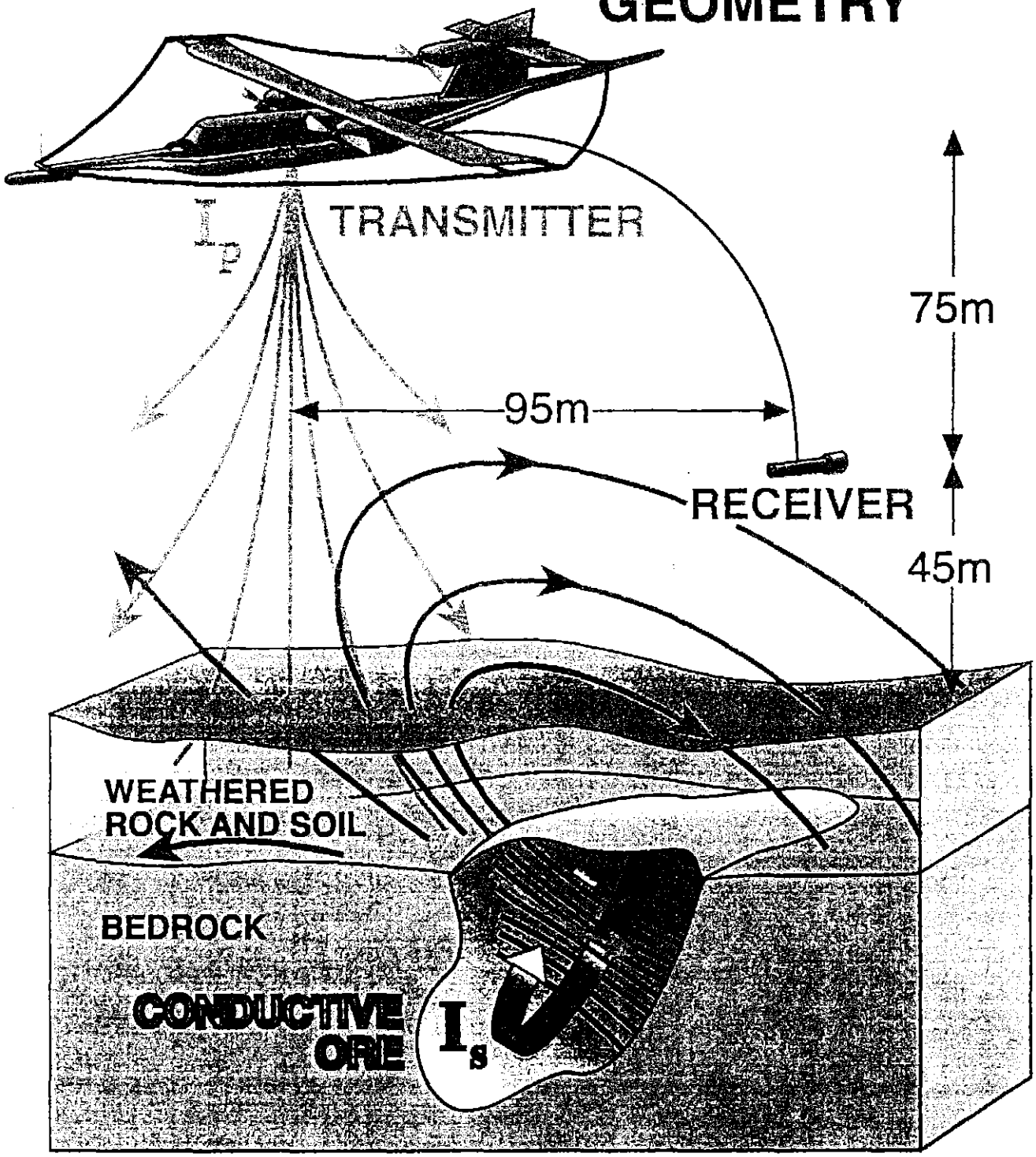
Type	-	Scintrex V201 split beam cesium vapour
Resolution	-	0.01 nT
Operating range	-	17,000 - 95,000 nT
Mounting	-	Nose Stinger
Sampling rate	-	0.5 second
Sample separation along line	-	26m

2.6 QUESTEM AIRBORNE TIME DOMAIN EM SYSTEM

QUESTEM is an airborne electromagnetic mapping system designed and operated by World Geoscience Corporation. Half-sine waveforms of electric current with alternating polarity are pulsed through the transmitter loop slung around the aircraft. The electromagnetic field generated by the loop penetrates the ground below the aircraft (Figure 1) and induces secondary, decaying currents from any conductive material. These are sensed by a receiver towed behind the aircraft. The secondary current amplitude and decay rate depends on the three dimensional distribution of the electrical conductivity in the ground.

Frequency of transmitter operation	-	75 Hz
Channels recorded	-	64
Transmitter waveform	-	Half-sine wave pulse
Transmitter on-time	-	2.0 msec
Transmitter off-time	-	4.67 msec
Bird height	-	60m
Flying height	-	130m
Peak transmitter loop current	-	200A
Transmitter loop turns	-	6
Transmitter loop moment	-	223,000 ATm^2
Number of digital samples per waveform	-	128
Sample size	-	52.08 microsec
Sensor	-	Horizontal coil in towed bird
EM reading duration	-	200 msec
EM readings per second	-	4
Sample separation along line	-	13m

QUESTEM SYSTEM GEOMETRY



I_p Primary current in transmitter loop

I_s Secondary current in the ground

EM windows specified by client

Window	Start (µsecs)	End (µsecs)
1	272	428
2	376	533
3	481	637
4	585	741
5	689	949
6	897	1,157
7	1,105	1,366
8	1,314	1,678
9	1,522	1,887
10	1,730	2,199
11	2,043	2,512
12	2,460	3,032
13	2,980	3,553
14	3,501	4,074
15	3,918	4,491

2.7 ACQUISITION SYSTEM

The airborne data acquisition system used was the Picodas PDAS 1000 system and Aerodata navigation software.

2.7.1 Digital Recording

Line Number
Flight
Year
Date
Time
Barometric Pressure
Radar Altimeter
Raw Magnetic Intensity
Navigation String (latitude, longitude, quality, age etc.)
AC Time
+ 64 Channel EM Data

2.7.2 RMS Graphic Recorder

Channel 0 EM1	FS	10000 ppm
Channel 1 EM2	FS	10000 ppm
Channel 2 EM3	FS	10000 ppm
Channel 3 EM4	FS	10000 ppm
Channel 4 EM5	FS	10000 ppm
Channel 5 EM6	FS	10000 ppm
Channel 6 EM7	FS	10000 ppm
Channel 7 EM8	FS	10000 ppm
Channel 8 EM9	FS	10000 ppm
Channel 9 EM10	FS	10000 ppm
Channel 10 EM11	FS	10000 ppm
Channel 11 EM12	FS	10000 ppm
Channel 12 EM13	FS	10000 ppm
Channel 13 EM14	FS	10000 ppm
Channel 14 EM15	FS	10000 ppm
Channel 15 Radar Altimeter	FS	1000 ft
Channel 16 Spherics monitor	FS	1000 ppm
Channel 17 Power line monitor	FS	1000 ppm
Channel 18 Raw mag	FS	100 nT
Channel 19 latitude	FS	0.010 deg
Channel 20 longitude	FS	0.010 deg
Channel 21 Barometric altimeter	FS	1000 ft

2.8 MAGNETIC BASE STATION

Type	-	Geometrics G-856AX
Resolution	-	0.1 nT
Sampling Rate	-	10 seconds
Location	-	Launceston airstrip
Recorder	-	Internal

3. CALIBRATIONS

3.1 MAGNETICS

3.1.1 Noise Envelope

The noise envelope matched or bettered the required specification of ± 0.2 nT.

3.1.2 Heading Error

Heading checks were performed by flying over a prominent non-magnetic feature, in a magnetically flat area at survey height. An offset was calculated from the average magnetic values in each direction and adjusted.

3.2 ELECTROMAGNETICS

3.2.1 Reference File

The primary waveform is measured at great height prior to the flight. This is used in converting the data to ppm.

3.2.2 Drift Correction

A zero file is recorded at great height prior to the flight, and a drift is collected at the end of the flight to enable a correction for transmitter drift due to warming.

4. PROCESSING

4.1 INFIELD VERIFICATION

Magnetic and electromagnetic data quality was checked daily using a Sun SparcStation and aircraft analogs. Flight path was also checked against survey specifications. Data processing was taken to final stage before leaving the base of operations.

4.2 MAGNETIC DATA PROCESSING

The airborne magnetic data was corrected for diurnal adjustments. The IGRF (1990 epoch extrapolated to 1992) was then removed at calculated intervals along each flight line. The data was also corrected for system parallax and heading differences. The data was then gridded at a cell size of 30 metres using selected lines.

4.3 ELECTROMAGNETIC DATA PROCESSING

The airborne electromagnetic data was corrected for transmitter drift. Algorithms were also applied to the data to compensate for varying bird-plane geometry. No contour plots were generated as the area is considered to be generally resistive. Early channel data (-2, -1 & 0) were acquired and is supplied to CRA as digital data. However as there were problems in compensating these channels due to difficult flying conditions, these channels were not transferred over to the final multiplots. The time constant included on the line profiles was calculated from channels 1 to 15 over a time of 4.05 milliseconds.

4.4 PROCESSED DATA

4.4.1 Data Tapes

The located data tapes contain all of the raw and reduced geophysical data including positional, diurnal and IGRF data, in an ASCII format supplied at 6,250 bpi on 9 track tape.

4.4.2 Multi-plots

Line profiles for each flight line at 1:25,000 scale include:

15 channels of electromagnetic data
Total magnetic field
Calculated magnetic vertical derivative
Altimeter profile
50 Hz monitor profile
Time constant trace

AMG co-ordinates are given in the title block and along the top of the profile. For the E-W lines, northing of the line start and finish are in the title block and relative easting provided along the line. For the N-S lines these are easting and northing respectively.

4.4.3 Final map products

Flight path plot of the differentially correct position - 1:25,000 and 1:10,000 scale
Stacked profiles of Total Magnetic Field - 1:10,000 scale
Stacked profiles of 1st Vertical Derivative - 1:10,000 scale
Stacked profiles of three selected QUESTEM channels - 1:10,000 scale
Preliminary computer generated EM anomaly pick - 1:10,000 scale

4.4.4 Computer Generated EM Anomaly Pick

Automatic anomaly picking is determined on a line by line basis. The process is essentially that of locating EM anomaly peak positions and outputting them in a listing after rejection criterion have been applied. The autopick routine looked for anomalies of interest between channels 1 to 12 with a minimum response amplitude of 50 ppm .

These initial computer generated picks were then manually assessed and extensively edited using WGC in-house software. As the autopick routine does not allow for flying height variations, correlation between altitude variations and EM response were noted and the anomalies disregarded if not considered due to a genuine bedrock or surficial response.

APPENDIX

FULL LIST OF LINES FLOWN

LINE NUMBER	LINE DIRECTION
10120	070°
10130	070°
10140	070°
10150	070°
10160	070°
10170	070°
10180	070°
10190	070°
10200	070°
10210	070°
10220	070°
10230	070°
10240	070°
10250	070°
10260	070°
10270	070°
10280	070°
10290	070°
10300	070°
10310	070°
10320	070°
10330	070°
10340	070°
10350	070°
10360	070°
10370	070°
10380	070°
10390	070°
10400	070°
10410	070°
* 10420	070°
10421	070°
* 10430	070°
10431	070°
* 10440	070°
* 10441	070°
10442	070°
* 10450	070°
10451	070°
10460	070°
17010	180°

* Lines scrubbed and reflown - data should not be included in final grids. Data from these lines is supplied to client for use in detailed EM analysis.

LINE NUMBER	LINE DIRECTION
20010	160°
20020	160°
20030	160°
20040	160°
20050	160°
20060	160°
20070	160°
20080	160°
20090	160°
20100	160°
20110	160°
20120	160°
20130	160°
20140	160°
20150	160°
20160	160°
20170	160°
20180	160°
20190	160°
20200	160°

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line		fiducial	anomaly type	chs	em channels 1	2	3	4	5	6	7	8	9	10	11	12	cond	alt	mag peak fid	val	em location easting	northing
10120	A	1113.50	S	2	86	53	-	-	-	-	-	-	-	-	-	-	-	254	-	-	361433	5366561
10120	B	1166.75	S	2	58	38	-	-	-	-	-	-	-	-	-	-	-	154	-	-	364629	5367735
10120	C	1183.25	S	2	95	51	-	-	-	-	-	-	-	-	-	-	-	154	-	-	365612	5368091
10130	A	1059.75	S	5	82	48	25	19	11	-	-	-	-	-	-	-	-	155	-	-	365358	5367918
10140	A	950.50	S	4	86	49	30	24	-	-	-	-	-	-	-	-	-	245	-	-	363455	5367084
10140	B	986.75	S	4	156	82	35	12	-	-	-	-	-	-	-	-	-	190	-	-	365594	5367862
10150	A	878.00	S	4	100	76	49	37	-	-	-	-	-	-	-	-	-	201	-	-	366289	5368038
10150	B	890.00	P	7	180	119	65	41	29	24	21	-	-	-	-	-	35	145	887.50	15	365456	5367744
10160	A	801.00	S	4	213	128	71	43	-	-	-	-	-	-	-	-	-	153	801.00	22	365669	5367709
10170	A	681.25	S	5	132	102	80	63	34	-	-	-	-	-	-	-	9	250	-	-	367073	5368051
10170	B	693.50	S	2	90	36	-	-	-	-	-	-	-	-	-	-	-	154	-	-	366187	5367753
10180	A	611.75	S	5	267	174	112	70	37	-	-	-	-	-	-	-	-	139	612.50	49	365689	5367507
10180	B	663.00	C	8	207	114	65	99	106	126	69	46	-	-	-	-	160	266	-	-	368238	5368414
10190	A	488.00	B	3	87	60	25	-	-	-	-	-	-	-	-	-	-	275	-	-	363667	5366616
10190	B	520.25	S	6	289	187	120	86	61	27	-	-	-	-	-	-	-	139	521.25	47	365712	5367374
10190	C	546.75	P	7	-30	-16	-11	-16	-5	-6	-17	-	-	-	-	-	-	254	-	-	367166	5367875
10190	D	565.25	C	3	121	106	83	-	-	-	-	-	-	-	-	-	-	172	-	-	368021	5368203
10190	E	569.50	C	3	146	85	53	-	-	-	-	-	-	-	-	-	-	247	570.75	261	368230	5368271
10200	A	364.50	S	4	102	67	36	20	-	-	-	-	-	-	-	-	-	228	-	-	363545	5366463
10200	B	369.25	S	3	83	45	14	-	-	-	-	-	-	-	-	-	-	186	-	-	363850	5366594
10200	C	381.25	S	5	-7	-12	-16	-11	0	-	-	-	-	-	-	-	-	128	-	-	364649	5366887
10200	D	397.75	S	6	208	174	128	89	42	9	-	-	-	-	-	-	-	132	398.75	40	365708	5367263
10200	E	415.00	S	3	136	75	34	-	-	-	-	-	-	-	-	-	-	215	-	-	366693	5367618
10200	F	425.25	P	10	56	54	39	32	36	41	32	13	10	5	-	-	125	258	-	-	367209	5367805
10200	G	442.50	C	2	155	97	-	-	-	-	-	-	-	-	-	-	-	228	445.00	383	368014	5368097
10200	H	447.00	C	2	283	190	-	-	-	-	-	-	-	-	-	-	-	230	-	-	368232	5368184
10210	A	222.00	S	5	66	62	47	34	11	-	-	-	-	-	-	-	-	190	-	-	361931	5365783
10210	B	252.25	S	4	67	51	31	23	-	-	-	-	-	-	-	-	-	217	-	-	363764	5366488
10210	C	262.75	P	7	1	22	20	13	7	6	4	-	-	-	-	-	-	157	-	-	364449	5366716
10210	D	282.75	B	5	216	159	116	85	42	-	-	-	-	-	-	-	-	134	283.75	45	365741	5367217
10210	E	298.50	S	5	463	280	153	89	43	-	-	-	-	-	-	-	-	189	-	-	366695	5367525
10210	F	302.25	S	6	510	326	199	133	73	40	-	-	-	-	-	-	-	206	-	-	366901	5367587
10210	G	307.25	B	12	322	287	243	210	166	125	87	73	62	55	40	24	31	230	-	-	367161	5367652
10210	H	325.75	C	5	184	97	51	34	25	-	-	-	-	-	-	-	-	245	325.25	536	368010	5368019
10210	J	332.25	C	7	243	253	189	98	75	79	41	-	-	-	-	-	-	235	-	-	368269	5368224
10220	A	2214.75	S	3	73	46	11	-	-	-	-	-	-	-	-	-	-	205	-	-	363734	5366375
10220	B	2247.50	S	3	186	104	60	-	-	-	-	-	-	-	-	-	-	149	2249.00	34	365760	5367099
10220	C	2265.00	B	10	613	385	254	174	108	48	19	5	2	-2	-	-	-	221	-	-	366769	5367468
10220	D	2273.25	B	11	179	172	161	149	126	95	77	52	40	23	15	-	30	251	-	-	367187	5367601
10220	E	2297.25	C	2	179	89	-	-	-	-	-	-	-	-	-	-	-	237	2298.75	1068	368247	5367974
10230	A	2104.50	S	3	67	34	10	-	-	-	-	-	-	-	-	-	-	196	-	-	363777	5365208
10230	B	2127.00	S	4	124	77	33	16	-	-	-	-	-	-	-	-	-	154	2128.00	31	365809	5367040
10230	C	2132.25	B	12	1750	1196	825	621	418	258	158	84	56	37	26	6	11	201	-	-	366704	5367314
10230	D	2152.25	B	12	154	115	104	101	97	73	60	41	32	26	22	12	49	259	-	-	367201	5367526
10230	E	2187.00	C	1	62	-	-	-	-	-	-	-	-	-	-	-	-	228	-	-	**368187**	5368034

PRELIMINARY EM ANOMALY LOCATIONS

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line		fiducial	anomaly type	anomaly chs	em channels 1	2	3	4	5	6	7	8	9	10	11	12	cond	alt	mag peak fid	mag peak val	em location easting	em location northing
10240	A	1994.50	S	2	111	57	-	-	-	-	-	-	-	-	-	-	-	205	-	-	363907	5366210
10240	B	2022.50	P	5	72	59	37	22	4	-	-	-	-	-	-	-	-	146	2024.75	25	365712	5366869
10240	C	2039.25	B	12	3212	2373	1819	1437	1058	706	516	358	270	200	142	96	17	154	-	-	366742	5367240
10240	D	2047.25	P	7	103	69	47	47	31	6	-12	-	-	-	-	-	-	225	-	-	367168	5367406
10240	E	2062.25	B	7	259	171	117	95	73	45	12	-	-	-	-	-	-	288	-	-	367859	5367645
10250	A	1881.25	S	2	111	57	-	-	-	-	-	-	-	-	-	-	-	205	-	-	363907	5366210
10250	B	1908.75	S	5	124	79	41	27	8	-	-	-	-	-	-	-	-	145	1911.00	22	365673	5366735
10250	C	1927.50	B	12	1929	1464	1160	962	745	542	408	298	232	178	133	91	25	169	-	-	366737	5367123
10250	D	1932.50	P	5	268	207	170	148	125	-	-	-	-	-	-	-	47	207	-	-	367003	5367206
10250	E	1950.50	C	10	439	349	288	246	190	119	55	31	15	4	-	-	13	263	-	-	367838	5367555
10250	F	1960.25	C	8	124	92	69	52	40	10	-2	-19	-	-	-	-	-	255	-	-	368063	5367899
10260	A	1811.75	S	2	122	43	-	-	-	-	-	-	-	-	-	-	-	193	-	-	363988	5366040
10260	B	1837.25	P	5	109	67	48	42	40	-	-	-	-	-	-	-	-	154	-	-	365587	5366646
10260	C	1856.25	B	12	2140	1630	1297	1063	812	582	437	327	269	215	162	105	24	155	-	-	366749	5367043
10270	A	1707.75	S	5	144	89	52	39	36	-	-	-	-	-	-	-	-	213	-	-	364034	5365928
10270	B	1732.75	S	4	111	56	24	14	-	-	-	-	-	-	-	-	-	154	-	-	365679	5366520
10270	C	1750.75	B	12	1186	905	697	559	429	311	227	162	134	123	95	96	25	197	-	-	366752	5366944
10270	D	1771.50	C	12	1387	1135	937	785	607	439	321	225	173	129	88	43	22	217	-	-	367894	5367374
10270	E	1775.75	C	4	1849	1285	866	646	-	-	-	-	-	-	-	-	9	212	-	-	368049	5367538
10280	A	1621.50	S	4	196	113	55	27	-	-	-	-	-	-	-	-	24	160	-	-	364009	5365839
10280	B	1646.50	S	4	82	65	34	16	-	-	-	-	-	-	-	-	-	149	-	-	365729	5366451
10280	C	1667.00	B	12	1357	1035	847	708	551	399	311	237	196	154	117	90	28	180	-	-	366805	5366891
10280	D	1667.00	B	12	1387	1135	937	785	607	439	321	225	173	129	88	43	22	217	-	-	367894	5367374
10290	A	1505.75	S	4	137	91	51	27	-	-	-	-	-	-	-	-	-	231	-	-	364125	5365769
10290	B	1532.50	S	2	106	47	-	-	-	-	-	-	-	-	-	-	-	175	-	-	365765	5366363
10290	C	1547.00	P	6	716	481	334	235	142	63	-	-	-	-	-	-	7	179	-	-	366618	5366658
10290	D	1550.25	B	12	542	440	355	301	246	191	150	107	84	60	45	40	31	206	-	-	366799	5366710
10290	E	1572.00	C	12	442	358	272	222	184	144	104	73	71	54	46	23	31	229	-	-	367874	5367147
10290	F	1582.75	C	10	1419	966	725	558	380	223	128	63	38	18	-	-	9	199	1583.75	856	368135	5367544
10300	A	1377.25	S	4	223	125	59	25	-	-	-	-	-	-	-	-	-	187	-	-	364126	5365665
10300	B	1419.75	P	7	312	222	140	92	49	30	14	-	-	-	-	-	-	235	-	-	366568	5366514
10300	C	1425.25	B	11	318	264	210	175	143	118	95	65	52	33	22	-	30	247	-	-	366823	5366612
10300	D	1447.50	C	7	174	98	51	57	67	64	44	-	-	-	-	-	91	253	-	-	367882	5367006
10300	E	1459.75	C	12	2010	1449	1040	785	534	333	209	113	62	37	18	-3	10	167	-	-	368151	5367509
10300	F	1467.50	C	3	-42	-25	-35	-	-	-	-	-	-	-	-	-	-	224	-	-	367976	5367337
10310	A	1252.50	S	3	253	163	89	-	-	-	-	-	-	-	-	-	-	176	-	-	364238	5365575
10310	B	1282.75	S	4	-15	-14	-9	-1	-	-	-	-	-	-	-	-	-	157	-	-	366038	5366222
10310	C	1292.75	P	4	430	265	137	66	-	-	-	-	-	-	-	-	-	208	-	-	366561	5366381
10310	D	1298.50	B	12	489	406	340	291	228	158	120	83	80	67	51	32	27	216	-	-	366844	5366464
10310	E	1319.75	C	3	212	112	60	-	-	-	-	-	-	-	-	-	-	234	-	-	367779	5366915
10310	F	1331.25	C	12	1776	1356	1089	897	695	493	354	236	190	138	85	32	20	217	-	-	367957	5367407
10310	G	1347.75	S	6	144	80	41	36	39	43	-	-	-	-	-	-	92	213	-	-	367345	5367969
10320	A	1169.25	S	6	354	206	117	78	50	25	-	-	-	-	-	-	-	170	-	-	364259	5365503
10320	B	1210.00	S	3	312	159	88	-	-	-	-	-	-	-	-	-	-	225	-	-	366556	5366311
10320	C	1216.50	B	12	452	351	284	246	207	168	131	103	85	70	49	25	39	224	-	-	366856	5366409
10330	A	1000.75	S	6	403	289	196	56	32	20	-	-	-	-	-	-	-	176	-	-	364271	5365426
10330	B	1101.75	S	3	53	43	29	-	-	-	-	-	-	-	-	-	-	154	1103.00	64	365550	5365381

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line		fiducial	anomaly type	anomaly chs	em channels 1	2	3	4	5	6	7	8	9	10	11	12	cond	alt	mag peak fid	mag peak val	em location easting	em location northing
10330	C	1121.00	S	2	263	143	-	-	-	-	-	-	-	-	-	-	-	218	-	-	366557	5366246
10330	D	1127.00	B	12	574	456	366	309	247	182	135	97	81	61	50	27	27	219	-	-	366851	5366331
10340	A	971.00	B	8	427	233	123	82	56	41	24	-1	-	-	-	-	-	184	-	-	364397	5365320
10340	B	993.25	S	3	76	53	29	-	-	-	-	-	-	-	-	-	-	144	992.25	94	365733	5365807
10340	C	1000.00	S	3	86	41	17	-	-	-	-	-	-	-	-	-	-	152	-	-	366110	5365928
10340	D	1010.50	S	2	327	166	-	-	-	-	-	-	-	-	-	-	-	196	-	-	366618	5366139
10340	E	1015.50	B	12	695	546	430	352	261	182	135	85	65	48	36	19	18	194	-	-	366850	5366223
10340	F	1040.50	S	2	40	0	-	-	-	-	-	-	-	-	-	-	-	253	1041.75	442	367891	5366561
10350	A	854.25	S	5	346	183	86	41	22	-	-	-	-	-	-	-	-	200	-	-	364437	5365238
10350	B	863.50	P	5	18	41	46	46	32	-	-	-	-	-	-	-	-	183	-	-	364995	5365415
10350	C	877.00	P	6	104	65	44	39	43	36	-	-	-	-	-	-	-	153	879.00	58	365781	5365715
10350	D	891.00	S	4	234	113	24	-19	-	-	-	-	-	-	-	-	-	184	-	-	366562	5365980
10350	E	896.75	B	12	479	382	305	256	189	129	85	51	37	36	27	24	18	201	-	-	366844	5366077
10350	F	923.00	S	2	37	-21	-	-	-	-	-	-	-	-	-	-	-	256	921.50	452	368006	5366529
10360	A	751.25	S	7	320	175	82	52	34	29	19	-	-	-	-	-	-	190	-	-	364543	5365134
10360	B	775.75	P	5	99	60	38	34	20	-	-	-	-	-	-	-	-	153	-	-	365420	5365461
10360	C	782.50	P	7	92	58	43	28	19	20	22	-	-	-	-	-	42	149	784.75	51	365609	5365605
10360	D	791.00	P	6	117	53	14	12	19	16	-	-	-	-	-	-	-	163	-	-	366278	5365767
10360	E	801.75	B	12	696	526	387	303	222	157	111	76	61	47	38	26	19	190	-	-	366815	5365947
10360	F	817.25	S	2	12	-2	-	-	-	-	-	-	-	-	-	-	-	223	-	-	367496	5366231
10370	A	667.25	S	4	286	153	65	23	-	-	-	-	-	-	-	-	-	163	-	-	364549	5365104
10370	B	678.75	S	4	92	44	25	35	-	-	-	-	-	-	-	-	-	150	-	-	365236	5365353
10370	C	684.50	S	4	61	38	30	24	-	-	-	-	-	-	-	-	-	150	-	-	365567	5365476
10370	D	689.25	S	5	110	80	52	32	10	-	-	-	-	-	-	-	-	149	690.75	48	365836	5365567
10370	E	696.50	P	7	84	51	42	50	50	30	21	-	-	-	-	-	-	162	-	-	366229	5365689
10370	F	708.50	C	12	1113	797	563	420	294	200	132	78	58	45	31	22	14	173	-	-	366818	5365918
10370	G	716.50	C	3	74	17	-4	-	-	-	-	-	-	-	-	-	-	183	-	-	367197	5366056
10370	H	725.00	S	2	-8	-35	-	-	-	-	-	-	-	-	-	-	-	215	-	-	367573	5366198
10370	J	737.50	S	5	24	3	3	20	20	-	-	-	-	-	-	-	-	217	735.00	489	368092	5366394
10380	A	584.50	S	3	71	31	10	-	-	-	-	-	-	-	-	-	-	160	-	-	364038	5364735
10380	B	594.50	S	5	103	69	47	46	29	-	-	-	-	-	-	-	-	219	-	-	364643	5364970
10380	C	607.25	S	1	102	-	-	-	-	-	-	-	-	-	-	-	-	151	-	-	365405	5365286
10380	D	620.50	B	5	192	103	46	26	27	-	-	-	-	-	-	-	-	151	-	-	366184	5365549
10380	E	632.25	C	12	758	510	387	290	214	150	109	75	56	33	13	0	15	185	-	-	366804	5365771
10390	A	514.50	S	4	23	12	-8	-18	-	-	-	-	-	-	-	-	-	193	-	-	363795	5364621
10390	B	528.25	S	5	77	78	54	38	16	-	-	-	-	-	-	-	-	244	-	-	364566	5364878
10390	C	551.25	S	2	117	50	-	-	-	-	-	-	-	-	-	-	-	195	552.75	31	365861	5365371
10390	D	558.00	B	7	216	135	87	61	44	26	17	-	-	-	-	-	14	164	-	-	366239	5365508
10390	E	568.50	C	12	758	519	391	308	223	145	113	85	80	66	55	51	22	187	-	-	366812	5365719
10400	A	434.25	P	6	142	93	58	43	19	12	-	-	-	-	-	-	10	231	-	-	364670	5364838
10400	B	456.25	S	3	161	92	35	-	-	-	-	-	-	-	-	-	-	180	457.00	29	365929	5365280
10400	C	462.00	B	7	583	341	186	112	68	37	13	-	-	-	-	-	-	154	-	-	366258	5365395
10400	D	472.00	C	9	880	465	319	239	171	115	64	32	17	-	-	-	11	155	-	-	366832	5365608
10410	A	383.75	P	7	53	54	50	50	41	36	26	-	-	-	-	-	39	253	-	-	363930	5364668
10410	B	394.50	S	6	131	71	42	38	38	26	-	-	-	-	-	-	-	214	-	-	364813	5364727
10410	C	374.75	S	2	99	29	-	-	-	-	-	-	-	-	-	-	-	153	377.00	31	365934	5365114
10410	D	382.00	B	5	759	157	282	175	85	25	-	-	-	-	-	-	-	154	-	-	366323	5365270
10410	E	392.50	P	6	169	120	103	95	85	49	-	-	-	-	-	-	-	178	-	-	366850	5365447

928065

line		fiducial	anomaly type	anomaly chs	em channels 1	2	3	4	5	6	7	8	9	10	11	12	cond	alt	mag peak fid	mag peak val	em location easting	em location northing
10420	A	318.00	P	5	53	54	50	50	41	-	-	-	-	-	-	-	39	253	-	-	361930	5363698
10420	B	330.75	S	5	122	67	35	20	6	-	-	-	-	-	-	-	-	152	-	-	364847	5364507
10420	C	347.75	S	1	67	-	-	-	-	-	-	-	-	-	-	-	-	124	-	-	365844	5365044
10421	A	239.25	P	10	-6	-1	3	14	11	26	26	33	26	21	-	-	160	217	-	-	363859	5364244
10421	B	244.00	P	6	78	36	21	18	24	17	-	-	-	-	-	-	-	247	-	-	364116	5364344
10421	C	258.50	S	2	124	55	-	-	-	-	-	-	-	-	-	-	-	208	-	-	364949	5364645
10421	D	265.25	P	12	16	7	6	24	31	45	48	41	34	38	43	52	160	151	-	-	365380	5364805
10421	E	273.25	P	7	-4	-8	-6	-6	3	-7	-10	-	-	-	-	-	-	151	-	-	365757	5364966
10421	F	285.75	B	7	521	332	207	136	61	5	-18	-	-	-	-	-	-	194	-	-	366412	5365193
10421	G	294.75	P	11	211	165	130	116	94	68	44	34	35	26	14	-	26	155	-	-	366864	5365387
10430	A	232.75	S	3	105	60	31	-	-	-	-	-	-	-	-	-	-	172	-	-	363648	5365916
10430	B	236.50	S	4	92	61	40	26	-	-	-	-	-	-	-	-	-	212	-	-	368453	5365795
10430	C	242.25	B	10	200	150	96	59	30	27	21	24	19	16	-	-	13	149	240.25	342	368107	5365664
10430	D	257.75	S	5	173	121	85	59	38	-	-	-	-	-	-	-	27	276	-	-	367131	5365397
10431	A	168.00	S	5	53	45	33	30	26	-	-	-	-	-	-	-	-	212	-	-	364908	5364533
10431	B	189.50	S	4	60	44	22	12	-	-	-	-	-	-	-	-	-	154	-	-	366086	5364901
10431	C	196.00	S	1	217	-	-	-	-	-	-	-	-	-	-	-	-	213	-	-	366408	5365023
10431	D	199.25	S	5	293	184	106	69	49	-	-	-	-	-	-	-	-	207	-	-	366563	5365096
10441	A	147.00	S	2	107	48	-	-	-	-	-	-	-	-	-	-	-	144	-	-	364953	5364430
10441	B	153.50	P	6	-42	-6	4	2	-6	-4	-	-	-	-	-	-	-	154	-	-	365335	5364568
10441	C	176.25	S	4	117	84	50	27	-	-	-	-	-	-	-	-	-	213	-	-	366478	5364979
10442	A	100.25	P	8	57	57	37	18	12	26	27	22	-	-	-	-	84	152	-	-	365725	5364707
10442	B	120.00	C	7	207	149	107	77	47	31	22	-	-	-	-	-	10	207	-	-	366634	5365069
10450	A	29.50	S	6	129	90	61	47	34	26	-	-	-	-	-	-	-	289	27.00	470	368082	5365503
10450	B	45.50	S	4	73	71	47	28	-	-	-	-	-	-	-	-	-	339	-	-	367125	5365171
10451	A	28.50	P	9	40	17	-1	-4	5	18	18	7	10	-	-	-	-	143	-	-	365698	5364576
10451	B	44.50	S	3	154	88	40	-	-	-	-	-	-	-	-	-	-	214	-	-	366460	5364822
10460	A	88.25	P	6	18	25	12	5	0	7	-	-	-	-	-	-	-	153	39.00	104	368387	5361741
10460	B	109.25	S	3	59	36	16	-	-	-	-	-	-	-	-	-	-	156	-	-	367708	5362707
10460	C	118.50	S	5	51	52	45	26	4	-	-	-	-	-	-	-	-	143	-	-	367402	5363155
10460	D	135.25	C	2	32	13	-	-	-	-	-	-	-	-	-	-	-	146	-	-	366837	5363973
10460	E	164.50	S	5	163	114	75	58	25	-	-	-	-	-	-	-	-	154	-	-	365869	5365353
10460	F	177.50	S	3	17	17	-2	-	-	-	-	-	-	-	-	-	-	140	-	-	365396	5365024
17010	A	6.50	P	9	60	47	38	26	26	19	23	16	17	-	-	-	70	232	4.75	150	366310	5367551
17010	B	12.75	P	7	56	57	50	45	29	19	9	-	-	-	-	-	-	196	-	-	366325	5367111
17010	C	35.25	S	6	571	222	74	7	-18	-14	-	-	-	-	-	-	-	151	-	-	366335	5365505
17010	D	42.75	P	2	75	29	-	-	-	-	-	-	-	-	-	-	-	153	-	-	366324	5364986
20010	A	16.00	S	5	29	47	42	32	18	-	-	-	-	-	-	-	-	297	16.25	151	366225	5367817
20010	B	28.00	U	10	1147	737	502	360	237	139	82	36	17	10	-	-	9	168	-	-	366680	5367039
20010	C	35.00	B	12	571	423	312	257	204	169	123	93	70	57	39	25	30	150	-	-	365907	5366575
20010	D	41.75	C	7	138	27	-18	-30	-23	-14	-19	-	-	-	-	-	-	174	39.75	12	367129	5366163
20020	A	62.50	S	5	62	50	31	19	13	-	-	-	-	-	-	-	-	352	-	-	367423	5367320
20020	B	75.00	B	12	215	134	90	**74**	56	**43**	**31**	21	**28**	24	20	-2	29	321	-	-	**367067**	**5366220**
20020	C	**82.00**	**B**	10	**478**	**327**	220	158	**113**	**71**	**49**	32	21	12	-	-	11	252	-	-	**366812**	**5366614**
20020	D	**91.75**	**S**	5	109	64	50	**41**	**24**	-	-	-	-	-	-	-	-	**153**	-	-	**366481**	**5367191**

line		fiducial	anomaly type	anomaly chs	em channels 1	2	3	4	5	6	7	8	9	10	11	12	cond	alt	mag peak fid	mag peak val	em location easting	em location northing
20020	E	96.75	P	7	69	53	31	25	13	14	16	-	-	-	-	-	-	142	-	-	366310	5367483
20020	F	101.75	S	4	50	27	14	10	-	-	-	-	-	-	-	-	-	135	101.00	148	366153	5367765
20020	G	107.00	S	7	-37	-24	-17	-10	-9	-8	-13	-	-	-	-	-	-	146	-	-	365981	5368039
20030	A	128.00	S	4	91	56	26	7	-	-	-	-	-	-	-	-	-	248	128.00	2911	365953	5367645
20030	B	144.25	B	8	722	426	256	156	72	25	14	16	-	-	-	-	6	142	-	-	366566	5366718
20030	C	155.25	S	12	1183	859	632	486	354	236	157	84	64	48	42	24	14	138	-	-	366895	5366081
20040	A	176.00	B	5	151	71	31	26	29	-	-	-	-	-	-	-	-	262	-	-	367282	5365327
20040	B	179.25	C	4	178	102	64	52	-	-	-	-	-	-	-	-	-	245	181.00	135	367193	5365487
20040	C	187.50	U	11	1268	719	440	283	161	89	67	57	42	22	6	-	9	168	-	-	366953	5365925
20040	D	192.75	B	12	455	304	191	121	74	50	41	32	23	21	11	2	12	143	-	-	366788	5366206
20040	E	205.50	S	4	48	42	20	-1	-	-	-	-	-	-	-	-	-	146	-	-	366412	5366845
20040	F	212.75	S	5	40	28	27	22	11	-	-	-	-	-	-	-	-	144	-	-	365199	5367211
20050	A	243.25	S	6	119	93	70	48	33	24	-	-	-	-	-	-	-	230	244.00	221	365797	5367628
20050	B	254.00	S	4	23	8	-5	-12	-	-	-	-	-	-	-	-	-	159	-	-	366236	5367059
20050	C	260.00	S	6	218	146	101	75	44	15	-	-	-	-	-	-	-	154	-	-	366441	5366721
20050	D	263.75	S	4	293	148	61	26	-	-	-	-	-	-	-	-	-	154	-	-	366549	5366502
20050	E	273.50	B	11	1078	716	567	446	306	185	121	72	62	56	44	-	14	145	-	-	366826	5365925
20050	F	283.25	C	6	-62	-69	-57	-46	-23	-5	-	-	-	-	-	-	-	180	281.25	176	367124	5365408
20060	A	305.25	C	6	255	195	149	113	88	44	-	-	-	-	-	-	-	189	-	-	367093	5365274
20060	B	311.25	U	9	620	351	215	143	89	43	22	17	12	-	-	-	7	153	-	-	366905	5365574
20060	C	316.50	B	10	736	450	306	221	140	79	46	26	19	14	-	-	9	131	-	-	366752	5365836
20060	D	360.25	S	2	58	19	-	-	-	-	-	-	-	-	-	-	-	155	-	-	365467	5366844
20070	A	374.25	S	4	71	47	34	26	-	-	-	-	-	-	-	-	-	178	373.50	223	365681	5367412
20070	B	387.25	P	7	84	65	58	52	32	13	10	-	-	-	-	-	-	146	-	-	366150	5366685
20070	C	393.25	S	3	109	67	37	-	-	-	-	-	-	-	-	-	-	153	-	-	366342	5366343
20070	D	405.50	B	11	590	432	303	214	140	89	58	40	29	23	8	-	11	150	-	-	366724	5365646
20070	E	413.00	C	1	-47	-	-	-	-	-	-	-	-	-	-	-	-	159	410.50	59	366961	5365238
20080	A	587.25	S	4	77	50	37	22	-	-	-	-	-	-	-	-	-	178	-	-	367341	5364471
20080	B	605.50	U	7	407	283	180	112	60	37	19	-	-	-	-	-	-	140	605.50	83	366832	5365359
20080	C	612.00	B	8	452	301	201	141	96	60	39	16	-	-	-	-	10	147	-	-	366644	5365690
20080	D	620.25	S	5	24	6	-7	-8	-7	-	-	-	-	-	-	-	-	147	-	-	366395	5366126
20090	A	532.00	S	4	69	54	34	20	-	-	-	-	-	-	-	-	-	139	-	-	365302	5366877
20090	B	556.00	B	10	820	492	283	167	104	80	51	23	20	18	-	-	10	153	-	-	366580	5365550
20090	C	564.50	C	1	-111	-	-	-	-	-	-	-	-	-	-	-	-	149	-	-	366829	5365059
20100	A	667.75	S	5	-9	-9	-9	-7	-11	-	-	-	-	-	-	-	-	187	-	-	365049	5368081
20100	B	698.00	S	3	70	44	12	-	-	-	-	-	-	-	-	-	-	132	-	-	365686	5366975
20100	C	714.25	B	9	1165	698	398	247	130	55	25	21	17	-	-	-	6	141	-	-	366492	5365524
20100	D	723.25	C	3	-97	-19	-6	-	-	-	-	-	-	-	-	-	-	154	-	-	366775	5365041
20110	A	739.75	S	4	81	62	37	13	-	-	-	-	-	-	-	-	-	137	-	-	367071	5364300
20110	B	749.50	C	3	177	91	34	-	-	-	-	-	-	-	-	-	-	137	-	-	366795	5364810
20110	C	757.50	U	7	782	441	219	117	56	35	12	-	-	-	-	-	-	132	-	-	366546	5365225
20110	D	764.75	B	9	1494	1120	778	48	10	25	-	-	-	-	-	-	-	160	-	-	366330	5365604
20110	E	791.50	S	2	31	2	-	-	-	-	-	-	-	-	-	-	-	151	-	-	365506	5366933
20110	F	803.50	S	3	57	10	-16	-	-	-	-	-	-	-	-	-	-	147	802.25	81	365169	5367612
20110	G	811.00	S	5	59	17	33	22	9	-	-	-	-	-	-	-	-	146	-	-	364936	5367985
20120	A	828.25	C	5	-24	-3	0	-4	-3	-	-	-	-	-	-	-	-	135	-	-	365098	5367571

line		fiducial	anomaly type	anomaly chs	em channels 1	2	3	4	5	6	7	8	9	10	11	12	cond	alt	mag peak fid	mag peak val	em location easting	em location northing
20120	B	835.00	S	6	-59	-35	-33	-36	-26	-5	-	-	-	-	-	-	-	129	-	-	365204	5367199
20120	C	843.00	S	4	15	2	2	0	-	-	-	-	-	-	-	-	-	139	-	-	365530	5366770
20120	D	848.25	S	5	73	46	23	11	-6	-	-	-	-	-	-	-	-	139	-	-	365672	5366464
20120	E	853.50	S	4	65	42	26	8	-	-	-	-	-	-	-	-	-	151	-	-	365829	5366205
20120	F	859.50	S	3	30	8	-2	-	-	-	-	-	-	-	-	-	-	145	-	-	366019	5365888
20120	G	868.00	B	7	632	278	130	56	10	-13	-14	-	-	-	-	-	-	140	-	-	366282	5365435
20120	H	878.50	S	1	91	-	-	-	-	-	-	-	-	-	-	-	-	146	-	-	366596	5364874
20120	J	885.00	C	1	41	-	-	-	-	-	-	-	-	-	-	-	-	144	-	-	366809	5364527
20130	A	892.25	C	1	-24	-	-	-	-	-	-	-	-	-	-	-	-	135	-	-	365098	5367574
20130	B	902.25	S	3	120	42	-13	-	-	-	-	-	-	-	-	-	-	128	-	-	366632	5364637
20130	C	912.25	S	3	383	190	60	-	-	-	-	-	-	-	-	-	-	142	-	-	366340	5365201
20130	D	918.50	B	7	131	86	58	49	43	30	27	-	-	-	-	-	30	134	-	-	366154	5365521
20130	E	939.25	S	3	50	19	-9	-	-	-	-	-	-	-	-	-	-	144	-	-	365535	5366602
20130	F	963.75	S	2	79	39	-	-	-	-	-	-	-	-	-	-	-	147	-	-	364816	5367835
20140	A	1002.50	S	1	54	-	-	-	-	-	-	-	-	-	-	-	-	150	-	-	365514	5366359
20140	B	1022.25	B	7	271	151	67	32	18	14	11	-	-	-	-	-	-	148	-	-	366154	5365264
20140	C	1028.25	S	3	128	61	11	-	-	-	-	-	-	-	-	-	-	149	-	-	366330	5364930
20150	A	1055.75	S	3	58	30	16	-	-	-	-	-	-	-	-	-	-	144	-	-	366184	5365040
20150	B	1060.75	B	6	202	125	70	46	20	17	-	-	-	-	-	-	-	119	1058.50	14	366029	5365310
20150	C	1080.75	S	1	-11	-	-	-	-	-	-	-	-	-	-	-	-	157	-	-	365418	5366210
20150	D	1113.50	B	2	141	102	-	-	-	-	-	-	-	-	-	-	-	144	-	-	364486	5365825
20160	A	1122.50	C	3	79	32	2	-	-	-	-	-	-	-	-	-	-	244	1122.50	120	364188	5368367
20160	B	1135.50	P	6	-7	6	7	1	-1	-3	-	-	-	-	-	-	-	178	-	-	364571	5367625
20160	C	1162.00	S	4	73	60	41	22	-	-	-	-	-	-	-	-	-	144	-	-	365485	5366064
20160	D	1176.25	S	3	85	56	23	-	-	-	-	-	-	-	-	-	-	168	-	-	365943	5365231
20160	E	1186.25	S	4	80	61	37	20	-	-	-	-	-	-	-	-	-	163	-	-	366263	5364692
20170	A	1205.75	P	5	8	16	9	11	3	-	-	-	-	-	-	-	-	161	-	-	366206	5364649
20170	B	1212.50	S	4	-17	0	3	0	-	-	-	-	-	-	-	-	-	165	-	-	365996	5364979
20170	C	1220.75	B	5	134	93	74	66	43	15	-	-	-	-	-	-	-	161	-	-	365747	5365416
20170	D	1234.00	S	3	31	19	1	-	-	-	-	-	-	-	-	-	-	150	-	-	365522	5366168
20170	E	1238.75	S	3	66	29	2	-	-	-	-	-	-	-	-	-	-	149	-	-	365167	5366431
20180	A	1300.00	S	2	51	10	-	-	-	-	-	-	-	-	-	-	-	157	-	-	365380	5365823
20180	B	1312.00	S	3	59	22	-6	-	-	-	-	-	-	-	-	-	-	198	-	-	365758	5365143
20190	A	1353.75	S	5	-1	1	12	16	20	-	-	-	-	-	-	-	-	183	-	-	365802	5364934
20190	B	1361.00	S	5	130	102	70	45	9	-	-	-	-	-	-	-	-	233	-	-	365586	5365299
20190	C	1373.00	S	1	73	-	-	-	-	-	-	-	-	-	-	-	-	190	-	-	365201	5365943
20200	A	1453.50	S	2	27	13	-	-	-	-	-	-	-	-	-	-	-	199	-	-	365233	5365782
20200	B	1464.75	P	8	92	39	24	25	23	18	18	24	-	-	-	-	95	198	-	-	365575	5365146
20200	C	1481.00	S	3	48	25	13	-	-	-	-	-	-	-	-	-	-	212	-	-	366064	5364275

APPENDIX III
SOIL SAMPLE LEDGER AND ASSAYS

MELBA FLATS EL 43/92 - SOIL DATA BASE

928070

SAMPNO.	DPO	EAST	NORTH	PROSPECT	DEPTH m	HORIZ	SAMPLE TYPE	COLOUR	LITHOLOGY/TEXTURE	COMMENTS	SUSC. x 10-5 SI	Ag ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ni ppm	Pb ppm	Zn ppm
3911707	77353	366480	5366150	VAUDEAU	0.7	C	R	YV	Ccy with Ssh rock fragments	Mines Dept grav stn. on road	50	-1	42	1113	266	10.90	154	23	122
3911708	77353	366440	5366150	VAUDEAU	1.5	C	R	PB	Ccy with Ssh	Next to 3528459-61 (ROCK)	16	-1	4	68	76	12.40	100	59	51
3911709	77353	366385	5366100	VAUDEAU	0.1	C	R	GY	Ccy with silisified Ssh & ooze	E/W costean full of water	350	-1	50	229	1737	10.90	792	29	175
3911710	77353	366500	5366310	VAUDEAU	0.4	C	R	V	V Ssh with Ccy	From CSR 6400E 6250N	24	-1	30	417	50	7.07	104	6	126
3911711	77353	366450	5366300	VAUDEAU	0.4	B/C	R	YO	Ccy with Ssh	Oon hill	20	-1	-3	156	64	9.36	72	130	90
3911712	77353	366275	5367315	NORTH CUNI	1.1	C	R	LGVO	Ccy with V Ssh	From CSR 6200E 7300N	19	-1	19	120	37	7.18	74	3	84
3911713	77353	366270	5367505	NORTH CUNI	0.4	B	R/T	O	Gritty Ccy	Star pickett S1899	13	-1	-3	153	10	6.70	9	50	24
3911714	77353	366345	5367610	NORTH CUNI	0.4	C	R	V	Ssh fragments	20 m E of North Cuni shaft	20	-1	13	334	69	4.18	82	835	223
3911715	77353	366345	5367687	NORTH CUNI	0.5	C	R	B	Ccy with minor Ssh	0E - Mines Dept gravity stn.	13	-1	-3	286	133	15.10	94	34	66
3911716	77353	366329	5367698	NORTH CUNI	0.4	C	R	B	Ccy with minor Ssh	20W	20	-1	-3	314	123	17.60	83	9	142
3911717	77353	366312	5367709	NORTH CUNI	0.5	C	R	DB	Ccy with Ssh & minor Vu qtz	40W	19	-1	-3	165	251	16.10	227	26	76
3911718	77353	366290	5367711	NORTH CUNI	0.8	C	R	B	Ccy with common Ssh	60W	20	-1	5	181	423	18.70	300	46	55
3911719	77353	366269	5367709	NORTH CUNI	0.8	C	R	DPB	Ccy with common Ssh	80W	15	-1	7	150	139	13.00	113	1338	85
3911720	77353	366247	5367712	NORTH CUNI	0.9	C	R	MLV	Ccy with minor Ssh	100W	26	-1	38	769	352	12.10	964	102	95
3911721	77353	366229	5367707	NORTH CUNI	0.7	B/C	R	MGV	Ccy with minor sed? RF	120W	12	-1	6	116	51	3.32	44	87	87
3911722	77353	366219	5367688	NORTH CUNI	0.7	C	R	MLV	Ccy with very minor sed?RF	140W	16	-1	25	139	21	6.02	139	41	407
3911723	77353	366198	5367680	NORTH CUNI	0.7	C	R	DPB	Ccy with common Ssh	160W	16	-1	19	102	25	9.31	57	14	115
3911724	77353	366180	5367677	NORTH CUNI	0.4	C	R	GLV	Ccy with Ssh	180W	20	-1	31	371	53	10.50	244	43	110
3911725	77353	366383	5367675	NORTH CUNI	0.4	C	R	B	Ccy with common Ssh	40E	18	-1	-3	128	190	13.10	39	69	74
3911726	77353	366403	5367671	NORTH CUNI	0.7	B/C	R	B	Ccy with very minor Ssh	60E	12	-1	-3	129	42	6.77	44	23	23
3911727	77353	366424	5367673	NORTH CUNI	0.6	C	R	LVG	Ccy with minor Ssh	80E	20	-1	13	99	22	11.00	58	69	110
3911728	77353	366444	5367673	NORTH CUNI	0.6	B/C	R	G	Gritty Ccy	100E	11	-1	-3	66	15	3.92	23	14	25
3911729	77353	366463	5367672	NORTH CUNI	0.4	C	R	LVG	Ccy with minor RF	120E	20	-1	6	199	12	4.30	25	12	47
3911730	77353	366483	5367670	NORTH CUNI	0.2	B/C	R	LGB	Ccy with common RF	140E - Very thin soil developed	15	-1	4	117	20	2.82	29	24	43
3911742	77353	366503	5367671	NORTH CUNI	0.3	B/C	R	P	Ssh	160E - Hit bedrock	15	-1	13	167	15	5.83	50	11	70
3911743	77353	366523	5367671	NORTH CUNI	0.6	B/C	R	P	Ccy	180E - Over Ssh?	19	-1	17	160	17	9.09	61	9	86
3911744	77353	366543	5367670	NORTH CUNI	0.4	B/C	R	MPO	Ccy	200E - Hard	16	-1	14	82	8	6.25	55	14	82
3911745	77353	366563	5367671	NORTH CUNI	0.8	C	R	LV	Ccy with LV Ssh	220E	25	-1	11	111	30	9.51	76	23	80
3912901	77355	366100	5365950	VAUDEAU	2.0	C?	R?	O	Friable Ccy		10	-1	30	264	104	13.10	116	8	128
3912902	77355	366125	5365950	VAUDEAU	1.3	B/C?	R?	O	Friable Ccy	Msl rock fragments	290	-1	13	308	96	16.00	63	-3	95
3912903	77355	366150	5365950	VAUDEAU	1.5	C	R	POG	Gritty Ccy	On track	10	-1	-3	117	94	7.34	22	31	2
3912904	77355	366175	5365950	VAUDEAU	1.1	C	R	O	Gritty friable Ccy	Msl rock fragments	20	-1	11	193	169	20.40	78	4	75
3912905	77355	366200	5365950	VAUDEAU	1.5	B	R	B	Silty	Track at 190E	20	-1	12	284	81	16.20	74	4	93
3912906	77355	366225	5365950	VAUDEAU	0.7	B	R	O	Sandy/silty		90	-1	13	223	77	12.20	61	-3	94
3912907	77355	366250	5365950	VAUDEAU	0.8	B/C	R?	BR	Sandy/silty	After sulphides?	20	-1	16	235	41	17.00	134	22	116
3912908	77355	366260	5365950	VAUDEAU	1.0	C	R	PO	Gritty friable Ccy		30	-1	13	2725	364	15.40	155	5	89
3912909	77355	366270	5365950	VAUDEAU	1.0	C	R	PO	Gritty friable Ccy		10	-1	23	613	123	15.10	173	16	99
3912910	77355	366280	5365950	VAUDEAU	1.0	C	R	POVG	Gritty friable Ccy	Rock fragments	20	-1	46	848	110	11.10	519	11	13
3912911	77355	366290	5365950	VAUDEAU	1.0	C	R	POVG	Gritty friable Ccy	Rock fragments	10	-1	6	104	42	7.75	58	15	8
3912912	77355	366300	5365950	VAUDEAU	0.8	C?	R?	PVG	Gritty friable Ccy	Green Msl rock fragments.	10	-1	55	153	12	2.61	40	13	40
3912913	77355	366310	5365950	VAUDEAU	0.7	C?	R?	PVG	Gritty friable Ccy	Green Msl rock fragments.	10	-1	-3	152	24	1.17	27	31	18
3912914	77355	366320	5365950	VAUDEAU	0.8	C?	R?	PVG	Gritty friable Ccy	Green Msl rock fragments.	0	-1	-3	92	20	1.26	25	10	22
3912915	77355	366330	5365950	VAUDEAU	0.8	C?	R?	PVG	Gritty friable Ccy	Green Msl rock fragments.	10	-1	8	137	60	3.58	81	22	79
3912916	77355	366340	5365950	VAUDEAU	0.7	C	R	PVG	Gritty friable Ccy	From swamp. V rock fragments	10	-1	10	147	70	7.17	67	29	77
3912917	77355	366350	5365950	VAUDEAU	1.2	C	R	PG	Ccy	Primary Msl foliation noted	0	-1	-3	41	10	0.94	16	77	20
3912918	77355	366360	5365950	VAUDEAU	1.1	B	R	MLBO	Gritty friable Ccy		10	-1	7	105	58	9.61	44	199	66

MELBA FLATS EL 43/92 - SOIL DATA BASE

SAMPNO.	DPO	EAST	NORTH	PROSPECT	DEPTH m	HORIZ	SAMPLE TYPE	COLOUR	LITHOLOGY/TEXTURE	COMMENTS	SUSC. x 10-5 SI	Ag ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ni ppm	Pb ppm	Zn ppm
3912919	77355	366370	5365950	VAUDEAU	1.1	B	R	MLBO	Gritty friable Ccy		220	-1	9	158	42	12.20	51	21	77
3912920	77355	366380	5365950	VAUDEAU	0.5	B/C	R	O	Ccy with hornfels Sw RF	On outcrop.	30	-1	19	112	19	10.40	57	5	95
3912921	77355	366390	5365950	VAUDEAU	1.3	B	R?	MNO	Gritty Ccy		10	3	-3	57	62	6.78	4	76	21
3912922	77355	366400	5365950	VAUDEAU	0.8	A/B	T	N	Gravely peat	Swampy broad gully	10	-1	4	222	23	6.20	70	42	89
3912923	77355	366430	5365950	VAUDEAU	0.3	B/C	R	B	Ccy with Sw rock fragments	Track at 425E.	10	-1	5	192	174	2.75	45	61	76
3912924	77355	366450	5366150	VAUDEAU	0.4	C	R	P	Ccy with Ssh fragments		20	-1	13	143	120	11.80	70	19	88
3912925	77355	366430	5366150	VAUDEAU	0.4	B/C	R	O	Ccy with rock fragments		70	-1	12	360	250	13.00	201	28	110
3912926	77355	366420	5366150	VAUDEAU	1.5	B	clay	PV	Ccy		30	-1	26	141	161	10.00	139	7	130
3912927	77355	366410	5366150	VAUDEAU	0.8	B/C	R	PV	Gritty Ccy	Green Ssh fragments	20	-1	48	228	155	8.29	169	16	180
3912928	77355	366400	5366150	VAUDEAU	2.0	B	Clay	PV	Ccy	Very soft at EOH	10	-1	22	105	63	4.39	199	4	120
3912929	77355	366390	5366150	VAUDEAU	1.3	B?C	R	PV	Ccy with Ssh fragments		20	-1	12	200	86	9.82	98	9	77
3912930	77355	366380	5366150	VAUDEAU	1.3	B/C	R	OV	Gritty Ccy	Green Ssh RF	30	-1	13	242	106	11.80	152	20	106
3912931	77355	366370	5366150	VAUDEAU	0.9	C	R	PV	RF with minor Ccy	1 m west of old trench	30	-1	15	133	76	6.36	63	-3	89
3912932	77355	366360	5366150	VAUDEAU	0.7	C?	R	O	Gritty Ccy with unidentified RF	Ck at 365E	10	-1	-3	84	86	7.55	19	10	41
3912933	77355	366350	5366150	VAUDEAU	1.0	C	R	O	Gritty Ccy with Ssh frag		10	-1	4	108	56	7.61	57	34	39
3912934	77355	366340	5366150	VAUDEAU	0.7	B/C	R	O	Gritty Ccy		20	-1	5	204	71	14.90	46	-3	69
3912935	77355	366330	5366150	VAUDEAU	0.4	C?	R	O	Gritty Ccy	Next to Igb float & Sss outcrop	130	-1	17	325	43	10.00	132	-3	66
3912936	77355	366320	5366150	VAUDEAU	0.4	C	R	VB	Ccy with shale rock fragments	Top of hill	20	-1	14	152	22	9.53	44	-3	63
3912937	77355	366310	5366150	VAUDEAU	0.3	B/C	R	B	Ccy.	Poor C horizon developed	50	-1	4	115	12	6.49	16	4	36
3912938	77355	366300	5366150	VAUDEAU	0.2	A/C	R	B	Ccy with Ssh rock fragments	Track at 6298E	130	1	6	124	23	7.41	15	10	41
3912939	77355	366290	5366150	VAUDEAU	0.6	C	R	PO	Ccy with Ssh rock fragments		40	-1	4	136	35	8.84	16	4	38
3912940	77355	366280	5366150	VAUDEAU	0.9	C	R	VB	Ccy with Ssh rock fragments	Creek at 6275E	20	-1	6	149	27	4.80	30	7	48
3912941	77355	366270	5366150	VAUDEAU	1.2	B/C	R/T	LG	Ccy with gravel and green Ssh	Gravels may be assoc. with ck	20	-1	10	420	24	2.45	40	22	76
3912942	77355	366260	5366150	VAUDEAU	0.3	B	T	OB	Ccy with gravels	Black Ssh and qtz fragments	60	-1	16	224	63	9.74	48	11	90
3912943	77355	366250	5366150	VAUDEAU	0.9	B/C	R	OV	Gritty sandy Ccy		20	-1	20	694	58	8.54	104	12	110
3912944	77355	366450	5365950	VAUDEAU	0.7	C	R	G	Ccy		20	-1	18	210	23	5.16	79	26	169
3912945	77355	366475	5365950	VAUDEAU	0.4	C	R	LBG	G Ssh friable	Water at EOH	10	-1	4	118	14	1.12	11	54	38
3912946	77355	366500	5365950	VAUDEAU	2.0	B		O	Ccy		20	-1	16	241	71	13.60	77	29	104
3912947	77355	366525	5365950	VAUDEAU	1.9	B		O	Ccy	On Hill	10	-1	8	249	111	8.00	109	16	57
3912948	77355	366550	5365950	VAUDEAU	1.0	B		O	Ccy	Very hard to pentrate. On hill.	10	-1	5	298	124	16.90	65	21	73
3912949	77355	366575	5365950	VAUDEAU	1.1	B		O	Ccy	Very hard to pentrate. On hill.	10	-1	3	232	86	14.30	81	23	95
3912950	77355	366600	5365950	VAUDEAU	0.6	B		LB	Ccy	Very hard to pentrate.	20	-1	10	196	46	6.66	80	114	53
3912951	77355	366625	5365950	VAUDEAU	1.0	B?		PO	Ccy	Very hard to pentrate.	10	-1	-3	151	66	9.54	23	33	24
3912952	77355	366650	5365950	VAUDEAU	0.9	B	R?	MOW		Very hard to pentrate.	10	-1	-3	141	64	12.00	21	18	38
3912953	77355	366675	5365950	VAUDEAU	0.8	B/C	R	DG	Sbs Ccy	Graphitic	10	-1	-3	60	28	1.11	9	22	17
3912954	77355	366700	5365950	VAUDEAU	1.5	C		MOW	Ccy	Very hard to pentrate.	20	-1	4	385	123	15.50	54	8	204
3912955	77355	366725	5365950	VAUDEAU	0.9	B/C	R?	MKO	Ccy with rock fragments	Very hard to pentrate.	20	-1	-3	225	82	13.50	30	7	46
3912956	77355	366750	5365950	VAUDEAU	1.5	B		OK	Ccy		10	-1	-3	400	119	7.07	80	20	21
3912957	77355	366775	5365950	VAUDEAU	1.2	B/C?	R?	LG	Ccy	Rock fragments?	20	-1	15	168	40	7.33	88	55	165
3912958	77355	366800	5365950	VAUDEAU	1.8	B/C		PV	Gritty Ccy	Water at 1.5 m	20	-1	14	164	57	5.14	130	42	97
3912959	77355	366225	5366150	VAUDEAU	1.0	C	R?	OV	Gritty Ccy with rock fragments	Ssh Sss and qtz rock fragmants	20	-1	19	1127	64	6.63	109	20	130
3912960	77355	366200	5366150	VAUDEAU	0.8	C	R/T	OV	Gritty Ccy with Sbs & V Sss		20	-1	27	620	53	4.39	116	12	155
3912961	77355	366175	5366150	VAUDEAU	1.1	C	R/T	V	Ccy & Cg with V Sss & Sbs		70	-1	41	487	67	4.51	127	9	211
3912962	77355	366150	5366150	VAUDEAU	0.8	B/C	R	V	Ccy with V Sss fragmants		60	-1	14	864	44	6.24	60	14	96
3912963	77355	366125	5366150	VAUDEAU	0.8	C	R/T	VO	Ccy with rock fragments	Qtz with V Sss	20	-1	15	475	64	9.64	81	28	103
3912964	77355	366100	5366150	VAUDEAU	0.6	B	R	LOV	Gitty Ccy	Creek cross at 536095E	20	-1	17	746	68	9.70	91	22	101

MELBA FLATS EL 43/92 - SOIL DATA BASE

SAMPNO.	DPO	EAST	NORTH	PROSPECT	DEPTH m	HORIZ	SAMPLE TYPE	COLOUR	LITHOLOGY/TEXTURE	COMMENTS	SUSC. x 10-5 SI	Ag ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ni ppm	Pb ppm	Zn ppm
3912965	77355	366475	5366150	VAUDEAU	0.8	B	R	PB	Ccy		10	-1	14	252	81	6.89	75	22	94
3912966	77355	366500	5366150	VAUDEAU	1.0	B	R	OV			10	-1	8	147	30	3.80	63	22	62
3912967	77355	366525	5366150	VAUDEAU	0.4	B	R	OV	Ccy & Sss fragments	Creek at 6515E	30	-1	9	583	38	7.90	53	9	68
3912968	77355	366550	5366150	VAUDEAU	0.9	C	R	GV	Ccy & rock fragments	Qtz, green and black Ssh	20	-1	15	633	39	3.08	77	24	115
3912969	77355	366575	5366150	VAUDEAU	0.8	B/C	R	GV	Ccy & rock fragments		5	-1	5	896	28	2.66	24	112	85
3912970	77355	366600	5366150	VAUDEAU	0.6	B/C	R	V	Ccy & rock fragments	Green Sss	10	-1	13	748	27	2.80	35	265	11
3912971	77355	366625	5366150	VAUDEAU	0.3	B	R/T	G	Ccy & rock fragments	Qtz & lgb	10	-1	4	614	25	1.41	13	32	59
3912972	77355	366650	5366150	VAUDEAU	0.5	B/C	R/T	V	Ccy & rock fragments	Qzt & black Ssh	20	-1	25	249	41	6.40	72	39	207
3912973	77355	366675	5366150	VAUDEAU	0.6	B/C	T?	OV	Ccy & rock fragments		10	-1	13	197	28	5.49	42	44	126
3912974	77355	366700	5366150	VAUDEAU	0.7	B/C	R	V	Ccy & qtz		10	-1	6	164	19	2.74	38	74	81
3912975	77355	366725	5366150	VAUDEAU	0.7	B	R	VY	Ccy & Sw		10	-1	4	198	20	1.88	38	291	97
3912976	77355	366750	5366150	VAUDEAU	0.3	B	T		Ccy & qtz		3	-1	-3	278	37	0.86	14	176	3
3912977	77355	366775	5366150	VAUDEAU	0.4	B	R	N	Sbs		2	-1	7	185	48	3.05	22	436	75
3912978	77355	366800	5366150	VAUDEAU	2.1	B	R	O	Frible Ccy		3	-1	-3	266	77	2.39	81	99	30
3912979	77355	366150	5367700	NORTH CUNI	0.4	B/C	R/T	O	Ccy & Qtz, P Ssh & lgb?		20	-1	3	190	15	3.77	11	48	62
3912980	77355	366175	5367700	NORTH CUNI	2.1	B	R	O	Ccy	On slight hill	10	-1	11	501	147	8.19	162	152	198
3912981	77355	366200	5367700	NORTH CUNI	0.7	B	R	B	Ccy		10	-1	10	217	24	8.30	40	13	9
3912982	77355	366225	5367700	NORTH CUNI	0.9	B	R?	VPB	Ccy with Qtz & Sss RF		10	-1	17	150	41	4.10	62	37	15
3912983	77355	366250	5367700	NORTH CUNI	0.9	B	R	GO	Ccy		20	-1	31	225	65	8.55	157	92	236
3912984	77355	366275	5367700	NORTH CUNI	0.9	B	R	O	Ccy		5	-1	-3	193	116	5.24	25	927	43
3912985	77355	366300	5367700	NORTH CUNI	0.4	B/C	R	VO	Ccy & lgb? rock fragments		40	-1	3	308	382	9.40	88	40	90
3912986	77355	366310	5367700	NORTH CUNI	0.3	B	R?	O	Ccy & qtz fragments		833	-1	6	322	364	14.20	267	36	6
3912987	77355	366320	5367700	NORTH CUNI	1.1	B	R	O	Ccy		10	-1	3	160	128	10.10	71	23	8
3912988	77355	366330	5367700	NORTH CUNI	0.7	B	R	O	Ccy	Near road	10	-1	-3	260	83	12.30	79	12	12
3912989	77355	366340	5367700	NORTH CUNI	1.0	B	R	OP	Ccy & P Msl		20	-1	-3	250	95	19.60	55	22	23
3912990	77355	366350	5367700	NORTH CUNI	1.4	B/C	R	O	Ccy		10	-1	3	175	110	16.00	52	63	150
3912991	77355	366360	5367700	NORTH CUNI	0.8	B	R	O	Ccy		10	-1	3	293	78	10.50	80	47	6
3912992	77355	366370	5367700	NORTH CUNI	2.1	B	R	OV	Ccy		10	-1	26	269	144	9.39	204	20	17
3912993	77355	366380	5367700	NORTH CUNI	1.3	B	R	OV	Ccy		N/A	-1	-3	102	28	2.56	31	26	3
3912994	77355	366390	5367700	NORTH CUNI	1.4	B/C	R	OV	Ccy & V Sss fragments		N/A	-1	-3	79	13	1.87	16	70	24
3912995	77355	366400	5367700	NORTH CUNI	0.7	B	R	O	Ccy		N/A	-1	3	105	13	3.47	13	25	25
3912996	77355	366410	5367700	NORTH CUNI	0.3	B/C	R	V	Ccy & V Sss		N/A	-1	-3	144	8	1.46	7	16	18
3912997	77355	366420	5367700	NORTH CUNI	0.6	B/C	R	V	Ccy & V Sss		N/A	2	-3	91	12	0.85	9	25	20
3912998	77355	366430	5367700	NORTH CUNI	0.4	C	R	V	V Ssh	Fresh bedrock	N/A	-1	16	118	63	8.54	53	7	11
3912999	77355	366440	5367700	NORTH CUNI	0.7	C	R	V	V Sss	Bedrock?	N/A	-1	10	158	32	3.63	33	48	66
3913000	77355	366450	5367700	NORTH CUNI	0.3	B/C	R	B	Ccy & V Sss		N/A	-1	10	183	17	4.80	34	9	72

928073

ROCKCHIP AND DRILLING CODES 17/2/93

BMR LITH

Rock code as per published geological map
For time designation use:-

Q	Quaternary	M	Permian	P	Proterozoic
T	Tertiary	C	Carboniferous	A	Archaean
		S	Silurian		
K	Cretaceous	D	Devonian		
R	Triassic	O	Ordovician		
J	Jurassic	E	Cambrian		

FIELD ID

Field term for rock type
Broad groupings are:-

S	Sedimentary	I	Intrusive	C	Surficial
M	Metamorphic	E	Extrusive	O	Others

SEDIMENTARY

Scg	Conglomerate	Sls	Limestone	Sw	Wacke
Sss	Sandstone	Sch	Chert	Sag	Agglomerate/mixtite
Ssi	Siltstone	Slf	BIF		
Ssh	Shale				
Sbs	Black shale	Sbx	Breccia		

METAMORPHIC

Mst	Slate	Mq	Quartzite	Mmg	Migmatite
Mph	Phyllite	Mm	Marble		
Msc	Schist	Ma	Amphibolite		
Mbs	Graphitic schist	Mcs	Calcsilicate	Msk	Skarn
Mgn	Gneiss	Mh	Hornfels		

INTRUSIVE IGNEOUS

If	Felsic undiff.	Ii	Intermed undiff.	Iu	Ultramafic
Ifp	Felsic porphyry	Iip	Intermed porph	Ius	Serpentinite
Iap	Aplite	Im	Matic undiff.		
Igr	Granite	Ido	Dolerite	Ipg	Pegmatite
Igd	Granodiorite	Igb	Gabbro		

EXTRUSIVE IGNEOUS

Ery	Rhyolite	Ean	Andesite	Et	Tuff undiff
Edc	Dacite	Eb	Basalt	Eft	Felsic tuff
				Emt	Matic tuff

SURFICIAL (COVER) MATERIAL

Ca	Alluvium	Clt	Laterite	Csg	Gossan
Ccn	Colluvium	Cso	Pisolites		
Cs	Sand	Cst	Ironstone	Cay	Clay
Cbs	Black soil	Csi	Silcrete		
Cg	Gravel	Ccl	Calcrete	Cv	Vegetation/peat

OTHERS

Ovq	Vein quartz	Omy	Mylonite	Oms	Massive sulphide
Ovc	Vein carbonate	Obx	Breccia		
Ovs	Vein sulphide	Of	Fault gouge	Ox	Unknown

TEXTURAL CODES

WEATHERING/SURFICIAL FEATURES

We	Weathered	Fe	Ferruginous
Bl	Bleached	Fo	Fe ox in frac
Le	Leached		

MINERALISATION/ALTERATION FEATURES

Gs	Gossanous	Vs	Vein sulphide	Al	Altered
Vn	Veined	Ds	Dissem sulph	Si	Silicified
Di	Disseminated	Fs	Fracture sulph		
		Bs	Banded sulph		

GEOLOGICAL FEATURES

Bd	Bedded	Fr	Fractured	Po	Porphyritic
Bn	Banded	Ib	Interbedded	Sc	Schistose
Bx	Brecciated	Lm	Laminated	Sh	Sheared
Fl	Fissile (slatey)	Ma	Massive	Vu	Vuggy

DIAGNOSTIC MINERALOGY

PRIMARY MINERALISATION

Ga	Galena	Py	Pyrite	Ni	Ni sulphides
Sa	Sphalerite	Po	Pyrrhotite		
Cp	Chalcopyrite	Su	Unknown sulph		

SECONDARY MINERALISATION

Ls	Lead secondaries	Cs	Copper sec.	Ns	Ni secondaries
Zs	Zinc "	Us	Uranium "		

ALTERATION/DIAGNOSTIC MINERALS

Cy	Clay	He	Haematite	Gt	Garnet
Ep	Epidote	Mt	Magnetite	Ky	Kyanite
Cc	Carbonate	Js	Jarosite	To	Tourmaline
Sd	Siderite	Mn	Manganese mins		

COLOUR CODES

L	Light	A	Banded	M	Mottled
D	Dark				
N	Black	P	Purple	V	Green
G	Grey	R	Red	K	Pink
Z	Brown	O	Orange	E	Blue
W	White	Y	Yellow	S	Silver

ANALABS

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

928074

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.08960	14/01/93	71516	1 OF 1

TUBE No.	SAMPLE No.	Cr	Cr	Cu	Cu	Fe	Ni	Ni		
1	3308004	-	1.00	4	-	4.57	660	-		
2	3308005	1350	-	5	-	5.85	1650	-		
3	3308006	1050	-	5	-	5.36	1550	-		
4	3308007	855	-	2	-	6.67	730	-		
5	3308008	500	-	3	-	4.98	1100	-		
6	3308009	1450	-	9	-	5.39	-	2.06		
7	3308010	185	-	825	-	1.81	-	26.60		
8	3308011	680	-	6	-	3.42	2000	-		
9	3308012	445	-	7	-	12.21	1200	-		
10	3308013	1650	-	2	-	18.34	1850	-		
11	3308014	1250	-	2	-	10.56	7800	-		
12	3308015	1700	-	2	-	3.52	7350	-		
13	3308016	1600	-	4	-	3.05	7100	-		
14	3308017	675	-	120	-	7.35	-	3.35		
15	3308018	745	-	67	-	6.24	-	2.55		
16	3308019	325	-	3350	-	11.20	4950	-		
17	3308020	265	-	4550	-	9.76	2900	-		
18	3308021	155	-	-	3.04	2.83	-	8.94		
19										
20										
21										
22										
23	DETECTION	7	0.01	2	0.01	0.01	3	0.01		
24	UNITS	ppm	%	ppm	%	%	ppm	%		
25	METHOD	GA140	GA104	GA140	GA104	GA140	GA140	GA104		

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

AUTHORISED OFFICER _____

ANALABS

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

928075

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.08960	14/01/93	71516	1 OF 2

TUBE No.	SAMPLE No.	Ag	Ag	Cu	Cu	Fe	Mn	Mn*	Pb	Pb*
1	3308022	<1	-	120	-	49.13	-	5.61	12	-
2	3308023	<1	-	8	-	52.23	-	4.08	<3	-
3	3308024	15	-	29	-	1.23	105	-	6600	-
4	3308025	-	197	900	-	0.99	480	-	-	1.76
5	3308026	-	75	290	-	0.39	205	-	-	3.40
6	3308027	10	-	36	-	0.99	130	-	4400	0.52*
7	3308028	-	124	385	-	0.06	79	-	-	2.28
8	3308029	4	-	6	-	23.43	8400	-	-	1.97
9	3308030	1	-	7	-	1.60	790	-	-	1.23
10	3308031	<1	-	16	-	1.83	375	-	2550	0.28
11	3308032	6	-	20	-	1.57	56	-	-	5.80
12	3308033	<1	-	6	-	0.61	300	-	1200	-
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	1	10	2	0.01	0.01	3	0.01	3	0.01
24	UNITS	ppm	ppm	ppm	%	%	ppm	%	ppm	%
25	METHOD	GA140	GA104	GA140	GA104	GA140	GA140	GA104	GA140	GA104

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

AUTHORISED OFFICER _____

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

928076

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.08960	14/01/93	71516	2 OF 2

TUBE No.	SAMPLE No.	Zn	% Zn	As	As					
1	3308022	95	-	-	200					
2	3308023	30	-	-	200					
3	3308024	-	2.16	-	750					
4	3308025	-	57.00	-	200					
5	3308026	-	23.30	-	3750					
6	3308027	-	1.08	-	200					
7	3308028	-	28.70	11	-					
8	3308029	-	18.75	2	-					
9	3308030	-	6.12	32	-					
10	3308031	-	1.06	7	-					
11	3308032	-	5.10	21	-					
12	3308033	1050	-	3	-					
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	2	0.01	1	100					
24	UNITS	ppm	%	ppm	ppm					
25	METHOD	GA140	GA104	GA114	GA140					

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

AUTHORISED OFFICER _____

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

928077

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09347	08/04/93	71540	1 OF 7

UBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Ni
1	3308092	4	-	<3	-	49	-	<1	-	1996
2	3308093	3	-	<3	-	54	-	<1	-	3298
3	3308094	2	-	<3	-	39	-	<1	-	1900
4	3308095	3	-	<3	-	38	-	<1	-	2026
5	3308096	2	-	<3	-	36	-	<1	-	2221
6	3308097	4	-	3	-	38	-	<1	-	2891
7	3308098	2	-	<3	-	38	-	<1	-	2397
8	3308099	2	-	<3	-	40	-	<1	-	2806
9	3308100	3	-	<3	-	45	-	<1	-	2239
10	3313768	4	-	<3	-	42	-	<1	-	1851
11	3313769	6	-	3	-	46	-	<1	-	776
12	3313770	37	-	77	-	77	-	1	-	119
13	3313771	29	-	9	-	76	-	<1	-	75
14	3313772	133	-	5	-	88	-	<1	-	30
15	3313773	126	-	4	-	56	-	<1	-	53
16	3313774	29	-	51	-	119	-	<1	-	100
17	3313786	2	-	16	-	198	-	<1	-	1083
18	3313787	<2	-	13	-	117	-	<1	-	2368
19	3313788	<2	-	23	-	329	-	<1	-	4703
20	3313789	2	-	12	-	219	-	<1	-	2279
21	3313790	2	-	5	-	229	-	<1	-	1937
22	3313791	2	-	16	-	445	-	<1	-	379
23	3313792	<2	-	3	-	509	-	<1	-	2540
24	3313793	2	-	11	-	151	-	<1	-	3081
25	3313794	2	-	3	-	191	-	<1	-	1524

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

928078

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09347	08/04/93	71540	2 OF 7

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Ni
1	3313795	2	-	6	-	139	-	<1	-	1140
2	3313796	8	-	12	-	196	-	<1	-	1801
3	3313797	2	-	17	-	345	-	<1	-	1203
4	3313798	2	-	18	-	232	-	<1	-	981
5	3313799	2	-	10	-	194	-	<1	-	1808
6	3313800	2	-	<3	-	156	-	<1	-	1461
7	3528456	-	1.66	39	-	92	-	8	-	-
8	3528457	1911	-	34	-	182	-	1	-	1159
9	3528458	1264	-	30	-	160	-	1	-	1854
10	3528459	208	-	<3	-	119	-	<1	-	377
11	3528460	3176	-	10	-	132	-	1	-	4401
12	3528461	-	7.21	298	-	1178	-	9	-	-
13	3528462	1885	-	25	-	160	-	1	-	1162
14	3528463	2589	-	-	4.14	-	17.50	-	221	1403
15	3528464	126	-	-	0.20	-	2.19	13	-	22
16	3528465	52	-	-	1.50	-	0.75	33	-	<3
17	3528466	40	-	82	-	275	-	1	-	78
18	3528467	6	-	22	-	119	-	<1	-	247
19	3528468	3	-	21	-	215	-	<1	-	-
20	3528469	6	-	66	-	233	-	<1	-	-
21	3528470	48	-	<3	-	79	-	<1	-	271
22	3528471	27	-	18	-	86	-	<1	-	69
23	3528472	12	-	19	-	85	-	<1	-	1000
24	3528473	98	-	5	-	69	-	<1	-	231
25	3528474	8	-	<3	-	37	-	<1	-	53

Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
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A Division of Inchcape Testing Services (Australia) Pty. Ltd.
A.C.N. 004 591 664

928079

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09347	08/04/93	71540	3 OF 7

TUBE No.	SAMPLE No.	Cu	Cu	Pb	Pb	Zn	Zn	Ag	Ag	Ni
1	3528475	3	-	4	-	64	-	<1	-	772
2	3528476	13	-	<3	-	68	-	<1	-	1362
3	3528477	5	-	<3	-	35	-	<1	-	230
4	3528478	<2	-	<3	-	80	-	<1	-	1706
5	3528479	<2	-	11	-	114	-	<1	-	3115
6	3528480	3	-	5	-	186	-	<1	-	1487
7	3528481	2	-	7	-	216	-	<1	-	1504
8	3528482	8	-	2799	-	656	-	<1	-	1086
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	2	0.01	3	0.01	2	0.01	1	10	3
24	UNITS	ppm	%	ppm	%	ppm	%	ppm	ppm	ppm
25	METHOD	GA140	GA104	GA140	GA104	GA140	GA104	GA140	GA104	GA140

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

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

928080

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09747	08/04/93	71540	4 OF 7

TUBE No.	SAMPLE No.	Ni	Co	Cr	Cr	Cr	Cr	V	S	S(R)
1	3308092	-	83	749	-	-	-	10	-	-
2	3308093	-	90	624	-	-	-	10	-	-
3	3308094	-	83	520	-	-	-	9	-	-
4	3308095	-	84	531	-	-	-	8	-	-
5	3308096	-	91	517	-	-	-	9	-	-
6	3308097	-	100	635	-	-	-	11	-	-
7	3308098	-	117	785	-	-	-	11	-	-
8	3308099	-	127	947	-	-	-	12	-	-
9	3308100	-	11	658	-	-	-	8	-	-
10	3313768	-	80	587	-	-	-	<5	-	-
11	3313769	-	58	1112	-	-	-	25	-	-
12	3313770	-	28	260	-	-	-	41	-	-
13	3313771	-	29	98	-	-	-	103	-	-
14	3313772	-	34	20	-	-	-	290	-	-
15	3313773	-	31	47	-	-	-	156	-	-
16	3313774	-	33	226	-	-	-	152	-	-
17	3313786	-	88	326	-	-	-	10	-	-
18	3313787	-	50	560	-	-	-	9	-	-
19	3313788	-	176	505	-	-	-	10	-	-
20	3313789	-	111	993	-	-	-	5	-	-
21	3313790	-	96	895	-	-	-	13	-	-
22	3313791	-	93	-	-	9852	-	74	-	-
23	3313792	-	99	-	-	-	1.27	53	-	-
24	3313793	-	81	795	-	-	-	5	-	-
25	3313794	-	82	500	-	-	-	7	-	-

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

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

928081

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09347	08/04/93	71540	5 OF 7

TUBE No.	SAMPLE No.	Ni	Co	Cr	Cr	Cr	Cr	V	S	S(R)
1	3313795	-	57	583	-	-	-	<5	-	-
2	3313796	-	91	855	-	-	-	<5	-	-
3	3313797	-	87	997	-	-	-	18	-	-
4	3313798	-	73	916	-	-	-	31	-	-
5	3313799	-	78	446	-	-	-	7	-	-
6	3313800	-	90	592	-	-	-	16	-	-
7	3528456	2.26	680	220	-	-	-	207	13.900	-
8	3528457	-	37	95	-	-	-	155	-	-
9	3528458	-	46	447	-	-	-	377	-	-
10	3528459	-	58	341	-	-	-	268	-	-
11	3528460	-	140	335	-	-	-	281	-	-
12	3528461	3.58	1230	197	-	-	-	84	-	31.4
13	3528462	-	72	113	-	-	-	189	-	-
14	3528463	-	94	119	-	-	-	50	-	-
15	3528464	-	14	37	-	-	-	15	-	-
16	3528465	-	4	10	-	-	-	<5	-	-
17	3528466	-	27	139	-	-	-	212	-	-
18	3528467	-	18	690	-	-	-	<5	-	-
19	3528468	1.26	60	749	-	-	-	6	0.020	-
20	3528469	0.64	110	530	-	-	-	6	0.025	-
21	3528470	-	27	1764	-	-	-	13	-	-
22	3528471	-	21	305	-	-	-	71	-	-
23	3528472	-	78	1471	-	-	-	40	-	-
24	3528473	-	27	274	-	-	-	43	-	-
25	3528474	-	12	84	-	-	-	31	-	-

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

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

928082

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09347	08/04/93	71540	6 OF 7

TUBE No.	SAMPLE No.	Ni	Co	Cr	Cr	Cr	Cr	V	S	S(R)
1	3528475	–	69	886	–	–	–	24	–	–
2	3528476	–	87	1497	–	–	–	24	–	–
3	3528477	–	31	943	–	–	–	10	–	–
4	3528478	–	89	2819	–	–	–	21	–	–
5	3528479	–	119	968	–	–	–	11	–	–
6	3528480	–	63	650	–	–	–	6	–	–
7	3528481	–	64	573	–	–	–	6	–	–
8	3528482	–	39	717	–	–	–	7	–	–
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	0.01	3	7	0.01	5	0.01	5	0.005	0.1
24	UNITS	%	ppm	ppm	%	ppm	%	ppm	%	%
25	METHOD	GA104	GA140	GA140	GA104	GX401	GX404	GA140	OM613	OM613

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

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

928083

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09347	08/04/93	71540	7 OF 7

TUBE No.	SAMPLE No.	Au	Au(R)	Pd	Pd(R)	Pt	Pt(R)			
1	3528456	492.00	473.00	218.00	227.00	493.00	463.00			
2	3528461	1280.0	1260.0	1180.0	1310.0	618.00	617.00			
3	3528468	<1.00	-	1.21	-	1.65	-			
4	3528469	3.15	-	<0.50	-	<0.50	-			
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	1.00	1.00	0.50	0.50	0.50	0.50			
24	UNITS	ppb	ppb	ppb	ppb	ppb	ppb			
25	METHOD	GS333	GS333	GS333	GS333	GS333	GS333			

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

AUTHORISED OFFICER

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

928084

[redacted]

Brisbane Head Office and Laboratory
32 Shand Street, Stafford, Q. 4053
P.O. Box 66, Everton Park, Q. 4053
Telephone: (07) 352 5577
Facsimile: (07) 352 5109

ANALYTICAL REPORT

CLIENT: CRA EXPLORATION PTY LTD
ADDRESS: P O BOX 8093
NORTHLAND CENTRE
VIC 3072

CONTACT: ADMIN OFFICER

LABORATORY: BENDIGO
BATCH NUMBER: BE1382-0

No. of SAMPLES: 28
DATE RECEIVED: 23/11/93
DATE COMPLETED: 22/12/93

D[illegible] No: 77352 SAMPLE TYPE: ROCK CHIP PROJECT No:

SAMPLE NUMBER	ELEMENT / UNIT / METHOD	Cu ppm IC586	Pb ppm IC586	Zn ppm IC586	Ag ppm IC586	Fe % IC586
3184279		168	137	143	2	8.30
3184280		4630	521	168	4	9.30
3184281		94	13	85	2	8.15
3184282		189	16	140	2	7.30
3184283		1240	6	83	2	7.69
3184284		1.12%	34	318	5	13.87
3184285		1320	2760	18.20%	48	12.49
3184286		27.80%	135	3620	59	18.43
3184287		26.50%	112	446	59	18.99
3184288		4240	108	147	2	12.92
3184289		427	33	119	1	17.54
3184290		3640	38	122	2	15.18
3184291		23.00%	89	255	5	20.08
3184292		521	19	197	1	11.17
3184293		216	10	105	1	11.29
3184294		176	25	144	1	10.78
3184295		3290	22.70%	12.80%	780	1.87
3184296		2.51%	8.42%	6.15%	790	4.86
3184297		21.80%	1.93%	1.64%	1360	18.75
3184298		9800	567	495	19	9.92
3184299		5090	141	181	8	11.74
3184300		1150	148	122	3	8.47
3911701		2.44%	2.65%	3.89%	530	4.01
3911702		2.65%	498	356	10	20.44
3911703		756	98	147	4	12.14
3911704		3770	53	146	4	11.26
3911705		9.60%	98	214	25	38.76
3911706		31.30%	397	576	74	27.37
[illegible]TION LIMIT:		5	5	5	1	0.01

MMENTS:
Cu values >1.00% reassayed by Method A101.
Pb values >1.00% reassayed by Method A101.
Zn values >1.00% reassayed by Method A101.
Ag values >25ppm reassayed by Method A101.

[illegible] Laboratory
[illegible]7) 79 9155 Fax: (077) 79 9729
[illegible] Towers Laboratory
[illegible]: (077) 87 4155 Fax: (077) 87 4220
[illegible]ge Laboratory
[illegible]: (063) 63 1722 Fax: (063) 63 1189
[illegible] Laboratory
[illegible]: (054) 46 1390 Fax: (054) 46 1389

Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
Alice Springs Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6028
Mt Isa Laboratory
Phone: (077) 49 5545 Fax: (077) 48 5546

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

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

928085

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ANALYTICAL REPORT

CLIENT: CRA EXPLORATION PTY LTD
ADDRESS: P O BOX 8093
NORTHLAND CENTRE
VIC 3072

CONTACT: ADMIN OFFICER

LABORATORY: BENDIGO
BATCH NUMBER: BE1382-0

No. of SAMPLES: 28
DATE RECEIVED: 23/11/93
DATE COMPLETED: 22/12/93

ORDER No: 77352 SAMPLE TYPE: ROCK CHIP PROJECT No:

SAMPLE NUMBER	ELEMENT UNIT METHOD	Co ppm IC586	Ni ppm IC586	Pt ppm PM217	Pd ppm PM217	Au ppm PM217
3184279		13	81			
3184280		84	2410			
3184281		19	108			
3184282		29	171			
3184283		60	1170			
3184284		206	9680	0.33	0.46	0.28
3184285		11	176			
3184286		459	4200			
3184287		712	8330	3.06	6.13	2.15
3184288		37	534			
3184289		20	229			
3184290		31	409			
3184291		1360	9080	0.34	0.25	1.30
3184292		51	200			
3184293		26	100			
3184294		37	136			
3184295		41	1390			
3184296		408	2.19%	0.51	0.58	0.22
3184297		73	5610	0.95	1.82	0.17
3184298		115	5210	0.39	0.48	0.40
3184299		139	5170	0.14	0.22	0.12
3184300		19	274			
3911701		183	9180	0.22	0.27	0.08
3911702		737	2.90%	0.30	0.32	0.38
3911703		30	521			
3911704		124	4830			
3911705		1600	2720			
3911706		34	512			
DETECTION LIMIT:		5	5	0.01	0.01	0.01

COMMENTS:

Laboratory
(077) 79 9155 Fax: (077) 79 9729
Towers Laboratory
(077) 87 4155 Fax: (077) 87 4220
Laboratory
(063) 63 1722 Fax: (063) 63 1189
Laboratory
(054) 46 1390 Fax: (054) 46 1389

Perth Laboratory
Phone: (09) 249 2988 Fax: (09) 249 2942
Kalgoorlie Laboratory
Phone: (090) 21 1457 Fax: (090) 21 6253
Alice Springs Laboratory
Phone: (089) 52 6020 Fax: (089) 52 6028
Mt Isa Laboratory
Phone: (077) 49 5545 Fax: (077) 48 5546

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

928086

Brisbane Head Office and Laboratory
32 Shand Street, Stafford, Q. 4053
P.O. Box 66, Everton Park, Q. 4053
Telephone: (07) 352 5577
Facsimile: (07) 352 5109

ANALYTICAL REPORT

CLIENT: CRA EXPLORATION PTY LTD
ADDRESS: P O BOX 8093
NORTHLAND CENTRE
VIC 3072

CONTACT: ADMIN OFFICER

LABORATORY: BENDIGO
BATCH NUMBER: BE1382-0

No. of SAMPLES: 28
DATE RECEIVED: 23/11/93
DATE COMPLETED: 22/12/93

OR No: 77352 SAMPLE TYPE: ROCK CHIP PROJECT No:

SAMPLE NUMBER	ELEMENT UNIT METHOD	Au PM217 ppm CHECKS X
3184279		
3184280		
3184281		
3184282		
3184283		
3184284		
3184285		
3184286		
3184287		
3184288		
3184289		
3184290		
3184291		1.22
3184292		
3184293		
3184294		
3184295		
3184296		
3184297		0.17
3184298		0.42
3184299		
3184300		
3911701		
3911702		
3911703		
3911704		
3911705		
3911706		
TECTION LIMIT:		0.01

OMMENTS:

...e Laboratory
...77) 79 9155 Fax: (077) 79 9729
...ns Towers Laboratory
...e: (077) 87 4155 Fax: (077) 87 4220
...ge Laboratory
...(063) 63 1722 Fax: (063) 63 1189
...Laboratory
...54) 46 1390 Fax: (054) 46 1389
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ANALYTICAL REPORT

CLIENT: CRA EXPLORATION PTY LTD
ADDRESS: P O BOX 8093
NORTHLAND CENTRE
VIC 3072

CONTACT: ADMIN OFFICER

LABORATORY: BENDIGO
BATCH NUMBER: BE1382-0

No. of SAMPLES: 28
DATE RECEIVED: 23/11/93
DATE COMPLETED: 22/12/93

No: 77352 SAMPLE TYPE: QUALITY CONTROL PROJECT No:

SAMPLE NUMBER	ELEMENT UNIT METHOD	Cu ppm IC586	Pb ppm IC586	Zn ppm IC586	Ag ppm IC586	Fe % IC586
*** 3184287		26.50%	104	419	59	18.36
*** 3184297		21.80%	1.92%	1.64%	1360	18.58
*** 3184298		9380	477	482	18	9.73
DETECTION LIMIT:		5	5	5	1	0.01

COMMENTS: Results which appear on this report are routine laboratory checks for QUALITY CONTROL purposes.

Laboratory
) 79 9155 Fax: (077) 79 9729
ara Towers Laboratory
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ge Laboratory
) 63 1722 Fax: (063) 63 1189
Laboratory
) 46 1390 Fax: (054) 46 1389

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ANALYTICAL REPORT

CLIENT: CRA EXPLORATION PTY LTD
ADDRESS: P O BOX 8093
NORTHLAND CENTRE
VIC 3072

CONTACT: ADMIN OFFICER

LABORATORY: BENDIGO
BATCH NUMBER: BE1382-0

No. of SAMPLES: 28
DATE RECEIVED: 23/11/93
DATE COMPLETED: 22/12/93

ORDER No: 77352 SAMPLE TYPE: QUALITY CONTROL PROJECT No:

SAMPLE NUMBER	ELEMENT UNIT METHOD	Co ppm IC586	Ni ppm IC586			
*** 3184287		683	8010			
*** 3184297		73	5550			
*** 3184298		114	5080			
DETECTION LIMIT:		5	5			

COMMENTS:

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ANALABS

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

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09901	24/12/93	77354	1 OF 1

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Fe	Fe	Ni	Co	Cr
1	3911732	54	<3	30	<1	1.58	-	88	10	66
2	3911733	10	<3	363	<1	-	11.50	2975	219	2477
3	3911734	4	<3	119	<1	-	6.50	580	92	1468
4	3911735	165	7	78	<1	-	10.90	71	37	136
5	3911736	327	2994	1090	7	-	17.60	474	586	81
6	3911737	242	302	442	<1	4.45	-	13	33	49
7	3911738	123	25	163	<1	-	13.80	57	50	47
8	3911739	108	14	91	<1	-	11.00	40	30	43
9	3911740	271	9	230	<1	-	16.80	159	172	138
10	3911741	75	9	44	<1	2.25	-	31	11	54
11	3911746	3967	26	234	1	-	17.30	2551	93	221
12	3911751	90	<3	116	<1	-	11.30	354	43	195
13	3911752	225	12	85	<1	-	11.10	94	9	145
14	3911753	54	<3	125	<1	-	10.60	91	27	127
15	3911754	453	6	208	<1	-	10.50	1432	84	332
16	3911755	112	6	247	<1	-	12.30	1743	90	320
17	3911756	108	6	209	<1	-	11.30	1514	64	226
18										
19										
20										
21										
22										
23	DETECTION	2	3	2	1	0.01	0.01	3	3	7
24	UNITS	ppm	ppm	ppm	ppm	%	%	ppm	ppm	ppm
25	METHOD	GA140	GA140	GA140	GA140	GA140	GA104	GA140	GA140	GA140

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

AUTHORISED OFFICER

APPENDIX IV
ROCK CHIP SAMPLE LEDGER & ASSAYS

MELBA FLATS EL 43/92 - ROCK CHIP DATA BASE

SAMPNO.	DPO	EAST	NORTH	PROSPECT AREA	BMRLITH	FIELD ID	TEXTURE	ALT/MIN	COLOUR	COMMENTS	PET DPO	SUSC. x10-5 SI
3308019	71516	366450	5366150	VAUDEAU	Es	Eb?	Ds	Py	DV	Py 2-5%. Massive basalt?		
3308020	71516	366450	5366150	VAUDEAU	Es	Igb	Ds	Py	DV	Py 2-5%. Massive basalt?		
3308021	71516	366450	5366150	VAUDEAU		Oms	MsBs	PyCpPoNi	Y	Massive sulphide.		
3313769	71540	368200	5367600	SERPENTINE HILL	Esu	Ius	Sh		V			
3528456	71540	366280	5365820	NICKEL REWARD	Egm	Oms		Py	DVE	Pyroxenite?		
3528457	71540	366280	5365820	NICKEL REWARD	Egm	Iu	BxSh	Py		Mullock heap		
3528458	71540	366280	5365820	NICKEL REWARD	Egm	Iulgb			VG	Pyroxenite		
3528459	71540	366440	5366150	VAUDEAU	Egm	Iulgb			GV	Mullock heap		
3528460	71540	366440	5366150	VAUDEAU	Egm	Igb		Py		Mullock heap 5-10%Py		
3528461	71540	366440	5366150	VAUDEAU	Egm		Ma	PyCpGa		Mullock heap		
3528462	71540	366320	5367620	NORTH CUNI	Egm	Iu?Ssh?	DiVn	Py		Mullock heap		
3528463	71540	366320	5367620	NORTH CUNI	Egm	OmsOvq	Bx	PyGaCp		Mullock heap		
3528464	71540	367080	5367850	LEAD BLOCKS	Etl	SbxSsi?	MaSi	Ga		Mullock heap		
3528465	71540	367080	5367850	LEAD BLOCKS	Etl		MaWe	Ga		Mullock heap		
3528466	71540	367080	5367850	LEAD BLOCKS	Etl	Ssi	SiWe	Su		Mullock heap		
3528470	71540	367900	5367010	SERPENTINE HILL	Eba	Siflu?	WeFe					
3528471	71540	367920	5367060	SERPENTINE HILL	Eba	Im		Py				
3528472	71540	367960	5367120	SERPENTINE HILL	Eba	Eb						
3528473	71540	368020	5367220	SERPENTINE HILL	Eba	Im	Vn					
3528474	71540	368080	5367320	SERPENTINE HILL	Eba	Ma						
3528475	71540	368240	5367380	SERPENTINE HILL	Eba	ImMa	Lm			85s/085		
3528476	71540	368340	5367580	SERPENTINE HILL	Eba	Imlus						
3528477	71540	368400	5367640	SERPENTINE HILL	Eba	Igbim	Al					
3184279	77352	366320	5366090	VAUDEAU	Evs	Sw	Bx?		G		77351	40
3184280	77352	366390	5366130	VAUDEAU	Egm	Igb	Fo	PyCp	MG	Mullock heap		60
3184281	77352	366390	5366130	VAUDEAU	Egm	Igb	VnFoDs	PyCp	G	Vfg sulph. <<1%		50
3184282	77352	366390	5366130	VAUDEAU	Etl	Ssi	FiFr	Py?	G	Mine slate		40
3184283	77352	366390	5366130	VAUDEAU	Egm	Igb	AlDs	PySu	MGV	Mullock heap		30
3184284	77352	366390	5366130	VAUDEAU	Egm	Igb	WeDs	PySu	DV	Mullock heap	77351	70
3184285	77352	366390	5366130	VAUDEAU	Etl	Ssi	Vs	SdSp?Ga	N	Mullock heap		40
3184286	77352	366350	5367770	GENET'S WINZE	Egm	Igb	We	Cs	OLV	Mullock heap		30
3184287	77352	366350	5367770	GENET'S WINZE	Egm	Igb	We	Cs	MOV	Mullock heap		20
3184288	77352	366350	5367770	GENET'S WINZE	Etl	Ssi	VnBd	PyPo?Cp?	DG	Mullock heap		50
3184289	77352	366350	5367770	GENET'S WINZE	Egm	Im	We		DG	Slickenside. Soft		90
3184290	77352	366350	5367770	GENET'S WINZE	Egm	Im	DsVs	Su		F grained.Slickensides	77351	60
3184291	77352	366350	5367770	GENET'S WINZE	Etl?Egm?	Iu?		CpNiCs	MVN	Hard bk groundmass	77351	20
3184292	77352	366280	5365910	WEST VAUDEAU	Etl	Sw	We		V	Volc. derived.		30
3184293	77352	366275	5365910	WEST VAUDEAU	Etl	Ssi	Bd		LKO			10
3184294	77352	366260	5365920	WEST VAUDEAU	Etl	Sw	We		V	Volc. derived.		40

MELBA FLATS EL 43/92 - ROCK CHIP DATA BASE

SAMPNO.	DPO	EAST	NORTH	PROSPECT AREA	BMRLITH	FIELD ID	TEXTURE	ALT/MIN	COLOUR	COMMENTS	PET DPO	SUSC. x10-5 SI
3184295	77352	366320	5367610	NORTH CUNI	Egm	Oms	VsBx	GaSpSdQtz		Mullock heap		10
3184296	77352	366320	5367610	NORTH CUNI	Egm	Omslgb?	VsBx	GaSpPyQtz	MVG	Mullock heap		30
3184297	77352	366320	5367610	NORTH CUNI	Egm	Oms		PyNiBo		Mullock heap		50
3184298	77352	366320	5367610	NORTH CUNI	Egm	Igb	We		MVG	Mullock heap	77351	60
3184299	77352	366320	5367610	NORTH CUNI	Egm	Igb	Ds	PyNiPo?	MVG	Mullock heap	77351	80
3184300	77352	366320	5367610	NORTH CUNI	Etl	Ssi	Bd		LG	Fine laminations		30
3911701	77352	366320	5367610	NORTH CUNI	Egm	Oms	Vn	GaSpPy		F grained. Mullock		10
3911702	77352	366320	5367610	NORTH CUNI	Egm	Igb	DsVs	PyCp	DV	F grained. Mullock	77351	60
3911703	77352	366320	5367610	NORTH CUNI	Egm	Igb	MaVn		DG	F grained. Mullock		40
3911704	77352	366320	5367610	NORTH CUNI	Egm	Igb	Fo	Py?	MGW	Mullock heap		40
3911705	77352	366320	5367610	NORTH CUNI	Egm	Oms	Ma	CpNi?		Mullock heap		11900
3911706	77352	366320	5367610	NORTH CUNI	Egm	Oms	Ma	Py		Mullock heap		10
3911746	77354	366390	5366130	VAUDEAU	Egm	Iu	Ds	SuPy	DG	Mullock heap		90
3911751	77354	366335	5366150	VAUDEAU	Egm	Igb	We		MLVY	Exposed in trench		35
3911752	77354	366335	5366150	VAUDEAU	Etl	Sw	We		V	Exposed in trench		30
3911753	77354	366335	5366100	VAUDEAU	Etl	SwSsi			V	Intercatated Siltstone		30
3911754	77354	366390	5366130	VAUDEAU	Egm	Igb	Ds	NiPy	DVG	Mullock heap		40
3911755	77354	366390	5366130	VAUDEAU	Egm	Igb	Ds	PyNi	DVG	Mullock heap		30
3911756	77354	366390	5366130	VAUDEAU	Egm	IgbOvq	Ds	PySu	DVG	Mullock heap		20

MELBA FLATS EL 43/92 - ROCK CHIP DATA BASE

SAMPNO.	EAST	NORTH	PROSPECT	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ni ppm	Pb ppm	Pd ppm	Pt ppm	S %	V ppm	Zn ppm
3308019	366450	5366150	VAUDEAU				325	3350	11.2	4950						
3308020	366450	5366150	VAUDEAU				265	4550	9.76	2900						
3308021	366450	5366150	VAUDEAU				155	30400	2.83	89400						
3313769	368200	5367600	SERPENTINE HILL	-1		58	1112	6		776	3				25	46
3528456	366280	5365820	NICKEL REWARD	8	0.482	680	220	16600		22600	39	0.224	0.478	13.9	207	92
3528457	366280	5365820	NICKEL REWARD	1		37	95	1911		1159	34				155	182
3528458	366280	5365820	NICKEL REWARD	1		46	447	1264		1854	30				377	180
3528459	366400	5366140	VAUDEAU	-1		58	341	208		377	-3				268	119
3528460	366400	5366140	VAUDEAU	1		140	335	3176		4401	10				281	132
3528461	366400	5366140	VAUDEAU	9	1.27	1280	197	72100		35800	298	1.25	0.618	31.4	84	1178
3528462	366280	5367620	NORTH CUNI	1		72	113	1885		1162	25				189	160
3528463	366280	5367620	NORTH CUNI	221		94	119	2589		1403	41400				50	175000
3528464	367080	5367850	LEAD BLOCKS	13		14	37	126		22	2000				15	21900
3528465	367080	5367850	LEAD BLOCKS	33		4	10	52		-3	15000				-5	7500
3528466	367080	5367850	LEAD BLOCKS	1		27	139	40		78	82				212	275
3528470	367900	5367010	SERPENTINE HILL	-1		27	1764	48		271	-3				13	79
3528471	367920	5367060	SERPENTINE HILL	-1		21	305	27		69	18				71	86
3528472	367960	5367120	SERPENTINE HILL	-1		78	1471	12		1000	19				40	85
3528473	368020	5367220	SERPENTINE HILL	-1		27	274	98		231	5				43	69
3528474	368080	5367320	SERPENTINE HILL	-1		12	84	8		53	-3				31	37
3528475	368240	5367380	SERPENTINE HILL	-1		69	886	3		772	4				24	64
3528476	368340	5367580	SERPENTINE HILL	-1		87	1497	13		1362	-3				24	68
3528477	368400	5367640	SERPENTINE HILL	-1		31	943	5		230	-3				10	35
3184279	366320	5366090	VAUDEAU	2		13		168	8.30	81	137					143
3184280	366390	5366130	VAUDEAU	4		84		4630	9.30	2410	521					168
3184281	366390	5366130	VAUDEAU	2		19		94	8.15	108	13					85
3184282	366390	5366130	VAUDEAU	2		29		189	7.30	171	16					140
3184283	366390	5366130	VAUDEAU	2		60		1240	7.69	1170	6					83
3184284	366390	5366130	VAUDEAU	5	0.28	206		11200	13.87	9680	34	0.46	0.33			318
3184285	366390	5366130	VAUDEAU	48		11		1320	12.49	176	2760					182000
3184286	366350	5367770	GENET'S WINZE	59		459		278000	18.43	4200	135					3620
3184287	366350	5367770	GENET'S WINZE	59	2.15	712		265000	18.99	8330	112	6.13	3.06			446
3184288	366350	5367770	GENET'S WINZE	2		37		4240	12.92	534	108					147
3184289	366350	5367770	GENET'S WINZE	1		20		427	17.54	229	33					119
3184290	366350	5367770	GENET'S WINZE	2		31		3640	15.18	409	38					122
3184291	366350	5367770	GENET'S WINZE	5	1.30	1360		230000	20.08	9080	89	0.25	0.34			255
3184292	366150	5365920	WEST VAUDEAU	1		51		521	11.17	200	19					197
3184293	366155	5365920	WEST VAUDEAU	1		26		216	11.29	100	10					105
3184294	366170	5365910	WEST VAUDEAU	1		37		176	10.78	136	25					144

MELBA FLATS EL 43/92 - ROCK CHIP DATA BASE

SAMPNO.	EAST	NORTH	PROSPECT	Ag ppm	Au ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ni ppm	Pb ppm	Pd ppm	Pt ppm	S %	V ppm	Zn ppm
3184295	366320	5367610	NORTH CUNI	780		41		3290	1.87	1390	227000					128000
3184296	366320	5367610	NORTH CUNI	790	0.22	408		25100	4.86	21900	84200	0.58	0.51			61500
3184297	366320	5367610	NORTH CUNI	1360	0.17	73		218000	18.75	5610	19300	1.82	0.95			16400
3184298	366320	5367610	NORTH CUNI	19	0.40	115		9800	9.92	5210	567	0.48	0.39			495
3184299	366320	5367610	NORTH CUNI	8	0.12	139		5090	11.74	5170	141	0.22	0.14			181
3184300	366320	5367610	NORTH CUNI	3		19		1150	8.47	274	148					122
3911701	366320	5367610	NORTH CUNI	530	0.08	183		24400	4.01	9180	26500	0.27	0.22			38900
3911702	366320	5367610	NORTH CUNI	10	0.38	737		26500	20.44	29000	498	0.32	0.30			356
3911703	366320	5367610	NORTH CUNI	4		30		756	12.14	521	98					147
3911704	366320	5367610	NORTH CUNI	4		124		3770	11.26	4830	53					146
3911705	366320	5367610	NORTH CUNI	25	1.45	1600		96000	38.76	2720	98	0.22	0.94			214
3911706	366320	5367610	NORTH CUNI	74	2.20	34		313000	27.37	512	397	8.59	7.26			576
3911746	366390	5366130	VAUDEAU	1		93	221	3967	17.3	2551	26					234
3911751	366335	5366150	VAUDEAU	-1		43	195	90	11.3	354	-3					116
3911752	366335	5366150	VAUDEAU	-1		9	145	225	11.1	94	12					85
3911753	366335	5366100	VAUDEAU	-1		27	127	54	10.6	91	-3					125
3911754	366390	5366130	VAUDEAU	-1		84	332	453	10.5	1432	6					208
3911755	366390	5366130	VAUDEAU	-1		90	320	112	12.3	1743	6					247
3911756	366390	5366130	VAUDEAU	-1		64	226	108	11.3	1514	6					209

928095

ROCKCHIP AND DRILLING CODES

17/2/93

STRATH

Rock code as per pubished geological map
For time designation use:-

Q	Quaternary	M	Permian	P	Proterozoic
T	Tertiary	C	Carboniferous	A	Archaean
		S	Silurian		
K	Cretaceous	D	Devonian		
R	Triassic	O	Ordovician		
J	Jurassic	E	Camorian		

FIELD ID

Field term for rock type
Broad groupings are:-

S	Sedimentary	I	Intrusive	C	Surficial
M	Metamorphic	E	Extrusive	O	Others

SEDIMENTARY

Scg	Conglomerate	Sls	Limestone	Sw	Wacke
Sss	Sandstone	Sch	Chert	Sag	Agglomerate/mixtite
Sst	Siltstone	Slf	BIF		
Ssh	Shale				
Sbs	Black shale	Sbx	Breccia		

METAMORPHIC

Mst	Slate	Mq	Quartzite	Mmg	Migmatite
Mph	Phyllite	Mm	Marble		
Msc	Schist	Ma	Amphibolite		
Mbs	Graphitic schist	Mcs	Calcsilicate	Msk	Skarn
Mgn	Gneiss	Mh	Hornfels		

INTRUSIVE IGNEOUS

If	Felsic undiff.	Ii	Intermed undiff.	Iu	Ultramafic
Ifp	Felsic porphyry	Iip	Intermed porph	Ius	Sarpentinite
Iap	Aplite	Im	Mafic undiff.		
Igr	Granite	Ido	Dolerite	Ipg	Pegmatite
Igd	Granodiorite	Igb	Gabbro		

EXTRUSIVE IGNEOUS

Ery	Rhyolite	Ean	Andesite	Et	Tuff undiff
Edc	Dacite	Eb	Basalt	Eft	Felsic tuff
				Emt	Mafic tuff

SURFICIAL (COVER) MATERIAL

Cal	Alluvium	Clt	Laterite	Csg	Gossan
Ccol	Colluvium	Csp	Pisolites		
Cs	Sand	Cst	Ironstone	Ccy	Clay
Cbs	Black soil	Csl	Silcrete		
Cg	Gravel	Ccl	Calcrete	Cv	Vegetation/peat

OTHERS

Ovq	Vein quartz	Omy	Mylonite	Oms	Massive sulphide
Ovc	Vein carbonate	Obx	Breccia		
Ovs	Vein sulphide	Of	Fault gouge	Ox	Unknown

TEXTURAL CODES

WEATHERING/SURFICIAL FEATURES

We	Weathered	Fe	Ferruginous
Bl	Bleached	Fo	Fe ox in fract
Le	Leached		

MINERALISATION/ALTERATION FEATURES

Gs	Gossanous	Vs	Vein sulphide	Al	Altered
Vn	Veined	Ds	Dissem sulph	Si	Silicified
Di	Disseminated	Fs	Fracture sulph		
		Bs	Banded sulph		

GEOLOGICAL FEATURES

Bd	Bedded	Fr	Fractured	Po	Porphyritic
Bn	Banded	Ib	Interbedded	Sc	Schistose
Bx	Brecciated	Lm	Laminated	Sh	Sheared
Fl	Fissile (slatey)	Ma	Massive	Vu	Vuggy

DIAGNOSTIC MINERALOGY

PRIMARY MINERALISATION

Ga	Galena	Py	Pyrite	Ni	Ni sulphides
Sa	Sphalerite	Po	Pyrrhotite		
Cp	Chalcopyrite	Su	Unknown sulph		

SECONDARY MINERALISATION

Ls	Lead secondaries	Cs	Copper sec.	Ns	Ni secondaries
Zs	Zinc "	Us	Uranium "		

ALTERATION/DIAGNOSTIC MINERALS

Cy	Clay	He	Haematite	Gt	Garnet
Ep	Epidote	Mt	Magnetite	Ky	Kyanite
Cc	Carbonate	Js	Jarosite	To	Tourmaline
Sd	Siderite	Mn	Manganese mins		

COLOUR CODES

L	Light	A	Banded	M	Mottled
D	Dark				
N	Black	P	Purple	V	Green
G	Grey	R	Red	K	Pink
Z	Brown	O	Orange	E	Blue
W	White	Y	Yellow	S	Silver

ANALABS

ACN 004 591 664

928096

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09900	13/01/94	77353	1 OF 3

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Fe	Fe	Ni	Co	Cr
1	3911707	266	23	122	<1	-	10.90	154	42	1113
2	3911708	76	59	51	<1	-	12.40	100	4	68
3	3911709	1737	29	175	<1	-	10.90	792	50	229
4	3911710	50	6	126	<1	-	7.07	104	30	417
5	3911711	64	130	90	<1	-	9.36	72	<3	156
6	3911712	37	3	84	<1	-	7.18	74	19	120
7	3911713	10	50	24	<1	-	6.70	9	<3	153
8	3911714	69	835	223	<1	4.18	-	82	13	334
9	3911715	133	34	66	<1	-	15.10	94	<3	286
10	3911716	123	9	142	<1	-	17.60	83	<3	314
11	3911717	251	26	76	<1	-	16.10	227	<3	165
12	3911718	423	46	55	<1	-	18.70	300	5	181
13	3911719	139	1338	85	<1	-	13.00	113	7	150
14	3911720	352	102	95	<1	-	12.10	964	38	769
15	3911721	51	87	87	<1	3.32	-	44	6	116
16	3911722	21	41	407	<1	-	6.02	139	25	139
17	3911723	25	14	115	<1	-	9.31	57	19	102
18	3911724	53	43	110	<1	-	10.50	244	31	371
19	3911725	190	69	74	<1	-	13.10	39	<3	128
20	3911726	42	23	23	<1	-	6.77	44	<3	129
21	3911727	22	69	110	<1	-	11.00	58	13	99
22	3911728	15	14	25	<1	3.92	-	23	<3	66
23	3911729	12	12	47	<1	4.30	-	25	6	199
24	3911730	20	24	43	<1	2.82	-	29	4	117
25	3911731	70	145	211	<1	-	30.70	1651	358	

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

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A.C.N. 004 591 664

928097

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09900	13/01/94	77353	2 OF 3

TUBE No.	SAMPLE No.	Cu	Pb	Zn	Ag	Fe	Fe	Ni	Co	Cr
1	3911742	15	11	70	<1	-	5.83	50	13	167
2	3911743	17	9	86	<1	-	9.09	61	17	160
3	3911744	8	14	82	<1	-	6.25	55	14	82
4	3911745	30	23	80	<1	-	9.51	76	11	111
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	✓ 2	✓ 3	✓ 2	✓ 1	0.01 ✓	0.01	✓ 3	✓ 3	✓ 7
24	UNITS	ppm	ppm	ppm	ppm	%	%	ppm	ppm	ppm
25	METHOD	GA140	GA140	GA140	GA140	GA140	GA104	GA140	GA140	GA140

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

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A.C.N. 004 591 664

928098

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
[redacted]	104165.60.09900	13/01/94	77353	3 OF 3

TUBE No.	SAMPLE No.	Cr %									
1	3911731	1.82									
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	0.01	/	✓	✓	✓	✓	✓	✓	✓	✓
24	UNITS	%									
25	METHOD	GX404									

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

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ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09956	27/01/94	77355	1 OF 5

	SAMPLE No.	Cu	Pb	Zn	Ag	Ni	Co	Fe	Fe	Cr
METHOD		GA140	GA140	GA140	GA140	GA140	GA140	GA140	GA104	GA140
1	3912901	104	8	128	<1	116	30	-	13.100	264
2	3912902	96	<3	95	<1	63	13	-	16.000	308
3	3912903	94	31	21	<1	22	<3	-	7.340	117
4	3912904	169	4	75	<1	78	11	-	20.400	193
5	3912905	81	4	93	<1	74	12	-	16.200	284
6	3912906	77	<3	94	<1	61	13	-	12.200	223
7	3912907	41	22	116	<1	134	16	-	17.000	235
8	3912908	364	5	89	<1	155	13	-	15.400	2725
9	3912909	123	16	99	<1	173	23	-	15.100	613
10	3912910	110	11	131	<1	519	46	-	11.100	848
11	3912911	42	15	81	<1	58	6	-	7.750	104
12	3912912	12	13	40	<1	40	55	2.61	-	153
13	3912913	24	31	18	<1	27	<3	1.17	-	152
14	3912914	20	10	22	<1	25	<3	1.26	-	92
15	3912915	60	22	79	<1	81	8	3.58	-	137
16	3912916	70	29	77	<1	67	10	-	7.170	147
17	3912917	10	77	20	<1	16	<3	0.94	-	41
18	3912918	58	199	66	<1	44	7	-	9.610	105
19	3912919	42	21	77	<1	51	9	-	12.200	158
20	3912920	19	5	95	<1	57	19	-	10.400	112
21	3912921	62	76	21	3	4	<3	-	6.780	57
22	3912922	23	42	89	<1	70	4	-	6.200	222
23	3912923	174	61	76	<1	45	5	2.75	-	192
24	3912924	120	19	88	<1	70	13	-	11.800	143
25	3912925	250	28	110	<1	201	12	-	13.000	360

Results in ppm unless otherwise specified
- = element not determined

IS = insufficient sample
SNR = sample not received

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Analabs

928100

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09956	27/01/94	77355	2 OF 5

	SAMPLE No.	Cu	Pb	Zn	Ag	Ni	Co	Fe	Fe	Cr
METHOD		GA140	GA140	GA140	GA140	GA140	GA140	GA140	GA104	GA140
1	3912926	161	7	130	<1	139	26	-	10.000	141
2	3912927	155	16	180	<1	169	48	-	8.290	228
3	3912928	63	4	120	<1	199	22	4.39	-	105
4	3912929	86	9	77	<1	98	12	-	9.820	200
5	3912930	106	20	106	<1	152	13	-	11.800	242
6	3912931	76	<3	89	<1	63	15	-	6.360	133
7	3912932	86	10	41	<1	19	<3	-	7.550	84
8	3912933	56	34	39	<1	57	4	-	7.610	108
9	3912934	71	<3	69	<1	46	5	-	14.900	204
10	3912935	43	<3	66	<1	132	17	-	10.000	325
11	3912936	22	<3	63	<1	44	14	-	9.530	152
12	3912937	12	4	36	<1	16	4	-	6.490	115
13	3912938	23	10	41	1	15	6	-	7.410	124
14	3912939	35	4	38	<1	16	4	-	8.840	136
15	3912940	27	7	48	<1	30	6	4.80	-	149
16	3912941	24	22	76	<1	40	10	2.45	-	420
17	3912942	63	11	90	<1	48	16	-	9.740	224
18	3912943	58	12	110	<1	104	20	-	8.540	694
19	3912944	23	26	169	<1	79	18	-	5.160	210
20	3912945	14	54	38	<1	11	4	1.12	-	118
21	3912946	71	29	104	<1	77	16	-	13.600	241
22	3912947	111	16	57	<1	109	8	-	8.000	249
23	3912948	124	21	73	<1	65	5	-	16.900	298
24	3912949	86	23	95	<1	81	3	-	14.300	232
25	3912950	46	114	53	<1	80	10	-	6.660	196

Results in ppm unless otherwise specified
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Analabs

928101

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09956	27/01/94	77355	3 OF 5

	SAMPLE No.	Cu	Pb	Zn	Ag	Ni	Co	Fe	Fe	Cr
METHOD		GA140	GA140	GA140	GA140	GA140	GA140	GA140	GA104	GA140
1	3912951	66	33	24	<1	23	<3	-	9.540	151
2	3912952	64	18	38	<1	21	<3	-	12.000	141
3	3912953	28	22	17	<1	9	<3	1.11	-	60
4	3912954	123	8	204	<1	54	4	-	15.500	385
5	3912955	82	7	46	<1	30	<3	-	13.500	225
6	3912956	119	20	21	<1	80	<3	-	7.070	400
7	3912957	40	55	165	<1	88	15	-	7.330	168
8	3912958	57	42	97	<1	130	14	-	5.140	164
9	3912959	64	20	130	<1	109	19	-	6.630	1127
10	3912960	53	12	155	<1	116	27	4.39	-	620
11	3912961	67	9	211	<1	127	41	4.51	-	487
12	3912962	44	14	96	<1	60	14	-	6.240	864
13	3912963	64	28	103	<1	81	15	-	9.640	475
14	3912964	68	22	101	<1	91	17	-	9.700	746
15	3912965	81	22	94	<1	75	14	-	6.890	252
16	3912966	30	22	62	<1	63	8	3.80	-	147
17	3912967	38	9	68	<1	53	9	-	7.900	583
18	3912968	39	24	115	<1	77	15	3.08	-	633
19	3912969	28	112	85	<1	24	5	2.66	-	896
20	3912970	27	265	111	<1	35	13	2.80	-	748
21	3912971	25	32	59	<1	13	4	1.41	-	614
22	3912972	41	39	207	<1	72	25	-	6.400	249
23	3912973	28	44	126	<1	42	13	-	5.490	197
24	3912974	19	74	81	<1	38	6	2.74	-	164
25	3912975	20	291	97	<1	38	4	1.88	-	198

Results in ppm unless otherwise specified
- = element not determined

IS = insufficient sample
SNR = sample not received

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Analabs

928102

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09956	27/01/94	77355	4 OF 5

	SAMPLE No.	Cu	Pb	Zn	Ag	Ni	Co	Fe	Fe	Cr
METHOD		GA140	GA140	GA140	GA140	GA140	GA140	GA140	GA104	GA140
1	3912976	37	176	34	<1	14	<3	0.86	-	278
2	3912977	48	436	75	<1	22	7	3.05	-	185
3	3912978	77	99	30	<1	81	<3	2.39	-	266
4	3912979	15	48	62	<1	11	3	3.77	-	190
5	3912980	147	152	198	<1	162	11	-	8.190	501
6	3912981	24	13	97	<1	40	10	-	8.300	217
7	3912982	41	37	151	<1	62	17	4.10	-	150
8	3912983	65	92	236	<1	157	31	-	8.550	225
9	3912984	116	927	43	<1	25	<3	-	5.240	193
10	3912985	382	40	90	<1	88	3	-	9.400	308
11	3912986	364	36	63	<1	267	6	-	14.200	322
12	3912987	128	23	85	<1	71	3	-	10.100	160
13	3912988	83	12	122	<1	79	<3	-	12.300	260
14	3912989	95	22	235	<1	55	<3	-	19.600	250
15	3912990	110	63	150	<1	52	3	-	16.000	175
16	3912991	78	47	62	<1	80	3	-	10.500	293
17	3912992	144	20	174	<1	204	26	-	9.390	269
18	3912993	28	26	39	<1	31	<3	2.56	-	102
19	3912994	13	70	24	<1	16	<3	1.87	-	79
20	3912995	13	25	25	<1	13	3	3.47	-	105
21	3912996	8	16	18	<1	7	<3	1.46	-	144
22	3912997	12	25	20	2	9	<3	0.85	-	91
23	3912998	63	7	111	<1	53	16	-	8.540	118
24	3912999	32	48	66	<1	33	10	3.63	-	158
25	3913000	17	9	72	<1	34	10	4.80	-	183

Results in ppm unless otherwise specified
- = element not determined

IS = insufficient sample
SNR = sample not received

AUTHORISED OFFICER

Analabs

A.C.N. 004 591 664

928103

ANALYTICAL DATA

SAMPLE PREFIX	REPORT No.	REPORT DATE	CLIENT ORDER No.	PAGE
	104165.60.09956	27/01/94	77355	5 OF 5

	SAMPLE No.	Cu	Pb	Zn	Ag	Ni	Co	Fe	Fe	Cr
METHOD		GA140	GA140	GA140	GA140	GA140	GA140	GA140	GA104	GA140
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24	DETECTION	✓ 2	✓ 3	✓ 2	✓ 1	✓ 3	✓ 3	✓ 0.01	✓ 0.005	✓ 7
25	UNITS	ppm	ppm	ppm	ppm	ppm	ppm	%	%	ppm

Results in ppm unless otherwise specified
– = element not determined

IS = insufficient sample
SNR = sample not received

AUTHORISED OFFICER

APPENDIX V
PETROLOGY REPORTS

Martin Gole and Associates
Geological and Petrological Services

928105

8 Landor Road
Gooseberry Hill W.A. 6076
Telephone (09) 293 4958

REPORT TO: CRA EXPLORATION

PETROLOGICAL DESCRIPTION OF SOME ROCKS FROM TASMANIA

DPo 71541

Martin Gole
April 1993

SUMMARY

Eleven polished thin sections of rocks from western Tasmania are herein described. All are metamorphosed or otherwise altered igneous rocks that can be divided into two groups: sulphide-bearing samples and serpentinised or partly serpentinised olivine-rich cumulates.

There are two sulphide-bearing rocks. Sample 3528483 is a weathered chlorite-plagioclase-sulphide schist containing 15% pyrite, pyrrhotite and chalcopyrite. It has vague pseudomorphed doleritic textures in places but is too chlorite-rich to be derived by straight forward metamorphism of dolerite or gabbro. The sulphides do not have typical magmatic textures. The rock may have been metasomatised and extensively recrystallised but a more definitive interpretation is not possible.

Sample 3528484 is massive sulphide and consists of pyrite, pentlandite, pyrrhotite, minor chalcopyrite, chromite, quartz, carbonate and stilpnomlane. The chromite is, in places, skeletal and this strongly suggests that the sulphides crystallised in a mafic/ultramafic magmatic environment. The presence of quartz in such an assemblage suggests that the sulphides have been metasomatised to some degree.

The serpentinised olivine-rich rocks consist of altered olivine orthocumulates, mesocumulates and adcumulates with one sample containing appreciable cumulate-textured pseudomorphed pyroxene. The present mineralogy consists dominantly of lizardite serpentine with minor magnetite with varying proportions of chlorite, brucite, pyroaurite and tremolite with a few samples containing relict igneous olivine and a trace of clinopyroxene. All samples contain relict igneous chromite. Only where the igneous porosity is moderate (ie in the orthocumulates and some mesocumulates) are relict igneous textures apparent. In most rocks the olivine grains were very tightly packed and it is not possible to recognise the former olivine grain boundaries. In some samples the shape of relict chromite grains is a guide to the igneous porosity of the protolith.

No sulphides or oxidised sulphides are present in the rocks. Sample 3528488 has a crude igneous layering defined by variations in the proportions of pseudomorphed olivine and pyroxene.

SAMPLE 3528483 Polished thin section

CHLORITE PLAGIOCLASE SULPHIDE SCHIST

Mineralogy	mode %
Chlorite	45
Plagioclase	30
Quartz	8
Pyrite	8
Pyrrhotite	4
Chalcopyrite	3
Titanite	1
Tremolite	1
Ilmenite	tr
Magnetite	tr

Weakly foliated fabric defined by poorly defined anastromosing network of chlorite-rich folia and alignment of sulphide aggregates separating domains of more or less massive, finely intergrown chlorite, murky plagioclase and quartz. In the massive domains chlorite needles have random orientations as have vague tabular laths of plagioclase. The murky nature of the feldspar is due to weathering and this unfortunately masks textural details of the feldspar intergrowths. However the feldspar grains in places appear to define a doleritic texture.

The sulphides are distributed evenly throughout the rock. In places chalcopyrite, pyrite and pyrrhotite form unusual banded aggregates. The scale of the banding and its randon orientation suggests that structure may reflect cleavage planes in minerals that have been replaced by the current sulphide assemblage. The textures of the sulphides appear to be all metamorphic rather than igneous and give no indication as to whether they are recrystallised magmatic sulphides or have some other origin.

The current mineralogy and textures do not provide a clear indication as to the origin and history of the rock. The possible pseudomorphed doleritic textures suggests a mafic igneous protolith. However the current mineralogy is far too chlorite-rich for such a parent. This may suggest that the rock has been metasomatically altered but a more definitive interterpretation is not possible.

Sample 3528483. Banded intergrowth of pyrite, pyrrhotite (both pale yellow) and chalcopyrite (yellow). The dark grey areas are silicates. Reflected light. Field of view (FOV) = 1.3 mm.

SAMPLE 3528484 Polished thin section

MASSIVE SULPHIDE

Mineralogy	mode %
Pyrite	30
Pyrrhotite	25
Pentlandite	20
Chalcopyrite	15
Quartz	4
Chromite	3
Carbonate	2
Stilpnomalane	0.5
Goethite	0.5

The sulphide mode is variable with pentlandite-pyrrhotite-pyrite patches and chalcopyrite-pyrite patches. The sulphides occur mostly in somewhat ragged intergrowths with a few areas of polygonal-textured aggregates. Pyrite, pentlandite and chalcopyrite are fresh whereas pyrrhotite is altered (presumably due to weathering) with a greyish bloom. Minor goethite occurs as alteration to sulphides along some grain boundaries and in a patch where boxworks after sulphides are present. Chromite is intergrown with sulphides as equant 0.1mm sized grains and as unusual, almost skeletal grains.

Quartz forms a vein or patch within the sulphide. Stilpnomalane and carbonate are present as patches and veins within the quartz and as scattered grains throughout the sulphide. The quartz and some carbonate appear to be in textural equilibrium with the sulpdide although stilpnomlane and some carbonate appear retrograde.

The mineral assemblage is unusual with chromite and pentlandite in the same rock as quartz. The presence of chromite, particularly the sheletal chromite, is very strong evidence that the sulphides are magmatic in origin. The quartz and carbonate suggest that the sulphides have been metasomatised. The sulphide textures, with intergrown ragged grains, are not magmatic and suggests that the sulphides have been extensively recrystallised, probably during the metasomatism.

Sample 3528484. Intergrowth of pentlandite, pyrite (both pale yellow), altered pyrrhotite (dark murky grey, black), minor chalcopyrite (yellow) and trace chromite (light grey). Reflected light. FOV = 2.6 mm.

Sample 3528484. Chalcopyrite-rich patch within massive sulphide composed of chalcopyrite (yellow), pyrite (pale yellow) and skeletal chromite (dark grey). Pyrite and chromite are closely intergrown. Reflrcted light. FOV = 1.3 mm.

928111

BPO No. 77351. PETROGRAPHIC NOTES FOR 7 SAMPLES OF CAMBRIAN SEDIMENTS AND INTRUSIVES

Prepared for T. Aravanis, CRA Exploration Ltd., Preston

3184279. Crackle-brecciated greywacke.

This dark green sample is a mass of <0.5-mm (but otherwise unsorted) angular crystal and rock fragments, with rare rock fragments up to 5 mm across.

The commonest clasts are quartz of various kinds: unstrained single crystals, aggregates of 50-µm anhedra dusted with very fine sericite, and chert. Almost as common are ferromagnesian crystal fragments altered to masses of very fine chlorite or a bright orange, near-isotropic sheet silicate. About 15% of the fragments are very heavily sericitised ?plagioclase. Fe-Ti oxide fragments (2-3%) have been altered to microcrystalline sphene. <0.3-mm flakes of clastic whitemica form about 0.5% of the sample. Rare <5-mm rock fragments seem to be ripped-up finer-grained relatives of the enclosing sediment.

Prominent <1-mm algal mats consist of fine flaky pyrobitumen, which also occurs in rare veinlets.

Minor fractures spaced on a cm scale show varying, slight amounts of movement.

The source seems to be mixed. Much of it is mafic, but the unstrained quartz may have a felsic igneous, or metamorphic source. Perhaps some is from ocean-floor hydrothermal deposits. There is no chromite, an indication that little or no boninite or ultramafic intrusive rocks were exposed in the source area.

3184284. Ni-Cu mineralised, chloritised gabbro.

The only fresh igneous relics are <2-mm anhedral brown hornblende (5-7%) which is commonly overgrown with actinolite. Abundant <2-mm tabular plagioclase has been altered almost completely to masses of <0.2-mm chlorite, with only rare relics of albite. Abundant 0.2-2 mm anhedral and stubby prismatic pyroxenes have been altered to chlorite dusted with a little fine pyrite, which has grown along cleavages and fractures. Minor masses of <0.2-mm ankerite have probably replaced augite. Minor clustered <0.3-mm anhedral ?secondary quartz is associated with sulphides (q.v.) and albitised plagioclase relics. Clustered <0.2-mm titanomagnetite (1-2%) is completely altered to microcrystalline sphene: on the other hand, very minor anhedral and tabular <0.5-mm ilmenite remains fresh.

The actinolite suggests low-grade metamorphism in the middle greenschist facies or its contact-metamorphic equivalent at say, 300-400°C. Though poorly preserved, the texture is an intrusive one. Lack of chromite indicates that the rock was probably thole-

1299. Ni-Cu mineralised, serpentinised gabbro.

This slightly coarser-grained relative of 3184284 is altered ely to a sheet silicate whose moderate birefringence is more patible with a serpentine mineral than with chlorite. No ibole remains: and it is usually impossible to distinguish entinised pyroxenes from serpentinised plagioclase. Rare -mm subhedral chromite indicates a primitive, perhaps even nitic composition. Prominent minor <0.2-mm tablets of mainly entinised biotite suggest contamination from melted crustal rial. Very minor clustered <0.2-mm octahedral magnetite, some contact with rare (though fresh) ilmenite and chromite, are red to soft masses of microcrystalline limonite, serpentine, sphene.

Disseminated anhedral 1-300 µm chalcopyrite and 10-500 µm erite account for about 2-3% each of Cu and Ni. Most miller- has minor fine inclusions of pyrite. Some millerite forms d <10-mm stringers with a little quartz.

Minor serpentinised irregular bodies up to 10 mm across are inguished by lack of disseminated sulphides. Though it is not ous what they were, they may be relics of partly melted tal xenoliths.

702. Cu-Ni mineralised, serpentinised gabbro.

This is a coarser relative of3184299 had an original grain around 2-5 mm. It lacks chromite; and serpentine-sphene cs of magnetite are coarser and more anhedral.

Disseminated 5-µm to <2-mm chalcopyrite, partly replacing oxenes, forms about 25 vol. % of the rock, suggesting as much ccounting for 15% Cu. <0.5-mm millerite, occurring with chal- cite, but also forming minor stringers with quartz, suggests ple of percent Ni.

A 15x5 mm ovoid body consists mainly of massive pyrite with <0.5-mm millerite, minor fine inclusions of quartz, and ures filled with serpentine. It may be a concretion, relict ide bleb, or an altered xenolith.

GENERAL COMMENTS

Ni-Cu sulphide assemblage

This is quite rich Ni-Cu mineralisation, in which the main neral, millerite (NiS, c. 60% Ni with almost no Fe) could bly produce a much better Ni concentrate than pentlandite 6% Ni, 26% Fe), the ore mineral of most Ni deposits.

A major question is: is this magmatic sulphide or hydrother- ineralisation? The high content of Ni, and absence of Zn and rongly suggest a magmatic origin. Though the sulphide tex- and mineralogy reflect low-T hydrothermal crystallisation, may be an overprint on a magmatic sulphide system.

The chemographic relations of some relevant sulphides in the Ni-Fe-S system are shown in Fig. 1. Most compositions plotted are taken from Patterson & Watkinson (1984). The composition of the sulphide assemblage in the present samples falls close to millerite (NiS) on the pyrite-millerite join, whereas fresh magmatic sulphide ores plot in the pyrite-pyrrhotite-pentlandite triangle closest to pyrrhotite. In other words these sulphides are too Fe poor to represent a sulphide liquid separating from a mafic melt. However it is common for chloritic alteration at low f_{O2} to absorb Fe from the sulphide assemblage, and enrich the residual sulphides in Ni and Cu compared with the high-T assemblage. Perhaps reaction of formerly abundant pyrrhotite with low-S, low-T hydrothermal fluid is responsible for the chlorite/serpentine alteration.

The presence of millerite rather than pentlandite is the only unusual feature, indicating alteration at higher f_{S2} than in most sulphide-liquid derived ores, which produce pentlandite on cooling. Millerite indicates f_{S2} much higher than heazlewoodite (which needs the very low-S environment of serpentinising peridotite). The reaction millerite + S_2 -> polydymite (Ni_3S_4) places an upper f_{S2} limit for millerite about 2 log units above pyrite-pyrrhotite (Barnes, 1979, p 387). Pyrite + millerite are stable relative to violarite + monosulphide solid solution only at T<200° (Barnes, 1979; p 327). The assemblage pyrite-millerite seems to have developed from violarite (a ?metastable sulphidation product of pentlandite) during metamorphism of magmatic Cu-Ni sulphides at the Thierry Mine, Ontario (Patterson & Watkinson, 1984); these sulphides are also strongly depleted in Fe. Actinolite in the present samples suggests metamorphism, possibly by a Devonian granite of the original Cambrian assemblage, and I suggest that millerite crystallised during the waning stages of metamorphism.

REFERENCES

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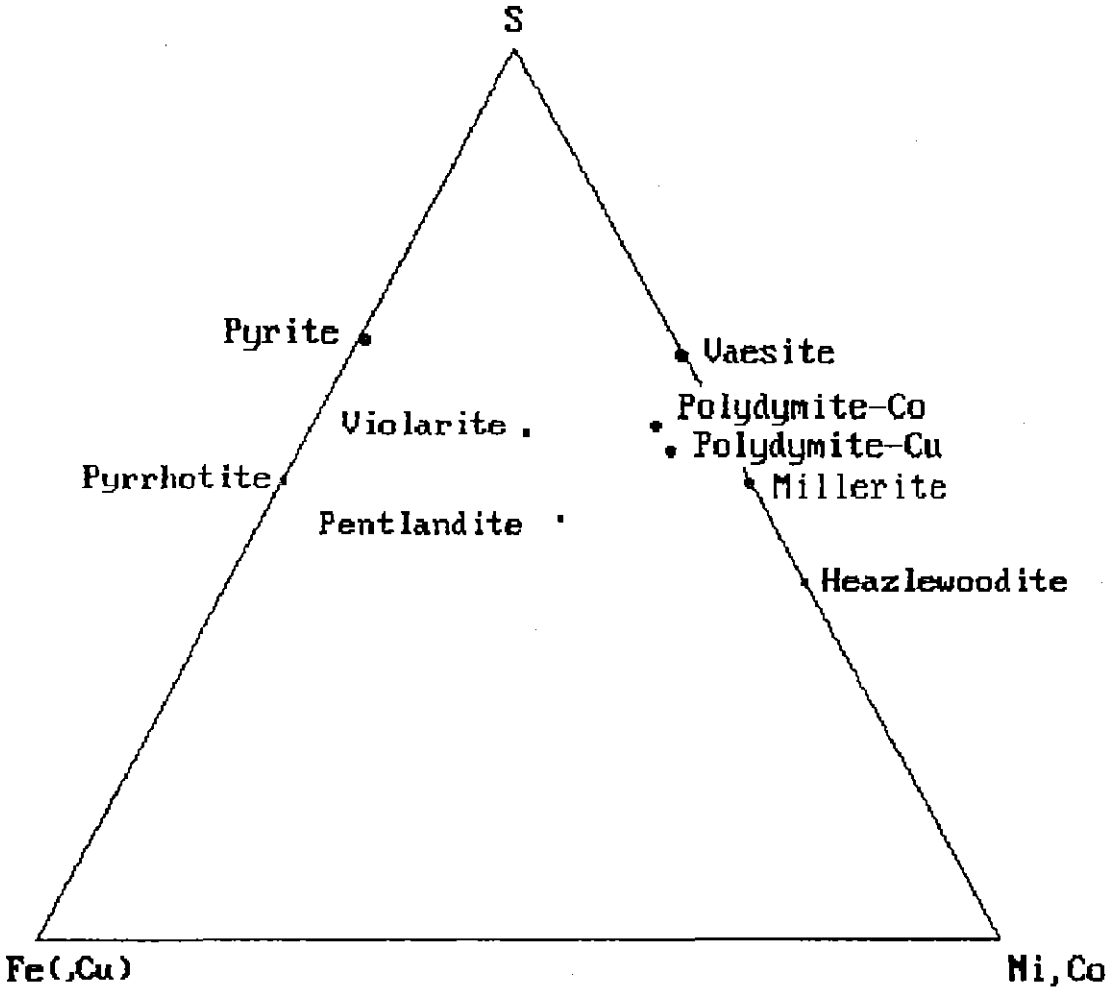
Fig. 1. Some relevant phases in the system Ni-Fe-S. Most compositions are taken from Patterson & Watkinson (1984). Traces of Cu in polydymite are plotted with Fe; and traces of Co with Ni.



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