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ZEEHAN No. 1 EL 28/88. REPORT ON EXPLORATION FOR THE FIFTH YEAR OF TENURE, 9/11/92 TO 9/11/93

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1. SUMMARY

CRA Exploration Pty. Limited (CRAE) is exploring EL 28/88 principally for stratiform-stratabound Zn-Pb shale-hosted deposits in the Proterozoic Oonah Formation, carbonate-hosted deposits in the Ordovician Gordon Limestone, and surficial secondary deposits derived by decomposition of mineralised limestone. Secondary targets include Ni mineralisation in ultramafic bodies, and skarn-type Zn-Pb deposits peripheral to the Heemskirk Granite.

Six targets were selected for work during 1993; Stonehenge, Avebury, Myrtle, Pyramid, Firewood Siding and Trial Harbour. Exploration during 1993 has upgraded the prospectivity of Myrtle, Firewood Siding and Avebury, and downgraded Stonehenge, Pyramid and Trial Harbour.

Air-core drilling of near-surface decomposed limestone at Myrtle has intersected significant thicknesses and grades of residual Zn mineralisation. Seventeen holes returned better than 2m @ 1% Zn. Best results include (1% Zn cut-off):-

ZM1	4-14m	10m	@ 5.7% Zn
ZM13	14-28m	14m	@ 5.9% Zn
ZM18	0-36m	36m	@ 4.2% Zn
ZM58	0-6m	6m	@ 5.2% Zn

The Zn is present as clean monominerallic grains of low Fe sphalerite, apparently easily liberated from the unconsolidated pug. These features suggest that should sufficient resources be defined, the deposit would have favourable mining and treatment characteristics.

Soil sampling at Avebury returned up to 7200ppm Zn, 4400ppm Pb, 450ppm Cu, 32% Fe, 980ppm As. Complex Zn-Pb-Cu-As anomalism , coupled with high Fe and strong aeromagnetic response, is suggestive of skarn-related mineralisation. Understanding the geology of this prospect is hindered by a lack of outcrop.

Mineralisation in the black shale - carbonate valley at Stonehenge is dominated by shear-controlled ankerite-sulphide veins of limited tonnage potential. No stratiform base-metal sulphides were intersected. Best drilling results include (1% Zn cut-off grade):-

DD92ZS1	119.2-121.35m =	2.15m	@ 7.8% Zn,	10.1% Pb,	191.3ppm Ag
	150.5-162.85m =	12.35m	@ 2.1% Zn,	0.4% Pb	
	223.8-232.65m =	8.85m	@ 1.5% Zn,	0.4% Pb	
DD92ZS2	100.5-112.0m =	11.5m	@ 4.1% Zn,	1.1% Pb,	10 ppm Ag
	124.0-136.0m =	12.0m	@ 1.8% Zn,	0.4% Pb,	19.5 ppm Ag
	190.25-190.5m =	0.25m	@ 20.0% Zn,	12.3% Pb,	415 ppm Ag
				2.9% Cu,	2.2% Sb,

Drill-testing of the Trial Harbour ultramafic has proven the anomalous soil/rock geochemistry in the W part of the body is due to surface enrichment of Ni in silicates, and does not represent substantial primary sulphide Ni.

The major focus for exploration in 1994 will be directed toward identifying and evaluating primary and residual mineralisation in the Gordon Limestone.

2. INTRODUCTION

EL 28/88 was granted to "His Grace, The Most Noble, The Duke of Avram" on 9th December 1988, and transferred to Major Mining Ltd on the 23rd November 1989. CRA Exploration Pty. Limited entered into a joint venture agreement with Major to explore EL 28/88, commencing on 23rd April 1991. At the time of writing, Major Mining Ltd was in the process of divesting its interest in the joint venture to Allegiance Mining NL, with the exploration tenements being transferred to CRAE (90%) and Allegiance (10%) as tenants in common.

EL 28/88 covers 129 sqkm located near Zeehan on the Tasmanian W coast (Plan Tv 431). During the period under review, the fifth year of tenure, CRAE has a statutory obligation to expend $129000. This report details all exploration activities conducted within EL 28/88 by CRAE during 1993.

CRAE's principal commodity of interest in the Zeehan area is Zn. The Zeehan area shows some similarities with the Lawn Hill area of NW Qld, where the Century Zn-Pb discovery is situated. On this basis, CRAE believes EL 28/88 holds potential for discovery of a stratabound shale-hosted Zn-Pb deposit.

Ordovician Gordon Limestone is prospective for carbonate-hosted Zn-Pb, and secondary deposits derived from the decomposition of the carbonate. During 1993, these styles of mineralisation dominated the exploration focus and will continue to do so during 1994.

Ultramafic bodies in the area may potentially host disseminated low-grade Ni mineralisation. Other mineralisation styles and commodities (e.g. Sn) are also valid targets that will be pursued as opportunities arise.

Six targets were selected for work during 1993; Stonehenge, Avebury, Myrtle, Pyramid, Firewood Siding and Trial Harbour (Plan Tv 443). Activities included literature studies and open-file data compilation, soil, rock and wacker geochemical sampling, geological mapping, and diamond and air-core drilling.

3. CONCLUSIONS

Exploration during 1993 has upgraded Myrtle, Firewood Siding and Avebury prospects, and downgraded the prospectivity of Stonehenge, Pyramid and Trial Harbour.

Air-core drilling of near-surface decomposed limestone at Myrtle has intersected significant thicknesses and grades of residual Zn mineralisation in several holes. Mineralogical studies indicate the Zn to be present as low Fe sphalerite, occurring as clean monominerallic grains, apparently easily liberated from the unconsolidated pug. These features suggest that should sufficient resources be defined, the deposit would have favourable mining and treatment characteristics.

Pyramid prospect, similar to Myrtle, does not appear to have significant thicknesses of well mineralised residuum. Additional drilling elsewhere on the Pyramid grid is required to fully evaluate this prospect.

Wacker sampling of the northern portion of Firewood Siding prospect shows enhanced Zn-Pb values at the Gordon Limestone - Crotty Quartzite contact. Potential exists for both residual and primary mineralisation developed at this prospect.

Primary sphalerite in carbonate was also intersected at Myrtle, highlighting the potential of this prospect, and the Gordon Limestone in general, to host stratabound carbonate-hosted deposits.

Infill soil sampling at Avebury has further highlighted the anomalous geochemistry of this poorly understood prospect. Complex Zn-Pb-Cu-As anomalism, coupled with high Fe and strong aeromagnetic response, is suggestive of skarn-related mineralisation. Understanding the geology of this prospect is hindered by a lack of outcrop.

Diamond drilling of the Sunshine black shale and carbonate valley at Stonehenge prospect has shown that the mineralisation is dominated by shear-controlled ankerite-sulphide veins of limited tonnage potential. No stratiform base-metal sulphides were intersected.

Drill-testing of the Trial Harbour ultramafic has proven the anomalous soil/rock geochemistry in the W part of the body is due to surface enrichment of Ni in silicates, and does not represent substantial primary sulphide Ni. Overall, the ultramafic has been substantially modified by metamorphism and serpentinisation. Any original igneous sulphide accumulations will also have been significantly remobilised. Additional exploration will need to take into account the effects of this potential remobilisation.

4. RECOMMENDATIONS

Continued exploration is required primarily directed toward mineralisation in the Gordon Limestone. A substantial program of air-core drilling is required to evaluate near-surface residual Zn mineralisation at Myrtle in order to estimate resources. Mineralogical and metallurgical studies should also be maintained to fully understand this style of deposit.

Regional air-core drilling traverses are required to locate additional accumulations of Zn-rich residuum in other areas of Gordon Limestone within EL 28/88.

Diamond drilling for stratabound primary carbonate-hosted deposits is also recommended for 1994, initially investigating the sphalerite occurrence in Myrtle hole ZM58.

At Avebury, a line of ground (or helicopter-borne) magnetics is required to determine the relationship of the magnetic anomaly to the soil anomaly. Some form of ground electrical or EM geophysics may help identify subsurface features possibly related to mineralisation. A shallow diamond drillhole will then be necessary to identify the underlying lithologies and hopefully define the cause of the widespread soil anomalism.

Of low priority is to undertake an air-core drilling traverse across the Sunshine valley at Stonehenge to quantify the amount of near-surface shear-hosted Zn mineralisation. The diamond drilling completed in late 1992 was inappropriate to fully test for this style of deposit. The potential size of the target is small, and would probably not interest CRAE as a single deposit.

No additional exploration is proposed for Trial Harbour during 1994. Nickel exploration activities will be directed at targets within CRAE's other ELs.

5. REGIONAL GEOLOGY

Zeehan and it's surrounding districts have seen almost continuous sedimentation, igneous activity and deformation from the Late Proterozoic to the Quaternary. Consequently the picture of geological evolution is a complex one. Recent mapping by the Tas Dept of Mines is helping to solve old puzzles, but also continues to open new cans of worms. Corbett (1989) gives a good summary of possible tectonic models to account for the early palaeozoic geology of NW Tasmania. Some interesting new concepts are summarised informally in Turner (1992). For CRAE staff, Parkinson (1992a) attempts to pull together a few loose threads. Regional geology is summarised on Plan Tv 628.

The Rocky Cape Association forms basement in NW Tasmania. This association is not represented on the Zeehan 1:63360 sheet. In the late Precambrian, around 700Ma, a shallow basin was forming in the stretched intracratonic area between the Rocky Cape and Tyennan Regions. Coarse clastic sediments (conglomerates and sandstones) of the Forest Conglomerate, Donaldson Fm and base of the Timbs Gp were deposited.

Turbidite sequences of interbedded sands and silts of upper Donaldson Fm, Timbs Gp and Oonah Fm were laid down as the intracratonic basin deepened.

As the rift phase drew to a close, sag phase Black River Dolomite, Savage Dolomite, ?Timbs Gp magnesite horizons, and Success Creek Gp limestones were deposited. Rift tholeiites and associated sediments of the Smithton Volcanics, Bernafai Volcanics, Timbs Gp and Crimson Creek Fm erupted over the now filled 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 E of the Tyennan Block. The gabbros 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 Gp sediments and Mount Read Volcanics were deposited. A local metamorphic event dated at 500Ma (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, limestones of the Gordon Group were 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, when the first rumblings of the Tabberabberan Orogeny were being felt.

Earliest of events forming part of the Tabberabberan Orogeny was 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 Gp over one another to produce the rapid, apparently quantum jumps in metamorphic grade seen in the Arthur Lineament. To the S, the Tenth Legion Thrust within the EL area 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, to "poke the tongue" of Zeehan area geology southward into the Henty Basin.

Continued Tabberabberan deformation folded the Zeehan Basin formations about NNW-trending axes.

Geological events subsequent to the Tabberabberan Orogeny do not capture the imagination of mineral explorers. 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 Ni-sulphides in ultramafics	Cuni
Ordovician	Stratabound sphalerite-galena in limestone.	Oceana
Devonian	Stratabound replacement cassiterite-pyrrhotite in carbonates	Renison Bell
Devonian Comstock	Discordant lode-style pyrite-galena-sphalerite	Spray,
Devonian	Discordant vein-style pyrite-galena-sphalerite	Comet
Devonian	Skarn magnetite (+sphalerite-cassiterite)	Saint Dizier
Devonian	Skarn pyrrhotite (+sphalerite-galena)	Sylvester
Quaternary	Residual Pb-Zn in surficial decomposed limestone	Myrtle, Grieves

Historically it has been the lode and 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 in Oonah or Crimson Creek Fms. These 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 practises, it is unlikely that such a target could be of economic interest on its own.

In the last 20 years or so, 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 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. A pre-mining resource is estimated at 42Mt @ 1.1% Sn (Collins, 1989).
Queen Hill is similar in style to Renison Bell, with a resource of 4Mt @1% Sn. Given the world oversupply of Sn, and the inherent low grade and metallurgical difficulties of these deposits, a replacement style Sn deposit is probably not a valid exploration target for a company without an existing Sn portfolio.

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

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

Nickel mineralisation as magmatic segregations within the ultramafics appears to be insignificant in quantity, although the grade of individual occurrences sounds impressive. Deposits are generally less than 50m long and of the order of 1m wide, with several percent of Ni and Cu (Blissett, 1962). Although some drilling has been carried out, there is no clear understanding of the geometry of the deposits with depth. This style of mineralisation should be considered incompletely explored.

Stratabound Pb-Zn in limestone is exemplified by the Oceana deposit where Amoco outlined a resource of 4Mt @ 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.

Perhaps more significant than potential within the limestone is near-surface enrichment of Zn by the dissolution of the carbonate. This decarbonatisation has left a layer of black sulphidic pug sitting above fresh limestone, beneath a veneer of glacial gravels. Zinc and Pb have been retained and concentrated in this pug layer. The mechanism for this process is unclear, but it is suggested that low pH, strongly reducing conditions have acted to remove carbonate, but preserve sulphides near the surface. The black pug is extensively developed over virtually all areas of near-surface Gordon Limestone.

The degree of upgrading is such that surface Zn concentrations can reach ore-grade. This fact, combined with likely favourable mining characteristics of low ore:waste ratio, ease of excavation, and close proximity to established infrastructure, significantly upgrades the prospectivity of this style of mineralisation. Potential of this target is currently being evaluated by CRAE.

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 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

Summons (1991) summarised relevant exploration activities by competitors prior to the granting of EL 28/88. Of particular significance to CRAE's activities are the exploration programs by RGC on EL 11/76, Amoco-EZ on EL 4/78, and EZ on SPL22.

An intensive program of Sn exploration was conducted by RGC on the Stonehenge grid (EL 11/76). A large volume of geological, geochemical, geophysical and drilling data was recorded, which has significantly helped CRAE to rapidly focus in on likely shale-hosted Zn-Pb targets.

Amoco-EZ in joint venture on EL 4/78, systematically evaluated the potential for the Ordovician Gordon Limestone to contain carbonate-hosted Pb-Zn deposits. Again considerable geological, geochemical, geophysical and drilling data was amassed which has allowed CRAE to rapidly identify areas requiring more detailed investigation.

At the height of the Ni boom, EZ explored the Trial Harbour ultramafic body for Kambalda-type massive Ni sulphide. Geological mapping, soil geochemistry, ground magnetic and VLF surveys were completed, culminating in a drilling program of 11 holes. This early work provided the impetus for CRAE to reinvestigate the Trial Harbour ultramafic.

Reports of the above exploration efforts are constantly referred to before implementing exploration strategies in the area to avoid duplication of effort.

8. EXPLORATION BY MAJOR MINING LTD / CRAE PRIOR TO 9/11/92

Year 1, Year 2: Activities by Major Mining prior to CRAE's involvement are detailed in the relevant statutory reports. Field activities included a gradient array IP survey covering a small area between the South Comstock and Tasmanian workings.

Year 3: Exploration by CRAE on EL 28/88 prior to 9/11/91 focussed on an extensive compilation and review of existing open-file data (Summons, 1991). Analysis of the structural controls to historical mineralisation suggested the Devonian NNW-trending shear/fracture controlled mineralisation to possibly overprint an earlier (Precambrian?) ENE-trending mineralised corridor.

Statistical evaluation of Ag:Pb ratios indicated a decline in Ag:Pb from Proterozoic to Ordovician deposits. Considering the ratio as a vector, areas of high Ag:Pb could be close to a postulated Precambrian "Mother Lode". On this basis, the Spray, Montana No. 2 and Junction deposits are the "closest to source".

Year 4: CRAE's exploration strategy in 1992 aimed to test these two models (Parkinson, 1992b). Dipole-dipole IP surveys at Stonehenge defined a chargeable conductor exceeding 1km strike length, coincident with mapped black shale. Soil and wacker sampling indicated this horizon to be anomalous in Zn and Pb. Previous drilling by RGC (hole TH12) intersected several metres of percent-level Zn in the area of interest. Diamond drilling to test stratigraphic and structural targets within the envelope of anomalous geophysics and geochemistry were proposed for 1992/93.
Soil sampling at the Avebury stream sediment anomaly detected Zn-Pb-Cu-As anomalism, in an area of poor outcrop within either Cambrian or Proterozoic lithologies. Infill soil sampling was proposed.

Open-file literature reviews revealed the presence of significant surface enrichment of Zn within residual black clays developed over Ordovician Gordon Limestone. Air-core drilling traverses were recommended for Myrtle and Pyramid prospects.

Systematical soil/rock sampling of dunite at Trial Harbour was recommended to determine whether the body was capable of hosting a bulk low-grade Ni sulphide resource.

9. EXPLORATION ACTIVITIES FOR THE PERIOD 9/11/92 TO 9/11/93

9.1 Exploration Philosophy

CRAE's principal commodity of interest in the Zeehan area is Zn. The Zeehan area shows similarities with the Lawn Hill area of NW Qld, where the Century and Walford's Creek Zn-Pb discoveries are situated. Common characteristics include the presence of Proterozoic sulphidic black shales and numerous discordant (remobilised?) Zn-Pb occurrences. CRAE believes EL 28/88 may hold potential for discovery of a stratiform shale-hosted Zn-Pb deposit.

Ordovician Gordon Limestone is prospective for carbonate-hosted Zn-Pb. The 1993 field program represents a fundamental shift from searching for a shale-hosted resource to focussing on carbonate-hosted mineralisation, and more specifically, secondary deposits derived from the decomposition of the carbonate .

Zinc mineralisation is being enriched near-surface by dissolution of the carbonate. This decarbonatisation has left a layer of black carbonaceous and sulphidic pug sitting above fresh limestone, beneath a veneer of glacial gravels. Zinc and Pb have been retained and concentrated in this pug layer. The mechanism for this process is unclear, but it is suggested that low pH, strongly reducing conditions have acted to remove carbonate, but preserve sulphides near the surface. The black pug is developed to some extent over virtually all areas of near-surface Gordon Limestone.

The degree of upgrading is such that surface Zn concentrations can reach ore-grade. This fact, combined with likely favourable mining characteristics of low waste:ore ratio, ease of excavation, and close proximity to established infrastructure, significantly upgrades the prospectivity of this style of mineralisation. Potential of this target is the current focus of exploration by CRAE.
Ultramafic bodies in the area may potentially host disseminated low-grade Ni sulphide mineralisation.

Other mineralisation styles and commodities (e.g. Sn) are also valid targets that will be pursued as opportunities arise.

Six targets were selected for work during 1993; Stonehenge, Avebury, Myrtle, Pyramid, Firewood Siding and Trial Harbour.

9.2 Stonehenge Prospect

9.2.1 Introduction

Stonehenge prospect is 3km WSW of Zeehan. The prospect covers several historical workings in the area between Comstock and Spray mines, including TLE, Stonehenge, Tasmanian, Swansea, Grubbs, Sunshine, Nubeena and several lesser workings.

CRAE selected Stonehenge as a focus for stratabound Zn-Pb exploration based on the presence of favourable sulphidic shale stratigraphy combined with these numerous base-metal occurrences. Open-file geophysical and geochemical data indicated linear conductive zones with elevated base-metal response parallel to stratigraphy. Diamond drilling logs recorded abundant sulphidic black shale.

Dipole-dipole IP surveys completed in 1992 defined a chargeable conductor exceeding 1km strike length, coincident with mapped black shale, in the vicinity of the Sunshine workings. Soil and wacker sampling indicated this horizon to be anomalous in Zn and Pb. Previous drilling by RGC (hole TH12) intersected several metres of percent-level Zn in the area of interest.

Diamond drilling to test stratigraphic and structural targets within the envelope of anomalous geophysics and geochemistry near the Sunshine workings were completed in 1992/93. No other work was carried out at Stonehenge during the year.

9.2.2 Geology and Mineralisation

Current geological understanding is summarised on plan Tv 452. Stratigraphic elements present in the Stonehenge area are:-

- Quarternary and Tertiary cover
- Ordovician Owen Conglomerate
- Cambrian Dundas Group
- Late Precambrian or early Cambrian Crimson Creek Formation
- Late Precambrian Oonah Formation

The Oonah Fm can be divided into three readily identified sub-units:-

- massive white to grey quartzite
- interbedded black shale, siltstone, greywacke and limestone
- muscovitic quartzite

Massive quartzite forms the steep hills S of Sunshine. Where intersected by drilling (DD92ZS3), the quartzite contains minor muscovite (detrital?) defining a weak wispy foliation, probably aligned with the original bedding.

Of interest for stratabound mineralisation is the shale-limestone unit. This horizon weathers in preference to the quartzites to form the E-W valley in the area of the Sunshine mine. Near Sunshine the shales are obscured by up to 10m of gravels. Results of this year's drilling show that dolomite may be dominant in this sequence, with a lesser amount of black shale, and minor siltstone.

Laminated micaceous quartzite forms the lower hills to the N of the Sunshine valley. In outcrop these quartzites contain considerably more mica than the S quartzite, forming a prominent lamination resulting in a platy weathering habit.

The exact stratigraphy of the Oonah Fm in this area is not clear. Currently the author's favoured interpretation is for the massive quartzite to the S to be the uppermost unit. This requires the sequence S of Sunshine to be overturned, possibly rolling over at the toe of the Tenth Legion thrust.

Crimson Creek Fm reddish-purple volcaniclastics, basalts, khaki mudstone and black shales crop out north of the tenement, in particular on Manganese Hill. This formation is interpreted to overlie Oonah Fm but at this locality the contact is faulted by the Balstrup Fault.

South of the Tasmanian tramway, chert-clast conglomerates and grits, and a "salt and peppery" sandstone crop out over a large area of subdued topography. These formations are part of the Dundas Group.

South of McLean Creek, cobble conglomerates of the Owen Conglomerate rise imposingly to the peak of Mount Zeehan.

Separating the Oonah Fm and Dundas Grp in the vicinity of the Tasmanian tramway is a recently identified sub-horizontal thrust - the Tenth Legion Thrust (Findlay and Brown, 1992). Before the discovery of the thrust, considerable stratigraphic gymnastics had to be indulged in to get the topographically higher Oonah Fm to underlie the Dundas Grp. Best evidence for the thrust is seen in road cuts and excavations at South Comstock. RGC drillhole TH12 intersected the thrust plane where brecciated and mylonitised mafic rocks were described. The age of the thrust is interpreted to be early Devonian, coincident with the beginning of the Tabberabberan Orogeny.

Numerous bedding measurements were collected in the Oonah Fm in an attempt to better define stratigraphic positions. General trends are summarised on the geological map (Tv 452). The quartzites are mostly steep N-dipping. Dips and strikes within the shale package are variable, probably indicating the willingness of these rock types to accept deformation. No facings could be unequivocally recognised to give a "way up" to the Oonah Fm.

Devonian shearing along a NNW trend has disrupted earlier formations. These structures are characterised by highly graphitic and sulphidic shear bands, locally hosting lodes of pyrite, galena and sphalerite that have been historically exploited. It is significant to note that shearing and mineralisation are most strongly developed where a structure cuts across the Oonah Fm shale-siltstone sub-unit. This sub-unit has been dragged into, and smeared along the shears.

Historically important Comstock, Sunshine and Spray deposits occur at the intersection of shears and the shale horizon. Minor deposits such as TLE, Tasmanian and numerous others occur where the shears have passed through less receptive quartzite or Dundas Grp.

9.2.3 Diamond Drilling

Three diamond drillholes totalling 732m were completed in Nov-Dec 1992 by Diamond Drilling Tasmania to test stratigraphic and structural targets within the envelope of anomalous geophysics and geochemistry near the Sunshine workings. All core was sawn, with half being assayed at Analabs Burnie by AAS (aqua regia-perchloric acid digest) for Ag-As-Cu-Pb-Zn-Fe. Selected samples were reanalysed for Au (fire assay), Bi-Cd-Mn-Mo (AAS), Sb-Sn (XRF). Hole locations and Zn intersections are shown on Plan Tv 587. Drill logs, assays and petrological reports are presented in Appendix 1.

Holes DD92ZS1 and ZS2, 100m apart, were drilled to test for structurally-controlled mineralisation in the Grubb's shear where the shear passes through the Oonah Fm black shale. Both holes intersected a mixed sequence of dolomite, siltstone and carbonaceous shale although it is not possible to correlate individual units. Overprinting the lithologies are sheared and brecciated zones with strong to total ankerite/siderite and silica alteration with coarse grained low-Fe sphalerite mineralisation. Narrow zones of polymetallic massive sulphide were also intersected. The alteration/mineralisation is interpreted to be Devonian shear-related.

Best results include (1% Zn cut-off grade):-

DD92ZS1	119.2-121.35m	= 2.15m @ 7.8% Zn, 10.1% Pb, 191.3ppm Ag
	150.5-162.85m	= 12.35m @ 2.1% Zn, 0.4% Pb
	223.8-232.65m	= 8.85m @ 1.5% Zn, 0.4% Pb
DD92ZS2	100.5-112.0m	= 11.5m @ 4.1% Zn, 1.1% Pb, 10 ppm Ag
	124.0-136.0m	= 12.0m @ 1.8% Zn, 0.4% Pb, 19.5 ppm Ag
	190.25-190.5m	= 0.25m @ 20.0% Zn, 12.3% Pb, 415 ppm Ag 2.9% Cu, 2.2% Sb,

Zinc mineralisation is only developed in the ankerite/siderite alteration zone, the unaltered lithologies containing low levels of base-metals. Widths given above are intersected widths. In most cases mineralisation was at a low angle to core-axis, therefore the true width will be less.

DD92ZS3 was designed to test the potential for stratiform mineralisation in the black shale outside the influence of the shear. Drilling was difficult, with very poor recovery for the first 135m. Lithologies intersected were the black shale-dolomite package to 171m, before passing into quartzite (with minor siltstone and shale) for the remainder. Strong quartz veining became common below 205m, possibly suggesting proximity to the Tenth Legion Thrust. Best result was (1% Zn cut-off grade):-

DD92ZS3	159.5-160.6m	= 1.1m @ 3.5% Zn, 0.1% Pb, 19 ppm Ag

This result was from a 5mm wide sphalerite-dolomite? vein running parallel to core axis for this distance. The shales and broken ground in the poor-recovery zone contain elevated levels of Zn and Pb, with a best result of 9m from 64m at 0.42% Zn and 0.38% Pb (<20% core recovery). A 300mm piece of pyritic quartzite from the interval 130m to 133m returned 0.9% Zn and 0.36% Pb. These results suggest some weak mineralisation may be developed as stratiform disseminations, but the poor recoveries preclude a more detailed interpretation.

Stereographic plots of siderite-sulphide veining to core-axis angles indicate the veins to be dipping 60deg toward 100deg AMG, consistent with expected tensional veining directions developed during dextral shearing on the NNW-trending Grubb's Shear.

Petrological reports indicate virtually all samples submitted were once carbonates, now altered to ankerite rocks (Appendix 1). Dolomite and siderite are minor constituents.

Overall the results lead to a number of conclusions. Firstly, the bulk, if not all mineralisation intersected is shear-hosted related to Devonian mineralising processes. No significant Proterozoic mineralisation has yet been detected. Secondly, both drilling directions were inappropriate to test the shear-hosted mineralisation. Thirdly, poor recoveries in soft and broken ground near surface suggest diamond drilling is unreliable to test for shallow low-grade mineralisation.

9.2.4 Proposed Exploration during 1994

Work completed during 1993 has shown that a large Proterozoic shale-hosted strataform deposit is unlikely to exist in the Sunshine valley area. However, the results from ZS1 and ZS2 suggest potential for a smaller, lower grade resource to exist within Grubb's shear where it intersects the dolomite-shale unit. Additional drilling is required to reliably quantify the true width and grade of this mineralisation. Two E-W fences of closely-spaced air-core holes across the valley are proposed. Holes should be inclined to the W, perpendicular to the interpreted veining direction

Additional shallow, easily exploited resources of similar type need to be located in the vicinity for this deposit to be of interest to CRA.

9.3 Avebury Prospect

9.3.1 Introduction

A review of CRAE and competitors' regional stream sediment database indicated several small creeks draining an unexplored area between McLean and Comstock Creeks to be strongly anomalous in Zn and Pb. Six anomalous samples draining a tightly constrained 1500m x 500m area produced a maximum response of 1280 ppm Zn and 580 ppm Pb (Plan Tv 472). The anomaly, detected and noted by RGC was not followed up by them as there was no associated Sn response.

The anomaly is in an area of no historical mining activity and the catchments are not contaminated by mine spoil as is common for most of the Zeehan area.

Reconnaissance soil sampling during 1992 identified a 400m x 300m zone in the centre of the grid with elevated Zn-Pb-Cu-As values up to 450ppm Cu, 1300ppm Pb, 1150ppm Zn and 210ppm As. Infill soil sampling to 50m x 25m has been completed this year to further define this anomaly.

Access to the anomaly, 3.5km SSW of Comstock, is via a logging area adjacent to the Trial Harbour road, then south along a walking track cut for CRAE (Plan Tv 472).

9.3.2 Geology

Outcrop on the grid is generally poor to non-existent, except on the steep topography to the south. The majority of the prospect appears to be underlain by mafic rocks, either gabbro or basalt, mantled by a sticky yellow-orange clay. The steep southern slopes are Owen conglomerate. A white sugary silicified rock is locally present. It's appearance is that of Oonah Fm siltstone, however it would seem to stratigraphically overlie the gabbro/basalt. The prospect may therefore be another exposure of the sub-horizontal Tenth Legion Thrust.

Coarse magnetite fragments were noted from the N of the grid during soil sampling, suggesting the possibility of a magnetite skarn in the area. Very high Fe in soil samples (see below) further advance this possibility.

Abundant chromite grains were recovered in one soil sample from the S of the grid, although it is not clear whether this was from weathering of an in-situ chromitiferous body, or detrital accumulations in Owen Conglomerate.

Interpreted local geology and observations from soil pits are summarised on Plan Tv 472.

9.3.3 Soil Geochemistry

Hand-augured C-horizon soil sampling was completed at 50m x 25m intervals over the central 600m x 600m area (Plan Tv 482, Appendix 2). Samples were assayed at Analabs Burnie by AAS (aqua regia-perchloric acid digest) for Ag-As-Cu-Ni-Pb-Zn-Fe-Mn. A total of 177 samples were collected. Results for combined 1992 and 1993 soil geochemistry for Zn-Pb-Cu-As-Fe-Mn-Ni are plotted on Plans Tv 588 to Tv 594.
The central infilled area is characterised by high background levels of Zn-Pb-Fe. Within this high background there is a NNW-trending zone of Zn-Pb values exceeding 1000ppm , up to 1900ppm Zn and 1700ppm Pb. There is an unrelated spot high of 7200ppm Zn nearby. These high Zn-Pb values lie within a more nebulous, perhaps semi-circular zone of elevated Zn-Pb-Fe-Mn-As-Ni values up to 32% Fe, 11% Mn, 980ppm As, 7300ppm Ni.

Surrounding this zone are elevated Cu values, up to 450ppm. Copper is considerably lower within the semi-circular Zn-Pb-Fe-Mn-As-Ni area, possibly indicating metal zonation? Iron is elevated above 10% throughout the sampled area.

On line 356050N there is a string of Pb values over 1000ppm, up to 4456ppm. There does not appear to be any corresponding elevated geochemistry in other elements.

9.3.4 Proposed Exploration during 1994

At this stage, geochemistry indicates Zn-Pb-Cu-As levels to be elevated over a large area, although no highly anomalous results have been recorded. Lack of outcrop has made tracking the anomaly to a visible surface source so far impossible. The form of mineralisation can still only be guessed at.

A line of ground (or helicopter-borne) magnetics is required to determine the relationship of the magnetic anomaly to the soil anomaly. Some form of ground electrical or EM geophysics may help identify subsurface features possibly related to mineralisation. Access to the area is difficult, so initial investigations should utilise easily portable equipment. A shallow diamond drillhole will then be necessary to identify the underlying lithologies and hopefully define the cause of the widespread soil anomalism.

9.4 Myrtle Prospect

9.4.1 Introduction

Myrtle prospect is a carbonate-hosted Zn target within Ordovician Gordon Limestone, 10km S of Zeehan on the Zeehan-Strahan road.

Extensive exploration by Amoco and EZ of the Gordon Limestone at Myrtle identified substantial Zn anomalism from wacker and costean sampling. Results included 8m @ 6.9% Zn from costean 50500N in black clay. Drilling beneath the costean anomalies failed to detect significant primary limestone-hosted mineralisation, although a best result of 11.3m @ 2.1% Zn was intersected in clays in ZWM15. Recoveries from diamond drilling in the clay zone were poor, and often nil.

CRAE regards the enriched metal levels within the near-surface black clay (decomposed limestone) to be a valid target in itself. Exploration by Amoco-EZ suggested the mineralisation may attain sufficient thickness and areal extent to host a modest Zn deposit. Likely benefits of ease of mining, proximity of established infrastructure, and consequent low capital costs to establish a mine enhance the prospectivity of this prospect.

During the year, CRAE completed air-core drilling traverses over accessible areas of Myrtle prospect, followed up by mineralogical studies of the mineralisation intersected. The existing Amoco-EZ grid was relocated and used for all work.

9.4.2 Geology

Basic geological elements are summarised on Plan Tv 544. Lowermost in the prospect area is the Cambro-Ordovician Owen Conglomerate which forms the prominent SE-trending Professor Range. Overlying the Owen Conglomerate is Ordovician Moina Sandstone, peneplained off to form the Professor plateau immediately S of the Strahan road.

Conformably above the Moina Sandstone, and in faulted contact with the Owen Conglomerate is the Gordon Limestone. Throughout the Zeehan area, the Gordon Limestone is eroded to form flat-bottomed valleys covered by a veneer of quartzite cobbles, peat and button-grass. Lack of outcrop prevents the limestone from being divided into sub-units. In-situ weathering of the limestone has decomposed the unit to a dark grey to black carbonaceous and sulphidic clay. This clay layer is irregularly developed, varying in thickness from absent to over 20m.

The only exposure of this decomposed layer in the prospect area is in the steep-sided road cutting immediately E of Myrtle. The clay-rich and sulphidic nature of the decomposed limestone is apparent, but overall structure is complicated by the presence of a fault cutting through the same area.
Silurian Crotty Quartzite sits conformably above the Gordon Limestone, also forming a peneplain above the limestone valley N of the Strahan road. Younger Silurian and Devonian sediments overlie the Crotty Quartzite further N outside the immediate prospect area.

Geological mapping suggests a major fault, trending NW, separates the Gordon Limestone from the Owen Conglomerate of the Professor range. Extrapolating this fault NW onto the drilling grid would position it exactly in line with air-core holes ZM1, ZM13 and ZM18, which encountered massive pyrite and vein quartz. Significantly, the fault has no expression in the overlying Silurian Crotty Quartzite, suggesting movement on the structure had ceased by the end of the Ordovician. One possible scenario is that limestone-hosted mineralisation may have been introduced along these Ordovician faults, perhaps as a late-stage hydrothermal episode related to the Cambrian exhalative massive sulphide event.

This fault is visible in the steep-sided road cutting immediately E of Myrtle, where quartzite breccias, quartz cobbles and clays are chaotically intermixed. Visible on aerial photographs, 400m of Moina Sandstone immediately S of the fault is plastically deformed.

Deformation during the Devonian Tabberabberan Orogeny folded the Zeehan Basin formations about NNW-trending axes, producing the NNW-plunging antiform in which Myrtle sits. Dips of bedding around the antiform are generally moderate to steep, between 50deg and 80deg.

9.4.3 Air-core Drilling

Sixty-three reverse-circulation air-core drillholes totalling 874m were completed in Feb 1993 by Wallis Drilling from Western Australia. The rig used is a small system mounted on a Bombardier Muskeg snowmobile. The fully operational rig has a total weight of eight tonnes, with a ground pressure of less than 4psi, slightly greater than a human footprint. Air-core drilling relies on compressed air to return drill cuttings to the surface. No water (except natural groundwater) or muds are circulated and all cuttings are collected via a cyclone into bags. This rig and drilling system are ideal for testing soft formations in areas where vegetation is sensitive to disturbance.

Cuttings were collected at 2m intervals, with a wet 1-2kg sample "snatched" by hand for analysis. Samples were assayed at Analabs Burnie by AAS (aqua regia-perchloric acid digest) for Ag-Cu-Pb-Zn-Fe-Mn.

Hole locations and mineralisation thickness at 0.4% Zn cut-off grade are shown on Plans Tv 595 and Tv 608. Sections through ZM14 to ZM21 displaying geology and Zn-Pb-Fe assays are presented on Plans Tv632 and Tv 633. Other selected lithological sections are plotted on Plan Tv 530. Drill logs and assays are presented in Appendix 3, and mineralised intersections at selected cut-off grades are listed in Table 1.

Seventeen holes returned better than 2m @ 1% Zn. Best results include (1% Zn cut-off):-

ZM1	4-14m	10m	@ 5.7% Zn	0.1% Pb	7 ppm Ag
ZM13	14-28m	14m	@ 5.9% Zn	0.1% Pb	16 ppm Ag
ZM18	0-36m	36m	@ 4.2% Zn	0.4% Pb	9 ppm Ag
ZM55	6-15.3m EOH	9.3m	@ 3.5% Zn	0.7% Pb	1 ppm Ag
ZM57	14-26m	12m	@ 2.6% Zn	<0.1% Pb	<1 ppm Ag
and	34-37.4m EOH	3.4m	@ 3.3% Zn	<0.1% Pb	<1 ppm Ag
ZM58	0-6m	6m	@ 5.2% Zn	<0.1% Pb	2 ppm Ag

Results show at least two, and possibly three styles of Zn mineralisation are developed at Myrtle:-

1. Zn in clay (decomposed limestone)
2. Zn with semi-massive pyrite, possibly in a fault zone
3. Zn in unweathered limestone

Zinc in decomposed limestone, the so-called black clay, is the most widespread, although of lower grade than the other types. Most mineralised holes intersected this style of mineralisation, either alone or combined with one of the other types. The appearance of this style is somewhat unimpressive. The clays are generally dark grey to black, but may be brown, orange, light blue and even white. Fragments of weathered limestone were occasionally intermixed with the clay, moreso as the fresh limestone was approached. Mineralisation in clay was never seen during drilling, but this may be because the drilling was too fast to allow detailed observation.

Zinc in clay style is distributed horizontally, developed in the near-surface weathering layer. Most mineralisation is centred on the position of the Zn with semi-massive pyrite, decreasing in thickness and grade away from this zone (Plans Tv 632 and Tv 633). Anomalous Zn levels begin immediately beneath the soil/vegetation layer, increase to a peak within the decomposed limestone, before dropping rapidly as the fresh limestone is encountered.

Zinc with semi-massive pyrite was intersected in ZM1, ZM13 and ZM18, and contains the thickest and highest grade intersections. These holes where characterised by common to abundant semi-massive pyrite as 2-10mm sized fragments (comminuted by drilling?), often with milky white vein quartz. The implication is that these intersections are within or adjacent to a fault zone. Geological mapping suggests a major fault, trending NW, separates the Gordon Limestone from the Owen Conglomerate of the Professor Range. Extrapolating this fault NW onto the drilling grid would position it exactly in line with holes ZM1, ZM13 and ZM18. As the drillholes were vertical, drilling into an interpreted sub-vertical structure, the intersections may not represent true thicknesses of mineralisation. Further work is needed in this area.

Zinc in unweathered limestone is most clearly exemplified by ZM57 and ZM58, these intersections representing true primary carbonate-hosted mineralisation. Coarse grained, colourless to pale red-amber sphalerite was visible as disseminations and veins within dark grey limestone. Previous "winkie" diamond drilling by EZ at the same location also intersected carbonate-hosted Zn mineralisation, but the core was not assayed and no further work was undertaken.

Air-core sample pulps with over 1% Zn were analysed for a multi-element suite. Results for all prospects show:-

- Ca and Mg values are low, indicating that virtually no limestone remains in the weathered pug layer.
- K and Al values are quite high, indicative of the development of clays
- As and Cd average less than 100ppm
- Sn, Bi, Mo and Au are very low to below detection
- Ba is also low, suggesting no barite alteration
- C values range up to 13%, reflecting the carbonaceous character of the pug

Principal components analysis reveals a number of associations including:-

- Ca-Mg-C reflecting limestone-dolomite hosted mineralisation
- Cu-Pb-Ag-Cd sulphide association
- Al-K indicative of strong clay development
- Fe-Mn correlative with siderite alteration

Further study is required to characterise the associations at individual prospects.

9.4.4 Mineralogical Studies

Apart from coarse grained sphalerite in holes ZM57 and ZM58, and the massive pyrite in ZM1, ZM13 and ZM18 no mineralisation was immediately apparent from the air-core samples at Myrtle. Some earlier petrology completed by CRAE on Zn-rich samples from costeans in decomposed limestone on adjacent EL 38/89 suggested smithsonite could be a dominant phase.

Visual estimates of mineralogy in panned concentrates of air-core samples with over 2% Zn commonly failed to identify sphalerite. Dense pale yellow,white or colourless minerals were tentatively identified as siderite or smithsonite, however, grainmount examination under microscope confirmed these minerals to be sphalerite (Appendix 4). Indeed, no smithsonite was reported for the eight panned concentrates submitted.

Sphalerite from the semi-massive pyrite zone was described as cloudy and inconspicuous. Fe content was estimated by visual properties to be less than 5%. Sphalerite occurring in fresh limestone was coarser, and amber to red-brown in colour. Fe content would necessarily be higher, but still regarded to be less than 5%. Results of the grainmount observations, by Central Mineralogical Services in South Australia are included in Appendix 4.

To become fully conversant with the type of Zn mineralisation developed, four air-core sample pulps from ZM13, ZM18, and ZM57 were submitted to Advanced Technical Development in Melbourne for detailed XRD and SEM scans (Appendix 4). Once again, sphalerite was the only Zn phase detected. Curiously, no carbonate at all was reported from the XRD scan, indicating less than 5% carbonate in the samples. SEM/EDX scans of sphalerite grains showed Fe contents ranging from 0.6% to 1.8%

Following on from this work, a composite sample from hole ZM13 between 16m and 28m was submitted to ATD for detailed chemical and mineralogical studies based on the naturally occurring grain-size distribution in the sample (Appendix 4). The major findings are:-

- only 13% of the sample is sized less than 38um
- Zn is preferentially present in the plus 38um fraction
- sphalerite is the only Zn species present
- sphalerite generally occurs as clean monomineralic grains
- sphalerite chemistry averages 66.5% Zn, 0.72% Fe, <0.02% Mn

The implication of this study is that, if the sample tested is representative, the mineralisation:-

- requires no crushing or grinding
- should be treatable by flotation
- high Zn recoveries should be attainable
- sphalerite concentrates will be of high purity

9.4.5 Proposed Exploration During 1994

Additional activities will proceed along three avenues. Metallurgical studies are now required to test whether the implications from the size-by-grade chemical and mineralogical studies are correct, i.e. flotation tests are required.

Additional air-core drilling, at close spacing will need to be conducted to enable resource estimation.

Potential for underlying primary carbonate-hosted mineralisation, especially near holes ZM57 and ZM58, should be tested by diamond drilling.

9.5 Pyramid Prospect

9.5.1 Introduction

Pyramid prospect is a carbonate-hosted Zn-Pb target within Ordovician Gordon Limestone, 5km S of Zeehan on the Zeehan-Strahan road, and 2km SE of Oceana carbonate-hosted Zn-Pb deposit. Mineralisation is regarded as similar to Myrtle, although the prospect is likely to be smaller.

Exploration by Amoco and EZ of the Gordon Limestone at Pyramid identified Zn-Pb anomalism from wacker and costean sampling. Results included 6m @ 2.1% Zn, 7.2% Pb from costean 1750N. Drilling beneath the costean anomalies failed to detect significant primary limestone-hosted mineralisation, although a best result of 0.4m @ 5.2% Zn, 5.0% Pb was intersected in ZWP27.

During the year, CRAE completed three air-core drilling traverses across Pyramid prospect. The existing Amoco-EZ grid was relocated and used for all work.

9.5.2 Geology

Basic geological elements are sketched on Plan Tv 596. Lowermost in the prospect area is the Cambro-Ordovician Owen Conglomerate which forms the prominent mountains to the W, including Mount Zeehan. Overlying the Owen Conglomerate is Ordovician Moina Sandstone, best exposed immediately W of the Strahan road a few hundred metres N of the crossing at the Little Henty River.

Conformably above the Moina Sandstone is the Gordon Limestone. Throughout the Zeehan area, the Gordon Limestone is eroded to form flat-bottomed valleys covered by a veneer of quartzite cobbles, peat and button-grass. Lack of outcrop prevents the limestone from being divided into sub-units. In-situ weathering of the limestone has decomposed the unit to a dark grey to black carbonaceous and sulphidic clay. This clay layer is irregularly developed, varying in thickness from absent to over 20m.

Silurian Crotty Quartzite sits conformably above the Gordon Limestone further NW along the Oceana Valley from Pyramid. In the area drilled, Silurian Amber Slate is in faulted contact with the limestone, also forming the valley floor. Silurian Keel Quartzite overlies the Amber Slate, forming the low hills N of the Little Henty River within the prospect. Younger Devonian sediments overlie the Keel Quartzite further N outside the immediate prospect area.

The Little Henty Fault, trending E-W, juxtaposes Ordovician sediments against Devonian sediments 2km S of Pyramid. Current models suggest the fault to be a low angle reverse fault, not quite low enough to be a true thrust. The Fault is Devonian in age, active during the Tabberabberan Orogeny.

The fault separating the Amber Slate and Gordon Limestone at Pyramid trends WNW, with S block up. The fault may be part of a "flower" structure related to the Little Henty Fault.

Dips of bedding at Pyramid are generally moderate, averaging 45deg to the NE.

9.5.3 Air-core Drilling

Thirty reverse-circulation air-core drillholes totalling 332m were completed in Feb 1993. Cuttings were collected at 2m intervals, with a 1-2kg sample "snatched" by hand for analysis. Samples were assayed at Analabs Burnie by AAS (aqua regia-perchloric acid digest) for Ag-Cu-Pb-Zn-Fe-Mn.

Hole locations, lithological sections and mineralisation thickness at 0.4% Zn cut-off grade are shown on Plans Tv 596, Tv512 and Tv 609. Drill logs and assays are presented in Appendix 5, and mineralised intersections at selected cut-off grades are listed in Table 2.

One hole returned better than 2m @ 1% Zn. Best results include (1% Zn cut-off):-

ZP19	4-8m	4m	@ 4.1% Zn	1.0% Pb	8 ppm Ag

Patchy weak mineralisation was developed in several holes, although there does not appear to be any potential for significant Zn-Pb accumulations in the areas tested.

Before downgrading this prospect it is necessary to test closer to the Moina Sandstone contact on the other side of the Strahan road.

9.5.4 Mineralogical Studies

No mineralisation was immediately apparent from the air-core samples at Pyramid. Coarse grained galena and sphalerite were visible in a panned concentrate of hole ZP19 4-6m.

Sphalerite with galena, pyrite and ankerite were confirmed by grainmount examination under microscope. No smithsonite was reported for the panned concentrate submitted.
Sphalerite was described as pale and colour zoned. Fe content was estimated by visual properties to be less than 5%. Results of the grainmount observations, by Central Mineralogical Services in South Australia are included in Appendix 4.

9.5.5 Proposed Exploration During 1994

Air-core drilling of the central area of Pyramid has downgraded the potential for this prospect to host significant accumulations of residual mineralisation. Further drilling remains to be completed closer to the Moina Sandstone contact on the other side of the Strahan road. It may also be prudent to test the carbonate stratigraphy closer to the Little Henty Fault in case this structure has acted as a feeder for mineralisation.

9.6 Trial Harbour Prospect

9.6.1 Introduction

Exploration activities by CRAE elsewhere in Australia have led to the recognition that certain types of ultramafic complex may host disseminated low-sulphur nickel mineralisation in a form that offers superior metallurgical characteristics to conventional pyrrhotite-pentlandite ores.

Whilst the mechanism to produce this style of mineralisation is not yet understood, it appears that a low total sulphur content at the time of Ni sulphide formation tends to produce minerals with high Ni:S ratios. Iron, which in a high S environment would form conventional pyrrhotite-pentlandite ore, instead forms magnetite. The type of mineralisation developed is dependent on S and O activity, and the relative partitioning co-efficients of Ni and Fe between sulphide, oxide and silicate facies. Serpentine development may assist in later refining and upgrading of the Ni mineralisation.

Work completed by CRAE during 1993 includes open-file data reviews, systematic soil and rockchip sampling, geological mapping, petrological studies, and diamond drilling.

9.6.2 Literature review

Serpentinised dunites at Trial Harbour have not been investigated for Ni mineralisation in recent times. A small sulphide Ni occurrence described by Blissett (1962), worked at the turn of the century, contains minor disseminated pentlandite and heazlewoodite, but was apparently of little economic value.

The only substantial systematic Ni exploration completed at Trial Harbour has been by EZ on SPL22 during the Ni boom years between 1968 and 1972 (Brathwaite, 1970; Burton, 1972). Work completed included soil sampling, geological mapping, ground magnetic and IP surveys, and diamond drilling.

Soil sampling was completed at 500ft x 100ft intervals on a 6000ft x 3500ft grid. Nickel values over ultramafic were up to 1%, and averaged 0.4% over most of the outcropping body (Plan Tv 601). Copper values were uniformly low, rarely exceeding 100ppm and often below 20ppm. A zone of weak Cu anomalism was detected at the S ultramafic contact. CRAE has digitised the EZ Ni soil geochemistry from open-file profiles (Appendix 6).

Mapping did not attempt to subdivide the ultramafic, apart from noting "siliceous gossans" on the S margin of the body. Fluxgate ground magnetic surveys did not distinguish areas high in disseminated magnetite. Frequency-domain IP surveys detected a well defined response from the S ultramafic contact.

Drilling of 11 diamond holes to a maximum depth of 127m to test the S ultramafic contact failed to locate substantial mineralisation. Best results included 0.54% Ni over 36ft, including 10ft @ 1.05% Ni in THP136. Three other holes intersected between 0.35% and 0.7% Ni over 5ft widths. Sulphide mineralisation was described as irregular hairline veinlets or disseminations of pyrrhotite-pentlandite-pyrite.

9.6.3 Geology

Despite an intensive mapping program by a geologist seconded from CRAE Townsville (Appendix 8, Plan Tv 531), the geology of the Trial Harbour area is still not clearly understood. Particular concerns relate to the nature of the contacts of the ultramafic with enclosing sediments, and the primary layering direction of the body itself.

The oldest unit on the prospect is the Proterozoic Oonah Fm, occurring as a 200m wide wedge between the Heemskirk Granite and the Trial Harbour ultramafic. Siltstones equivalent to Cambrian Dundas Gp are present between the Oonah Fm and ultramafic to the E, and also to the S of the ultramafic. This S contact is mapped by the Geological Survey as faulted (Plan Tv 545).

The ultramafic itself is believed to be Cambrian in age, as for all Tasmanian ultramafics. Overall the body is dunitic, with minor to moderate degrees of serpentinisation obscuring the original textures. Based largely on information from CRAE's shallow stratigraphic drilling, with limited surface reconciliation where possible, the dunite has been crudely sub-divided. From N to S the units are:-

- massive blue-grey olivine accumulate - "lower accumulate"
- green olivine-magnetite mesocumulate with narrow zones of banded magnetite-olivine orthocumulate
- dark green-blue olivine accumulate with minor bladed olivine - "upper accumulate"

More recent petrological observations of drill cores cast doubt on the validity of cumulate terminology. The magnetite "mesocumulate" is the most visually striking sub-unit of the dunite, and basically forms the prominent E-W ridge. It is a bright green sandy olivine rock, conspicuous in the pale green to blue-grey of the "adcumulates".

9.6.4 Soil/Rockchip Geochemistry

Soil/rockchip samples were collected over the W half of the ultramafic at 100m x 25m spacing (Plan Tv 602, Appendix 7). Samples were assayed at Analabs Burnie by AAS (aqua regia-perchloric acid digest) for Co-Cu-Cr-Fe-Ni (Plans Tv 603 to Tv 607). Samples exceeding 0.4% Ni were re-assayed by Analabs Perth for Au-Pt-Pd by ICP-MS and S by Leco furnace.

Nickel results ranged up to 1.6%, and confirm the elevated values detected by EZ 20 years earlier (Plans Tv 601 and Tv 603). Values drop rapidly to below outside the ultramafic, and are depressed below 1000ppm over the lateritised areas. Cu-Pt-Pd-S geochemistry is not elevated with the Ni, suggesting the Ni concentration is not a primary chalcophile association (Appendix 7).

Copper values reach a maximum of only 64ppm, with most values under 10ppm (Plan Tv 604). Cobalt does not show any clear trends apart from a subtle increase to the E (Plan Tv 605). Chromium is similarly enriched to the E, although it must be stressed that acid digest techniques for Cr are unsuitable for absolute values as chromite is only very weakly soluble (Plan Tv 606). The laterite dominates the Fe response, largely obscuring any variations in the ultramafic body (Plan Tv 607).

Adits were systematically chip sampled. A maximum value of 0.7% Ni was obtained from a 5m sample where disseminated Ni sulphides were exposed in the top adit. Other values were around 2000ppm Ni, reflecting silicate background levels.

9.6.5 Diamond Drilling

N. Poltock was contracted to drill nine shallow diamond drill holes across the dunite to define the "stratigraphy", test identified sulphide accumulations at the adit, target geochemical anomalies and conceptually favourable geological positions. A total of 515.8m was completed. CRAE and EZ hole locations are shown on Plan Tv 617. Drill logs, and geochemistry are found in Appendix 9, and petrological reports are included in Appendix 10.

DD93ZT1 (TD=54.95m) and DD93ZT2 (TD=50.65m) tested the extent of

sulphide remobilisation into the regional cleavage direction in the vicinity of the existing workings. Both holes encountered olivine adcumulates with only rare 100mm zones of pyrrhotite-dominent disseminated sulphides. Assays were generally less than 0.2% Ni except for weak enrichment of non-sulphide Ni at surface.

Hole DD93ZT3, 150m E of ZT1 and ZT2, tested outcropping olivine-magnetite orthocumulate. The entire hole (TD=66.15m) intersected olivine-magnetite orthocumulate with between 5 and 20% magnetite. Sulphides were locally visible intergrown with the magnetite although the overall sulphide content was negligible. Assays returned a maximum result of 1.0% Ni between 3.95 and 11.7m. Sulphur assays were less than 0.01%, indicating Ni is bound in weathered silicate minerals. Other assays from ZT3 were less than 0.2% Ni.

DD93ZT4 (TD=63.5m), 50m N of ZT3, was designed to test the same unit, and intersected mesocumulate with under 5% magnetite. No sulphides were seen in ZT4, and analyses were below 0.2% Ni.

DD93ZT5, 150m E of ZT4, and N of the main orthocumulate layer, was drilled to test the source of 1.6% Ni in soil. The entire hole (TD=66.65m) intersected olivine accumulate, barren of sulphides, with assays less than 0.2% Ni.

DD93ZT6 (TD=51.7m) encountered lower olivine accumulate, lacking magnetite or sulphides. Assays were between 0.15% and 0.2% Ni.

Holes ZT7 to ZT9 intersected upper mesocumulate. ZT7 (TD=48.55m), drilled 100m S of ZT6 contained 1-2% magnetite throughout, with rare sulphide intergrown with the magnetite. A best result of 0.29% Ni was recorded from weathered ultramafic at the top of the hole, other intervals containing less than 0.2% Ni.

Hole ZT8 (TD=57.4m), drilled 100m S of ZT7 contained 1-2% sulphide to 27.6m. Below this, magnetite became dominant, ranging up to 5% of some intervals. Assays were less than 0.2% Ni.

DD93ZT9 (TD=56.25m), drilled 100m S of ZT8, contained up to 5% magnetite between 13.4 and 26m, but the remainder of the hole was generally barren of sulphides or magnetite.

Copper analyses from all holes have been below 10ppm.

No significant primary sulphide mineralisation has been intersected. It is concluded that there is no large stratabound Ni deposit at shallow depth in the area tested, and that anomalous soil and rockchip Ni geochemistry are caused by surface enrichment of Ni silicates. Some potential may still exist in the poorly exposed, untested portion of the dunite.

9.6.6 Mineralogical Studies

Selected rockchip and drill core samples were submitted to Dr Martin Gole in Perth for petrological examination to identify primary rock types and textures (Appendix 10).

Initially two samples of the sulphidic material from the adit were submitted (Samples 3093087, 88). These are described as olivine-sulphide cumulates showing classic magmatic sulphide textures. Pyrrhotite, pentlandite and heazlewoodite were identified, but curiously magnetite was absent.

A selection of nine outcrop samples were submitted to attempt to characterise the mapped subdivisions of the body. Adcumulates were described for the more massive parts of the ultramafic. The sandy olivine-magnetite rock was described as mesocumulate to orthocumulate, consistent with field observations. However, metamorphism and serpentinisation has largely obscured original primary textures apart from chromite morphologies, making these subdivisions somewhat dubious.

A final suite of 23 fresh drill core samples were studied. The conclusions were that the mineralogy largely reflected a high-grade metamorphic assemblage, and that no primary igneous textures can now be observed. The ultramafic was serpentinised then metamorphosed, followed by another episode of serpentinisation. Minor sulphides present include pentlandite and heazlewoodite, produced by the introduction of S during the early serpentinisation, and may not reflect igneous processes. Original lithologies of olivine mesocumulate and accumulate were postulated.

Sediments enclosing the ultramafic are not metamorphosed, indicating that metamorphism of the ultramafic occurred prior to tectonic emplacement.

The conclusion of this sequence of petrological studies is that classic magmatic sulphide segregation models for the formation of Ni deposits may not be appropriate for Trial Harbour. Effects of Ni and S mobility during serpentinisation and metamorphism need to be taken into account.

9.6.7 Proposed Exploration During 1994

Work completed during 1993 has shown there is no significant stratabound Ni deposit at shallow depth in the area tested, and that anomalous soil and rockchip Ni geochemistry are caused by surface enrichment of Ni in silicates. Some potential may still exist in the poorly exposed, untested portion of the dunite although at present there are no plans to extend exploration at Trial Harbour.

9.7 Firewood Siding Prospect

9.7.1 Introduction

Firewood Siding prospect is 12km S of Zeehan, straddling the Zeehan-Strahan road (Plan Tv 443). Most of this prospect falls on EL 34/88, however the northernmost part of the target is within EL 28/88.

The target was selected based on the presence of a major plumbing system, the Firewood Siding Fault, intersecting the Gordon Limestone. Incomplete Amoco-EZ bedrock sampling returned up to 1.45% Zn, but no follow-up was initiated. CRAE considered the Firewood Siding Fault may have been a conduit for metal-rich fluids passing into the limestone, and as such the area of the fault/limestone contact was a prime focus for exploration.

Wacker sampling was carried out during 1993 along old Amoco-EZ gridlines.

9.7.2 Geology

Firewood Siding prospect sits in a N-plunging antiform (Plan Tv 618). The fold core is Moina Sandstone, overlain by Gordon Limestone followed by Crotty Quartzite and subsequent younger lithologies. Variations in apparent thickness of the Gordon Limestone around the fold suggest steep dips on the W limb, flattening on the NE limb.

The Firewood Siding Fault, a major NW-trending structure, cuts the antiform. Movement on this fault has been as recent as Jurassic, and may well have been active since Cambrian times. The Eden Fault, a N-trending structure, cuts the axis of the antiform. This fault is most clearly seen on aerial photographs displacing the Crotty Quartzite.

Permian sediments abut the W side of the Eden Fault, S of the Firewood Siding Fault. Quaternary gravels obscure the limestone, which has eroded to form the Badger River valley between the plateaux of Moina Sandstone and Crotty Quartzite.

9.7.3 Wacker Bedrock Geochemistry

Bedrock wacker sampling was completed at 25m spacing on three grid lines. In all, 45 samples were collected during 1993. Samples were submitted to Analabs, Burnie for aqua regia - perchloric acid digest followed by AAS analysis of Ag-As-Cu-Pb-Zn-Fe. Ledgers and results are listed in Appendix 11. Sample locations, depth, Zn and Pb geochemistry are presented on plans Tv 620 to Tv 623.

Although lines are widely-spaced, it is apparent that significantly elevated

Zn-Pb up to 0.69% Zn and 2.34% Pb are developed at or near the Gordon Limestone - Crotty Quartzite contact. Arsenic values are also strongly enhanced coincident with the high Zn-Pb, up to 480ppm. Iron shows a more subtle elevation with Zn-Pb. The As-Fe association suggests a geochemical alteration halo may be developed around underlying mineralisation. Arsenic-Fe-Zn (-Mn) are locally enriched in the alteration zones at Navan and Reocin. Manganese has not been analysed for at Firewood Siding prospect.

Sample depths are generally less than 10m, suggesting unconsolidated residuum is not thickly developed in the N part of Firewood Siding prospect. A 20m deep sample at the end of line 59800E is the best indication of thick clays developed within this area.

9.7.4 Proposed Exploration During 1994

Results indicate potential for both primary and near-surface residual Zn-Pb mineralisation to be developed at or near the Gordon Limestone - Crotty Quartzite contact. Air-core drilling of the contact to test for residuals is warranted in 1994. A shallow diamond hole is required to test for primary stratabound deposits beneath the best surface geochemical indications.

10. ENVIRONMENT AND REHABILITATION

A number of activities conducted during 1993 have impacted on the environment. These include:-

- diamond drilling at Stonehenge
- diamond drilling at Trial Harbour
- air-core drilling at Myrtle
- air-core drilling at Pyramid
- grid line cutting at Firewood Siding

Rehabilitation of disturbance included:-

- refilling of diamond drill sumps
- capping of diamond drill hole collars
- raking of drill sites
- covering with ti-tree slash where appropriate
- filling air-core holes
- removing excess air-core cuttings from sites

Drill sites and grid lines will naturally revegetate. No permanent new access tracks

were created. Where possible low-impact technologies were employed in exploration.

One problem area may be Myrtle prospect where severe gorse infestations along access tracks put in by previous explorers have got beyond control by chemical means. This illustrates the importance of not removing the natural vegetation cover where weeds can be a problem.

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KEYWORDS

Tasmania, Proterozoic, Ordovician, Oonah Formation, Gordon Limestone, Literature Review, Soil Sampling, Rockchip Sampling, Wacker Sampling, Diamond Drilling, Air-core Drilling, Petrology, Mineralogy, Zinc, Lead, Nickel.

LOCATION

Queenstown	SK55-5	1:250,000
Pieman	7914	1:100,000
Zeehan	7914-s	1:50,000

LIST OF DPOs

71520-71521, 71523-71525, 71529-71530, 71532, 71534-71535, 71540-71541, 71543-71545, 71548-71550, 77101-77104, 77106-77109

LIST OF PLANS

Plan no.:	Title:	Scale:
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Tv 443	Zeehan Area Grid and Prospect Location Plan	1:50,000
Tv 628	Zeehan Project - Regional Geology	1:100,000
Tv 452	Zeehan No.1 EL 28/88 - Stonehenge Prospect Interpretive Geology	1:10,000
Tv 587	Zeehan No. 1 EL 28/88 - Stonehenge Prospect	1:5,000
Tv 472	Zeehan No.1 Avebury Prospect Geological Plan	1:10,000
Tv 482	Zeehan No. 1 EL28/88 - Avebury Prospect Soil Sample Locations	1:10,000
Tv 588	Zeehan No. 1 EL 28/88 - Avebury Prospect Soil Geochemistry - Zinc ppm	1:5,000
Tv 589	Zeehan No. 1 EL 28/88 - Avebury Prospect Soil Geochemistry - Lead ppm	1:5,000
Tv 590	Zeehan No. 1 EL 28/88 - Avebury Prospect Soil Geochemistry - Copper ppm	1:5,000
Tv 591	Zeehan No. 1 EL 28/88 - Avebury Prospect Soil Geochemistry - Arsenic ppm	1:5,000
Tv 592	Zeehan No. 1 EL 28/88 - Avebury Prospect Soil Geochemistry - Nickel ppm	1:5,000
Tv 593	Zeehan No. 1 EL 28/88 - Avebury Prospect Soil Geochemistry - Iron ppm	1:5,000

Tv 594	Zeehan No. 1 EL 28/88 - Avebury Prospect Soil Geochemistry - Manganese ppm	1:5,000
Tv 544	Zeehan No. 1 EL 28/88 - Myrtle Prospect Geological Plan	1:10,000
Tv 595	Zeehan No. 1 EL 28/88 - Myrtle Prospect Aircore Drillhole Locations	1:10,000
Tv 608	Zeehan No. 1 EL 28/88 Myrtle Prospect	1:50,000
Tv 632	Zeehan No. 1 EL 28/88 Myrtle Prospect	1:100,000
Tv 633	Zeehan No. 1 EL 28/88 Myrtle Prospect	1:100,000
Tv 530	Zeehan No. 1 Myrtle Prospect Aircore Drilling Geological Sections	1:1,000
Tv 596	Zeehan No. 1 EL 28/88 - Pyramid Prospect Aircore Drillhole Locations	1:50,000
Tv 512	Zeehan No. 1 EL 28/88 - Pyramid Prospect Aircore Drilling Geological Sections	1:1,000
Tv 609	Zeehan No. 1 EL 28/88 - Pyramid Prospect	1:5,000
Tv 601	Zeehan No. 1 EL 28/88 - Trial Harbour Soil/Rock Geochemistry	1:5,000
Tv 531	Zeehan No. 1 EL 28/88 - Trial Harbour Prospect Geological Plan	1:5,000
Tv 545	Zeehan No. 1 Trial Harbour Prospect Geological Fact Plan	1:2,500
Tv 602	Zeehan No. 1 EL 28/88 - Trial Harbour Rock Sample Locations	1:5,000
Tv 603	Zeehan No. 1 EL 28/88 - Trial Harbour Rock Geochemistry Nickel	1:5,000
Tv 604	Zeehan No. 1 EL 28/88 - Trial Harbour Rock Geochemistry Copper	1:5,000
Tv 605	Zeehan No. 1 EL 28/88 - Trial Harbour Rock Geochemistry Cobalt	1:5,000
Tv 606	Zeehan No. 1 EL 28/88 - Trial Harbour Rock Geochemistry Chromium	1:5,000

Tv 607	Zeehan No. 1 EL 28/88 - Trial Harbour Rock Geochemistry Iron	1:5,000
Tv 617	Zeehan No. 1 EL 28/88 - Trial Harbour Prospect Dril lhole Location Plan	1:5,000
Tv 618	Zeehan No. 1 EL 34/88 - Firewood Siding Geological Plan	1:10,000
Tv 620	Zeehan No. 1 EL 28/88 - Firewood Siding (Nth) Wacker Sampling Locations	1:5,000
Tv 621	Zeehan No. 1 EL 28/88 - Firewood Siding (Nth) Wacker Sampling Locations, Geochemistry Depth	1:5,000
Tv 622	Zeehan No. 1 EL 28/88 - Firewood Siding (Nth) Wacker Sampling Locations, Geochemistry Depth Zinc	1:5,000
Tv 623	Zeehan No. 1 EL 28/88 - Firewood Siding (Nth) Wacker Sampling Locations, Geochemistry Depth Lead	1:5,000

LIST OF APPENDICES

Appendix 1: - Stonehenge diamond drill logs, geochemistry and petrology.

Appendix 2: - Avebury prospect soil sampling ledgers and geochemistry.

Appendix 3: - Myrtle prospect air-core drill logs and geochemistry.

Appendix 4: - Myrtle prospect mineralogical reports.

Appendix 5: - Pyramid prospect air-core drill logs and geochemistry.

Appendix 6: - Trial Harbour EZ open-file soil geochemistry.

Appendix 7: - Trial Harbour CRAE rockchip sampling ledgers and geochemistry.

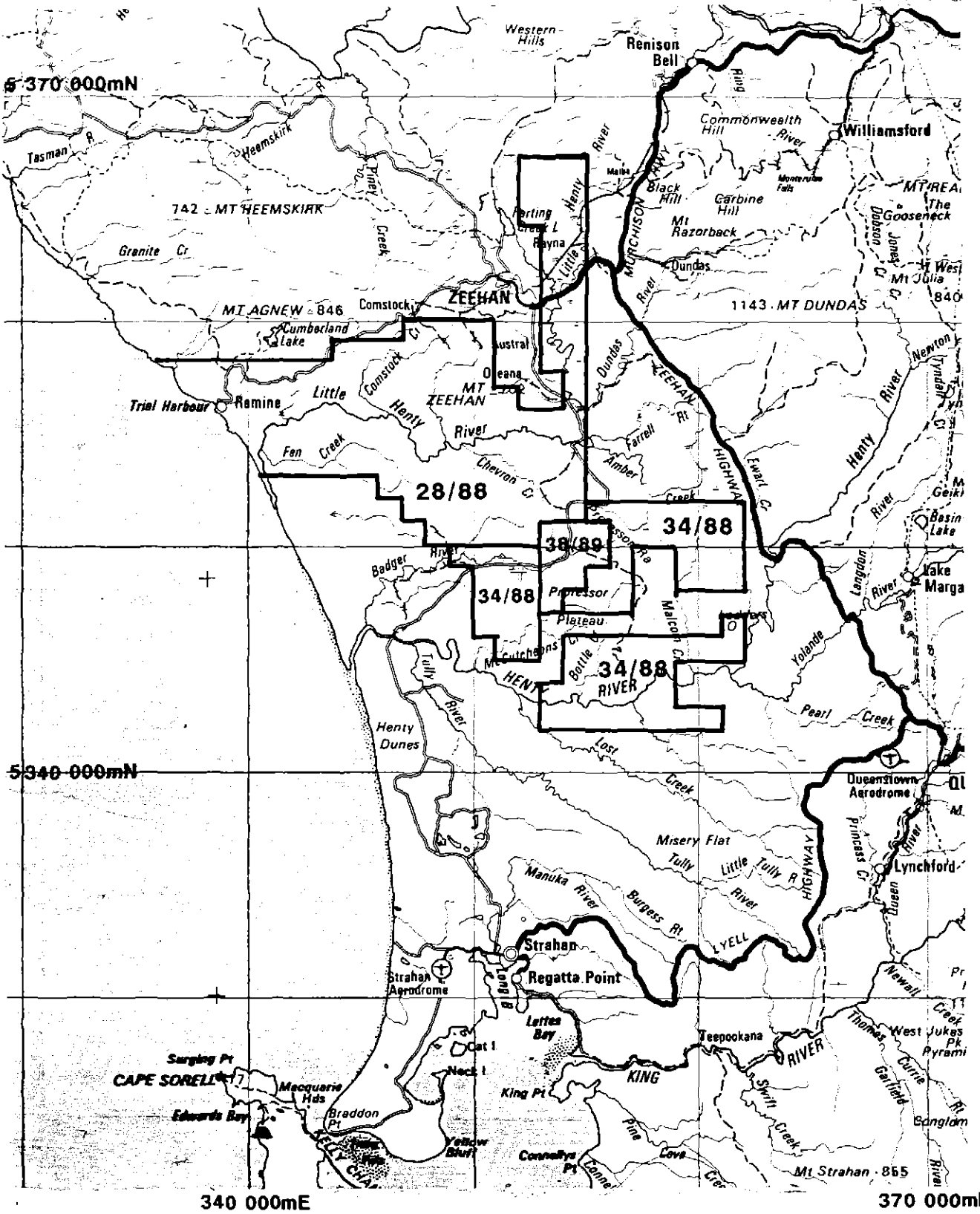
Appendix 8: - Trial Harbour. Memo from HJ Shaw to RG Parkinson.

Appendix 9: - Trial Harbour diamond drill logs and geochemistry.

Appendix 10: - Trial Harbour petrological reports.

Appendix 11: - Firewood Siding prospect wacker sampling ledgers and geochemistry.

957038



5 cm

0 5 10 15

kilometres

Nov.1991

CRA EXPLORATION PTY. LIMITED

ZEEHAN JOINT VENTURES

LOCALITY DIAGRAM

Ref.: SK 55 - 5	Scale: 1:250 000
Author: T. Summons	Report No.: 19284
Drawn: R. Travierso	Plan No.: TV 431

360 000mE
5 370 000mN
370 000mE
380 000mE
5 370 000mN
340 000mE
5 360 000mN
350 000mE
5 360 000mN
5 350 000mN
340 000mE
5 350 000mN
5 340 000mN
350 000mE
360 000mE
370 000mE
380 000mE
5 340 000mN

EL 28/88
Sassafrass Grid
EL 43/92
ZEEHAN
Black Jacks Grid
North Austral Grid
Austral Grid
Mariposa Grid
Stonehenge Grid
Agnew Grid
Nubeena Grid
Oceana Grid
Pyramid Grid
Avebury Grid
Bannockburn Grid
Leatherwood Grid
EL 45/92
Remine
Trial Harbour Grid
SOUTHERN
OCEAN
EL 33/89 (Relinquished)
Myrtle and Myrtle Extended Grid
Laurel Grid
Professor Range Grid
King Billy Grid
Amber Creek Grid
EL 38/89
Firewood Siding Grid
Grieves Grid
EL 34/88
Baura Grid
EL 34/88
Rose Valley Grid
EL 34/88
5 cm
Queenstown Aerodrome

93-3519. 957039

North

** NOTE **
Contiguous grids are internally consistent, however the relative position of groups of grids may vary.

0 1 2 3 4kilometres

CRA EXPLORATION PTY. LIMITED

ZEEHAN AREA
Western Tasmania
Grid & Prospect Location Plan

Ref.:	SK55 – 5	File:	ZEEHAN\443
Scale:	1 : 50000	Date:	November 1993
Author:	T.W. Dickson	Report No.:	19284
Drawn:	R. Travierso	Plan No.:	Tv 443

93-3519.

5 cm

5 361 000mN
5 360 000mN
5 359 000mN
5 358 000mN
5 357 000mN

357 000mE
358 000mE
359 000mE
360 000mE
361 000mE
362 000mE

EL 28/88

No mapping in this area

No mapping in this area

Harbour Road
Trial
Comstock
TENTH LEGION THRUST
Susanite
McCLEAN
CREEK
NIKE
BALSTRUP FAULT
ZEEHAN
Spray
AUSTRAL
Stonehenge
Nubeena
Tasmanian
Grubbs
Swansea
STONEHENGE
McLEAN
CREEK

€c
€d
€b
Po
Pom
Pos
Poq

Crimson Creek Formation– Interbedded dark green basalt, reddish–orange volcaniclastics, khaki mudstone and dark grey shale.

Dundas Ggoup– Undifferentiated chert conglomerates, gritty sandstone, siltstone and light green basalt.

Coarse grained basalt, interpreted by T.D. of Mines as allochthonous sheet from fore–arc environment.

Oonah Formation– Undifferentiated

Oonah Formation– Massive quartzite. Light grey

Oonah Formation– Interbedded greywackes, siltstone, shale and rare limestone.

Oonah Formation– Muscovitic quartzite. Light grey.

Owen Conglomerate– Cobble conglomerate.

Lode–Open Stope

Unconformity

Fault

Thrust Fault. Teeth on upper unit.

Shear Zone. Approximate limit of strong cleavage development, and rotation of bedding.

Lithographic boundary– accurate / approximate

Road, Track

Creeks

0 200 400 600 800 metres

AMG North
Mag. North
Grid North
12°
20°

95704O

CRA EXPLORATION PTY. LIMITED

ZEEHAN No.1 EL 28/88

STONEHENGE PROSPECT INTERPRETIVE GEOLOGY

Ref.: SK55–05	File: ZEEHAN1\452
Scale: 1 : 10 000	Date: July 1992
Author: Rob Parkinson	Report No.: **19284**
Drawn: Rocco Traviersо	Plan No.: Tv 452

5 360 000mN

5 359 000mN

5 358 000mN

5 357 000mN

5 356 000mN

354 000mE

355 000mE

357 000mE

Po

Eg

Ec

Oo

Sc

Sa

Df

Og

TRIAL

HARBOUR

ROAD

Creek

Comstock

Kyngance

Creek

Stonehenge

Creek

Little

Henty

River

Comstock

Creek

5 cm

70/<10

30/<10

80/60

Avebury Grid

120/60

90/30

60/<10

90/30

308/90

370/250

460/310

1280/
580

520/40

550/290

240/90

640/210

90/20

60/<10

F

F

AMG
North

Mag.
North

12°

* Note *
Mapping from: Zeehan 1:63 360
Soil pit geology on grid
Photointerpretation

93-3519.

0 200 400 600 800

metres

957041

DEVONIAN:
Df Florence Quartzite

SILURIAN:
Sa Amber Formation
Sc Crotty Quartzite

ORDOVICIAN:
Og Gordon Limestone
Oo Owen Conglomerate

CAMBRIAN:
Eg Gabbro/basalt
Ec Crimson Creek Formation

PROTEROZOIC:
Po Oonah Formation

Road

Walking Track

Creek

Grid Line

Lithological Contact

Fault

Thrust (teeth on upper side).

90/60 RGC −80# SS sample location with Zn/Pb assays (only relevant samples shown)

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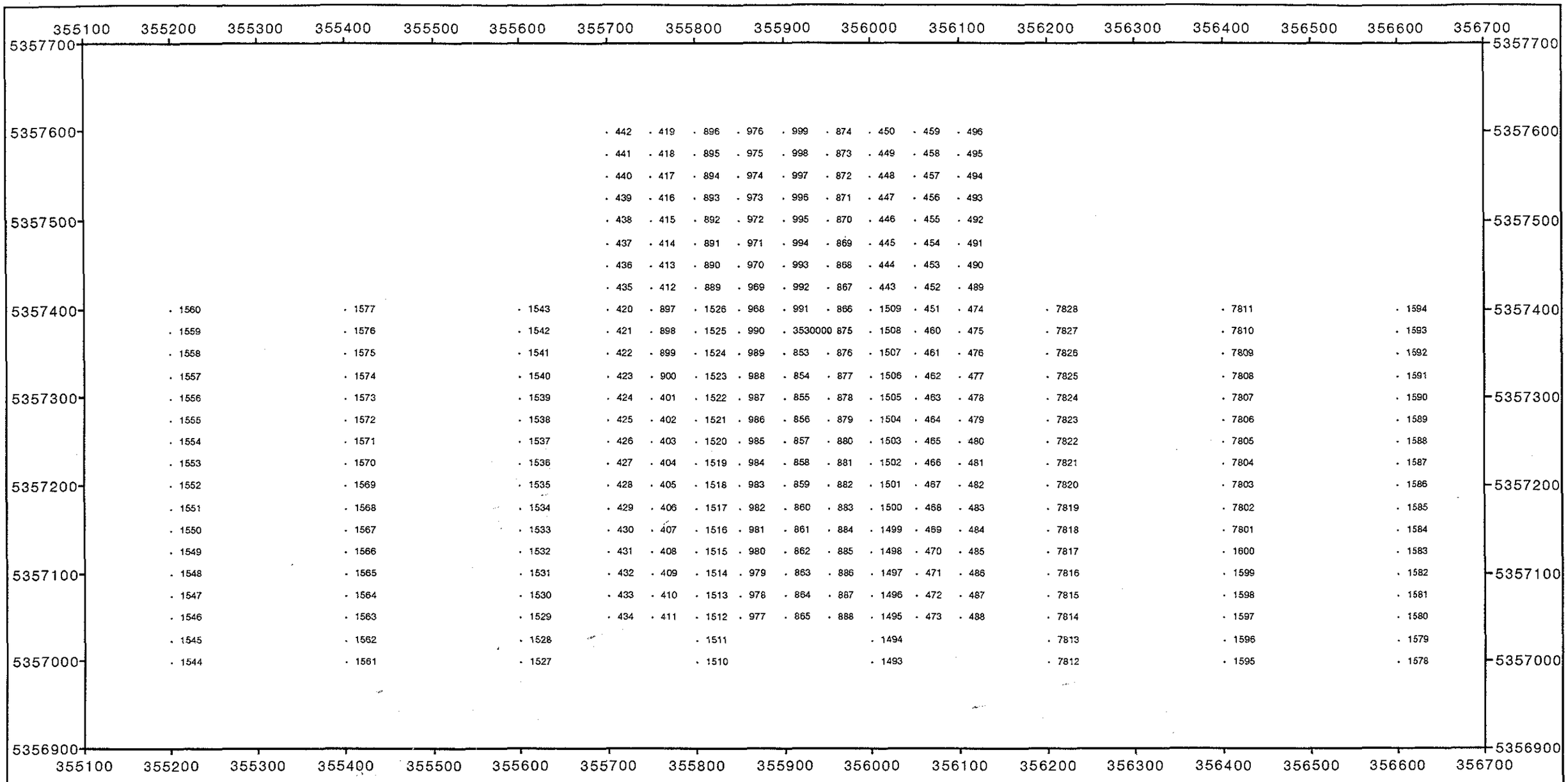
ZEEHAN No.1 EL 28/88
Avebury Prospect
Geological Plan

Ref.:	Queenstown SK55 – 5	File:	ZEEHAN1\472
Scale:	1 : 10000	Date:	August 1992
Author:	ROB PARKINSON	Report No.:	**19284**
Drawn:	Rocco Travierso	Plan No.:	Tv 472



968 - 999 PREFIXED 3529---
853 - 900 " 3529---
401 - 496 " 3573---
1493 - 1600 " 319 ----
7801 - 7828 " 330 ----

C-horizon samples

jmap

100m

CRA Exploration Pty Limited

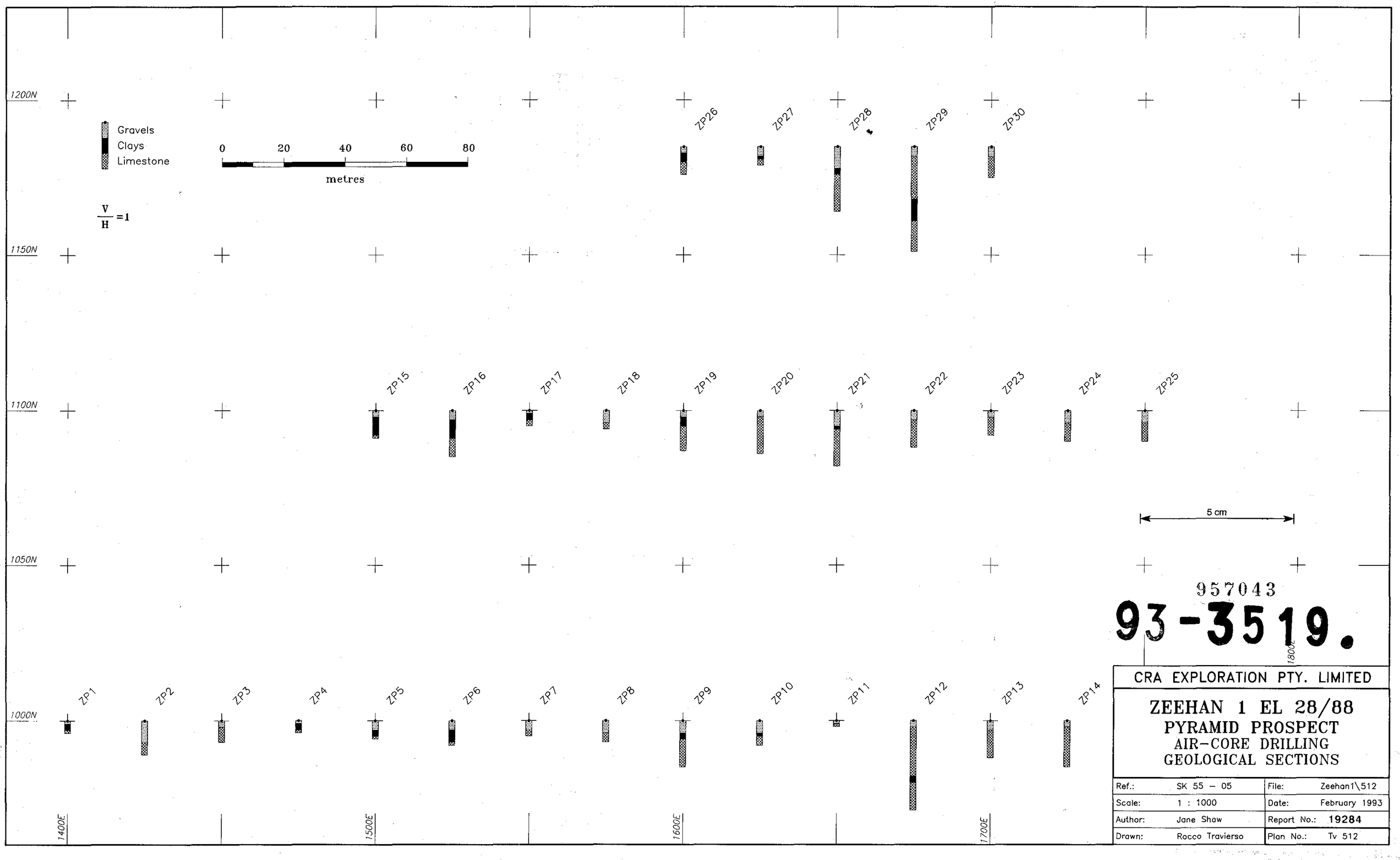
ZEEHAN 1 EL28/88 - AVEBURY PROSPECT

SOIL SAMPLE LOCATIONS

Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date:29/6/1993	Plan: Tv482

957042

93-3519.



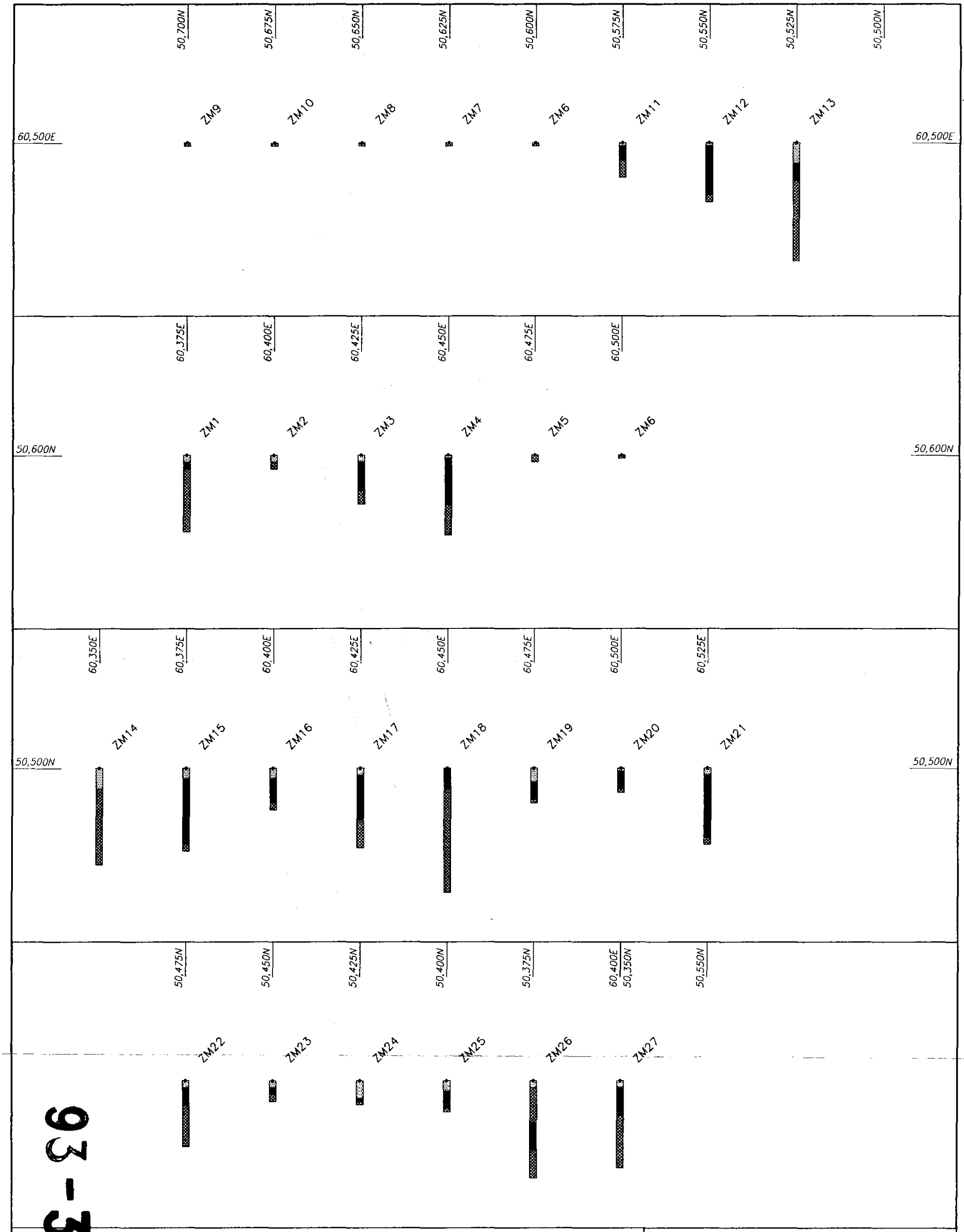
957043

93-3519.

CRA EXPLORATION PTY. LIMITED

ZEEHAN 1 EL 28/88
PYRAMID PROSPECT
AIR-CORE DRILLING
GEOLOGICAL SECTIONS

Ref.:	SK 55 – 05	File:	Zeehan1\512
Scale:	1 : 1000	Date:	February 1993
Author:	Jane Shaw	Report No.:	19284
Drawn:	Rocco Travierso	Plan No.:	Tv 512



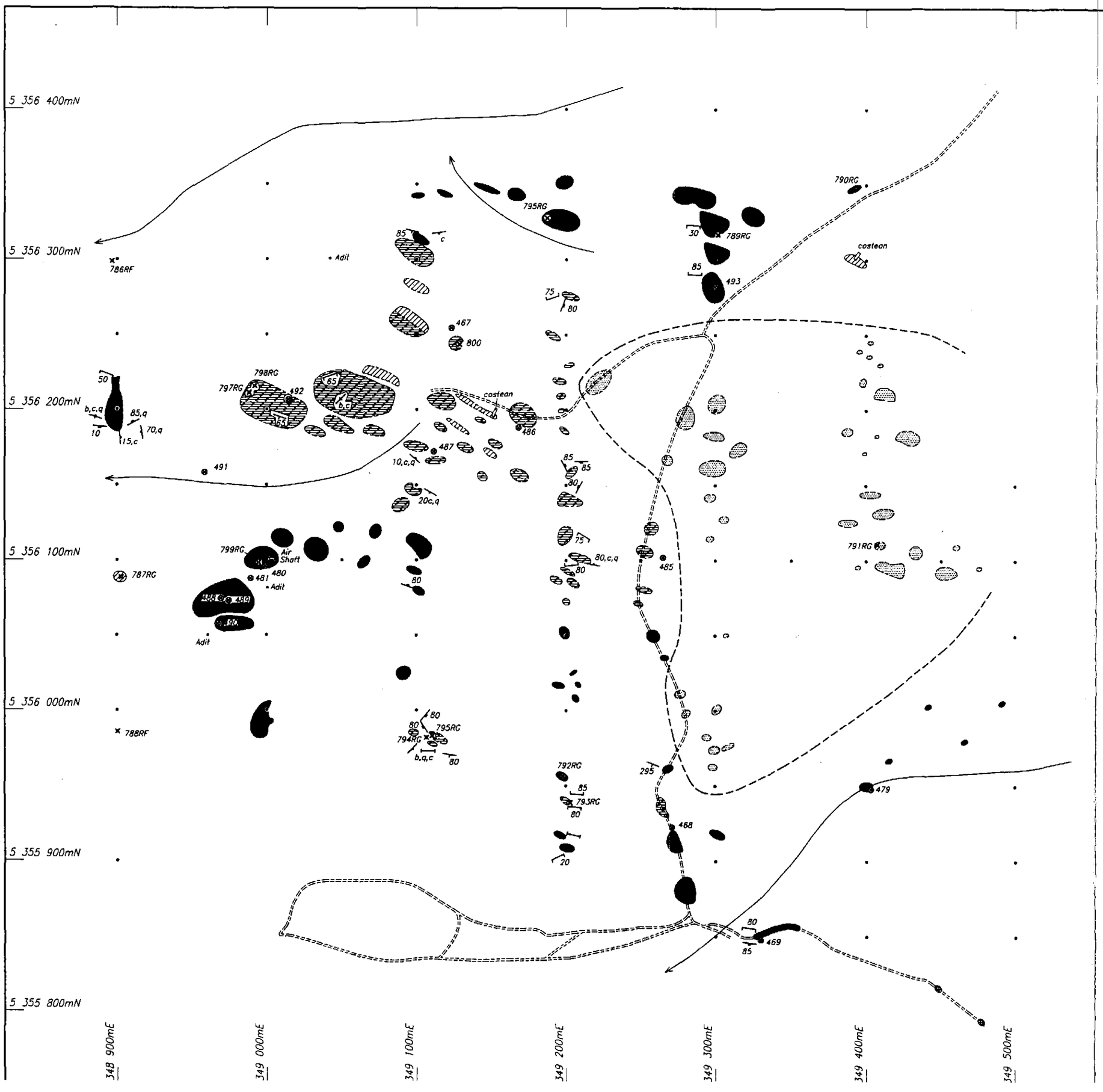
93-3519.

9570 44

CRA EXPLORATION PTY. LIMITED

ZEEHAN 1 EL 28/88
MYRTLE PROSPECT
AIR-CORE DRILLING
GEOLOGICAL SECTIONS

Ref.:	SK 55 - 05	File:	Zeehan1\530
Scale:	1 : 1000	Date:	March 1993
Author:	Jane Shaw	Report No.:	**19284**
Drawn:	Rocco Travierso	Plan No.:	Tv 530



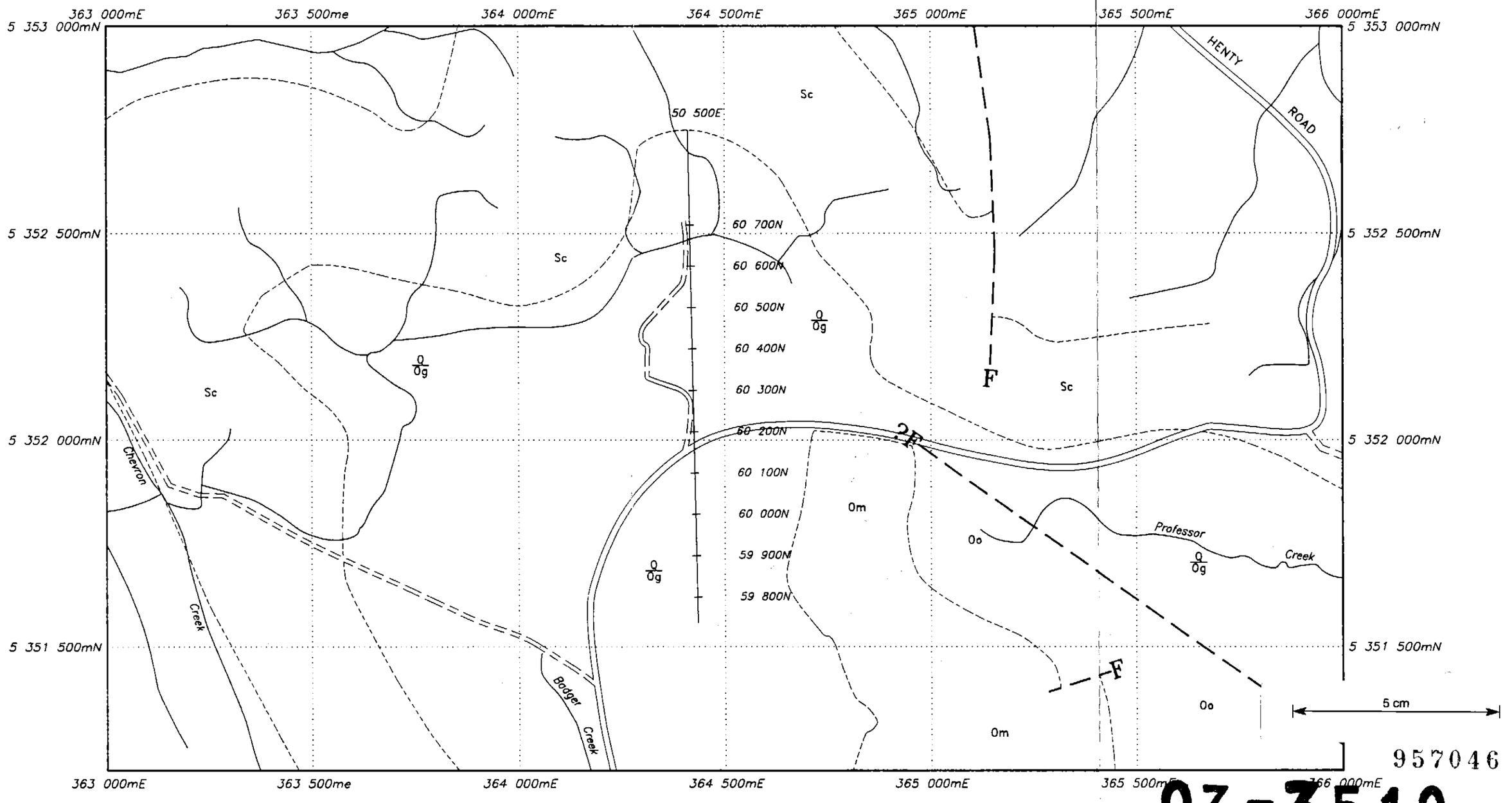
- Laterite Outcrop
- Serpentinite 'Fibrous'
- Serpentinite 'Magnetic Layering'
- Serpentinite 'Granular'
- Sandstone
- Extent of Laterite
- Grid Peg
- Lithological Layering (?metamorphic magnetic alignment)
- Vein, Strike & Dip; c–chalcedonic, q–open space quartz, b–brecciated
- Joint with dip
- Vertical Joint
- Cleavage with dip
- Vertical cleavage
- × 792RG Rock Grab Sample – Prefix 3313___
- × 792RF Rock Float Sample – Prefix 3313___
- ● 485 Rock Sample – Prefix 3528___
- Track
- Creek or Gully

CRA EXPLORATION PTY. LIMITED

957045

ZEEHAN No.1 EL 28/88
TRIAL HARBOUR
Geological Fact Map

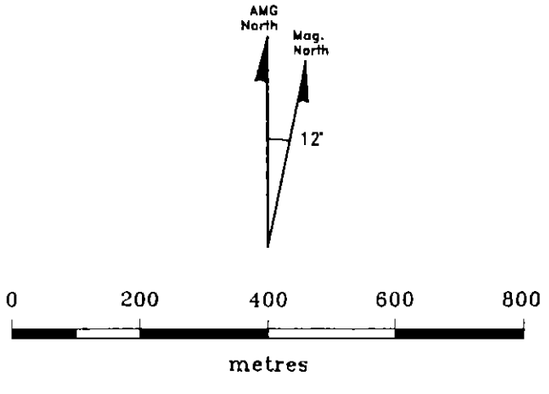
Ref.:	Queenstown SK 55–5	File:	Zeehan1\531
Scale:	1 : 2500	Date:	March 1993
Author:	Jane Shaw	Report No.:	**19284**
Drawn:	Rocco Traviersa	Plan No:	Tv 531



957046

93-3519

Q	Quaternary Cover		Road, Track
Sc	Silurian Crotty Quartzite		Creek
Og	Ordovician Gordon Limestone		Myrtle Baseline
Om	Ordovician Moina Sandstone		Lithological Boundary
Oo	Ordovician Owen Conglomerate		Fault

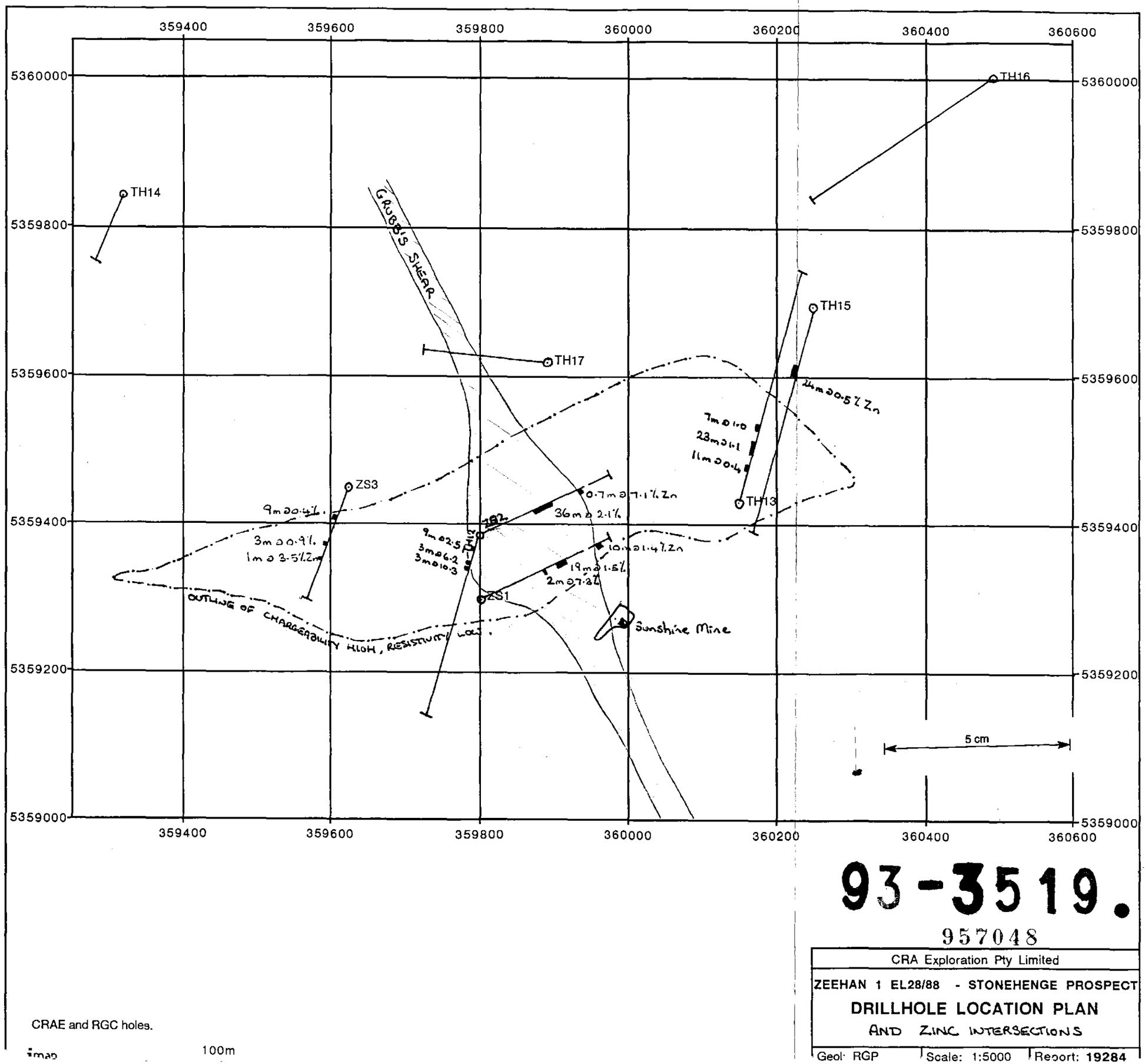


CRA EXPLORATION PTY. LIMITED

ZEEHAN No. 1 EL 28/88
MYRTLE PROSPECT
Geological Plan

Ref.:	SK 55-5	File:	Zeehan1\544
Scale:	1 : 10000	Date:	June 1993
Author:	R.G. Parkinson	Report No.:	**19284**
Drawn:	R. Traviersо	Plan No.:	Tv 544

Dg
Dg
Dg
Pou
Pou
Pou
Q
Q
Q



CRAE and RGC holes.

imap 100m

93-3519.

957048

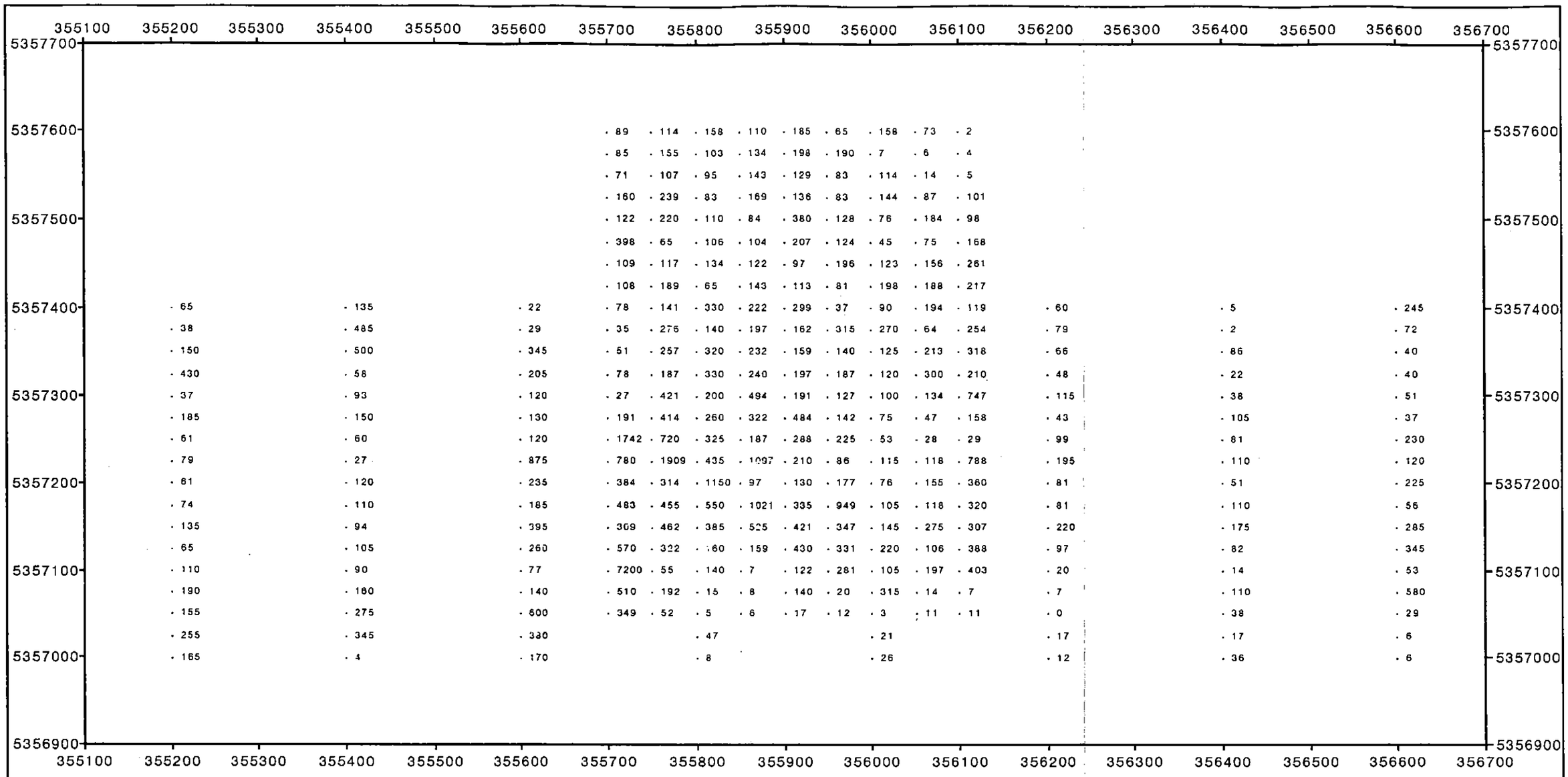
CRA Exploration Pty Limited

ZEEHAN 1 EL28/88 - STONEHENGE PROSPECT

DRILLHOLE LOCATION PLAN

AND ZINC INTERSECTIONS

Geol: RGP | Scale: 1:5000 | Report: 19284



5 cm

1992 and 1993 C-horizon samples

jmap

100m

CRA Exploration Pty Limited

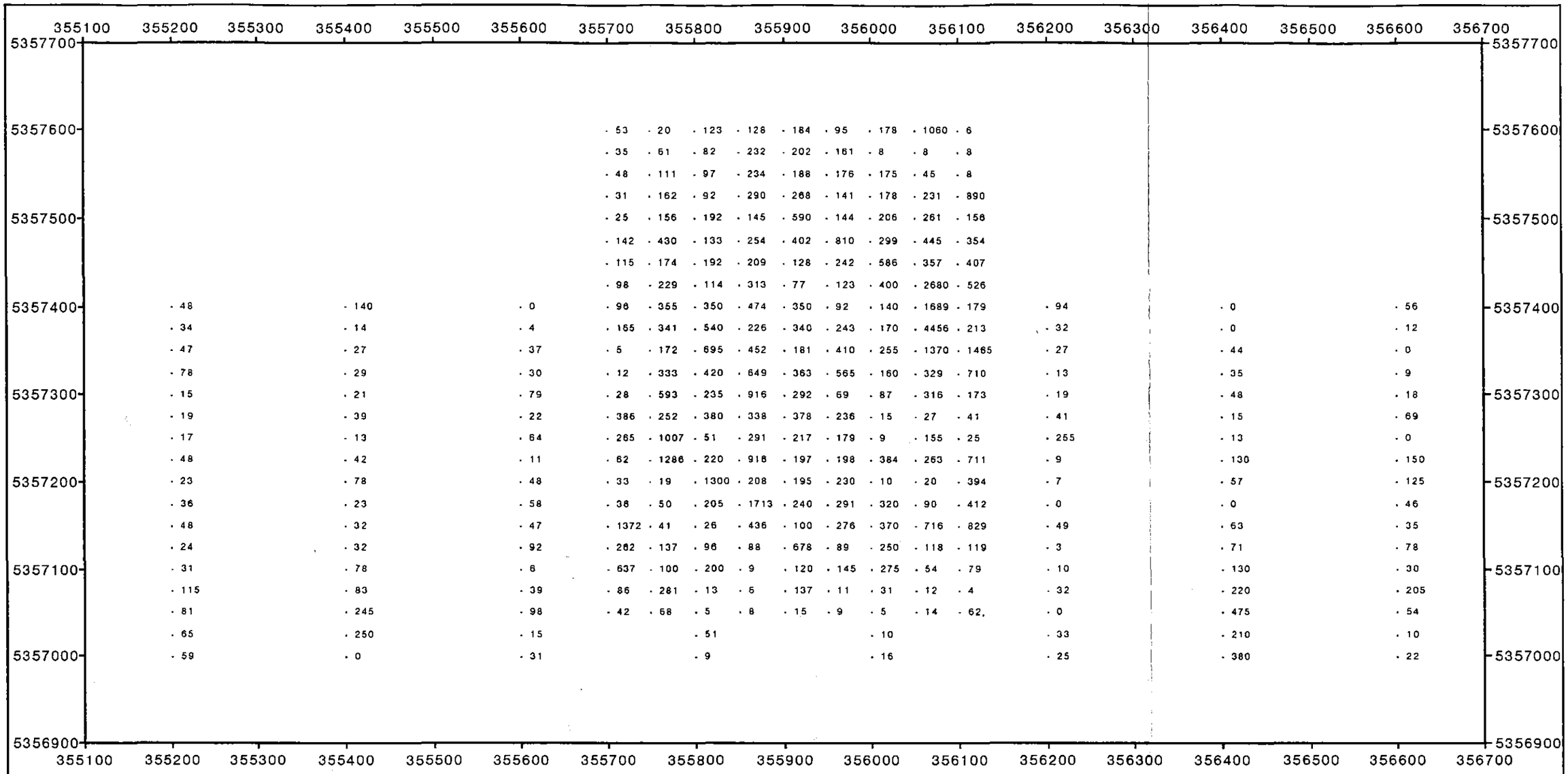
ZEEHAN 1 EL28/88 - AVEBURY PROSPECT

SOIL GEOCHEMISTRY - ZINC ppm

Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date:8/10/1993	Plan: Tv 588

957049

93-3519.



1992 and 1993 C-horizon samples

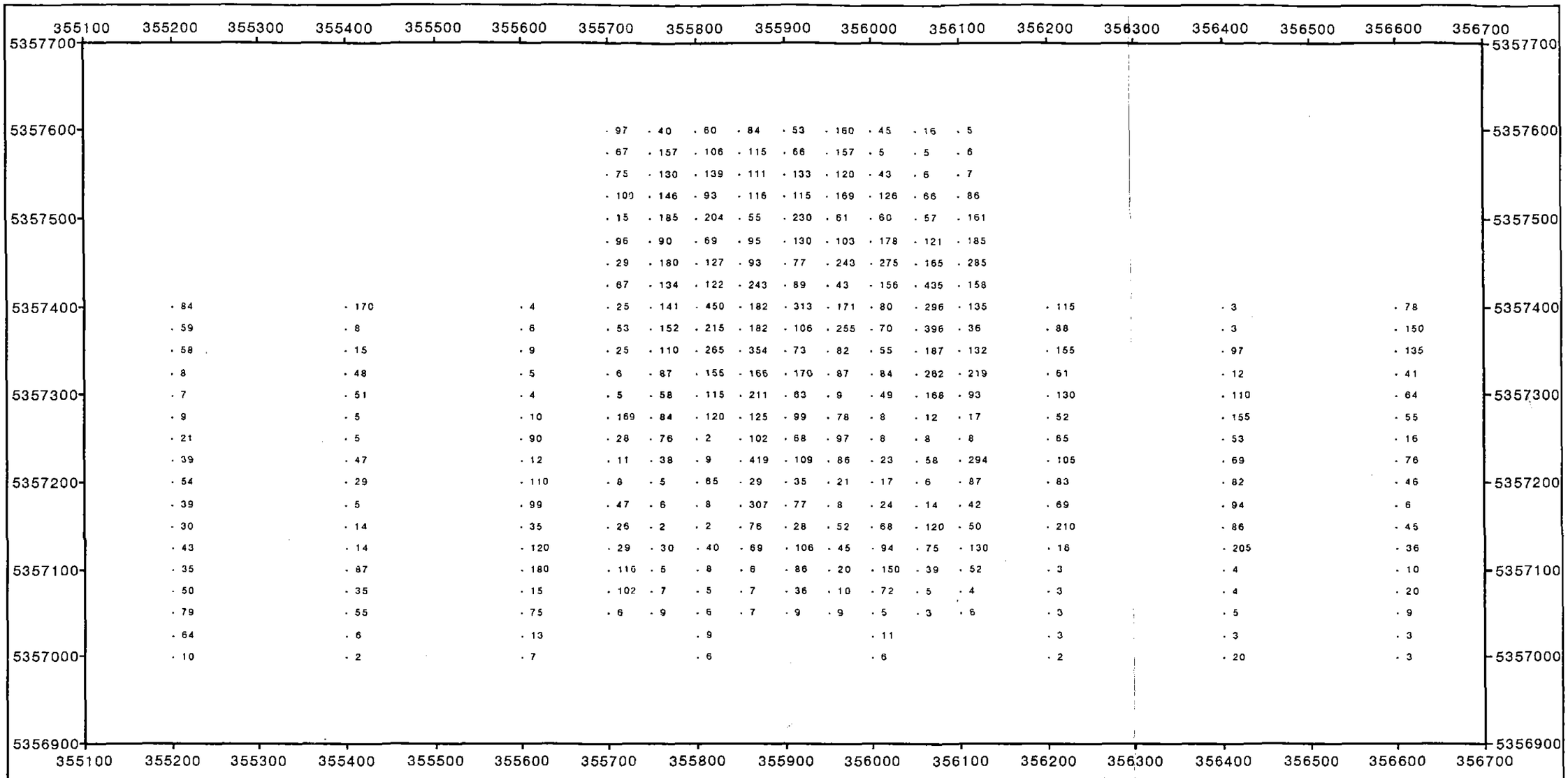
jmap 100m

5 cm

CRA Exploration Pty Limited		
ZEEHAN 1 EL28/88 - AVEBURY PROSPECT		
SOIL GEOCHEMISTRY - LEAD ppm		
Geol: RGP	Scale: 1:5000	Report: 19284
Drawn: RGP	Date:8/10/1993	Plan: Tv 589

957050

93-3519.



5 cm

1992 and 1993 C-horizon samples

jmap 100m

CRA Exploration Pty Limited

ZEEHAN 1 EL28/88 - AVEBURY PROSPECT

SOIL GEOCHEMISTRY - COPPER ppm

Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date:8/10/1993	Plan: Tv 590

957051

93-3519.

355100 355200 355300 355400 355500 355600 355700 355800 355900 356000 356100 356200 356300 356400 356500 356600 356700

5357700

5357600

						23	4	2	8	7	11	0	1	0				
						48	4	23	7	4	12	0	0	1				
						11	15	95	8	7	13	2	2	7				
						4	22	17	9	15	15	6	9	63				

5357500

						7	22	16	10	16	11	5	7	19				
						8	8	9	9	17	27	28	9	6				
						5	40	9	6	13	12	4	4	56				
						5	30	10	21	19	4	42	37	45				

5357400

65	50	2	2	8	15	37	9	13	6	22	36	12	0	13				
23	8	0	340	14	23	13	7	15	3	5	4	13	11	9				
26	130	13	26	4	20	17	14	5	11	44	6	11	30	10				
5	19	6	7	7	10	11	11	6	7	33	170	5	4	3				

5357300

1	15	16	12	5	21	13	4	6	11	13	8	4	14	9				
4	5	7	40	220	20	12	5	92	7	8	150	10	14	11				
8	3	5	100	48	8	10	7	12	23	4	13	8	4	27				
6	5	19	9	33	9	980	170	31	0	38	36	3	10	52				

5357200

8	7	21	5	5	8	110	27	26	8	5	140	5	15	54				
6	3	15	10	7	10	680	28	9	100	150	54	14	190	20				
8	10	8	3	5	2	180	9	16	97	73	45	34	50	120				
8	10	2	33	23	40	10	16	12	18	11	26	6	180	43				

5357100

5	14	12	25	18	27	1	24	8	4	3	6	1	2	1				
13	10	2	26	120	7	1	40	3	3	0	1	1	2	1				
15	12	75	5	7	0	0	3	3	2	0	0	0	1	1				
12	12	8			1				4			0	20	1				

5357000

14	3	9			0				3			0	63	19				

5356900

355100 355200 355300 355400 355500 355600 355700 355800 355900 356000 356100 356200 356300 356400 356500 356600 356700

5 cm

1992 and 1993 C-horizon samples

jmap 100m

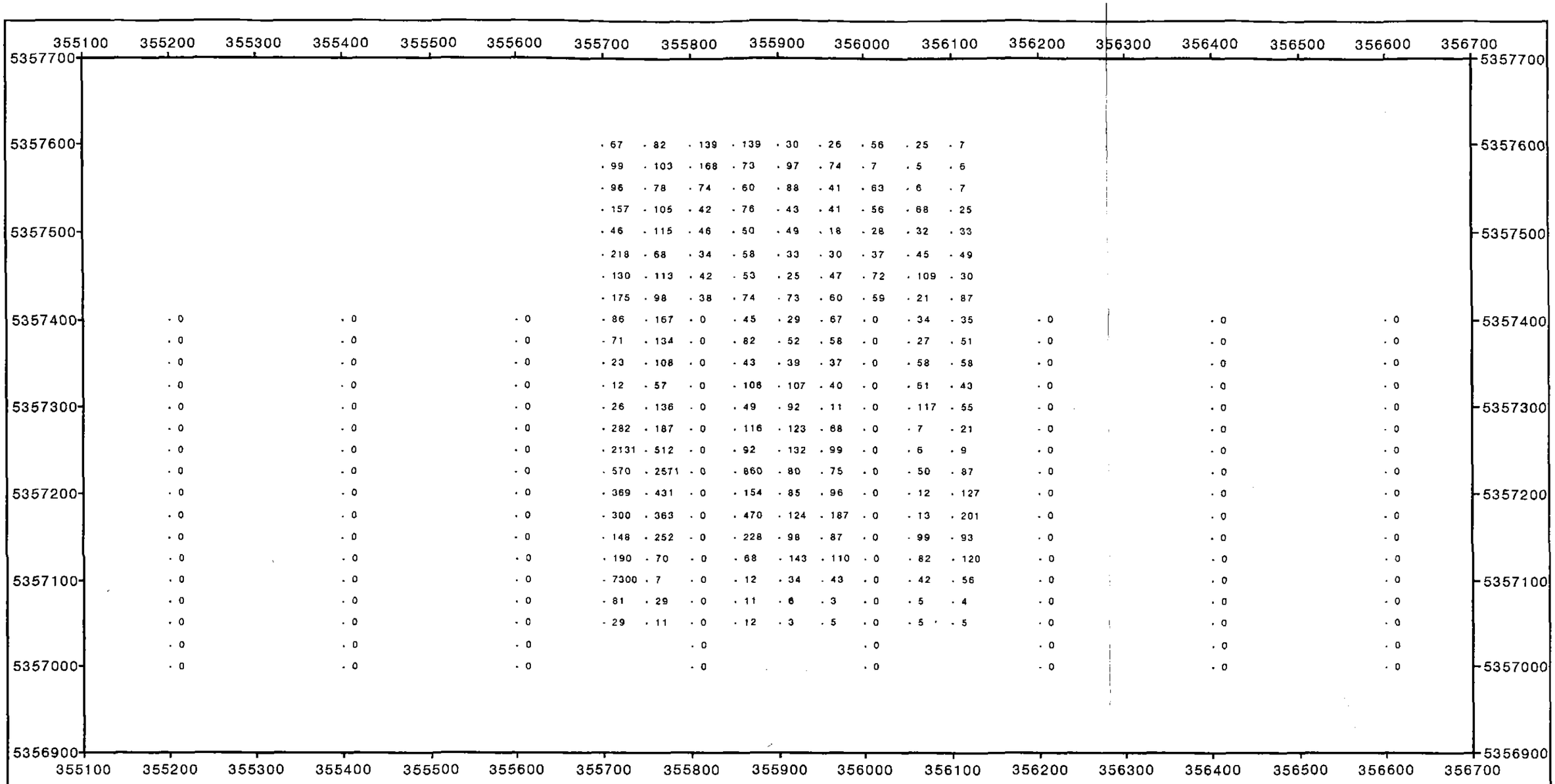
CRA Exploration Pty Limited

ZEEHAN 1 EL28/88 - AVEBURY PROSPECT

SOIL GEOCHEMISTRY - ARSENIC ppm

Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date:8/10/1993	Plan: Tv 591

957052



5 cm

O = Not assayed in 1992

1992 and 1993 C-horizon samples

jmap

100m

CRA Exploration Pty Limited

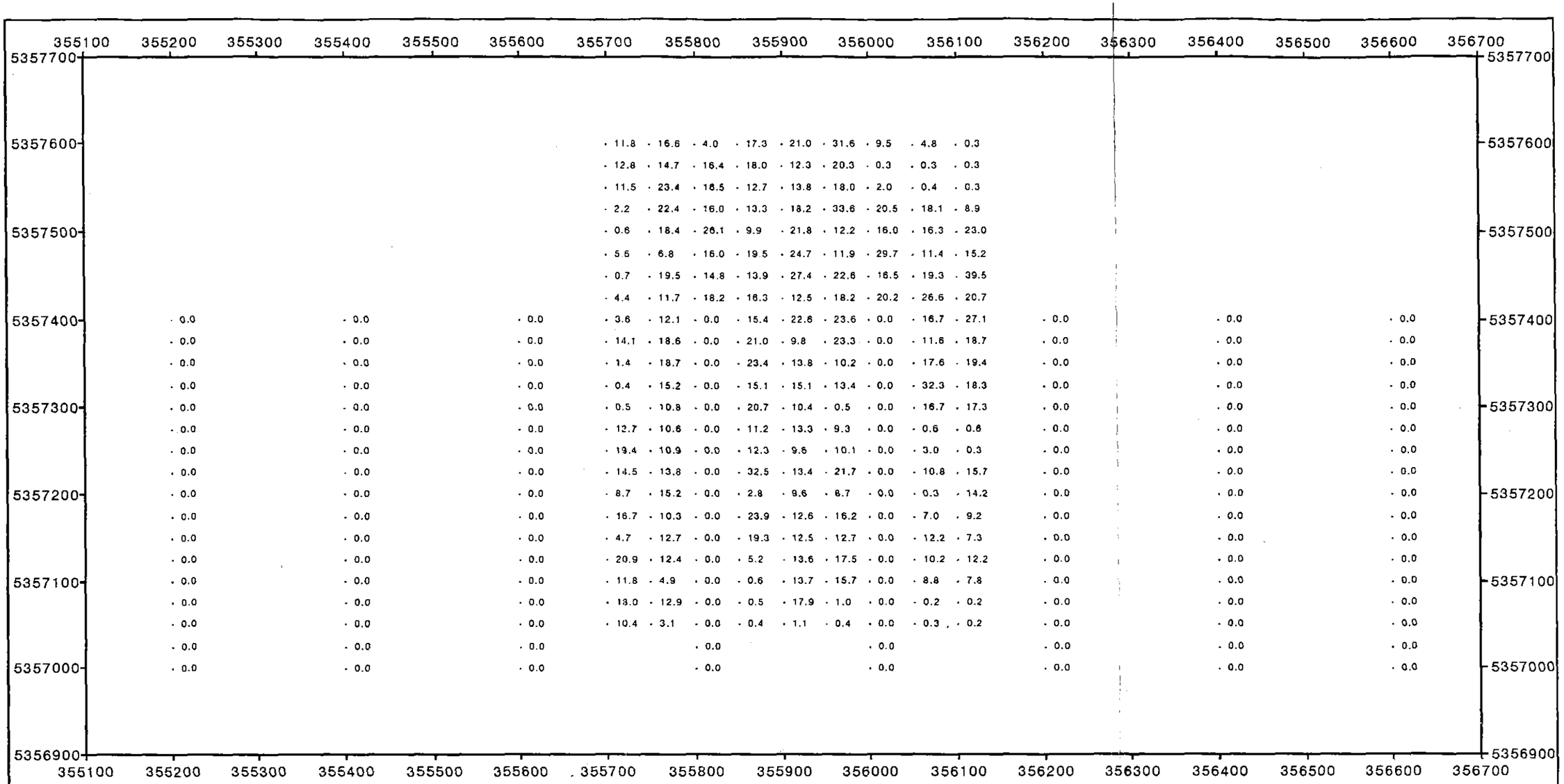
ZEEHAN 1 EL28/88 - AVEBURY PROSPECT

SOIL GEOCHEMISTRY - NICKEL

Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date:8/10/1993	Plan: Tv 592

957053

93-3519.



5 cm

O = Not assayed in 1992

1992 and 1993 C-horizon samples

jmap 100m

CRA Exploration Pty Limited

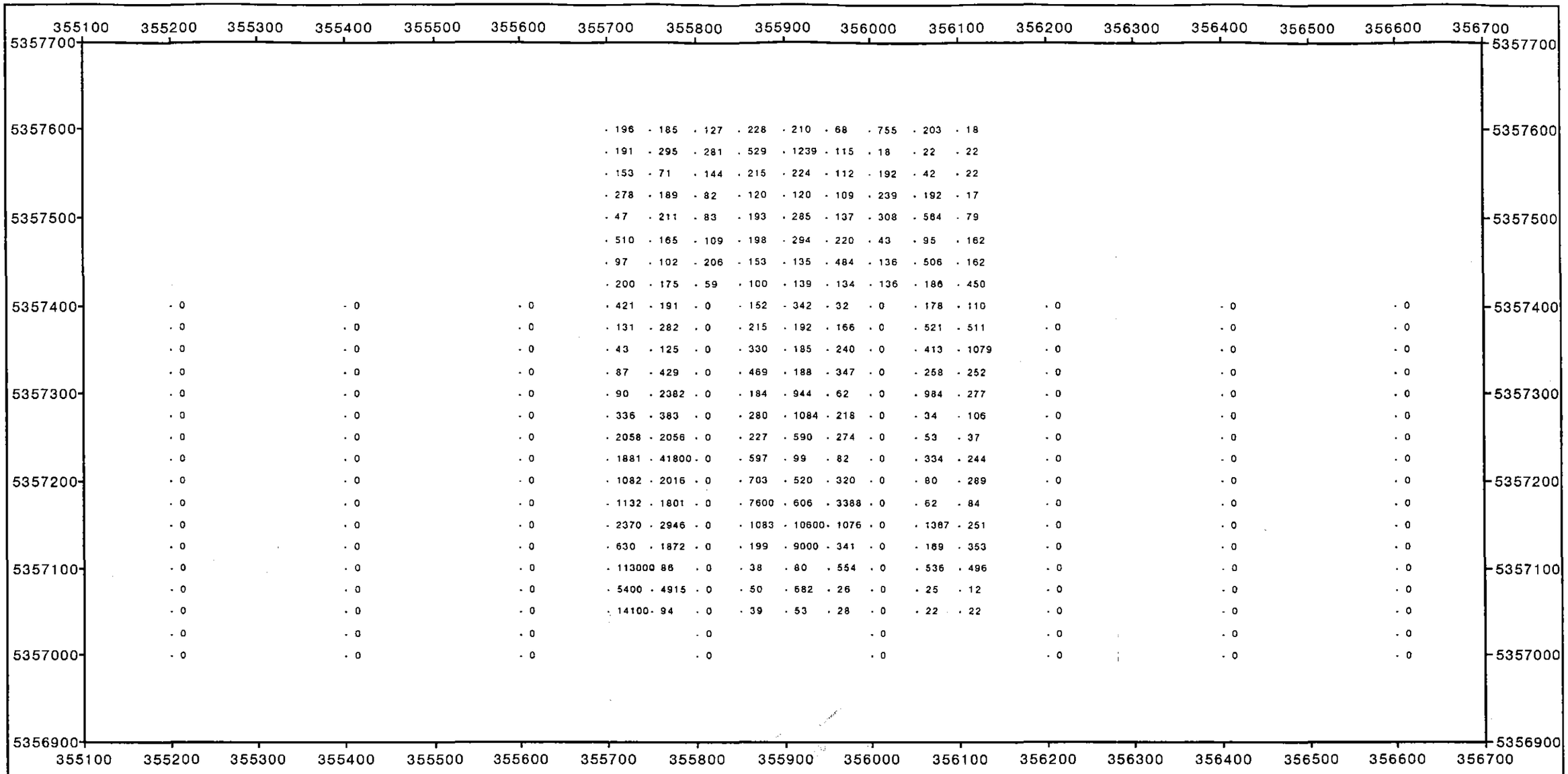
ZEEHAN 1 EL28/88 - AVEBURY PROSPECT

SOIL GEOCHEMISTRY - IRON %

Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date: 8/10/1993	Plan: Tv 593

957054

93-3519.



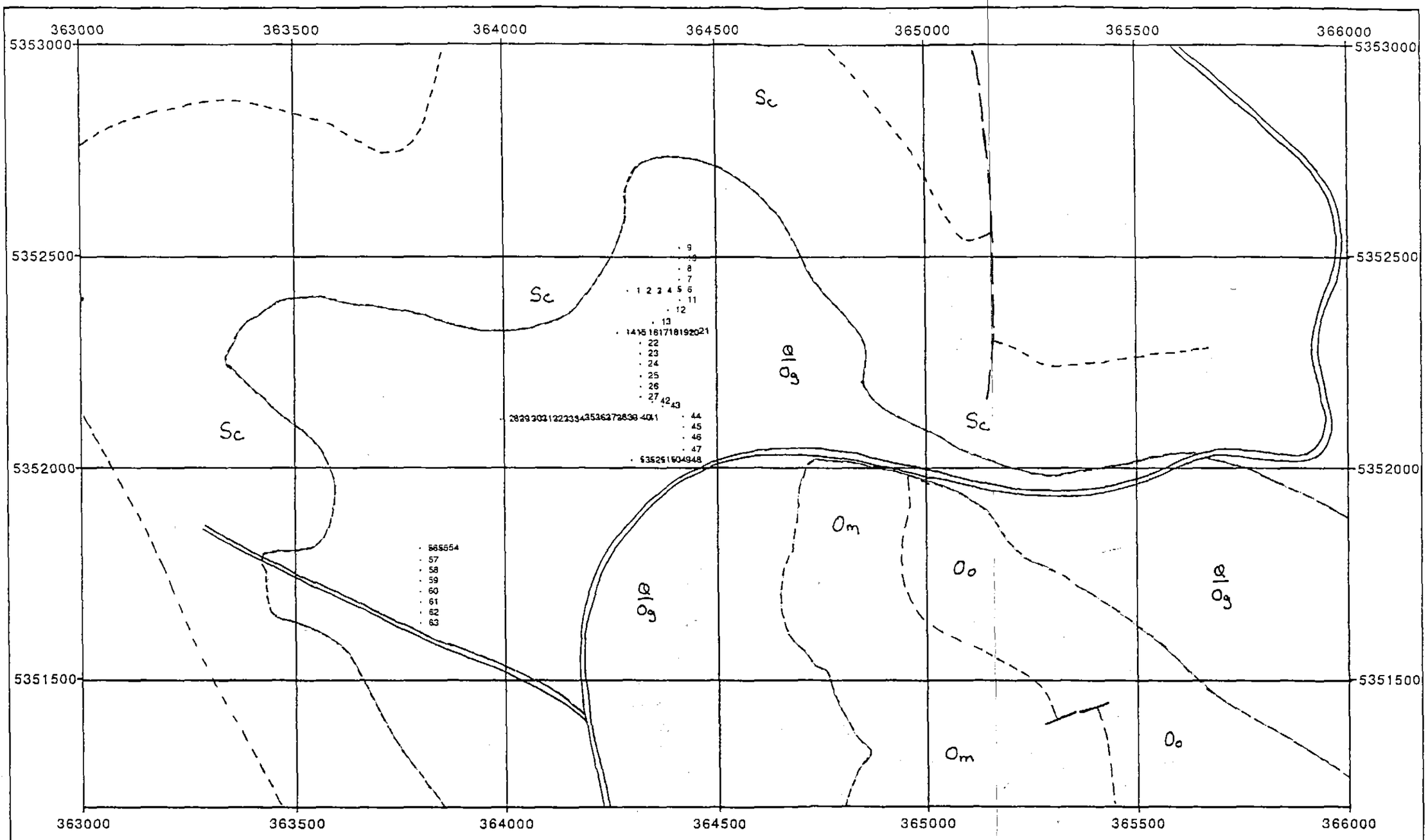
O = Not assayed in 1992.
1992 and 1993 C-horizon samples

jmap 100m

CRA Exploration Pty Limited		
ZEEHAN 1 EL28/88 - AVEBURY PROSPECT		
SOIL GEOCHEMSITRY - MANGANESE		
Geol: RGP	Scale: 1:5000	Report: 19284
Drawn: RGP	Date: 8/10/1993	Plan: Tv 594

957055

93-3519.



"CRA EXPLORATION PTY. LIMITED"

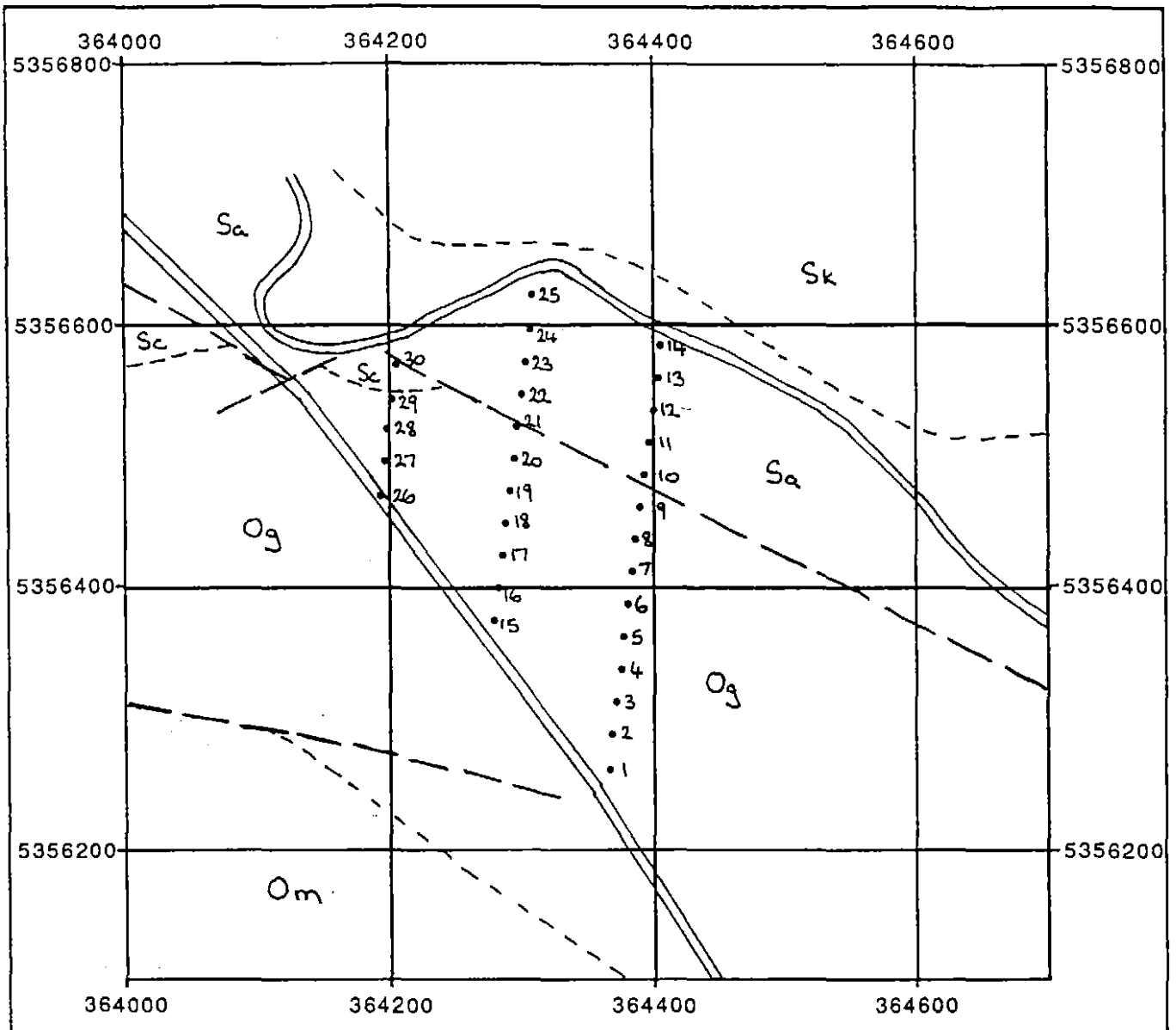
ZEEHAN 1 EL28/88 - MYRTLE PROSPECT

AIR-CORE DRILL-HOLE LOCATIONS

Geol: RGP	Scale: 1:10000	Report: **19284**
Drawn: RGP	Date: 12/3/93	Plan: Tv 595

957056

93-3519.



"CRA EXPLORATION PTY. LIMITED"

ZEEHAN 1 EL28/88 - PYRAMID PROSPECT

AIR-CORE DRILL-HOLE LOCATIONS

Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date:12/5/1993	Plan: Tv 596

Hole prefix ZP--

jmap

100m

957057

93-3519.

348600 348800 349000 349200 349400 349600 349800 350000 350200 350400 350600

5356800 5356600 5356400 5356200 5356000 5355800 5355600

5 cm

-200 200-500 500-1000 1000-2000

2000-4000 4000-6000 6000-8000 8000-10000 +10000

93-3519.

957058

All CRAE and EZ samples

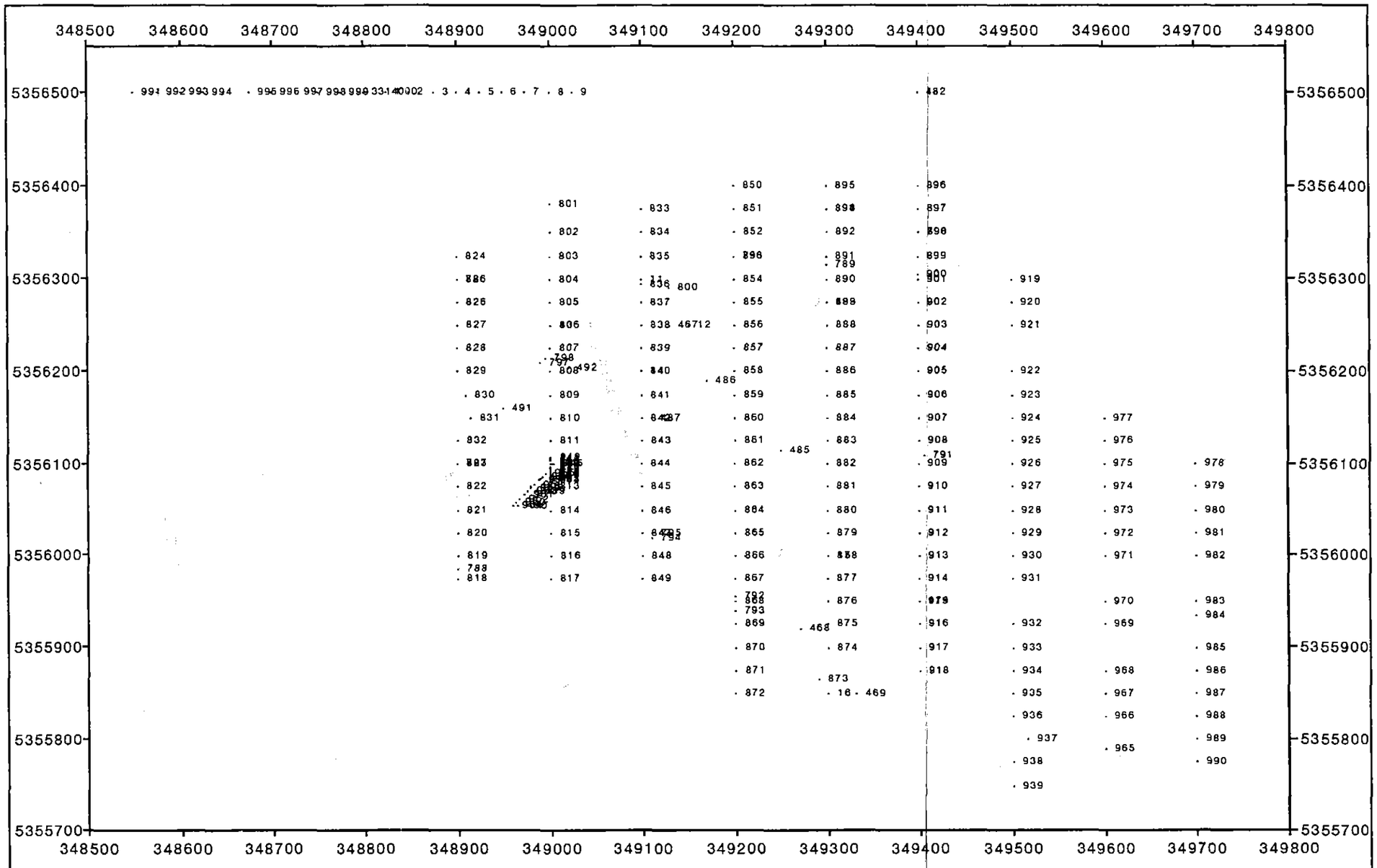
jmap 100m

CRA Exploration Pty Limited

ZEEHAN 1 EL28/88 - TRIAL HARBOUR

SOIL/ROCK GEOCHEMISTRY - Ni ppm

Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date: 10/6/1993	Plan: Tv601



Samples 487 - 493 prefixed 3528 ---
-"- 801 - 999 -"- 3313 ---
-"- 11 - 18 -"- 33080 --
-"- 1 - 9 -"- 331400 -

jmap

100m

93-3519.

957059

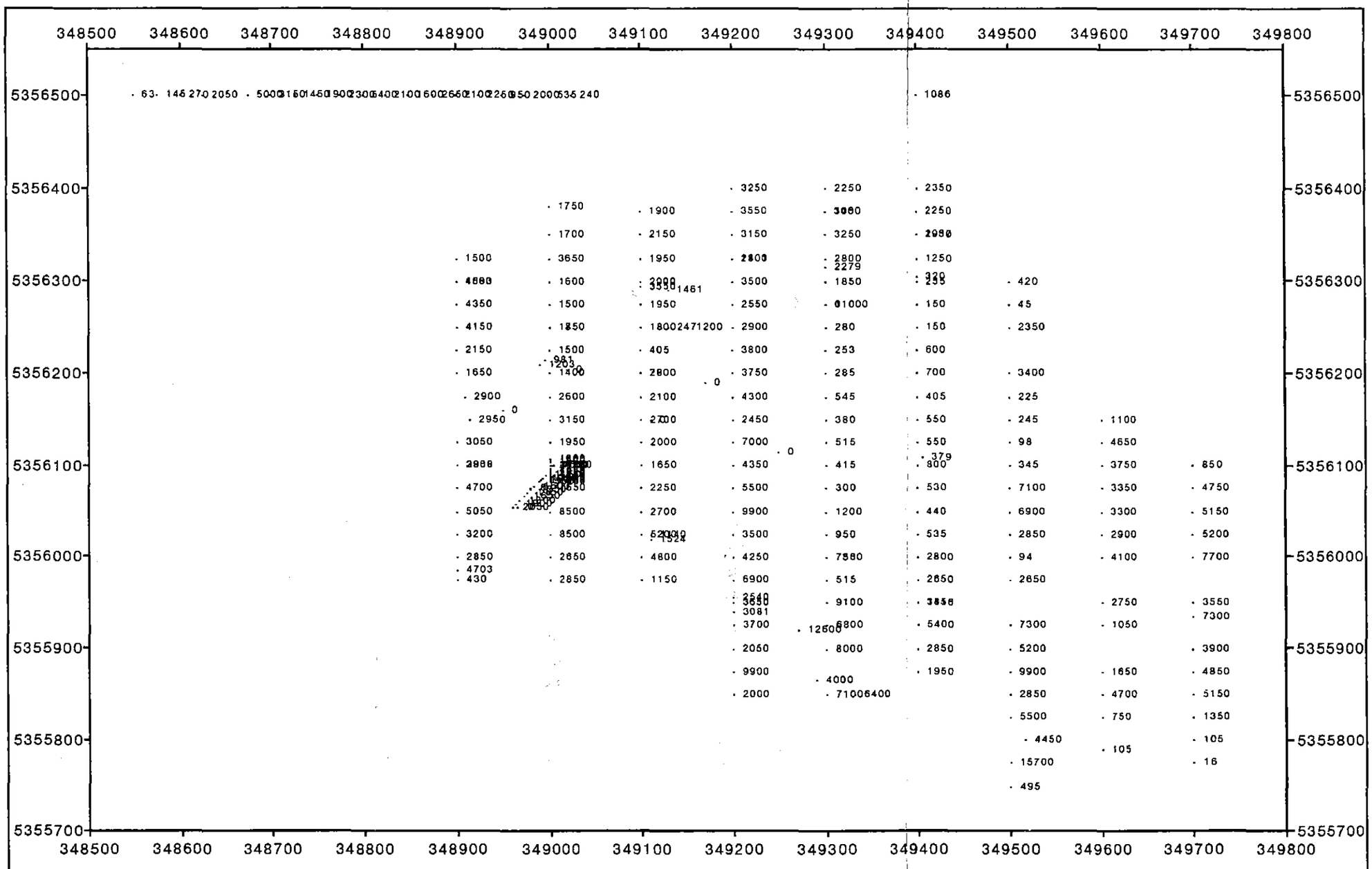
CRA Exploration Pty Limited

ZEEHAN 1 EL28/88 - TRIAL HARBOUR

ROCK SAMPLE LOCATIONS

Geol: RGP	Scale: 1:5000	Report: 19284
Drawn: RGP	Date: 12/10/1993	Plan: Tv 602

5 cm

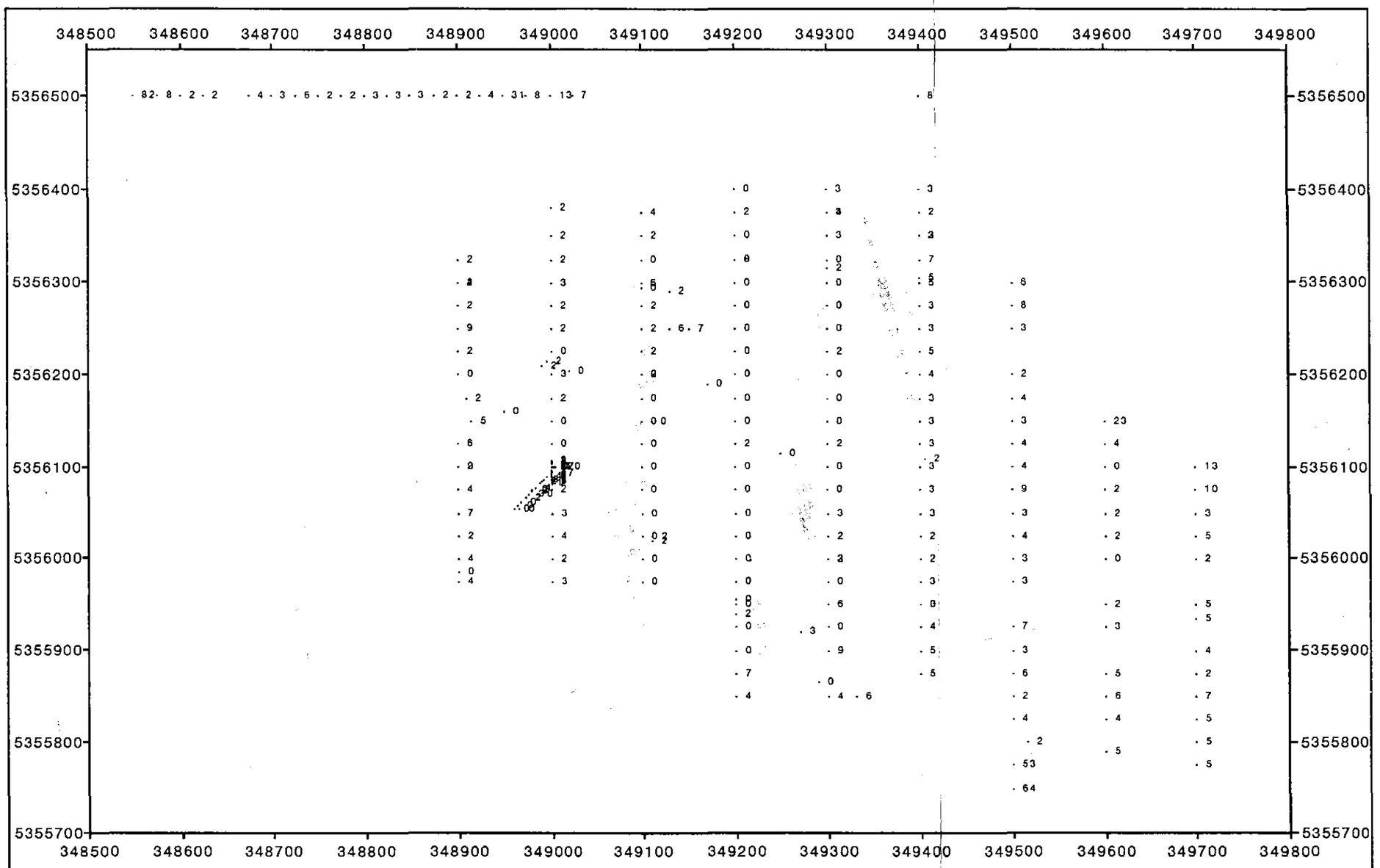


93-3519.

957060

CRA Exploration Pty Limited		
ZEEHAN 1 EL28/88 - TRIAL HARBOUR		
ROCK GEOCHEMISTRY - NICKEL		
Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date:12/10/1993	Plan: Tv603

5 cm



93-3519.

957061

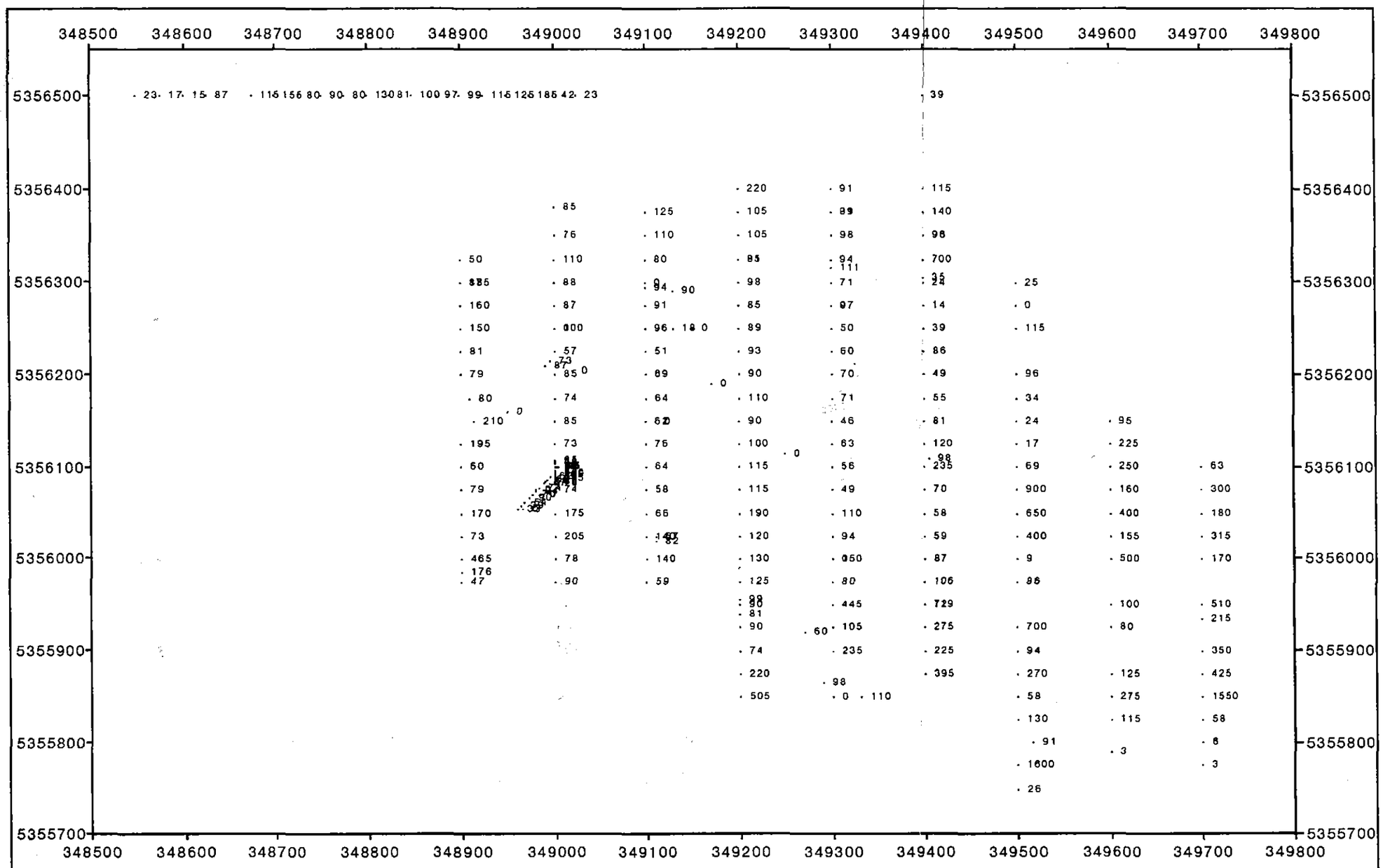
CRA Exploration Pty Limited		
ZEEHAN 1 EL28/88 - TRIAL HARBOUR ROCK GEOCHEMISTRY - COPPER		
Geol: RGP	Scale: 1:5000	Report: 19284
Drawn: RGP	Date: 12/10/1993	Plan: Tv604

Results in ppm.

jmap

100m

5 cm



93-3519.

957062

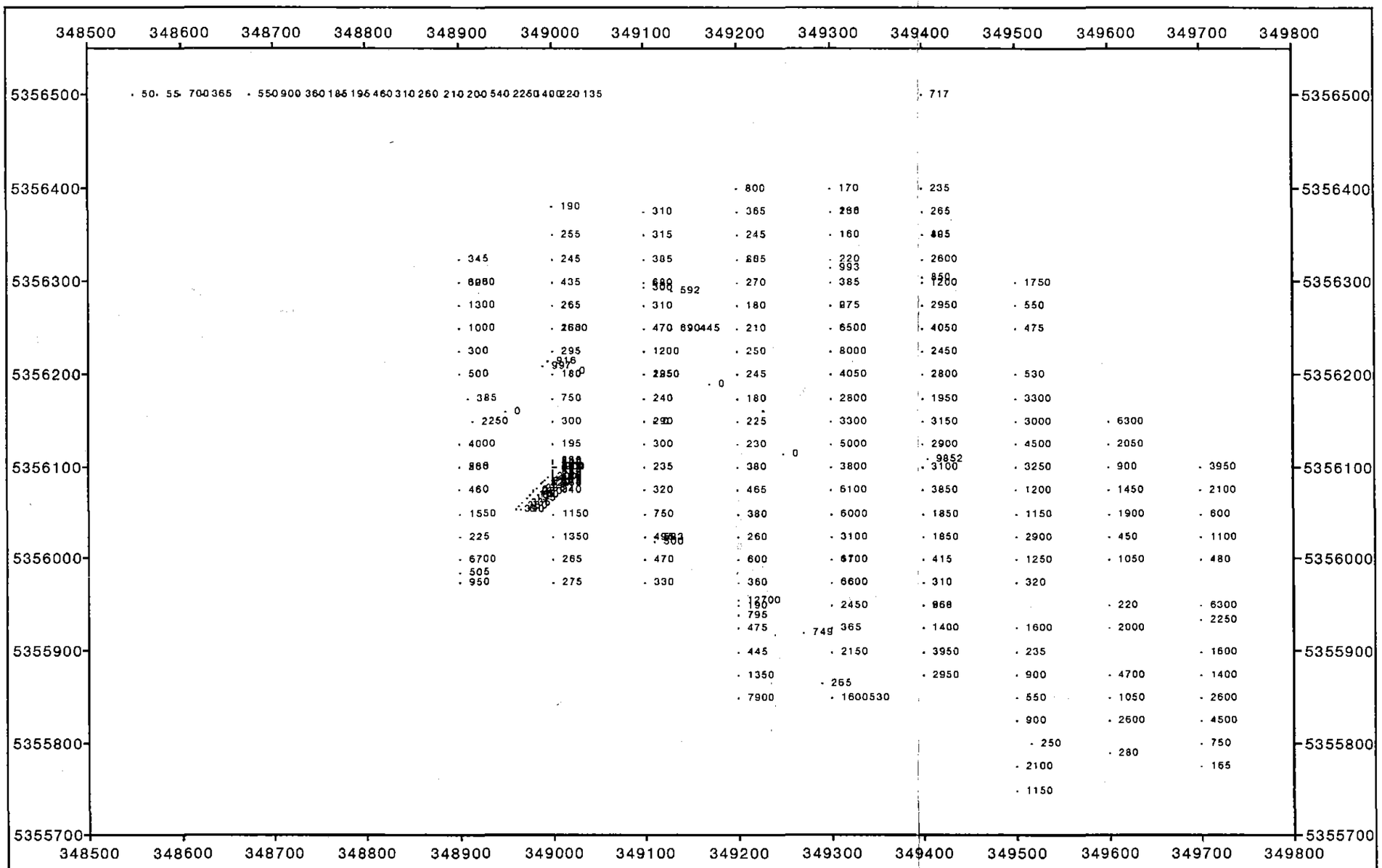
CRA Exploration Pty Limited

ZEEHAN 1 EL28/88 - TRIAL HARBOUR

ROCK GEOCHEMISTRY - COBALT

Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date: 12/10/1993	Plan: Tv 605

5 cm



93-3519.

957063

CRA Exploration Pty Limited		
ZEEHAN 1 EL28/88 - TRIAL HARBOUR		
ROCK GEOCHEMISTRY - CHROMIUM		
Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date:12/10/1993	Plan: Tv 606

Results in ppm.

jmap

100m

5 cm

348500 348600 348700 348800 348900 349000 349100 349200 349300 349400 349500 349600 349700 349800

5356500 5356400 5356300 5356200 5356100 5356000 5355900 5355800 5355700

- 2.3 1.9 2.2 3.8 - 10.0 12.9 8.6 4.9 4.9 6.5 4.9 7.7 6.3 5.4 5.1 27.9 33.4 34.1 4.1
- 0.0
- 13.2 - 4.9 - 8.7
- 4.3 - 9.2 - 5.1 - 8.2 - 19.7
- 3.6 - 6.8 - 5.2 - 4.2 - 8.8
- 4.1 - 4.9 - 3.4 - 8.8 - 5.2 - 43.5
- 0.0
- 0.0 - 4.4 - 4.6 - 3.4 - 3.4 - 0.0 - 3.3 - 3.7 - 8.7
- 10.7 - 4.9 - 4.8 - 3.9 - 8.8 - 35.5 - 4.1
- 14.8 - 7.3 - 9.8 - 0.0 12.2 - 4.8 - 31.4 - 37.1 - 4.6
- 5.0 - 3.0 - 7.9 - 4.0 - 35.3 - 36.2
- 0.0 - 0.0
- 10.6 - 4.7 0.0 - 3.6 - 0.0 - 3.0 - 39.4 - 34.5 - 4.5
- 3.8 - 4.6 - 3.4 - 3.3 - 41.4 - 39.0 - 12.6
- 0.0
- 16.1 - 3.7 - 2.8 0.0 - 3.7 - 39.5 - 35.7 - 9.2 - 33.8
- 20.2 - 2.5 - 3.9 - 4.2 - 47.4 - 37.9 - 1.7 - 17.8
- 0.0
- 0.0
- 4.0 - 1.9 - 4.3 - 44.9 - 35.6 - 17.7 - 8.4 - 14.6
- 12.7 - 9.5 - 2.9 - 3.7 - 42.8 - 36.3 - 10.6 - 16.0 - 13.0
- 4.5 - 9.4 - 3.8 0.0 - 2.9 - 39.1 - 38.2 - 22.8 - 12.3 - 11.8
- 27.6 - 3.5 - 3.6 - 3.9 - 38.0 - 2.7 - 1.1 - 11.4 - 4.9
- 0.0
- 3.5 - 6.4 - 3.8 - 3.7 - 33.3 - 2.9 - 3.4
- 0.0
- 4.0
- 0.0
- 18.1 - 0.0 - 2.6 - 24.2
- 4.5 - 3.7 - 11.8 - 33.1 - 11.4
- 2.4 - 9.2 - 19.1 - 7.9
- 8.9 - 2.8 - 26.9 - 17.8 - 41.4 - 11.1
- 26.0 - 3.0 - 0.0 - 6.2 - 9.1 - 10.4 - 12.8
- 5.3 - 14.4 - 12.9
- 13.8 - 7.9 - 0.8 - 3.5
- 16.5 - 1.0
- 6.4

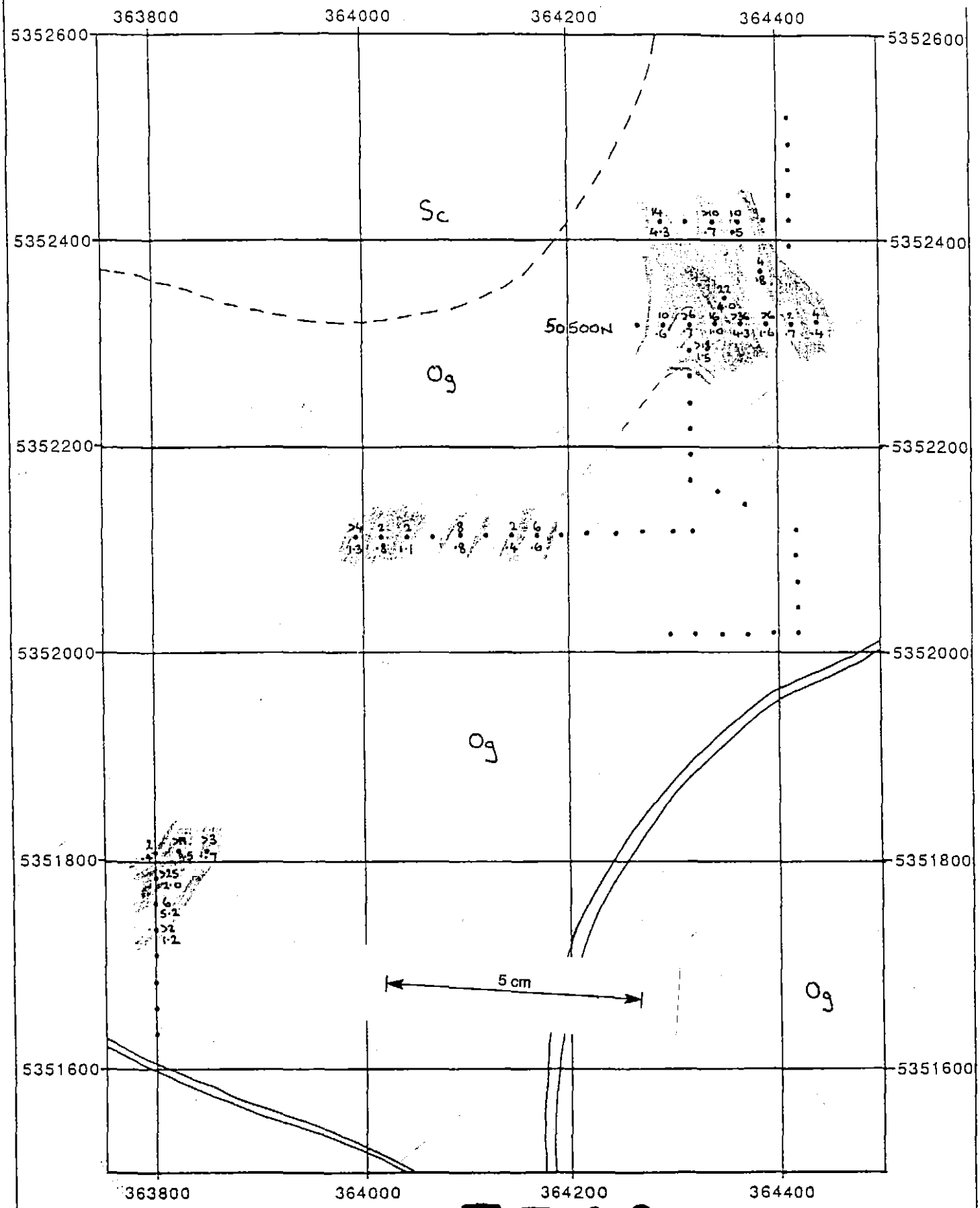
0 = Not assayed.

jmap 100m

93-3519.
957064

CRA Exploration Pty Limited		
ZEEHAN 1 EL28/88 - TRIAL HARBOUR		
ROCK GEOCHEMISTRY - IRON %		
Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date: 12/10/1993	Plan: Tv607

5 cm



93-3519.

957065

"CRA EXPLORATION PTY. LIMITED"

ZEEHAN 1 EL28/88 - MYRTLE PROSPECT

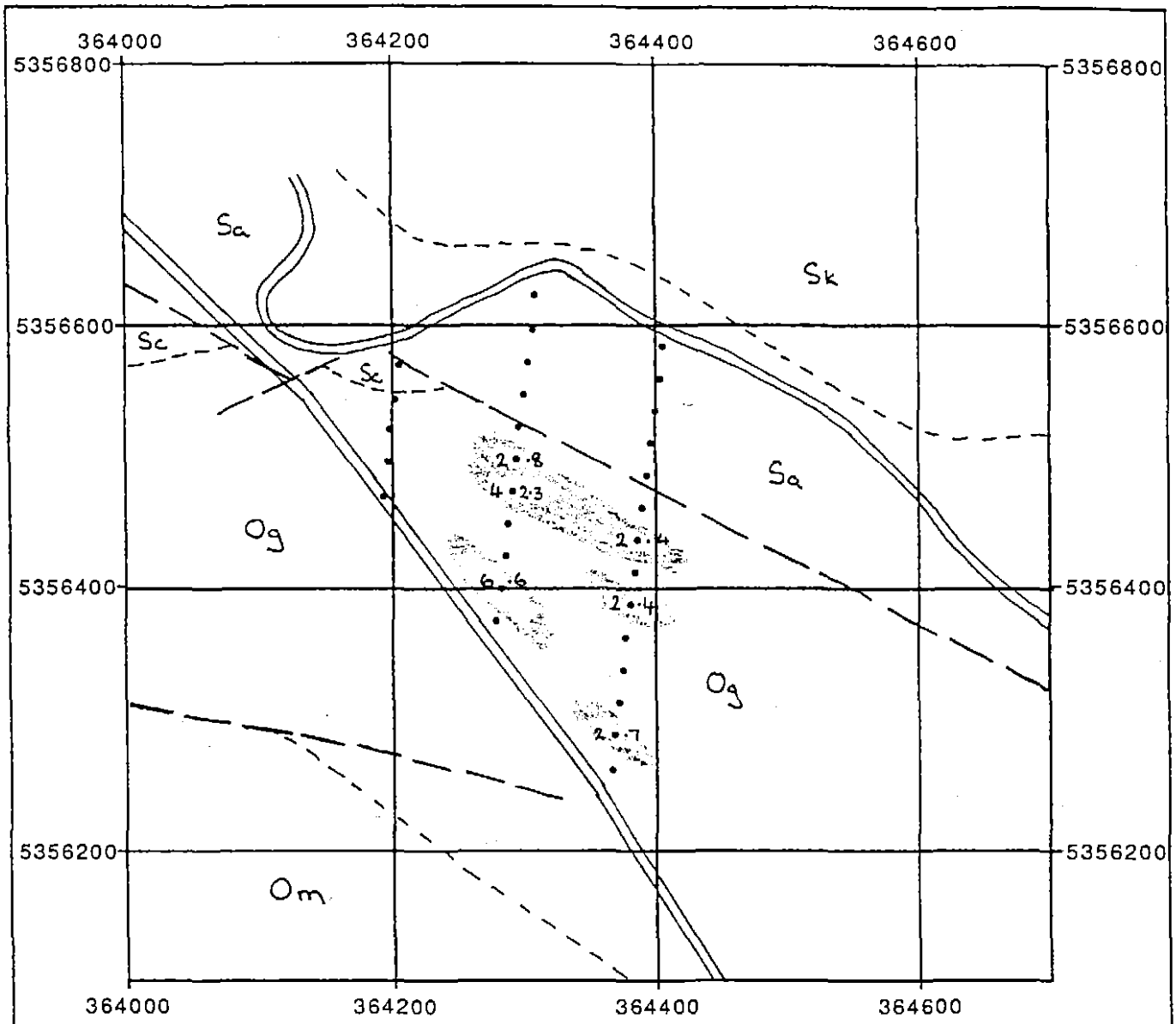
ORE THICKNESS AT +0.4 % ZINC

Thickness
grade % Zn

jmap

100m

Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date: 12/5/93	Plan: Tv608



"CRA EXPLORATION PTY. LIMITED"

ZEEHAN 1 EL28/88 - PYRAMID PROSPECT

ORE THICKNESS AT +0.4% ZINC

Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date:12/5/1993	Plan: Tv 609

Hole prefix ZP--

jmap

100m

957066

93-3519.

T-Q Tertiary, Quaternary

P-J *Permo-Carboniferous beds and Jurassic dolerite*

\+ + Devonian granite

S-D / Ogl Siluro-Devonian Eldon Group / *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

S-D

Ogl

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

The Sisters

WESTERN SEQUENCE

Henty R.

SOUTHERN OCEAN

360

370

5 cm

93-3519

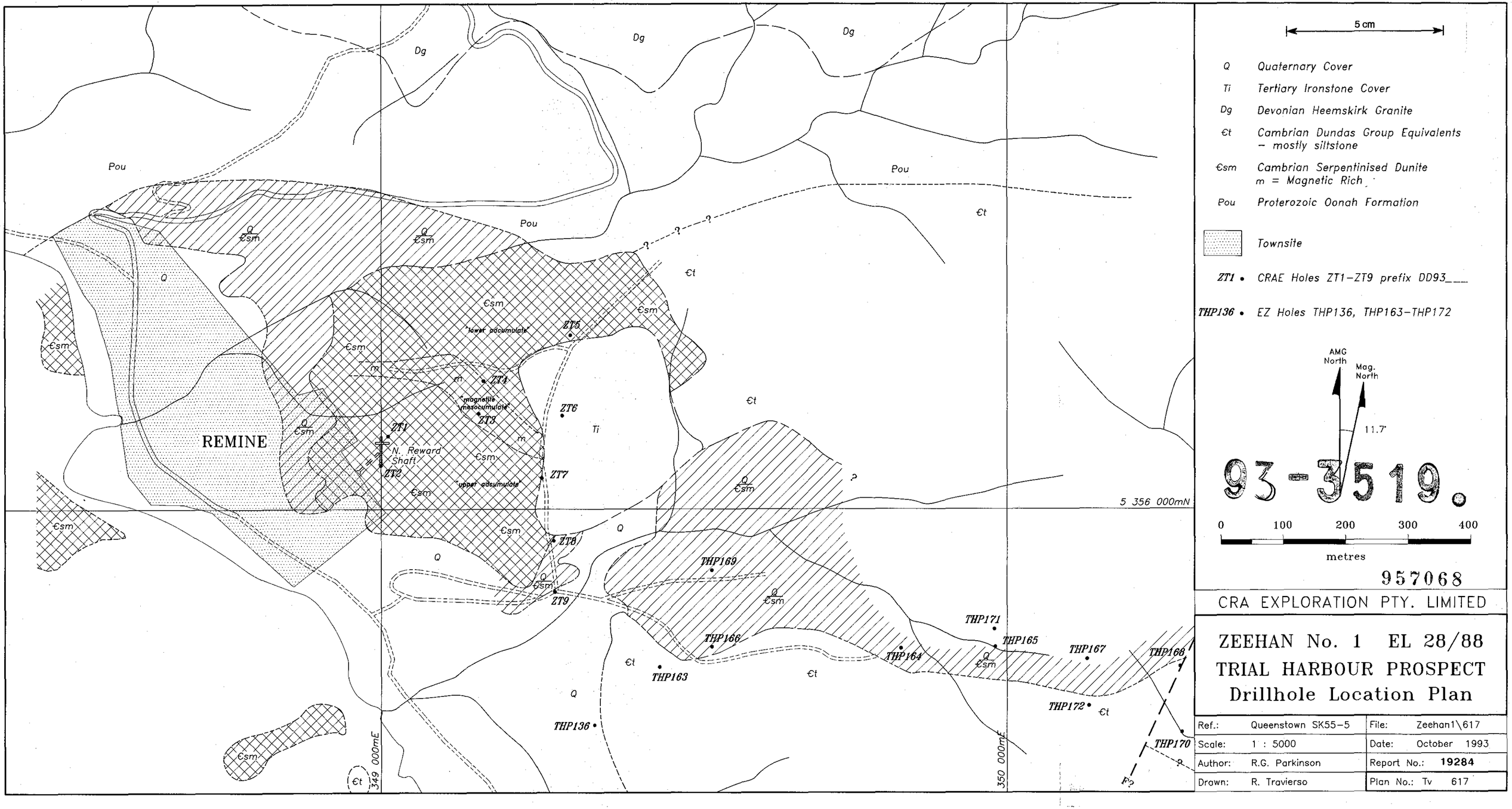
957067

CRA EXPLORATION PTY. LIMITED

ZEEHAN PROJECT

REGIONAL GEOLOGY

Ref.: SK55-5	Scale: 1:100 000
Author: RGP	Report No.: 19284
Drawn: RGP	Plan No.: Tv628



CRA EXPLORATION PTY. LIMITED

ZEEHAN No. 1 EL 28/88
TRIAL HARBOUR PROSPECT
Drillhole Location Plan

Ref.:	Queenstown SK55–5	File:	Zeehan1\617
Scale:	1 : 5000	Date:	October 1993
Author:	R.G. Parkinson	Report No.:	**19284**
Drawn:	R. Travierso	Plan No.:	Tv 617

360 000mE

61

62

63

5 cm

51

Sk

Sa

Sc

Og

Om

P

5350 000mN

Firewood Siding Fault

River

Badger

HENTY ROAD

B27

49

48

AMG North

Mag. North

Grid Magnetic Convergence 11.8°

Fault 957069

- P Permian Cover
- Sk Keel Quartzite
- Sa Amber Slate
- Sc Crotty Quartzite
- Og Gordon Limestone
- ▽ ?Limestone Breccia
- Om Moina Sandstone

03-3519

0 500 1000 1500

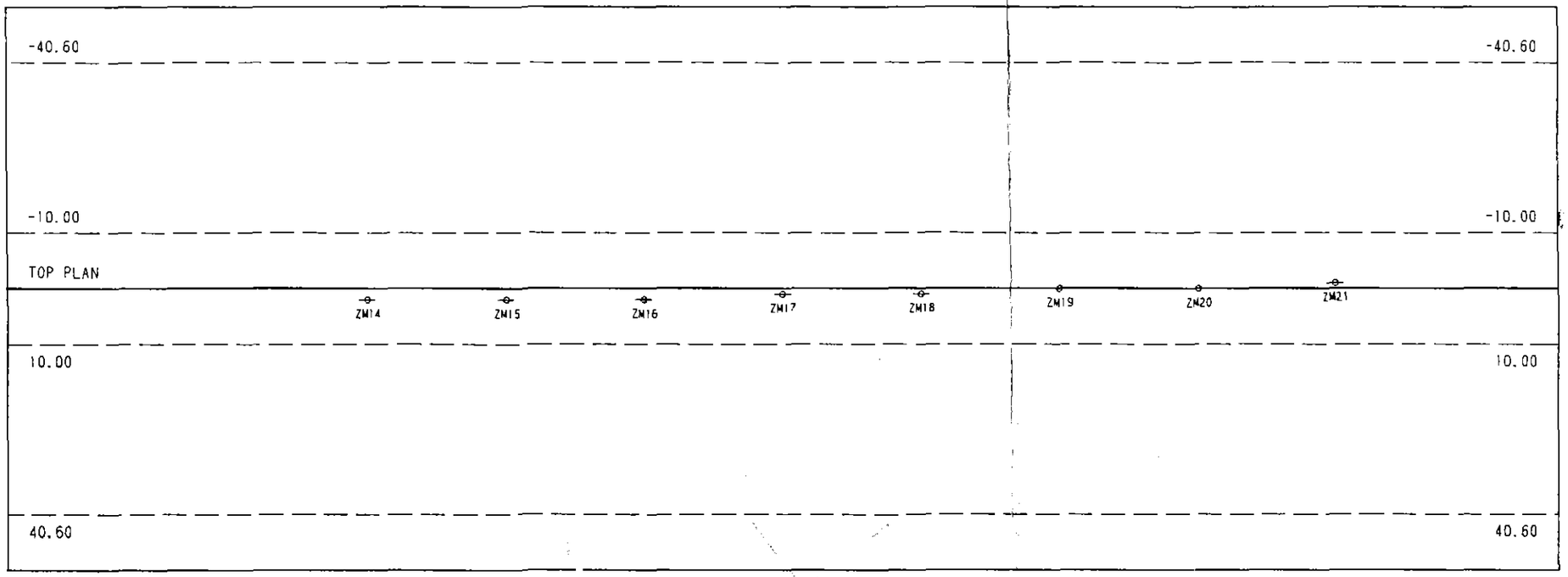
metres

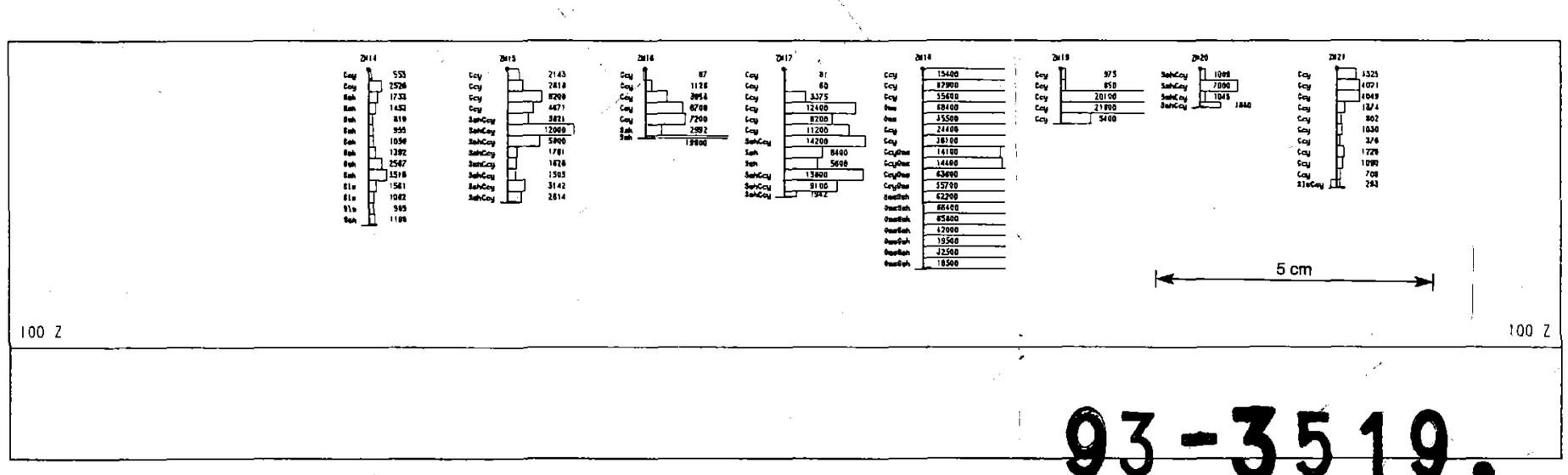
CRA EXPLORATION PTY. LIMITED

ZEEHAN No.2 EL 34/88
Firewood Siding Prospect
GEOLOGICAL PLAN

Ref.: SJ55-5, 7914, 3634	File: ZEEHAN2\618
Scale: 1 : 10 000	Date: October 1993
Author: Rob Parkinson	Report No.: 19284
Drawn: R. Travierso	Plan No.: Tv 618

Tv632





93-3519.

957070

SECTION SPECS :

REF. PT. E, N	364200	352320
EXTENTS	280	75
SECTION TOP, BOT	155	80
TOLERANCE +/-	10 M	

Lithology on LHS
Zinc ppm on RHS : 1cm = 10,000ppm

0 20 40 60 80
metres

AZIMUTH (DEG) = 90

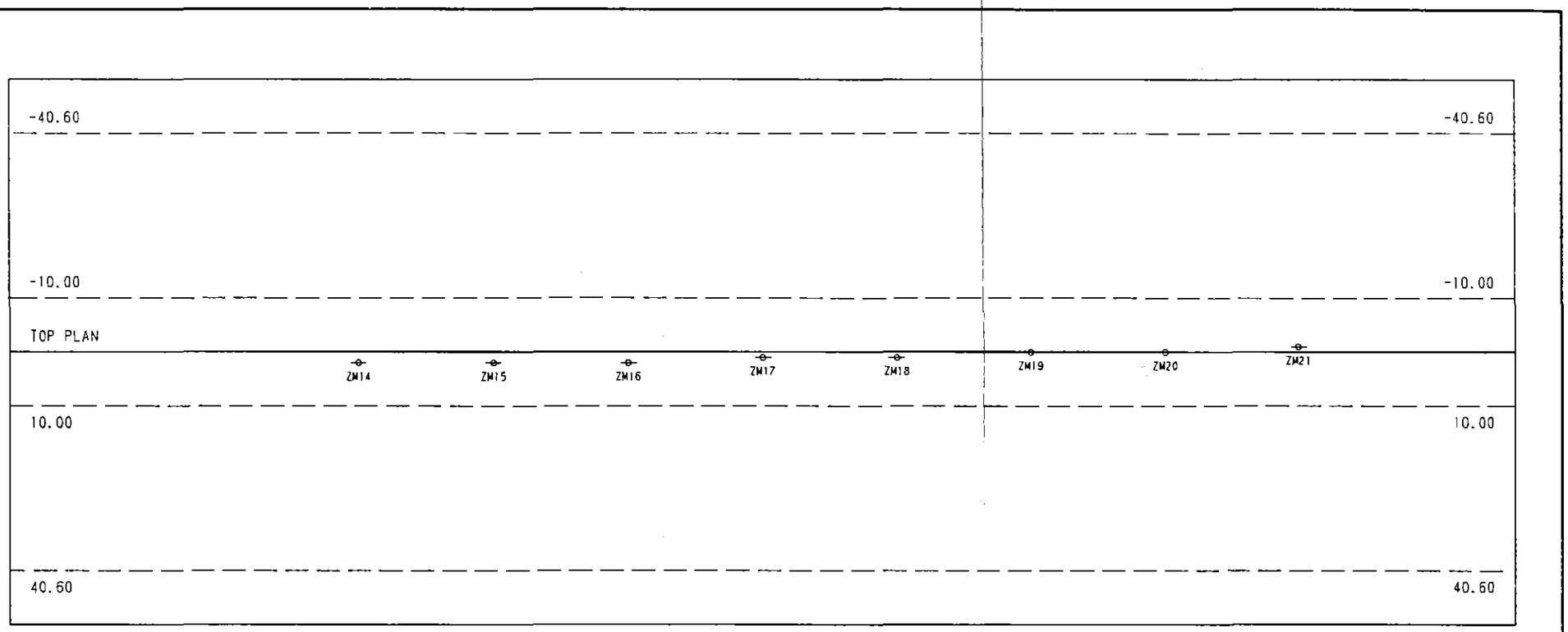
N
W E
S

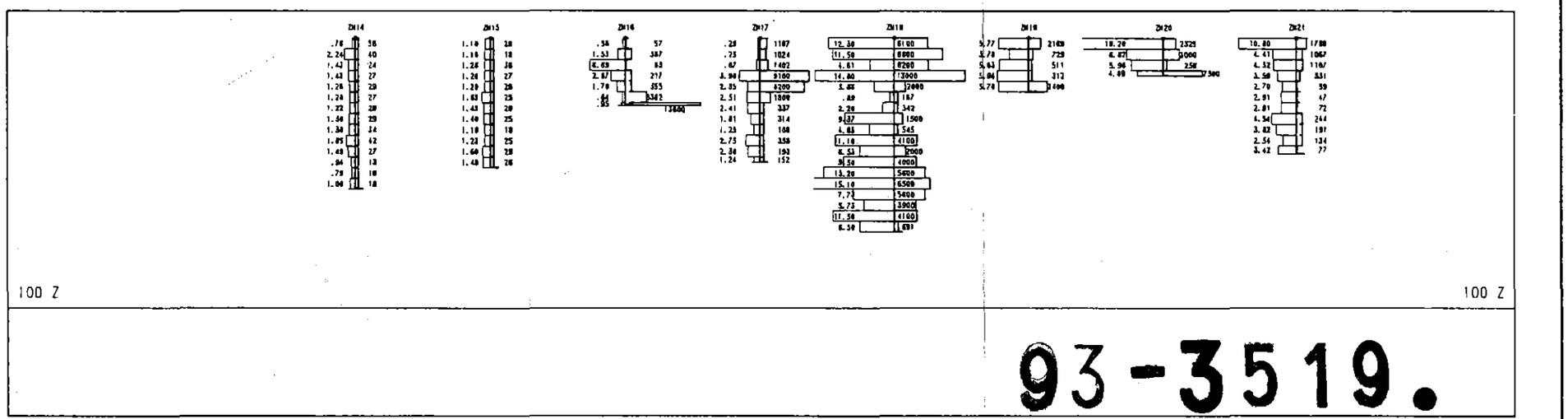
CRA EXPLORATION PTY. LIMITED

ZEEHAN No.1 EL 28/88
MYRTLE PROSPECT
Section through ZM14–ZM21
Lithology and Zinc Geochemistry

Ref.:	Queenstown SK55–05	File:	Zeehan1\632
Scale:	1 : 1000	Date:	November 1993
Author:	R.G. Parkinson	Report No.:	19284
Drawn:	R. Travierso	Plan No.:	Tv 632

Tv 633





93-3519.

957071

SECTION SPECS :

REF. PT. E, N	364200	352320
EXTENTS	280	75
SECTION TOP, BOT	155	80
TOLERANCE +/-	10 M	

Iron % on LHS : 1cm = 10%
Lead ppm on RHS : 1cm = 10,000ppm

0 20 40 60 80
metres

AZIMUTH (DEG) = 90
N
W E
S

CRA EXPLORATION PTY. LIMITED

ZEEHAN No.1 EL 28/88
MYRTLE PROSPECT
Section through ZM14-ZM21
Iron and Lead Geochemistry

Ref.:	Queenstown SK55-05	File:	Zeehan1\633
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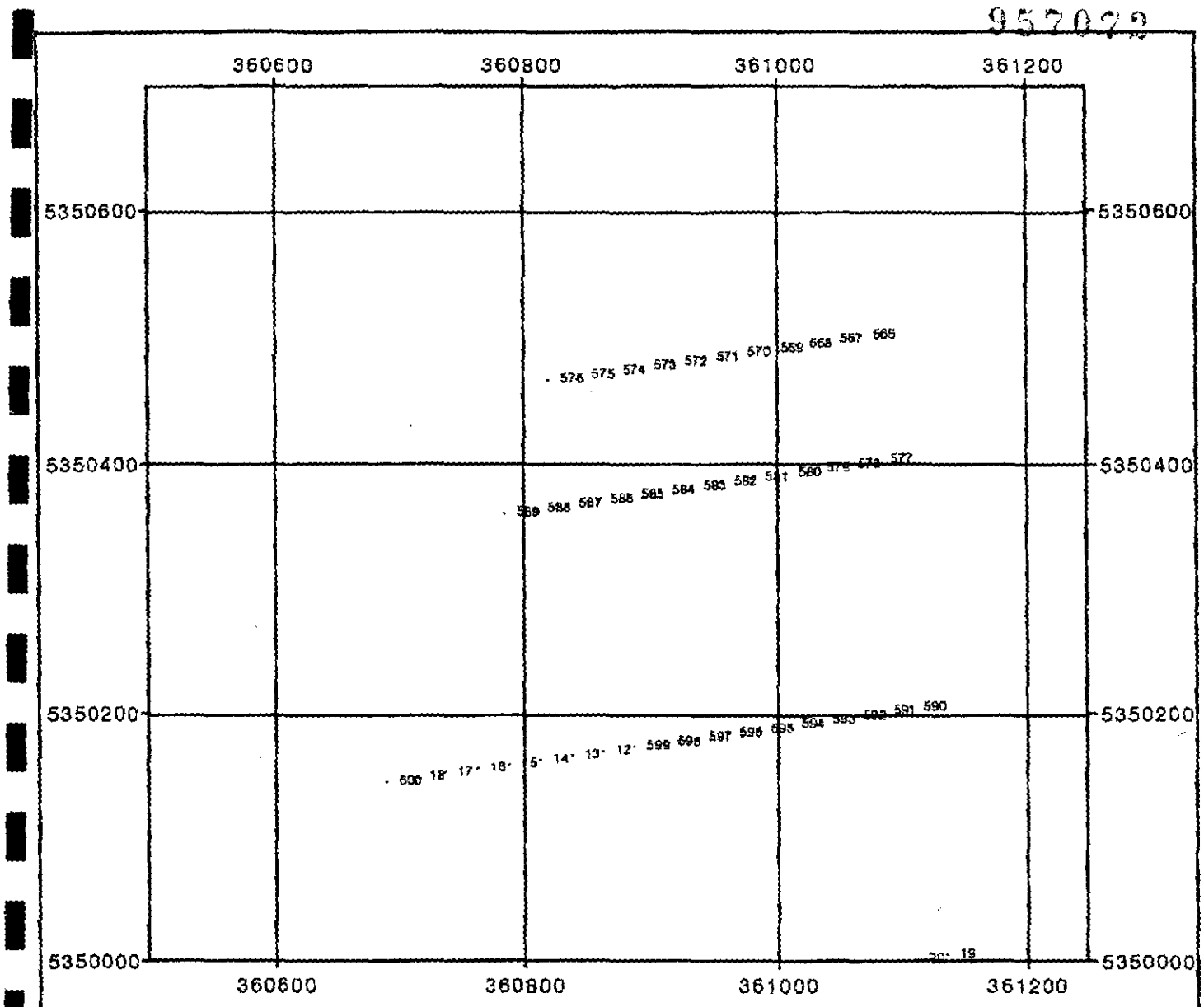
952022



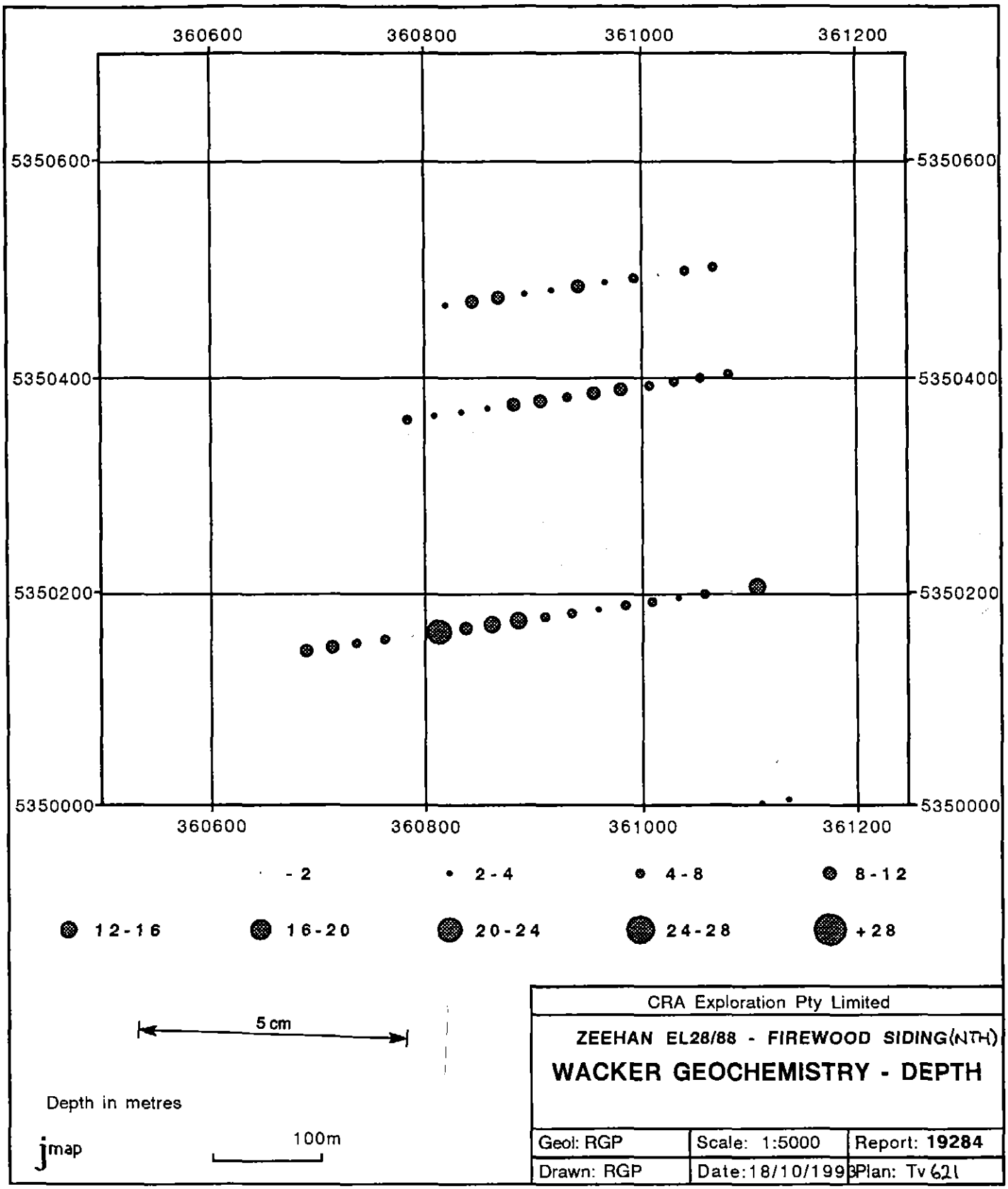
Sample prefix 3528— for 566-600
35299-- " 12- 20

100m

jmap

CRA Exploration Pty Limited		
ZEEHAN EL28/88 - FIREWOOD SIDING (NTH)		
WACKER SAMPLE LOCATIONS		
Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date: 18/10/1993	Plan: Tv620

957073



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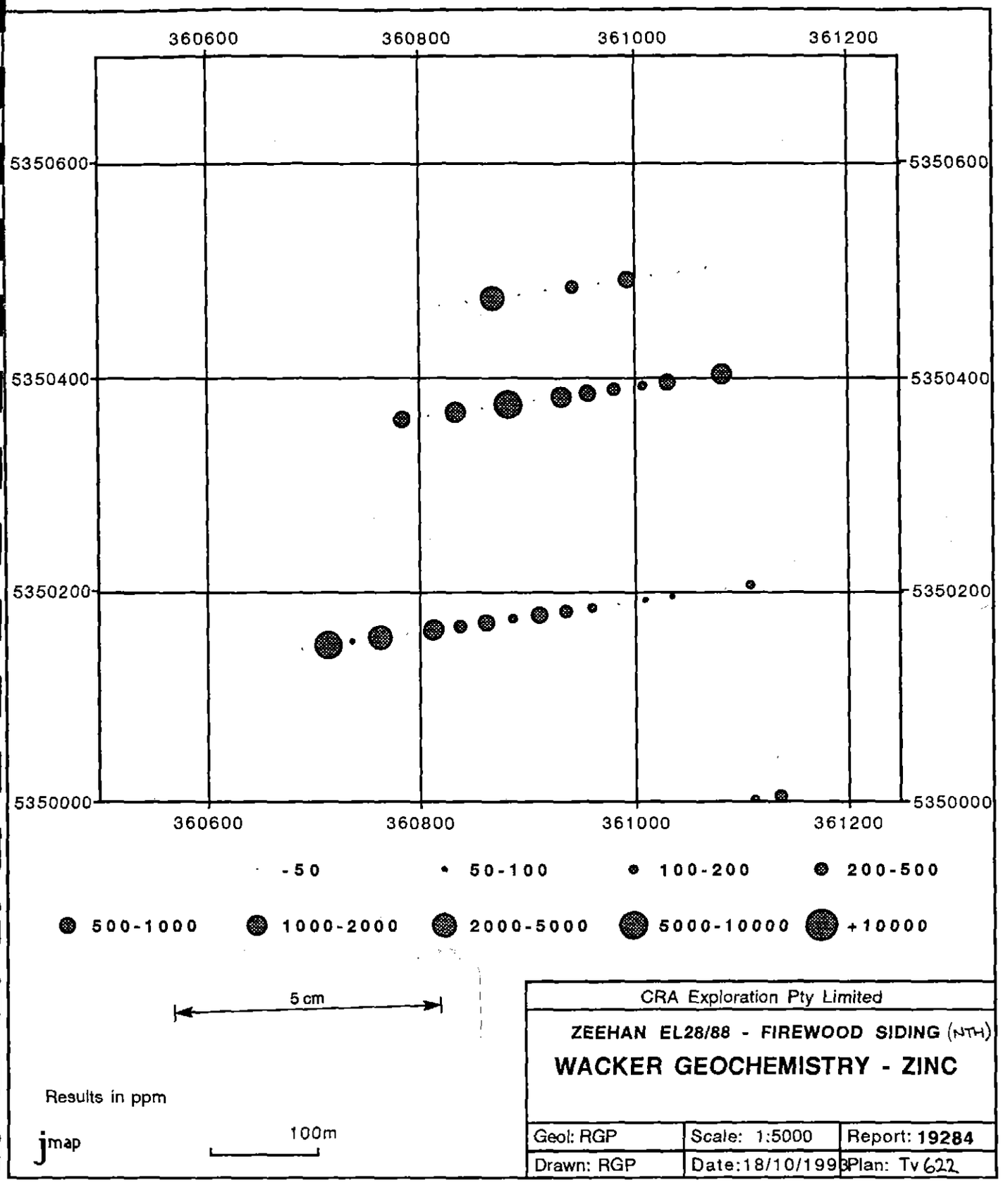
ZEEHAN EL28/88 - FIREWOOD SIDING(NTH)

WACKER GEOCHEMISTRY - DEPTH

Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date: 18/10/199	Plan: Tv 621



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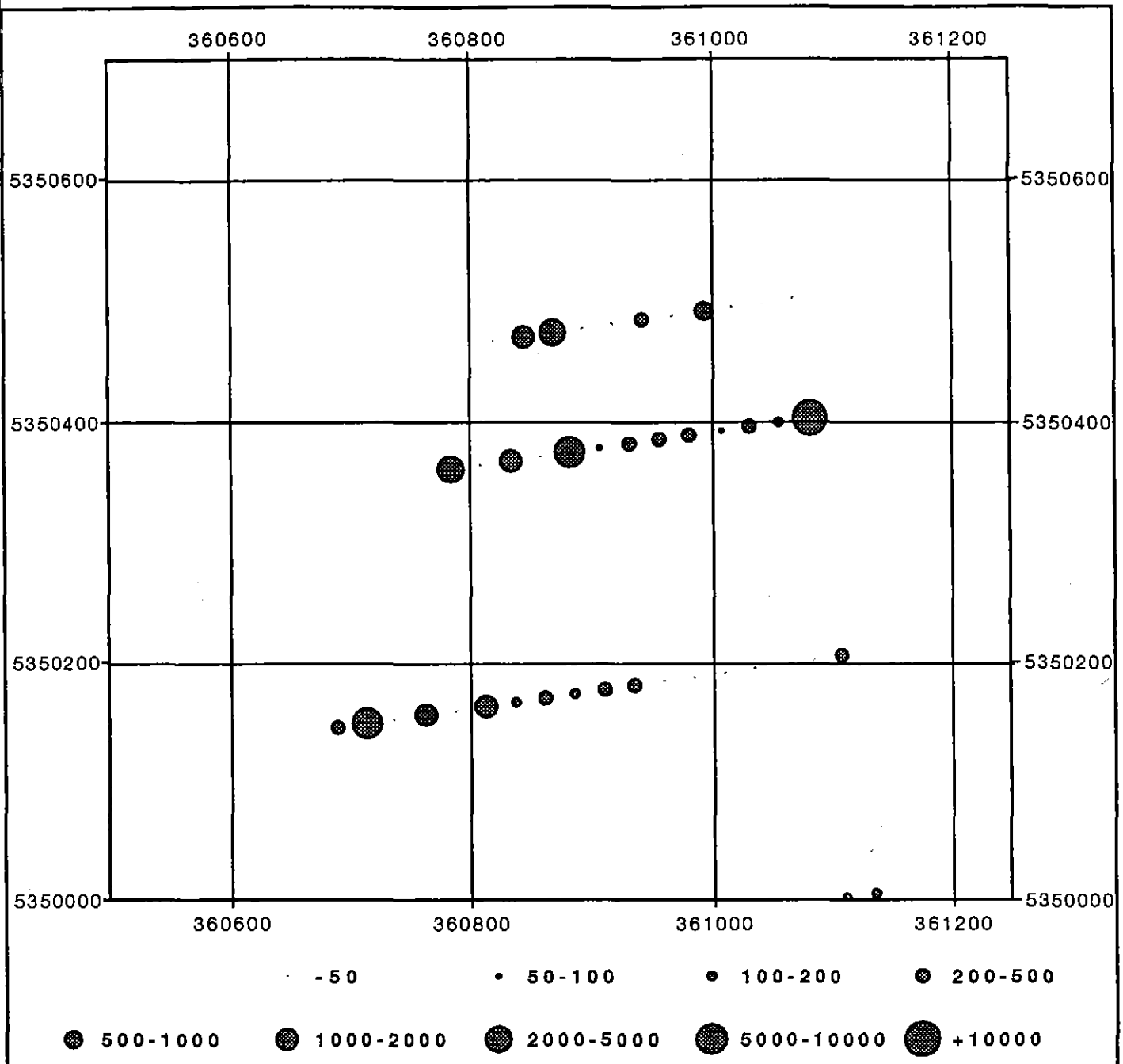
ZEEHAN EL28/88 - FIREWOOD SIDING (NTH)

WACKER GEOCHEMISTRY - ZINC

Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date: 18/10/1993	Plan: Tv 622



5 cm

Results in ppm

jmap

100m

CRA Exploration Pty Limited

ZEEHAN EL28/88 - FIREWOOD SIDING (NTH)

WACKER GEOCHEMISTRY - LEAD

Geol: RGP	Scale: 1:5000	Report: **19284**
Drawn: RGP	Date: 18/10/1993	Plan: Tv623

APPENDIX 1:

STONEHENGE DIAMOND DRILL LOGS, GEOCHEMISTRY AND PETROLOGY.

APPENDIX 2:

AVEBURY PROSPECT SOIL SAMPLING LEDGERS AND GEOCHEMISTRY.

APPENDIX 3:

MYRTLE PROSPECT AIR-CORE DRILL LOGS AND GEOCHEMISTRY.

APPENDIX 4:

MYRTLE PROSPECT MINERALOGICAL REPORTS.

APPENDIX 5:

PYRAMID PROSPECT AIR-CORE DRILL LOGS AND GEOCHEMISTRY.

APPENDIX 6:

TRIAL HARBOUR EZ OPEN-FILE SOIL GEOCHEMISTRY.

APPENDIX 7:

TRIAL HARBOUR CRAE ROCKCHIP SAMPLING LEDGERS AND GEOCHEMISTRY.

APPENDIX 8:

TRIAL HARBOUR. MEMO FROM HJ SHAW TO RG PARKINSON.

APPENDIX 9:

TRIAL HARBOUR DIAMOND DRILL LOGS AND GEOCHEMISTRY.

APPENDIX 10:

TRIAL HARBOUR PETROLOGICAL REPORTS.

APPENDIX 11:

FIREWOOD SIDING PROSPECT WACKER SAMPLING LEDGERS AND GEOCHEMISTRY.

957087

APPENDIX 1:

STONEHENGE DIAMOND DRILL LOGS, GEOCHEMISTRY AND PETROLOGY.

957088

CRA EXPLORATION PTY. LIMITED

DRILL-HOLE SUMMARY LOG

EL NAME: ZEEHAN 1 HOLE NAME: DD92ZS1
EL NUMBER: EL 28/88 PROSPECT: STONEHENGE
DATE DRILLED: NOV 1992
LOGGED BY: RGP

AMG EAST: 359800 E GRID EAST: 12125E
AMG NORTH: 5359300 N GRID NORTH: 5115N
RL: ~257 m ASL TOTAL DEPTH: 251m

DEPTH	AZIM. (MAG)	INCLIN.
0	048°	-50°
83	054°	-51.5°
166	051°	-53°
241	051°	-52.5°

OBJECTIVES OF HOLE:

To test Gribbo's Shear Zone where it is interpreted to cut Oonah Fm sulphidic black shales. In this position Zn mineralisation may be enriched or focussed.

LITHOLOGICAL SUMMARY:

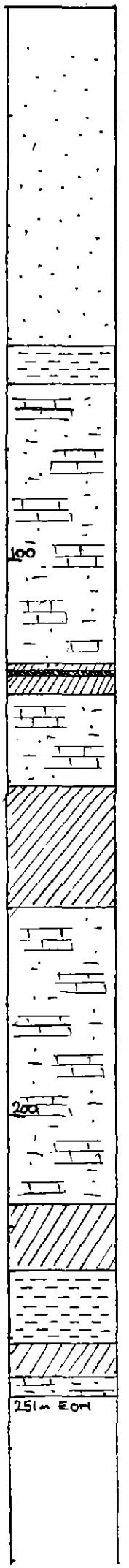
DFROM	DTO	COMMENTS
0	61.1	Sandstone/qbarbeite
61.1	68.1	Carbonaceous shale +10% dissem py
68.1	119.2	Siltstone - dolomite
119.2	124.3	Siderite alteration zone. 120.3-121.0 = massive ga-sp-py
124.3	141.0	Dolomite
141.0	162.8	Siderite altern zone.
162.8	216.3	Siltstone - dolomite
216.3	228.3	Siderite altern zone.
228.3	241.4	Carbonaceous shale
241.4	247.4	Siderite altern zone
247.4	251.0	Siltstone - dolomite

MINERALISATION SUMMARY:

DFROM	DTO	COMMENTS	
119.2	121.35	2.15m @ 7.78% Zn, 10.08% Pb, 191.3 ppm Ag	(0.5% Zn c/off)
143.5	162.85	19.35m @ 1.52% Zn 0.41% Pb 5.7 Ag	-"-
223.8	234.0	10.2m @ 1.40% 0.46% 9.8	-"-

CONCLUSIONS:

Wide zones of low-grade sphalerite mineralisation within structurally controlled siderite alteration envelopes. Unlikely to be of economic significance.



AMG 359800E 5359300N 12125E

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 1 of 13

TENEMENT NAME ZEEHAN 1 No. EL 28/88

PLAN – MAP REFERENCE

CO-ORDINATES 5115N AZIMUTH 048° MAG DRILLERS DIAMOND DRILLING TAS COMMENCED 11/11/92 DEPTH 251.0m HOLE No. DD92ZS1

RL COLLAR ~257m ASL INCLINATION -50° DRILL TYPE LY38 COMPLETED 20/11/92 CASING LEFT HQ 54-78m DPO No(s) 71523

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....)
0	0.3	–	PRECOLLAR		IRONSTONE. Surficial vuggy yellow-brown ironstone	Roller bit precollar. Lithologies + depths based on sump extraction + drill cuttings.					
0.3	5	–	PRECOLLAR		CLAY. Yellow structureless saprolite?						
~5	14.5	–	PRECOLLAR		SANDSTONE. White to light grey. fine gls. Oonah Fm.						
14.5	20.5	3.5	HQ		SANDSTONE. White to light grey fine gls qtz sst. Locally laminated. Totally broken with numerous sandy clay shear zones with no recovery. Oonah Fm.	Pyrite - rare traces of disseminated euhedral grains.	3314010	14.5	17.1	1.9	
							3314011	17.1	20.5	1.6	
20.5	25.0	0	HQ		SANDY CLAY SHEAR. No recovery.						
25.0	30.4	0.8	HQ		SANDSTONE. As for 14.5-20.5m		3314012	25.0	28.0	0.2	
							4013	28.0	32.5	1.1	
30.4	32.5	0.5	HQ		SANDY CLAY. Unconsolidated white to light grey clay and sand.						
32.5	34.0	0	HQ		NO RECOVERY						
34.0	~35.5	0.2	HQ		SANDSTONE. As for 14.5-20.5m. Lower contact is approximate, between 34.3 to 36.7, due to severe core loss		3314014	34.0	37.0	0.45	

DRILL RUNS

FROM	TO	REC
0	14.5	–
14.5	16.0	0.9
	17.1	1.0
	19.0	1.25
	20.5	1.35
	22	0
	25	0
	28	0.2
	30.4	0.6
	32.5	0.5
	34	0
	37	0.45

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 2 of 13

TENEMENT NAME ..... No. EL28/88

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH 048° mag DRILLERS DD TAS COMMENCED 11/11/92 DEPTH ..... HOLE No. ZS1

RL COLLAR ..... INCLINATION -50° DRILL TYPE LY38 COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....)	DRILL RUNS FROM	DRILL RUNS TO	DRILL RUNS REC
~35.5	43.8	3.0	HQ		QUARTZITE / SILICIFIED ROCK. Light to dark grey. Fractured and vuggy. Probable shear and breccia zones in areas of no recovery. Local disseminations and fracture coatings of py, up to 5%, but overall ~0.5%. Rock is massive, unable to determine whether the unit is quartzite or silicified sediment. No visible bedding. No core in pieces >10cm, badly fractured. 37.5m Fract - C.A ∠ 60° 37.6m " " 30° 37.7m " " 55° 38.7m " " 70°		3313015	37.0	41.7	2.3		37	37.3	0.5
							3314016	41.7	43.8	0.5			38.7	1.5
													41.7	0.3
							3313715	PET	37.85		Pyritic Siliceous Sinter		43	0.25
													43.8	0.25
													45.9	0.2
													49	0.4
													52	0.5
													55	0
													58	0
													61	0.5
43.8	52.0	1.1	HQ		QUARTZITE / SILICIFIED ROCK Light grey. Silicified rock or massive quartzite? Very strongly vuggy - almost honeycombed. Strongly broken + cut by carbonaceous shears. No core in pieces >10cm. Severe core loss. No visible sulphides		3314017	43.8	45.9	0.2				
							4018	45.9	49.0	0.4				
							4019	49.0	52.0	0.5				
52.0	58.0	0	HQ		NO RECOVERY									
58.0	61.1	0.5	HQ		QUARTZITE / SILICIFIED ROCK. As for 43.8 - 52.0m		3314020	58.0	61.1	0.5				

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 3 of 13

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZS1

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....)	DRILL RUNS From	DRILL RUNS To	DRILL RUNS REC
61·1	68·1	5.85	HQ		CARBONACEOUS SHEAR.		3314021	61·1	63·4	1.85		61	62	0·75
					Shiny black. Carbonaceous and graphitic shear zone with		4022	63·4	65·8	1·9			63·4	1·1
					10-20% very fine g/s dissem. py. Minor calcite		4023	65·8	68·1	2·1			64·7	1·1
					wisps and veinlets.								65·3	0·6
					Graphitic shear surface is wavy + generally irregular.		3313776	PET	66·0		Pyritic Carbonaceous		65·8	0·2
					61·4m shear surface to c.A. ∠ ~40°						Shale.		66·8	0·9
					61·5m " " ~50								68	1·15
					62·5m " " ~50								69·3	0·85
					63·8m " " ~60								70	0·7
					66·5m " " ~55								72·3	2·2
					67·4m " " ~50								75·4	3·1
68·1	68·3	0·2	HQ		CARBONATE BRECCIA.									
					White to light grey. Brecciated clay and carbonate.									
					Rare traces of galena + sphalerite?									
					Contact zone between carbonaceous shear and									
					limestone.									
68·3	72·9	3·9	HQ		LIMESTONE									
					White to light grey massive limestone. Abundant		3314024	68·1	72·9	4·1				
					network of narrow calcite veins making up 20% of									
					core volume.		3313777	PET	71·0		Dolomite Rock.			
					Minor narrow sphalerite veins, generally <2mm									
					wide, 0.2% of core volume.									
					Core is competent, commonly as pieces >10cm.									

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 4 of 13

TENEMENT NAME..... No. .....

PLAN – MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. ZS1

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)	DRILL RUNS From	DRILL RUNS To	DRILL RUNS Rec.
72.9	90.8	15.8	HQ/NQ		LIMESTONE		3314025	72.9	77.8	2.94.7		75.4	77.8	2.2
					Light grey laminated limestone. Laminations probably		4026	77.8	82.0	3.7			79	1.1
					due to silty bands. White calcite vein network		4027	82.0	86.0	4.0			80.6	1.2
					comprising 20% of core vol. Between 80.6-82.0m veining		4028	86.0	90.8	4.4			82	1.4
					is so intense (60% of vol) that rock is 1st breccia with								85	3
					calcite matrix.								88	3
					Laminations contorted, but generally at low $\measuredangle$ to c.A								89.6	1.35
					Sphalerite veins, ave 2mm wide at 74.4m.								90.6	1.3
					Core competent, mostly as pieces >10cm. Broken								92.1	1.05
					zones 79.8-80.3m, 88.8-89.6m.								94	1.75
					74.9m So to c.A $\measuredangle$	20°							95.1	0.55
					82.0m " "	45°								
					85.0m " "	15°								
					86.8m " "	40°								
					90.0m " "	20°								
					* REDUCED TO NQ AT 77.8m.									
					* DOWNHOLE SURVEY 83m	51.5° → 054° MAG								
90.8	95.25	3.7	NQ		SILTSTONE		3314029	90.8	95.25	3.7				
					Grey well laminated siltstone, probably									
					calcareous. Upper contact with limestone gradational									
					between ~90-90.8m. Minor calcite veins,									
					generally 0.5-5mm wide, some ll to S_o, approx									
					5% of core volume. Between 92.5m-93m are									
					5-20mm wide siderite-sphalerite veins. Sp approx									
					5% of interval									
					Core moderately broken. Sheared 91.7-91.9m.									
					91.4 S_o to c.A $\measuredangle$	30°								
					92.2 " "	40°								
					93.2 " "	15°								

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 5 of 13

TENEMENT NAME..... No. .....

PLAN – MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. ZS1

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)	DRILL RUNS From	DRILL RUNS To	DRILL RUNS REC
95.25	115.6	15.4	NQ		LIMESTONE AND SILTSTONE		3314030	95.25	100.0	4.5		95.1	97	1.75
					Light grey weakly laminated limestone grading to darker grey, more strongly laminated calcareous siltstone. Gradations are broad and indistinct. Siltstone becomes more dominant with increasing depth.		4031	100.0	105.0	3.7			98.9	1.75
							4032	105.0	107.5	2.1			100	1.1
													102.6	2.4
							3314033	109.4	112.9	2.6			103.2	0.4
					Network of 0.5 to 5mm calcite veins, 5-10% of rock volume.		4034	112.9	115.6	2.5			105.2	1.0
													106	0.8
					Core competent above 100.5m, then strongly fractured below. Cavities 107.5-109.4m, and 50cm between 103.2-105.2m.		3313778	PET	102.0		Carbonaceous Siliceous Dolostone.		107.5	1.2
													109.4	0
													109.9	0.4
					At ~~97.1~~ 113.8m is narrow sp-ga vein that overprints calcite network veins.								111.5	1.5
													112.9	0.7
					97.1m S_o to c.A. ∡ 45°								115	2.0
					102.0 " " 10								115.6	0.5
					102.4 " " 20								119.2	0
					103.4 " " 25								121	1.45
					110.3 " " 5									
					113.2 " " 5									
					113.8 " " 10°	$S_o \rightarrow V_{sp}$ ∡ 85°								
					113.8 V_{spga} ∡ 20°									
115.6	119.2	0	NQ		CAVITY								CO	
													CO	
119.2	120.3	0.9	NQ		SIDERITE VEIN		3314035	119.2	120.3	0.9			CO	
					Light brown. Coarse g/s siderite vein with 1-2% each of sphalerite and galena.								CO	
													CO	

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

TENEMENT NAME..... No. .....

PLAN – MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. ZS1

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)	DRILL RUNS From	DRILL RUNS To	DRILL RUNS Rec
20.3	121.0	0.55	NQ		MASSIVE (VEIN) SULPHIDE		3314036	120.3	121.0	0.55		121.0	121.8	0.8
					Massive (probably vein) sulphide composed of 40% galena, 20% sphalerite, 10% pyrite 30% siderite and calcite gangue.								124	2.1
					Sulphide is cavernous and vuggy – at low ∠ to C.A ~20°. True width is therefore <0.7m.								124.3	0.25
													126.7	1.65
												?	128.9	0.6
													129.3	1.8
													130.0	0.55
121.0	121.35	0.35	NQ		SIDERITE VEIN		3314037	121.0	121.35	0.35			133	2.75
					As for 119.2 – 120.3m but with 5mm sp-ga vein at 121m = end of massive sulphide vein.								136	2.95
					121m V_s – C.A ∠ 20°								139	2.8
													139.5	0.6
													142	2.5
21.35	124.3	2.8	NQ		SIDERITE ALTERED LIMESTONE		3314038	121.35	124.3	2.8				
					Light grey with light brown tinge. Massive fine g/s carbonate rock with minor to moderate amounts of siderite as veins and pervasive alteration. Also 5-10% white calcite veins. Minor sp-ga-py mineralisation associated with heaviest siderite development, especially 123.7m.									
124.3	141.0	15.1	NQ		LIMESTONE		3314039	124.3	129.3	4.05				
					Light grey massive unlaminated. Network of 0.5–3mm wide calcite veins, 5-10% of core vol.		4040	129.3	133.0	3.3				
					Locally (esp 130–133m) 1st shows sedimentary breccia textures – 1-5mm grey 1st fragments in light grey 1st matrix.		4041	133.0	138.0	4.9				
					Some black convoluted material at 135.4, look like stylolites.		4042	138.0	141.0	2.9				
					Partly sheared + more intensely calcite veined 130–130.8m.									
					Low levels ~0.5% sp-ga throughout interval in									

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 7 of 13

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZS1

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) DRILL RUNS From	TO	REC	RQ
124.3	141.0	CTD			calcite and siderite veins. Siderite veins overprint calcite veins. Better mineralisation at 129.4m, 132.3m, 132.9m.						142	145	2.65	3
												147.2	1.65	2
					130.3 Calcite breccia – C.A ∡ 35°	Bx$_{cc}$ – V$_{cc}$ ∡ 0°								
					130.4 V$_{cc}$ – C.A. 65°									
					130.45 Bx$_{cc}$ 40°									
					130.6 V$_{cc}$ 65°									
					131.3 V$_{cc}$ 50°									
					132.9 V$_{cc\,sp}$ 70°									
					136.2 V$_{sid}$ 20°									
					136.7 V$_{cc}$ 80°									
					138.8 V$_{cc}$ 70°									
41.0	143.5	2.3	NQ		SIDERITE VEINED LIMESTONE		3314043	141.0	143.5	2.3				
					Light grey to light brown calcite veined limestone as for 124.3 – 141 m.									
					Irregular vuggy light brown siderite veins 2-10mm wide, at low ∡ to C.A 5-10% of core vol.									
					Locally contains traces of sp minerals									
					141.2m V$_{sid}$ – CA 10°									
43.5	147.2	1.95	NQ		SIDERITE VEIN		3314044	143.5	145.0	1.3				
					Light brown coarse gls vuggy siderite vein with 1-2% each of sp-ga-py. Within the vein are ragged-rimmed pieces of dark grey totally silicified limestone. These pieces are cut by very fine veinlets of siderite ± sp-ga.		4045	145.0	147.2	1.65				
					Possibility the siderite "vein" is total pervasive siderite alteration of limestone?									
					Between 144.4 – 144.7m is siderite veined lst as for 141 – 143.5m.									

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

TENEMENT NAME..... No. .....

PLAN – MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. ZS1

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)	DRILL RUNS From	To	REC.	RQ
147·2	150·5	2·1	NQ		LIMESTONE Massive calcite veined limestone as for 124·3-141m.		3314046	147·2	150·5	2·1		147·2	148	065	4
													150·1	1·1	5
													153·2	2·7	3
50·5	154·0	2·65	NQ		SIDERITE VEINED LIMESTONE As for 141-143·5m.		3314047	150·5	154·0	2·65			154	0·3	5
														incl casing	4 qtz
54·0	155·65	1·6	NQ		SIDERITE VEINED LIMESTONE As above, but siderite veins and local pervasive alteration comprise 10-15% of core vol. Siderite veins also contain significant sp-ga-py minerals. Sulphide % py 2%, sp 1%, ga 0·5% 155m V_{sid-sp} -CA ∢ 5°] V_{sid}-V_{cc} ∢ 90° 155m V_{cc} -CA ∢ 65°]		3314048	154·0	155·65	1·6		154	157	2·9	2
													159·2	2·0	2
													162·3	2·9	3
155·65	158·35	0·7	NQ		SIDERITE VEIN Light brown (may be totally siderite altered limestone?) Minor fragments of dark grey ragged-rimmed silicified rock. Abundant coarse gls sp 5% and ga 1%. Sp as zoned crystals, yellow-brown cores, rusty brown rims.		3314049	155·65	158·35	0·7					
158·35	162·85	6·0	NQ		SIDERITE VEINED ~~LIMESTONE~~ QUARTZITE? ~~Carbonate veining.~~ Gradual increase in streak hardness and decrease in calcite veining. May be silicified lst? Light grey, massive - fine gls. 20% coarse gls siderite veins at low ∢ to C.A, locally with sp-ga minerals - especially 157·35m. Interval contains 1% py, 0·5% sp+ga. Massive siderite 161·5-162·3m with minor sp.		3314050	158·35	159·35	2·8					
							4051	159·35	162·85	3·2					
							3313719	PET	161·7		Siderite Rock				

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 9 of 13

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZS1

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From M	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....)	DRILL RUNS From	To	REC	RQ
					157.35 $V_{sed-sp-qa}$ – C.A ⟩	20°						162.3	162.3	0.95	3
					157.9 V_{qa-sp} – ⟩	15°							166	2.45	2
					159.3 V_{sed-sp} –	15°							169	3.1	2
													172	3.1	2
162.85	172.35	9.38	NQ		QUARTZITE ?		3314052	162.85	167.6	4.5			173.3	1.2	3
					Light grey massive qtzite (silicified lst?) and interbedded grey siltstone. Carbonate may be present as black, convoluted stylolites are developed on some qtzite–siltstone contacts.		4053	167.6	172.35	4.85			175	1.7	2
							3313780	PET	167.2		Banded Chert–Carbonate Rock.		177.4	2.2	3
					2–5% of 0.2–2mm calcite network veins.										
					Carbonate vein breccia between 165.8 – 166.5m.										
					167.3 S_o – C.A. ⟩	25°									
					168.4 S_o ⟩	20°									
					170.0 S_o ⟩	37°									
					171.2 S_o ⟩	30°									
172.35	176.45	4.0	NQ		QUARTZITE BRECCIA		3314054	172.35	176.45	4.0					
					Light grey massive quartzite (silicified lst?) breccia becoming less brecciated and more strongly calcite veined below 174.6m.										0.6 0.8 1.1 0.5 1.1
					Breccia fragments are generally not angular, and appear to have been plastic during brecciation (∴ sedimentary?). Breccia is now silicified.										
					Below 174.6m interval contains 20% of 0.5–10mm white calcite veins.										
					DOWNHOLE SURVEY 166m	–53° → 051° MAG									

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

TENEMENT NAME..... No. .....
PLAN – MAP REFERENCE.....
CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. ZS1
RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)	DRILL RUNS From	DRILL RUNS To	DRILL RUNS Rec	DRILL RUNS RQ
176.45	194.2	15.6	NQ		LAMINATED SILTSTONE		3314055	176.45	181.0	3.7		177.4	178	0	5
					Dark grey finely laminated siltstone. Laminations 1-5mm wide interbedded 1st units at 179.4-179.9 and		4056	181.0	186.0	3.0			184	1.1	5
					189.6m. Silicified 1st breccia (quartzite breccia?) at		4057	186.0	191.0	4.85			187	2.85	3
					186.5-187.9m.		4058	191.0	194.2	3.05			190	3.0	4
					Numerous 0.5-5mm calcite veins in a preferred								193	2.75	4
					orientation - ie not network veins. Angular siltstone								196	2.9	3
					fragments commonly caught up in veins.								199	2.75	2
					Minor very fine disseminated py in siltstone, ~2%								202	2.90	2
					Trace chalcopyrite? at 181.6m.								203.8	1.75	3
					178.3 S_o - C.A ∢ 5°										
					179 S_o ∢ 0°										
					181.2 V_{cc} ∢ 55°] S_o-V_{cc} ∢ 85°										
					181.2 S_o ∢ 10°]										
					186 S_o ∢ 0°										
					188.6 S_o ∢ 0°										
					189 S_o ∢ 0°										
					189.2 S_o ∢ 15°										
194.2	203.2	8.55			LIMESTONE		3314059	194.2	199.0	4.45					
					Light grey massive limestone. 10% calcite		4060	199.0	203.2	4.1					
					veins 0.5-3mm wide.										
					194.2-197.6 1st breccia (sedimentary?)										
					197.6-198.2 laminated siltstone										
					200 -203.2 30% calcite network veins										
					197.8 S_o - C.A ∢ 15°										

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 11 of 13

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZS1

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT HQ 54-78m DPO No(s) 71523

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....)	DRILL RUNS From	DRILL RUNS To	DRILL RUNS REC	DRILL RUNS RQ
203.2	212.6	9.55	NQ		LAMINATED SILTSTONE		3314061	203.2	208.2	5.2		203.8	206.8	3.2	3
					Grey laminated siltstone, probably calcareous.		4062	208.2	212.6	4.35			208.2	1.45	3
					Laminations 5-30 mm wide. Boundaries with limestone								211	2.75	1
					are gradational								214	3.45	2
					5-10% of calcite network veins 0.5-3mm. Minor								217	2.45	2
					sp-calcite veins 211.8-212.1m.								220	2.9	2
					203.8 So - CA ∡ 0°								223	3.2	3
					204.7 So 15°								226	2.75	5
					205 So 27°										
					205.2 So 0°	fold									
					208 So 21°										
					209 So 20°										
					211 So 20°										
212.6	216.3	3.6	NQ		LIMESTONE		3314063	212.6	216.3	3.6					
					Light grey limestone with distorted bedding grading to										
					limestone breccia. May be sedimentary/diagenetic										
					deformation?										
					20% calcite stockwork veins 0.5-10mm wide										
216.3	222.95	6.75	NQ		SIDERITE VEINED LIMESTONE		3314064	216.3	219.6	3.2					
					Light grey massive and brecciated limestone with		4065	219.6	222.95	3.55					
					intense calcite and siderite veining. Calcite as										
					1-10mm wide stockwork veins locally containing										
					floating angular lst fragments.										
					Siderite as 5-20mm veins that overprint										
					calcite veins. 10% of core volume overall, but up										
					to 40% between 217-219.5m.										

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 12 of 13

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZS1

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....)
222.95	223.8	0.8	NQ		SIDERITE BRECCIA Yellow-grey. Dark grey angular siltstone fragments in siderite matrix. Matrix supported. Appears to be controlled along S_0 direction. 10% of 1-5mm siderite veins cross-cutting siderite breccia ⇒ later. Breccia – C.A. ∠ 13°		3314066	222.95	223.8	0.8	
223.8	228.3	3.7	NQ		SIDERITE ALTERED + VEINED LIMESTONE Yellow-grey limestone with 40% pervasive siderite alteration and 20% siderite veins 1-10mm wide. Limestone cut by greasy black carbonaceous shears at low ∠ to C.A. Very greasy (bituminous?) when mixed with water. Significant py-sp-ga mineralisation at boundaries between shears - lst. Approx 20% py, 5% sp and 1% ga. 40% dissem py in lst between 226-226.8m		3314067 4068 4069 4070	223.8 224.6 225.7 226.9	224.6 225.7 226.9 228.3	0.8 1.0 0.9 1.0	
228.3	231.5	2.8	NQ		SHEARED CARBONACEOUS UNIT. Greasy black sheared and brecciated carbonaceous unit. Fine g/s. Unit may not be sedimentary but structurally remobilised. Minor zones of siderite altered and veined limestone. 5% dissem very fine g/s py. Minor sp-ga in siderite veins adjacent to carbonaceous – limestone contacts <1% combined sp+ga.		3314071	228.3	231.5	2.8	
231.5	232.65	1.0	NQ		SIDERITE ALTERED AND VEINED LIMESTONE As for 223.8-228.3 but not cut by carb shears. Approx 2% sp 0.5% ga in siderite veins, especially at 232.65		3314072	231.5	232.65	1.0	

DRILL RUNS From	To	Rec	Rq
226	228	1.5	5
	229.9	1.6	5
	230.7	0.7	5
	232.2	1.3	4

CORE LOSS

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

TENEMENT NAME..... No. .....
PLAN – MAP REFERENCE.....
CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH 251.0m HOLE No. ZS1
RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s) 71523

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)
232.65	241.4	8.4	NQ		CARBONACEOUS SHALE Shiny black sheared highly carbonaceous shale. 2% of white calcite tension veins 0.5-1mm wide. 5% very fine g/s dissem py. 237.3m S_o - C.A ∡ 15°		3314073	232.65	234.0	1.3
							4074	234.0	236.0	2.2
							4075	236.0	238.0	1.8
							4076	238.0	240.0	1.8
							4077	240.0	241.4	1.3
241.4	247.45	5.7	NQ		SIDERITE AND QUARTZ VEINED LIMESTONE Light grey laminated silty limestone, laminations strongly deformed. 10% siderite veins 3-20mm wide, locally with sp+ga mineralisation. 10% milky quartz veins 20-50mm thick, brecciated and cut by siderite veins. 0.5% each of sp+ga. Best minerals 245.8m 247.8m Vsid - C.A ∡ 30°		3314078	241.4	244.4	2.7
							4079	244.4	247.45	3.0
247.45	251.0	3.3	NQ		LIMESTONE Light grey laminated silty limestone. 5% milky quartz veins 5-30mm wide. 2% calcite veins 2mm wide. DOWNHOLE SURVEY 241m 52.5° → 051° MAG END OF HOLE = 251m		3314080	247.45	251.0	3.3

ASSAY VALUES (Analysed by.....)

DRILL RUNS

From	To	Rec	RQ
232.2	233.5	1.2	5
	234.2	0.7	5
	237.1	3.0	5
	238.4	1.1	5
	240.3	1.8	5
	241.5	1.05	5
	244	2.3	3
	247	2.95	2
	250	2.9	2
	251	0.8	4

ZS1 251.0m

957102

STONEHENGE DRILLHOLE LEDGERS AND ASSAYS										
Results in ppm except Fe (%).										
Database last updated on13/10/93										
SAMPNO.	DPO	HOLE	DFROM	DTO	BMRLITH	RELDID	TEXTURE	ALT/MIN	COLOUR	COMMENTS
		DD92ZS1	0.00	14.50						NO REC.
3314010	71523	DD92ZS1	14.50	17.10	Pou	Sss			WLG	
3314011	71523	DD92ZS1	17.10	20.50	Pou	Sss			WLG	
		DD92ZS1	20.50	25.00						NO REC.
3314012	71523	DD92ZS1	25.00	28.00	Pou	Sss			WLG	
3314013	71523	DD92ZS1	28.00	30.40	Pou	Sss			WLG	
3314013	71523	DD92ZS1	30.40	32.50	Pou	CsCcy			WLG	
		DD92ZS1	32.50	34.00						NO REC.
3314014	71523	DD92ZS1	34.00	35.50	Pou	Sss			WLG	
3314014	71523	DD92ZS1	35.50	37.00	Pou	Mq	SlVuDs	Py	G	
3314015	71523	DD92ZS1	37.00	41.70	Pou	Mq	SlVuDs	Py	G	
3314016	71523	DD92ZS1	41.70	43.80	Pou	Mq	SlVuDs	Py	G	
3314017	71523	DD92ZS1	43.80	45.90	Pou	Mq	SlVu		LG	
3314018	71523	DD92ZS1	45.90	49.00	Pou	Mq	SlVu		LG	
3314019	71523	DD92ZS1	49.00	52.00	Pou	Mq	SlVu		LG	
		DD92ZS1	52.00	58.00						NO REC.
3314020	71523	DD92ZS1	58.00	61.10	Pou	Mq	SlVu		LG	
3314021	71523	DD92ZS1	61.10	63.40	Pou	Sbs	ShDs	Py	N	
3314022	71523	DD92ZS1	63.40	65.80	Pou	Sbs	ShDs	Py	N	
3314023	71523	DD92ZS1	65.80	68.10	Pou	Sbs	ShDs	Py	N	
3314024	71523	DD92ZS1	68.10	72.90	Pou	Sls	Vn	Cc	WLG	
3314025	71523	DD92ZS1	72.90	77.80	Pou	Sls	LmVn	Cc	LG	
3314026	71523	DD92ZS1	77.80	82.00	Pou	Sls	LmVn	Cc	LG	
3314027	71523	DD92ZS1	82.00	86.00	Pou	Sls	LmVn	Cc	LG	
3314028	71523	DD92ZS1	86.00	90.80	Pou	Sls	LmVn	Cc	LG	
3314029	71523	DD92ZS1	90.80	95.25	Pou	Ssi	LmVs	Sp	G	
3314030	71523	DD92ZS1	95.25	100.00	Pou	SlsSsi	LmVn	Cc	ALDG	
3314031	71523	DD92ZS1	100.00	105.00	Pou	SlsSsi	LmVn	Cc	ALDG	
3314032	71523	DD92ZS1	105.00	107.50	Pou	SlsSsi	LmVn	Cc	ALDG	
3314033	71523	DD92ZS1	109.40	112.90	Pou	SlsSsi	LmVn	Cc	ALDG	
3314034	71523	DD92ZS1	112.90	115.60	Pou	SlsSsi	LmVn	Cc	ALDG	
		DD92ZS1	115.60	119.20						NO REC.
3314035	71523	DD92ZS1	119.20	120.30	D	Ovc	Vs	SdSpGa	LB	
3314036	71523	DD92ZS1	120.30	121.00	D	Oms	Vs	GaSpPy	SB	
3314037	71523	DD92ZS1	121.00	121.35	D	Ovc	Vs	SdSpGa	LB	
3314038	71523	DD92ZS1	121.35	124.30	Pou	Sls	AlVs	SdSpGa	LGB	
3314039	71523	DD92ZS1	124.30	129.30	Pou	Sls	Vn	Cc	LG	
3314040	71523	DD92ZS1	129.30	133.00	Pou	Sls	Vn	Cc	LG	
3314041	71523	DD92ZS1	133.00	138.00	Pou	Sls	Vn	Cc	LG	
3314042	71523	DD92ZS1	138.00	141.00	Pou	Sls	Vn	Cc	LG	
3314043	71523	DD92ZS1	141.00	143.50	Pou	Sls	Vn	SdCcSp	LGB	
3314044	71523	DD92ZS1	143.50	145.00	D	Ovc	Vs	SdSpGa	LB	
3314045	71523	DD92ZS1	145.00	147.20	D	Ovc	Vs	SdSpGa	LB	
3314046	71523	DD92ZS1	147.20	150.50	Pou	Sls	Vn	Cc	LG	
3314047	71523	DD92ZS1	150.50	154.00	Pou	Sls	Vn	SdCcSp	LGB	
3314048	71523	DD92ZS1	154.00	155.65	Pou	Sls	AlVn	SdCcSp	LGB	
3314049	71523	DD92ZS1	155.65	156.35	D	Ovc	Vs	SdSpGa	LB	
3314050	71523	DD92ZS1	156.35	159.35	Pou	Sls?	Sl?Vn	SdSpGa	LG	
3314051	71523	DD92ZS1	159.35	162.85	Pou	MqSls?	Sl?Vn	SdSpGa	LG	
3314052	71523	DD92ZS1	162.85	167.60	Pou	MqSls?	Ma		LG	
3314053	71523	DD92ZS1	167.60	172.35	Pou	MqSls?	Ma		LG	
3314054	71523	DD92ZS1	172.35	176.45	Pou	MqSls?Sbx	Vn	Cc	LG	
3314055	71523	DD92ZS1	176.45	181.00	Pou	Ssi	LmDs	Py	DG	
3314056	71523	DD92ZS1	181.00	186.00	Pou	Ssi	LmDs	Py	DG	
3314057	71523	DD92ZS1	186.00	191.00	Pou	Ssi	LmDs	Py	DG	
3314058	71523	DD92ZS1	191.00	194.20	Pou	Ssi	LmDs	Py	DG	
3314059	71523	DD92ZS1	194.20	199.00	Pou	Sls	Vn	Cc	LG	
3314060	71523	DD92ZS1	199.00	203.20	Pou	Sls	Vn	Cc	LG	
3314061	71523	DD92ZS1	203.20	208.20	Pou	Ssi	Lm		G	
3314062	71523	DD92ZS1	208.20	212.60	Pou	Ssi	Lm		G	
3314063	71523	DD92ZS1	212.60	216.30	Pou	Sls	Vn	Cc	LG	
3314064	71523	DD92ZS1	216.30	219.60	Pou	Sls	AlVn	SdCc	LGB	
3314065	71523	DD92ZS1	219.60	222.95	Pou	Sls	AlVn	SdCc	LGB	
3314066	71523	DD92ZS1	222.95	223.80	D	Obx	AlDs	Sd	YG	
3314067	71523	DD92ZS1	223.80	224.60	Pou	Sls	AlVn	SdSpPyGa	YG	
3314068	71523	DD92ZS1	224.60	225.70	Pou	Sls	AlVn	SdSpPyGa	YG	
3314069	71523	DD92ZS1	225.70	226.90	Pou	Sls	AlVn	SdSpPyGa	YG	
3314070	71523	DD92ZS1	226.90	228.30	Pou	Sls	AlVn	SdSpPyGa	YG	
3314071	71523	DD92ZS1	228.30	231.50	Pou	Sbs	ShDs	Py	N	
3314072	71523	DD92ZS1	231.50	232.65	Pou	Sls	AlVn	SdSpPyGa	YG	
3314073	71523	DD92ZS1	232.65	234.00	Pou	Sbs	ShDs	Py	N	
3314074	71523	DD92ZS1	234.00	236.00	Pou	Sbs	ShDs	Py	N	
3314075	71523	DD92ZS1	236.00	238.00	Pou	Sbs	ShDs	Py	N	
3314076	71523	DD92ZS1	238.00	240.00	Pou	Sbs	ShDs	Py	N	
3314077	71523	DD92ZS1	240.00	241.40	Pou	Sbs	ShDs	Py	N	
3314078	71523	DD92ZS1	241.40	244.40	Pou	Sls	Vn	SdSpGa	LG	
3314079	71523	DD92ZS1	244.40	247.45	Pou	Sls	Vn	SdSpGa	LG	
3314080	71523	DD92ZS1	247.45	251.00	Pou	SlsSsi	Lm		LG	

SAMPNO.	HOLE	DFROM	DTO	Ag	As	Cu	Fe%	Pb	Zn	Au	Bi	Cd	Mn	Mo	Sb	Sn
	DD92ZS1	0.00	14.50													
3314010	DD92ZS1	14.50	17.10	-1	30	36	0.39	26	315							
3314011	DD92ZS1	17.10	20.50	-1	8	32	0.32	34	365							
	DD92ZS1	20.50	25.00													
3314012	DD92ZS1	25.00	28.00	-1	19	41	0.65	30	490							
3314013	DD92ZS1	28.00	30.40	1	17	35	0.61	110	290							
3314013	DD92ZS1	30.40	32.50	1	17	35	0.61	110	290							
	DD92ZS1	32.50	34.00													
3314014	DD92ZS1	34.00	35.50	2	50	22	0.98	390	235							
3314014	DD92ZS1	35.50	37.00	2	50	22	0.98	390	235							
3314015	DD92ZS1	37.00	41.70	1	39	18	0.68	190	345							
3314016	DD92ZS1	41.70	43.80	-1	24	7	2.18	32	110							
3314017	DD92ZS1	43.80	45.90	1	39	8	12.6	1000	550							
3314018	DD92ZS1	45.90	49.00	1	15	46	10.8	165	335							
3314019	DD92ZS1	49.00	52.00	1	22	24	6.4	65	485							
	DD92ZS1	52.00	58.00													
3314020	DD92ZS1	58.00	61.10	1	12	68	17.7	13	330							
3314021	DD92ZS1	61.10	63.40	1	75	110	1.51	120	120							
3314022	DD92ZS1	63.40	65.80	2	100	135	1.1	1150	1150							
3314023	DD92ZS1	65.80	68.10	3	75	96	0.9	1000	240							
3314024	DD92ZS1	68.10	72.90	2	50	21	1.1	350	1650							
3314025	DD92ZS1	72.90	77.80	1	75	15	2.88	495	2700							
3314026	DD92ZS1	77.80	82.00	1	75	7	3.98	580	675							
3314027	DD92ZS1	82.00	86.00	1	45	5	1.72	260	88							
3314028	DD92ZS1	86.00	90.80	-1	10	4	2.39	97	88							
3314029	DD92ZS1	90.80	95.25	1	30	17	3.92	130	1600							
3314030	DD92ZS1	95.25	100.00	1	20	5	2.21	150	365							
3314031	DD92ZS1	100.00	105.00	4	17	150	2.69	28	115							
3314032	DD92ZS1	105.00	107.50	-1	27	6	2.81	12	205							
3314033	DD92ZS1	109.40	112.90	1	15	4	3.27	190	420							
3314034	DD92ZS1	112.90	115.60	2	14	23	2.99	350	790							
	DD92ZS1	115.60	119.20													
3314035	DD92ZS1	119.20	120.30	22	2000	67	21.2	13600	14900	0.005	-10	61	69100	-5	250	27
3314036	DD92ZS1	120.30	121.00	540	27	795	0.4	285000	203000	0.01	-10	965	17100	-5	1420	510
3314037	DD92ZS1	121.00	121.35	26	160	87	18.2	6500	24800	-0.005	-10	110	66600	-5	352	65
3314038	DD92ZS1	121.35	124.30	4	27	16	3.84	1800	2200							
3314039	DD92ZS1	124.30	129.30	-1	6	3	0.72	47	375							
3314040	DD92ZS1	129.30	133.00	2	7	6	1.92	740	2500							
3314041	DD92ZS1	133.00	138.00	1	125	11	1.04	625	800							
3314042	DD92ZS1	138.00	141.00	1	100	5	0.67	250	650							
3314043	DD92ZS1	141.00	143.50	2	300	20	2.16	640	2200							
3314044	DD92ZS1	143.50	145.00	8	650	17	18.6	6200	6700	-0.005	-10	24	62500	-5	25	11
3314045	DD92ZS1	145.00	147.20	9	2200	18	18.8	6700	9200	-0.005	-10	35	71600	-5	39	16
3314046	DD92ZS1	147.20	150.50	1	950	5	1.48	285	2000	-0.005	-10	8.2	4800	-5	5	3
3314047	DD92ZS1	150.50	154.00	4	2150	17	10.6	2600	15300	0.005	-10	56	30100	-5	11	19
3314048	DD92ZS1	154.00	155.65	9	4550	50	4.46	6000	33000	0.005	-10	150	27300	-5	33	13
3314049	DD92ZS1	155.65	156.35	14	4900	67	21.1	9500	94200	0.005	-10	355	74000	-5	116	28
3314050	DD92ZS1	156.35	159.35	9	2600	24	10.1	6600	14400	0.005	-10	55	33600	-5	32	13
3314051	DD92ZS1	159.35	162.85	3	275	11	10.7	2500	11300	-0.005	-10	44	32200	-5	11	4
3314052	DD92ZS1	162.85	167.60	1	28	14	0.95	215	305							
3314053	DD92ZS1	167.60	172.35	1	49	13	0.64	55	80							
3314054	DD92ZS1	172.35	176.45	-1	-1	5	1.09	81	66							
3314055	DD92ZS1	176.45	181.00	1	10	23	1.63	81	49							
3314056	DD92ZS1	181.00	186.00	1	8	49	3.09	47	53							
3314057	DD92ZS1	186.00	191.00	-1	1	12	0.92	15	58							
3314058	DD92ZS1	191.00	194.20	-1	3	8	3.14	20	320							
3314059	DD92ZS1	194.20	199.00	-1	27	53	1.66	30	48							
3314060	DD92ZS1	199.00	203.20	-1	-1	10	0.81	36	150							
3314061	DD92ZS1	203.20	208.20	-1	4	6	0.92	65	110							
3314062	DD92ZS1	208.20	212.60	1	100	7	1.3	260	285							
3314063	DD92ZS1	212.60	216.30	1	1200	12	3.05	920	1600							
3314064	DD92ZS1	216.30	219.60	1	300	22	4.64	260	115							
3314065	DD92ZS1	219.60	222.95	-1	16	13	3.18	47	36							
3314066	DD92ZS1	222.95	223.80	1	26	42	21.4	31	88							
3314067	DD92ZS1	223.80	224.60	15	325	225	1.31	5400	13600	0.01	-10	52	8400	25	148	24
3314068	DD92ZS1	224.60	225.70	7	1350	77	0.32	1600	17900	0.01	-10	74	13200	6	24	14
3314069	DD92ZS1	225.70	226.90	4	700	15	22.5	885	1150	-0.005	-10	5.2	49100	-5	18	9
3314070	DD92ZS1	226.90	228.30	15	425	185	0.99	8800	39000	0.01	-10	160	13000	10	36	41
3314071	DD92ZS1	228.30	231.50	11	225	76	2.33	4900	7600	0.01	-10	28	13900	30	41	20
3314072	DD92ZS1	231.50	232.65	5	50	37	18.7	3600	18300	-0.005	-10	76	66700	-5	5	20
3314073	DD92ZS1	232.65	234.00	10	125	77	2.22	5900	8100	0.005	-10	28	11300	30	52	23
3314074	DD92ZS1	234.00	236.00	5	100	68	1.06	375	660							
3314075	DD92ZS1	236.00	238.00	3	100	69	1.36	210	285							
3314076	DD92ZS1	238.00	240.00	83	225	1900	0.95	340	720	0.01	-10	4	1100	30	810	5
3314077	DD92ZS1	240.00	241.40	3	100	110	0.86	180	290							
3314078	DD92ZS1	241.40	244.40	1	42	27	2.73	580	1750							
3314079	DD92ZS1	244.40	247.45	5	50	14	3.61	3050	3350							
3314080	DD92ZS1	247.45	251.00	2	22	12	2.54	135	235							

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CRA EXPLORATION PTY. LIMITED

DRILL-HOLE SUMMARY LOG

EL NAME: ZEEHAN 1 HOLE NAME: DD92ZS2
EL NUMBER: EL 28/88 PROSPECT: STONEHENGE
DATE DRILLED: NOV 1992
LOGGED BY: RGP

AMG EAST: 359800E GRID EAST: 12100E
AMG NORTH: 5359385N GRID NORTH: 5200N
RL: ~257.5m ASL TOTAL DEPTH: 250.0m

DEPTH	AZIM. (MAG)	INCLIN.
0	048°	-45°
83	052°	-47°
166	052.5°	-50°
249	054.5°	-52°

OBJECTIVES OF HOLE:

To test Grubbs Shear Zone where it is interpeted to intersect Oonah Fm black shales. Potential focus or zone of enrichment of Zn minerals. ~100m along shear from hole ZS1.

LITHOLOGICAL SUMMARY:

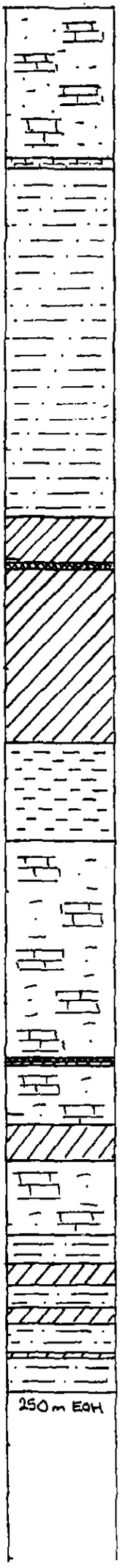
DFROM	DTO	COMMENTS
0	30.0	Siltstone + dolomite
30.0	93.0	Banded Greywacke
93.0	100.5	Siderite alteration zone.
100.5	101.85	MASSIVE SP-PY-GA MINERALISATION
101.85	133.0	Siderite alteration zone.
123.0	151.0	Carbonaceous Shale
151.0	190.25	Dolomite
190.25	190.5	MASSIVE PY-SP-GA MINERALISATION
190.5	191.0	Siderite alteration zone.
191.0	202.0	Dolomite
202.0	208.0	Siderite alteration zone.
208.0	221.9	Dolomite
221.9	250.0	Banded Greywacke with siderite alteration between 227-231, 235-237.8 and 243-244m.

MINERALISATION SUMMARY:

DFROM	DTO	COMMENTS (0.5% Zn cut-off)
100.5	136.0	35.5m @ 2.13% Zn 0.56% Pb 10.4 ppm Ag
190.25	191.0	0.75m @ 7.12% Zn 4.48% Pb 138.3 Ag 0.98% Cu

CONCLUSIONS:

Wide zones of low-grade sphalerite mineralisation within structurally controlled NNW-trending siderite alteration envelopes. Massive sulphide zone containing Cu may be significant.



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C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 1 of 7

TENEMENT NAME ZEEHAN 1 No. EL 28/88

PLAN – MAP REFERENCE

CO-ORDINATES 12000E 5200N AZIMUTH 048° MAG DRILLERS DD TAS COMMENCED 23/11/92 DEPTH 250.0m HOLE No. DD92ZS2

RL COLLAR ~257.5m ASL INCLINATION -45° DRILL TYPE LY38 COMPLETED 1/12/92 CASING LEFT HW DPO No(s) 71524

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....)
0	0.2	–	ROLLER		IRONSTONE Yellow-brown vuggy surficial ironstone						
0.2	~2.0	–	ROLLER		WEATHERED SHALE. White to light grey. After black shale/siltstone.						
~2	10	–	ROLLER		SILTSTONE Black siltstone with disseminated pyrite.						
10.0	27.8	2.5	HQ		LAMINATED SILTSTONE Dark grey laminated siltstone with minor black shale and dolomite beds. Bedding strongly disrupted and brecciated. 5-10% dolomite veins 0.5-3mm wide, ave 1mm. 1% siderite veins 5mm wide 2-5% dissem py preferentially in silty beds.		3314081	10.0	16.0	0.5	
							4082	16.0	22.0	1.85	
							4083	25.0	30.0	0.8	
27.8	30.0	0.65	HQ		DOLOMITE Light grey clay altered and locally brecciated dolomite. Convoluted black stylolites common. 10% dolomite veins 0.5-5mm wide, ave 2mm.						
		38.9					3313181	PET	58.0		Carbonaceous, Chert, Ankerite Rock.
30.0	86.5	[illegible]	HQ/NQ		BANDED GREYWACKE. Grey banded rock comprised of white quartz, dark grey siltstone and probable dolomite. Bands appear to be tectonic, not sedimentary – ie wispy fine grained sediment wrapping around quartz schlieren. Traces of very fine gls dissem py, <0.5%. Between 33.8-37m is siderite altered and veined greywacke, 20-40% siderite.		3314084	30.0	35.0	2.9	
							4085	35.0	40.0	4.2	
							4086	40.0	45.4	4.55	
							4087	45.4	50.0	3.05	
							4088	50.0	55.0	4.3	
							4089	55.0	60.0	4.8	
							4090	60.0	65.0	3.5	
							4091	65.0	70.0	3.9	
							4092	70.0	76.0	2.6	

DRILL RUNS

From	TO	REC	RQ
0	10	–	–
10	13	0.15	5
13	16	0.35	5
	19	0.7	5
	19.8	0.45	5
	22	0.7	5
	25	0	5
	28	0.3	5
	31	1.05	4
	32.4	0.3	5
	33.8	0.9	4
	34.8	0.95	4
	36.2	1.2	4
	38.2	1.8	2
	39.8	1.2	4
	41.7	1.7	3
	43	0.75	3
	45.4	2.3	2
REDUCE HQ-NQ			45
45.4	47.5	1.55	2
	48.4	1.3	2
	51.5	2.4	3
	53	1.3	2
	55	1.8	3
	58	2.85	2
	60.7	2.65	2
	63.8	2.8	3
incl 1.6m cavity	66.9	1.2	4
	67.3	0.4	2
	70	2.3	3
	73	2.3	3

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

957106

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZS 2

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....)	DRILL RUNS From	DRILL RUNS To	DRILL RUNS REC	DRILL RUNS RQ
					45.2m banding – C.A	@ 20°	3314093	76.0	81.0	2.1	cavities	73	76	0.3	5
					56 " "	15°	4094	81.0	86.5	3.0			79	1.5	4
													82	1.0	4
86.5	93.0	4.25	NQ		DOLOMITE VEINED GREYWACKE		3314095	86.5	90.0	3.05			85	1.6	4
					Light grey banded greywacke as for 30.0 – 86.5m.		4096	90.0	93.0	1.2			86.2	1.15	3
					20% dolomite stockwork veins 0.5 – 5mm wide, ave 2mm.								88	1.0	5
					Possible pervasive dolomite/clay alteration as								91	2.8	4
					banding is indistinct and rock is generally soft.								94	0.45	5
													95.9	0.35	5
93.0	100.5	3.9	NQ		SIDERITE ALTERATION ZONE		3314097	93.0	95.9	0.5			97	0.8	5
					Yellow-grey totally altered rock, probably greywacke.		4098	95.9	98.8	1.7			97.8	0.3	5
					Highly vuggy – now honeycombed with numerous cavities.		4099	98.8	100.5	1.7			98.8	0.6	5
					20% siderite stockworks 0.2 – 5mm wide. Also		3313782	PET	96.0		Leached Ankerite Rock		100	1.15	4
					local pervasive siderite alteration.								100.8	0.9	4
					Traces of py-sp-ga in siderite veins, although								102.1	0.95	4
					total sulphide probably <1%.								103	0.5	4
													103.8	0.15	5
100.5	101.85	1.15	NQ		MASSIVE SULPHIDE		3314100	100.5	101.85	1.15			105.7	0.6	5
					Massive sp-py-ga in siderite gangue. Weak								106.8	0.35	5
					banding locally developed. Sp 60%, py 10%,								107.7	0.45	4
					ga 5%, siderite 25%.								108.1	0.25	4
													108.7	0.4	4
101.85	133.0	9.1	NQ		SIDERITE ALTERATION ZONE		3314101	101.85	103.8	0.8			109.6	0.65	4
					As for 93.0 – 100.5m.		4102	103.8	106.8	0.95	} [illegible]		112	0.45	5
					Local sp-ga mineralisation in siderite veins, approx		4103	106.8	107.7	0.45	}		115	0.25	1
					0.5% sp+ga.		4104	107.7	109.6	1.3			117.2	0.45	
					Core is extremely puggy and brecciated below		4105	109.6	112.0	0.45			118	0.3	
					112m with considerable core loss due to clay +		4106	112.0	115.0	0.25			119.5	0.2	
					broken core + cavities.		4107	115.0	118.0	0.75			121	0.5	
					120 – 122m is fault breccia. Angular rock fragments		4108	118.0	121.0	0.7			122	0.5	
					in dark grey clay matrix.		4109	121.0	124.0	0.95			123.2	0.2	

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C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 3 of 7

TENEMENT NAME..... No. .....

PLAN – MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. ZS2

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....) DRILL RUNS From	To	Rec	RQ
101.85	133.0		NQ		Between approx 130.5–131 is massive siderite with 30% py 10% sp · 5% ga.		3314110	124.0	127.0	0.7	123.2	124	0.25	5
	CTD				102.8 m Sp band – C.A. ∠ 30°		4111	127.0	130.0	0.8		125	0.3	
					107.2 sid breccia	∠ 25°	4112	130.0	131.5	0.8		127	0.4	
					107.3 V sid-sp	∠ 15°	4113	131.5	133.0	0.2		128	0.15	
												129	0.5	
												130	0.15	
133.0	151.0	5.15	NQ		CARBONACEOUS SHALE (SHEAR?)		3314114	133.0	136.0	0.6		131.5	0.8	
					Shiny black sheared carbonaceous rock. Unable to		4115	136.0	139.3	1.55		133	0.2	
					determine whether unit is a sheared shale, or		4116	140.5	143.5	1.2		134.5	0.45	
					totally remobilised carbonaceous shear. Strongly		4117	143.5	147.8	1.15		136	0.15	
					sheared, broken and puggy.		4118	147.8	151.0	0.65		136.6	0.4	
					5–10% very fine dissem py.							137.5	0.4	
												139	0.5	
51.0	190.25	22.65	NQ		DOLOMITE		3314119	151.0	154.0	1.15		139.3	0.25	
					Light grey. Strongly deformed, clay altered, brecciated		4120	154.0	158.5	0.45		140.5	0	
					and dolomite veined. Only rare sedimentary structures		4121	158.5	162.7	2.2		142	0.35	
					preserved – minor distorted bedding and sedimentary		4122	162.7	164.7	1.95		143.5	0.85	
					breccia beds.		4123	164.7	167.6	2.3		143.7	0.2	
					10% fine dolomite stockwork 0.1–1mm wide, ave 0.2mm.		4124	167.6	170.5	1.4		145	0.8	
					locally some 5mm dolomite veins with minor py at		4125	170.5	173.5	1.55		145.6	0.1	
					low ∠ to C.A.		4126	173.5	176.5	1.95		147.8	0.05	
					ie 153m V dol – C.A	∠ 20°	4127	176.5	181.0	3.3		148	0.3	
					165.4 "	25°	4128	181.0	187.0	3.7		151	0.35	5
					173 "	45°	4129	187.0	190.25	2.7		154	1.15	3
					Between 154m – 158.5m is a dark grey broken vuggy							157	0.2	5
					silicified zone with 5% dissem py ± tr sp+ga.							160	0.5	5
					Between 162.7 – 164.7m is silicified limestone.							161.1	0.5	5
					Core is massive and competent.							163	1.7	1
					Between 165.6 – 170.5 is totally clay altered +							165.2	2.2	1
					brecciated dolomite in fault zone.							167.6	1.8	5
												169	0.6	5

957108

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

TENEMENT NAME..... No. .....

PLAN – MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. ZS 2

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)
151.0	190.25 (CTD)				Between 170.5 – 176.5, dolomite is interbedded with carbonaceous black shale, 5% dissem py in shale bands.					
					173.2m So – C.A. ∡	15°				
					174 So	25°				
					176.3 So	35°				
					179.6 – 187 – interbedded dolomite – black shale as for 170.5 – 176.5m.					
					180 – 183 – fault breccia. Milled angular fragments of shale-dolomite in rock flour matrix. Soft, puggy.					
					183 – 190.25 – Strongly clay altered dolomite with minor black shale interbeds.					
					189.70 – 190.25 – Total clay alteration. Strong brecciation. Boundary with sulphide zone below is marked by 5mm carbonaceous shear.					
190.25	190.5	0.25	NQ		MASSIVE SULPHIDE		3314130	190.25	190.5	0.25
					Banded py-sp-ga. py = 40%, sp = 30%, ga = 10%, sidertic and carbonaceous gange = 20%.					
					Bands at high ∡ to C.A. ⇒ close to true width?					
					Upper-lower margins are marked by black carbonaceous shears.					
					Sulphide band – C.A ∡	60°				
					" " "	55°				
190.5	191.0	0.4	NQ		SIDERITE ALTERATION ZONE		3314131	190.5	191.0	0.4
					Yellow-grey very broken core with 20% pervasive siderite alteration. Original rock dolomite? Puggy with clay shears.					

ASSAY VALUES (Analysed by.....)

DRILL RUNS

From	To	REC	RQ
169	171.1	1.1	5
	172	0.35	5
	175	1.8	4
	176	0.75	5
	178	1.8	3
	179.6	1.0	5
	181	0.8	↑
	182.5	0.8	
	184	1.35	
	185.8	1.2	
	187	0.35	
	190	2.5	↓
	191	0.85	5

957109

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 5 of 7

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. 252

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) DRILL RUNS From	To	REC	RQ
191·0	202·0	9·2	NQ		DOLOMITE?		3314132	191·0	196·0	4·75	R1	193	20	1
					Grey dolomite? (or carbonate altered quartzite?).		4133	196·0	202·0	4·45		196	2·75	2
					Rock is too soft to be quartzite, and locally responds		3313783	PET	198·5		Brecciated Ankerite	199	3·0	1
					to HCl (but many fine calcite veins, pervasive alteration						Rock.	202	1·45	5
					also?), but no visible carbonate cleavage forms on							204·8	1·9	4
					grains.							206	0·7	5
					Strongly veined by dolomite, calcite, quartz,							208	1·5	5
					and siderite. 20% of core volume, veins 0·1–2mm							211	2·85	1
					wide. Dolomite, calcite and quartz are contemporaneous							214	3·0	3
					and intermixed in single veins. Siderite is later and							216	1·6	3
					is cross-cutting others.							218·9	2·25	5
					191 – 192.4 ± milled breccia.									
					198·4 Vsid – c.A ∡ 10°									
					199·9 " " ∡ 22°									
202·0	208·0	4·1	NQ		SIDERITE ALTERED GREYWACKE		3314134	202·0	205·0	2·0				
					Dark grey. Fine bands of quartz, dolomite		4135	205·0	208·0	2·1				
					and shale that appear to be a tectonic foliation									
					(ie as for 30 – 86·5m).									
					Local strong pervasive siderite alteration, siderite									
					approx 10% of interval. Core is vuggy where siderite									
					altered.									
					Dissem py throughout, ave 0·5%, but more									
					abundant around 203m.									
208·0	218·0	9·15	NQ		CARBONATE VEINED DOLOMITE?		3314136	208·0	213·0	4·85				
					Light grey dolomite? or carbonate altered quartzite?		4137	213·0	218·0	4·3				
					Intense dolomite-quartz-calcite veining, 50% of interval,		3313784	PET	210·8		Silicified Ankerite Rock.			
					mostly in 10–30mm massive veins, but with some									
					fine 0·1–1mm stockworks.									
					Stylolites developed locally.									

957110

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 7 of 7

TENEMENT NAME..... No. .....

PLAN – MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH 250 m HOLE No. ZS2

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....)
221.9	250.0	16.65	NQ		INTERBEDDED GREYWACKE - DOLOMITE		3314139	221.9	226.0	2.3	
	EOH				Grey, locally dark grey or yellow-grey.		140	226.0	230.0	1.8	
					Dominantly greywacke as for 202-208m but with		141	230.0	235.0	3.05	
					several 1-2m wide dolomite beds.		142	235.0	240.0	2.8	
					Greywacke zones are dark grey to yellow grey. Locally		143	240.0	245.0	3.4	
					pervasively sidente altered and silicified? Vuggy		144	245.0	250.0	3.3	
					where silicification is most intense (235-237.8m).						
					Dolomite beds are light grey with minor stylolite		3313785	PET	239.25		Carbonaceous, Cherty
					banding. Strong to total clay alteration of dolomite						Ankerite rock.
					locally.						
					5-10% dolomite veining confined to dolomite beds.						
					Sidente alteration is weak to moderate, 5-20%						
					of some intervals, but is patchily developed. Confined						
					to greywacke zones. Main sidente zones are						
					227-231m, 235-237.8m, 243-244m, and a						
					weak zone from 245.4-250m.						
					Core is cut by numerous clay alteration zones						
					and fault breccia zones. Entire interval may be						
					caught up in a wide fault zone.						
					222.4 S_0? (banding) - C.A. ≯ 45°						
					239.1 " 55						
					241 " 55						
					244.3 " 50						

DRILL RUNS

From	To	Rec	RQD
218.9	220	0.75	5
	222.6	1.8	4
	225.2	1.25	5
	227.5	1.35	5
	229	0.7	5
	232	1.0	5
	233.3	0.95	4
	235	1.4	5
	236.5	0.55	5
	237.8	0.9	5
	238.8	0.35	5
	241.9	2.65	4
	243.5	0.6	5
	246.5	1.45	4
	247	0.6	5
	250	2.4	5

957111

SAMPNO.	DPO	HOLE	DFROM	DTO	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	COMMENTS
		DD92ZS2	0.00	10.00						NO REC.
3314081	71524	DD92ZS2	10.00	16.00	Pou	Ssi	LmVnDs	Py	DG	
3314082	71524	DD92ZS2	16.00	22.00	Pou	Ssi	LmVnDs	Py	DG	
		DD92ZS2	22.00	25.00						NO REC.
3314083	71524	DD92ZS2	25.00	27.80	Pou	Ssi	LmVnDs	Py	DG	
3314083	71524	DD92ZS2	27.80	30.00	Pou	Sls	Vn	Cc	LG	
3314084	71524	DD92ZS2	30.00	35.00	Pou	Ssi?	Bn		G	
3314085	71524	DD92ZS2	35.00	40.00	Pou	Ssi?	Bn		G	
3314086	71524	DD92ZS2	40.00	45.40	Pou	Ssi?	Bn		G	
3314087	71524	DD92ZS2	45.40	50.00	Pou	Ssi?	Bn		G	
3314088	71524	DD92ZS2	50.00	55.00	Pou	Ssi?	Bn		G	
3314089	71524	DD92ZS2	55.00	60.00	Pou	Ssi?	Bn		G	
3314090	71524	DD92ZS2	60.00	65.00	Pou	Ssi?	Bn		G	
3314091	71524	DD92ZS2	65.00	70.00	Pou	Ssi?	Bn		G	
3314092	71524	DD92ZS2	70.00	76.00	Pou	Ssi?	Bn		G	
3314093	71524	DD92ZS2	76.00	81.00	Pou	Ssi?	Bn		G	
3314094	71524	DD92ZS2	81.00	86.50	Pou	Ssi?	Bn		G	
3314095	71524	DD92ZS2	86.50	90.00	Pou	Ssi?	BnVn	Cc	LG	
3314096	71524	DD92ZS2	90.00	93.00	Pou	Ssi?	BnVn	Cc	LG	
3314097	71524	DD92ZS2	93.00	95.90	Pou	Ssi?	AlVu	Sd	YG	
3314098	71524	DD92ZS2	95.90	98.80	Pou	Ssi?	AlVu	Sd	YG	
3314099	71524	DD92ZS2	98.80	100.50	Pou	Ssi?	AlVu	Sd	YG	
3314100	71524	DD92ZS2	100.50	101.85	D	Oms	Vs	SpSdPyGa		
3314101	71524	DD92ZS2	101.85	103.80	Pou	Ssi?	AlVuVs	SdSpGa	YG	
3314102	71524	DD92ZS2	103.80	106.80	Pou	Ssi?	AlVuVs	SdSpGa	YG	
3314103	71524	DD92ZS2	106.80	107.70	Pou	Ssi?	AlVuVs	SdSpGa	YG	
3314104	71524	DD92ZS2	107.70	109.60	Pou	Ssi?	AlVuVs	SdSpGa	YG	
3314105	71524	DD92ZS2	109.60	112.00	Pou	Ssi?	AlVuVs	SdSpGa	YG	
3314106	71524	DD92ZS2	112.00	115.00	Pou	Ssi?	AlVuVs	SdSpGa	YG	
3314107	71524	DD92ZS2	115.00	118.00	Pou	Ssi?	AlVuVs	SdSpGa	YG	
3314108	71524	DD92ZS2	118.00	121.00	Pou	Ssi?	AlVuVs	SdSpGa	YG	
3314109	71524	DD92ZS2	121.00	124.00	Pou	Ssi?	AlVuVs	SdSpGa	YG	
3314110	71524	DD92ZS2	124.00	127.00	Pou	Ssi?	AlVuVs	SdSpGa	YG	
3314111	71524	DD92ZS2	127.00	130.00	Pou	Ssi?	AlVuVs	SdSpGa	YG	
3314112	71524	DD92ZS2	130.00	131.50	Pou	Ssi?	AlVuVs	SdSpGa	YG	
3314113	71524	DD92ZS2	131.50	133.00	Pou	Ssi?	AlVuVs	SdSpGa	YG	
3314114	71524	DD92ZS2	133.00	136.00	Pou	Sbs	ShDs	Py	N	
3314115	71524	DD92ZS2	136.00	139.30	Pou	Sbs	ShDs	Py	N	
3314116	71524	DD92ZS2	140.50	143.50	Pou	Sbs	ShDs	Py	N	
3314117	71524	DD92ZS2	143.50	147.80	Pou	Sbs	ShDs	Py	N	
3314118	71524	DD92ZS2	147.80	151.00	Pou	Sbs	ShDs	Py	N	
3314119	71524	DD92ZS2	151.00	154.00	Pou	Sls	Vn	Cc	LG	
3314120	71524	DD92ZS2	154.00	158.50	Pou	Sls	Vn	Cc	LG	
3314121	71524	DD92ZS2	158.50	162.70	Pou	Sls	Vn	Cc	LG	
3314122	71524	DD92ZS2	162.70	164.70	Pou	Sls	Vn	Cc	LG	
3314123	71524	DD92ZS2	164.70	167.60	Pou	Sls	Vn	Cc	LG	
3314124	71524	DD92ZS2	167.60	170.50	Pou	Sls	Vn	Cc	LG	
3314125	71524	DD92ZS2	170.50	173.50	Pou	Sls	Vn	Cc	LG	
3314126	71524	DD92ZS2	173.50	176.50	Pou	Sls	Vn	Cc	LG	
3314127	71524	DD92ZS2	176.50	181.00	Pou	Sls	Vn	Cc	LG	
3314128	71524	DD92ZS2	181.00	187.00	Pou	Sls	Vn	Cc	LG	
3314129	71524	DD92ZS2	187.00	190.25	Pou	Sls	Vn	Cc	LG	
3314130	71524	DD92ZS2	190.25	190.50	D	Oms	Vs?	PySpSdGa		
3314131	71524	DD92ZS2	190.50	191.00	D	Ovc?	Al	Sd	YG	
3314132	71524	DD92ZS2	191.00	196.00	Pou	Sls	Vn	Cc	G	
3314133	71524	DD92ZS2	196.00	202.00	Pou	Sls	Vn	Cc	G	
3314134	71524	DD92ZS2	202.00	205.00	Pou	Ssi?	AlDs	SdPy	DG	
3314135	71524	DD92ZS2	205.00	208.00	Pou	Ssi?	AlDs	SdPy	DG	
3314136	71524	DD92ZS2	208.00	213.00	Pou	Sls	Vn	Cc	LG	
3314137	71524	DD92ZS2	213.00	218.00	Pou	Sls	Vn	Cc	LG	
3314138	71524	DD92ZS2	218.00	221.90	Pou	Obx			DG	
3314139	71524	DD92ZS2	221.90	226.00	Pou	SsiSls	IbVn	Cc	G	
3314140	71524	DD92ZS2	226.00	230.00	Pou	SsiSls	IbVn	Cc	G	
3314141	71524	DD92ZS2	230.00	235.00	Pou	SsiSls	IbVn	Cc	G	
3314142	71524	DD92ZS2	235.00	240.00	Pou	SsiSls	IbVn	Cc	G	
3314143	71524	DD92ZS2	240.00	245.00	Pou	SsiSls	IbVn	Cc	G	
3314144	71524	DD92ZS2	245.00	250.00	Pou	SsiSls	IbVn	Cc	G	

SAMPNO.	HOLE	DFROM	DTO	Ag	As	Cu	Fe%	Pb	Zn	Au	Bi	Cd	Mn	Mo	Sb	Sn
	DD92ZS2	0.00	10.00													
3314081	DD92ZS2	10.00	16.00	-1	9	8	9.76	63	170							
3314082	DD92ZS2	16.00	22.00	-1	10	12	3.32	365	81							
	DD92ZS2	22.00	25.00													
3314083	DD92ZS2	25.00	27.80	-1	5	4	1.85	38	71							
3314083	DD92ZS2	27.80	30.00	-1	5	4	1.85	38	71							
3314084	DD92ZS2	30.00	35.00	-1	17	7	13.9	48	290							
3314085	DD92ZS2	35.00	40.00	-1	19	11	9.81	49	175							
3314086	DD92ZS2	40.00	45.40	-1	5	4	6.32	41	175							
3314087	DD92ZS2	45.40	50.00	-1	3	5	1.48	35	87							
3314088	DD92ZS2	50.00	55.00	-1	19	3	3.97	150	245							
3314089	DD92ZS2	55.00	60.00	-1	3	3	0.97	34	84							
3314090	DD92ZS2	60.00	65.00	-1	3	5	4.93	16	96							
3314091	DD92ZS2	65.00	70.00	-1	10	15	10.6	13	160							
3314092	DD92ZS2	70.00	76.00	-1	22	88	6.5	53	145							
3314093	DD92ZS2	76.00	81.00	-1	5	6	10.6	5	260							
3314094	DD92ZS2	81.00	86.50	-1	6	3	5.35	11	190							
3314095	DD92ZS2	86.50	90.00	-1	22	14	7.32	66	970							
3314096	DD92ZS2	90.00	93.00	-1	5	3	8.29	9	165							
3314097	DD92ZS2	93.00	95.90	2	37	35	19.3	215	1350							
3314098	DD92ZS2	95.90	98.80	6	100	86	19.4	560	4550							
3314099	DD92ZS2	98.80	100.50	-1	75	5	25.6	540	3750							
3314100	DD92ZS2	100.50	101.85	56	6600	165	26.7	66500	232000	-0.005	-10	1080	24500	-5	4130	38
3314101	DD92ZS2	101.85	103.80	9	850	13	26.1	10200	27500	-0.005	-10	115	68400	-5	326	19
3314102	DD92ZS2	103.80	106.80	3	400	9	24.8	3100	10000	-0.005	-10	38	37500	-5	36	12
3314103	DD92ZS2	106.80	107.70	2	250	12	26.8	1200	14500	-0.005	-10	63	58000	-5	18	11
3314104	DD92ZS2	107.70	109.60	2	750	15	26.9	900	19000	-0.005	-10	83	57100	-5	18	13
3314105	DD92ZS2	109.60	112.00	3	175	9	25	2700	10000	-0.005	-10	41	51700	-5	16	12
3314106	DD92ZS2	112.00	115.00	-1	150	6	19.7	460	3650	-0.005	-10	8.6	24400	-5	-4	6
3314107	DD92ZS2	115.00	118.00	2	47	11	27.4	2100	8100	-0.005	-10	34	68900	-5	14	8
3314108	DD92ZS2	118.00	121.00	3	225	51	24.8	1100	4900	-0.005	-10	34	43800	-5	99	5
3314109	DD92ZS2	121.00	124.00	2	700	26	30.3	2000	7600	0.005	-10	34	38900	-5	60	10
3314110	DD92ZS2	124.00	127.00	11	4200	39	35.1	6600	35500	0.015	-10	175	59200	-5	57	22
3314111	DD92ZS2	127.00	130.00	20	150	310	17.5	1100	4200	-0.005	-10	19	22900	-5	340	7
3314112	DD92ZS2	130.00	131.50	5	1050	16	32.2	3900	17000	0.005	-10	79	44000	-5	44	11
3314113	DD92ZS2	131.50	133.00	1	300	13	8.48	1300	3900	-0.005	-10	16	29800	-5	17	4
3314114	DD92ZS2	133.00	136.00	44	400	1100	19	7100	21000	0.005	-10	84	11900	6	1390	9
3314115	DD92ZS2	136.00	139.30	6	150	340	8.74	1600	1250							
3314116	DD92ZS2	140.50	143.50	3	125	170	7.92	1300	3550							
3314117	DD92ZS2	143.50	147.80	3	100	110	7.68	1350	1400							
3314118	DD92ZS2	147.80	151.00	2	100	83	7.5	1350	170							
3314119	DD92ZS2	151.00	154.00	-1	10	23	1.12	99	285							
3314120	DD92ZS2	154.00	158.50	6	18	105	0.67	640	1300							
3314121	DD92ZS2	158.50	162.70	4	11	73	0.91	150	150							
3314122	DD92ZS2	162.70	164.70	-1	6	3	1.05	27	81							
3314123	DD92ZS2	164.70	167.60	-1	14	12	1.41	200	325							
3314124	DD92ZS2	167.60	170.50	1	9	28	1.01	195	200							
3314125	DD92ZS2	170.50	173.50	-1	13	36	1.83	100	155							
3314126	DD92ZS2	173.50	176.50	2	31	170	2.59	235	210							
3314127	DD92ZS2	176.50	181.00	3	12	190	1.43	72	135							
3314128	DD92ZS2	181.00	187.00	1	22	185	3.14	475	350							
3314129	DD92ZS2	187.00	190.25	4	50	705	4.05	1400	940							
3314130	DD92ZS2	190.25	190.50	415	1800	29000	21.9	123000	200000	0.005	-10	1070	5600	-5	21800	65
3314131	DD92ZS2	190.50	191.00	-1	75	525	10.9	5700	6800	-0.005	-10	40	17100	-5	590	7
3314132	DD92ZS2	191.00	196.00	-1	7	22	1.12	115	185							
3314133	DD92ZS2	196.00	202.00	-1	5	9	1.41	53	305							
3314134	DD92ZS2	202.00	205.00	1	250	32	11.5	175	240							
3314135	DD92ZS2	205.00	208.00	2	100	28	15.9	215	1000							
3314136	DD92ZS2	208.00	213.00	-1	3	31	1.03	61	160							
3314137	DD92ZS2	213.00	218.00	2	33	16	1.56	700	1450							
3314138	DD92ZS2	218.00	221.90	2	29	160	3.12	440	480							
3314139	DD92ZS2	221.90	226.00	1	11	63	3	195	360							
3314140	DD92ZS2	226.00	230.00	-1	13	12	13.2	210	1100							
3314141	DD92ZS2	230.00	235.00	-1	5	13	8.11	130	290							
3314142	DD92ZS2	235.00	240.00	-1	11	32	6.02	220	370							
3314143	DD92ZS2	240.00	245.00	-1	13	13	8.61	59	285							
3314144	DD92ZS2	245.00	250.00	1	10	85	5.42	405	790							

957113

CRA EXPLORATION PTY. LIMITED

DRILL-HOLE SUMMARY LOG

EL NAME: ZEEHAN 1 HOLE NAME: DD92ZS3
EL NUMBER: EL 28/88 PROSPECT: STONEHENGE
DATE DRILLED: DEC'92
LOGGED BY: RGP

AMG EAST: 359625E GRID EAST: 11900E
AMG NORTH: 5359450N GRID NORTH: 5200N
RL: ~265m ASL TOTAL DEPTH: 231.0m

DEPTH	AZIM. (MAG)	INCLIN.
0	188°	-45°
83m	?	-50°
166m	185°	-50.5°
231m	184°	-51°

OBJECTIVES OF HOLE: To test combined IP and wacker Zn soil anomaly coincident with interpreted thick Oonah Fm black shale horizon for stratiform Zn mineralisation.

LITHOLOGICAL SUMMARY:

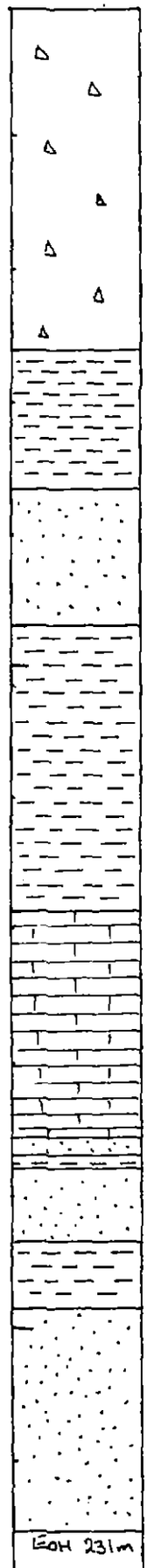
DFROM	DTO	COMMENTS
0	52.0	BROKEN ZONE - SANDS, GRAVEL + CLAY
52.0	73.0	CARBONACEOUS SHALE
73.0	94.0	QUARTZITE
94.0	136.9	CARBONACEOUS SHALE
136.9	171.7	DOLOMITE (+MINOR SILTSTONE)
171.7	174.1	QUARTZITE
174.1	176.1	CARBONACEOUS SHALE
176.1	187.6	QUARTZITE
187.6	197.3	CARBONACEOUS SHALE
197.3	231.0	QUARTZITE (+MINOR SILTSTONE)

MINERALISATION SUMMARY:

DFROM	DTO	COMMENTS
64	73	9m @ 0.42% Zn 0.38% Pb
130	133	3m @ 0.9% Zn 0.36% Pb
159.5	160.6	1.1m @ 3.5% Zn 0.1% Pb

CONCLUSIONS:

Weakly elevated Zn geochem in upper part of hole possibly indicative of stratiform mineralisation?
Deeper intersection is narrow vein ⊥ to C.A.
⇒ insignificant.



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C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 1 of 8

AMG 359625E 5359450N

TENEMENT NAME ZEEHAN No 1 No. EL 28/88

PLAN – MAP REFERENCE

CO-ORDINATES 11900E 5200N AZIMUTH 188° MAG DRILLERS DD TAS COMMENCED 3/12/92 DEPTH 231m. HOLE No DD92ZS3

RL COLLAR ~265m ASL INCLINATION -45° DRILL TYPE LY38 COMPLETED 19/12/92 CASING LEFT DPO No(s) 71525

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)
0	9	–	ROLLER		PRECOLLAR - NO CORE.					
9	12	0.85	HQ		FAULT?		3314145	9	12	0.85
					Light grey-brown clay and angular qtz fragments.					
					5-10% nodular lumps of py, 10-20mm in size.					
12	14.5	1.3	HQ		WEATHERED CARBONACEOUS SHALE.		4146	12	14.5	1.3
					White to light grey leached and weathered shale. Rare fragments still black and not leached. Strongly brecciated.					
14.5	25.0	1.0	HQ		FAULT?		4147	14.5	25.0	1.0
					Grey clay, weathered shale and angular qtz fragments.					
25	28	0			NO RECOVERY					
28.0	31.0	0.3	HQ		IRON OXIDES (GOSSAN?)		4148	28.0	31.0	0.3
					Yellow-orange-brown soft, vuggy zone.					
31.0	52.0	5.4	HQ		FAULT?		4149	31.0	37.0	0.8
					Light grey. Clay, sand and gravel zone.		4150	40.0	46.0	2.7
							4151	46.0	52.0	1.9
52.0	56.5	0.55	HQ		CARBONACEOUS SHALE		4152	52.0	56.5	0.55
					Black highly carbonaceous shale. Brecciated.					
					No visible sulphides					

ASSAY VALUES (Analysed by .....)

DRILL RUNS

From	To	REC	RQ
0	9	–	
9	10	0.2	5
	11.5	0.45	
	13	0.6	
	14.5	0.9	
	16	0.3	
	19	0	
	22	0.5	
	25	0.2	
	28	0	
	31	0.3	
	34	0.4	
	37	0.4	
	40	0	
	43	0.2	
	46	2.5	
	49	0.6	
	50.5	0	
	52	1.3	
	55	0.35	
	58	0.4	5

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 2 of 8

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZS3

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....)	DRILL RUNS From	DRILL RUNS TO	DRILL RUNS REC	DRILL RUNS Rqd
56·5	73·0	3·3	HQ		WEATHERED CARBONACEOUS SHALE		3314153	56·5	64·0	1·7		58	61	0·4	5
					Light grey weathered carbonaceous shale. Locally		4154	64·0	73·0	1·6			64	1·1	
					brecciated. Pieces of wood in breccia zones between								67	0·7	
					70–73m!								70	0·3	
					Strong foliation (bedding?) preserved at 66m								73	0·6	
					66m S_0 – C.A. ∠ 70°								76	0·1	
													79	0·15	
73·0	~~82·0~~ 94	~~0·85~~ 1·0	HQ		QUARTZITE		4155	73·0	82·0	0·45			82	0·2	
					White to light grey massive vuggy quartzite.		4156	82·0	85·0	0·35			85	0·35	
					Between 82–85m, quartzite is yellow-orange-brown		4157	91·0	94·0	0·2			88	0	
					+ Fe stained.								91	0	
					No recovery between 85–91m.								94	0·2	
													98	0·15	
94·0	104·8	2·15			CARBONACEOUS SHALE		4158	94·0	98·0	0·15			100	0	
					Black pyritic carbonaceous shale. 5% dissem py.		4159	100·0	104·8	2·0			102·7	0·8	
					Core brecciated and highly fissile along bedding partings.								104·8	1·2	
					Kink zones visible between 94–98m.								130	0	
													131·2	0·2	
104·8	130·0	0			NO RECOVERY.		4160	104·8 (cavings).	130·0	4			133·	0·1	
					One tray of cavein sample from somewhere in the								135·3	0	
					interval as for 94–104·8, but with 10% dissem										
					py. Sample most likely to have been 120–130m.										
130·0	133·0	0·3	NQ		QUARTZITE		4161	130·0	133·0	0·3					
					Massive grey quartzite with 10% dissem py.										
133·0	135·3	0			NO RECOVERY										

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 3 of 8

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZS3

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....)
135·3	136·9	1·2	NQ		CARBONACEOUS SHALE Strongly deformed black carbonaceous shale. 10% wispy dolomite and siderite veins. 5% dissem py and traces of p.r.ga. Between 135·3 – 135·45 is strongly banded shale + quartzite with 40% dissem + vein py. 136·4m S_o – C.A ∠ 72°		3314162	135·3	136·9	1·2	
136·9	139·0	2·0			INTERBEDDED SILTSTONE AND DOLOMITE Banded light and dark grey. Well laminated dark grey siltstone interbedded with massive light grey dolomite. Minor stylolites developed in dolomite. Stylolites contain 20% very fine dissem py. 1-2% dissem py in siltstone beds. 138 m S_o – C.A ∠ 45°		4163	136·9	139·0	2·0	
139·0	152·0	13·0			DOLOMITE Light grey massive dolomite. Minor convoluted stylolites (<1% of core vol) with 10-20% py. 5% dolomite + quartz veins 1-10 mm wide, ave 3mm, with indistinct vein margins merging with country rock.		4164 4165	139·0 145·0	145·0 152·0	6·0 6·9	
152·0	159·5	7·3			DOLOMITE VEINED DOLOMITE As for 139-152m but with abrupt increase in dolomite veining at 152m to 20% of core volume.		4165	152·0	159·5	7·3	

DRILL RUNS

FROM	TO	REC	RQ
135·3	136	0·4	5
	139	2·8	2
	142	3·05	2
	145	3·0	2
	148	3·0	2
	151	2·95	2
	154	3·0	2
	157	3·0	2
	160	2·75	3

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

TENEMENT NAME..... No. .....
PLAN – MAP REFERENCE.....
CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. ZS3
RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....) DRILL RUNS From	To	Rec.	Rec
59·5	162·2	2·9	NQ		SILTSTONE WITH DOLOMITE-SPHALERITE VEINS. Grey turbiditic siltstone. Laminated coarse and fine silt beds showing graded bedding. Fining uphole. 5mm wide dol-sp vein at low ∠ to c.A. or ll to c.A. Becomes py-dominant with increasing depth. Sp ~ 5%, py 5%, ga 0·5% of interval 162·8 m V_{dol-sp} ⊆ c.A. ∠ 15°] S_o-V_{dol} 120° 163·2 S_o 35°]		3314167	159·5	160·6	1·2		160	164·5	4·5	4
							4168	160·6	162·2	1·7			165·8	1·5	1
													168·9	3·1	2
													172	3·0	2
													174·2	2·1	4
													[redacted]		
													[redacted]		
162·2	168·4	6·4			DOLOMITE VEINED DOLOMITE As for 152·0-159·5 m. Narrow zones of banded greywacke at 167·1-167·7m. 165·3 S_o - c.A - ∠ 42° 167·6 S_o 45°		4169	162·2	168·4	6·4					
168·4	171·7	3·2			INTENSELY DOLOMITE VEINED SILTSTONE + DOLOMITE Light grey with tinges of light brown. Massive dolomite and deformed banded siltstone. Intense dolomite stockwork veining, 60% of core vol. 2-5% later siderite veins at low ∠ to c.A. containing traces of sp + py. 169·5 V_{sid} - c.A ∠ 10°		4170	168·4	171·7	3·2					
171·7	174·1	2·3			BANDED SILTSTONE AND QUARTZITE Anastamosing dark grey micaceous silt wisps in light grey quartzite. Tectonic modification of original sedimentary layering. Local carbonaceous shear partings, probably sheared shale bands. 5% qtz+dol veins, ave 3mm wide 173 m S_o? - c.A ∠ 60°		4171	171·7	174·1	2·3					

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZS3

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)
187·6	197·3		NQ		CARBONACEOUS SHALE		3314177	192·1	197·3	
					Dark grey laminated silty shale. Coarser grained and less carbonaceous than other carb shale units.					
					Minor beds of qtzite + coarse silt.					
					5% fine dissem py. 1% 1-3mm wispy siderite veins					
					194·1 S_o – C.A. ∡	55°				
					196·7 S_o	50°				
					197·1 S_o	80°				
197·3	203·0				MICACEOUS QUARTZITE		178	197·3	203·0	
					As for 176·1 – 182·5m. Muscovite ~10% of vol as wisps wrapping around qtz grains. Defines bedding					
					Minor laminated siltstone interbeds.					
203·0	205·4				LAMINATED SILTSTONE		179	203·0	205·4	
					Banded light + dark grey. 2-10mm laminations of coarse quartzose + fine carbonaceous silt. Laminations are strongly deformed with well developed folding of laminations.					
					5%-10% dissem py, preferentially in fine bands.					
					203·9 S_o – C.A. ∡	65°				
2					205·4 S_o	55°				
205·4	215·4				QUARTZ VEINED QUARTZITE.		180	205·4	210·2	
					As for 176·1 – 182·5m.		181	210·2	213·3	
					20% of 30-300mm massive milky qtz veins at low ∡ to C.A. Locally with minor siderite in veins.		182	213·3	215·0	
					Between 210·2 – 213·3, qtz veining = 50% of core vol. Major fault zone between 213·3 – 215·0 marked by broken qtzite + qtz-py vein material.					

ASSAY VALUES (Analysed by .....)

DRILL RUNS

From	To	Rec	RQ
187·6	188·2	0·5	5
	189·3	0·75	5
	192·1	0·95	4
	193·0	0·85	3
	194·1	1·0	3
	195·8	1·55	4
	199	2·8	3
	201·6	2·6	3
	204·6	2·9	3
	207·2	2·5	2
	210·2	3·0	3
	211	0·75	3
	213·8	2·7	3
	214·8	0·6	5
	215·4	0·6	5

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 1 of 8

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZS3

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)
205·4	215·4		NQ		With increasing depth, bedding is becoming ∥ to qtz veining					
	CTD				209·2 S_o – C.A ⊀	72°				
					210·7 V_q	15°				
					211·0 S_o	40°] S_o-V_q ⊀ 0°				
					211·0 V_q	35°]				
					211·7 S_o	25°				
					212·0 V_q	20°				
					213·0 S_o	15°] S_o-V_q ⊀ 0°				
					213·2 V_q	16°]				
215·4	217·8				QUARTZITE		3314183	215·0	217·8	
					Light grey very weakly bedded qtzite. Minor muscovite only, not micaceous qtzite.					
					2% wispy siderite veins 0·5-2mm wide.					
					Lower contact at 217·8m is zone of carbonaceous shearing + qtz veining.					
					215·2 S_o ⊀	50°				
217·8	220·45				LAMINATED SILTSTONE		184	217·8	220·45	
					As for 203·0 – 205·4m. Carbonaceous bands dominate. 2-5% dissem py.					
					2% siderite veins 0·5-2mm wide with minor py.					
					219·2 S_o ⊀	45°				
					220·0 S_o	20°				

ASSAY VALUES (Analysed by .....)

DRILL RUNS

From	To	REC	RQ
215·4	216·8	1·3	3
	219·8	3	1
	222·2	2·1	2
	222·8	0·6	3

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

TENEMENT NAME ..... No. .....
PLAN – MAP REFERENCE .....
CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZS3
RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) 71525

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....)	DRILL RUNS From	DRILL RUNS To	DRILL RUNS Rec	DRILL RUNS No
220.45	221.5		NQ		QUARTZ VEINED QUARTZITE.		3314185	220.45	225.7			220.8	225.7	2.8	2
					As for 215.4 – 217.8m.		186	225.7	227.5				227.5	1.8	3
					Several thick 10-50mm milky qtz veins with minor py, 5% of vol. Increasing to 200mm veins, 40% of vol below 233.6m. Minor siderite in qtz veins.								228.3	0.65	4
					2% of 0.5-2mm siderite veins with minor py, (and rare sp at 221.8m). 2% dissem py throughout.								231	2.2	3
					At 226.4m is thick vuggy qtz-py vein										
					Traces of serpentine on some partings.										
					226.4m Vein-py ∠ 45°										
227.5	231.0				LAMINATED SILTSTONE		187	227.5	231						
	EOH				As for 203.0 – 205.4m.										
					1-2% dissem py. Traces of serpentine on some partings										
					228.6m So ∠ 40°										

COPIED

SAMPNO.	DPO	HOLE	DFROM	DTO	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	COMMENTS
		DD92ZS3	0.00	9.00						NO REC.
3314145	71525	DD92ZS3	9.00	12.00	Pou	Of		Py	LGB	
3314146	71525	DD92ZS3	12.00	14.50	Pou	Sbs	We		WLG	
3314147	71525	DD92ZS3	14.50	25.00	Pou	Of			LGB	
		DD92ZS3	25.00	28.00						NO REC.
3314148	71525	DD92ZS3	28.00	31.00	Pou	Csg?	Vu		YOB	
3314149	71525	DD92ZS3	31.00	37.00	Pou	Of			LG	
3314150	71525	DD92ZS3	40.00	46.00	Pou	Of			LG	
3314151	71525	DD92ZS3	46.00	52.00	Pou	Of			LG	
3314152	71525	DD92ZS3	52.00	56.50	Pou	Sbs			N	
3314153	71525	DD92ZS3	56.50	64.00	Pou	Sbs	We		LG	
3314154	71525	DD92ZS3	64.00	73.00	Pou	Sbs	We		LG	
3314155	71525	DD92ZS3	73.00	82.00	Pou	Mq	MaVu		WLG	
3314156	71525	DD92ZS3	82.00	85.00	Pou	Mq	MaVu		WLG	
		DD92ZS3	85.00	91.00						NO REC.
3314157	71525	DD92ZS3	91.00	94.00	Pou	Mq	MaVu		WLG	
3314158	71525	DD92ZS3	94.00	98.00	Pou	Sbs	Ds	Py	N	
3314159	71525	DD92ZS3	100.00	104.80	Pou	Sbs	Ds	Py	N	
3314160	71525	DD92ZS3	104.80	130.00	Pou	Sbs	Ds	Py	N	
3314161	71525	DD92ZS3	130.00	133.00	Pou	Mq	MaDs	Py	G	
		DD92ZS3	133.00	135.30						NO REC.
3314162	71525	DD92ZS3	135.30	136.90	Pou	Sbs	Ds	Py	N	
3314163	71525	DD92ZS3	136.90	139.00	Pou	SsiSls	lbDs	Py	ALBG	
3314164	71525	DD92ZS3	139.00	145.00	Pou	Sls	MaVn	Cc	LG	
3314165	71525	DD92ZS3	145.00	152.00	Pou	Sls	MaVn	Cc	LG	
3314166	71525	DD92ZS3	152.00	159.50	Pou	Sls	MaVn	Cc	LG	
3314167	71525	DD92ZS3	159.50	160.60	Pou	Ssi	LmVs	CcSpPy	G	
3314168	71525	DD92ZS3	160.60	162.20	Pou	Ssi	LmVs	CcSpPy	G	
3314169	71525	DD92ZS3	162.20	168.40	Pou	Sls	MaVn	Cc	LG	
3314170	71525	DD92ZS3	168.40	171.70	Pou	SlsSsi	lbVn	Cc	LG	
3314171	71525	DD92ZS3	171.70	174.10	Pou	SsiMq	lb		ALDG	
3314172	71525	DD92ZS3	174.10	176.10	Pou	Sbs	Fs		N	
3314173	71525	DD92ZS3	176.10	181.30	Pou	Mq			LG	
3314174	71543	DD92ZS3	181.30	182.50	Pou	Mq			LG	
3314174	71543	DD92ZS3	182.50	184.15	Pou	Ssi	LmDs	Py	G	
3314175	71543	DD92ZS3	184.15	186.40	Pou	Ssi	LmDs	Py	DGN	
3314176	71543	DD92ZS3	186.40	187.60	Pou	Mq			LG	
3314176	71543	DD92ZS3	187.60	192.10	Pou	SbsSsi	LmDs	Py	DG	
3314177	71543	DD92ZS3	192.10	197.30	Pou	Mq			LG	
3314178	71543	DD92ZS3	197.30	203.00	Pou	Mq			LG	
3314179	71543	DD92ZS3	203.00	205.40	Pou	Ssi	LmDs	Py	ALDG	
3314180	71543	DD92ZS3	205.40	210.20	Pou	Mq	Vn		LG	
3314181	71543	DD92ZS3	210.20	213.30	Pou	Mq	Vn		LG	
3314182	71543	DD92ZS3	213.30	215.00	Pou	Mq	Vn		LG	
3314183	71543	DD92ZS3	215.00	217.80	Pou	Mq			LG	
3314184	71543	DD92ZS3	217.80	220.45	Pou	Ssi	LmDs	Py	ALDG	
3314185	71543	DD92ZS3	220.45	225.70	Pou	Mq	Vn		LG	
3314186	71543	DD92ZS3	225.70	227.50	Pou	Mq	Vn		LG	
3314187	71543	DD92ZS3	227.50	231.00	Pou	Ssi	LmDs	Py	ALDG	

957122

SAMPNO.	HOLE	DFROM	DTO	Ag	As	Cu	Fe%	Pb	Zn	Au	Bi	Cd	Mn	Mo	Sb	Sn
	DD92ZS3	0.00	9.00													
3314145	DD92ZS3	9.00	12.00	-1	100	41	0.68	59	640							
3314146	DD92ZS3	12.00	14.50	1	75	47	1.28	57	2050							
3314147	DD92ZS3	14.50	25.00	1	50	210	3.01	885	4500							
	DD92ZS3	25.00	28.00													
3314148	DD92ZS3	28.00	31.00	1	75	275	8.32	1150	515							
3314149	DD92ZS3	31.00	37.00	-1	19	96	0.31	390	250							
3314150	DD92ZS3	40.00	46.00	-1	50	47	1.29	195	3150							
3314151	DD92ZS3	46.00	52.00	1	50	94	1.74	335	1050							
3314152	DD92ZS3	52.00	56.50	14	17	120	0.5	125	115							
3314153	DD92ZS3	56.50	64.00	1	9	72	0.37	670	38							
3314154	DD92ZS3	64.00	73.00	5	41	145	0.54	3850	4200							
3314155	DD92ZS3	73.00	82.00	1	10	42	0.52	305	185							
3314156	DD92ZS3	82.00	85.00	2	75	125	20.4	570	1500							
	DD92ZS3	85.00	91.00													
3314157	DD92ZS3	91.00	94.00	5	23	62	0.49	1400	1400							
3314158	DD92ZS3	94.00	98.00	-1	23	35	1.36	205	160							
3314159	DD92ZS3	100.00	104.80	-1	25	27	1.13	205	480							
3314160	DD92ZS3	104.80	130.00	6	75	66	1.24	3500	355							
3314161	DD92ZS3	130.00	133.00	8	1850	230	5.31	3600	9000	0.105	-10	44	18600	-5	45	-3
	DD92ZS3	133.00	135.30													
3314162	DD92ZS3	135.30	136.90	3	100	90	3.94	380	260							
3314163	DD92ZS3	136.90	139.00	-1	13	23	1.81	59	98							
3314164	DD92ZS3	139.00	145.00	-1	7	12	1.38	50	84							
3314165	DD92ZS3	145.00	152.00	-1	5	12	1.26	19	30							
3314166	DD92ZS3	152.00	159.50	-1	4	6	1.55	44	46							
3314167	DD92ZS3	159.50	160.60	7	19	64	0.64	1200	35000	0.005	-10	134	2700	8	18	25
3314168	DD92ZS3	160.60	162.20	2	950	15	2.17	94	3200	0.03	-10	14	4400	5	8	-3
3314169	DD92ZS3	162.20	168.40	-1	5	5	1.59	130	1150							
3314170	DD92ZS3	168.40	171.70	1	14	8	4.86	410	735							
3314171	DD92ZS3	171.70	174.10	-1	18	28	2.46	36	51							
3314172	DD92ZS3	174.10	176.10	2	31	38	2.45	37	50							
3314173	DD92ZS3	176.10	181.30	1	75	29	2.3	245	46							
3314174	DD92ZS3	181.30	182.50	2	15	17	2.9	292	53							
3314174	DD92ZS3	182.50	184.15	2	15	17	2.9	292	53							
3314175	DD92ZS3	184.15	186.40	2	5	28	3.6	64	40							
3314176	DD92ZS3	186.40	187.60	1	14	19	2.84	68	51							
3314176	DD92ZS3	187.60	192.10	1	14	19	2.84	68	51							
3314177	DD92ZS3	192.10	197.30	1	6	20	3.39	69	49							
3314178	DD92ZS3	197.30	203.00	1	10	21	2.77	194	91							
3314179	DD92ZS3	203.00	205.40	2	4	26	3.13	47	37							
3314180	DD92ZS3	205.40	210.20	-1	3	22	2.45	10	22							
3314181	DD92ZS3	210.20	213.30	2	11	19	2.56	143	32							
3314182	DD92ZS3	213.30	215.00	3	12	13	4.35	348	63							
3314183	DD92ZS3	215.00	217.80	1	200	8	2.53	133	29							
3314184	DD92ZS3	217.80	220.45	1	9	23	3.23	84	211							
3314185	DD92ZS3	220.45	225.70	1	23	28	2.7	104	194							
3314186	DD92ZS3	225.70	227.50	3	20	40	4.26	470	245							
3314187	DD92ZS3	227.50	231.00	1	16	19	2.97	43	40							

DPO 71530

957123

CRA EXPLORATION PTY. LIMITED
(INC. IN N.S.W.)

29 BELL STREET PRESTON VICTORIA 3072. AUSTRALIA.

P.O.BOX 8093
NORTHLAND CENTRE
PHONE : (03) 4801866
FAX : (03) 4841375

A.C.N. 000 057 125.

11th January 1993

Mr W. Fander,
Central Mineralogical Services,
8 Bradshaw Ave,
CRAFERS S.A. 5152

SAMPLES SUBMITTED FOR PETROLOGICAL EXAMINATION

Dear Wally,

Please find enclosed 11 drill core samples that I would like thin-sectioned for petrological examination. Samples are from two drillholes on a prospect in western Tasmania. Broadly speaking, the holes encountered an interbedded sequence of carbonate units, black shale and quartzite. Zones of siderite alteration and veining, accompanied by minor sphalerite mineralisation, cut the sedimentary sequence.

Please provide a general lithological and textural description for each sample. For some samples there are a few specific questions I would like addressed:-

3313775	Vuggy silicified rock. Can the original unit be determined?
3313776	Carbonaceous shale. Is the carbon graphite or bitumenous?
3313777	Carbonate. Is the carbonate dolomite, and if so, is it replacive?
3313778	Laminated siltstone. Is the banding tectonic?
3313779	Siderite altered rock. If possible, determine the original rock, and estimate degree of alteration.
3313780	Banded carbonate. General lithological and textural description.
3313781	Banded sediment. Is the banding tectonic and can an original lithology be determined? Comment on the degree of deformation.
3313782	Siderite altered rock. If possible, determine the original rock, and estimate degree of alteration.
3313783	Carbonate breccia. General lithological and textural description.
3313784	Silicified carbonate. Comment on the degree of silicifation. Are the convoluted black surfaces stylolites and do they define a deformed bedding surface?
3313785	Banded sediment. Is the banding tectonic and can an original lithology be determined? Comment on the degree of deformation and alteration.

Could you please return the section and offcuts to me for our reference collection?

Thankyou for your help.

Yours sincerely,

ROBERT PARKINSON
(Project Geologist)

RECEIVED
- 3 FEB
CRAE
PRESTON

957124

Central Mineralogical Services

8 Bradshaw Avenue, Crafers, S.A. 5152
Telephone (08) 370 9779 Fax (08) 370 9788
International: Telephone + 618 370 9779 Fax + 618 370 9788

CMS

3 February 1993

Mr R Parkinson
CRAE Pty Ltd
P O Box 8093
NORTHLAND CENTRE VIC 3072

REPORT CMS 93/1/14

YOUR REFERENCE:	DPO 71530
DATE RECEIVED:	12 January 1993
SAMPLE NO'S:	3313775 - 785.
SUBMITTED BY:	R. Parkinson
WORK REQUESTED:	Petrology.

H.W. Fander, M.Sc.

COPIES TO:
CRA Exploration Pty Ltd
P O Box 8093
NORTHLAND CENTRE 3072
Attention: Craig Hayward

CRA Exploration Pty Ltd
P O Box 3709
MANUKA ACT 2603
Attention: CRAE Information Systems

957125

REPORT CMS 93/1/4

DRILL CORE INTERSECTIONS 3313775 – 787

Eleven drill core intersections were received for petrographic study. Thin sections were prepared, and offcuts were subjected to carbonate stain tests to aid identification and interpretation. The rocks are described in the attached sheets.

Almost all the rocks are carbonates, and stain-test results suggest that the main species is ankerite, with minor dolomite, siderite and an Mg/Fe carbonate (such as pistomesite). In many cases the evidence is more in favour of a primary rather than a replacive origin for the rocks.

Metamorphic effects were minimal and were mainly dynamic; the absence of calc-silicates indicates that no thermal metamorphism was involved.

The sphalerite in 779 is pale, low-Fe variety; it appears replacive and may represent a Mississippi Valley style of mineralisation.

SAMPLE NO.: 3313775 (T.S.63190) ZS1 37·85m

CLASSIFICATION: Pyritic, Siliceous Sinter. 957126

COMPOSITION: Virtually entirely microcrystalline quartz with textures typical of sinters; many voids; coarser lenses surrounded by finer material. Scattered small euhedral pyrite crystals.

FABRIC: Vague bedding. Textures suggest crystallisation from cryptocrystalline/colloidal silica. Many trapped gas bubbles.

MINOR MINERALS: Occasional cloudy, semi-opaque streaks of ?TiO_2 ("leucoxene").

INTERPRETATION/
COMMENTS: Believed to be a chemically-formed sinter, possibly related to volcanic activity. Assays for Au, Hg, Te, Se recommended.

SAMPLE NO.: 3313776 (T.S. 63191) ZS1 66·0m

CLASSIFICATION: Pyritic, Carbonaceous Shale.

COMPOSITION: Very fine, thin laminations of carbonaceous-pyritic particles alternating with thin argillaceous laminations with minor fine (silt-sized) clastic quartz. Indurated.

FABRIC: Uniform, finely-laminated, with minor folding. Small parallel bedding - plane faults displacing cross-cutting veinlets.

MINOR MINERALS: Veinlets of quartz-carbonate common, at right angles to bedding/laminations.

INTERPRETATION/
COMMENTS: Conventional black shale with syngenetic pyrite. Indurated but not significantly metamorphosed. Carbon is amorphous to subgraphitic and is not bituminous (heat test).

957127

CLASSIFICATION: Dolomite Rock.

COMPOSITION: Consists very largely of dolomite (stain test) as small to medium-grained crystals; mostly cloudy, with irregular fine-grained patches surrounded by variable, coarser material, with minor intergrown quartz.

FABRIC: Variable crystallinity with coarser and veinlike masses. Quartz-carbonate bodies have columnar textures. Typical replacement features.

MINOR MINERALS: Thin stylolitic carbonaceous veinlets. Traces of very fine pyrite.

INTERPRETATION/
COMMENTS: Believed to be a replacive carbonate rock; carbonate composition may be more ankeritic than dolomitic, as suggested by carbonate stain test results.

SAMPLE NO.: 3313778 (T.S. 63193) ZS 1 102.0m

CLASSIFICATION: Carbonaceous, Siliceous Dolostone.

COMPOSITION: Mainly composed of micro crystalline dolomite, with minor interstitial amorphous silica as well as thin parallel streaks of dark, carbon-pigmented silica and carbonaceous streaks.

FABRIC: Thinly laminated, with uniform grainsizes around 0.02 – 0.05mm, and some cross-fractures.

MINOR MINERALS: Ultrafine pyrite (syngenetic). Fracture-filling ankerite veinlets.

INTERPRETATION/
COMMENTS: An essentially chemically-formed fine-grained sediment, with primary laminations. Tectonism confined to fracturing after lithification.

SAMPLE NO.: 3313779 (T.S. 63194) ZS1 161.7m

957128

CLASSIFICATION: Siderite Rock with Sphalerite.

COMPOSITION: Dominantly composed of well-crystallized sparry siderite or related Mg/Fe carbonate, with individual crystals of amber-brown sphalerite (colour-zoned).

FABRIC: Uniform, well-defined rhombs of siderite. Sphalerite crystals up to 3mm, with larger groups; small carbonate inclusions.

MINOR MINERALS: Rock (and sphalerite) cut by ankerite veins. Trace of fine pyrite. Interstitial quartz between siderite crystals. Quartz veinlets.

INTERPRETATION/
COMMENTS: Nature of original rock not determinable; siderite and quartz probably replacive. Sphalerite deposited after siderite but predating ankerite and quartz veining.

SAMPLE NO.: 3313780 (T.S. 63195) ZS1 167.2m

CLASSIFICATION: Banded Chert-Carbonate Rock.

COMPOSITION: Mainly composed of bands of very fine-grained dark (carbonaceous) carbonate – very probably an Mg/Fe carbonate, alternating with bands of pale greenish chert.

FABRIC: Regular banding with sharp boundaries although chert contains scattered carbonate rhombs. Some crossfractures, veins.

MINOR MINERALS: Veins of coarser quartz – ankerite, at high angle to banding. Scattered pyrite crystals. Carbonaceous stylolites.

INTERPRETATION/
COMMENTS: The carbonate, which <u>appears</u> primary, is an Mg/Fe or ankeritic variety. Green colour of chert bands due to ultra-fine ?chlorite. Indurated chemical sediment.

SAMPLE NO.: 3313781 (T.S. 63196) ZS2 58·0m

CLASSIFICATION: Carbonaceous, Cherty Ankerite Rock. 957129

COMPOSITION: Dominantly consisting of finely-crystalline ankerite (or similar carbonate) with thin wisps/films of carbon and small streaks of cherty quartz.

FABRIC: Lensoid fabric with irregular subparallel orientation of streaks and films; minor folding. ?Diagenetic veins at low angles.

MINOR MINERALS: Ankerite veins of diagenetic and younger (post-lithification) formation.

INTERPRETATION/
COMMENTS: The carbonate appears primary though it may have replaced an earlier carbonate during diagenesis, but evidence of this is lacking.

SAMPLE NO.: 3313782 (T.S. 63197) ZS2 96·0m

CLASSIFICATION: Leached Ankerite Rock.

COMPOSITION: Study of TS and stained surface indicates a breccia, of cherty ankerite and ankerite fragments, cemented by ankerite – now extensively leached, porous. Cut by coarser veins of siderite.

FABRIC: Ankerite is cloudy, semi-opaque and textures are obscured. Extensive leaching has also removed features. Possibly an intra formational breccia.

MINOR MINERALS: A few small pyrite crystals.

INTERPRETATION/
COMMENTS: May have been broadly similar to 781 and others but brecciated prior to lithification, then siderite-veined, later leached.

SAMPLE NO.: 3313783 (T.S. 63198) ZS2 198·5m

957130

CLASSIFICATION: Brecciated Ankerite Rock.

COMPOSITION: Dominantly ankerite, as medium–crystalline masses, extensively stressed and microfractured, with ultrafine carbonaceous pigmentation; coarser, clearer patches.

FABRIC: Recrystallised to coarser masses in places. Network of microfractures but little or no displacement or cobation. Later fracturing/veining.

MINOR MINERALS: Minor interstitial quartz and stressed, disrupted quartz veins. Stylolitic veinlets of carbonaceous matter. Siderite veins.

INTERPRETATION/
COMMENTS: Quite possibly related to 782 but not leached. Siderite veins appear to postdate the brecciation.

SAMPLE NO.: 3313784 (T.S. 63199) ZS2 210·8m

CLASSIFICATION: Silicified Ankerite Rock.

COMPOSITION: Variable, massive ankerite; as granular masses with radial textures, and as very coarsely–crystalline (recrystallised) material. Patches of replacive quartz with radial textures.

FABRIC: The radial textures in the ankerite are characteristic of diagenetically recrystallised carbonate muds.

MINOR MINERALS: Veinlets and intergranular films of black carbonaceous matter; relatively coarse and flaky, possibly ?graphite.

INTERPRETATION/
COMMENTS: The carbonaceous matter probably represents stylolitic veinlets in the original rock but is mostly re–orientated due to recrystallisation. Textures in the ankerite suggest a primary origin.

CLASSIFICATION: Carbonaceous, Cherty Ankerite Rock. 957131

COMPOSITION: Mainly finely-crystalline ankerite as small lenses defined by dark carbonaceous streaks, and lenses/streaks of amorphous to microcrystalline, cherty SiO_2; some is dark smoky grey.

FABRIC: Fine lensoid preferred fabric, some tight folding and shearing. Some suggestion of pre-consolidation movement.

MINOR MINERALS: Scattered pyrite crystals.

INTERPRETATION/
COMMENTS: Appears to have been a siliceous, ankeritic chemical sediment subjected to shearing before lithification, and again after lithification.

SAMPLE NO.: (T.S.

CLASSIFICATION:

COMPOSITION:

FABRIC:

MINOR MINERALS:

INTERPRETATION/
COMMENTS:

APPENDIX 2:

AVEBURY PROSPECT SOIL SAMPLING LEDGERS AND GEOCHEMISTRY.

AVEBURY SOIL SAMPLE LEDGERS AND GEOCHEMISTRY															
Database last updated on 8/10/93															
Results in ppm except Fe (%).															
SAMPNO	DPO	AMGE	AMGN	DEPTH	HORIZON	COLOUR	COMMENTS	Ag	As	Cu	Pb	Zn	Fe%	Mn	Ni
3529968	71550	355850	5357400	1.0	C	OB		-1	37	182	474	222	15.4	152	45
3529969	71550	355850	5357425	1.6	C	OB		-1	21	243	313	143	16.3	100	74
3529970	71550	355850	5357450	1.0	C	OB		-1	6	93	209	122	13.9	153	53
3529971	71550	355850	5357475	1.0	C	WBG		-1	9	95	254	104	19.5	198	58
3529972	71550	355850	5357500	1.4	C	LBGR		-1	10	55	145	84	9.9	193	50
3529973	71550	355850	5357525	1.5	C	OB		-1	9	116	290	169	13.3	120	76
3529974	71550	355850	5357550	1.1	C	VB		-1	8	111	234	143	12.7	215	60
3529975	71550	355850	5357575	0.7	C	OB		-1	7	115	232	134	18	529	73
3529976	71550	355850	5357600	0.9	C	OB		-1	8	84	128	110	17.3	228	139
3529977	71550	355850	5357050	0.3	C	LG		-1	-1	7	8	6	0.44	39	12
3529978	71550	355850	5357075	0.3	C	LG		-1	1	7	6	8	0.53	50	11
3529979	71550	355850	5357100	0.3	C	LG		-1	1	6	9	7	0.56	38	12
3529980	71550	355850	5357125	0.8	C	OBR	CREEK	-1	10	69	88	159	5.25	199	68
3529981	71550	355850	5357150	0.6	C	OBR		-1	180	76	436	525	19.3	1083	228
3529982	71550	355850	5357175	0.6	C	YBRN		-1	680	307	1713	1021	23.9	7600	470
3529983	71550	355850	5357200	0.3	C	LG		-1	110	29	208	97	2.84	703	154
3529984	71550	355850	5357225	1.0	C	OB		-1	980	419	916	1097	32.5	597	860
3529985	71550	355850	5357250	1.6	C	OB		-1	10	102	291	187	12.3	227	92
3529986	71550	355850	5357275	1.2	C	OB		-1	12	125	338	322	11.2	280	116
3529987	71550	355850	5357300	0.6	C	ROB		-1	13	211	916	494	20.7	184	49
3529988	71550	355850	5357325	1.5	C	VG		-1	11	166	649	240	15.1	469	106
3529989	71550	355850	5357350	0.6	C	RB		-1	17	354	452	232	23.4	330	43
3529990	71550	355850	5357375	0.8	C	RYB		-1	13	182	226	197	21	215	82
3529991	71550	355900	5357400	1.2	C	ROB		-1	9	313	350	299	22.6	342	29
3529992	71550	355900	5357425	0.9	C	VOB		-1	19	89	77	113	12.5	139	73
3529993	71550	355900	5357450	1.2	C	ROB	Fe oxide chips. Skarn subcrop?	-1	13	77	128	97	27.4	135	25
3529994	71550	355900	5357475	0.8	C	DB		-1	17	130	402	207	24.7	294	33
3529995	71550	355900	5357500	0.6	C	ROB		-1	16	230	590	380	21.8	285	49
3529996	71550	355900	5357525	0.8	C	ROB	Fe oxide chips. Skarn subcrop?	-1	15	115	268	136	18.2	120	43
3529997	71550	355900	5357550	0.8	C	YOB		-1	7	133	188	129	13.8	224	88
3529998	71550	355900	5357575	0.7	C	VG		-1	4	66	202	198	12.3	1239	97
3529999	71550	355900	5357600	0.7	C	OB		-1	7	53	184	185	21	210	30
3530000	71550	355900	5357375	0.9	C	OB		-1	7	106	340	162	9.79	192	52
3529853	71550	355900	5357350	0.7	C	OB		-1	14	73	181	159	13.8	185	39
3529854	71550	355900	5357325	1.1	C	OGB		-1	11	170	363	197	15.1	188	107

SAMPNO	DPO	AMGE	AMGN	DEPTH	HORIZON	COLOUR	COMMENTS	Ag	As	Cu	Pb	Zn	Fe%	Mn	Ni
3529855	71550	355900	5357300	0.6	C	VGOB		-1	4	63	292	191	10.4	944	92
3529856	71550	355900	5357275	0.4	C	RBG	CREEK	-1	5	99	378	484	13.3	1084	123
3529857	71550	355900	5357250	2.0	C	VG		-1	7	68	217	288	9.55	590	132
3529858	71550	355900	5357225	0.6	C	OBW		-1	170	109	197	210	13.4	99	80
3529859	71550	355900	5357200	0.4	C	ROB		-1	27	35	195	130	9.56	520	85
3529860	71550	355900	5357175	1.2	C	VGOBW	WHITE CHIPS	-1	28	77	240	335	12.6	606	124
3529861	71550	355900	5357150	0.3	C	OBRB		-1	9	28	100	421	12.5	10600	98
3529862	71550	355900	5357125	0.8	C	LOBW	THROUGH QTZITE GRAVELS	-1	16	106	678	430	13.6	9000	143
3529863	71550	355900	5357100	0.7	C	RBOB	" " "	-1	24	86	120	122	13.7	80	34
3529864	71550	355900	5357075	0.4	C	GB	RIDGETOP	-1	40	36	137	140	17.9	682	6
3529865	71550	355900	5357050	0.4	C	ROB		-1	3	9	15	17	1.07	53	3
3529866	71550	355950	5357400	1.1	C	OBGB		-1	13	171	92	37	23.6	32	67
3529867	71550	355950	5357425	1.3	C	OBB		-1	4	43	123	81	18.2	134	60
3529868	71550	355950	5357450	1.3	C	OBRB		-1	12	243	242	196	22.6	484	47
3529869	71550	355950	5357475	0.7	C	OBRB		-1	27	103	810	124	11.9	220	30
3529870	71550	355950	5357500	0.6	C?	OVB		-1	11	61	144	128	12.2	137	18
3529871	71550	355950	5357525	1.2	C	OBRB		-1	15	169	141	83	33.6	109	41
3529872	71550	355950	5357550	0.8	C	OBRB		-1	13	120	176	83	18	112	41
3529873	71550	355950	5357575	1.4	C	OBRBYB		-1	12	157	161	190	20.3	115	74
3529874	71550	355950	5357600	0.8	C	RBYB		-1	11	160	95	65	31.6	68	26
3529875	71550	355950	5357375	0.9	C?	OB		-1	15	255	243	315	23.3	166	58
3529876	71550	355950	5357350	0.4	C?	LBYB		-1	5	82	410	140	10.2	240	37
3529877	71550	355950	5357325	0.7	B	LOB		-1	6	87	565	187	13.4	347	40
3529878	71550	355950	5357300	0.0	OC	WLG	3m OUT OF CREEK	-1	6	9	69	127	0.46	62	11
3529879	71550	355950	5357275	0.5	B	O		-1	92	78	236	142	9.3	218	68
3529880	71550	355950	5357250	1.1	C	LBGR	Fe CHIPS	-1	12	97	179	225	10.1	274	99
3529881	71550	355950	5357225	0.8	C	LRBO		-1	31	86	198	86	21.7	82	75
3529882	71550	355950	5357200	0.4	B	LBO		-1	26	21	230	177	8.72	320	96
3529883	71550	355950	5357175	0.2	C	ORB		-1	9	8	291	949	16.2	3388	187
3529884	71550	355950	5357150	0.6	C	OBRB		-1	16	52	276	347	12.7	1076	87
3529885	71550	355950	5357125	0.7	C	LOBWB		-1	12	45	89	331	17.5	341	110
3529886	71550	355950	5357100	0.6	C	RB		-1	8	20	145	281	15.7	554	43
3529887	71550	355950	5357075	0.3	C	GW	QTZITE GRAVELS	-1	3	10	11	20	1.01	26	3
3529888	71550	355950	5357050	0.3	C	GW	" " TOP OF RIDGE	-1	3	9	9	12	0.42	28	5
3529889	71550	355800	5357425	0.9	C	OW		-1	10	122	114	65	18.2	59	38
3529890	71550	355800	5357450	0.8	C	O		-1	9	127	192	134	14.8	206	42
3529891	71550	355800	5357475	0.8	C	O		-1	9	69	133	106	16	109	34
3529892	71550	355800	5357500	1.2	C	OR	Fe CHIPS	-1	16	204	192	110	26.1	83	46

SAMPNO	DPO	AMGE	AMGN	DEPTH	HORIZON	COLOUR	COMMENTS	Ag	As	Cu	Pb	Zn	Fe%	Mn	Ni
3529893	71550	355800	5357525	1.0	C	LOO		-1	17	93	92	83	16	82	42
3529894	71550	355800	5357550	0.6	C	OBVBYB		-1	95	139	97	95	16.5	144	74
3529895	71550	355800	5357575	1.4	C?	VBOB		-1	23	106	82	103	16.4	281	168
3529896	77103	355800	5357600	0.7	C	G	ROCK CHIPS IN CREEKBED	-1	2	60	123	158	4.01	127	139
3529897	77103	355750	5357400	1.2	C	LOBB		-1	8	141	355	141	12.1	191	167
3529898	77103	355750	5357375	1.3	C	GORB		-1	14	152	341	276	18.6	282	134
3529899	77103	355750	5357350	1.1	C	LO		-1	4	110	172	257	18.7	125	108
3529900	77103	355750	5357325	0.8	C	LO		-1	7	87	333	187	15.2	429	57
3753401	77103	355750	5357300	0.5	C	GBLOB		-1	5	58	593	421	10.8	2382	136
3753402	77103	355750	5357275	1.4	C	OB	SHINY BLACK CRYSTALS	-1	220	84	252	414	10.6	383	187
3753403	77103	355750	5357250	0.8	C	LOBW		-1	48	76	1007	720	10.9	2056	512
3753404	77103	355750	5357225	0.0	CC	LGOB	CREEK FLOOR S.S#9965	1	33	38	1286	1909	13.8	41800	2571
3753405	77103	355750	5357200	0.0	CC	EV		-1	5	5	19	314	15.2	2016	431
3753406	77103	355750	5357175	0.8	C	BGO		-1	7	6	50	455	10.3	1801	363
3753407	77103	355750	5357150	0.3	C	OBG	VALLEY BOTTOM	-1	5	2	41	462	12.7	2946	252
3753408	77103	355750	5357125	0.6	C	OBW		-1	23	30	137	322	12.4	1872	70
3753409	77103	355750	5357100	0.4	C?	O	WITH QTZITE GRAVELS	-1	18	5	100	55	4.88	86	7
3753410	77103	355750	5357075	0.4	C?	ODB	" " " RIDGELINE	-1	120	7	281	192	12.9	4915	29
3753411	77103	355750	5357050	0.3	C	B	" " " "	-1	7	9	68	52	3.12	94	11
3753412	77103	355750	5357425	0.9	C	OBW		-1	30	134	229	189	11.7	175	98
3753413	77103	355750	5357450	0.9	C	OBW		-1	40	180	174	117	19.5	102	113
3753414	77103	355750	5357475	0.8	C	WO		-1	8	90	430	65	6.83	165	68
3753415	77103	355750	5357500	1.6	C?	VOG		-1	22	185	156	220	18.4	211	115
3753416	77103	355750	5357525	1.3	C	VOGB		-1	22	146	162	239	22.4	189	105
3753417	77103	355750	5357550	1.0	C	LOB		-1	15	130	111	107	23.4	71	78
3753418	77103	355750	5357575	1.2	C?	GLOB		-1	4	157	61	155	14.7	295	103
3753419	77103	355750	5357600	0.8	C?	OBVG		-1	4	40	20	114	16.6	185	82
3753420	77103	355700	5357400	1.0	C	VG	PYRITE PARTICLES	-1	2	25	96	78	3.6	421	86
3753421	77103	355700	5357375	0.6	B	O	GRAVELS	-1	340	53	165	35	14.1	131	71
3753422	77103	355700	5357350	0.0	CC	WG	TOP OF RIDGE	-1	26	25	5	51	1.36	43	23
3753423	77103	355700	5357325	0.2	CC	W		24	7	6	12	78	0.42	87	12
3753424	77103	355700	5357300	0.3	B	WG	QTZITE GRAVELS	3	12	5	28	27	0.52	90	26
3753425	77103	355700	5357275	0.5	C	OB		-1	40	169	386	191	12.7	336	282
3753426	77103	355700	5357250	0.2	CC	DGDV	IN STREAM BED	-1	100	28	265	1742	19.4	2058	2131
3753427	77103	355700	5357225	0.7	C	LOBW		-1	9	11	62	780	14.5	1881	570
3753428	77103	355700	5357200	0.5	C	LOBW		-1	5	8	33	384	8.73	1082	369
3753429	77103	355700	5357175	0.6	C	LOBW		-1	10	47	36	483	16.7	1132	300
3753430	77103	355700	5357150	0.0	CC	VGDB		-1	3	26	1372	309	4.73	2370	148

SAMPNO	DPO	AMGE	AMGN	DEPTH	HORIZON	COLOUR	COMMENTS	Ag	As	Cu	Pb	Zn	Fe%	Mn	Ni
3753431	77103	355700	5357125	0.7	C	OB		-1	33	29	262	570	20.9	630	190
3753432	77103	355700	5357100	0.0	OC	NOBVB	IN STREAM BED	-1	25	116	637	7200	11.8	113000	7300
3753433	77103	355700	5357075	0.2	C?	VG	IRON STAINED/QTZ CRYSTALS	-1	26	102	86	510	18	5400	81
3753434	77103	355700	5357050	0.0	OC	NLV	IRON STAINED	-1	5	6	42	349	10.4	14100	29
3753435	77103	355700	5357425	0.9	C?	GO	SWAMP	-1	5	67	98	108	4.36	200	175
3753436	77103	355700	5357450	2.0	C?	G	SWAMP	-1	5	29	115	109	0.7	97	130
3753437	77103	355700	5357475	0.6	C?	VG	SWAMP	-1	8	96	142	398	5.61	510	218
3753438	77103	355700	5357500	1.3	C?	LGW	SWAMP	1	7	15	25	122	0.59	47	46
3753439	77103	355700	5357525	0.8	C?	GVG	SWAMP	-1	4	100	31	160	2.15	278	157
3753440	77103	355700	5357550	1.0	C?	LBG		-1	11	75	48	71	11.5	153	96
3753441	77103	355700	5357575	1.6	C	OG		-1	48	67	35	85	12.8	191	99
3753442	77103	355700	5357600	1.0	C	OBLB		-1	23	97	53	89	11.8	196	67
3753443	77103	356000	5357425	1.4	C	ROGB		-1	42	156	400	198	20.2	136	59
3753444	77103	356000	5357450	1.7	C	ROGB		-1	4	275	586	123	16.5	136	72
3753445	77103	356000	5357475	1.8	C	KRO		-1	28	178	299	45	29.7	43	37
3753446	77103	356000	5357500	0.8	C	OLB		-1	5	60	206	76	16	308	28
3753447	77103	356000	5357525	1.7	C	OLB		-1	6	126	178	144	20.5	239	56
3753448	77103	356000	5357550	1.8	C	WLO		-1	2	43	175	114	2.05	192	63
3753449	77103	356000	5357575	0.2	B	G	QTZITE GRAVELS	-1	-1	5	8	7	0.31	18	7
3753450	77103	356000	5357600	0.4	C	GR		-1	-1	45	178	158	9.52	755	56
3753451	77103	356050	5357400	0.6	C?	O		-1	22	296	1689	194	16.7	178	34
3753452	77103	356050	5357425	0.7	C?	O		-1	37	435	2680	188	26.6	186	21
3753453	77103	356050	5357450	0.9	C?	OGV		-1	4	165	357	156	19.3	506	109
3753454	77103	356050	5357475	0.8	C	OW		-1	9	121	445	75	11.4	95	45
3753455	77103	356050	5357500	0.4	C	O		-1	7	57	261	184	16.3	564	32
3753456	77103	356050	5357525	0.7	C?	O		-1	9	66	231	87	18.1	192	68
3753457	77103	356050	5357550	0.6	C	LG	STREAMBED	-1	2	6	45	14	0.42	42	6
3753458	77103	356050	5357575	0.6	B	G	TOP OF SMALL RIDGE	-1	-1	5	8	6	0.31	22	5
3753459	77103	356050	5357600	1.0	C?	LOW		-1	1	16	1060	73	4.76	203	25
3753460	77103	356050	5357375	0.6	C	LORB		-1	5	396	4456	64	11.6	521	27
3753461	77103	356050	5357350	0.8	C	OB		-1	44	187	1370	213	17.6	413	58
3753462	77103	356050	5357325	1.3	C	ORB		-1	33	262	329	300	32.3	258	61
3753463	77103	356050	5357300	0.7	C	LVGO		-1	13	168	316	134	16.7	984	117
3753464	77103	356050	5357275	0.2	B	GW	SMALL RIDGE TOP	-1	8	12	27	47	0.63	34	7
3753465	77103	356050	5357250	0.4	B	GW		-1	4	8	155	28	2.96	53	6
3753466	77103	356050	5357225	0.7	C?	O		-1	38	58	263	118	10.8	334	50
3753467	77103	356050	5357200	0.3	B	G	QTZITE GRAVELS	-1	5	6	20	155	0.34	80	12
3753468	77103	356050	5357175	0.3	B	GB	IRON STAINED	-1	150	14	90	118	6.97	62	13

SAMPNO	DPO	AMGE	AMGN	DEPTH	HORIZON	COLOUR	COMMENTS	Ag	As	Cu	Pb	Zn	Fe%	Mn	Ni
3753469	77103	356050	5357150	0.0	CC	OKN		-1	73	120	716	275	12.2	1367	99
3753470	77103	356050	5357125	0.6	C	O	BOTTOM OF VALLEY	-1	11	75	118	106	10.2	169	82
3753471	77103	356050	5357100	0.3	C	BG	IRON STAINED	-1	3	39	54	197	8.79	536	42
3753472	77103	356050	5357075	0.6	B	LK	QTZITE GRAVELS	-1	-1	5	12	14	0.24	25	5
3753473	77103	356050	5357050	0.9	B	GW	QTZITE GRAVELS	-1	-1	3	14	11	0.27	22	5
3753474	77103	356100	5357400	0.8	C?	LO		-1	36	135	179	119	27.1	110	35
3753475	77103	356100	5357375	1.0	C?	LOLVG		-1	4	36	213	254	18.7	511	51
3753476	77103	356100	5357350	0.9	C	OW		-1	6	132	1465	318	19.4	1079	58
3753477	77103	356100	5357325	1.1	C	GBR		-1	170	219	710	210	18.3	252	43
3753478	77103	356100	5357300	1.1	C	LBGB		-1	8	93	173	747	17.3	277	55
3753479	77103	356100	5357275	0.0	CC	WG	QTZITE ROCK Vu	-1	150	17	41	158	0.64	106	21
3753480	77103	356100	5357250	0.2	B	WG	QTZITE GRAVELS	-1	13	8	25	29	0.3	37	9
3753481	77103	356100	5357225	1.5	C	OB		1	36	294	711	788	15.7	244	87
3753482	77103	356100	5357200	0.9	C	OBGB		-1	140	87	394	360	14.2	289	127
3753483	77103	356100	5357175	0.5	C	OBW		-1	54	42	412	320	9.23	84	201
3753484	77103	356100	5357150	0.7	C	ROB		-1	45	50	829	307	7.31	251	93
3753485	77103	356100	5357125	0.8	C	LOB	BOTTOM OF VALLEY	-1	26	130	119	388	12.2	353	120
3753486	77103	356100	5357100	0.8	C	VGLO		-1	6	52	79	403	7.78	496	56
3753487	77103	356100	5357075	0.3	B	GW	QTZITE GRAVELS	-1	1	4	4	7	0.16	12	4
3753488	77103	356100	5357050	0.4	B	G	QTZITE GRAVELS	-1	-1	6	62	11	0.24	22	5
3753489	77103	356100	5357425	1.6	C	LBLOB		-1	45	158	526	217	20.7	450	87
3753490	77103	356100	5357450	2.0	C	ORB		-1	56	285	407	261	39.5	162	30
3753491	77103	356100	5357475	0.7	C?	LORB		-1	6	185	354	168	15.2	162	49
3753492	77103	356100	5357500	0.5	C	DRB		-1	19	161	156	98	23	79	33
3753493	77103	356100	5357525	0.8	C	DRBLO	SMALL VALLEY/TRACK CROSSES	-1	63	86	890	101	8.87	17	25
3753494	77103	356100	5357550	0.7	B	WG	QTZITE GRAVELS	-1	7	7	8	5	0.34	22	7
3753495	77103	356100	5357575	0.9	B	WG	QTZITE GRAVELS/TOP OF SMALL RIDGE	-1	1	6	8	4	0.3	22	6
3753496	77103	356100	5357600	0.6	B	WG	QTZITE GRAVELS	-1	-1	5	6	2	0.29	18	7

APPENDIX 3:

MYRTLE PROSPECT AIR-CORE DRILL LOGS AND GEOCHEMISTRY.

MYRTLE PROSPECT AIR-CORE DRILLHOLE COLLAR DATA							
Hole prefix AC93—							
HOLE	LOCALE	LOCALN	AMGE	AMGN	TOTAL DEPTH	AZIMUTH	DIP
ZM1	60375	50600	364288	5352418	21.7	0	-90
ZM2	60400	50600	364313	5352418	3.3	0	-90
ZM3	60425	50600	364338	5352419	14.5	0	-90
ZM4	60450	50600	364363	5352419	23	0	-90
ZM5	60475	50600	364388	5352420	1.3	0	-90
ZM6	60500	50600	364413	5352420	0.5	0	-90
ZM7	60500	50625	364412	5352445	0.8	0	-90
ZM8	60500	50650	364412	5352470	0.5	0	-90
ZM9	60500	50700	364411	5352520	0.7	0	-90
ZM10	60500	50675	364412	5352495	0.6	0	-90
ZM11	60500	50575	364413	5352395	9.5	0	-90
ZM12	60470	50550	364385	5352370	16.4	0	-90
ZM13	60435	50525	364350	5352345	33.7	0	-90
ZM14	60350	50500	364265	5352318	28	0	-90
ZM15	60375	50500	364290	5352318	24	0	-90
ZM16	60400	50500	364315	5352318	12.5	0	-90
ZM17	60425	50500	364340	5352319	23	0	-90
ZM18	60450	50500	364365	5352319	36	0	-90
ZM19	60475	50500	364390	5352320	10	0	-90
ZM20	60500	50500	364415	5352320	7	0	-90
ZM21	60525	50500	364440	5352321	21.5	0	-90
ZM22	60400	50475	364315	5352293	20	0	-90
ZM23	60400	50450	364315	5352268	6	0	-90
ZM24	60400	50425	364315	5352243	6.6	0	-90
ZM25	60400	50400	364316	5352218	8.7	0	-90
ZM26	60400	50375	364316	5352193	28	0	-90
ZM27	60400	50350	364316	5352168	25.2	0	-90
ZM28	60075	50300	363993	5352113	18.7	0	-90
ZM29	60100	50300	364018	5352113	21.5	0	-90
ZM30	60125	50300	364043	5352114	26.5	0	-90
ZM31	60150	50300	364068	5352114	19.6	0	-90
ZM32	60175	50300	364093	5352115	17.8	0	-90
ZM33	60200	50300	364118	5352115	9.2	0	-90
ZM34	60225	50300	364143	5352115	13	0	-90
ZM35	60250	50300	364168	5352116	19.2	0	-90
ZM36	60275	50300	364193	5352116	15.3	0	-90
ZM37	60300	50300	364218	5352117	7.4	0	-90
ZM38	60325	50300	364243	5352117	34.6	0	-90
ZM39	60350	50300	364268	5352118	21.2	0	-90
ZM40	60380	50300	364298	5352118	10.8	0	-90
ZM41	60400	50300	364318	5352118	16	0	-90
ZM42	60425	50340	364343	5352158	7.3	0	-90
ZM43	60450	50325	364368	5352145	5.2	0	-90
ZM44	60500	50300	364418	5352120	4.7	0	-90
ZM45	60500	50275	364418	5352095	13	0	-90
ZM46	60500	50250	364419	5352070	18	0	-90
ZM47	60500	50225	364419	5352045	28.2	0	-90
ZM48	60500	50200	364420	5352020	12.3	0	-90
ZM49	60475	50200	364395	5352020	7.5	0	-90
ZM50	60450	50200	364370	5352019	5.3	0	-90
ZM51	60425	50200	364345	5352019	1.2	0	-90
ZM52	60400	50200	364320	5352018	16.8	0	-90
ZM53	60375	50200	364295	5352018	13.8	0	-90
ZM54	59925	50000	363848	5351810	5.7	0	-90
ZM55	59900	50000	363823	5351810	15.3	0	-90
ZM56	59875	50000	363799	5351809	30	0	-90
ZM57	59875	49975	363799	5351784	37.4	0	-90
ZM58	59875	49950	363799	5351759	6.6	0	-90
ZM59	59875	49925	363799	5351734	6.8	0	-90
ZM60	59875	49900	363799	5351709	2.4	0	-90
ZM61	59875	49875	363799	5351684	2	0	-90
ZM62	59875	49850	363799	5351659	0.5	0	-90
ZM63	59875	49825	363799	5351634	0.2	0	-90

957140

ROCKCHIP AND DRILLING CODES 17/2/93

STRATIGRAPHY

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

Msl	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	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

Ca	Alluvium	Clt	Laterite	Csg	Gossan
Clu	Colluvium	Csp	Pisolites		
Cs	Sand	Cst	Ironstone	Ccy	Clay
Cbs	Black soil	Csi	Silcrete		
Cg	Gravel	Cct	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*
La	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

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

DIAGNOSTIC MINERALOGY

PRIMARY MINERALISATION

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

SECONDARY MINERALISATION

Ls	Lead secondaries	Cs	Copper sec.	Nl	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
B	Brown	O	Orange	E	Blue
W	White	Y	Yellow	S	Silver

MYRTLE AIR-CORE DRILLING DATABASE - DRILLING LOGS AND ASSAY																
Database last updated 24/5/93																
Results in ppm (Fe in %)																
Hole names prefixed AC93---																
HOLE	DFROM	DTO	SAMPNO	DPO	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	COMMENTS	Zn	Pb	Ag	Cu	Fe%	Mn
ZM1	0.0	2.0	3527993	71534	Qha	Ccy			B		49	29	-1	2	0.24	22
ZM1	2.0	4.0	3527994	71534	Og	Ccy			DB		3173	204	4	10	0.41	18
ZM1	4.0	6.0	3527995	71534	Og	Sls	We				140000	2700	23	11	0.72	19
ZM1	6.0	8.0	3527996	71534	Og	Sls	We				61000	1200	7	10	1.54	23
ZM1	8.0	10.0	3527997	71534	Og	Sls	We				37100	800	3	10	2.14	21
ZM1	10.0	12.0	3527998	71534	Og	Sls	We				36300	679	3	10	1.81	23
ZM1	12.0	14.0	3527999	71534	Og	Sls	We		DGN		12800	210	1	13	2.78	30
ZM1	14.0	16.0	3528000	71534	Og	Sls	We		DGN		8500	95	1	16	1.49	27
ZM1	16.0	18.0	3528001	71534	Og	Sls	Ds	Sp	G		4230	78	-1	13	1.29	22
ZM1	18.0	20.0	3528002	71534	Og	Sls	Ds	Sp	G		1801	46	-1	21	1.42	28
ZM1	20.0	21.7	3528003	71534	Og	Sls	Vn	Cc	GN		624	39	-1	28	1.89	90
ZM2	0.0	2.0	3528004	71534	Qha	Ccy			G		31	24	-1	3	0.36	15
ZM2	2.0	3.3	3528005	71534	Og	Sls			N		43	103	-1	5	0.62	14
ZM3	0.0	2.0	3528006	71534	Qha	Ccy			B		452	149	-1	7	0.5	19
ZM3	2.0	4.0	3528007	71534	Og	Ccy			GN		624	216	-1	21	1.72	33
ZM3	4.0	6.0	3528008	71534	Og	Ccy			GNV		4609	255	1	21	2.14	34
ZM3	6.0	8.0	3528009	71534	Og	SlsCcy	We		GB		4597	122	1	17	2.43	35
ZM3	8.0	10.0	3528010	71534	Og	SshCcy			GN		4276	104	1	15	1.58	29
ZM3	10.0	12.0	3528011	71534	Og	Ssh					3441	496	1	16	2.12	31
ZM3	12.0	14.0	3528012	71534	Og	Ssh	Ds	Py		Py 10%	15100	1200	3	15	2.95	28
ZM3	14.0	14.5	3528013	71534	Og	Ssh	Ds	Py		Py 10%	28200	546	3	17	1.79	30
ZM4	0.0	2.0	3528014	71534	Og	Ccy			BGN		4412	352	1	19	0.93	19
ZM4	2.0	4.0	3528015	71534	Og	Ccy			GN		6200	355	1	22	1.64	33
ZM4	4.0	6.0	3528016	71534	Og	Ccy			GN		1949	255	1	23	2.32	35
ZM4	6.0	8.0	3528017	71534	Og	Ccy			GN		3927	303	-1	17	2.09	38
ZM4	8.0	10.0	3528018	71534	Og	SshCcy			GN		9800	1576	-1	9	1.79	26
ZM4	10.0	12.0	3528019	71534	Og	SshCcy			GN		3197	322	-1	12	1.84	81
ZM4	12.0	14.0	3528020	71534	Og	SshCcy	Ds	Py	GN		237	53	-1	10	1.31	185
ZM4	14.0	16.0	3528021	71534	Og	Ssh	Vn	Cc			164	35	-1	9	1.54	175
ZM4	16.0	18.0	3528022	71534	Og	Ssh	Vn	Cc			224	26	-1	7	1.7	154
ZM4	18.0	20.0	3528023	71534	Og	Ssh	Vn	Cc			175	24	-1	7	1.63	154
ZM4	20.0	22.0	3528024	71534	Og	SshCcy	Vn	Cc	GN		145	25	-1	11	2.31	150
ZM4	22.0	23.0	3528025	71534	Og	Ssh	Vn	Cc			135	21	-1	8	1.71	153
ZM5	0.0	1.3	3528026	71534	Og	SlsSsh					109	46	-1	10	1.1	51
ZM6	0.0	0.5	3528027	71534	Og	Sls					33	14	-1	5	0.73	108
ZM7	0.0	0.8	3528028	71534	QhaOg	CcySls					57	18	-1	4	0.57	79
ZM8	0.0	0.5	3528029	71534	QhaOg	CcySls					49	13	-1	5	0.63	81
ZM9	0.0	0.7	3528030	71534	QhaOg	CcySls					17	5	-1	7	0.37	111
ZM10	0.0	0.6	3528031	71534	QhaOg	CcySls					197	23	-1	5	0.88	99
ZM11	0.0	2.0	3528032	71534	Og	Ccy			GBV		1055	269	-1	48	0.91	19
ZM11	2.0	4.0	3528033	71534	Og	Ccy			DG		1893	64	-1	24	2.8	23
ZM11	4.0	6.0	3528034	71534	Og	Ssh					1871	247	-1	22	1.83	29

ZM11	6.0	8.0	3528035	71534	Og	Ssh					1693	103	-1	24	1.89	46
ZM11	8.0	9.5	3528036	71534	Og	Ssh					352	33	-1	10	2.36	116
ZM12	0.0	2.0	3528037	71534	QhaOg	Ccy			BG		128	756	2	100	2.5	24
ZM12	2.0	4.0	3528038	71534	Og	Ccy			G		107	694	6	42	2.99	16
ZM12	4.0	6.0	3528039	71534	Og	Ccy			G		99	487	2	23	0.61	19
ZM12	6.0	8.0	3528040	71534	Og	Ccy			DG		2964	2252	15	151	1.47	19
ZM12	8.0	10.0	3528041	71534	Og	Ccy			DG		8800	2000	12	56	1.56	27
ZM12	10.0	12.0	3528042	71534	Og	Ccy			DG		7900	921	3	25	1.74	26
ZM12	12.0	14.0	3528043	71534	Og	Ccy			DG		2119	624	2	31	0.73	15
ZM12	14.0	16.0	3528044	71534	Og	CcySsh	WeDs	Py	DG	Py 1%	2771	562	1	18	1.35	44
ZM12	16.0	16.4	3528045	71534	Og	CcySsh			G		1963	228	1	8	1.48	94
ZM13	0.0	2.0	3528046	71534	QhaOg	Ccy			Y		38	24	-1	2	1.67	14
ZM13	2.0	4.0	3528047	71534	QhaOg	Ccy			Y		34	76	-1	45	3.12	11
ZM13	4.0	6.0	3528048	71534	Og	Ccy			LGDG		201	481	-1	69	1.74	28
ZM13	6.0	8.0	3528049	71534	Og	CcySsh			DG		608	554	-1	21	2	61
ZM13	8.0	10.0	3528050	71534	Og	CcySsh			DG		2111	1908	3	104	2	49
ZM13	10.0	12.0	3528051	71534	Og	Ssh					5600	180	-1	17	1.96	35
ZM13	12.0	14.0	3528052	71534	Og	Ssh	Ds	Py			8500	347	-1	19	1.83	39
ZM13	14.0	16.0	3528053	71534	Og	Ssh	Ds	Py			9500	223	1	13	1.9	33
ZM13	16.0	18.0	3528054	71534	Og	Ssh	Ds	Py			20700	93	3	13	1.57	34
ZM13	18.0	20.0	3528055	71534	Og	Oms	Ms	Py			28800	211	7	26	4.5	33
ZM13	20.0	22.0	3528056	71534	Og	Oms	Ms	Py			21400	1100	13	41	24.9	30
ZM13	22.0	24.0	3528057	71534	Og	OmsSsh	Ms	Py			155000	1200	29	66	4.76	34
ZM13	24.0	26.0	3528058	71534	Og	OmsSsh	Ms	Py			145000	1800	50	84	10.4	34
ZM13	26.0	28.0	3528059	71534	Og	Ccy	Ds	Py	DG		34100	2500	11	40	2.77	42
ZM13	28.0	30.0	3528060	71534	Og	Ccy			DG		6200	223	2	19	2.28	32
ZM13	30.0	32.0	3528061	71534	Og	Ssh	Ds	Py			8400	419	2	22	2.32	40
ZM13	32.0	33.7	3528062	71534	Og	Ssh					3368	5600	2	11	1.98	112
ZM14	0.0	2.0	3528063	71534	Og	Ccy			N		555	56	-1	24	0.76	14
ZM14	2.0	4.0	3528064	71534	Og	Ccy			N		2526	40	-1	17	2.24	51
ZM14	4.0	6.0	3528065	71534	Og	Ssh					1733	24	-1	16	1.43	48
ZM14	6.0	8.0	3528066	71534	Og	Ssh					1453	27	-1	17	1.43	48
ZM14	8.0	10.0	3528067	71534	Og	Ssh					810	29	-1	15	1.28	50
ZM14	10.0	12.0	3528068	71534	Og	Ssh					955	27	-1	14	1.28	42
ZM14	12.0	14.0	3528069	71534	Og	Ssh					1050	28	-1	18	1.22	48
ZM14	14.0	16.0	3528070	71534	Og	Ssh					1392	29	-1	17	1.3	47
ZM14	16.0	18.0	3528071	71534	Og	Ssh					2587	34	-1	14	1.38	32
ZM14	18.0	20.0	3528072	71534	Og	Ssh	Ds	Py		Py 5%	3516	42	-1	15	1.85	34
ZM14	20.0	22.0	3528073	71534	Og	Sls	Ds	Py	DGLG		1561	27	-1	16	1.49	21
ZM14	22.0	24.0	3528074	71534	Og	Sls	Ds	Py	DGLG		1082	13	-1	12	0.94	21
ZM14	24.0	26.0	3528075	71534	Og	Sls	Ds	Py	DGLG		989	16	-1	11	0.79	23
ZM14	26.0	28.0	3528076	71534	Og	Ssh			DG		1198	18	-1	17	1.08	27
ZM15	0.0	2.0	3528077	71534	Og	Ccy			LGB		2143	28	-1	12	1.1	20
ZM15	2.0	4.0	3528078	71534	Og	Ccy			LBV		2818	18	-1	13	1.18	19
ZM15	4.0	6.0	3528079	71534	Og	Ccy			GB		6200	36	1	21	1.26	22
ZM15	6.0	8.0	3528080	71534	Og	Ccy			GB		4671	27	-1	16	1.2	24
ZM15	8.0	10.0	3528081	71534	Og	SshCcy					3821	26	-1	16	1.2	31
ZM15	10.0	12.0	3528082	71534	Og	SshCcy					12000	25	-1	17	1.65	35

ZM15	12.0	14.0	3528083	71534	Og	SshCcy					5800	28	1	18	1.45	43
ZM15	14.0	16.0	3528084	71534	Og	SshCcy					1761	25	-1	19	1.4	47
ZM15	16.0	18.0	3528085	71534	Og	SshCcy					1626	18	-1	15	1.19	48
ZM15	18.0	20.0	3528086	71534	Og	SshCcy	Ds	Py			1505	25	-1	14	1.23	50
ZM15	20.0	22.0	3528087	71534	Og	SshCcy	Ds	Py			3142	29	-1	16	1.6	45
ZM15	22.0	24.0	3528088	71534	Og	SshCcy	Ds	Py			2614	26	-1	25	1.49	29
ZM16	0.0	2.0	3528089	71534	Qha	Ccy			Y		67	57	-1	3	0.58	15
ZM16	2.0	4.0	3528090	71534	QhaOg	Ccy			YG		1128	387	1	11	1.53	25
ZM16	4.0	6.0	3528091	71534	Og	Ccy			DG		3953	83	-1	18	6.69	36
ZM16	6.0	8.0	3528092	71534	Og	Ccy			DG		6700	217	-1	15	2.87	37
ZM16	8.0	10.0	3528093	71534	Og	Ccy			VB		7200	355	-1	13	1.7	42
ZM16	10.0	12.0	3528094	71534	Og	Ssh					2992	3382	3	100	0.64	17
ZM16	12.0	12.5	3528095	71534	Og	Ssh	Ds	PySp?			19800	13600	12	139	0.95	16
ZM17	0.0	2.0	3528096	71534	QhaOg	Ccy			LB		81	1167	1	6	0.29	20
ZM17	2.0	4.0	3528097	71534	Og	Ccy			LGB		60	1024	1	2	0.25	19
ZM17	4.0	6.0	3528098	71534	Og	Ccy			DG		3375	1402	2	16	0.67	18
ZM17	6.0	8.0	3528099	71534	Og	Ccy			DG		12400	9100	-1	17	3.98	22
ZM17	8.0	10.0	3528100	71534	Og	Ccy			DG		8200	8200	1	23	2.35	40
ZM17	10.0	12.0	3528101	71534	Og	Ccy			DG		11200	1800	-1	18	2.51	24
ZM17	12.0	14.0	3528102	71534	Og	SshCcy			DG		14200	337	-1	17	2.41	25
ZM17	14.0	16.0	3528103	71534	Og	Ssh	Ds	Py			6400	314	-1	13	1.81	41
ZM17	16.0	18.0	3528104	71534	Og	Ssh	Ds	Py			5600	108	-1	9	1.25	26
ZM17	18.0	20.0	3528105	71534	Og	SshCcy	Ds	Py	DG		13800	358	2	19	2.75	41
ZM17	20.0	22.0	3528106	71534	Og	SshCcy	Ds	Py	DG		9100	193	-1	18	2.3	43
ZM17	22.0	23.0	3528107	71534	Og	SshCcy	Ds	Py	DG		1942	152	-1	5	1.24	113
ZM18	0.0	2.0	3528108	71534	Og	Ccy	Ds	Py	G		15400	6100	18	40	12.3	34
ZM18	2.0	4.0	3528109	71534	Og	Ccy	Ds	Py	VB		82900	8800	46	90	11.5	27
ZM18	4.0	6.0	3528110	71534	Og	Ccy	Ds	Py	VB		55600	6200	23	42	4.61	40
ZM18	6.0	8.0	3528111	71534	Og	Oms	Ms	Py			68400	13000	35	62	14.8	58
ZM18	8.0	10.0	3528112	71534	Og	Oms	Ms	Py			35500	2000	7	21	3.88	18
ZM18	10.0	12.0	3528113	71534	Og	Ccy	Ds	Sp	YDG		24400	187	-1	8	0.89	9
ZM18	12.0	14.0	3528114	71534	Og	Ccy	Ds	Sp	YDG		38100	342	1	7	2.2	10
ZM18	14.0	16.0	3528115	71534	Og	CcyOms	Ms	PySp	YDG		14100	1500	4	31	9.37	29
ZM18	16.0	18.0	3528116	71534	Og	CcyOms	Ms	Py	DG		14400	545	1	19	4.65	49
ZM18	18.0	20.0	3528117	71534	Og	CcyOms	Ms	Py	DG		63600	4100	3	18	11.1	47
ZM18	20.0	22.0	3528118	71534	Og	CcyOms	Ms	Py	DG		55700	2000	3	17	6.53	34
ZM18	22.0	24.0	3528119	71534	Og	OmsSsh	Ms	Py	DG		62200	4000	4	17	9.5	31
ZM18	24.0	26.0	3528120	71534	Og	OmsSsh	Ms	Py			66400	5600	6	23	13.2	40
ZM18	26.0	28.0	3528121	71534	Og	OmsSsh	Ms	Py			65800	6500	5	24	15.1	56
ZM18	28.0	30.0	3528122	71534	Og	OmsSsh	Ms	Py			42000	5600	1	16	7.73	162
ZM18	30.0	32.0	3528123	71534	Og	OmsSsh	Ms	Py			19500	3900	2	19	5.73	135
ZM18	32.0	34.0	3528124	71534	Og	OmsSsh	Ms	Py			32500	4100	5	29	11.5	78
ZM18	34.0	36.0	3528125	71534	Og	OmsSsh	Ms	Py			18500	691	5	38	6.5	65
ZM19	0.0	2.0	3528126	71534	Og	Ccy			YDG		975	2169	10	82	5.77	17
ZM19	2.0	4.0	3528127	71534	Og	Ccy			YDG		850	729	9	53	3.7	14
ZM19	4.0	6.0	3528128	71534	Og	Ccy			YDG		20100	511	17	56	5.63	26
ZM19	6.0	8.0	3528129	71534	Og	Ccy			DG		21800	313	4	17	5.94	74
ZM19	8.0	10.0	3528130	71534	Og	Ccy			LGDG		5400	3400	4	41	5.7	29

ZM20	2.0	4.0	3528131	71534	Og	SshCcy	Ds	Py	GV		7000	3000	4	39	6.82	38
ZM20	0.0	2.0	3528132	71534	Og	SshCcy	Ds	Py	GV		1009	2325	1	25	18.2	39
ZM20	4.0	6.0	3528133	71534	Og	SshCcy	Ds	Py	GV		1045	256	-1	9	5.96	130
ZM20	6.0	7.0	3528134	71534	Og	SshCcy	Ds	Py	G		3880	7300	1	75	4.89	46
ZM21	0.0	2.0	3528135	71534	Og	Ccy			LBVG		3325	1788	1	23	10.8	63
ZM21	2.0	4.0	3528136	71534	Og	Ccy	Ds	Py	DG		4021	1067	1	18	4.41	39
ZM21	4.0	6.0	3528137	71534	Og	Ccy	Ds	Py	VG		4049	1107	1	19	4.32	42
ZM21	6.0	8.0	3528138	71534	Og	Ccy	Ds	Py	VG		1374	331	1	19	3.59	53
ZM21	8.0	10.0	3528139	71534	Og	Ccy	Ds	Py	VG		802	59	-1	18	2.7	56
ZM21	10.0	12.0	3528140	71534	Og	Ccy	Ds	Py	VG		1030	47	-1	20	2.91	71
ZM21	12.0	14.0	3528141	71534	Og	Ccy	Ds	Py	DG		376	72	-1	19	2.91	68
ZM21	14.0	16.0	3528142	71534	Og	Ccy	Ds	Py	DG		1228	244	1	27	4.54	57
ZM21	16.0	18.0	3528143	71534	Og	Ccy	Ds	Py	DG		1090	191	-1	25	3.82	38
ZM21	18.0	20.0	3528144	71534	Og	Ccy	Ds	Py	DG		708	134	-1	25	2.54	20
ZM21	20.0	21.5	3528145	71534	Og	SlsCcy			DG		293	77	-1	21	3.42	81
ZM22	0.0	2.0	3528146	71534	Qha	Ccy			YLB		58	22	-1	4	0.86	39
ZM22	2.0	4.0	3528147	71534	Og	Ccy	Ds	Py	V		24700	6000	2	66	1.71	23
ZM22	4.0	6.0	3528148	71534	Og	SlsCcy			VDG		27300	1800	1	18	1.42	24
ZM22	6.0	8.0	3528149	71534	Og	SlsCcy			V		13400	1700	1	19	1.67	33
ZM22	8.0	10.0	3528150	71534	Og	Ssh	Ds	Py			19200	1900	1	13	4.61	23
ZM22	10.0	12.0	3528151	71534	Og	Ssh	Ds	Py			19300	2200	1	15	2.06	23
ZM22	12.0	14.0	3528152	71534	Og	Ccy			DV		8400	1300	1	26	1.78	34
ZM22	14.0	16.0	3528153	71534	Og	Ssh	Ds	Py			10300	5300	3	19	1.54	28
ZM22	16.0	18.0	3528154	71534	Og	SlsCcy	Ds	Py			10000	549	1	23	7.43	81
ZM22	18.0	20.0	3528155	71534	Og	SlsCcy	Ds	Py			5400	215	-1	7	6.7	148
ZM23	0.0	2.0	3528156	71534	QhaOg	Ccy			Y		202	788	1	16	0.53	18
ZM23	2.0	4.0	3528157	71534	Og	Ccy			LGDG		1825	177	1	20	0.86	18
ZM23	4.0	6.0	3528158	71534	Og	SlsCcy	Ds	Py	DG		2508	302	-1	27	1.21	27
ZM24	0.0	2.0	3528159	71534	QhaOg	Ccy			Y		56	446	-1	14	0.27	20
ZM24	2.0	4.0	3528160	71534	QhaOg	Ccy			Y		249	636	-1	31	0.34	16
ZM24	4.0	6.0	3528161	71534	Og	Ccy			YDG		2553	406	1	45	1.67	24
ZM24	6.0	6.6	3528162	71534	Og	SlsCcy	Ds	Py	DG		792	67	-1	11	1.2	111
ZM25	0.0	2.0	3528163	71534	QhaOg	Ccy			Y		244	113	-1	29	2.02	38
ZM25	2.0	4.0	3528164	71534	QhaOg	Ccy			YOG		512	224	-1	58	3.3	38
ZM25	4.0	6.0	3528165	71534	Og	Ccy			LGDG		100	64	1	50	0.33	15
ZM25	6.0	8.0	3528166	71534	Og	Ccy			DG		2185	121	1	71	3.31	60
ZM25	8.0	8.7	3528167	71534	Og	Sls					524	18	-1	4	1.01	138
ZM26	0.0	2.0	3528168	71534	Qha	Ccy			Y		49	36	1	67	0.67	18
ZM26	2.0	4.0	3528169	71534	Og	SlsCcy			LG		30	70	1	41	0.3	14
ZM26	4.0	6.0	3528170	71534	Og	Sls	We		B		66	44	-1	29	0.31	17
ZM26	6.0	8.0	3528171	71534	Og	Sls	We		B		373	206	1	48	0.53	17
ZM26	8.0	10.0	3528172	71534	Og	Sls	We		B		842	209	-1	41	1.36	24
ZM26	10.0	12.0	3528173	71534	Og	Sls	We		B		746	33	-1	15	1.51	20
ZM26	12.0	14.0	3528174	71534	Og	Ccy			DG		539	77	-1	32	4.82	31
ZM26	14.0	16.0	3528175	71534	Og	SlsCcy			DG		66	27	-1	16	2.03	21
ZM26	16.0	18.0	3528176	71534	Og	SlsCcy			DG		191	24	-1	12	1.59	25
ZM26	18.0	20.0	3528177	71534	Og	SlsCcy			DG		480	53	-1	17	2.48	28
ZM26	20.0	22.0	3528178	71534	Og	SlsCcy			DG		239	72	-1	17	3.41	45

ZM26	22.0	24.0	3528179	71534	Og	Sls	Ds	Py			450	36	-1	15	2.02	27
ZM26	24.0	26.0	3528180	71534	Og	Sls	Ds	Py			161	37	-1	16	2.3	36
ZM26	26.0	28.0	3528181	71534	Og	Sls	Ds	Py			91	35	-1	17	2.56	64
ZM27	0.0	2.0	3528182	71534	Qha	Ccy			Y		60	27	-1	102	0.71	13
ZM27	2.0	4.0	3528183	71534	Og	Ccy			LG		45	74	-1	47	0.32	22
ZM27	4.0	6.0	3528184	71534	Og	Ccy			LG		30	58	-1	57	0.24	14
ZM27	6.0	8.0	3528185	71534	Og	Ccy			GV		433	206	-1	53	0.77	12
ZM27	8.0	10.0	3528186	71534	Og	Ccy			GV		396	113	-1	43	1.01	19
ZM27	10.0	12.0	3528187	71534	Og	Sls			DG		174	32	-1	16	1.56	37
ZM27	12.0	14.0	3528188	71534	Og	Sls	Ds	Py	DG		120	26	-1	19	2.05	38
ZM27	14.0	16.0	3528189	71534	Og	Sls			DG		41	22	-1	19	1.9	29
ZM27	16.0	18.0	3528190	71534	Og	Sls			DG		38	19	-1	15	1.6	24
ZM27	18.0	20.0	3528191	71534	Og	Sls			DG		47	25	-1	16	1.75	37
ZM27	20.0	22.0	3528192	71534	Og	Sls			DG		240	24	-1	18	1.74	34
ZM27	22.0	24.0	3528193	71534	Og	Sls			DG		113	44	-1	31	3.4	36
ZM27	24.0	25.2	3528194	71534	Og	SlsSsh	Ds	Py	DG		75	30	-1	22	2.09	59
ZM28	0.0	2.0	3528195	71534	Qha	Ccy			OB		100	69	-1	9	1.09	35
ZM28	2.0	4.0	3528196	71534	Og	Ccy			YBLG		368	53	-1	17	2.14	33
ZM28	4.0	6.0	3528197	71534	Og	Ccy			YB		344	36	-1	18	2.52	50
ZM28	6.0	8.0	3528198	71534	Og	Ccy			LGOB		859	464	-1	29	7.49	90
ZM28	8.0	10.0	3528199	71534	Og	Ccy			OB		1420	1641	-1	39	4.9	53
ZM28	10.0	12.0	3528200	71534	Og	CcyCsf			Y	Ironstone frags	1740	1519	-1	36	12.5	77
ZM28	12.0	14.0	3528201	71534	Og	CcyCsf			Y	Ironstone frags	2440	1942	1	28	10	66
ZM28	14.0	16.0	3528202	71534	Og	Ccy			G		9600	355	-1	32	4.07	42
ZM28	16.0	18.0	3528203	71534	Og	Ccy			DGN		43200	168	-1	54	3.78	25
ZM28	18.0	18.7	3528204	71534	Og	Sls	Ma		DG		11500	122	-1	17	1.44	137
ZM29	0.0	2.0	3528205	71534	Qha	Ccy			YB		32	97	-1	6	0.35	16
ZM29	2.0	4.0	3528206	71534	Qha	Ccy			YB		33	41	-1	53	0.33	15
ZM29	4.0	6.0	3528207	71534	Og	Ccy			DG		1420	786	-1	89	1.69	29
ZM29	6.0	8.0	3528208	71534	Og	CcySls			B		3441	2226	-1	33	3.73	23
ZM29	8.0	10.0	3528209	71534	Og	CcySls			VG		3092	1303	-1	29	7.66	1208
ZM29	10.0	12.0	3528210	71534	Og	CcySls			VG		2820	1067	-1	20	9.45	1868
ZM29	12.0	14.0	3528211	71534	Og	CcySls	Ds	Py	G		2372	817	-1	16	10.6	2292
ZM29	14.0	16.0	3528212	71534	Og	Sls	Ds	Py	DG		7800	332	-1	40	12.7	734
ZM29	16.0	18.0	3528213	71534	Og	Sls	Ds	Py	DG		1160	194	-1	9	8.93	1810
ZM29	18.0	20.0	3528214	71534	Og	Sls	Ds	Py	DG		1680	250	-1	17	5.98	595
ZM29	20.0	21.5	3528215	71534	Og	CcySls	Ds	Sp	G		3707	620	-1	25	13.8	1914
ZM30	0.0	2.0	3528216	71534	Qha	CcyCg			B		12	708	-1	2	0.28	14
ZM30	2.0	4.0	3528217	71534	Og	Ccy			B		12	781	-1	11	0.32	22
ZM30	4.0	6.0	3528218	71534	Og	Ccy			LB		10	313	-1	14	0.27	13
ZM30	6.0	8.0	3528219	71534	Og	CcySls	We		B		25	832	-1	36	0.3	19
ZM30	8.0	10.0	3528220	71534	Og	Sls	We		B		718	1735	1	96	0.35	13
ZM30	10.0	12.0	3528221	71534	Og	Ccy			G		10700	1412	-1	50	1.65	35
ZM30	12.0	14.0	3528222	71534	Og	Ccy			DB		1555	1250	-1	48	1.7	22
ZM30	14.0	16.0	3528223	71534	Og	Ccy			DVG		2286	950	-1	42	2.55	20
ZM30	16.0	18.0	3528224	71534	Og	Ccy			N		1995	496	1	32	2.46	28
ZM30	18.0	20.0	3528225	71534	Og	Sls			DG		2152	153	-1	19	2.07	44
ZM30	20.0	22.0	3528226	71534	Og	Sls	We		DG		295	68	-1	27	1.99	55

ZM30	22.0	24.0	3528227	71534	Og	Sls	We		DG			77	28	-1	20	1.56	97
ZM30	24.0	26.0	3528228	71534	Og	Sls	We		DG			1169	57	-1	14	2.14	185
ZM30	26.0	26.5	3528229	71534	Og	Sls	Ma		DG			688	76	-1	9	1.51	178
ZM31	0.0	2.0	3528230	71534	Qha	Ccy			Y			62	1339	-1	37	2.17	14
ZM31	2.0	4.0	3528231	71534	Og	Ccy			LYG			48	449	-1	32	1.2	11
ZM31	4.0	6.0	3528232	71534	Og	Ccy			LYB			76	135	-1	36	2.09	15
ZM31	6.0	8.0	3528233	71534	Og	Ccy			LYB			32	59	-1	41	1.9	12
ZM31	8.0	10.0	3528234	71534	Og	Ccy			LYG			82	86	-1	47	2.04	16
ZM31	10.0	12.0	3528235	71534	Og	Ccy			Y			515	49	-1	26	2.34	34
ZM31	12.0	14.0	3528236	71534	Og	Ccy			LGN			726	160	-1	52	2.92	22
ZM31	14.0	16.0	3528237	71534	Og	Sls	We	Sd	DG			588	32	-1	16	1.52	23
ZM31	16.0	18.0	3528238	71534	Og	Sls	We		DG			415	38	-1	21	1.82	72
ZM31	18.0	19.6	3528239	71534	Og	Sls	We		DG			655	32	-1	18	1.65	99
ZM32	0.0	2.0	3528240	71534	Qha	Ccy			LYG			15	40	-1	23	1.79	14
ZM32	2.0	4.0	3528241	71534	Qha	Ccy			LYG			48	37	-1	22	1.15	16
ZM32	4.0	6.0	3528242	71534	Og	Ccy			LG			25	2945	-1	40	1.01	13
ZM32	6.0	8.0	3528243	71534	Og	Ccy			LGN			8700	1900	1	56	6.88	18
ZM32	8.0	10.0	3528244	71534	Og	Ccy			DGN			6000	2600	-1	74	2.25	15
ZM32	10.0	12.0	3528245	71534	Og	Ccy			N			6200	1000	1	33	3.11	30
ZM32	12.0	14.0	3528246	71534	Og	SlsCcy			N			9900	181	-1	16	7.74	117
ZM32	14.0	16.0	3528247	71534	Og	Sls			DG			2594	34	-1	7	2.33	136
ZM32	16.0	17.8	3528248	71534	Og	Sls			LGDG			675	13	-1	6	1	66
ZM33	0.0	2.0	3528249	71534	Qha	Ccy			LBDG			196	428	-1	41	1.51	20
ZM33	2.0	4.0	3528250	71534	Og	Ccy			G			1076	2256	1	29	2.07	51
ZM33	4.0	6.0	3528251	71534	Og	Ccy			G			3790	806	-1	23	2.31	39
ZM33	6.0	8.0	3528252	71534	Og	CcySls			DG			2233	140	-1	21	1.71	30
ZM33	8.0	9.2	3528253	71534	Og	SlsCcy			LGDG			2479	127	-1	17	2.09	62
ZM34	0.0	2.0	3528254	71534	Qha	Ccy			LYG			84	87	-1	8	0.53	14
ZM34	2.0	4.0	3528255	71534	Qha	Ccy			LYG			41	67	-1	29	0.57	15
ZM34	4.0	6.0	3528256	71534	Og	CcySls			LYG			65	90	-1	28	0.56	18
ZM34	6.0	8.0	3528257	71534	Og	Ccy			LYO			40	108	-1	37	1.55	16
ZM34	8.0	10.0	3528258	71534	Og	Ccy			LODG			1522	57	-1	33	1.81	25
ZM34	10.0	12.0	3528259	71534	Og	Ccy			DG			4190	41	-1	25	2.17	30
ZM34	12.0	13.0	3528260	71534	Og	Ccy			DG			3499	57	-1	22	2.29	33
ZM35	0.0	2.0	3528261	71534	Og	Ccy			G			97	109	-1	77	0.34	17
ZM35	2.0	4.0	3528262	71534	Og	Ccy			DG			24	184	-1	300	0.41	15
ZM35	4.0	6.0	3528263	71534	Og	Ccy			LGDG			77	236	-1	29	0.52	19
ZM35	6.0	8.0	3528264	71534	Og	Ccy			DG			412	68	-1	24	2.32	21
ZM35	8.0	10.0	3528265	71534	Og	Ccy			DG			613	86	-1	19	3.24	22
ZM35	10.0	12.0	3528266	71534	Og	CcySls	Al	Sd	DG			3006	516	-1	117	2.33	21
ZM35	12.0	14.0	3528267	71534	Og	Sls	AlDs	SdSp	YG			4558	360	-1	73	2.04	13
ZM35	14.0	16.0	3528268	71534	Og	Sls	AlDs	SdSp	YG			6300	170	-1	35	2.43	18
ZM35	16.0	18.0	3528269	71534	Og	Sls	Al	Sd	G			7300	104	-1	19	2.12	41
ZM35	18.0	19.2	3528270	71534	Og	Sls			G			228	26	-1	-2	0.95	85
ZM36	0.0	2.0	3528271	71534	Qha	CcyCv			LGB			18	121	-1	8	0.27	16
ZM36	2.0	4.0	3528272	71534	Og	Ccy			WLG			72	346	-1	115	0.26	11
ZM36	4.0	6.0	3528273	71534	Og	Ccy			LG			263	501	-1	276	0.34	14
ZM36	6.0	8.0	3528274	71534	Og	Ccy			G			3192	424	-1	48	1.48	11

ZM36	8.0	10.0	3528275	71534	Og	Ccy			G		3614	144	-1	30	1.86	16
ZM36	10.0	12.0	3528276	71534	Og	CcySls	AlDs	SdSp	YG		2207	67	-1	16	5.49	236
ZM36	12.0	14.0	3528277	71534	Og	Ccy			G		642	39	-1	18	3.33	183
ZM36	14.0	15.3	3528278	71534	Og	Ccy			G		1315	58	-1	22	6.35	92
ZM37	0.0	2.0	3528279	71534	Og	Ccy			LYG		224	213	-1	33	2.06	50
ZM37	2.0	4.0	3528280	71534	Og	Ccy			WYG		646	186	-1	62	9.78	185
ZM37	4.0	6.0	3528281	71534	Og	Ccy			YB		1370	107	-1	31	9.87	230
ZM37	6.0	7.4	3528282	71534	Og	Sls			G		94	13	-1	4	1.71	204
ZM38	0.0	2.0	3528283	71534	Og	Ccy			LYG		48	70	-1	18	0.85	28
ZM38	2.0	4.0	3528284	71534	Og	Ccy			LG		69	67	-1	37	0.35	17
ZM38	4.0	6.0	3528285	71534	Og	Ccy			LG		55	109	-1	40	0.51	24
ZM38	6.0	8.0	3528286	71534	Og	Ccy			YB		160	249	-1	55	1.63	51
ZM38	8.0	10.0	3528287	71534	Og	Ccy			GYB		220	100	-1	44	1.21	31
ZM38	10.0	12.0	3528288	71534	Og	Ccy			DG		352	155	-1	30	1.47	27
ZM38	12.0	14.0	3528289	71534	Og	Ccy			DG		450	127	-1	27	1.6	34
ZM38	14.0	16.0	3528290	71534	Og	Ccy			LGDG		210	195	-1	36	1.33	36
ZM38	16.0	18.0	3528291	71534	Og	Ccy			DG		562	96	-1	27	1.5	35
ZM38	18.0	20.0	3528292	71534	Og	Ccy			G		293	63	-1	30	1.13	38
ZM38	20.0	22.0	3528293	71534	Og	Ccy			G		781	112	-1	39	2.15	37
ZM38	22.0	24.0	3528294	71534	Og	Ccy			LGDG		713	107	-1	41	2.13	71
ZM38	24.0	26.0	3528295	71534	Og	CcySls			G		211	49	-1	17	2.27	246
ZM38	26.0	28.0	3528296	71534	Og	CcySls			G		188	42	-1	19	1.84	207
ZM38	28.0	30.0	3528297	71534	Og	CcySls			LGDG		392	64	-1	26	1.65	157
ZM38	30.0	32.0	3528298	71534	Og	CcySls			LGDG		809	47	-1	23	2.07	155
ZM38	32.0	34.0	3528299	71534	Og	CcySls			DG		350	41	-1	18	2.08	140
ZM38	34.0	34.6	3528300	71534	Og	Sls	Ma		DG		79	16	-1	11	1.69	349
ZM39	0.0	2.0	3528301	71534	Qha	CcyCv			WLG		26	10	-1	3	0.32	28
ZM39	2.0	4.0	3528302	71534	Og	Ccy			LYG		13	31	-1	22	0.93	15
ZM39	4.0	6.0	3528303	71534	Og	Ccy			W		30	137	-1	22	0.29	12
ZM39	6.0	8.0	3528304	71534	Og	Ccy			WLG		66	223	-1	45	0.26	13
ZM39	8.0	10.0	3528305	71534	Og	Ccy			LB		50	145	-1	58	0.2	12
ZM39	10.0	12.0	3528306	71534	Og	Ccy			LG		173	134	-1	67	0.74	17
ZM39	12.0	14.0	3528307	71534	Og	Ccy			N		1084	56	-1	32	1.97	16
ZM39	14.0	16.0	3528308	71534	Og	Ccy			DG		1720	60	-1	42	1.59	12
ZM39	16.0	18.0	3528309	71534	Og	Ccy			LGDG		470	51	-1	34	1.58	21
ZM39	18.0	20.0	3528310	71534	Og	Ccy			DG		455	632	-1	88	2.25	18
ZM39	20.0	21.2	3528311	71534	Og	CcySls			DG		804	551	-1	30	2.12	73
ZM40	0.0	2.0	3528312	71534	Qha	CcyCv			LYG		70	132	-1	64	0.79	21
ZM40	2.0	4.0	3528313	71534	Og	Ccy			LGDG		1587	112	-1	36	2.48	20
ZM40	4.0	6.0	3528314	71534	Og	Ccy			DGN		1538	67	-1	32	3.54	30
ZM40	6.0	8.0	3528315	71534	Og	Ccy			DGN		799	155	-1	44	2.86	37
ZM40	8.0	10.0	3528316	71534	Og	Ccy			DGN		1095	236	-1	45	3.04	31
ZM40	10.0	10.8	3528317	71534	Og	Sls			G		33	23	-1	8	1.11	107
ZM41	0.0	2.0	3528318	71534	Qha	Ccy			LB		76	45	-1	40	0.36	22
ZM41	2.0	4.0	3528319	71534	Og	Ccy			LGB		216	150	-1	62	0.66	14
ZM41	4.0	6.0	3528320	71534	Og	Ccy			DG		706	98	-1	36	3.86	21
ZM41	6.0	8.0	3528321	71534	Og	Ccy			DGN		623	67	-1	34	3.2	23
ZM41	8.0	10.0	3528322	71534	Og	CcySls			DGN		108	36	-1	26	2.34	76

ZM41	10.0	12.0	3528323	71534	Og	CcySls			DG		870	70	-1	16	3.52	168
ZM41	12.0	14.0	3528324	71534	Og	Sls	Vn	Cc	G		23	11	-1	6	1.12	169
ZM41	14.0	16.0	3528325	71534	Og	Sls	Vn	Cc	G		16	10	-1	7	0.98	190
ZM42	0.0	2.0	3528326	71534	Qha	CcyCv			B		1979	114	-1	24	4.14	29
ZM42	2.0	4.0	3528327	71534	Og	Ccy			DG		976	76	-1	20	3.69	26
ZM42	4.0	6.0	3528328	71534	Og	Ccy			DG		490	57	-1	22	3.03	26
ZM42	6.0	7.3	3528329	71534	Og	Sls	Vn	Py	G		1517	83	-1	24	4.14	175
ZM43	0.0	2.0	3528330	71534	QhaOg	CcyCv			DG		1681	54	-1	16	3.66	58
ZM43	2.0	4.0	3528331	71534	Og	Ccy			DG		415	38	-1	11	3.47	294
ZM43	4.0	5.2	3528332	71534	Og	Sls			DG		295	59	-1	26	1.81	458
ZM44	0.0	2.0	3528333	71534	Qha	CcyCv			B		66	23	-1	14	0.96	46
ZM44	2.0	4.0	3528334	71534	Og	Ccy			GB		623	54	-1	28	2.45	26
ZM44	4.0	4.7	3528335	71534	Og	Ssh	Fi		DGN		312	41	-1	34	2.51	66
ZM45	0.0	2.0	3528336	71534	Qha	CcyCvCg			B		15	18	-1	18	0.49	41
ZM45	2.0	4.0	3528337	71534	QhaOg	CcyCv			BG		455	185	-1	53	2.4	25
ZM45	4.0	6.0	3528338	71534	Og	Sls			G		689	50	-1	27	2.29	20
ZM45	6.0	8.0	3528339	71534	Og	Ccy			DG		320	51	-1	26	6.3	20
ZM45	8.0	10.0	3528340	71534	Og	CcySls			LBG		370	55	-1	25	3.05	30
ZM45	10.0	12.0	3528341	71534	Og	Sls	Vn	Cc	G		30	12	-1	7	1.45	214
ZM45	12.0	13.0	3528342	71534	Og	Sls	Vn	Cc	G		36	10	-1	8	1.52	233
ZM46	0.0	2.0	3528343	71534	Qha	CcyCvCg			B		17	14	-1	9	0.45	35
ZM46	2.0	4.0	3528344	71534	Og	Sls			G		43	41	-1	19	0.46	14
ZM46	4.0	6.0	3528345	71534	Og	Ccy			G		96	36	-1	28	2.02	25
ZM46	6.0	8.0	3528346	71534	Og	Ccy			G		120	34	-1	26	2.29	51
ZM46	8.0	10.0	3528347	71534	Og	CcySls	Vn	Cc	G		46	15	-1	9	1.66	224
ZM46	10.0	12.0	3528348	71534	Og	Sls			G		25	7	-1	6	1.67	266
ZM46	12.0	14.0	3528349	71534	Og	Sls			G		20	11	-1	7	1.64	249
ZM46	14.0	16.0	3528350	71534	Og	Sls			G		29	11	-1	7	1.3	328
ZM46	16.0	18.0	3528351	71534	Og	Sls	Vn	Cc	G		18	11	-1	8	1.35	222
ZM47	0.0	2.0	3528352	71534	Qha	CcyCv			B		16	12	-1	9	0.37	31
ZM47	2.0	4.0	3528353	71534	QhaOg	CcySls			B		630	178	-1	74	1.82	14
ZM47	4.0	6.0	3528354	71534	Og	Sls					1047	43	-1	24	4.4	25
ZM47	6.0	8.0	3528355	71534	Og	Sls					911	29	-1	21	4.32	23
ZM47	8.0	10.0	3528356	71534	Og	Sls			BG		694	21	-1	17	4.78	17
ZM47	10.0	12.0	3528357	71534	Og	Sls			BG		819	25	-1	19	7.45	20
ZM47	12.0	14.0	3528358	71534	Og	Sls			BG		644	24	-1	23	10.1	29
ZM47	14.0	16.0	3528359	71534	Og	Ccy			G		85	20	-1	18	2.47	29
ZM47	16.0	18.0	3528360	71534	Og	CcySls			G		47	26	-1	20	2.23	30
ZM47	18.0	20.0	3528361	71534	Og	Ssh	Fi		DG		59	29	-1	27	2.13	24
ZM47	20.0	22.0	3528362	71534	Og	Sls			DG		51	28	-1	31	2	24
ZM47	22.0	24.0	3528363	71534	Og	Sls			DG		110	29	-1	26	3.22	31
ZM47	24.0	26.0	3528364	71534	Og	CcySls			G		608	43	-1	37	1.78	27
ZM47	26.0	28.0	3528365	71534	Og	Ccy			G		110	42	-1	26	3.02	38
ZM47	28.0	28.2	3528366	71534	Og	Sls	Vn	Cc	G		51	9	-1	6	0.53	210
ZM48	0.0	2.0	3528367	71534	Qha	CcyCvCg			B		20	9	-1	8	0.58	44
ZM48	2.0	4.0	3528368	71534	QhaOg	Ccy			B		190	105	-1	33	1.64	36
ZM48	4.0	6.0	3528369	71534	Og	Ccy			BG		737	178	-1	32	6.42	35
ZM48	6.0	8.0	3528370	71534	Og	Ccy			BG		380	114	-1	36	4.53	25

ZM48	8.0	10.0	3528371	71534	Og	Ccy			BG		296	77	-1	29	4.99	32
ZM48	10.0	12.0	3528372	71534	Og	Ccy			BG		174	61	-1	31	4.88	39
ZM48	12.0	12.3	3528373	71534	Og	Sls			LG		62	13	-1	7	0.91	179
ZM49	0.0	2.0	3528374	71534	Qha	CcyCvCg			B		19	10	-1	5	0.41	35
ZM49	2.0	4.0	3528375	71534	Qha	CcyCg			GB		100	13	-1	9	0.43	34
ZM49	4.0	6.0	3528376	71534	Og	Ccy			GB		148	40	-1	25	1.96	44
ZM49	6.0	7.5	3528377	71534	Og	CcySls			VB		93	28	-1	21	2.15	101
ZM50	0.0	2.0	3528378	71534	Qha	CcyCg			LB		33	13	-1	9	0.67	44
ZM50	2.0	4.0	3528379	71534	Qha	CcyCg			LB		13	5	-1	9	0.65	57
ZM50	4.0	5.3	3528380	71534	Og	SlsCcy					29	11	-1	11	1.11	59
ZM51	0.0	1.2	3528381	71534	QhaOg	CcyCvSls			DG		106	19	-1	11	0.58	55
ZM52	0.0	2.0	3528382	71534	Qha	CcyCg			GB		38	18	-1	14	3.02	66
ZM52	2.0	4.0	3528383	71534	Og	SlsCcy			DG		20	10	-1	8	1.99	138
ZM52	4.0	6.0	3528384	71534	Og	Sls			DG		58	12	-1	9	1.83	161
ZM52	6.0	8.0	3528385	71534	Og	SlsCcy			DG		25	10	-1	7	1.13	117
ZM52	8.0	10.0	3528386	71534	Og	SlsCcy			DG		27	11	-1	9	1.61	124
ZM52	10.0	12.0	3528387	71534	Og	Sls	Ds	Py	DG		16	12	-1	9	1.78	212
ZM52	12.0	14.0	3528388	71534	Og	Sls	Ds	Py	DG		24	11	-1	8	1.6	175
ZM52	14.0	16.0	3528389	71534	Og	Sls	Ds	Py	DG		115	20	-1	10	2.46	245
ZM52	16.0	16.8	3528390	71534	Og	Sls			LG		17	11	-1	8	1.07	241
ZM53	0.0	2.0	3528391	71534	QhaOg	CcyCg			DG		238	34	-1	17	2.53	42
ZM53	2.0	4.0	3528392	71534	Og	SlsCcy			DG		78	33	-1	20	3.23	87
ZM53	4.0	6.0	3528393	71534	Og	SlsCcy			DG		36	16	-1	11	1.25	102
ZM53	6.0	8.0	3528394	71534	Og	SlsCcy			DG		24	13	-1	7	1.38	175
ZM53	8.0	10.0	3528395	71534	Og	Sls			LG		14	11	-1	7	1.14	156
ZM53	10.0	12.0	3528396	71534	Og	Sls			LG		25	13	-1	6	1.35	171
ZM53	12.0	13.8	3528397	71534	Og	Sls			LG		44	10	-1	7	0.91	125
ZM54	0.0	2.0	3528398	71535	Qha	Ccy			LGYB		110	411	-1	30	2.2	23
ZM54	2.0	4.0	3528399	71535	Og	Ccy			LGDG		7400	1300	-1	45	3.69	11
ZM54	4.0	5.7	3528400	71535	Og	Sls	Vn	Cc	LGDG		7500	900	-1	39	3.11	26
ZM55	0.0	2.0	3528401	71535	Qha	Ccy			LBY		29	49	-1	5	0.43	16
ZM55	2.0	4.0	3528402	71535	Qha	Ccy			LB		28	98	-1	10	0.21	14
ZM55	4.0	6.0	3528403	71535	Og	Ccy			DVG		1928	1655	1	575	0.53	14
ZM55	6.0	8.0	3528404	71535	Og	CcySls	Ds	Py	DVG		35500	22700	1	734	3	18
ZM55	8.0	10.0	3528405	71535	Og	Ccy			DGV		31700	1200	-1	54	2.45	25
ZM55	10.0	12.0	3528406	71535	Og	Ccy			DGV		42000	2500	-1	38	2.09	22
ZM55	12.0	14.0	3528407	71535	Og	Ccy			G		47900	7500	1	48	2.07	30
ZM55	14.0	15.3	3528408	71535	Og	Sls	Vn	Cc	LGDG		11000	358	-1	28	1.95	178
ZM56	0.0	2.0	3528409	71535	Qha	Ccy			LBG		91	53	-1	22	0.34	18
ZM56	2.0	4.0	3528410	71535	Og	Ccy			GB		673	580	-1	29	1.91	36
ZM56	4.0	6.0	3528411	71535	Og	Ccy			GB		570	84	-1	17	2.41	32
ZM56	6.0	8.0	3528412	71535	Og	Sls			DG		911	40	-1	17	1.27	36
ZM56	8.0	10.0	3528413	71535	Og	Sls	Al	Sd			1249	24	-1	26	1.51	31
ZM56	10.0	12.0	3528414	71535	Og	SlsCcy			LV		1365	12	-1	15	3.51	26
ZM56	12.0	14.0	3528415	71535	Og	Ccy			DG		1549	23	-1	15	3.12	27
ZM56	14.0	16.0	3528416	71535	Og	Ccy			LG		2567	28	-1	14	1.27	20
ZM56	16.0	18.0	3528417	71535	Og	Ccy			G		1429	13	-1	9	1.09	21
ZM56	18.0	20.0	3528418	71535	Og	SshCcy			G		862	13	-1	14	0.9	24

ZM56	20.0	22.0	3528419	71535	Og	SshCcy	Vn	Cc	G		2404	18	-1	17	1.52	32
ZM56	22.0	24.0	3528420	71535	Og	SshCcy	Vn	Cc	G		4410	24	-1	21	1.85	27
ZM56	24.0	26.0	3528421	71535	Og	CcySls			G		3135	18	-1	29	1.7	24
ZM56	26.0	28.0	3528422	71535	Og	Sls	Vn	Cc	LG		882	12	-1	24	1.21	38
ZM56	28.0	30.0	3528423	71535	Og	SshCcy	Vn	Cc	LG		667	5	-1	12	0.94	29
ZM57	0.0	2.0	3528424	71535	QhaOg	Ccy			LVG		237	20	-1	16	2.36	27
ZM57	2.0	4.0	3528425	71535	Og	Ccy			LG		309	24	-1	19	4.39	27
ZM57	4.0	6.0	3528426	71535	Og	Ccy			LG		295	25	-1	23	3.21	35
ZM57	6.0	8.0	3528427	71535	Og	Ccy			LGV		328	35	-1	23	4.02	31
ZM57	8.0	10.0	3528428	71535	Og	Ccy			DG		447	49	-1	26	3.31	42
ZM57	10.0	12.0	3528429	71535	Og	Ccy			DG		509	52	-1	25	2.52	49
ZM57	12.0	14.0	3528430	71535	Og	CcySls			DG		7100	607	-1	48	3.39	39
ZM57	14.0	16.0	3528431	71535	Og	Sls	Al	Sd?	DG		49600	2200	-1	96	6.24	32
ZM57	16.0	18.0	3528432	71535	Og	SlsCcy			DG		40200	800	-1	60	3.35	28
ZM57	18.0	20.0	3528433	71535	Og	SlsCcy			DG		32000	700	-1	55	3.84	38
ZM57	20.0	22.0	3528434	71535	Og	SlsCcy			DG		11400	900	-1	32	4.86	20
ZM57	22.0	24.0	3528435	71535	Og	SlsCcy			DG		8100	303	-1	26	4.83	26
ZM57	24.0	26.0	3528436	71535	Og	Sls			G		16300	248	-1	22	5.86	19
ZM57	26.0	28.0	3528437	71535	Og	Sls			G		9800	305	-1	87	3.29	35
ZM57	28.0	30.0	3528438	71535	Og	SlsCcy			DG		6600	136	-1	35	3.25	24
ZM57	30.0	32.0	3528439	71535	Og	SlsCcy			DG		7200	240	-1	31	3.73	57
ZM57	32.0	34.0	3528440	71535	Og	Sls			DG		4710	59	-1	12	3.3	333
ZM57	34.0	36.0	3528441	71535	Og	Sls	Ds	Sp	G		45400	244	-1	60	1.91	436
ZM57	36.0	37.4	3528442	71535	Og	Sls	Ds	Sp	G		14300	1000	-1	16	2.3	449
ZM58	0.0	2.0	3528443	71535	Og	Sls	Ds	Sp	YG		51100	410	2	367	2.1	17
ZM58	2.0	4.0	3528444	71535	Og	Sls	Ds	Sp	G		90600	315	5	648	2.1	25
ZM58	4.0	6.0	3528445	71535	Og	CcySls			DG		13100	180	-1	57	3.09	29
ZM58	6.0	6.6	3528446	71535	Og	Sls			G		1492	22	-1	12	0.84	104
ZM59	0.0	2.0	3528447	71535	Qha	CcyCvCs			B		428	178	-1	16	0.29	19
ZM59	2.0	4.0	3528448	71535	Og	Ccy			G		2527	174	-1	10	1.18	19
ZM59	4.0	6.0	3528449	71535	Og	Ccy			DG		13100	1500	-1	22	3.07	29
ZM59	6.0	6.8	3528450	71535	Og	Ccy			G		9000	456	-1	16	3.47	78
ZM60	0.0	2.0	3528451	71535	Qha	CcyCv			DB		152	196	-1	63	0.63	47
ZM60	2.0	2.4	3528452	71535	Og	Ccy			G		425	2980	-1	89	1.37	65
ZM61	0.0	2.0	3528453	71535	Qha	CcyCv			B		67	223	-1	80	0.76	36
ZM62	0.0	0.5	3528454	71535	Og	Sls			G		27	8	-1	8	0.41	82
ZM63	0.0	0.2	3528455	71535	Og	Sls			G		13	5	-1	6	0.24	88

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MYRTLE PROSPECT - MULTI-ELEMENT GEOCHEMISTRY FOR HIGH Zn SAMPLES																
Results in ppm except Fe-C-S (in %)					DPO # 77107											
HOLE	DFROM	DTO	SAMPNO	Ag	Al	As	Au	Ba	Bi	C%	Ca	Cd	Co	Cr	Cu	Fe%
ZM1	4.0	6.0	3527995	23	53700	111	-0.008	244	-10	2.8	331	309	45	117	11	0.72
ZM1	6.0	8.0	3527996	7	69700	102	-0.008	45	-10	3.9	316	101	57	103	10	1.54
ZM1	8.0	10.0	3527997	3	122000	85	-0.008	48	10	3.7	481	51	68	96	10	2.14
ZM1	10.0	12.0	3527998	3	136000	70	-0.008	55	-10	3.75	927	54	63	98	10	1.81
ZM1	12.0	14.0	3527999	1	80400	273	-0.008	35	10	1.45	770	54	76	233	13	2.78
ZM3	12.0	14.0	3528012	3	125000	59	-0.008	53	-10	1.1	900	20	59	105	15	2.95
ZM3	14.0	14.5	3528013	3	38300	246	-0.008	28	15	1.35	1580	30	47	262	17	1.79
ZM13	16.0	18.0	3528054	3	34300	228	-0.008	35	11	2.05	11300	48	42	59	13	1.57
ZM13	18.0	20.0	3528055	7	157000	121	-0.008	79	-10	2.05	981	7	54	156	26	4.5
ZM13	20.0	22.0	3528056	13	27200	711	-0.008	40	-10	1.3	676	49	60	226	41	24.9
ZM13	24.0	26.0	3528058	50	22700	833	-0.008	47	-10	0.94	610	551	78	164	84	10.4
ZM13	26.0	28.0	3528059	11	46700	404	-0.008	28	-10	1.8	1550	106	69	161	40	2.77
ZM15	10.0	12.0	3528082	-1	143000	33	-0.008	154	-10	1.3	454	-5	43	129	17	1.65
ZM16	12.0	12.5	3528095	12	93900	46	-0.008	172	-10	1.3	605	95	15	88	139	0.95
ZM17	6.0	8.0	3528099	-1	63200	67	-0.008	66	-10	2.35	313	289	73	108	17	3.98
ZM17	10.0	12.0	3528101	-1	76400	62	-0.008	86	-10	1.9	309	57	37	116	18	2.51
ZM17	12.0	14.0	3528102	-1	103000	59	-0.008	89	-10	1.6	990	15	34	119	17	2.41
ZM17	18.0	20.0	3528105	2	73900	49	0.016	143	-10	1.3	2560	8	35	169	19	2.75
ZM18	0.0	2.0	3528108	18	28200	286	0.008	38	-10	2.85	13700	69	23	165	40	12.3
ZM18	4.0	6.0	3528110	23	33500	611	-0.008	47	-10	4.15	427	198	52	171	42	4.61
ZM18	6.0	8.0	3528111	35	38700	773	-0.008	43	-10	3.65	771	289	98	177	62	14.8
ZM18	8.0	10.0	3528112	7	71800	333	-0.008	56	-10	3.75	251	117	37	117	21	3.88
ZM18	10.0	12.0	3528113	-1	239000	292	-0.008	213	-10	5.8	320	10	26	91	8	0.89
ZM18	12.0	14.0	3528114	1	211000	382	-0.008	132	-10	6.6	780	22	69	123	7	2.2
ZM18	14.0	16.0	3528115	4	78600	255	-0.008	35	-10	3	1930	42	48	177	31	9.37
ZM18	16.0	18.0	3528116	1	95300	119	-0.008	45	-10	0.97	3470	32	43	111	19	4.65
ZM18	18.0	20.0	3528117	3	54500	284	-0.008	28	-10	0.74	2970	163	49	154	18	11.1
ZM18	20.0	22.0	3528118	3	75800	181	-0.008	38	-10	0.91	3130	217	35	123	17	6.53
ZM18	22.0	24.0	3528119	4	49800	261	-0.008	31	-10	0.89	2430	254	38	201	17	9.5
ZM18	24.0	26.0	3528120	6	40500	364	-0.008	29	-10	0.6	2310	250	41	230	23	13.2
ZM18	28.0	30.0	3528122	1	27600	181	-0.008	79	-10	4.7	83600	156	20	106	16	7.73
ZM18	30.0	32.0	3528123	2	50300	134	-0.008	84	-10	3.9	67800	76	18	96	19	5.73
ZM18	32.0	34.0	3528124	5	49100	332	-0.008	36	-10	2	36700	107	34	159	29	11.5
ZM18	34.0	36.0	3528125	5	50100	128	-0.008	51	-10	2.05	16600	43	29	142	38	6.5

MYRTLE PROSPECT - MULTI-ELEMENT GEOCHEMISTRY FOR HIGH Zn SAMPLES																
Results in ppm except Fe-C-S (in %)					DPO 77107											
HOLE	DFROM	DTO	SAMPNO	K	Mg	Mn	Mo	Na	Ni	P	Pb	S%	Sb	Sn	V	Zn
ZM1	4.0	6.0	3527995	15700	2830	19	-10	849	113	693	2700	9.75	15	8	50	140000
ZM1	6.0	8.0	3527996	14300	3100	23	-10	754	189	832	1200	8.7	11	6	50	61000
ZM1	8.0	10.0	3527997	14600	3760	21	-10	765	288	1400	800	7.05	14	-3	56	37100
ZM1	10.0	12.0	3527998	15800	4260	23	-10	873	213	2630	679	6.2	13	-3	59	36300
ZM1	12.0	14.0	3527999	16600	1970	30	-10	639	244	3130	210	7.55	25	17	71	12800
ZM3	12.0	14.0	3528012	21800	6740	28	-10	1290	185	876	1200	14.8	11	5	69	15100
ZM3	14.0	14.5	3528013	13900	2540	30	-10	490	279	770	546	9.9	12	-3	40	28200
ZM13	16.0	18.0	3528054	16300	6240	34	-10	578	296	1020	93	3.85	8	6	44	20700
ZM13	18.0	20.0	3528055	29100	3850	33	-10	1050	148	3210	211	12.2	12	-3	95	28800
ZM13	20.0	22.0	3528056	5040	732	30	-10	145	310	1430	1100	37.5	12	16	30	21400
ZM13	24.0	26.0	3528058	4790	1090	34	-10	178	402	678	1800	33.2	38	-3	22	145000
ZM13	26.0	28.0	3528059	14500	3410	42	-10	521	224	625	2500	15.6	47	9	63	34100
ZM15	10.0	12.0	3528082	34300	6260	35	-10	1720	96	590	25	3.6	9	8	96	12000
ZM16	12.0	12.5	3528095	19700	2490	16	-10	507	56	2750	13600	2.4	48	8	58	19800
ZM17	6.0	8.0	3528099	22300	2960	22	-10	529	185	443	9100	6.9	13	3	70	12400
ZM17	10.0	12.0	3528101	19800	2560	24	-10	507	155	217	1800	4	9	5	65	11200
ZM17	12.0	14.0	3528102	19400	2960	25	-10	584	159	427	337	3.6	7	4	86	14200
ZM17	18.0	20.0	3528105	28500	4710	41	-10	996	92	1000	358	3.5	10	10	91	13800
ZM18	0.0	2.0	3528108	13100	2350	34	-10	416	139	219	6100	17.2	23	7	34	15400
ZM18	4.0	6.0	3528110	15900	2040	40	-10	489	180	520	6200	10.3	13	-3	76	55600
ZM18	6.0	8.0	3528111	10100	1370	58	-10	315	534	2720	13000	21.6	15	-3	66	68400
ZM18	8.0	10.0	3528112	10400	1250	18	-10	361	172	3060	2000	6.75	8	-3	58	35500
ZM18	10.0	12.0	3528113	6600	1000	9	-10	320	92	2420	187	2.75	-1	-3	95	24400
ZM18	12.0	14.0	3528114	4700	780	10	-10	270	243	1100	342	5.7	4	-3	94	38100
ZM18	14.0	16.0	3528115	14000	2150	29	-10	550	222	978	1500	12.3	9	-3	74	14100
ZM18	16.0	18.0	3528116	26300	3850	49	-10	980	137	1170	545	6.5	13	4	81	14400
ZM18	18.0	20.0	3528117	19500	2840	47	11	740	204	1090	4100	16.6	22	4	63	63600
ZM18	20.0	22.0	3528118	25700	3170	34	10	1020	166	1420	2000	9.9	5	3	75	55700
ZM18	22.0	24.0	3528119	21200	3560	31	12	810	209	1250	4000	16.7	8	4	71	62200
ZM18	24.0	26.0	3528120	12600	2840	40	13	500	234	803	5600	21.6	12	15	46	66400
ZM18	28.0	30.0	3528122	9200	41200	162	-10	350	100	544	5600	10.7	8	5	31	42000
ZM18	30.0	32.0	3528123	19200	33700	135	-10	800	86	542	3900	7.05	-1	3	49	19500
ZM18	32.0	34.0	3528124	17800	18000	78	-10	770	190	587	4100	15.7	9	7	52	32500
ZM18	34.0	36.0	3528125	21500	13100	65	-10	890	114	463	691	7.9	7	7	63	18500

95152

APPENDIX 3 : MYRTLE PROSPECT MULTI-ELEMENT GEOCHEMISTRY FOR HIGH ZINC SAMPLES

HOLE	DFROM	DTO	SAMPNO	Ag	Al	As	Au	Ba	Bi	C%	Ca	Cd	Co	Cr	Cu	Fe%
ZM19	4.0	6.0	3528128	17	137000	240	-0.008	98	-10	2.1	1830	57	38	189	56	5.63
ZM19	2.0	4.0	3528147	2	63800	68	-0.008	106	-10	2.05	250	122	19	123	66	1.71
ZM19	4.0	6.0	3528148	1	43500	57	-0.008	249	-10	1.65	140	98	29	156	18	1.42
ZM19	6.0	8.0	3528149	1	100000	46	-0.008	182	-10	1.55	260	54	30	103	19	1.67
ZM19	8.0	10.0	3528150	1	39500	68	-0.008	50	-10	2.1	440	49	66	122	13	4.61
ZM19	10.0	12.0	3528151	1	62900	69	-0.008	85	-10	2.8	510	41	39	107	15	2.06
ZM19	14.0	16.0	3528153	3	48200	46	-0.008	230	-10	1.35	460	23	23	151	19	1.54
ZM19	16.0	18.0	3528154	1	39400	129	-0.008	81	-10	2.55	31300	9	43	128	23	7.43
ZM55	6.0	8.0	3528404	1	78700	90	-0.008	121	-10	3.75	2320	697	56	143	734	3
ZM55	8.0	10.0	3528405	-1	78600	60	-0.008	217	-10	2.6	2560	34	59	126	54	2.45
ZM55	10.0	12.0	3528406	-1	67500	47	-0.008	223	-10	2.1	2540	39	39	133	38	2.09
ZM55	12.0	14.0	3528407	1	28300	42	-0.008	201	-10	2.2	11200	64	27	133	48	2.07
ZM55	14.0	15.3	3528408	-1	52000	36	-0.008	223	-10	5.6	109000	24	9	64	28	1.95
ZM57	16.0	18.0	3528432	-1	38200	60	-0.008	175	-10	2.4	650	94	29	164	60	3.35
ZM57	18.0	20.0	3528433	-1	79700	65	-0.008	117	-10	2.3	1410	70	34	230	55	3.84
ZM57	20.0	22.0	3528434	-1	58800	129	-0.008	122	-10	3.4	1700	18	68	128	32	4.86
ZM57	24.0	26.0	3528436	-1	41600	196	-0.008	83	-10	2.4	1080	19	136	208	22	5.86
ZM57	34.0	36.0	3528441	-1	8400	-25	-0.008	42	-10	4.55	84000	95	8	86	60	1.91
ZM57	36.0	37.4	3528442	-1	9200	-25	-0.008	44	-10	7	135000	30	12	63	16	2.3
ZM58	0.0	2.0	3528443	2	46700	83	-0.008	53	-10	2.45	2010	116	24	141	367	2.1
ZM59	4.0	6.0	3528449	-1	63000	59	-0.008	222	-10	3.3	4780	17	55	214	22	3.07

APPENDIX 3: MYRTLE PROSPECT MULTI-ELEMENT GEOCHEMISTRY FOR HIGH ZINC SAMPLES

HOLE	DFROM	DTO	SAMPNO	K	Mg	Mn	Mo	Na	Ni	P	Pb	S%	Sb	Sn	V	Zn
ZM19	4.0	6.0	3528128	25800	4480	26	-10	1030	92	938	511	3.5	5	10	89	20100
ZM19	2.0	4.0	3528147	23000	2700	23	-10	710	60	1270	6000	3.3	52	-3	92	24700
ZM19	4.0	6.0	3528148	13800	1520	24	-10	720	72	1070	1800	2.9	9	-3	56	27300
ZM19	6.0	8.0	3528149	24500	3100	33	-10	1240	80	831	1700	2.85	7	8	91	13400
ZM19	8.0	10.0	3528150	11600	1470	23	-10	440	207	755	1900	7.45	16	8	51	19200
ZM19	10.0	12.0	3528151	16200	2270	23	-10	470	104	1250	2200	3.9	14	6	60	19300
ZM19	14.0	16.0	3528153	12000	1720	28	-10	380	73	431	5300	2.65	5	4	39	10300
ZM19	16.0	18.0	3528154	14400	13200	81	-10	410	119	561	549	9.15	22	9	76	10000
ZM55	6.0	8.0	3528404	15200	3240	18	-10	300	136	1680	22700	6.7	47	4	82	35500
ZM55	8.0	10.0	3528405	24500	4870	25	-10	510	191	579	1200	5.25	12	8	115	31700
ZM55	10.0	12.0	3528406	23100	4470	22	-10	460	121	380	2500	5	10	10	103	42000
ZM55	12.0	14.0	3528407	20900	6450	30	11	470	81	422	7500	5.15	8	3	80	47900
ZM55	14.0	15.3	3528408	25300	38600	178	-10	470	33	711	358	2.7	-1	7	63	11000
ZM57	16.0	18.0	3528432	19200	3990	28	10	350	77	649	800	6.6	14	11	51	40200
ZM57	18.0	20.0	3528433	24400	5900	38	-10	420	88	909	700	7.1	13	-3	67	32000
ZM57	20.0	22.0	3528434	15200	3710	20	-10	280	166	1290	900	7.4	14	8	56	11400
ZM57	24.0	26.0	3528436	11400	2330	19	-10	250	307	1490	248	13.6	13	-3	46	16300
ZM57	34.0	36.0	3528441	3400	37300	436	-10	80	19	370	244	3.55	5	-3	11	45400
ZM57	36.0	37.4	3528442	3400	56600	449	-10	60	23	350	1000	2.6	3	9	14	14300
ZM58	0.0	2.0	3528443	4700	1280	17	11	170	55	535	410	4.55	126	6	32	51100
ZM59	4.0	6.0	3528449	24000	6040	29	-10	610	146	883	1500	5.4	4	4	119	13100

951154

APPENDIX 4:

MYRTLE PROSPECT MINERALOGICAL REPORTS.

APPENDIX 4.

957156

Central Mineralogical Services

8 Bradshaw Avenue, Crafers, S.A. 5152
Telephone (08) 370 9779 Fax (08) 370 9788
International: Telephone + 618 370 9779 Fax + 618 370 9788

13 April 1993

Mr R. Parkinson
CRA Exploration Pty Ltd
P O Box 8093
NORTHLAND CENTRE
PRESTON VIC 3072

RECEIVED
CRAE
PRESTON

REPORT CMS 93/3/12

YOUR REFERENCE:	DPO 71544
DATE RECEIVED:	29 March 1993
SAMPLE NO'S:	3314188 – 200
SUBMITTED BY:	R. Parkinson
WORK REQUESTED:	Mineralogy

H.W. Fander, M.Sc.

COPIES TO:

CRA Exploration Pty Ltd
PO Box 8093
Northland Centre
PRESTON VIC 3072
ATTENTION: Craig Hayward

CRA Exploration Pty Ltd
P O Box 3709
MANUKA ACT 2603
ATTENTION: CRAE Information Systems

957157

REPORT CMS 93/3/12

PANNED CONCENTRATES 3314188 - 3314200

Thirteen panned concentrates were received for mineralogical examination and identification. Each sample was examined under the stereobinocular microscope, augmented by optical mineralogy and stain tests. The results are given in the attached table. Because the samples were unsized and showed a very wide range of sizes from 50μ or less to 10mm, it was not possible to quantify the results.

As far as could be determined, sphalerite was the only significant Zn mineral present, occurring as well-crystallised, often very coarse material, ranging from colourless through amber to pale reddish brown, sometimes colour-zoned; its Fe content is believed to be low, very probably <5%, perhaps <3% in some cases, suggesting epithermal formation.

The sphalerite is accompanied by variable amounts of galena, and by pyrite which occurs partly as well-formed crystals, as fine encrustations and aggregates, and as framboids. The assemblage is typical of Mississippi Valley -style deposits.

Little information on ore genesis could be gleaned from these concentrates, and will have to await studies on core material. Sphalerite percentages will be able to be calculated from Zn assays.

957158

SAMPLE NO.	ZN MINERALS	OTHERS	
3314 188	Sphalerite; much is coarse (up to 7mm). Pale, zoned; Fe content probably <5%.	Pyrite, galena (some as veinlets in carbonate). Minor ankerite.	ZP19 4-6 4.1% Zn

3314 193	Pale, cloudy sphalerite (Fe <5%), as inconspicuous aggregates.	Rock fragments (micaceous); carbonates; galena, quartz.	Zm1 4-6 14% Zn
194	Pale, cloudy inconspicuous sphalerite (Fe <5%).	Dominant pyrite; quartz; carbonate. Dark, carbonaceous rock fragments. ?No galena.	Zm13 22-24 15.5%
195	Abundant but inconspicuous pale sphalerite as cloudy grains; Fe probably <5%.	Dominant pyrite; minor galena; very minor quartz.	Zm18 6-8 6.8%
196	Pale amber translucent sphalerite (Fe <5%).	Dominant pyrite; minor galena; very minor quartz.	Zm18 26-28 6.6%
197	Abundant, often coarsely-crystalline, pale, colour-zoned (yellow to brown) sphalerite (Fe <5%?).	Shale/carbonaceous shale fragments; minor pyrite; minor quartz; earthy limonite.	Zm28 16-18 4.3%
3314 198	Amber to brown sphalerite (Fe = 5 - 7%?)	Carbonaceous rock fragments; quartz; ankeritic carbonate; pyrite; very minor galena; calcite.	Zm55 12-14 4.8%
199	Abundant, often coarsely-crystalline, yellow/amber/pale brown sphalerite (Fe <5%?)	Dominant pyrite as fine-grained aggregates. Very minor galena, quartz, carbonate.	Zm57 14-16 5.0%
200	Sample is dominantly sphalerite, as coarsely-crystalline (up to 5mm crystals) masses, pale to reddish-brown (Fe <5%?).	Minor pyrite, quartz, carbonate; very minor galena.	Zm58 2-4 9.1% Zn

957159

CRA
ADVANCED TECHNICAL DEVELOPMENT

Melbourne

THE MINERALOGY OF A FURTHER SIX SAMPLES FROM A TASMANIAN RESOURCE

PROJECT REPORT PR93/A857A

Author: C Halsall/R Walker

Copies to: T Dickson (CRAE)
R Parkinson (CRAE)
M Laverty (R&PD)
J Box
S Roden/ minfile
B Kelley/P O'Neill/file

Date: 18 June 1993

Ref: A857A/639ch

DPO 77101

PROJECT SUMMARY

957160

FOCUS

CRAE commissioned ATD to identify the minerals present in a further six samples from a Tasmanian resource. The focus of the work was to determine if the zinc was present as sphalerite or as a zinc silicate species such as fraipontite.

FINDINGS

- The major Zn-bearing mineral in these samples is sphalerite.

- This sphalerite is a low Fe variety.

957161

PROJECT DETAILS

BACKGROUND

CRAE commissioned ATD to identify the minerals present in a further six samples from a Tasmanian resource. The focus of the work was to determine if the zinc was present as sphalerite or as the mineral fraipontite which had been detected previously.

The techniques used to define the mineralogy were X-ray diffraction (XRD), and scanning electron microscopy (SEM) together with energy dispersive X-ray analysis (EDX). Chemical assays were supplied with the samples.

RESULTS

957162

Sample 3528057 ZM 13

XRD and SEM/EDX identified the main sulphide minerals as sphalerite and pyrite. In addition, small amounts of galena were observed by SEM (see Table 3). The gangue minerals are quartz and muscovite (sericite). Initial XRD analysis also identified some illite. EDX analysis of three grains of sphalerite gave Fe values ranging from 0.8 to 1.2 wt%.

Assay	Cu 66ppm, Pb 1200ppm, Zn 155000ppm, Ag 29ppm, Fe 4.76%, Mn 34ppm
XRD	Quartz (major); Sphalerite (minor); Pyrite (minor); Muscovite (trace)
SEM	Confirms XRD. Galena was also observed.

Table 3. Assay, XRD and SEM results for sample 2538057

Sample 3528109 Zn18

XRD and SEM/EDX identified the main sulphide minerals as sphalerite and pyrite. In addition, small amounts of galena were observed by SEM (see Table 4). The main gangue mineral is quartz. Small amounts of muscovite (sericite) were also detected by SEM. EDX analysis of three grains of sphalerite gave Fe values ranging from 0.8 to 1.2 wt%.

Assay	Cu 90ppm, Pb 8800ppm, Zn 82900ppm, Ag 46ppm, Fe 11.5%, Mn 27ppm
XRD	Quartz (major); Sphalerite (minor); Pyrite (minor)
SEM	Confirms XRD. Small amounts of galena and muscovite were also observed.

Table 4. Assay, XRD and SEM results for sample 3528109

Sample 3528121 Zn18

XRD and SEM/EDX identified the main sulphide minerals as pyrite and sphalerite. In addition, small amounts of galena were observed by SEM. The main gangue minerals are quartz and muscovite (sericite). Small amounts of carbonate (calcite) were also observed by SEM. EDX analysis of four grains of sphalerite gave Fe values ranging from 1.1 to 1.8 wt%.

Assay	Cu 24ppm, Pb 6500ppm, Zn 65800ppm, Ag 5ppm, Fe 15.1%, Mn 56ppm.
XRD	Quartz (major); Pyrite (minor); Sphalerite (minor); Muscovite (trace)
SEM	Confirms XRD. Small amounts of galena and carbonate were also observed.

Table 5. Assay, XRD and SEM results for sample 3528121

957164

Sample 3528431 2m57

XRD and SEM/EDX identified the main sulphide minerals as sphalerite, pyrite and galena (see Table 6). The main gangue minerals are quartz and muscovite. EDX analysis of three grains of sphalerite gave Fe values ranging from 0.6 to 1.2 wt%.

Assay	Cu 96ppm, Pb 2200ppm, Zn 49600, Ag -1ppm, Fe 6.24%, Mn 32ppm
XRD	Quartz (major); Muscovite (minor); Sphalerite (minor); Pyrite (trace); Galena (trace)
SEM	Confirms XRD. No other mineral observed.

Table 6. Assay, XRD and SEM results for sample 3528431

NEXT STEPS

- Conduct a comprehensive size by grade chemical and mineralogical investigation to establish more accurately the nature and distribution of Zn minerals, galena and chalcopyrite.

Summary/Conclusion:
In order of abundance-

G1886			
33-1161	Quartz	SiO2	50-100%
5-0566	Sphalerite	ZnS	5-50%
26-080	Pyrite	FeS2	5-50%
7-0042	Muscovite-3T	(K,Na)(Al,Mg,Fe)2(Si3.1Al0.9)O10(OH)2	~5%
G1887			
33-1161	Quartz	SiO2	50-100%
5-0566	Sphalerite	ZnS	5-50%
26-080	Pyrite	FeS2	5-50%
G1888			
33-1161	Quartz	SiO2	50-100%
26-080	Pyrite	FeS2	5-50%
5-0566	Sphalerite	ZnS	5-50%
7-0042	Muscovite-3T	(K,Na)(Al,Mg,Fe)2(Si3.1Al0.9)O10(OH)2	~5%
G1889			
33-1161	Quartz	SiO2	50-100%
7-0025	Muscovite-1M	KAl2Si3AlO10(OH)2	5-50%
5-0566	Sphalerite	ZnS	5-50%
26-080	Pyrite	FeS2	~5%
5-0592	Galena	PbS	~5%

For all of the samples, the first four minerals listed account for about 95% of the intensity. After CRA personnel had checked the preliminary report it was suggested that dolomite, rutile, apatites and serpentines may be present. Although some of these minerals were possiblities in some of the samples, identification was not definite.

957166

CRA-ATD powdered samples for bulk qualitative XRD phase analysis

La Trobe University-Geology: final XRD report

Date: 28/5/93

CRA-ATD officer:	Carol Halsall
Sample identification:	*G1884 to G1889*
Date sample received:	17/05/93

Sample information supplied:

Material type:	Zinc minerals
Approximate composition:	not given
Possible phases:	Dolomite, sphalerite and quartz.

Sample preparation:
The pulverised powder was poured into the XRD sample holder and flattened. A straight glass edge was dragged over the surface of the powdered material before presentation to the XRD.

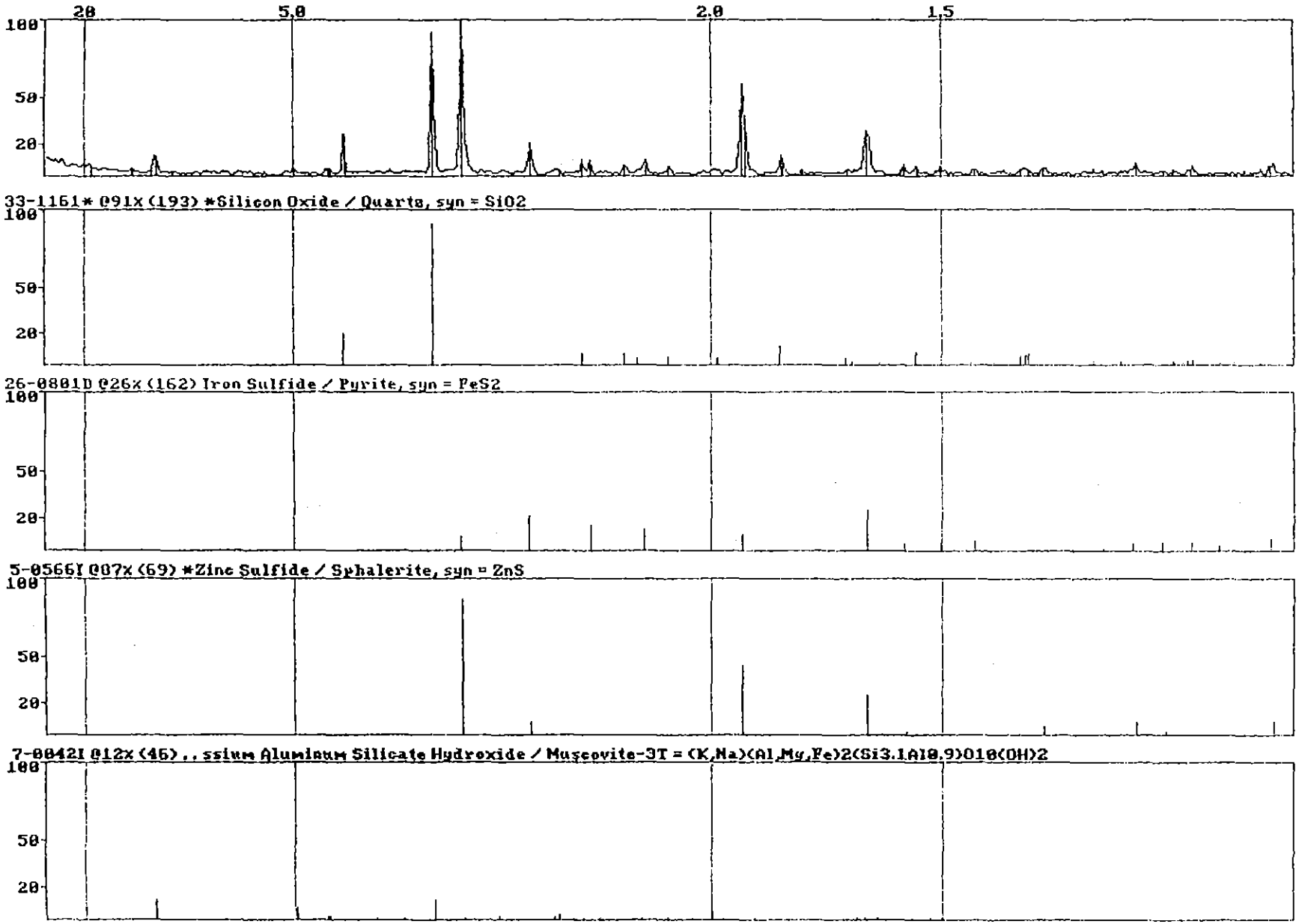
XRD information attached:
uDPSM search/match report with graphical representation.

Preliminary report submitted: 21/5/93

G1886
3528057

IDENTIFIED PHASES
33-1161 26-0801 5-0566 7-0042

Intensities: Linear

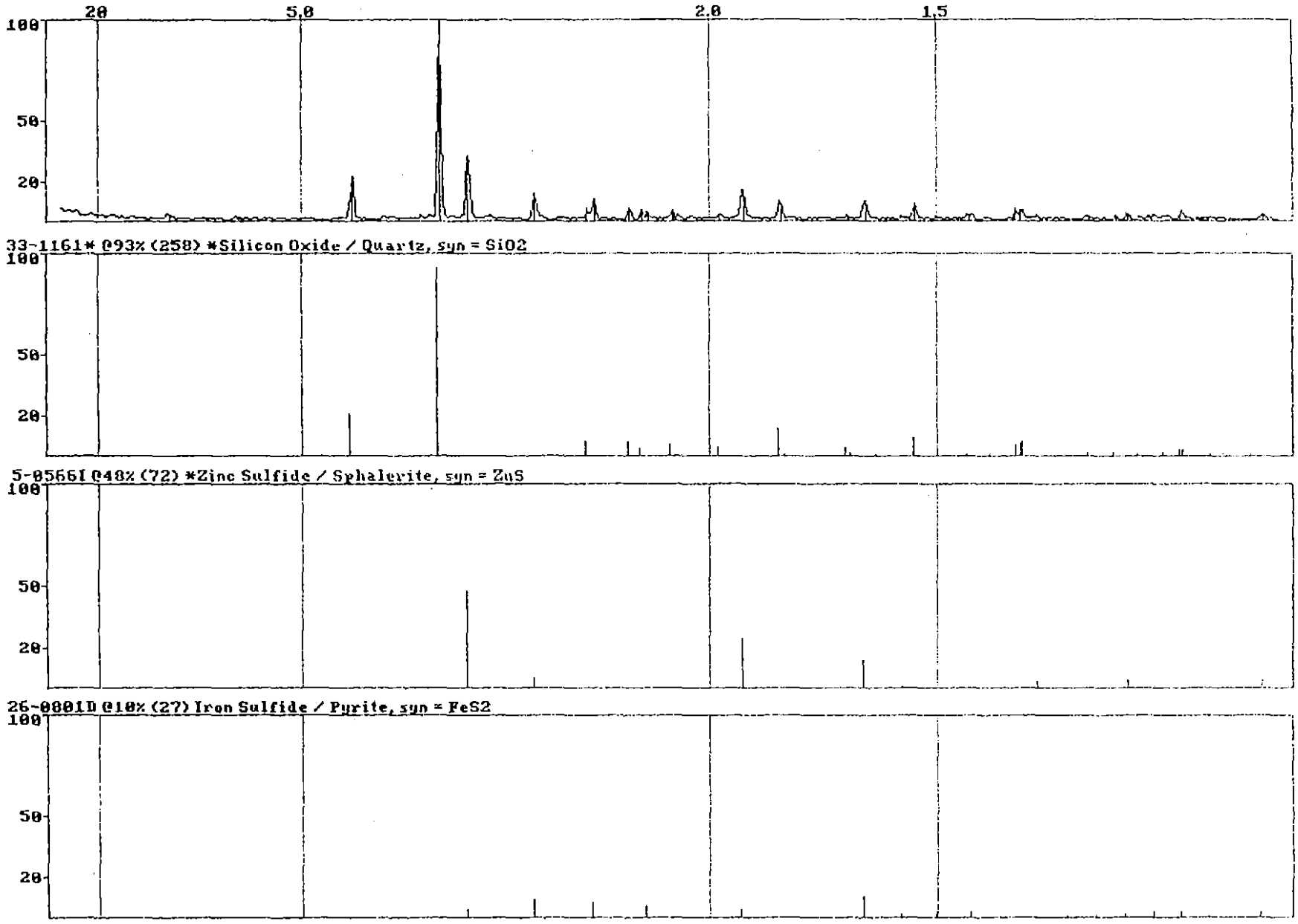


9571697

G1887
3528109

IDENTIFIED PHASES
33-1161 5-0566 26-0801

Intensities: Linear

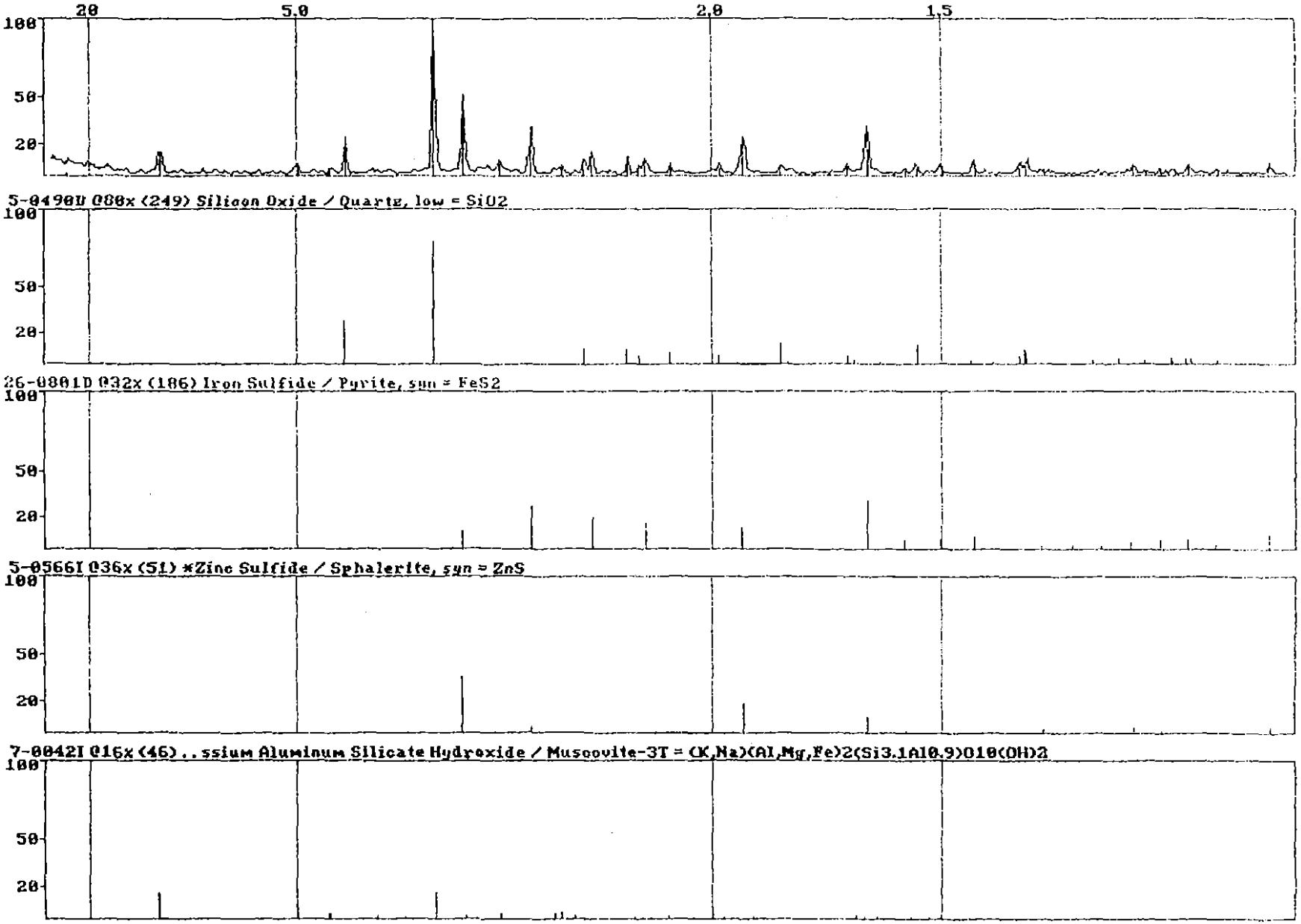


957168

G1888
3528121

IDENTIFIED PHASES
5-0490 26-0001 5-0566 7-0042

Intensities: Linear

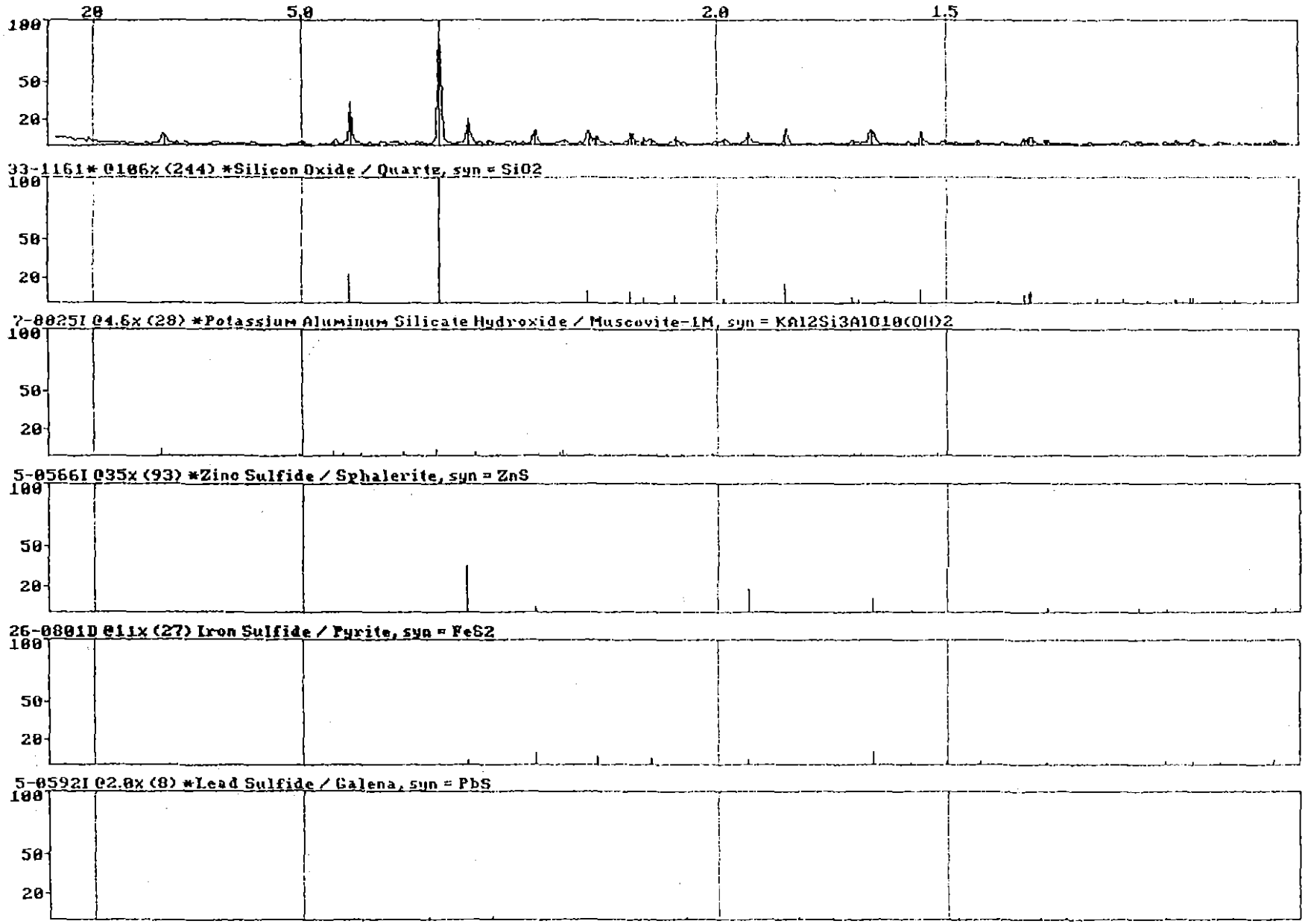


G1888
3528121

G1889
352843

IDENTIFIED PHASES
33-1161 7-0025 5-0566 26-0801 5-0592

Intensities: Linear



0271796

957171

CRA EXPLORATION PTY. LIMITED
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A.C.N. 000 057 125.

28th June 1993

Mr R. Walker,
Advanced Technical Development,
1 Research Ave,
BUNDOORA VIC.

SAMPLES SUBMITTED FOR DETAILED SIZE-BY-GRADE ANALYSIS

Dear Rob,

Please find enclosed two composite air-core samples from CRAE's Tasmanian zinc prospects for detailed chemical and mineralogical characterisation by size fractions as per our agreed quotation.

Sample 3753498 (hole ZM13, 16-28m) is a pyrite-rich sample from another prospect 3km from the first sample. The interval assayed 6.7% Zn and 0.1% Pb. Sample pulp 3528057 came from this interval, and samples 3528109 and 3528121 were from an adjacent hole with similar geological characteristics (ATD ref A857A/639ch).

Can you please retain any excess sample for future reference, including geochemical sample pulps in case further assays are required.

Thankyou for your help.

Yours sincerely,

ROBERT PARKINSON
(Project Geologist - Tasmania)

957172

Advanced Technical Development
Melbourne

A Report prepared for
CRAE, Preston

Chemical and Mineralogical Characteristics of a Tasmanian Resource

CONFIDENTIAL

1 October 1993

957173

Chemical and Mineralogical Characteristics of a Tasmanian Resource

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CRA Advanced Technical Development
Melbourne

Report

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SUMMARY

Project Focus

CRAE commissioned ATD to conduct a comprehensive size by grade chemical and mineralogical characterisation of two air-core composite samples from a Tasmanian zinc prospect. The aim of this characterisation was to establish more accurately the nature and distribution of valuable minerals in two contrasting samples.

What are the main chemical and mineralogical features of the two samples?

Research Conducted

Samples were sized at ATD. All of the size fractions were submitted for chemical analysis at ATD. Selected size fractions were sent to Genalysis (Perth) for trace element determinations. Five size fractions of each sample were selected for the mineralogical study. Their mineralogy was characterised using a combination of optical microscopy, X-ray diffraction (XRD) and scanning electron microscopy with energy dispersive X-ray capabilities (SEM/EDX).

Findings

- **The size distribution of the two samples is very different**

[redacted]

Sample 3753498 contains more sulphide with >30% of its mass reporting in the +2mm size fraction.

[redacted]

- **Sample 3753498** MYRTLE ZM13 16-28m

  The mineralogy of this sample is dominated by pyrite, sphalerite, sericite, and quartz.

- **Implications**

[redacted]

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Project Focus

CRAE commissioned ATD to undertake a comprehensive size by grade chemical and mineralogical characterisation of two contrasting air-core composite samples from a Tasmanian zinc prospect. The aim of the characterisation was to establish more accurately the nature and distribution of the valuable minerals. Some work had been done previously on samples from this prospect (see reports by R Walker: A857A/603ms, and C Halsall/R Walker: A857A639ch). The focus of the previous work had been to try and determine whether the main zinc bearing mineral was sphalerite, a Zn-aluminosilicate, or smithsonite (Zn carbonate). The results suggested that both sphalerite and a Zn-aluminosilicate (possibly fraipontite) were present in varying amounts.

Research Conducted

Sizing

Samples were sized at ATD. Sample preparation was achieved by splitting the sample in half by cone and quartering and then wet screening at 38µm. Prior to wet screening the samples were disagglomerated to ensure a natural size distribution would be obtained. Following wet screening the +38µm size fraction was sized to 2mm by dry screening. The -38µm size fraction of the clay rich sample (3753497) was further sized in a cyclosizer down to 10µm.

Chemical and mineralogical analysis

All of the size fractions were submitted for chemical analysis at ATD. Selected size fractions were sent to Genalysis (Perth) for trace element determinations. Five size fractions of each sample were selected for the mineralogical study. Their mineralogy was characterised using a combination of optical microscopy, X-ray diffraction (XRD), and scanning electron microscopy with energy dispersive X-ray capabilities (SEM/EDX). SEM/EDX analysis was carried out at ATD. XRD analysis was carried out at La Trobe University with selected samples also sent to AMDEL in South Australia for more detailed XRD analysis of clay minerals.

Findings

- **The size distribution of the two samples is very different**

Sample 3753498 contains more sulphide. Its size distribution is in sharp contrast to that of 3753497 with 36.1% reporting to the +2mm size fraction. Agglomeration is much less of a problem in sample 3753498.

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Table 1. Percentage size distribution by weight for each sample

	3753498
+2mm	36.1
-2+1mm	11.5
-1+0.5mm	10.3
-500+212um	12.3
-212+106um	8.2
-106+63um	4.7
-63+38um	4.2
-38um	12.7
-38+20um	
-20+10um	
-10um	

overlooked.

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Mineralogical information for sample 3753497 is summarised in Appendix 3. Figure 1 (Appendix 2) is a SEM photomicrograph of this sample showing the main minerals of interest.

- **Sample 3753498**

Zn assays remain relatively constant through the size fractions

Results of chemical analysis of sample 3753498 are shown in Appendix 1 (Table A1.1). The mean values for Zn and Pb are 10.15 wt% and 0.11 wt%. Zinc values range from 3.5 wt% to 15.6wt% but there is no consistent variation through the size fractions. The lowest zinc assay corresponds to the finest size fraction (-38μm) The highest zinc assay corresponds to the -212+106μm size fraction.

A visual estimate of mineral abundances in this sample suggests an average modal composition (by volume) of 50% pyrite, 20% sphalerite, 20% fine grained aluminosilicates (mainly sericite), and 10% quartz. Variations in Zn assay can be directly related to sphalerite content as there do not appear to be any other Zn-bearing phases present. The proportion of pyrite remains fairly constant throughout the size fractions. Attempts at image analysis and optical point counting were again unsuccessful in the coarser size fractions due to the presence of relatively fine grained sphalerite in agglomerates.

Pyrite is dominant sulphide

Pyrite is the most common sulphide in all of the size fractions and is much more abundant in this sample than in sample 3753497. This is reflected in the Fe and S assays for the two samples (Appendix 1, Table A1.1). The majority of the pyrite grains are clean although some contain <10μm inclusions of galena (Figure 5, Appendix 2). Some very fine grained aggregates of pyrite (framboids?) were also observed.

Sphalerite contains <1wt% Fe

Sphalerite is common in all of the size fractions. Most of the sphalerite is clean although many of the grains have a thin surface coating of agglomerated material. There are occasional complex intergrowths between sphalerite and other sulphides or silicates (Figure 6, Appendix 2). "Microbreccia" textures were observed in some sulphide fragments. A number of grains of sphalerite were analysed by microprobe at the University of Melbourne. Sphalerite compositions are quite uniform with an average Fe content of <1wt% (Table 4).

Sericite is dominant K-aluminosilicate

A fine grained K-aluminosilicate is present in all of the size fractions. It usually occurs in fine grained aggregates which resemble rock fragments. XRD analysis by AMDEL suggests that this phase is muscovite (sericite). The grain size of the sericite is generally <10μm and individual grains often display preferred orientation within the aggregates. Some relatively coarse grained muscovite was observed in the +212μm size fractions.

A minor amount of chlorite was observed associated with pyrite in the -1000+500μm size fraction.

Discrete grains of quartz are present in all of the size fractions.

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Table 4. Results of microprobe analysis of sphalerite (sample 3753498)

3753498 (-500+212um)					
(wt%)					
Zn	66.946	66.94	67.243	66.813	66.746
Fe	0.372	0.863	0.343	0.743	0.243
Mn	0	0.005	0.012	0.002	0.02
S	33.03	33.062	32.938	33.148	33.039
Total	100.348	100.87	100.536	100.706	100.048
3753498 (-63+38um)					
(wt%)					
Zn	66.476	65.983	65.849	65.821	66.797
Fe	0.705	1.347	1	0.958	0.662
Mn	0	0	0.006	0.05	0.019
S	32.902	32.66	32.873	33.215	32.872
Total	100.083	99.99	99.728	100.044	100.35

No carbonate was observed

Average values for Ca, Mg, and C in this sample are 0.02 wt%, 0.12 wt%, and 1.49 wt% respectively (Appendix 1, Table A1.1) suggesting that the sample contains very little carbonate. No carbonate was observed in the mineralogical study.

The results of trace element analysis of selected size fractions are shown in Appendix 1 (Table A1.2). Values for Ni and As are both higher in this sample than in sample 3753497 (Table 5), suggesting that Ni and As are associated with sulphides.

Mineralogical information for this sample is summarised in Appendix 3. Figure 4 (Appendix 2) is an SEM photomicrograph of this sample showing the main minerals of interest.

Implications

The physical characteristics and mineralogy of the sulphide sample 3753498, suggest that it will behave normally during processing.

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APPENDIX 1

Results of chemical analysis - major and trace elements

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Table A1.1 Results of major element analysis for all size fractions (wt%).

	Ca	Si	Al	K	Mg	C	S	Pb	Zn	Fe
3753498										
+2mm	0.03	10.60	3.49	0.83	0.07	0.87	32.20	0.11	8.87	23.80
-2mm+1mm	<0.01	10.90	3.78	0.92	0.08	1.18	29.40	0.11	8.25	26.80
-1000+500um	0.03	10.80	3.75	0.93	0.10	1.30	28.50	0.09	12.20	19.80
-500+212um	<0.01	9.35	3.08	0.71	0.09	1.24	30.40	0.12	15.40	20.90
-212+106um	<0.01	11.70	4.11	1.00	0.09	1.35	27.40	0.11	15.60	21.90
-106+63um	0.01	13.10	4.99	1.14	0.12	1.44	25.90	0.12	6.62	20.70
-63+38um	<0.01	13.90	4.50	1.16	0.09	1.74	22.40	0.13	10.80	18.10
-38um	<0.01	17.50	6.71	1.58	0.29	2.80	14.10	0.10	3.50	11.40
Mean	*0.02*	*12.23*	*4.30*	*1.03*	*0.12*	*1.49*	*26.29*	*0.11*	*10.16*	*20.43*

Table A1.2 Results of trace element analysis of selected size fractions

	Mn	Ni	Cu	As	Ag	Cd	Bi
3753498							
-1000+500um	16	190	74	400	13	360	0.5
-212+106um	20	215	62	400	13	270	0.5
-63+38um	18	225	78	580	9	160	0.5

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APPENDIX 2

SEM Photomicrographs

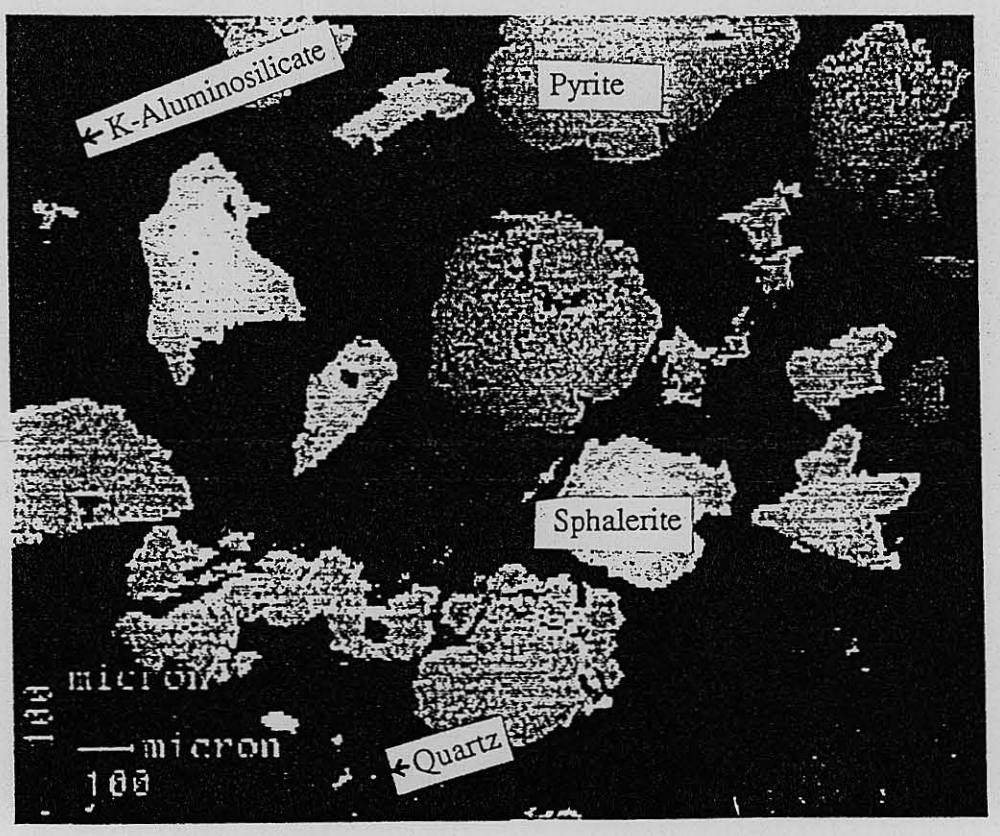

Figure 4: Sample 3753498. A representative field of view showing the main minerals present.

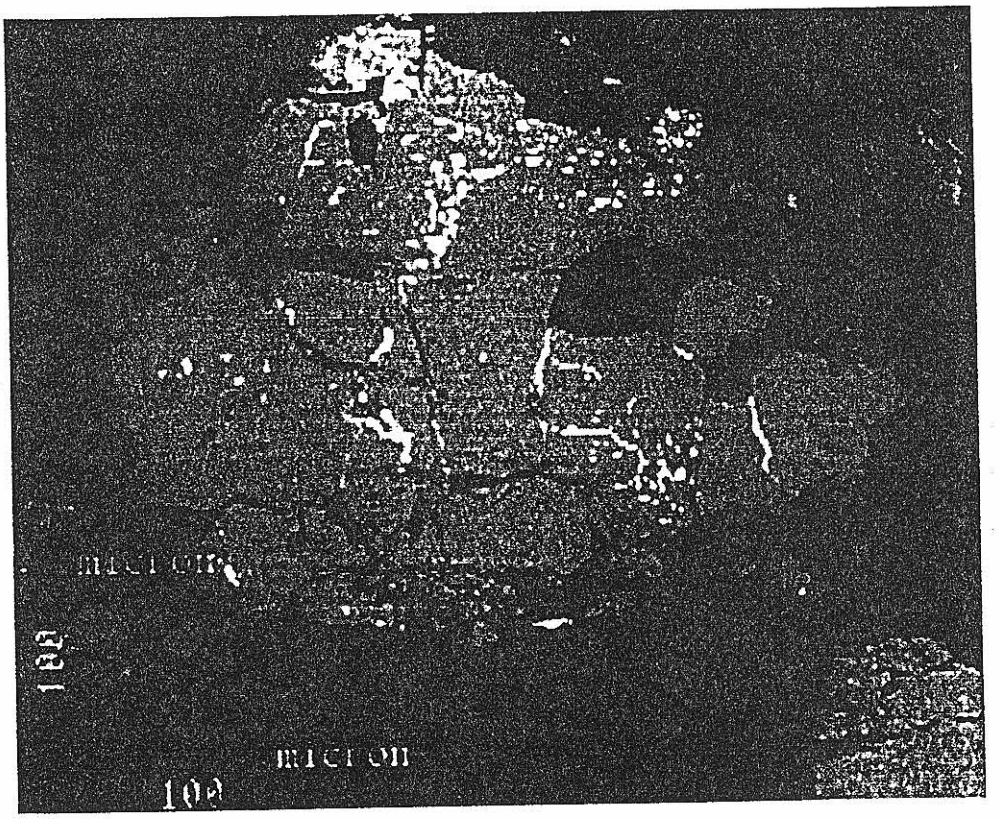

Figure 5: Sample 3753498. Galena inclusions (white) in pyrite.

Figure 6: Sample 3753498. A complex intergrowth of sphalerite (brightest phase), pyrite (grey) and silicate (darkest phase).

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APPENDIX 3

Summary of mineralogical information and XRD reports from La Trobe University and AMDEL

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3753498

-1000+500µm (Assay: 12.2%Zn, 0.09%Pb, 19.8%Fe, 28.5%S)
XRD quartz, sphalerite, pyrite, muscovite/sericite
SEM K-aluminosilicate, quartz, pyrite, sphalerite, chlorite

-500+212µm (Assay 15.4%Zn, 0.12%Pb, 20.9%Fe, 30.4%S)
XRD quartz, sphalerite, pyrite, muscovite/sericite
SEM K-aluminosilicate, quartz, sphalerite, pyrite, galena, muscovite

-212+106µm (Assay: 15.6%Zn, 0.11%Pb, 21.9%Fe, 27.4%S)
XRD quartz, sphalerite, pyrite, muscovite/sericite
SEM K-aluminosilicate, quartz, pyrite, sphalerite, galena, phosphate?

-106+63µm (Assay: 6.62%Zn, 0.12%Pb, 20.7%Fe, 25.9%S)
XRD quartz, sphalerite, pyrite, muscovite/sericite
SEM K-aluminosilicate, quartz, pyrite, sphalerite, galena

-63+38µm (Assay: 10.8%Zn, 0.13%Pb, 18.1%Fe, 22.4%S)
XRD quartz, sphalerite, pyrite, muscovite/sericite
SEM K-aluminosilicate, quartz, pyrite, sphalerite, galena

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APPENDIX 5:

PYRAMID PROSPECT AIR-CORE DRILL LOGS AND GEOCHEMISTRY.

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PYRAMID PROSPECT AIR-CORE DRILLHOLE COLLAR DATA							
Hole prefix AC93—							
HOLE	LOCALE	LOCALN	AMGE	AMGN	TOTAL DEPTH	AZUMITH	DIP
ZP1	1400	1000	364366	5356263	3.7	0	-90
ZP2	1425	1000	364369	5356288	11.0	0	-90
ZP3	1450	1000	364372	5356313	7.5	0	-90
ZP4	1475	1000	364375	5356338	4.0	0	-90
ZP5	1500	1000	364378	5356363	6.7	0	-90
ZP6	1525	1000	364381	5356387	8.5	0	-90
ZP7	1550	1000	364384	5356412	4.9	0	-90
ZP8	1575	1000	364387	5356437	7.3	0	-90
ZP9	1600	1000	364390	5356462	14.6	0	-90
ZP10	1625	1000	364394	5356487	7.6	0	-90
ZP11	1650	1000	364397	5356511	2.8	0	-90
ZP12	1675	1000	364400	5356536	29.2	0	-90
ZP13	1700	1000	364403	5356561	12.0	0	-90
ZP14	1725	1000	364406	5356585	15.0	0	-90
ZP15	1500	1100	364279	5356375	8.5	0	-90
ZP16	1525	1100	364282	5356400	15.1	0	-90
ZP17	1550	1100	364285	5356424	4.5	0	-90
ZP18	1575	1100	364288	5356449	6.3	0	-90
ZP19	1600	1100	364291	5356474	12.5	0	-90
ZP20	1625	1100	364294	5356499	13.6	0	-90
ZP21	1650	1100	364297	5356524	18.0	0	-90
ZP22	1675	1100	364300	5356548	12.0	0	-90
ZP23	1700	1100	364303	5356573	8.0	0	-90
ZP24	1725	1100	364306	5356598	10.0	0	-90
ZP25	1750	1100	364309	5356623	10.0	0	-90
ZP26	1600	1185	364192	5356471	9.0	0	-90
ZP27	1625	1185	364195	5356496	5.5	0	-90
ZP28	1650	1185	364198	5356521	21.0	0	-90
ZP29	1675	1185	364201	5356545	33.6	0	-90
ZP30	1700	1185	364204	5356570	10.0	0	-90

ROCKCHIP AND DRILLING CODES

17/2/93

BMRLITH

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

Msl	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	Malic tuff

SURFICIAL (COVER) MATERIAL

Ca	Alluvium	Clt	Laterite	Csg	Gossan
Cco	Colluvium	Csp	Pisolites		
Cs	Sand	Cst	Ironstone	Ccy	Clay
Cbs	Black soil	Csi	Silcrete		
Cg	Gravel	Cct	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
Fi	Fissile (slatey)	Ma	Massive	Vu	Vuggy

DIAGNOSTIC MINERALOGY

PRIMARY MINERALISATION

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

SECONDARY MINERALISATION

Ls	Lead secondaries	Cs	Copper sec.	Nl	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	Gray	R	Red	K	Pink
B	Brown	O	Orange	E	Blue
W	White	Y	Yellow	S	Silver

PYRAMID AIR-CORE DRILLING DATABASE - DRILLING LOGS AND ASSAYS															
Database last updated 7/6/93															
Results in ppm (Fe in %)															
HOLE	DFROM	DTO	SAMPNO	DPO	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	Cu	Pb	Zn	Ag	Fe%	Mn
ZP1	0.0	2.0	3523850	71532	QhaOg	CgCcy			LB	9	34	54	-1	0.84	42
ZP1	2.0	3.7	3523851	71532	Og	CcySls			BN	14	47	89	-1	1.09	39
ZP2	0.0	2.0	3523852	71532	Qha	CgCcy			LB	6	42	24	-1	0.68	44
ZP2	2.0	4.0	3523853	71532	Qha	Cg				7	55	51	-1	0.99	59
ZP2	4.0	6.0	3523854	71532	Qha	Cg				9	74	62	-1	1.06	72
ZP2	6.0	8.0	3523855	71532	QhaOg	CgCcy			G	22	269	6800	-1	1.75	131
ZP2	8.0	10.0	3523856	71532	Og	SlsCcy			G	21	188	1991	-1	2.53	106
ZP2	10.0	11.0	3523857	71532	Og	SlsCcy			G	9	32	123	-1	1.54	254
ZP3	0.0	2.0	3523858	71532	Qha	CgCcy			B	10	39	46	1	0.54	54
ZP3	2.0	4.0	3523859	71532	Og	SlsCcy			NGB	25	159	340	2	0.62	41
ZP3	4.0	6.0	3523860	71532	Og	SlsCcy			NVB	13	90	368	-1	2.95	338
ZP3	6.0	7.5	3523861	71532	Og	SlsCcy			GN	6	84	385	-1	1.27	346
ZP4	0.0	2.0	3523862	71532	Qha	CvCgCcy				10	59	137	-1	0.92	59
ZP4	2.0	4.0	3523863	71532	Og	SlsCcy			NGB	8	404	1094	1	1.33	485
ZP5	0.0	2.0	3523864	71532	QhaOg	CgCcy			G	6	78	176	-1	0.82	95
ZP5	2.0	4.0	3523865	71532	QhaOg	CgCcy			GN	12	110	250	-1	1.3	88
ZP5	4.0	6.0	3523866	71532	Og	Ccy			GN	14	121	330	-1	1.64	115
ZP5	6.0	6.7	3523867	71532	Og	SlsCcy			GN	5	79	895	-1	0.74	359
ZP6	0.0	2.0	3523868	71532	Qha	CvCcy			B	13	99	109	-1	0.71	110
ZP6	2.0	4.0	3523869	71532	QhaOg	CgCcy			GB	11	359	1631	1	2.55	556
ZP6	4.0	6.0	3523870	71532	Og	SlsCcy			VB	5	262	1162	1	0.92	451
ZP6	6.0	8.0	3523871	71532	Og	SlsCcy			VB	15	482	7400	3	2.67	1313
ZP6	8.0	8.5	3523872	71532	Og	SlsCcy			VN	7	285	2297	1	1.46	618
ZP7	0.0	2.0	3523873	71532	Qha	CvCcy			B	5	113	264	-1	0.7	72
ZP7	2.0	4.0	3523874	71532	QhaOg	CgCcy			VB	11	117	685	-1	1.63	101
ZP7	4.0	4.9	3523875	71532	QhaOg	CgSls			GN	10	362	1849	-1	1.89	119
ZP8	0.0	2.0	3523876	71532	Qha	CvCg				8	42	55	-1	0.95	65
ZP8	2.0	4.0	3523877	71532	QhaOg	CgCcy			GB	23	700	4353	1	2.49	75
ZP8	4.0	6.0	3523878	71532	Og	SlsCcy			GN	10	275	1260	-1	3.06	552
ZP8	6.0	7.3	3523879	71532	Og	SlsCcy			GN	7	295	1769	-1	1.75	716

9571190

HOLE	DFROM	DTO	SAMPNO	DPO	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	Cu	Pb	Zn	Ag	Fe%	Mn
ZP9	0.0	2.0	3523880	71532	Qha	Ccy			LB	7	52	37	-1	0.52	34
ZP9	2.0	4.0	3523881	71532	Qha	Cg				9	52	86	-1	1.05	66
ZP9	4.0	6.0	3523882	71532	Og	SlsCcy			GN	21	332	1175	-1	2.27	48
ZP9	6.0	8.0	3523883	71532	Og	SlsCcy			GN	22	117	561	-1	2.32	55
ZP9	8.0	10.0	3523884	71532	Og	SlsCcy			GN	22	227	739	-1	2.61	297
ZP9	10.0	12.0	3523885	71532	Og	SlsCcy			GN	23	296	944	-1	2.59	197
ZP9	12.0	14.0	3523886	71532	Og	Sls				5	187	564	-1	1.75	553
ZP9	14.0	14.6	3523887	71532	Og	Sls				5	297	982	-1	1.23	398
ZP10	0.0	2.0	3523888	71532	Qha	Ccy			LB	7	53	58	-1	0.65	43
ZP10	2.0	4.0	3523889	71532	Qha	Cg				9	86	57	-1	1.12	72
ZP10	4.0	6.0	3523890	71532	Sa?	SlsCcy			GB	16	76	299	-1	1.3	54
ZP10	6.0	7.6	3523891	71532	Sa?	SlsCcy			GN	19	90	810	-1	1.62	34
ZP11	0.0	2.0	3523892	71532	QhaSa?	CgCcy			YB	14	77	90	-1	1.58	65
ZP11	2.0	2.8	3523893	71532	Sa?	Sls			G	10	74	63	-1	1.24	68
ZP12	0.0	2.0	3523894	71532	Qha	CvCg				10	27	35	-1	0.49	37
ZP12	2.0	4.0	3523895	71532	Sa?	SlsCcy			G	27	76	238	-1	3.02	86
ZP12	4.0	6.0	3523896	71532	QhaSa?	CgSls				16	63	96	-1	0.98	56
ZP12	6.0	8.0	3523897	71532	Sa?	SlsCcy			GN	23	45	170	-1	2.81	82
ZP12	8.0	10.0	3523898	71532	Sa?	SlsCcy			G	25	44	157	-1	2.5	74
ZP12	10.0	12.0	3523899	71532	Sa?	SlsCcy			G	37	17	131	-1	1.2	29
ZP12	12.0	14.0	3523900	71532	Sa?	SlsCcy			G	34	10	65	-1	1.31	31
ZP12	14.0	16.0	3523901	71532	Sa?	SlsCcy			G	26	15	94	-1	1.16	30
ZP12	16.0	18.0	3523902	71532	Sa?	SlsCcy			G	21	15	127	-1	1.16	33
ZP12	18.0	20.0	3523903	71532	Sa?	SlsCcy			G	22	16	117	-1	1.81	151
ZP12	20.0	22.0	3523904	71532	Sa?	SlsCcySsh			G	22	28	122	-1	2.23	247
ZP12	22.0	24.0	3523905	71532	Sa?	SlsCcySsh			G	20	33	125	-1	4.05	1128
ZP12	24.0	26.0	3523906	71532	Sa?	SlsCcySsh			G	29	23	96	-1	1.8	177
ZP12	26.0	28.0	3523907	71532	Sa?	SlsCcySsh			G	55	83	303	-1	2.06	281
ZP12	28.0	29.2	3523908	71532	Sa?	SlsCcy	Vn	Cc	G	15	48	137	-1	2.18	399
ZP13	0.0	2.0	3523909	71532	Qha	CgCv				14	142	105	-1	1.36	101
ZP13	2.0	4.0	3523910	71532	QhaSa?	CgSlsCcy				23	54	134	-1	3.14	133
ZP13	4.0	6.0	3523911	71532	Sa?	Sls			G	30	28	155	-1	3.98	124
ZP13	6.0	8.0	3523912	71532	Sa?	Sls			G	35	29	166	-1	3.98	110
ZP13	8.0	10.0	3523913	71532	Sa?	Sls			G	24	32	210	-1	4.15	104
ZP13	10.0	12.0	3523914	71532	Sa?	Sls			G	19	54	187	-1	3.75	94

c1996

HOLE	DFROM	DTO	SAMPNO	DPO	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	Cu	Pb	Zn	Ag	Fe%	Mn
ZP14	4.0	6.0	3523917	71532	Sa	Ssh	We		V	24	12	152	-1	3.8	147
ZP14	6.0	8.0	3523918	71532	Sa	Ssh	We		V	24	16	127	-1	3.58	117
ZP14	8.0	10.0	3523919	71532	Sa	Ssh	We		V	32	44	203	-1	3.38	151
ZP14	10.0	12.0	3523920	71532	Sa	Ssh	We		V	26	64	254	-1	3.27	65
ZP14	12.0	14.0	3523921	71532	Sa	Ssh	We		V	20	63	226	-1	3.62	170
ZP14	14.0	15.0	3523922	71532	Sa	Ssh	WeVn		V	24	25	153	-1	3.06	95
ZP15	0.0	2.0	3523923	71532	Qha	CgCv				10	42	116	-1	1.83	99
ZP15	2.0	4.0	3523924	71532	QhaOg	CgCcy			VB	28	273	880	-1	1.49	59
ZP15	4.0	6.0	3523925	71532	Og	SlsCcy			NVB	13	346	2542	-1	3.05	234
ZP15	6.0	8.0	3523926	71532	Og	SlsCcy			NVB	15	345	2126	-1	1.89	210
ZP15	8.0	8.5	3523927	71532	Og	SlsCcy			N	4	50	330	-1	0.96	162
ZP16	0.0	2.0	3523928	71532	Qha	CgCv				5	47	104	-1	0.76	62
ZP16	2.0	4.0	3523929	71532	QhaOg	CgCcy			VB	24	752	1117	1	1.28	37
ZP16	4.0	6.0	3523930	71532	Og	Ccy			VB	24	4400	7300	4	2.45	54
ZP16	6.0	8.0	3523931	71532	Og	Ccy			VB	18	678	2921	1	3.11	186
ZP16	8.0	10.0	3523932	71532	Og	CcySls			VB	19	2400	6500	3	2.67	55
ZP16	10.0	12.0	3523933	71532	Og	CcySss			VB	11	297	1044	1	0.95	42
ZP16	12.0	14.0	3523934	71532	Og	CcySss			VB	19	554	1320	1	1.77	38
ZP16	14.0	15.1	3523935	71532	Og	CcySls			VB	10	103	744	-1	1.96	288
ZP17	0.0	2.0	3523936	71532	Qha	CgCvCcy			LB	6	78	161	-1	0.41	20
ZP17	2.0	4.0	3523937	71532	Og	SlsCcy			NGB	10	51	227	-1	1.59	301
ZP17	4.0	4.5	3523938	71532	Og	SlsCcy			NGB	8	14	76	-1	1.4	390
ZP18	0.0	2.0	3523939	71532	Qha	CgCvCcy			LB	9	45	80	-1	0.89	95
ZP18	2.0	4.0	3523940	71532	Qha	Cg				6	49	159	-1	0.97	77
ZP18	4.0	6.0	3523941	71532	Og	SlsCcy			G	7	73	123	-1	1.07	293
ZP18	6.0	6.3	3523942	71532	Og	Sls			G	5	111	435	-1	0.79	319
ZP19	0.0	2.0	3523943	71532	Qha	CvCcy			LB	6	41	65	-1	0.42	68
ZP19	2.0	4.0	3523944	71532	Og	Ccy			VB	12	246	306	-1	0.64	53
ZP19	4.0	6.0	3523945	71532	Og	SlsCcy			GB	54	9900	41200	8	1.98	1099
ZP19	6.0	8.0	3523946	71532	Og	Sls			GN	15	878	4852	2	1.84	581
ZP19	8.0	10.0	3523947	71532	Og	Sls			GN	10	794	2641	1	1.66	556
ZP19	10.0	12.0	3523948	71532	Og	SlsSsi				7	364	2238	-1	1.81	560
ZP19	12.0	12.5	3523949	71532	Og	SlsSsi				6	136	1088	-1	1.15	358
ZP20	0.0	2.0	3523950	71532	Qha	CgCcy			Y	19	33	82	-1	1	31
ZP20	2.0	4.0	3523951	71532	Og	SlsCcy			G	17	87	516	-1	1.31	27
ZP20	4.0	6.0	3523952	71532	Og	SlsSsh			GN	17	331	754	-1	2.12	32
ZP20	6.0	8.0	3523953	71532	Og	SlsSsh			GN	22	347	1190	1	2.36	39
ZP20	8.0	10.0	3523954	71532	Og	SlsSsh			GN	25	524	2360	2	2.22	45
ZP20	10.0	12.0	3523955	71532	Og	SlsSshCcy			VB	99	3400	8400	7	4.62	37
ZP20	12.0	13.6	3523956	71532	Og	Sls			GN	14	388	1023	-1	1.86	405

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HOLE	DFROM	DTO	SAMPNO	DPO	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	Cu	Pb	Zn	Ag	Fe%	Mn
ZP21	4.0	6.0	3523959	71532	QhaSa?	CgCcy			VB	9	450	840	1	2.52	34
ZP21	6.0	8.0	3523960	71532	Sa?	Sls				14	116	294	-1	1.89	31
ZP21	8.0	10.0	3523961	71532	Sa?	Sls				12	101	322	-1	1.45	24
ZP21	10.0	12.0	3523962	71532	Sa?	SlsSsh				13	45	321	-1	9.49	2428
ZP21	12.0	14.0	3523963	71532	Sa?	SlsSsh				16	57	455	-1	2.15	83
ZP21	14.0	16.0	3523964	71532	Sa?	SlsSsh				20	82	463	-1	1.71	49
ZP21	16.0	18.0	3523965	71532	Sa?	SlsSsh				16	32	288	-1	3.2	646
ZP22	0.0	2.0	3523966	71532	Qha	CgCv				12	43	48	-1	0.76	51
ZP22	2.0	4.0	3523967	71532	QhaSa?	CgSlsSsh				15	42	88	-1	2.62	71
ZP22	4.0	6.0	3523968	71532	Sa?	SlsSsh				25	38	91	-1	2.96	85
ZP22	6.0	8.0	3523969	71532	Sa?	SlsSsh				30	46	159	-1	3.48	73
ZP22	8.0	10.0	3523970	71532	Sa?	SlsSsh				28	22	137	-1	3.24	73
ZP22	10.0	12.0	3523971	71532	Sa?	SlsSsh				27	25	162	-1	3.51	75
ZP23	0.0	2.0	3523972	71532	QhaSa?	CgCcy			LB	13	100	80	-1	0.74	37
ZP23	2.0	4.0	3523973	71532	QhaSa?	CgSlsSsh			GN	18	66	161	-1	2.37	62
ZP23	4.0	6.0	3523974	71532	Sa?	SlsSsh			GN	34	30	210	-1	3.21	79
ZP23	6.0	8.0	3523975	71532	Sa?	SlsSsh			GN	27	30	238	-1	3.42	86
ZP24	0.0	2.0	3523976	71532	Qha	CgCvCcy			LB	14	101	104	-1	1.07	53
ZP24	2.0	4.0	3523977	71532	QhaSa?	CgSlsSsh				24	59	142	-1	2.59	79
ZP24	4.0	6.0	3523978	71532	Sa?	SlsSsh				17	14	116	-1	3.67	90
ZP24	6.0	8.0	3523979	71532	Sa?	SlsSsh				21	16	133	-1	3.64	108
ZP24	8.0	10.0	3523980	71532	Sa?	SlsSsh				26	17	130	-1	3.93	110
ZP25	0.0	2.0	3523981	71532	Qha	CgCcy			LB	12	87	44	1	0.55	28
ZP25	2.0	4.0	3523982	71532	Qha	Cg				12	107	85	-1	1.47	89
ZP25	4.0	6.0	3523983	71532	Sa?	SlsSsh				42	72	391	-1	2.91	68
ZP25	6.0	8.0	3523984	71532	Sa?	SlsSsh				22	25	171	-1	2.84	75
ZP25	8.0	10.0	3523985	71532	Sa?	SlsSsh				22	35	183	-1	2.9	62
ZP26	0.0	2.0	3523986	71532	Qha	CgCv				12	80	59	-1	0.77	38
ZP26	2.0	4.0	3523987	71532	Og	Ccy			VB	29	505	1202	2	1.07	16
ZP26	4.0	6.0	3523988	71532	Og	CcySls			VBN	33	652	2986	3	2.38	284
ZP26	6.0	8.0	3523989	71532	Og	SlsSsh				9	123	517	1	1.6	561
ZP26	8.0	9.0	3523990	71532	Og	SlsSsh				6	121	701	-1	1.64	558
ZP27	0.0	2.0	3523991	71532	Qha	Cg				15	66	82	-1	1.14	74
ZP27	2.0	4.0	3523992	71532	QhaOg	CgCcy			GB	23	927	876	3	1.48	54
ZP27	4.0	5.5	3523993	71532	Og	Sls				9	270	775	1	1.05	489

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HOLE	DFROM	DTO	SAMPNO	DPO	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	Cu	Pb	Zn	Ag	Fe%	Mn
ZP28	4.0	6.0	3523995	71532	QhaOg	CgCcy			LB	24	30	52	-1	0.68	13
ZP28	6.0	8.0	3523996	71532	QhaOg	CgSlsSsh			LB	20	21	54	1	0.56	12
ZP28	8.0	10.0	3523997	71532	Og	SlsSsh			GN	20	123	307	-1	1.22	20
ZP28	10.0	12.0	3523998	71532	Og	SlsSsh				19	59	616	-1	1.78	16
ZP28	12.0	14.0	3523999	71532	Og	SlsSsh				21	57	373	-1	1.38	24
ZP28	14.0	16.0	3524000	71532	Og	SlsSsh				16	27	334	-1	1.17	14
ZP28	16.0	18.0	3527601	71532	Og	SlsSsh				17	25	253	-1	1.39	17
ZP28	18.0	21.0	3527602	71532	Og	SlsSsh				16	44	184	-1	1.42	18
ZP29	0.0	2.0	3527603	71532	Qha	Cg				12	37	51	-1	0.68	17
ZP29	2.0	4.0	3527604	71532	QhaOg	CgSlsSsh				27	541	921	1	1.44	42
ZP29	4.0	6.0	3527605	71532	Og	SlsSsh				25	179	348	1	1.66	25
ZP29	6.0	8.0	3527606	71532	Og	SlsSsh				26	263	660	1	1.55	29
ZP29	8.0	10.0	3527607	71532	Og	SlsSsh				21	138	236	1	1.93	31
ZP29	10.0	12.0	3527608	71532	Og	SlsSsh				26	529	1380	1	1.9	40
ZP29	12.0	14.0	3527609	71532	Og	SlsSsh				16	103	187	-1	1.5	24
ZP29	14.0	16.0	3527610	71532	Og	SlsCcy				24	197	206	1	1.8	43
ZP29	16.0	18.0	3527611	71532	Og	SlsCcy				23	225	594	1	2.34	44
ZP29	18.0	20.0	3527612	71532	Og	CcySlsSsh			GB	49	318	1482	2	2.84	28
ZP29	20.0	22.0	3527613	71532	Og	CcySlsSsh			GB	30	375	2550	2	2.68	30
ZP29	22.0	24.0	3527614	71532	Og	CcySlsSsh			GB	22	314	1834	2	1.98	38
ZP29	24.0	26.0	3527615	71532	Og	SlsSsh				18	213	516	-1	1.15	38
ZP29	26.0	28.0	3527616	71532	Og	SlsSsh				22	319	1605	1	1.64	40
ZP29	28.0	30.0	3527617	71532	Og	SlsSsh				21	195	773	1	1.63	47
ZP29	30.0	32.0	3527618	71532	Og	SlsSsh				21	64	281	-1	1.54	46
ZP29	32.0	33.6	3527619	71532	Og	SlsSsh				18	50	618	-1	1.44	41
ZP30	0.0	2.0	3527620	71532	Qha	CgCa				14	82	68	-1	2	71
ZP30	2.0	4.0	3527621	71532	QhaSa?	CgSlsSsh				15	81	139	-1	1.75	67
ZP30	4.0	6.0	3527622	71532	Sa?	SlsSsh				14	55	143	-1	2.59	192
ZP30	6.0	8.0	3527623	71532	Sa?	SlsSsh				15	106	171	-1	2.93	265
ZP30	8.0	10.0	3527624	71532	Sa?	SlsSsh				28	58	179	-1	3.9	554

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PYRAMID PROSPECT - MULTI-ELEMENT GEOCHEMISTRY FOR HIGH ZINC SAMPLES														
Results In ppm except C-Fe-S (in %)				DPO 77107										
HOLE	DFROM	DTO	SAMPNO	Ag	Al	As	Au	Ba	Bi	C%	Ca	Cd	Co	Cr
ZP19	4.0	6.0	3523945	8	21100	30	-0.008	125	-10	8.1	130000	210	16	95
				Cu	Fe%	K	Mg	Mn	Mo	Na	Ni	P	Pb	S%
				54	1.98	8070	63700	1099	-10	154	44	178	9900	3.25
				Sb	Sn	V	Zn							
				28	7	30	41200							

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APPENDIX 6:

TRIAL HARBOUR EZ OPEN-FILE SOIL GEOCHEMISTRY.

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TRIAL HARBOUR SOIL GEOCHEMISTRY				
Open-file data collected by EZ on SPL22.				
NOTE:	Results are to nearest 100ppm, scaled off profile plots.			
	AMG co-ordinates approximate			
LOCALE	**LOCALN**	**AMGE**	**AMGN**	**Ni ppm**
4W	500	348780	5356680	-200
4W	400	348780	5356650	-200
4W	300	348780	5356620	-200
4W	200	348780	5356590	600
4W	100	348780	5356560	5500
4W	0	348780	5356530	2500
4W	-100	348780	5356500	6100
4W	-200	348780	5356470	3800
4W	-300	348780	5356440	1600
4W	-400	348780	5356410	3400
4W	-500	348780	5356380	200
4W	-600	348780	5356350	4800
3W	500	348930	5356680	-200
3W	400	348930	5356650	-200
3W	300	348930	5356620	-200
3W	200	348930	5356590	-200
3W	100	348930	5356560	200
3W	0	348930	5356530	700
3W	-100	348930	5356500	500
3W	-200	348930	5356470	700
3W	-300	348930	5356440	1000
3W	-400	348930	5356410	1100
3W	-500	348930	5356380	400
3W	-600	348930	5356350	500
3W	-700	348930	5356320	4700
3W	-800	348930	5356290	4700
3W	-900	348930	5356260	6200
3W	-1000	348930	5356230	5600
3W	-1100	348930	5356200	7300
3W	-1200	348930	5356170	5200
3W	-1300	348930	5356140	6300
3W	-1400	348930	5356110	4900
3W	-1500	348930	5356080	4400
3W	-1600	348930	5356050	4000
3W	-1700	348930	5356020	4600
2W	200	349139	5356589.26	-200
2W	100	349135	5356559.63	-200
2W	0	349130	5356530	-200
2W	-100	349125	5356500.37	-200
2W	-200	349121	5356470.74	3400
2W	-300	349116	5356441.11	1100
2W	-400	349111	5356411.48	4500
2W	-500	349107	5356381.85	9000
2W	-600	349102	5356352.22	6700
2W	-700	349097	5356322.59	3200
2W	-800	349092	5356292.95	4500
2W	-900	349088	5356263.32	4200
2W	-1000	349083	5356233.69	6100
2W	-1100	349078	5356204.06	4100

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2W	-1200	349074	5356174.43	3800
2W	-1300	349069	5356144.8	6900
2W	-1400	349064	5356115.17	7700
2W	-1500	349060	5356085.54	7100
2W	-1600	349055	5356055.91	5700
2W	-1700	349050	5356026.28	3600
2W	-1800	349046	5355996.65	5300
2W	-1900	349041	5355967.02	4200
2W	-2000	349036	5355937.39	6400
2W	-2100	349031	5355907.76	4700
1W	200	349230	5356590	-200
1W	100	349230	5356560	-200
1W	0	349230	5356530	-200
1W	-100	349230	5356500	900
1W	-200	349230	5356470	1200
1W	-300	349230	5356440	5200
1W	-400	349230	5356410	7200
1W	-500	349230	5356380	4200
1W	-600	349230	5356350	8700
1W	-700	349230	5356320	5900
1W	-800	349230	5356290	9400
1W	-900	349230	5356260	7600
1W	-1000	349230	5356230	7600
1W	-1100	349230	5356200	2300
1W	-1200	349230	5356170	4100
1W	-1300	349230	5356140	6400
1W	-1400	349230	5356110	7600
1W	-1500	349230	5356080	6900
1W	-1600	349230	5356050	5800
1W	-1700	349230	5356020	1300
1W	-1800	349230	5355990	3600
1W	-1900	349230	5355960	11000
1W	-2000	349230	5355930	6800
1W	-2100	349230	5355900	2000
1W	-2200	349230	5355870	1100
1W	-2300	349230	5355840	400
1W	-2400	349230	5355810	400
0E	400	349380	5356650	-200
0E	300	349380	5356620	-200
0E	200	349380	5356590	-200
0E	100	349380	5356560	200
0E	0	349380	5356530	-200
0E	-600	349380	5356350	-200
0E	-700	349380	5356320	-200
0E	-800	349380	5356290	-200
0E	-900	349380	5356260	400
0E	-1000	349380	5356230	-200
0E	-1100	349380	5356200	-200
0E	-1200	349380	5356170	-200
0E	-1300	349380	5356140	-200
0E	-1400	349380	5356110	-200
0E	-1500	349380	5356080	-200
0E	-1600	349380	5356050	4500
0E	-1700	349380	5356020	4100
0E	-1800	349380	5355990	600

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0E	-1900	349380	5355960	4000
0E	-2000	349380	5355930	-200
0E	-2100	349380	5355900	-200
0E	-2200	349380	5355870	1300
0E	-2300	349380	5355840	-200
0E	-2400	349380	5355810	300
0E	-2500	349380	5355780	-200
0E	-2600	349380	5355750	800
0E	-2700	349380	5355720	-200
0E	-2800	349380	5355690	-200
1E	400	349530	5356650	-200
1E	300	349530	5356620	-200
1E	200	349530	5356590	-200
1E	100	349530	5356560	-200
1E	0	349530	5356530	-200
1E	-100	349530	5356500	-200
1E	-200	349530	5356470	-200
1E	-300	349530	5356440	-200
1E	-400	349530	5356410	-200
1E	-500	349530	5356380	-200
1E	-600	349530	5356350	300
1E	-700	349530	5356320	-200
1E	-800	349530	5356290	-200
1E	-900	349530	5356260	700
1E	-1000	349530	5356230	-200
1E	-1100	349530	5356200	200
1E	-1200	349530	5356170	-200
1E	-1300	349530	5356140	-200
1E	-1400	349530	5356110	-200
1E	-1500	349530	5356080	2800
1E	-1600	349530	5356050	5600
1E	-1700	349530	5356020	1000
1E	-1800	349530	5355990	800
1E	-1900	349530	5355960	2000
1E	-2000	349530	5355930	-200
1E	-2100	349530	5355900	7100
1E	-2200	349530	5355870	2500
1E	-2300	349530	5355840	8500
1E	-2400	349530	5355810	9300
1E	-2500	349530	5355780	5000
1E	-2600	349530	5355750	300
1E	-2700	349530	5355720	-200
1E	-2800	349530	5355690	-200
1E	-2900	349530	5355660	-200
2E	500	349680	5356680	-200
2E	400	349680	5356650	-200
2E	300	349680	5356620	-200
2E	200	349680	5356590	-200
2E	100	349680	5356560	-200
2E	0	349680	5356530	-200
2E	-100	349680	5356500	-200
2E	-200	349680	5356470	-200
2E	-300	349680	5356440	-200
2E	-400	349680	5356410	-200
2E	-500	349680	5356380	-200

957200

2E	-600	349680	5356350	-200
2E	-700	349680	5356320	-200
2E	-800	349680	5356290	-200
2E	-900	349680	5356260	400
2E	-1000	349680	5356230	500
2E	-1100	349680	5356200	2600
2E	-1200	349680	5356170	-200
2E	-1300	349680	5356140	-200
2E	-1400	349680	5356110	-200
2E	-1500	349680	5356080	1700
2E	-1600	349680	5356050	1600
2E	-1700	349680	5356020	500
2E	-1800	349680	5355990	2500
2E	-1900	349680	5355960	1500
2E	-2000	349680	5355930	2500
2E	-2100	349680	5355900	700
2E	-2200	349680	5355870	1300
2E	-2300	349680	5355840	5600
2E	-2400	349680	5355810	8700
2E	-2500	349680	5355780	-200
2E	-2600	349680	5355750	-200
2E	-2700	349680	5355720	-200
2E	-2800	349680	5355690	-200
2E	-2900	349680	5355660	-200
2E	-3000	349680	5355630	-200
3E	500	349830	5356680	-200
3E	400	349830	5356650	-200
3E	300	349830	5356620	-200
3E	200	349830	5356590	-200
3E	100	349830	5356560	-200
3E	0	349830	5356530	-200
3E	-100	349830	5356500	-200
3E	-200	349830	5356470	-200
3E	-300	349830	5356440	-200
3E	-400	349830	5356410	-200
3E	-500	349830	5356380	-200
3E	-600	349830	5356350	-200
3E	-700	349830	5356320	-200
3E	-800	349830	5356290	-200
3E	-900	349830	5356260	-200
3E	-1000	349830	5356230	200
3E	-1100	349830	5356200	-200
3E	-1200	349830	5356170	200
3E	-1300	349830	5356140	-200
3E	-1400	349830	5356110	-200
3E	-1500	349830	5356080	-200
3E	-1600	349830	5356050	-200
3E	-1700	349830	5356020	500
3E	-1800	349830	5355990	1300
3E	-1900	349830	5355960	2400
3E	-2000	349830	5355930	9200
3E	-2100	349830	5355900	6000
3E	-2200	349830	5355870	6200
3E	-2300	349830	5355840	5600
3E	-2400	349830	5355810	2000

957201

3E	-2500	349830	5355780	3100
3E	-2600	349830	5355750	400
3E	-2700	349830	5355720	1100
3E	-2800	349830	5355690	-200
3E	-2900	349830	5355660	-200
4E	900	349980	5356800	-200
4E	800	349980	5356770	-200
4E	700	349980	5356740	-200
4E	600	349980	5356710	-200
4E	500	349980	5356680	-200
4E	400	349980	5356650	-200
4E	300	349980	5356620	-200
4E	200	349980	5356590	-200
4E	100	349980	5356560	-200
4E	0	349980	5356530	-200
4E	-100	349980	5356500	-200
4E	-200	349980	5356470	-200
4E	-300	349980	5356440	-200
4E	-400	349980	5356410	-200
4E	-500	349980	5356380	-200
4E	-600	349980	5356350	-200
4E	-700	349980	5356320	-200
4E	-800	349980	5356290	-200
4E	-900	349980	5356260	-200
4E	-1000	349980	5356230	-200
4E	-1100	349980	5356200	-200
4E	-1200	349980	5356170	-200
4E	-1300	349980	5356140	-200
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4E	-1500	349980	5356080	400
4E	-1600	349980	5356050	-200
4E	-1700	349980	5356020	7000
4E	-1800	349980	5355990	2000
4E	-1900	349980	5355960	-200
4E	-2000	349980	5355930	500
4E	-2100	349980	5355900	3400
4E	-2200	349980	5355870	1400
4E	-2300	349980	5355840	500
4E	-2400	349980	5355810	200
4E	-2500	349980	5355780	-200
4E	-2600	349980	5355750	3000
4E	-2700	349980	5355720	-200
4E	-2800	349980	5355690	-200
4E	-2900	349980	5355660	-200
4E	-3000	349980	5355630	-200
5E	900	350130	5356800	-200
5E	800	350130	5356770	-200
5E	700	350130	5356740	-200
5E	600	350130	5356710	-200
5E	500	350130	5356680	-200
5E	400	350130	5356650	-200
5E	300	350130	5356620	-200
5E	200	350130	5356590	-200
5E	100	350130	5356560	-200
5E	0	350130	5356530	-200

957202

5E	-100	350130	5356500	-200
5E	-200	350130	5356470	-200
5E	-300	350130	5356440	-200
5E	-400	350130	5356410	-200
5E	-500	350130	5356380	-200
5E	-600	350130	5356350	-200
5E	-700	350130	5356320	-200
5E	-800	350130	5356290	-200
5E	-900	350130	5356260	-200
5E	-1000	350130	5356230	-200
5E	-1100	350130	5356200	-200
5E	-1200	350130	5356170	-200
5E	-1300	350130	5356140	-200
5E	-1400	350130	5356110	-200
5E	-1500	350130	5356080	-200
5E	-1600	350130	5356050	500
5E	-1700	350130	5356020	-200
5E	-1800	350130	5355990	-200
5E	-1900	350130	5355960	-200
5E	-2000	350130	5355930	-200
5E	-2100	350130	5355900	-200
5E	-2200	350130	5355870	-200
5E	-2300	350130	5355840	-200
5E	-2400	350130	5355810	-200
5E	-2500	350130	5355780	-200
5E	-2600	350130	5355750	-200
5E	-2700	350130	5355720	1000
5E	-2800	350130	5355690	-200
5E	-2900	350130	5355660	-200
5E	-3000	350130	5355630	-200
6E	900	350280	5356800	-200
6E	800	350280	5356770	-200
6E	600	350280	5356710	-200
6E	500	350280	5356680	-200
6E	400	350280	5356650	-200
6E	300	350280	5356620	-200
6E	200	350280	5356590	-200
6E	100	350280	5356560	-200
6E	0	350280	5356530	-200
6E	-100	350280	5356500	-200
6E	-200	350280	5356470	-200
6E	-300	350280	5356440	-200
6E	-400	350280	5356410	-200
6E	-500	350280	5356380	-200
6E	-600	350280	5356350	800
6E	-700	350280	5356320	-200
6E	-800	350280	5356290	-200
6E	-900	350280	5356260	-200
6E	-1000	350280	5356230	-200
6E	-1100	350280	5356200	-200
6E	-1200	350280	5356170	-200
6E	-1300	350280	5356140	600
6E	-1400	350280	5356110	-200
6E	-1500	350280	5356080	200
6E	-1600	350280	5356050	-200

957203

6E	-1700	350280	5356020	700
6E	-1800	350280	5355990	-200
6E	-1900	350280	5355960	-200
6E	-2000	350280	5355930	-200
6E	-2100	350280	5355900	200
6E	-2200	350280	5355870	-200
6E	-2300	350280	5355840	300
6E	-2400	350280	5355810	-200
6E	-2500	350280	5355780	1100
6E	-2600	350280	5355750	300
6E	-2700	350280	5355720	-200
6E	-2800	350280	5355690	-200
6E	-2900	350280	5355660	-200
6E	-3000	350280	5355630	7000
7E	900	350430	5356800	-200
7E	800	350430	5356770	-200
7E	700	350430	5356740	-200
7E	600	350430	5356710	-200
7E	500	350430	5356680	-200
7E	400	350430	5356650	-200
7E	300	350430	5356620	-200
7E	200	350430	5356590	-200
7E	100	350430	5356560	-200
7E	0	350430	5356530	-200
7E	-100	350430	5356500	-200
7E	-200	350430	5356470	-200
7E	-300	350430	5356440	-200
7E	-400	350430	5356410	-200
7E	-500	350430	5356380	-200
7E	-600	350430	5356350	-200
7E	-700	350430	5356320	-200
7E	-800	350430	5356290	-200
7E	-900	350430	5356260	-200
7E	-1000	350430	5356230	-200
7E	-1100	350430	5356200	-200
7E	-1200	350430	5356170	-200
7E	-1300	350430	5356140	-200
7E	-1400	350430	5356110	-200
7E	-1500	350430	5356080	-200
7E	-1600	350430	5356050	-200
7E	-1700	350430	5356020	-200
7E	-1800	350430	5355990	-200
7E	-1900	350430	5355960	-200
7E	-2000	350430	5355930	-200
7E	-2100	350430	5355900	-200
7E	-2200	350430	5355870	-200
7E	-2300	350430	5355840	-200
7E	-2400	350430	5355810	200
7E	-2500	350430	5355780	500
7E	-2600	350430	5355750	1500
7E	-2700	350430	5355720	900
7E	-2800	350430	5355690	-200
7E	-2900	350430	5355660	-200
8E	900	350580	5356800	-200
8E	800	350580	5356770	-200

957204

8E	700	350580	5356740	-200
8E	600	350580	5356710	-200
8E	500	350580	5356680	-200
8E	400	350580	5356650	-200
8E	300	350580	5356620	-200
8E	200	350580	5356590	-200
8E	100	350580	5356560	-200
8E	0	350580	5356530	-200
8E	-100	350580	5356500	-200
8E	-200	350580	5356470	-200
8E	-300	350580	5356440	-200
8E	-400	350580	5356410	-200
8E	-500	350580	5356380	-200
8E	-600	350580	5356350	-200
8E	-700	350580	5356320	-200
8E	-800	350580	5356290	-200
8E	-900	350580	5356260	-200
8E	-1000	350580	5356230	-200
8E	-1100	350580	5356200	-200
8E	-1200	350580	5356170	-200
8E	-1300	350580	5356140	-200
8E	-1400	350580	5356110	-200
8E	-1500	350580	5356080	-200
8E	-1600	350580	5356050	-200
8E	-1700	350580	5356020	-200
8E	-1800	350580	5355990	-200
8E	-1900	350580	5355960	-200
8E	-2000	350580	5355930	-200
8E	-2100	350580	5355900	-200
8E	-2200	350580	5355870	-200
8E	-2300	350580	5355840	-200
8E	-2400	350580	5355810	-200
8E	-2500	350580	5355780	-200
8E	-2600	350580	5355750	-200
8E	-2700	350580	5355720	-200
8E	-2800	350580	5355690	-200
8E	-2900	350580	5355660	2900
8E	-3000	350580	5355630	1200

APPENDIX 7:

TRIAL HARBOUR CRAE ROCKCHIP SAMPLING LEDGERS AND GEOCHEMISTRY.

957206

ROCKCHIP AND DRILLING CODES

17/2/93

BMRLITH

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

Msl	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	Mafic undiff.		
Igr	Granite	Ido	Dolerite	Ipg	Pegmatite
Igd	Granodiorite	Igb	Gabbro		

EXTRUSIVE IGNEOUS

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

SURFICIAL (COVER) MATERIAL

Ca	Alluvium	Clt	Laterite	Csg	Gossan
Cco	Colluvium	Csp	Pisolites		
Cs	Sand	Cst	Ironstone	Ccy	Clay
Cbs	Black soil	Csi	Silcrete		
Cg	Gravel	Cct	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	Disseminated 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
Sp	Sphalerite	Po	Pyrrhotite		
Cp	Chalcopyrite	Su	Unknown sulph		

SECONDARY MINERALISATION

Ls	Lead secondaries	Cs	Copper sec.	Nl	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
B	Brown	O	Orange	E	Blue
W	White	Y	Yellow	S	Silver

TRIAL HARBOUR ROCKCHIP DATABASE.										
All results in ppm except Fe and S (in %).										
SAMPNO	DPO	EAST	NORTH	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	COMMENTS	PET
3308076	71521	348550	5356500	D	Msk	Ds	MtPy	MGB	Mt 50%, Py 20%. Float on rd.	
3308077	71521	348900	5356500	D	Mh	Di	Mt	DGN	Px-Gt-Mt hornfels.	
3308078	71521	349500	5355775	Ets	Sch	Ds	Py	DG	Flt. Very fine gs py 10%.	
3308079	71521	349500	5355775	Ets	Ox	VuSlVn		MLBG	Flt. Qz veined, vuggy silicified rock.	
3308080	71521	349500	5355775	Ets	Ox	WeVuFe		MOB	Flt. Spongy Fe in vugs.	
3313801	71520	349000	5356380	Esd	Ius	WeDi	MtNs?	LLV		
3313802	71520	349000	5356350	Esd	Ius	WeDi	MtNs?	LGV		
3313803	71520	349000	5356325	Esd	Ius	WeDi	Mt	LLV		
3313804	71520	349000	5356300	Esd	Ius	WeDs	MtNs	V		
3313805	71520	349000	5356275	Esd	Ius	WeDi	Mt	V		
3313806	71520	349000	5356250	Esd	Ius	WeDs	MtNs	V		
3313807	71520	349000	5356225	Esd	Ius	WeDi	MtNs?	LGV		
3313808	71520	349000	5356200	Esd	Ius	WeDi	Mt	V		
3313809	71520	349000	5356175	Esd	Ius	WeDi	Mt	LV		
3313810	71520	349000	5356150	Esd	Ius	WeDi	Mt	LYG		
3313811	71520	349000	5356125	Esd	Ius	We		LBV		
3313812	71520	349000	5356100	Esd	Ius	WeDi	Mt	V		
3313813	71520	349000	5356075	Esd	Ius	WeDi	Mt	LV		
3313814	71520	349000	5356050	Esd	Ius	We		V	SOIL C-hor 0.6m	
3313815	71520	349000	5356025	Esd	Ius	We		V	SOIL C-hor 0.5m	
3313816	71520	349000	5356000	Esd	Ius	WeDi	Mt	LV		
3313817	71520	349000	5355975	Esd	Ius	WeDi	Mt	V		
3313818	71520	348900	5355975	Qha	Qa			LB	SOIL T/ported 1.0m	
3313819	71520	348900	5356000	Esd?	Ccy			B	SOIL B-hor 1.0m	
3313820	71520	348900	5356025	Esd	Ius	WeDi	Mt	LYV		
3313821	71520	348900	5356050	Esd	Ius			MBYV	SOIL C-hor 1.0m	
3313822	71520	348900	5356075	Esd	Ius	We		LYV		
3313823	71520	348900	5356100	Esd	Ius	WeDi	Mt	LV		
3313824	71520	348900	5356325	Esd	Ius	We		V		
3313825	71520	348900	5356300	Esd	Ius	We		MYV	SOIL C-hor 0.4m	
3313826	71520	348900	5356275	Esd	Ius	We		MYV	SOIL C-hor 0.3m	
3313827	71520	348900	5356250	Esd	Ius	We		MYV	SOIL C-hor 0.6m	
3313828	71520	348900	5356225	Esd	Ius	WeDi	Mt	V		
3313829	71520	348900	5356200	Esd	Ius	WeDi	Mt	LV		
3313830	71520	348910	5356175	Esd	Ius	WeBx		LYV		
3313831	71520	348915	5356150	Esd	Ius	We		MVB	SOIL C-hor 0.8m	
3313832	71520	348900	5356125	Esd?	Ccy			YB	SOIL B/C-hor 1.0m	
3313833	71520	349100	5356375	Esd	Ius	WeDi	Mt	LGV		
3313834	71520	349100	5356350	Esd	Ius	We		YG		
3313835	71520	349100	5356325	Esd?	Ius?	WeBl		LB	Could be metasomatised qtzite	
3313836	71520	349100	5356295	Esd	Ius	WeDi	Mt	LV		
3313837	71520	349100	5356275	Esd	Ius	WeDi	Mt	LV		
3313838	71520	349100	5356250	Esd	Ius	WeDi	Mt	V		
3313839	71520	349100	5356225	Esd?	IusCsl	Sl		MWYV		
3313840	71520	349100	5356200	Esd	Ius			V		
3313841	71520	349100	5356175	Esd	Ius	WeDi	Mt	LV		
3313842	71520	349100	5356150	Esd	Ius	WeDi	Mt	LV		
3313843	71520	349100	5356125	Esd	Ius	WeDi	Mt	LV		
3313844	71520	349100	5356100	Esd	Ius	We		V		
3313845	71520	349100	5356075	Esd	Ius	We		LWV		
3313846	71520	349100	5356050	Esd	Ius	WeDi	Mt	MLVB		
3313847	71520	349100	5356025	Esd	Ius	WeDi	Mt	LYV		
3313848	71520	349100	5356000	Esd	Ius	WeDi	Mt	LYV		
3313849	71520	349100	5355975	Esd	Ius	WeDs	NiNs	MWV		
3313850	71520	349200	5356400	Esd	Ius	We		V	SOIL C-hor 0.3m	
3313851	71520	349200	5356375	Esd	Ius	WeDi	Mt	GV	Looks like dirty qtzite	
3313852	71520	349200	5356350	Esd	Ius	WeDi	Mt	MYV		
3313853	71520	349200	5356325	Esd	Ius	WeDi	Mt	V		
3313854	71520	349200	5356300	Esd	Ius	WeDi	Mt	LV		
3313855	71520	349200	5356275	Esd	Ius	WeDi	Mt	V		
3313856	71520	349200	5356250	Esd	Ius	WeDi	Mt	V		
3313857	71520	349200	5356225	Esd	Ius	WeDi	Mt	V		
3313858	71520	349200	5356200	Esd	Ius			V		
3313859	71520	349200	5356175	Esd	Ius			V		
3313860	71520	349200	5356150	Esd	Ius			V		
3313861	71520	349200	5356125	Esd	Ius			V		
3313862	71520	349200	5356100	Esd	Ius			V		
3313863	71520	349200	5356075	Esd	Ius	We		LV		
3313864	71520	349200	5356050	Esd	Ius	We		MVB		
3313865	71520	349200	5356025	Esd	Ius	We		LV		
3313866	71520	349200	5356000	Esd	Ius	We		LV		
3313867	71520	349200	5355975	Esd	Ius	Di		V		

SAMPNO	DPO	EAST	NORTH	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	COMMENTS	PET
3313868	71520	349200	5355950	Esd	Ius	WeDi	Mt	LV		
3313869	71520	349200	5355925	Esd	Ius	WeBxVn		LGV	Resinous brown vn and bx fill.	
3313870	71520	349200	5355900	Esd	Ius	WeDi	Mt	LV		
3313871	71520	349200	5355875	Esd	Ius	We		V	SOIL C-hor 0.5m	
3313872	71520	349200	5355850	Esd?	Ccy	We		MBN	SOIL B-hor 0.9m	
3313873	71520	349290	5355865	Esd	Ius	We		LV		
3313874	71520	349300	5355900	Esd	Ius	We		V	SOIL C-hor 0.6m	
3313875	71520	349300	5355925	Esd	Ius	We		LV		
3313876	71520	349300	5355950	Esd	Ius	We		MVB	SOIL C-hor 0.8m	
3313877	71520	349300	5355975	T	Clt			MYB		
3313878	71520	349300	5356000	T	Clt			MYB		
3313879	71520	349300	5356025	T	Clt			MYB		
3313880	71520	349300	5356050	T	Clt			MYB		
3313881	71520	349300	5356075	T	Clt			MYB		
3313882	71520	349300	5356100	T	Clt			MYB		
3313883	71520	349300	5356125	T	Clt			MYB		
3313884	71520	349300	5356150	T	Clt			MYB		
3313885	71520	349300	5356175	T	Clt			MYB		
3313886	71520	349300	5356200	T	Clt			MYB		
3313887	71520	349300	5356225	T	Clt			MYB	Not o/crop, surficial frags only	
3313888	71520	349300	5356250	T	Clt			MYB	Not o/crop, surficial frags only	
3313889	71520	349300	5356275	Esd	Ius	WeDi	Mt	LV		
3313890	71520	349300	5356300	Esd	Ius	Si		V		
3313891	71520	349300	5356325	Esd	Ius	Si		V		
3313892	71520	349300	5356350	Esd	Ius	WeDi	Mt	LV		
3313893	71520	349300	5356375	E?	Ovq	VnVu			Qtz network with weath serp.	
3313894	71520	349300	5356375	Esd	Ius	WeDiVn	Mt	MYG		
3313895	71520	349300	5356400	Pou?	Mq?	Si		GB	Scree? Contact Mtm?	
3313896	71520	349400	5356400	Esd	Ius	WeDiVn	Mt	LV		
3313897	71520	349400	5356375	Esd	Ius	WeDiFe	He	BV		
3313898	71520	349400	5356350	Esd	Ius	WeDiFe	He	LV		
3313899	71520	349400	5356325	Esd?	Ccy			MBN	SOIL B?-hor 0.9m	
3313900	71520	349400	5356305	Esd?	Ius?	WeVu		MYRV	Very light spongey rock.	
3313901	71520	349400	5356300	Esd?	Ius?	WeVuVn		MYR	Qtz veined spongey rock.	
3313902	71520	349400	5356275	T	Clt			MYB		
3313903	71520	349400	5356250	T	Clt			MYB		
3313904	71520	349400	5356225	T	Clt			MYB		
3313905	71520	349400	5356200	T	Clt			MYB		
3313906	71520	349400	5356175	T	Clt			MYB		
3313907	71520	349400	5356150	T	Clt			MYB		
3313908	71520	349400	5356125	T	Clt			MYB		
3313909	71520	349400	5356100	T	Clt			MYB		
3313910	71520	349400	5356075	T	Clt			MYB		
3313911	71520	349400	5356050	T	Clt			MYB		
3313912	71520	349400	5356025	T	Clt			MYB		
3313913	71520	349400	5356000	Esd	Ius	WeSi?		LV		
3313914	71520	349400	5355975	Esd	Ius			V		
3313915	71520	349400	5355950	Esd	Ius	We		V		
3313916	71520	349400	5355925	Esd	Ius	We		V	SOIL C-hor 0.6m	
3313917	71520	349400	5355900	Esd	Ius	We		MYV	SOIL C-hor 0.9m	
3313918	71520	349400	5355875		Ccy			B	SOIL B?-hor 0.9m	
3313919	71520	349500	5356300		Ccy			MBN	SOIL B/C-hor 1.0m	
3313920	71520	349500	5356275	Pou?	Sss?			YB	SOIL C?-hor 1.0m	
3313921	71520	349500	5356250	Esd?	Ius?	WeDi	Mt	LG		
3313922	71520	349500	5356200	Etu?	Sss?	We		G	Dundas Gp?	
3313923	71520	349500	5356175		Ccy			B	SOIL T/ported 0.8m	
3313924	71520	349500	5356150	Etu?	CsCcy			MBG	SOIL B/C-hor 1.0m	
3313925	71520	349500	5356125	Pou?	Sss	We		LGW	SOIL C-hor 0.9m	
3313926	71520	349500	5356100	T	Clt			MYB		
3313927	71520	349500	5356075	Esd	Ius	We		MYVN	SOIL C-hor 0.8m	
3313928	71520	349500	5356050	Esd	Ius	We		GV	SOIL C-hor 1.0m	
3313929	71520	349500	5356025	Esd?	Ccy			MBNY	SOIL B-hor 1.0m	
3313930	71520	349500	5356000		Os			MVY	SOIL T/ported? 0.8m	
3313931	71520	349500	5355975	Esd	Ius	WeDi	Mt	LGV		
3313932	71520	349500	5355925	Esd	Ius	We		MYV	SOIL C-hor 0.8m	
3313933	71520	349500	5355900	Esd	Ius	We		LYV		
3313934	71520	349500	5355875	Esd	Ius	We		MYVN	SOIL C-hor 1.0m	
3313935	71520	349500	5355850	Esd	Ius	WeDi	Mt	G		
3313936	71520	349500	5355825	Esd	Ius	We		MYVG	SOIL C-hor 0.8m	
3313937	71520	349515	5355800	Esd	Ius	We		LYV		
3313938	71520	349500	5355775	Esd	Ius	We		MYVN	SOIL C-hor 1.0m	
3313939	71520	349500	5355750	Ets?	Ccy			OB	SOIL B?-hor 1.0m	
3313940	71520	349000	5356107	Esd	Ius	Ma		LV	Upper adit sampling 2m RC.	
3313941	71520	349000	5356105	Esd	Ius	Ma		LV	Upper adit, 2m RC.	
3313942	71520	349000	5356103	Esd	Ius	Ma		V	Upper adit, 2m RC.	

SAMPNO	DPO	EAST	NORTH	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	COMMENTS	PET
3313943	71520	349000	5356101	Esd	Ius	Di	Mt	DV	Upper adit, 2m RC.	
3313944	71520	349003	5356101	Esd	Ius	Ma		V	Upper adit, 2m RC.	
3313945	71520	349005	5356101	Esd	Ius	Ma		V	Upper adit, 2m RC.	
3313946	71520	349000	5356096	Esd	Ius	Di	Mt	MLDV	Upper adit, 2m RC.	
3313947	71520	349000	5356094	Esd	Ius	Ds	NiMt	V	Upper adit, 2m RC. 5% Sulph.	
3313948	71520	349000	5356092	Esd	Ius	Ds	NiMt	DV	Upper adit, 2m RC. 5% Sulph.	
3313949	71520	349000	5356090	Esd	Ius	MaDi	Mt	LV	Upper adit, 2m RC.	
3313950	71520	349000	5356088	Esd	Ius	Ma		LV	Upper adit, 2m RC.	
3313951	71520	349000	5356086	Esd	Ius	WeDi	Mt	LV	Upper adit, 2m RC.	
3313952	71520	349000	5356084	Esd	Ius	WeDi	Mt	V	Upper adit, 2m RC.	
3313953	71520	349000	5356082	Esd	Ius	WeDi	Mt	LV	Upper adit, 2m RC.	
3313954	71520	349000	5356094	Esd	Ius	Ds	Ni?	DGN	Lower adit, 1.5m RC.	
3313955	71520	348996	5356090	Esd	Ius	Ma		DGN	Lower adit, 1.5m RC.	
3313956	71520	348992	5356086	Esd	Ius	Ma		DGN	Lower adit, 1.5m RC.	
3313957	71520	348988	5356082	Esd	Ius	Ma		MV	Lower adit, 1.5m RC.	
3313958	71520	348984	5356078	Esd	Ius	Di	MtNi?	V	Lower adit, 1.5m RC.	
3313959	71520	348980	5356074	Esd	Ius	Sh		MMLG	Lower adit, 1.5m RC.	
3313960	71520	348976	5356070	Esd	Ius	Di	MtNs	MLVG	Lower adit, 1.5m RC.	
3313961	71520	348972	5356066	Esd	Ius	Di	Mt	LV	Lower adit, 1.5m RC.	
3313962	71520	348968	5356062	Esd	Ius			V	Lower adit, 1.5m RC.	
3313963	71520	348964	5356058	Esd	Ius	WeDi	Mt	V	Lower adit, 1.5m RC.	
3313964	71520	348960	5356054	Esd	Ius	WeDi	Mt	LV	Lower adit, 1.5m RC.	
3313965	71520	349600	5355790	Ets	Ssi	We		WLY		
3313966	71520	349600	5355825	Esd?	Ius?			DEV	SOIL C-hor 0.9m	
3313967	71520	349600	5355850	Esd?	Ius?			DEV	SOIL C-hor 0.9m	
3313968	71520	349600	5355875		Ccy			O	SOIL B-hor 0.9m	
3313969	71520	349600	5355925		Ccy			OB	SOIL B-hor 0.9m	
3313970	71520	349600	5355950	Esd	Ius	We		LVG		
3313971	71520	349600	5356000	Esd	Ius	We		MYVB	SOIL C-hor 0.5m	
3313972	71520	349600	5356025	Esd	Ius	We		MYVB	SOIL C-hor 0.9m	
3313973	71520	349600	5356050	Esd	Ius	We		MYVB	SOIL C-hor 0.5m	
3313974	71520	349600	5356075	Esd	Ius	WeDi	Mt	DV	SOIL C-hor 0.5m	
3313975	71520	349600	5356100	Esd	Ius	We		LV	SOIL C-hor 0.4m	
3313976	71520	349600	5356125	Esd	Ius	We		LV	SOIL C-hor 0.8m	
3313977	71520	349600	5356150	Pou?	Ccy			OB	SOIL B?-hor 0.8m	
3313978	71520	349700	5356100	Pou?	Ccy			OB	SOIL B?-hor 0.7m	
3313979	71520	349700	5356075	Esd	Ius	We		MBV	SOIL C-hor 1.0m	
3313980	71520	349700	5356050	Esd	Ius	We		MBV	SOIL C-hor 0.7m	
3313981	71520	349700	5356025	Esd	Ius	We		MBYV	SOIL C-hor 0.8m	
3313982	71520	349700	5356000	Esd	Ius	We		LGV	SOIL C-hor 0.6m	
3313983	71520	349700	5355950	Esd	Ius	We		LGV	SOIL C-hor 0.6m	
3313984	71520	349700	5355935	Esd	Ius	We		LGV	SOIL C-hor 0.5m	
3313985	71520	349700	5355900	Esd	Ius	We		MGV	SOIL C-hor 0.6m	
3313986	71520	349700	5355875	Esd	Ius	We		MGV	SOIL C-hor 0.6m	
3313987	71520	349700	5355850	Esd	Ius	We		GV	SOIL C-hor 0.8m	
3313988	71520	349700	5355825	Esd?	Ius?	WeDi	Mt	OB	SOIL B-hor 1.0m	
3313989	71520	349700	5355800	Ets?	CcyCs			O	SOIL B?-hor 0.8m	
3313990	71520	349700	5355775	Ets?	Cs			YO	SOIL C?-hor 1.0m	
3313991	71520	348550	5356500	Pou	Mq	Ma		G		
3313992	71520	348575	5356500	Pou	Mq	Ma		G		
3313993	71520	348600	5356500	Esd	Ius	WeDi	Mt	WLV		
3313994	71520	348625	5356500	Esd	Ius	We		LV		
3313995	71520	348675	5356500	Esd	Ius	WeDi	Mt	GB		
3313996	71520	348700	5356500	Esd	Ius	WeDi	Mt	DV		
3313997	71520	348725	5356500	Esd	Ius	WeDi	Mt	GV		
3313998	71520	348750	5356500	Esd	Ius	WeMaVn		LVO	Asbestos veins.	
3313999	71520	348775	5356500	Esd	Ius	We		DGLV		
3314000	71520	348800	5356500	Esd	Ius	WeShVn		WLV	Asbestos and Fe veins.	
3314001	71520	348825	5356500	Esd	Ius	WeDi	Mt	MYGV		
3314002	71520	348850	5356500	Esd	Ius	WeDi	Mt	YV		
3314003	71520	348875	5356500	Esd	Ius	Di	Mt	YV		
3314004	71520	348900	5356500	Esd	Ius	Di	Mt	DGV		
3314005	71520	348925	5356500	Esd	Ius	Di	MtNi	GV	Ni 5% in one piece	
3314006	71520	348950	5356500	Esd?	Ius?	We		MYB		
3314007	71520	348975	5356500	Esd?	Ius?	We		DGN		
3314008	71520	349000	5356500	D	Mh	Ds	MtPy	N	Mt 20%, Py 5%	
3314009	71520	349025	5356500	Pou	Mq	Ma		DG	Garnet qtzite	
3313786	71540	348900	5356300	Esd	Iulus		Mt		MS 15000-20000	
3313787	71540	348900	5356100	Esd	Ius	WeBl				
3313788	71540	348900	5355985	Esd	Ius	We			NiCO3?	
3313789	71540	349300	5356315	Esd	Iu	We				
3313790	71540	349400	5356350	Esd	Ius	Vn			Ovq/Fe/Mn	
3313791	71540	349405	5356110	Esd	Clt				Porous angular fragmented	
3313792	71540	349200	5355955	Esd		Vs				
3313793	71540	349200	5355940	Esd	Iu	We		E		

SAMPNO	DPO	EAST	NORTH	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	COMMENTS	PET
3313794	71540	349110	5356020	Esd	lu		Mt	V		
3313795	71540	349110	5356025	Esd	Ovq	Bx			Chalcedonic	
3313796	71540	349200	5356325	Esd	lus		Mt	V		
3313797	71540	348990	5356210	Esd	lus	Ma	Mt			
3313798	71540	348995	5356215	Esd	lus	AlVn		VE		
3313799	71540	349000	5356100	Esd	lus			V		
3313800	71540	349130	5356290	Esd	lu		Mt		Slight lus	
3528467	71540	349130	5356250	Esd	lulus		Mt			
3528468	71540	349270	5355920	Esd	lus					
3528469	71540	349330	5355850	Esd	lulus	We				
3528479	71540	349400	5355950	Esd	lu	We				
3528480	71540	349000	5356095	Esd	lu			N		
3528481	71540	348990	5356085	Esd	lu					
3528482	71540	349400	5356500	Esd	lu	Sl	PyGa?			
3528485	71541	349250	5356115	Esd	lu	FoWe		LV	Orthoaccumulate	Y
3528486	71541	349170	5356190	Esd	lu	Lm	SuMt	V		Y
3528487	71541	349110	5356150	Esd	lu	Lm	Mt	KV		Y
3528488	71541	348980	5356075	Esd	lu	BdLm		LV	72N/080	Y
3528489	71541	348985	5356070	Esd	lu	Al				Y
3528490	71541	348965	5356055	Esd	lu			KG		Y
3528491	71541	348950	5356160	Esd			Mt	Y		Y
3528492	71541	349020	5356205	Esd	lu		MtSu?	YVR		Y
3528493	71541	349300	5356275	Esd			Mt	LV		Y

TRIAL HARBOUR ROCKCHIP DATABASE.													
All results in ppm except Fe and S (in %).													
SAMPNO	Ag	Au	Co	Cr	Cu	Fe%	Ni	Pb	Pd	Pt	S%	V	Zn
3308076	56	0.3120			1750	40.5		800					1100
3308077	1	-0.0050			15	6.48		82					550
3308078	-1	-0.0050			47	2.21		86					100
3308079	1	-0.0050			8	0.59		22					94
3308080	-1	-0.0050			47	28.4		9					175
3313801			85	190	2	4.34	1750						
3313802			76	255	2	3.59	1700						
3313803			110	245	2	4.88	3650						
3313804			88	435	3	4.62	1600						
3313805			87	265	2	4.89	1500						
3313806			100	260	2	7.16	1750						
3313807			57	295	-2	2.98	1500						
3313808			85	180	3	4.7	1400						
3313809			74	750	2	4.58	2600						
3313810			85	300	-2	3.65	3150						
3313811			73	195	-2	2.46	1950						
3313812			90	205	2	5.41	2000						
3313813			74	340	2	4.84	1650						
3313814		0.0012	175	1150	3	9.51	8500		-0.0005	0.0011	0.005		
3313815		-0.0010	205	1350	4	9.38	8500		-0.0005	0.0016	0.005		
3313816			78	265	2	3.46	2650						
3313817			90	275	3	6.45	2850						
3313818			47	950	4	3.48	430						
3313819			465	6700	4	27.6	2850						
3313820			73	225	2	4.46	3200						
3313821		0.0015	170	1550	7	12.7	5050		-0.0005	0.0008	0.005		
3313822		0.0017	79	460	4	4.02	4700		-0.0005	-0.0005	0.005		
3313823			60	235	2	3.2	3900						
3313824			50	345	2	4.1	1500						
3313825		0.0014	175	6000	4	14.4	4500		-0.0005	0.0025	0.005		
3313826		0.0011	160	1300	2	10.7	4350		-0.0005	0.0010	0.005		
3313827		0.0025	150	1000	9	14.8	4150		-0.0005	0.0022	0.005		
3313828			81	300	2	5.03	2150						
3313829			79	500	-2	10.6	1650						
3313830			80	385	2	3.75	2900						
3313831			210	2250	5	16.1	2950						
3313832			195	4000	6	20.2	3050						
3313833			125	310	4	9.23	1900						
3313834			110	315	2	6.83	2150						
3313835			80	385	-2	3.44	1950						
3313836			94	300	-2	4.71	3550						
3313837			91	310	2	4.79	1950						
3313838			96	470	2	9.82	1800						
3313839			51	1200	2	7.88	405						
3313840			69	295	-2	3.15	2900						
3313841			64	240	-2	3.44	2100						
3313842			62	290	-2	2.63	2700						
3313843			76	300	-2	3.94	2000						
3313844			64	235	-2	3.54	1650						
3313845			58	320	-2	1.93	2250						
3313846			66	750	-2	2.86	2700						
3313847		-0.0010	140	495	-2	3.14	5200		-0.0005	0.0026	0.005		
3313848		-0.0010	140	470	-2	3.63	4800		-0.0005	0.0021	0.005		
3313849			59	330	-2	3.77	1150						
3313850			220	800	-2	13.2	3250						
3313851			105	365	2	5.13	3550						
3313852			105	245	-2	5.17	3150						
3313853			85	205	-2	4.53	2400						
3313854			98	270	-2	3.41	3500						
3313855			85	180	-2	3.86	2550						
3313856			89	210	-2	4.82	2900						
3313857			93	250	-2	4.04	3800						
3313858			90	245	-2	3.03	3750						
3313859		-0.0010	110	180	-2	3.26	4300		-0.0005	0.0020	0.005		
3313860			90	225	-2	3.73	2450						
3313861		0.0021	100	230	2	4.19	7000		-0.0005	-0.0005	0.005		
3313862		-0.0010	115	380	-2	4.5	4350		-0.0005	-0.0005	0.005		
3313863		-0.0010	115	465	-2	4.33	5500		-0.0005	0.0019	0.01		
3313864		-0.0010	190	380	-2	3.71	9900		-0.0005	0.0025	0.01		
3313865			120	260	-2	2.88	3500						
3313866		-0.0010	130	600	-2	3.88	4250		-0.0005	0.0019	0.01		
3313867		0.0015	125	360	-2	3.72	6900		-0.0005	0.0008	0.01		

SAMPNO	Ag	Au	Co	Cr	Cu	Fe%	Ni	Pb	Pd	Pt	S%	V	Zn
3313868			90	190	-2	4.02	3650						
3313869			90	475	-2	4.47	3700						
3313870			74	445	-2	2.44	2050						
3313871		0.0018	220	1350	7	8.93	9900		-0.0005	0.0005	0.025		
3313872			505	7900	4	26	2000						
3313873		0.0013	98	265	-2	2.85	4000		-0.0005	0.0007	0.01		
3313874		0.0024	235	2150	9	9.25	8000		-0.0005	0.0029	0.015		
3313875		0.0068	105	365	-2	3.73	6800		0.0028	0.0006	0.01		
3313876		0.0015	445	2450	6	18.1	9100		-0.0005	0.0095	0.01		
3313877			80	6600	-2	33.3	515						
3313878			150	6100	3	38	750						
3313879			94	3100	2	39.1	950						
3313880			110	6000	3	42.8	1200						
3313881			49	6100	-2	44.9	300						
3313882			56	3800	-2	44	415						
3313883			63	5000	2	47.4	515						
3313884			46	3300	-2	39.5	380						
3313885			71	2800	-2	41.4	545						
3313886			70	4050	-2	39.4	285						
3313887			60	8000	2	35.3	253						
3313888			50	6500	-2	31.4	280						
3313889		-0.0010	97	275	-2	4.11	11000		-0.0005	0.0014	0.01		
3313890			71	385	-2	3.28	1850						
3313891			94	220	-2	5.24	2800						
3313892			98	160	3	4.17	3250						
3313893			31	130	3	2.13	1050						
3313894			99	265	4	5.16	3400						
3313895			91	170	3	4.87	2250						
3313896			115	235	3	8.69	2350						
3313897			140	265	2	19.7	2250						
3313898			93	405	3	9.6	2050						
3313899			700	2600	7	43.5	1250						
3313900			35	850	5	7.61	320						
3313901			24	1200	5	9.67	255						
3313902			14	2950	3	35.5	150						
3313903			39	4050	3	37.1	150						
3313904			86	2450	5	36.2	600						
3313905			49	2800	4	34.5	700						
3313906			55	1950	3	39	405						
3313907			81	3150	3	35.7	550						
3313908			120	2900	3	37.9	550						
3313909			235	3100	3	37.3	800						
3313910			70	3850	3	35.6	530						
3313911			58	1850	3	36.3	440						
3313912			59	1850	2	38.2	535						
3313913			87	415	2	2.74	2800						
3313914			106	310	3	2.86	2650						
3313915			72	650	3	3.59	1850						
3313916		0.0011	275	1400	4	11.8	5400		-0.0005	0.0010	0.01		
3313917			225	3950	5	19.1	2850						
3313918			395	2950	5	26.9	1950						
3313919			25	1750	6	8.74	420						
3313920			-3	550	8	4.12	45						
3313921			115	475	3	4.59	2350						
3313922			96	530	2	4.5	3400						
3313923			34	3300	4	12.6	225						
3313924			24	3000	3	9.19	245						
3313925			17	4500	4	1.67	98						
3313926			69	3250	4	33.7	345						
3313927		0.0021	900	1200	9	17.7	7100		-0.0005	0.0018	0.01		
3313928		0.0010	650	1150	3	10.6	6900		-0.0005	0.0093	0.015		
3313929			400	2900	4	22.8	2850						
3313930			9	1250	3	1.07	94						
3313931			86	320	3	3.44	2650						
3313932		-0.0010	700	1600	7	17.8	7300		-0.0005	0.0063	0.01		
3313933		0.0016	94	235	3	6.19	5200		-0.0005	0.0008	0.01		
3313934		0.0017	270	900	6	9.07	9900		0.0007	0.0025	0.01		
3313935			58	550	2	5.29	2850						
3313936		-0.0010	130	900	4	13.8	5500		-0.0005	0.0008	0.005		
3313937		-0.0010	91	260	2	7.91	4450		-0.0005	0.0005	0.065		
3313938		0.0026	1600	2100	53	16.6	15700		0.0009	0.0052	0.005		
3313939			26	1150	64	6.45	495						
3313940			65	260	2	3.48	1600						
3313941			58	240	2	2.6	1500						
3313942			62	285	-2	2.59	1500						

SAMPNO	Ag	Au	Co	Cr	Cu	Fe%	Ni	Pb	Pd	Pt	S%	V	Zn
3313943			59	230	3	3.35	1450						
3313944			50	170	-2	1.75	1700						
3313945			45	200	-2	1.56	1650						
3313946			73	175	2	3.59	2350						
3313947		0.0169	180	175	17	4.19	7000		-0.0005	-0.0005	0.19		
3313948			135	200	4	4.17	2850						
3313949			53	185	2	5.18	1250						
3313950			105	140	6	3.55	1550						
3313951			78	210	3	5.15	2000						
3313952			80	315	3	3.89	1600						
3313953			70	360	2	5.06	1950						
3313954			56	235	4	5.22	1200						
3313955			62	200	4	4.3	1150						
3313956			62	105	8	3.38	1350						
3313957			57	320	11	2.73	1550						
3313958			74	285	4	4.5	1600						
3313959			84	200	8	5.29	1350						
3313960			70	160	3	4.78	1150						
3313961			90	195	2	4.49	1650						
3313962			54	335	-2	1.16	1800						
3313963			39	360	-2	2.51	1900						
3313964			33	390	-2	3.6	2050						
3313965			3	280	5	0.82	105						
3313966			115	2600	4	14.4	750						
3313967		0.0012	275	1050	6	10.4	4700		-0.0005	0.0020	0.025		
3313968			125	4700	5	41.4	1650						
3313969			80	2000	3	33.1	1050						
3313970			100	220	2	2.64	2750						
3313971		-0.0010	500	1050	-2	11.4	4100		-0.0005	0.0015	0.01		
3313972			155	450	2	12.3	2900						
3313973			400	1900	2	16	3300						
3313974			160	1450	2	8.38	3350						
3313975			250	900	-2	8.88	3750						
3313976		0.0019	225	2050	4	17.8	4650		-0.0005	0.0017	0.005		
3313977			95	6300	23	33.8	1100						
3313978			63	3950	13	29.8	850						
3313979		0.0026	300	2100	10	14.6	4750		0.0006	0.0044	0.01		
3313980		0.0011	180	600	3	13	5150		-0.0005	0.0024	0.01		
3313981		-0.0010	315	1100	5	11.8	5200		-0.0005	0.0031	0.01		
3313982		-0.0010	170	480	2	4.93	7700		-0.0005	0.0030	0.01		
3313983			510	6300	5	24.2	3550						
3313984		-0.0010	215	2250	5	11.4	7300		-0.0005	0.0014	0.015		
3313985			350	1600	4	7.89	3900						
3313986		-0.0010	425	1400	2	11.1	4850		-0.0005	0.0018	0.005		
3313987		-0.0010	1550	2600	7	12.8	5150		-0.0005	0.0035	0.03		
3313988			58	4500	5	12.9	1350						
3313989			6	750	5	3.46	105						
3313990			3	165	5	1.03	16						
3313991			23	50	82	2.3	63						
3313992			17	55	8	1.79	145						
3313993			15	700	2	2.22	270						
3313994			87	365	2	3.76	2050						
3313995		-0.0010	115	550	4	9.97	5000		-0.0005	0.0007	0.005		
3313996			155	900	3	12.9	3150						
3313997			80	360	6	8.64	1450						
3313998			90	185	2	4.92	1900						
3313999			80	195	2	4.88	2300						
3314000		-0.0010	130	460	3	6.49	5400		-0.0005	-0.0005	-0.005		
3314001			81	310	3	4.91	2100						
3314002			100	260	3	7.7	1600						
3314003			97	210	2	6.33	2650						
3314004			99	200	2	5.43	2100						
3314005			115	540	4	5.14	2250						
3314006			125	2250	31	27.9	950						
3314007			185	1400	8	33.4	2000						
3314008			42	220	13	34.1	535						
3314009			23	135	7	4.1	240						
3313786	-1		88	326	2		1083	16				10	198
3313787	-1		50	560	-2		2368	13				9	117
3313788	-1		176	505	-2		4703	23				10	329
3313789	-1		111	993	2		2279	12				5	219
3313790	-1		96	895	2		1937	5				13	229
3313791	-1		98	9852	2		379	16				74	445
3313792	-1		99	12700	-2		2540	3				53	509
3313793	-1		81	795	2		3081	11				5	151

SAMPNO	Ag	Au	Co	Cr	Cu	Fe%	Ni	Pb	Pd	Pt	S%	V	Zn
3313794	-1		82	500	2		1524	3				7	191
3313795	-1		57	583	2		1140	6				-5	139
3313796	-1		91	855	8		1801	12				-5	196
3313797	-1		87	997	2		1203	17				18	345
3313798	-1		73	916	2		981	18				31	232
3313799	-1		78	446	2		1808	10				7	194
3313800	-1		90	592	2		1461	-3				16	156
3528467	-1		18	690	6		247	22				-5	119
3528468	-1	-1.0000	60	749	3		12600	21	0.0012	0.0016	0.02	6	215
3528469	-1	0.0031	110	530	6		6400	66	-0.0005	-0.0005	0.025	6	233
3528479	-1		119	968	-2		3115	11				11	114
3528480	-1		63	650	3		1487	5				6	186
3528481	-1		64	573	2		1504	7				6	216
3528482	-1		39	717	8		1086	2799				7	656
3528485													
3528486													
3528487													
3528488													
3528489													
3528490													
3528491													
3528492													
3528493													

APPENDIX 8:

TRIAL HARBOUR. MEMO FROM HJ SHAW TO RG PARKINSON.

APPENDIX 8

957216

MEMO TO: R G PARKINSON
FROM H J SHAW

9/3/93

TRIAL HARBOUR

Grid mapping at 1:2500 scale of the mafic to ultramafic rocks at Trial Harbour delineated three broad rock types trending east-west and probably dipping steeply to moderately to the south. These units are:

- a "magnetite layered" unit occurring mostly in the north of the area, this rock is typically very magnetic and composed of fine-grained ?olivine and stringers of magnetite (plus other magnetic oxides/sulphides?) aligned along one plane interpreted to represent primary igneous layering. This plane dipped on average at 60-70°S/280°. There is a small adit on the northern side of the ridge made up of the layered unit, the adit only goes into the hill for a few metres.
- a "sandy" unit occurring mostly in the south is the dominant rock type mapped. The rock generally consists of fine-grained ?olivine and magnetite(plus other magnetic oxides/sulphides?) with a sandy texture and more pore-space than the layered unit. The sandy unit is internally variable from magnetite-rich to magnetite-poor, and varies in colour from blue to olive-green to green to yellow. These differences were distinctive but not traceable along strike. Igneous layering was not readily discernible within this unit. The two main adits of the old workings were dug into this unit and samples from the end of the lower adit consisted of a very fine-grained black rock, the relationship of this to the surficial material is not certain.
- several lenses of a "fibrous" serpentinite, this mostly cropped out as a siliceous boxwork laterite but also occurred as fibrous to massive serpentinite. These lenses were aligned towards 280-300° and generally only one to two metres thick.

Cleavage and joint readings were taken and are tabulated below along with vein measurements including the type of vein, and sample number and type. Grid references are given in the table. Note: there are a couple of corrections to the map, see attached.

Trial Harbour sample locations and structural data

AMG E	AMG N	Sample No.	MS	Cleavage*		Jointing*		Igneous		Veining*#		Comments	
			(SIx10-5)	dip	strike	dip	strike	Layering*		dip	strike		
348896	5356300	3313786	17500									?mt layered	
348900	5356230		1500	50 S	094								
348900	5356215		10500							c-15 E	160		
										q-85 W	055		
										70 S	345		
348900	5356090	3313787	500									?sandy	
348900	5355985	3313788	6000									?Ni carbonate	
349300	5356280			80 N	265								
349300	5356316	3313789	5000	30 S	085							?sandy	
349395	5356350	3313790										?sandy	
349400	5356300							S	280				
349405	5356110	3313791	4500							c-80 N	270	laterite	
349200	5356100		3500	70 S	254								
349200	5355958	3313792	80000 (maf.-3500)									?2° py vein (ox)	
349200	5355940	3313793	3500	90	268							bluish maf.	
349200	5355915			90	270								
349200	5355900			20 E	230								
349108	5355982	3313794	17500			80 E	212	85 S	090			mt layered	
349112	5355983	3313795				20 W	140					q.c.breccia	
349200	5356100			75 S	300	80 N	012						
349200	5356150		2500			85 W	138						
						85 S	075						
349200	5356275		3500	75 N	075	80 S	180						
349190	5356325	3313796	7500									green granular	
349100	5356250		50000										
349100	5356255			85 S	094					c-80 S	074		
349100	5356080			80 N	279								
349100	5356150									c-20 S	290		
349100	5356170									c-25 N	290		

349100	5356200		20000							c.b-90	030		
										c-65 S	255		
349075	5356205							65 S	104				
348987	5356213	3313797	25000					85 SW	115			mt-rich rock	
348990	5356215	3313798										veined u/maf	
348994	5356100	3313799	4500	80 S	090							green granular	
				20 SW	320								
349130	5356250	3313800										mt layered	
349130	5356232	3528467										green, milky, fibrous serp	
349270	5355920	3258468										serp	
349330	5355850	3528469		30 S	086	85 S	090					granular, wthd	
349400	5355950	3528479										wthd granular	
349268	5355965							40 S	295				
349250	5356115	3528485										sandy olive	
349170	5356190	3528486						72 N	080			mt layered	
348980	5356075	3528488										pale green sandy	
349110	5356150	3528487										sandy pink-green	
348985	5356070	3528489										altd., large ?ol grains	
348968	5356058	3528490										adit, pink-grey f.g.	
348950	5356160	3528491										yellow sandy, mt stringers	
349020	5356205	3528492										yellow-green, mt, sandy	
349300	5356275	3528493										pale green sandy	
* all readings are in degrees mag.													
# c-chalcedonic quartz; q-open-space quartz; b-brecciated													

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APPENDIX 9:

TRIAL HARBOUR DIAMOND DRILL LOGS AND GEOCHEMISTRY.

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

TRIAL HARBOUR

SHEET No. 1 of 4

TENEMENT NAME ZEEHAN 1 No. EL 28/88

PLAN – MAP REFERENCE TRIAL 1:25000

CO-ORDINATES 349010E 5356108N AZIMUTH 210° AMG DRILLERS N. POLTOCK COMMENCED 26/4/93 DEPTH 54.95 HOLE No. DD93ZT1

RL COLLAR 49m ASL INCLINATION -53° DRILL TYPE WINKIE COMPLETED 29/4/93 CASING LEFT DPO No(s) 71548

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) MAG SUS	Ni %
0	0.75	–			NO RECOVERY - Non coring							
0.75	9.00	7.8	NQ		WEATHERED ULTRAMAFIC. Mottled yellow green. Probably partly serpentinised dunite. Several soft clay zones, deep weathering along fractures. Numerous irregular fractures with serpentinous selvages, probably weathering? No visible sulphides or magnetite		3753501	0.75	4.25	3.05	0	.45
							502	4.25	9.00	4.75	0	.28
9.00	17.8	8.85	NQ		PARTLY WEATHERED ULTRAMAFIC Light green serpentine weathered ultramafic with some zones of dark blueish grey fresh ultramafic. Dunite?. (Adcumulate?) Fresh u/m is massive and ?fine grained. Weathered u/m contains numerous fractures filled by either calcite or a red-brown earthy mineral, maybe weathered sulphide? Serpentine selvages common. One 10mm wide vein of colourless radiating acicular crystals at 0° to C.A. 10.6m Vcc 45° to C.A. 11.1m Vcc 45° 17.5m S_1 45°		503	9.00	13.65	4.75	0.8	.19
							504	13.65	17.8	4.1	0.8	.15
17.8	19.8	2.05	NQ		MASSIVE ULTRAMAFIC Blue-grey ?fine grained rock. 1% of 1-3mm calcite veins. Minor pervasive calcite alteration or weathering. Rare mt disseminations <0.5%. Gradational contact at 19.8m. Adcumulate?		505	17.8	19.8	2.05	0.4	.26
							3530281	PET	19.6			

DRILL RUNS

From	To	Rec	RQ
0	0.75	–	–
	1.4	0.7	3F
	2.65	0.85	4X
	3.25	0.55	5X
	4.25	0.95	2F
	5.65	1.45	2F
	6.8	1.2	4F
	8.0	1.2	3F
	9.6	1.5	3F
	11.0	1.5	3V
	12.25	1.25	3V
	13.65	1.5	3V
	15.15	1.5	3F
	16.7	1.55	3F
	19.45	2.8	2V

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. 2T1

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) MAG SUS	Ni%	DRILL RUNS FR	TO	REC	RQ	
19·8	21·5	1·7	NQ BQ 21m		MASSIVE ULTRAMAFIC WITH DISSEMINATED MAGNETITE		3753506	19·8	21·5	1·7	7	·14	19·45	21	1·45	1F	REDUCE TO BQ AT 21m
					As for 17·8–19·8 but with 5% magnetite as 1-3mm blebby aggregates. Traces of pale brassy sulphides intergrown with mt. Probably <0·5% of interval.									22	1·05	1F	
														24·9	2·6	1F	
					Gradational contact at [redacted] 21·5m. Adcum?									27·15	2·3	1F	
														30·1	2·8	2F	
21·5	22·6	1·1	BQ		MAGNETITE LAYERED ULTRAMAFIC		507	21·5	22·6	1·1	12	·14					
					Banded light green at metallic bluegrey. Light green serpentinised u/m with 10–20% of 1–5mm wisps and bands of mt. Minor brassy sulphides within the mt bands, <0·5% of interval, but difficult to see in dull light. Mesocum?		3530282	PET	21·8								
					mt bands primary layering or tectonic?												
					mt band 30° to C.A.												
22·6	29·6	6·6	BQ		MIXED SERPENTINISED + MASSIVE ULTRAMAFIC.		508	22·6	26·2	3·3	0·7	·18					
					Interval grades in and out of light green serpentinised u/m to massive blue grey u/m.		509	26·2	29·6	3·3	0·8	·17					
					Serpentinised intervals are strongly fractured with 5% of 1–3mm calcite veins. Blue grey u/m zones are more competent + not veined.												
					Minor dissem mt, ~1% mainly in serpentinised zones. Traces of sulphide in mt but probably <0·1% overall.												
					Increase in mag sus (⇒ mt?) toward 29·6m. Adcumulate?												

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 3 of 4

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZT1

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) DRILL RUNS MAG SUS	N:1.		FR	TO	REC	RQD
29·6	35·4	5·95	BQ		MASSIVE ULTRAMAFIC WITH DISSEMINATED MAGNETITE		3753510	29·6	30·5	1·1	3·5	·18		30·1	31·15	1·05	3F
					AND SULPHIDES		511		31·5	1·0	3·5	·14			34·15	2·7	1F
					Dark blue grey ?fine grained u/m with minor		512		32·5	0·95	5	·13			34·6	0·5	1F
					light green zones of serpentinised u/m.		513		33·5	0·95	4·5	·13			35·5	1·0	1F
					5% Mt and sulphide as 0·5 – 5mm wisps and		514		34·5	0·95	6	·12			38·45	3·05	1F
					blebby aggregates. Generally no preferred alignment.		515		35·4	1·0	5	·12			40·75	2·1	1F
					Sulphide appears to be pyrrhotite dominant.										41·65	0·9	1F
					Actual sulphide % unable to be determined because		3530283	PET	31·75								
					of the fine intergrowth with Mt. Adcumulate?												
					32·5m Mt layering 45° – c.A.												
35·4	36·0	0·6	BQ		MATRIX SULPHIDE ZONE.		516	35·4	36·0	0·6	20	·13					
					Mottled white, light green + metallic red-brown.												
					Complex and irregular intergrowth of coarse grained		3530284	PET	35·5								
					(5–10mm) serpentinised olivine, talc + carbonate, and												
					sulphide. Orthocumulate?												
					20% sulphide blebs, dominantly Po.												
36·0	39·7	3·65	BQ		MASSIVE ULTRAMAFIC		517	36·0	39·7	3·66	1·5	·18					
					Massive fine grained blue grey u/m. Mt + sulphides												
					rare to absent, <0·1% of interval. Adcumulate?												
					Sharp but irregular contacts at 36 and 39·7m.												
					39·7m layering ~55° – c.A.												
39·7	42·15	2·35	BQ		MATRIX SULPHIDE ZONE		518	39·7	40·75	1·0	2	·14					
					Mottled white – light green – metallic red-brown. Irregular		519	40·75	41·65	0·9	1	·13					
					intergrowths of of 5–10mm serpentinised olivine, talc-carbonates		520	41·65	42·15	0·45	7	·12					
					and sulphides. 20% sulphide, dominantly po as		3530285	PET	41·95								
					2–10mm irregular blebby aggregates.												
					Narrow orthocumulate ol zone 40·75 – 41·65m.												

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 4 of 4

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZT1

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by DRILL RUNS) MAG SUS	N: 1	FR	To	Rec	Rec
42.15	43.15	1.0	BQ		MASSIVE ULTRAMAFIC As for 36 – 39.7m		3753521	42.15	43.15	1.0	1	.16	41.65	44.46	2.9	2F
														46.68	2.2	1F
														49.55	2.35	1F
43.15	45.3	2.3	BQ		OLIVINE ORTHOCUMULATE? (OLIVINE-TREMOLITE ROCK?) Spotted light and dark green. clay altered/weathered 1-2mm ol grains in serpentinite clay matrix (tremolite?) No visible sulphides or mt.		522	43.15	45.3	2.3	1	.19		52.0	2.95	1F
														54.95	2.9	1F
45.3	50.5	5.15	BQ		MASSIVE ULTRAMAFIC Massive blue-grey fine-med grained ultramafic. Minor fine dissems of pale brassy sulphides, <0.5% of core volume. Minor blebby po, 1-2% of core vol, but decreasing to absent below 49m. Adcum? 10cm zones with 20% po at 47.6 + 48.4m.		523	45.3	47.9	2.6	3	.15				
							524	47.9	50.5	2.55	2.5	.13				
50.5	52.95	2.4	BQ		MASSIVE ULTRAMAFIC Massive blue-grey fine grained ultramafic. Minor fine dissems of pale brassy sulphides + mt, ~0.1% of core vol. Adcumulate?		525	50.5	52.95	2.4	2	.15				
52.95	54.95	2.0	BQ		TALC-MOTTLED ULTRAMAFIC Mottled white and blue grey medium grainsize ultramafic. Irregular patches of white talc with intergrowths of coarse mt + po. Minor fine pale brassy sulphides throughout. Mt + sulphide approx 5% of core vol. Mesocumulate? END OF HOLE 54.95m.		526	52.95	54.95	2.0	5	.16				
							353028	PET	53.2m							

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

TRIAL HARBOUR

SHEET No. 1 of 3

TENEMENT NAME ZEEHAN 1 No. EL 28/88

PLAN – MAP REFERENCE TRIAL

CO-ORDINATES 349000E 5356098N AZIMUTH 357° AMG DRILLERS N. POLTOCK COMMENCED 30/4/93 DEPTH 50.65m HOLE No. DD93 ZT2

RL COLLAR 42m ASL INCLINATION -52° DRILL TYPE WINKIE COMPLETED 4/5/93 CASING LEFT NIL DPO No(s) 71549

DEPTH From M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) MAG SUS	Ni%
0	1.25	–	–		PRECOLLAR – NO RECOVERY							
1.25	6.95	5.25	NQ		WEATHERED ULTRAMAFIC Mottled light yellow-green-orange serpentinised u/m. Numerous weathering fractures, probably following regional cleavage with massive serpentine selvages, occasionally w.th Fe oxide +/or carbonate infilling. No visible mineralisation 1.95 S_1 : 65° – C.A. 2.7 S_1 : 65° 4.9 V_{caleav}: 45° 6.1 S_1 : 50°		3753527	1.25	4.00	2.5	1.5	.22
							528	4.00	6.95	2.75	1.5	.18
6.95	8.2	1.25	NQ		WEATHERED ULTRAMAFIC WITH DISSEM SULPHIDES Mottled light yellow-green-brown serpentine weathered u/m. ~10% of 5-10 mm aggregates of a red-brown mineral probably weathered po. Cuspate to irregular blebby form. No preferred alignment Moderately fractured due to weathering of cleavage, Fe oxide – carbonate fracture fill.		529	6.95	8.2	1.25	0.5	.13
8.2	9.95	1.75	NQ		WEATHERED ULTRAMAFIC WITH MINOR DISSEM SULPHIDES As for 6.95-8.2m but with 2-5% Fe oxides after po.		530	8.2	9.95	1.75	1	.14
9.95	10.7	0.7	NQ		COARSE GRAINED TALC-SERPENTINE ROCK. Mottled blue-grey and yellow-green coarse grained? talc-serpentine rock. 10% of dark grey-brown 5-10mm irregular patches, possibly after po?		531	9.95	10.7	0.7	4	.14

DRILL RUNS

From	To	Rec	RQ
0	1.25	–	–
	1.95	0.7	3C
	2.8	0.7	4C
	3.7	0.8	4C
	3.8	0.1	5X
	5.25	1.45	3C
	6.85	1.4	3C
	8.2	1.35	2F
	9.6	1.45	3F
	11.15	1.4	3F

[redacted]

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

TENEMENT NAME..... No. .....
PLAN – MAP REFERENCE.....
CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. ZT2
RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....) MAG SUS	Ni %	DRILL RUNS From	To	Rec	RQ
10·7	17·7	6·95	NQ		WEATHERED ULTRAMAFIC		3753532	10·7	14·1	3·4	2	·16	11·15	12·55	1·5	4C
					Mottled light yellow-green serpentine weathered u/m.		533	14·1	17·7	3·55	2	·17		14·1	1·5	2C
					Numerous weathering fractures following regional cleavage?									15·5	1·3	3F
					with ~~3~~ massive serpentine selvages and Fe ox +/or									17·05	1·45	3F
					carbonate infill.									17·85	0·9	3F
					Generally no visible mt or sulphides except 10%									19·4	1·5	1F
					weathered po at 17·6-17·7m.									20·8	1·35	2F
														22·0	1·2	2F
17·7	19·8	2·0	NQ		MASSIVE ULTRAMAFIC		534	17·7	19·8	2·0	1	·16	REDUCED TO BQ			22m
					Fresh blue-grey massive fine grained u/m. Minor								22·0	22·75	0·55	3F
					1-3mm calcite veins, <2% of interval. Irregular									23·3	0·5	3F
					patches of very light blue alteration, rarely with									24·15	–	BQ
					dissem heazlewoodite.	~0·2% sulphides.								25·55	1·1	3F
														25·9	0·46	3F
19·8	21·05	1·2	NQ		WEATHERED ULTRAMAFIC		535	19·8	21·05	1·2	1	·14				
					Light green serpentine weathered u/m. Strongly											
					fractured with calcite - Fe oxides along fractures											
					- near surface weathering effects.											
					Rare dissem mt, ~0·2% of interval											
21·05	26·25	3·8	NQ BQ		MASSIVE ULTRAMAFIC WITH DISSEMINATED SULPHIDES		536	21·05	22·0	0·95	2	·16				
					Massive fine to medium grained dark blue-grey		537	22·0	23·3	1·05	2	·16				
					u/m. Irregular patches of pervasive light blue alteration.		538	24·15	25·2	0·75	5	·14				
					Fine dissems and small aggregates of pale brassy		539	25·2	26·25	1·05	5	·15				
					sulphides - heazlewoodite? Sulphides concentrated											
					in zones of light blue alteration. 1-2% sulphide		3530281	PET	25·15							
					to ~24·5m then 2-5% sulphide to 26·25m.											
					Sharp contact at 26·25m defined by grainsize											
					difference. Contact at 30° - C.A.											
					ADIT INTERSECTED 1m FROM END BETWEEN 23·3 - 24·15m.											
					REDUCED TO BQ at 22m.											

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 3 of 3

TENEMENT NAME..... No. .....

PLAN – MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. ZT2

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....) MAG SUS	Ni%	DRILL RUNS From	To	REC	RQD
26.25	31.9	5.15	BQ		MASSIVE ULTRAMAFIC		3753540	26.25	31.9	5.15	0.5	.19	25.9	29.0	2.45	2F
					Massive fine grained dark blue grey u/m. Absent								28.65	31.7	2.85	2F
					to rare dissem sulphides, heazlewoodite? <0.1%									34.3	2.4	4X
					of interval.									37.25	2.6	3F
														39.85	2.5	2F
31.9	48.3	15.65	BQ		FEATHERY TREMOLITE-OLIVINE ULTRAMAFIC		541	31.9	36.0	3.9	0.3	.19		41.85	2.0	2F
					Variable colour from dark blue-grey with		542	36.0	40.0	3.95	0.8	.18		44.9	2.80	1F
					light green patches, locally mottled. Medium		543	40.0	44.0	3.85	2	.21		47.9	2.8	2V
					to coarse grained ol, 1-3mm grains, with interstitial		544	44.0	48.3	3.95	1	.21		50.65	2.65	1F
					white to very light green patchy to feathery											
					(radiating, bladed) mineral - possibly tremolite?		3530288	PET	32.3		layered ol-trem, bladed trem					
					Some zones up to 50% tremolite give spotted		289	PET	34.0		coarse ol adcum?					
					appearance. Feathery where tremolite 5-20%.		290	PET	34.55		spotted trem ol orthocum?					
					Primary? layering visible in several sections,											
					defined by preferred alignment of tremolite											
					feathers and olivine grains.											
					32.35 layering	45° - C.A.										
					33.0 "	40°										
					Sharp contact between tremolite-rich + tremolite-											
					poor u/m at 34.6m.											
					34.6m contact	35° - C.A.										
					Sulphides + mt rare to absent <0.1% of interval.											CORE
					Core soft throughout. Puggy with green serpentine											LOSS
					veins between 33.5-34.0 and 47.3-48.0m.											
48.3	50.65	2.3	BQ		MASSIVE ULTRAMAFIC		545	48.3	50.65	2.3	3	.22				
					Massive fine to medium grained blue-grey u/m.											
					Minor dissem heazlewoodite, ~1% between											
					48.3-48.8m, but decreasing to 0.2% at 50.65m											
					END OF HOLE	50.65m.										

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

TRIAL HARBOUR

SHEET No. 1 of 3

TENEMENT NAME ZEEHAN 1 No. EL 28/88

349150E

CO-ORDINATES 5356150N AZIMUTH – DRILLERS N. POLTOCK COMMENCED 4/5/93

PLAN – MAP REFERENCE TRIAL

DEPTH 66.15m HOLE No. DD93 ZT 3

RL COLLAR ~59m ASL INCLINATION -90° DRILL TYPE WINKIE COMPLETED

CASING LEFT NIL DPO No(s) 71549/7110

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) MAG SUS	Ni%
0	3.95	–			PRECOLLAR – NO CORE							
3.95	11.7	5.2	NQ2		STRONGLY WEATHERED ULTRAMAFIC WITH DISSEMINATED MAGNETITE. Mottled green, yellow + black, strongly weathered u/m. Abundant dissem mt as individual grains and large aggregates, 10-20% of core vol. Core very strongly fractured + broken due to weathering. Numerous irregular Fe oxide-filled fractures. Minor zaratite at 8.55 in broken core.		3153546	3.95	7.8	2.55	15	
							547	7.8	11.7	2.65	10	
11.7	24.0	9.8	NQ2 BQ		WEATHERED ULTRAMAFIC WITH DISSEM MAGNETITE. Dark green. Essentially as for 3.95–11.7m but less weathered + not as broken. 10-20% mt as fine dissems, blebby aggregates + bands, increasing to 20-30% between 14–23.5m. Mt bands may represent primary layering? Rare sulphides or zaratite intergrown with mt, usually weathered to red-brown Fe oxides.		548	11.7	14.4	2.55	15	.44
							549	14.4	16.7	2.25	10	.30
							550	16.7	18.95	2.05	10	.28
							551	18.95	22.0	0.95	10	
							552	22.0	24.0	2.0	20	.27
					12.3m Mt layering 40° – C.A.		3930291	PET	13.4			
					15.35 " " 35° – C.A.		292	PET	15.3			
					REDUCE TO BQ AT 14.4m.							
					15.9 Mt layering 40° – C.A.							
					16.5 " " 40							
					16.9 " " 45							
					22.75 " " 45°							

DRILL RUNS

From	To	Rec	Rq
0	3.95	–	–
	5.75	1.25	5x
	6.75	0.85	5x
	7.8	0.45	5x
	8.55	0.25	5x
	9.85	0.85	5x
	11.0	0.95	3F
	11.7	0.6	4F
	12.85	1.1	3F
	13.1	0.15	3F
	14.4	1.3	3F
REDUCE TO BQ 14.4m			
	15.7	1.35	3F
	18.95	2.95	2F
	21.1	0.5	5x
	21.5	0.25	5x

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

TENEMENT NAME..... No. .....

PLAN – MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. ZT3

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....) MAG SUS	Ni %	DRILL RUNS From	To	Rec	Rqd
24·0	32·2	8·3	BQ		OLIVINE ULTRAMAFIC WITH BANDED MAGNETITE + ?SULPHIDES		3753553	24·0	26·0	1·95	10	·20	21·5	24·45	2·65	3F
					Green olivine-magnetite ultramafic. Med g/s		554	26·0	28·0	1·90	7	·18		26·9	2·35	3F
					1-2mm olivine grains, orthocumulate texture?		555	28·0	30·0	2·0	12	·15		29·3	2·3	2F
					15% mt as thin bands + irregular wisps. Bands		556	30·0	32·2	2·45	12	16		32·1	3·1	2F
					define primary layering? Some mt bands contain									35·0	2·9	2F
					sulphides, although the amount is not able to be									37·9	2·7	3F
					estimated as both have a fine grained, silvery									40·75	2·95	3F
					habit. Possibly a large bleb of heazlewoodite at									42·80	2·25	3F
					27·3m?									45·85	2·9	3F
					Gradational contact with weathered u/m above.									48·75	2·95	3F
					29·0m mt Layering 50°-C.A.									51·8	2·8	2F
					Sharp contact at 32·2m 45°-C.A.									54·5	2·9	1F
32·2	49·3	~~17·1~~	BQ		CARBONATE ALTERATION ZONE.		557	32·2	37·0	4·7	0·5	·06				
					Mottled white + green. Strong to totally carbonate		558	37·0	41·0	4·1	0·5	·08				
					altered ultramafic? 1-5% d.s.sem mt preserved throughout		559	41·0	45·0	4·0	0·5	·09				
					Numerous fractures at low A to C.A. filled with brown		560	45·0	49·3	4·3	7	·21				
					chalcedony-infilling cleavage?											
					Minor unaltered zones of ol-mt orthocumulate at		3530293	PET	40·7							
					34·2-34·6m, 41·3-42·0m, + 45·0-46·85m.											
					No primary textures preserved in carbonate rock.											
49·3	52·8	3·3	BQ		MAGNETITE-OLIVINE ROCK		561	49·3	51·0	1·6	40	·17				
					Dark green to black. Large massive mt aggregates,		562	51·0	52·8	1·7	40	·13				
					40-60% of interval with narrow zones of 1mm grainsize												
					ol orthocumulate. No obvious layering. Some		3530294	PET	52·0							
					broken zones contain vermiculite? mica?											
					Sharp contact at 49·3m, gradational at 52·8m.											

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 3 of 3

TENEMENT NAME..... No. .....

PLAN – MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. ZT3

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....) MAG SUS	Ni %				DRILL RUNS From	To	Rec	Rec
52·8	56·0	3·45	BQ		OLIVINE-MAGNETITE ULTRAMAFIC Dark green massive ol-mt orthocumulate. 0·5-1mm ol grains with 10-20% interstitial mt as single grains & coarse aggregates. Gradational contacts marked by diminishing mt at 52·8 - 56m.		3753563	52·8	56·0	3·45	15	·12				51·8	54·5	2·9	1F
																	57·4	2·95	1F
																	60·4	2·9	1F
																	62·4	1·9	4X
																	65·45	2·85	3X
																	66·15	0·65	4F
56·0	60·25	4·2	BQ		OLIVINE ULTRAMAFIC WITH WISPY MAGNETITE Green Ol mesocumulate? 5% mt, mostly as very fine wisps, & some irregular aggregates.		564	56·0	60·25	4·2	7	·17							
60·25	63·0	2·6	BQ		TALC ALTERATION AND BRECCIA ZONE Ol-mt u/m (as for 63-66·15m) with wide zones of puggy talc-rich breccia. Dark green, but light green in broken & altered zones.		565	60·25	63·0	2·6	7	·16							
63·0	66·15 EOH	2·95	BQ		OLIVINE-MAGNETITE ULTRAMAFIC. Mottled dark green & black. 0·5-1mm ol grains with 10% coarse mt aggregates commonly 3-10mm wide. (Ortho-meso cumulate?) END OF HOLE 66·15m.		566	63·0	66·15 EOH	2·95	10	·22							

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 1 of 2

TENEMENT NAME ZEEHAN 1 No. E 28/88

PLAN – MAP REFERENCE TRIAL

CO-ORDINATES 349160E 5356200N AZIMUTH – DRILLERS N. POLTOCK COMMENCED 1/5/93 DEPTH 63.5m HOLE No. DD93ZT4

RL COLLAR ~65m ASL INCLINATION -90° DRILL TYPE COMPLETED 1/5/93 CASING LEFT NIL DPO No(s) 77102

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) MAG 305	Ni%	DRILL RUNS From	To	REC	RCG
0	0.5	–			PRECOLLAR – NO CORE								0	0.5	–	
													0.5	1.2	0.7	4F
0.5	9.95	9.3	NQ		WEATHERED OLIVINE – MAGNETITE ULTRAMAFIC		3753567	0.5	5.0	4.45	5	.20		2.65	1.45	4F
					Green. Tight packed 0.5–1mm ol grains with 5% mt as single grains, irregular thin bands. (mesocumulate?). Quite strongly fractured due to weathering.		568	5.0	9.95	4.85	7	.15		3.75	1.1	4F
														5.25	1.45	4F
														6.75	1.45	4F
														8.3	1.45	4x
														9.75	1.55	5x
9.95	15.0	5.0	NQ		WEATHERED OLIVINE ULTRAMAFIC		569	9.95	15.0	5.0	7	.15		10.75	0.8	3F
					Dark green. Quite massive, individual grains hard to distinguish. 5% mt as single grains, irregular bands and minor aggregates. Adcumulate?									11.9	1.4	3F
														13.45	1.45	4F
														14.95	1.45	4F
														16.35	1.5	3F
15.0	18.4	3.55	NQ		MASSIVE OLIVINE ULTRAMAFIC WITH CARBONATE VEINLETS		570	15.0	18.4	3.55	7	.13		17.8	1.5	2F
					Dark blue-grey. Fresh massive ol u/m, fine grained? Unable to distinguish individual grains. Approx 5% very fine disseminated magnetite dusted throughout. Adcumulate?									19.15	1.35	3F
							3530295	PET	16.8					20.65	1.5	1F
														22.3	1.4	1F
													REDUCED TO BQ 22.3			
					2% calcite as 0.5mm wide impersistent tension-fractures. Constantly oriented at 65° – C.A.								22.3	25.1	2.9	2F
														28.0	2.75	1F
					Orange-brown weathering selvages 10–100mm wide around fractures.									30.7	2.8	1F
														33.4	2.85	1F
18.4	32.0	13.5	NQ BQ		MASSIVE OLIVINE ULTRAMAFIC		571	18.4	22.3	3.65	10	.15				
					Dark green to black. Massive ol u/m with ~5% mt as very fine dustings throughout. Similar to 15–18.4m but without CO_2 gashes. ⇒ Adcumulate?		572	22.3	27.0	4.65	20	.14				
							573	27.0	32.0	5.2	5	.16				
					Lighter green sections (e.g. 22.3–24.5m) are coarser ol with wispy mt aggregates ⇒ mesocumulate?											
					Coarse mt aggregates at 18.65, 20.65, 28.0m.											
					REDUCED TO BQ 22.3m.											

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 2 of 2

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH 63.5m HOLE No. ZT4

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) MAG SUS	Ni%	DRILL RUNS FROM	TO	REC	RQD
32.0	35.85	3.8	BQ		MASSIVE ULTRAMAFIC?		3153514	32.0	35.85	3.8	3	.15	33.4	36.3	2.8	1F
					Black massive weakly magnetic rock. Very fine grainsize? Unable to determine mineralogy.									39.3	2.95	1F
							3530296	PET	33.4					42.2	2.9	3x
					Rapid gradational contacts over 50mm at 32 & 35.85m.									45.15	2.7	4x
														46.2	0.9	5x
														48.5	2.2	3x
35.85	44.2	8.1	BQ		MASSIVE SERPENTINISED ULTRAMAFIC.		575	35.85	40.0	4.1	2	.20		51.4	2.9	3F
					Green to light green. Smooth, even textured massive u/m, probably serpentinised. Rare mt, ~0.5%, as 1-2mm lath-like grains.		576	40.0	44.2	4.0	2	.22		54.05	2.7	3F
														56.95	2.9	1F
							3530297	PET	41.0					59.2	2.35	1F
					Core increasingly broken toward 44.2m with tale-filled fractures.									62.05	2.85	1F
														63.5	1.45	1F
44.2	49.15	4.65	BQ		SERPENTINE-TALC (BRECCIA) ZONE		577	44.2	49.15	4.65	4	.18				
					Light green. Strongly broken zone of serpentine ± tale altered ol u/m.											
							3530298	PET	48.3							
					Between 48-48.5m is a serpentine breccia - Milled rock fragments in serpentinous matrix (PET).											
					1% disssem mt as irregular clots.											
49.15	63.5	14.5	BQ		MASSIVE ULTRAMAFIC.		578	49.15	54.0	4.9	2	.18				
	EOH				Dark green. Massive ol u/m with small irregular		579	54.0	59.0	5.1	1.5	.18				
					clots or feathers of light green serpentine, probably after tremolite?		580	59.0	63.5	4.5	1.5	.18				
					Rare mt, <0.1%, as fine single grains.											
					END OF HOLE 63.5m											

SHEET No. 1 of 1

957232

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

TRIAL HARBOUR.

TENEMENT NAME ZEEHAN 1 No. EL 28/88

PLAN – MAP REFERENCE TRIAL

CO-ORDINATES 349293 E 5956275 N AZIMUTH – DRILLERS N. POLTOCK COMMENCED 15/93

DEPTH 66.65m HOLE No. DD93ZT5

RL COLLAR ~58m ASL INCLINATION -90° DRILL TYPE COMPLETED 20/5/93

CASING LEFT – DPO No(s) 77104

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....) MAG SUS	Ni%
0	1.5	–	–		PRECOLLAR – NO RECOVERY							
1.5	15.7	13.66	NQ		WEATHERED MASSIVE OLIVINE ULTRAMAFIC. Green. Massive even-textured ol u/m. 0.1-0.5% Mt as 1-2mm lath-like grains. Adcumulate? Moderately fractured due to weathering.		353581	1.5	6.0	4.05	1.0	.20
							582	6.0	11.0	5.15	1.5	.19
							583	11.0	15.7	4.45	1.5	.18
15.7	66.65	1.99	NQ BQ		MASSIVE OLIVINE ULTRAMAFIC. Dark blue grey. Massive even-textured ol u/m as for 1.5 - 15.7m but fresh. Mt rare to absent ~0.1% as 1mm laths or fine single grains. Adcumulate? Rock locally spotted with 5-10mm clots of feathery serpentine asbestos, after tremolite? 50mm band of massive mt + rare chalcopyrite at 59.0m. 59.0m mt band 70° - CA.		584	15.7	20.0	4.30	1.0	.19
							585	20.0	25.0	5.05	0.7	.20
							586	25.0	30.0	4.85	0.7	.20
							587	30.0	35.0	5.05	1.0	.19
							588	35.0	40.0	4.6	1.2	.19
							589	40.0	45.0	4.75	0.7	.19
							590	45.0	50.0	4.8	0.7	.20
							591	50.0	55.0	4.85	1.5	.20
							592	55.0	60.0	4.9	1.5	.21
							593	60.0	65.0	5.1	1.5	.20
							594	65.0	66.65	1.65	2.5	.20
							353099	PET	17.4			

DRILL RUNS

From	To	REC	Rec
0	1.5	–	–
1.5	4.2	2.3	3F
	5.55	1.3	3F
	6.85	1.3	3F
	8.5	1.5	3F
	7.75	1.5	3F
	11.2	1.5	3F
	13.7	1.5	3F
	14.15	1.45	3F
	15.7	1.3	2F
	16.6	1.15	1F
	18.1	1.35	1F
	19.35	1.5	1F
	21.0	1.3	4F
	22.25	1.25	3F
	23.5	1.4	1F
	25.0	1.4	1F
REDUCE TO BQ			25.0
	27.0	1.5	2F
	29.5	2.8	1F
	31.1	1.7	1F
	34.0	2.95	2F
	36.8	2.7	1F
	39.8	2.65	3F
	42.6	2.7	2F
	45.6	2.8	2F
	47.45	1.7	4x
	52.15	4.7	2F
	55.15	2.85	1F
	58.05	2.85	1F
	61.0	2.90	1F
	63.9	2.85	1F
	66.65	2.9	1F

957233

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 1 of 1

TENEMENT NAME ZEEHAN 1 No. EL 28/88

PLAN – MAP REFERENCE TRIAL

CO-ORDINATES 349288E 5356150N AZIMUTH ↑ DRILLERS N. POLTOCK COMMENCED 24/5/93 DEPTH 51.7m HOLE No. DD93ZT6

RL COLLAR ~49m ASL INCLINATION -90° DRILL TYPE COMPLETED 27/5/93 CASING LEFT – DPO No(s)

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....) MAG SUS	Ni%	DRILL RUNS FROM	TO	REC	RQ
0	2.4	–	–		PRECOLLAR - No core. Ironstone capping & weath u/m.								0	2.4	–	–
														3.3	0.9	4F
2.4	8.95	6.65	NQ		WEATHERED OLIVINE ULTRAMAFIC.		3753595	2.4	5.7	3.4	2	.20		4.8	1.4	4F
					Mottled light green & orange. Massive, even-textured		596	5.7	8.95	3.25	2	.18		6.15	1.6	4F
					ol u/m with 0.1% mt as rectangular laths. ⇒ Adcumulate?									7.8	1.5	3F
					Strongly fractured at 70°-90° to C.A., due to etching									9.2	1.45	3F
					of layering by weathering?									10.75	1.5	2F
														13.35	2.55	1F
8.95	51.7	41.6	NQ		MASSIVE OLIVINE ULTRAMAFIC.		597	8.95	12.8	3.85	2	.19		14.65	1.5	↑
			BQ		Dark bluish grey. Massive even-textured ol u/m,		598	12.8	16.6	3.7	2.5	.18		16.2	1.3	
					fine grained? Rare mt as 1-2mm rectangular laths		599	16.6	20.5	4.0	1.5	.20		19.15	2.9	
					and as fine single grains. ⇒ Adcumulate?		600	20.5	25.0	4.35	2.5	.19		20.5	1.5	
					Minor but common zones of light green feathery		601	25.0	30.0	4.9	2.5	.18	REDUCE TO BQ			
					serpentine after 5mm long bladed (tabular) ol.		602	30.0	35.0	4.75	2.5	.17	20.5	23.35	2.7	
					Narrow zone of dark green ol mesocumulate?		603	35.0	40.0	4.9	3	.17		26.05	2.7	↓
					with sharp contact with adcumulate at 13.4m.		604	40.0	45.0	4.8	3	.16		29.0	2.95	1F
					Contact @ 60° - C.A.		605	45.0	50.0	4.85	2.5	.16		33.1	3.75	3S
					Numerous serpentinous fractures (~3/m) with		606	50.0	51.7	1.5	1.5	.19		36.0	2.85	1F
					1-5mm wide pale green serpentinous selvages.									37.5	1.45	1F
					Dominantly at 60°-70° to C.A.									40.35	2.85	1F
					Puggy clay zone (probable core loss) 43.2-43.8m.									43.4	2.9	2S
														45.7	2.2	2X
														48.2	2.65	1F
														49.4	1.05	3F
														49.85	0.4	3F
														51.7	1.7	1F

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C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

TRIAL HARBOUR

SHEET No. 1 of 2

TENEMENT NAME ZEEHAN 1 No. EL 28/88

PLAN – MAP REFERENCE TRIAL

CO-ORDINATES 349255E 5356050N AZIMUTH – DRILLERS N. POLTOCK COMMENCED 27/5/93 DEPTH 48.55m HOLE No. DD93ZT7

RL COLLAR 38m ASL INCLINATION -90° DRILL TYPE COMPLETED 31/5/93 CASING LEFT – DPO No(s)

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) MAG SUS	N.I.	DRILL RUNS From	To	REC	RQD
0	0.65	-	-		PRECOLLAR - No Core.								0	0.65	-	-
					Weathered u/m outcrop nearby. Layering dip-str 18°, 230 AMG.									1.85	1.05	5x
														3.35	1.35	5x
														4.75	1.45	4F
0.65	6.05	5.15	NQ		WEATHERED OLIVINE ULTRAMAFIC		3753607	0.65	6.05	5.15	0.7	.29		6.0	1.25	4F
					Mottled orange & light green. Weathered ol u/m with 1-2% mt as 2-5mm rounded aggregates.									8.15	1.95	1F
					Strongly fractured & broken due to weathering.									9.4	1.25	1F
					Sharp boundary with unweathered u/m at 6.05m.									10.75	1.3	2F
														12.05	1.25	3x
														13.4	1.35	3x
6.05	31.9	24.9	NQ BQ		BLADED OLIVINE ULTRAMAFIC		608	6.05	11.0	4.7	1.5	.20		15.0	1.45	2F
					Dark blueish grey when fresh, but quickly bleaches to light green (overnight!). Fine to med gls 0.2-0.5mm? ol u/m. 5-10% feathery Serpentine after 1-5mm bladed ol, developed along fractures? and possibly primary layering? Hard to tell if it is primary layering, but it is at low ∠ to c.A. - 0-30°.		609	11.0	16.0	4.9	1.5	.19		17.7	2.95	1F
							610	16.0	22.0	6.05	1.0	.19		19.25	1.45	1F
							611	22.0	27.0	4.35	1.5	.19		20.7	1.25	1F
							612	27.0	31.9	4.9	1.5	.20		22.0	1.5	1F
														REDUCE TO BQ 2x		
							3530300	PET	19.4				22.0	25.2	3.0	2F
														25.65	0.2	4F
					1-2% mt as 1-2mm rounded to wispy aggregates, rarely with intergrown sulphides (py). ⇒ Meso-Adcumulate?									28.6	2.55	1F
														29.4	1.05	3F
														32.85	3.35	1F
					Several puggy clay breccia zones, e.g. 9.8m, 12m, 13m.									35.7	2.75	3V
														36.2	0.45	2F
					Reduce to BQ at 22.0m.											
31.9	36.15	4.05	BQ		FOLIATED BLADED OLIVINE ULTRAMAFIC.		613	31.9	36.15	4.05	2	.19				
					Dark blue-grey when fresh, quickly bleaching to light green. Similar to 6.05 - 31.9m but with strong preferred alignment of bladed serp after ol as bands at low ∠ to c.A, ~20°.											

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C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 2 of 2

TENEMENT NAME..... No. .....

PLAN – MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. DD93ZT7

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....) MAG SUS	NMT	DRILL RUNS From	To	REC	RQ
31·9	36·15		BQ		2% mt as 1-3 mm rounded to wispy aggregates, with rare intergrown sulphides. ⇒ Meso-adcumulate?								36·2	39·1	2·85	2F
	CTD													40·6	1·4	2F
														42·0	1·1	3F
														42·6	0·35	4F
36·15	42·6	5·75	BQ		BLADED OLIVINE ULTRAMAFIC As for 6·05 – 31·9 m, but ?slightly coarser grained? 2% mt as 1-3 mm rounded to wispy aggregates, and very fine dustings. Rare sulphides intergrown with mt. ⇒ Meso-adcumulate?		3573614	36·15	39·4	3·15	2	·19		42·85	0·25	5x
							615	39·4	42·6	2·6	1	·20		43·2	0·3	5x
														43·9	NA	CON
														44·25	·25	3F
														45·7	1·3	4x
														48·0	1·85	3x
														48·55	·35	4x
42·6	43·2	0·55	BQ		PUGGY BRECCIA ZONE Blue grey angular to milled ultramafic fragments in light blue-grey ultramafic clay.		[redacted]	42·6	43·2	·55	0·5	[redacted]				
43·2	43·9	–	–		PUGGY BRECCIA ZONE ? Dalled with non-coring bit.											
43·9	48·55	3·75	BQ		FAULTED AND BROKEN OLIVINE ULTRAMAFIC Dark green. Massive ol u/m. Bladed ol absent or rare. 0·5% mt as 1-2 mm rounded aggregates. Strongly faulted and bacciated, with clay and mill-rock bands at 0° to c.A. Hole abandoned due to bad ground.		616	43·9	48·55	3·75	2	·14				

TRIAL HARBOUR

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 1 of 4

TENEMENT NAME ZEEHAN 1 No. E 28/88

PLAN – MAP REFERENCE TRIAL

CO-ORDINATES 349276E 5355950N AZIMUTH - DRILLERS N. POLTOCK COMMENCED 31/5/93 DEPTH 57.4 HOLE No. DD93ZT8

RL COLLAR 24m ASL INCLINATION -90° DRILL TYPE COMPLETED 8/6/93 CASING LEFT – DPO No(s) 7104/7108

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....) MAG SUS	N:I	DRILL RUNS FROM	TO	REC	RQD
0	2.0	–	–		PRECOLLAR – No Core.								0	2.0	–	–
														3.2	1.0	4F
2.0	5.9	3.5	NQ		STRONGLY WEATHERED ULTRAMAFIC		35136[illegible]17	2.0	5.9	3.5	0.3	.24		4.35	1.0	4F
					Mottled orange, light green and black. Strongly weathered + fractured ultramafic. Fractures									5.5	1.1	3F
					filled with Fe oxides, carbonate + serpentine, with									7.0	1.4	2F
					massive serpentine selvages. Weathering etching									8.5	0.8	2F
					out cleavage? At low ∠ to c.A.									9.1	1.05	3F
														10.9	1.35	4x
														12.05	1.05	3F
5.9	10.9	4.2	NQ		WEATHERED OLIVINE ULTRAMAFIC		618	5.9	10.9	4.2	1.0	.17		13.5	1.4	3V
					Mottled orange, brown and green, weakly									14.85	1.35	3V
					weathered ol u/m. Looks even-textured 0.2-0.5mm									16.4	1.55	4V
					grainsize? Moderately fractured with carbonate +									17.45	1.05	4V
					Fe oxides filling fractures. Fractures at low ∠ to									19.55	2.0	3F
					c.A. ~ 30°.											
10.9	17.45	6.4	NQ		OLIVINE-MAGNETITE ULTRAMAFIC.		619 ~~619~~	10.9	14.2	3.15	1.0	.18				
					Bright green. Medium grainsize? 0.5-2mm?		620	14.2	17.45	3.25	1.5	.18				
					ol u/m. 1-2% mt as 1-2mm rectangular grains +											
					irregular wisps. ~ 0.2% sulphide, similar habit to											
					mt, dominated by po+py? Sulphide content											
					increasing to 17.45m.											
					⇒ Mesocumulate.											
					Numerous 1-3mm calcite veins with serpentine											
					selvages. White talc-carbonate alteration between											
					15.9 – 16.35m.											
17.45	18.35	0.85	NQ		SERPENTINE(-MAGNETITE-SULPHIDE) ROCK		621	17.45	18.35	0.85	7	.18				
					Mottled light green-brown. Massive light green		3528494	PET	18.2							
					serpentine with blots of carbonate and unknown											

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 3 of 4

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH ..... HOLE No. ZT 8

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) MAG SUS	Ni %	DRILL RUNS From	To	Rec	RQD
27.6	29.0	1.4	BQ		OLIVINE – MAGNETITE ULTRAMAFIC. Light-mid green. Medium grainsize (0.5-1mm?) ol u/m with 2-10mm wispy aggregates of mt + minor sulphides, 5% of interval. ⇒ Mesocum? Gradational contacts at 27.6 + 29m.		6273	27.6	29.0	1.4	3.5		27.3	29.7	2.8	2F
														32.75	2.45	3F
														35.6	2.9	2F
														35.9	0.15	2F
29.0	31.2	2.2	BQ		MASSIVE SERPENTINE. Pale greenish grey. Massive even-textured soapy serpentine. 1% mt or sulphides. Numerous fractures with 1-20mm talc-serp selvages. Possibly an alteration front to the mt unit at 31.2m. Sharp but gradational contact over 200mm at 31.2-31.4m.		6277	29.0	31.2	2.2	1.0					
31.2	32.2	1.0	BQ		MAGNETITE-SERPENTINE ROCK. Black massive magnetite rock with 30% "wormy" interstitial pale green-grey serp merging in with mt. Mt is fine grained – probably finely intergrown with serp. Rock not magnetic enough to be massive mt. Several 2-10mm serpentinous fractures. Contact a 32.2m is sharp – at 20° to c.A.		6278	31.2	32.2	1.0	6.5					
32.2	36.15	3.75	BQ		SERPENTINE ROCK. Light green massive, even-textured serp with 1% Mt as 1-2mm xtals or rectangular aggregates. Shrinkage cracks filled with CO_3 between 36.2 36.4m. Sharp contact at 36.15 – 40° – c.A.		6279 6280	32.2	36.15	3.75	0.5					

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 4 of 4

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH 57.4m HOLE No. ZT8

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) MAG SUS	Ni %	DRILL RUNS From	To	Rec	Rq
36.15	45.35	9.6	BQ		FEATHERY OLIVINE ULTRAMAFIC.		3573630	36.15	40.75	4.6	1.2		35.9	38.75	2.9	3F
					Light to mid green. Narrow bladed ol up to 5mm long as feathery, almost spinifex aggregates.		631	40.75	45.35	4.0	0.2			40.5	1.7	3x
					0.5-1% mt as 1-2mm rektangular crystals, as as very fine dustings throughout.									41.0	0.6	5x
					Gradational contact at 45.35m shown by									43.6	2.3	3x
					decrease in bladed ol.									44.35	0.35	5x
					Several 100-500mm wide brecciated ~~ol~~ and									46.0	1.65	3F
					clay pug zones throughout.									46.85	0.6	4F
														48.35	1.45	4F
														49.25	0.6	4F
														50.5	1.2	3F
45.35	54.2	7.5	BQ		OLIVINE ULTRAMAFIC.		632	45.35	49.8	3.85	0.2			51.4	0.8	4F
					Mid-green medium to coarse grained (1-3mm?)		633	49.8	54.2	3.65	0.5			54.2	2.2	2F
					ol u/m with 1-2% of 1-2mm rectangular mt									56.8	2.45	4x
					crystals and 5mm wisps.									57.4	0.3	5x
					⇒ Meso-orthocumulate.											
					Minor bladed ol toward 54.2m.											
54.2	57.4	2.75	BQ		OLIVINE ULTRAMAFIC.		634	54.2	57.4	2.75	0.7					
					Dark blueish grey massive ol u/m with minor											
					interstitial light blue serpentine patches. No visible											
					mt. ⇒ meso-adcumulate?											
					Puggy clay zones throughout.											
					EOH 57.4m.											

3 3 2 2 3 3 3

TRIAL HARBOUR

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 1 of 2

TENEMENT NAME ZEEHAN 1 No. EL 28/88

PLAN – MAP REFERENCE TRIAL 1:25000

CO-ORDINATES 349278E 5355868N AZIMUTH – DRILLERS N. POLTOCK COMMENCED 16/93 DEPTH 56.25 HOLE No. DD93ZT9

RL COLLAR 3m ASL INCLINATION -90° DRILL TYPE COMPLETED 16/93 CASING LEFT – DPO No(s) T1108

DEPTH From (M)	DEPTH To(M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) MAG SUS	N:/.	DRILL RUNS From	To	Rec	RQ
0	0.7				PRECOLLAR - No Core.								0.7	1.2	0.5	5x
														3.75	1.7	5x
0.7	3.75	2.2	NQ		STRONGLY WEATHERED ULTRAMAFIC		3753635	0.7	5.4	4.15	0.1			5.0	1.55	4V
					Mottled orange/green. Strongly weathered and fractured ol u/m.									6.6	1.4	4F
														8.1	1.4	1F
														9.4	1.4	2F
3.75	5.4	1.95	NQ		WEATHERED ULTRAMAFIC									10.85	1.45	3x
					Mid-green ol u/m. Strongly veined along carbonate veins and fractures. Rare dissem mt, <0.2%.									12.15	1.25	3x
					V_{CO_3} - C.A. ∠ 80°									13.4	1.4	3x
														14.9	1.3	2F
														15.9	1.05	2F
5.4	13.4	7.9	NQ		OLIVINE ULTRAMAFIC.		6386	5.4	9.4	3.8	0.3			17.1	1.2	2F
					Dark blueish-green grey ol u/m. Massive appearance, no visible ol grains. Rare dissem mt, ≤0.1% of interval. ⇒ Adcumulate?		6387	9.4	13.4	4.1	0.5			18.15	1.1	3F
														19.35	1.2	3F
														20.6	1.15	3F
					Minor talcose fractures throughout.								REDUCE TO BQ AT 21.9	21.9	22.3	0.35	4F
					Contact at 13.4m marked by 100mm of puggy breccia.								21.9	22.6	0.2	4F
														23.25	0.65	4F
13.4	26.0	12.05	NQ BQ		OLIVINE-MAGNETITE ULTRAMAFIC.		6388	13.4	17.65	4.05	3.0			23.95	0.65	3F
					Mid-dark green. Massive 0.2-0.5mm g/s ol u/m.		6389	17.65	21.9	4.2	1.0			25.15	1.2	3F
					2-5% mt as irregular wisps and rarely as 1-2mm rectangular grains. Rare sulphides intergrown with mt.		6390	21.9	26.0	3.8	0.7			25.6	0.35	4F
					⇒ Mesocumulate?											
					Gradational contact over 300mm at 26.0m											
					Reduce to BQ at 21.9m.											

C.R.A. EXPLORATION PTY. LIMITED

DRILL CORE LOG

SHEET No. 2 of 2

TENEMENT NAME ..... No. .....

PLAN – MAP REFERENCE .....

CO-ORDINATES ..... AZIMUTH ..... DRILLERS ..... COMMENCED ..... DEPTH 56.25 HOLE No. ZT9

RL COLLAR ..... INCLINATION ..... DRILL TYPE ..... COMPLETED ..... CASING LEFT ..... DPO No(s) .....

DEPTH From (M)	DEPTH To (M)	Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by .....) MAG SUS	Ni %	DRILL RUNS From	To	REC	RQD
26.0	30.6	4.35	BQ		FEATHERY OLIVINE ULTRAMAFIC. Dark green to black. Massive ol u/m with 10% of 3mm long finely bladed ol. Rare mt as fine dissems. Gradational contacts at 26.0 – 30.6m marked by colour change.		3573641	26.0	30.6	4.35	0.5		25.6	26.95	1.35	2F
														27.1	0.15	4F
														27.45	0.2	4F
														27.9	0.4	4F
														30.85	2.9	3F
														31.1	0.2	3F
														33.7	2.45	3F
30.6	40.55	9.8	BQ		FEATHERY OLIVINE ULTRAMAFIC Mid to dark green. Similar to 26.0 – 30.6 but lighter green + with smaller ol blades, 1-2mm long. Gradational contact at 40.55m marked by colour change.		6432	30.6	35.6	4.6	0.7			34.4	0.9	3F
							6433	35.6	40.55	5.2	1.0			36.3	1.6	3F
														38.65	2.5	2F
														41.65	2.8	3F
														44.15	2.45	3F
										5.05				46.3	2.05	2F
40.55	56.25	14.9	BQ		FEATHERY OLIVINE ULTRAMAFIC As for 26 – 30.6, but with very fine ol blades, ave 1mm length. Mt + sulphide generally absent.		6434	40.55	45.8	5.05	2.0			49.3	2.35	2F
							6435	45.8	51.0	4.9	0.5			49.75	0.8	3F
							6436	51.0	56.25	4.95	0.3			51.55	1.8	3F
														52.9	1.25	3F
														54.3	0.8	3F
					EOH = 56.25m.									56.25	2.35	2F

957241

ROCKCHIP AND DRILLING CODES 17/2/93

BMRLITH

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	Sif	BIF		
Ssh	Shale				
Sbs	Black shale	Sbx	Breccia		

METAMORPHIC

Msl	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	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

Ca	Alluvium	Clt	Laterite	Csg	Gossan
Cco	Colluvium	Csp	Pisolites		
Cs	Sand	Csf	Ironstone	Ccy	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 fract
Le	Leached		

MINERALISATION/ALTERATION FEATURES

Gs	Gossanous	Vs	Vein sulphide	Al	Altered
Vn	Veined	Ds	Disem 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
Sp	Sphalerite	Po	Pyrrhotite		
Cp	Chalcopyrite	Su	Unknown sulph		

SECONDARY MINERALISATION

Ls	Lead secondaries	Cs	Copper sec.	Nl	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
B	Brown	O	Orange	E	Blue
W	White	Y	Yellow	S	Silver

TRIAL HARBOUR DIAMOND DRILLHOLE LOGS AND ASSAYS										
Results in ppm except Fe-S (in %).										
SAMPNO	DPO	HOLE	DFROM	DTO	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	COMMENTS
		DD93ZT1	0.00	0.75						PRECOLLAR
3753501	71548	DD93ZT1	0.75	4.25	Esd	lu	We		MYG	
3753502	71548	DD93ZT1	4.25	9.00	Esd	lu	We		MYG	
3753503	71548	DD93ZT1	9.00	13.65	Esd	lu	We		LV	
3753504	71548	DD93ZT1	13.65	17.80	Esd	lu	We		LV	
3753505	71548	DD93ZT1	17.80	19.80	Esd	lu	Ma		BG	
3753506	71548	DD93ZT1	19.80	21.50	Esd	lu	MaDi	Mt	BG	
3753507	71548	DD93ZT1	21.50	22.60	Esd	lu	BnDi	Mt	ALVEG	
3753508	71548	DD93ZT1	22.60	26.20	Esd	lulus	Vn	Cc	LVEG	
3753509	71548	DD93ZT1	26.20	29.60	Esd	lulus	Vn	Cc	LVEG	
3753510	71548	DD93ZT1	29.60	30.50	Esd	lu	MaDi	MtSu	BG	
3753511	71548	DD93ZT1	30.50	31.50	Esd	lu	MaDi	MtSu	BG	
3753512	71548	DD93ZT1	31.50	32.50	Esd	lu	MaDi	MtSu	BG	
3753513	71548	DD93ZT1	32.50	33.50	Esd	lu	MaDi	MtSu	BG	
3753514	71548	DD93ZT1	33.50	34.50	Esd	lu	MaDi	MtSu	BG	
3753515	71548	DD93ZT1	34.50	35.40	Esd	lu	MaDi	MtSu	BG	
3753516	71548	DD93ZT1	35.40	36.00	Esd	lus	Ds	Po	MWLV	Po 20%
3753517	71548	DD93ZT1	36.00	39.70	Esd	lu	Ma		BG	
3753518	71548	DD93ZT1	39.70	40.75	Esd	lus	Ds	Po	MWLV	Po 20%
3753519	71548	DD93ZT1	40.75	41.65	Esd	lus	Ds	Po	MWLV	Po 20%
3753520	71548	DD93ZT1	41.65	42.15	Esd	lus	Ds	Po	MWLV	Po 20%
3753521	71548	DD93ZT1	42.15	43.15	Esd	lu	Ma		BG	
3753522	71548	DD93ZT1	43.15	45.30	Esd	lus			MLVDV	
3753523	71548	DD93ZT1	45.30	47.90	Esd	lu	MaDs	Su	BG	
3753524	71548	DD93ZT1	47.90	50.50	Esd	lu	MaDs	Su	BG	
3753525	71548	DD93ZT1	50.50	52.95	Esd	lu	Ma		BG	
3753526	71548	DD93ZT1	52.95	54.95	Esd	lus	MaDi	MtSu	MWEG	
		DD93ZT2	0.00	1.25						PRECOLLAR
3753527	71549	DD93ZT2	1.25	4.00	Esd	lu	We		MYG	
3753528	71549	DD93ZT2	4.00	6.95	Esd	lu	We		MYG	
3753529	71549	DD93ZT2	6.95	8.20	Esd	lu	WeDs	Po	MLYVB	Po 10%
3753530	71549	DD93ZT2	8.20	9.95	Esd	lu	WeDs	Po	MLYVB	Po 5%
3753531	71549	DD93ZT2	9.95	10.70	Esd	lus			MEGYV	
3753532	71549	DD93ZT2	10.70	14.10	Esd	lu	We		MYG	
3753533	71549	DD93ZT2	14.10	17.70	Esd	lu	We		MYG	
3753534	71549	DD93ZT2	17.70	19.80	Esd	lu	Ma		BG	
3753535	71549	DD93ZT2	19.80	21.05	Esd	lu	We		LV	
3753536	71549	DD93ZT2	21.05	22.00	Esd	lu	MaDs	Su	BG	
3753537	71549	DD93ZT2	22.00	23.30	Esd	lu	MaDs	Su	BG	
		DD93ZT2	23.30	24.15						ADIT
3753538	71549	DD93ZT2	24.15	25.20	Esd	lu	MaDs	Su	BG	
3753539	71549	DD93ZT2	25.20	26.25	Esd	lu	MaDs	Su	BG	
3753540	71549	DD93ZT2	26.25	31.90	Esd	lu	Ma		BG	
3753541	71549	DD93ZT2	31.90	36.00	Esd	lu			MEG	
3753542	71549	DD93ZT2	36.00	40.00	Esd	lu			MEG	
3753543	71549	DD93ZT2	40.00	44.00	Esd	lu			MEG	
3753544	71549	DD93ZT2	44.00	48.30	Esd	lu			MEG	
3753545	71549	DD93ZT2	48.30	50.65	Esd	lu	Ma		BG	

SAMPNO	Ag	As	Co	Cr	Cu	Fe%	Ni	Pb	Zn	S%	Au	Pt	Pd
3753501	-1	4	105	409	6	4.29	4464	19	108				
3753502	-1	3	66	347	8	2.42	2831	29	132				
3753503	-1	2	67	237	5	2.56	1857	17	97				
3753504	-1	2	52	193	4	2.19	1547	14	93				
3753505	-1	6	84	194	30	2.54	2580	13	239				
3753506	-1	7	61	287	6	5.94	1392	11	128				
3753507	-1	13	60	263	5	10.2	1418	7	111				
3753508	-1	1	56	240	4	2.45	1848	16	87				
3753509	-1	6	60	228	4	2.42	1712	16	106				
3753510	-1	13	71	348	4	7.87	1839	22	147				
3753511	-1	2	54	266	4	4.77	1392	20	95				
3753512	-1	2	56	270	3	7.4	1309	12	119				
3753513	-1	2	59	314	4	6.85	1346	8	140				
3753514	-1	6	56	339	4	10.7	1203	4	141				
3753515	-1	3	53	165	4	4.61	1155	8	147				
3753516	-1	13	57	319	6	13.8	1274	11	117				
3753517	-1	-1	63	261	3	3.32	1797	21	126				
3753518	-1	7	59	258	5	7.91	1411	6	101				
3753519	-1	7	52	205	4	6.2	1341	9	100				
3753520	-1	9	61	364	6	14.2	1218	-3	99				
3753521	-1	2	60	271	4	4.41	1608	14	139				
3753522	-1	4	50	287	4	3.32	1936	13	96				
3753523	-1	7	68	268	4	4.89	1524	21	413				
3753524	-1	5	67	234	4	6.5	1333	12	269				
3753525	-1	4	69	275	5	5.41	1476	8	217				
3753526	-1	6	61	232	5	7.87	1591	11	189				
3753527	-1	6	78	386	3	4.47	2199	17	213				
3753528	-1	3	69	277	5	3.4	1756	14	116				
3753529	-1	9	43	524	4	4.54	1273	7	74				
3753530	-1	8	52	345	2	4.14	1376	8	131				
3753531	-1	11	49	366	2	7.49	1431	7	112				
3753532	-1	5	57	226	5	4.31	1631	9	123				
3753533	-1	7	66	205	2	4.32	1693	7	134				
3753534	-1	4	73	303	2	4.61	1551	8	158				
3753535	-1	4	58	277	2	3.69	1391	8	142				
3753536	-1	6	66	273	2	3.94	1616	5	145				
3753537	-1	2	67	283	-2	4.52	1579	6	153				
3753538	-1	2	61	309	2	6.78	1354	6	152				
3753539	-1	2	61	345	2	7.55	1497	12	139				
3753540	-1	1	72	423	4	3.28	1896	34	174				
3753541	-1	2	57	411	-2	2.43	1896	13	67				
3753542	-1	3	50	514	5	2.64	1782	13	71				
3753543	-1	3	51	391	-2	2.71	2074	12	50				
3753544	-1	3	54	357	3	2.71	2055	20	85				
3753545	-1	7	68	286	4	4.84	2218	105	233				

SAMPNO	DPO	HOLE	DFROM	DTO	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	COMMENTS
3753546	71549	DD93ZT3	3.95	7.80	Esd	lu	WeDi	Mt	MVYN	Mt 10-20%
3753547	71549	DD93ZT3	7.80	11.70	Esd	lu	WeDi	Mt	MVYN	Mt 10-20%
3753548	71549	DD93ZT3	11.70	14.40	Esd	lu	WeDi	Mt	DV	Mt 10-20%
3753549	71549	DD93ZT3	14.40	16.70	Esd	lu	WeDi	Mt	DV	Mt 10-20%
3753550	71549	DD93ZT3	16.70	18.95	Esd	lu	WeDi	Mt	DV	Mt 10-20%
3753551	71549	DD93ZT3	18.95	22.00	Esd	lu	WeDi	Mt	DV	Mt 10-20%
3753552	71549	DD93ZT3	22.00	24.00	Esd	lu	WeDi	Mt	DV	Mt 10-20%
3753553	71549	DD93ZT3	24.00	26.00	Esd	lu	BnDi	Mt	V	Mt 10-20%
3753554	77102	DD93ZT3	26.00	28.00	Esd	lu	BnDi	Mt	V	Mt 10-20%
3753555	77102	DD93ZT3	28.00	30.00	Esd	lu	BnDi	Mt	V	Mt 10-20%
3753556	77102	DD93ZT3	30.00	32.20	Esd	lu	BnDi	Mt	V	Mt 10-20%
3753557	77102	DD93ZT3	32.20	37.00	Esd	lus?	Al	Cc	MWV	Carbonate altern?
3753558	77102	DD93ZT3	37.00	41.00	Esd	lus?	Al	Cc	MWV	Carbonate altern?
3753559	77102	DD93ZT3	41.00	45.00	Esd	lus?	Al	Cc	MWV	Carbonate altern?
3753560	77102	DD93ZT3	45.00	49.30	Esd	lus?	AlDi	CcMt	MWV	Carbonate altern?
3753561	77102	DD93ZT3	49.30	51.00	Esd	lu	Di	Mt	DVN	Mt 40%
3753562	77102	DD93ZT3	51.00	52.80	Esd	lu	Di	Mt	DVN	Mt 40%
3753563	77102	DD93ZT3	52.80	56.00	Esd	lu	Di	Mt	DV	Mt 10-20%
3753564	77102	DD93ZT3	56.00	60.25	Esd	lu	Di	Mt	V	Mt 5%
3753565	77102	DD93ZT3	60.25	63.00	Esd	lus	AlBxDi	Mt	DVLV	
3753566	77102	DD93ZT3	63.00	66.15	Esd	lu	Di	Mt	MDVN	Mt 10%
		DD93ZT4	0.00	0.50						PRECOLLAR
3753567	77102	DD93ZT4	0.50	5.00	Esd	lu	WeDi	Mt	V	Mt 5%
3753568	77102	DD93ZT4	5.00	9.95	Esd	lu	WeDi	Mt	V	Mt 5%
3753569	77102	DD93ZT4	9.95	15.00	Esd	lu	WeDi	Mt	DV	Mt 5%
3753570	77102	DD93ZT4	15.00	18.40	Esd	lu	MaDiVn	MtCc	BG	Mt 5%
3753571	77102	DD93ZT4	18.40	22.30	Esd	lu	MaDi	Mt	DVN	Mt 5%
3753572	77102	DD93ZT4	22.30	27.00	Esd	lu	MaDi	Mt	DVN	Mt 5%
3753573	77102	DD93ZT4	27.00	32.00	Esd	lu	MaDi	Mt	DVN	Mt 5%
3753574	77102	DD93ZT4	32.00	35.85	Esd	lu	Ma		N	
3753575	77102	DD93ZT4	35.85	40.00	Esd	lus	Ma		LV	
3753576	77102	DD93ZT4	40.00	44.20	Esd	lus	Ma		LV	
3753577	77102	DD93ZT4	44.20	49.15	Esd	lus	AlBxDi		LV	
3753578	77102	DD93ZT4	49.15	54.00	Esd	lu	Ma		DV	
3753579	77102	DD93ZT4	54.00	59.00	Esd	lu	Ma		DV	
3753580	77102	DD93ZT4	59.00	63.50	Esd	lu	Ma		DV	
		DD93ZT5	0.00	1.50						PRECOLLAR
3753581	77104	DD93ZT5	1.50	6.00	Esd	lu	MaWe		V	
3753582	77104	DD93ZT5	6.00	11.00	Esd	lu	MaWe		V	
3753583	77104	DD93ZT5	11.00	15.70	Esd	lu	MaWe		V	
3753584	77104	DD93ZT5	15.70	20.00	Esd	lu	Ma		BG	
3753585	77104	DD93ZT5	20.00	25.00	Esd	lu	Ma		BG	
3753586	77104	DD93ZT5	25.00	30.00	Esd	lu	Ma		BG	
3753587	77104	DD93ZT5	30.00	35.00	Esd	lu	Ma		BG	
3753588	77104	DD93ZT5	35.00	40.00	Esd	lu	Ma		BG	
3753589	77104	DD93ZT5	40.00	45.00	Esd	lu	Ma		BG	
3753590	77104	DD93ZT5	45.00	50.00	Esd	lu	Ma		BG	
3753591	77104	DD93ZT5	50.00	55.00	Esd	lu	Ma		BG	
3753592	77104	DD93ZT5	55.00	60.00	Esd	lu	Ma		BG	
3753593	77104	DD93ZT5	60.00	65.00	Esd	lu	Ma		BG	
3753594	77104	DD93ZT5	65.00	66.65	Esd	lu	Ma		BG	
		DD93ZT6	0.00	2.40						PRECOLLAR
3753595	77104	DD93ZT6	2.40	5.70	Esd	lu	MaWe		MLVO	
3753596	77104	DD93ZT6	5.70	8.95	Esd	lu	MaWe		MLVO	
3753597	77104	DD93ZT6	8.95	12.80	Esd	lu	Ma		BG	
3753598	77104	DD93ZT6	12.80	16.60	Esd	lu	Ma		BG	
3753599	77104	DD93ZT6	16.60	20.50	Esd	lu	Ma		BG	
3753600	77104	DD93ZT6	20.50	25.00	Esd	lu	Ma		BG	
3753601	77104	DD93ZT6	25.00	30.00	Esd	lu	Ma		BG	
3753602	77104	DD93ZT6	30.00	35.00	Esd	lu	Ma		BG	
3753603	77104	DD93ZT6	35.00	40.00	Esd	lu	Ma		BG	
3753604	77104	DD93ZT6	40.00	45.00	Esd	lu	Ma		BG	
3753605	77104	DD93ZT6	45.00	50.00	Esd	lu	Ma		BG	
3753606	77104	DD93ZT6	50.00	51.70	Esd	lu	Ma		BG	

SAMPNO	Ag	As	Co	Cr	Cu	Fe%	Ni	Pb	Zn	S%	Au	Pt	Pd
3753546	-1	20	134	1466	13	28.1	10400	14	372	0.005	-0.005	-0.05	-0.005
3753547	-1	15	156	830	13	16.9	10100	69	600	0.005	0.014	-0.05	-0.005
3753548	-1	10	124	487	4	15.3	4442	16	196				
3753549	-1	11	91	717	3	20.5	2990	4	157				
3753550	-1	9	91	529	4	16.8	2760	-3	147				
3753551	-1	14	115	978	4	29.5	7400	-3	201	-0.005	0.03	-0.05	-0.005
3753552	-1	7	88	537	4	21.2	2666	4	143				
3753553	-1	6	87	152	10	13.7	2031	-3	125				
3753554	-1	14	90	197	4	14	1827	4	158				
3753555	-1	8	79	217	4	12.4	1518	3	132				
3753556	-1	7	77	605	3	11.6	1566	5	143				
3753557	-1	4	22	388	7	1.73	630	12	77				
3753558	-1	4	27	513	5	2.17	796	12	88				
3753559	-1	4	33	521	5	3.62	826	8	95				
3753560	-1	8	77	623	4	9.6	2129	17	197				
3753561	-1	15	81	1105	6	34.9	1715	-3	152				
3753562	-1	12	83	1839	6	34.5	1281	-3	197				
3753563	-1	8	77	562	4	13.8	1182	8	151				
3753564	-1	3	90	510	2	9.21	1695	10	175				
3753565	-1	4	84	558	2	9.92	1619	14	168				
3753566	-1	15	97	527	14	17.2	2150	174	400				
3753567	-1	3	99	550	6	9.94	2042	13	216				
3753568	-1	3	92	540	6	12.4	1502	14	153				
3753569	-1	2	97	318	3	11.1	1531	15	202				
3753570	-1	3	97	365	5	11.2	1352	10	194				
3753571	-1	4	104	506	12	14.7	1459	158	356				
3753572	-1	8	98	487	5	13.3	1357	10	183				
3753573	-1	6	97	452	2	9.93	1620	30	211				
3753574	-1	3	93	762	-2	7.61	1512	25	219				
3753575	-1	3	94	535	3	6.92	1960	41	273				
3753576	-1	3	86	564	12	5.66	2194	239	437				
3753577	-1	5	63	222	3	4.4	1813	21	194				
3753578	-1	3	70	550	2	4.93	1769	14	176				
3753579	-1	1	76	533	2	4.74	1757	15	178				
3753580	-1	1	81	379	2	4.21	1753	10	152				
3753581	-1	2	67	143	3	3.2	2005	12	108				
3753582	-1	2	68	135	2	3.43	1863	14	115				
3753583	-1	1	68	127	2	3.94	1789	12	144				
3753584	-1	1	71	123	2	3.71	1861	16	147				
3753585	-1	1	73	132	2	4.17	2013	11	155				
3753586	-1	1	71	130	-2	3.19	1958	8	116				
3753587	-1	1	67	134	-2	3.27	1916	7	108				
3753588	-1	1	64	164	-2	3.41	1851	11	108				
3753589	-1	2	70	128	-2	3.37	1890	6	99				
3753590	-1	2	71	184	-2	3.58	1956	5	109				
3753591	-1	1	77	130	-2	4.81	1972	9	166				
3753592	-1	2	81	171	-2	6.19	2061	8	149				
3753593	-1	1	81	152	-2	4.69	2011	8	137				
3753594	-1	2	91	220	-2	7.6	2035	26	178				
3753595	-1	1	77	184	-2	4.98	2036	11	129				
3753596	-1	1	80	157	-2	7.98	1826	12	131				
3753597	-1	1	80	152	-2	4.66	1868	13	130				
3753598	-1	1	79	164	-2	5.7	1830	16	143				
3753599	-1	2	73	105	-2	4.41	1997	11	140				
3753600	-1	1	72	180	-2	5.72	1874	15	141				
3753601	-1	1	74	178	-2	5.75	1797	18	141				
3753602	-1	1	75	195	-2	6.44	1736	19	140				
3753603	-1	1	78	182	-2	7.26	1720	20	149				
3753604	-1	1	81	238	-2	8.22	1586	18	179				
3753605	-1	-1	81	203	-2	7.26	1643	14	166				
3753606	-1	-1	78	136	-2	3.95	1896	22	141				

SAMPNO	DPO	HOLE	DFROM	DTO	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	COMMENTS
		DD93ZT7	0.00	0.65						PRECOLLAR
3753607	77104	DD93ZT7	0.65	6.05	Esd	lu	We		MOLV	
3753608	77104	DD93ZT7	6.05	11.00	Esd	lu	Ma?		LV	
3753609	77104	DD93ZT7	11.00	16.00	Esd	lu	Ma?		LV	
3753610	77104	DD93ZT7	16.00	22.00	Esd	lu	Ma?		LV	
3753611	77104	DD93ZT7	22.00	27.00	Esd	lu	Ma?		LV	
3753612	77104	DD93ZT7	27.00	31.90	Esd	lu	Ma?		LV	
3753613	77104	DD93ZT7	31.90	36.15	Esd	lu	Bn		LV	
3753614	77104	DD93ZT7	36.15	39.40	Esd	lu	Ma?		LV	
3753615	77104	DD93ZT7	39.40	42.60	Esd	lu	Ma?		LV	
		DD93ZT7	42.60	43.90	Esd	Obx	Bx		LEG	No Rec
3753616	77104	DD93ZT7	43.90	48.55	Esd	lu	Bx		DV	
		DD93ZT8	0.00	2.00						PRECOLLAR
3753617	77104	DD93ZT8	2.00	5.90	Esd	lu	We		MOLVN	
3753618	77104	DD93ZT8	5.90	10.90	Esd	lu	We		MOBV	
3753619	77104	DD93ZT8	10.90	14.20	Esd	lu			V	
3753620	77104	DD93ZT8	14.20	17.45	Esd	lu			V	
3753621	77104	DD93ZT8	17.45	18.35	Esd	lus	DsAl?	MtSuCc	MLVB	Mt 5%, Su 0.5%
3753622	77104	DD93ZT8	18.35	20.00	Esd	lus	DsAl?	MtSuCc	DVN	Mt 10%, Su 2%
3753623	77104	DD93ZT8	20.00	20.40	Esd	lus	DsAl?	MtSuCc	MWLV	Mt + Su 2%
3753623	77104	DD93ZT8	20.40	21.65	Esd	lu	Ma		DV	
3753624	77108	DD93ZT8	21.65	24.20	Esd	lu	Ma		DV	
3753625	77108	DD93ZT8	24.20	27.60	Esd	lu	Ma		DV	
3753626	77108	DD93ZT8	27.60	29.00	Esd	lu	Di	Mt	V	Mt 5%
3753627	77108	DD93ZT8	29.00	31.20	Esd	lus	Ma		LVG	
3753628	77108	DD93ZT8	31.20	32.20	Esd	lus	Ds	Mt	N	Mt 20%
3753629	77108	DD93ZT8	32.20	36.15	Esd	lus	Ma		LV	
3753630	77108	DD93ZT8	36.15	40.75	Esd	lu			LV	
3753631	77108	DD93ZT8	40.75	45.35	Esd	lu			LV	
3753632	77108	DD93ZT8	45.35	49.80	Esd	lu			V	
3753633	77108	DD93ZT8	49.80	54.20	Esd	lu			V	
3753634	77108	DD93ZT8	54.20	57.40	Esd	lu			EG	
		DD93ZT9	0.00	0.70						PRECOLLAR
3753635	77108	DD93ZT9	0.70	5.40	Esd	lu	We		MOV	
3753636	77108	DD93ZT9	5.40	9.40	Esd	lu	Ma		EG	
3753637	77108	DD93ZT9	9.40	13.40	Esd	lu	Ma		EG	
3753638	77108	DD93ZT9	13.40	17.65	Esd	lu	MaDi	Mt	DV	Mt 2-5%
3753639	77108	DD93ZT9	17.65	21.90	Esd	lu	MaDi	Mt	DV	Mt 2-5%
3753640	77108	DD93ZT9	21.90	26.00	Esd	lu	MaDi	Mt	DV	Mt 2-5%
3753641	77108	DD93ZT9	26.00	30.60	Esd	lu	Ma		DVN	
3753642	77108	DD93ZT9	30.60	35.60	Esd	lu			DV	
3753643	77108	DD93ZT9	35.60	40.55	Esd	lu			DV	
3753644	77108	DD93ZT9	40.55	45.80	Esd	lu			DVN	
3753645	77108	DD93ZT9	45.80	51.00	Esd	lu			DVN	
3753646	77108	DD93ZT9	51.00	56.25	Esd	lu			DVN	

SAMPNO	Ag	As	Co	Cr	Cu	Fe%	Ni	Pb	Zn	S%	Au	Pt	Pd
3753607	-1	-1	84	311	-2	3.65	2878	7	55				
3753608	-1	-1	72	172	-2	3.11	2041	7	47				
3753609	-1	2	73	142	-2	2.56	1900	11	48				
3753610	-1	1	69	158	-2	2.32	1918	6	39				
3753611	-1	2	63	172	-2	3.47	1949	7	49				
3753612	-1	1	70	143	-2	2.96	1956	11	60				
3753613	-1	1	69	178	-2	3.79	1881	9	90				
3753614	-1	-1	72	152	-2	4.13	1889	11	94				
3753615	-1	-1	73	150	-2	2.65	1984	10	73				
3753616	-1	-1	72	202	-2	3.83	1932	9	85				
3753617	-1	3	55	67	-2	3.33	1351	9	217				
3753618	-1	3	88	120	-2	4.4	2416	12	284				
3753619	-1	4	65	136	-2	3.88	1713	13	164				
3753620	-1	4	64	130	-2	3.87	1817	12	143				
3753621	-1	3	68	135	-2	4.96	1829	10	125				
3753622	-1	19	73	175	6	9.32	1833	15	143				
3753623	-1	3	78	122	-2	4.83	2040	16	155				
3753623	-1	3	78	122	-2	4.83	2040	16	155				
3753624	-1	1	81	127	-2	4.24	1801	16	144				
3753625	-1	7	65	217	6	5.23	2316	11	153				
3753626	-1	40	62	602	4	6.8	2285	18	152				
3753627	-1	8	32	130	6	2.37	1311	3	48				
3753628	-1	26	32	234	173	16	1283	33	118				
3753629	-1	5	41	271	6	3.39	1996	8	97				
3753630	-1	2	49	232	3	3.06	1828	10	85				
3753631	-1	1	60	224	3	2.45	1748	11	74				
3753632	-1	2	68	275	3	2.4	1869	9	79				
3753633	-1	3	68	251	3	2.78	1919	9	75				
3753634	-1	3	67	287	4	3.66	1996	8	85				
3753635	-1	1	77	211	3	2.23	2134	11	63				
3753636	-1	1	66	208	2	2.41	1889	11	66				
3753637	-1	1	58	236	2	2.99	1888	12	79				
3753638	-1	1	54	214	2	3.88	1952	8	77				
3753639	-1	1	44	296	2	3.26	1747	8	79				
3753640	-1	1	68	195	2	2.86	2101	7	68				
3753641	-1	1	71	213	2	2.3	2233	11	63				
3753642	-1	1	56	262	2	3.29	1857	9	98				
3753643	-1	2	68	217	2	3.09	2064	12	91				
3753644	-1	1	66	301	8	3.69	1965	21	112				
3753645	-1	6	67	349	3	4.52	2065	21	98				
3753646	-1	1	71	356	2	3.12	2103	6	54				

APPENDIX 10:

TRIAL HARBOUR PETROLOGICAL REPORTS.

Sample 3093087

Rock Name	:	Serpentinised olivine sulphide cumulate
Location	:	Trial Harbour, Tasmania

Mineralogy	:	Mode %
Lizardite	:	70
Sulphide	:	15
Olivine	:	5
Chlorite	:	5
Brucite	:	5
Tremolite	:	Trace
Chromite	:	Trace

Former olivine grains contain minor relict olivine but are largely pseudomorphed by somewhat murky lizardite, brucite and chlorite. Chlorite and tremolite occur along former olivine grain boundaries. Olivines range from small (0.2mm) round to oval grains to larger polygonal shaped grains (up to 1.5mm across) with abundant mutual grain boundary contact. The smaller olivine grains are intergrown with sulphides either as inclusions within sulphide aggregates or along the margin of such aggregates (Figure 1).

Sulphides form lobate to cuspate-shaped aggregatges, up to 1cm across, largely or completely filling the interstitial space between olivine grains. The sulphide aggregates form a semi-continuous network of interconnected sulphides throughout the rock. As such the sulphide are a beautiful example of magmatic matrix or net-textured sulphides.

The sulphides consist of pyrrhotite and minor pentlandite. These are altered in places to trace amounts of violarite, pyrite and a minute trace of an unidentified sulphide (Figure 2).

Small chromite grains are intergrown with the sulphides.

An unusual feature of this rock is the complete lack of magnetite. Magnetite is a common product of serpentisation of olivine and its absence in this rock is somewhat puzzling.

957250

Sample 3093088

Rock Name	:	Serpentinised olivine sulphide mesocumulate
Location	:	Trial Harbour, Tasmania

Mineralogy	:	Mode %
Lizardite	:	70
Olivine	:	18
Chlorite	:	5
Sulphide	:	3
Chromite	:	2
Brucite	:	2
Tremolite		Trace

Relict olivine is present within a very fine-grained mixture of lizardite, brucite and chlorite which pseudomorph olivine grains. These grains range from round to oval 0.2mm sized grains associated with sulphide aggregates to 1.5mm polygonal shaped grains having a high proportion of mutual grain boundary contact with adjacent, similar grains (Figure 3).

Sulphides are disseminated throughout the rock showing classic magmatic textures of lobate aggregates filling the interstitial space between olivine grains (Figure 4). Sulphides consist of pentlandite (75%) and heazlewoodite (25%).

Chromite is commonly intergrown with the sulphide aggregates and have lobate shapes where chromite fills a high proportion of the interstitial space and are rounded to equant where the sulphide fills most of the space.

Sulphides and chromite are extensively veined by silicates. No magnetite is present in the rock, a surprising feature given the extensive serpentisation of olivine.

952251

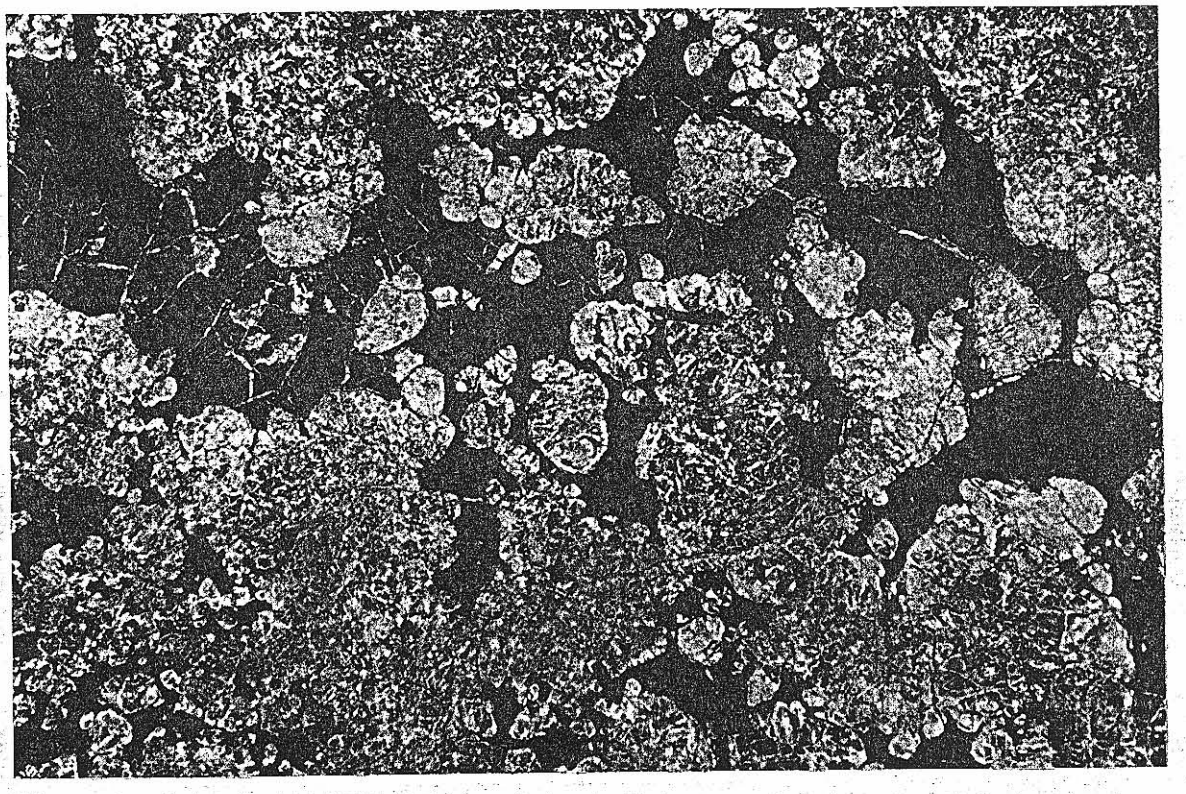

Figure 1 : Sample 3093087. Serpentinised olivine ranging from small round grains within sulphide (black) and coarser, anhedral grains away from the sulphide. Sulphide completely fills the interstitial space between olivine grains. Width of field is 8.7mm. Plane light.

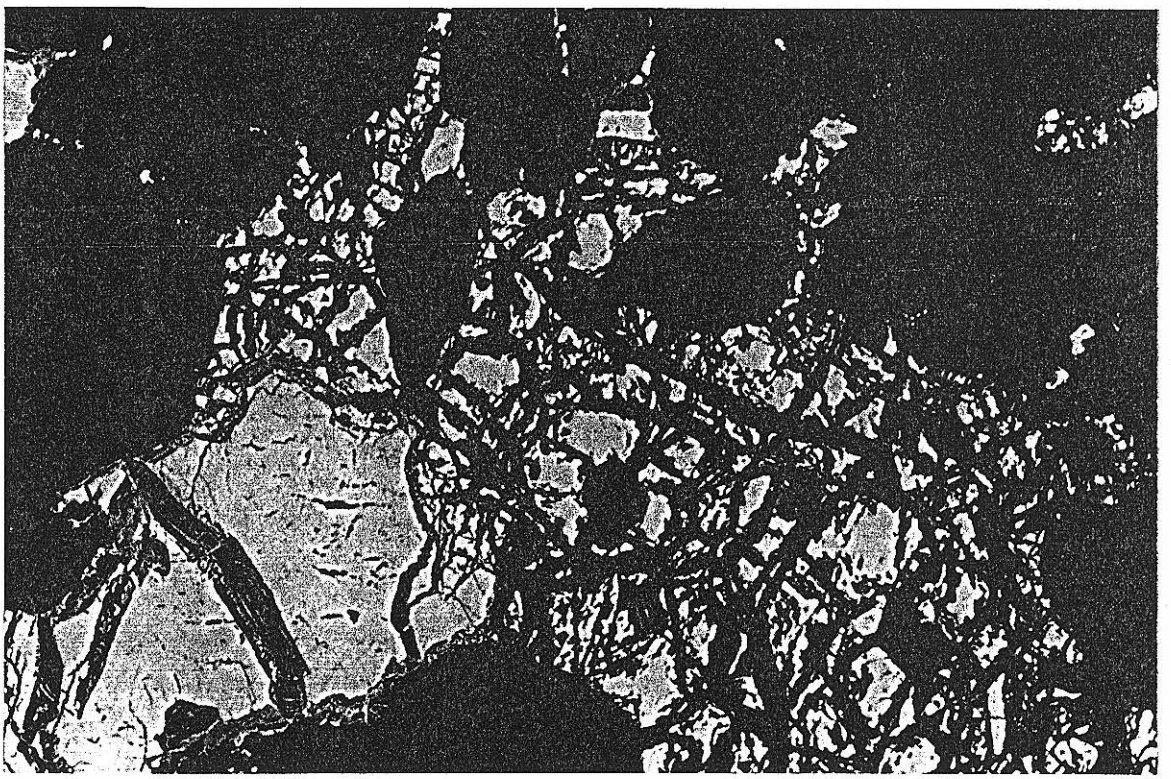

Figure 2. Sample 3093087. Pentlandite (cream), strongly veined by silicates and pyrrhotite (yellowish) moulded around altered olivine grains. Margins of pyrrhotite are altered to goethite. Pentlandite mode in this field of view is higher than average for rock. Field of view is 2.6mm. Reflected light.

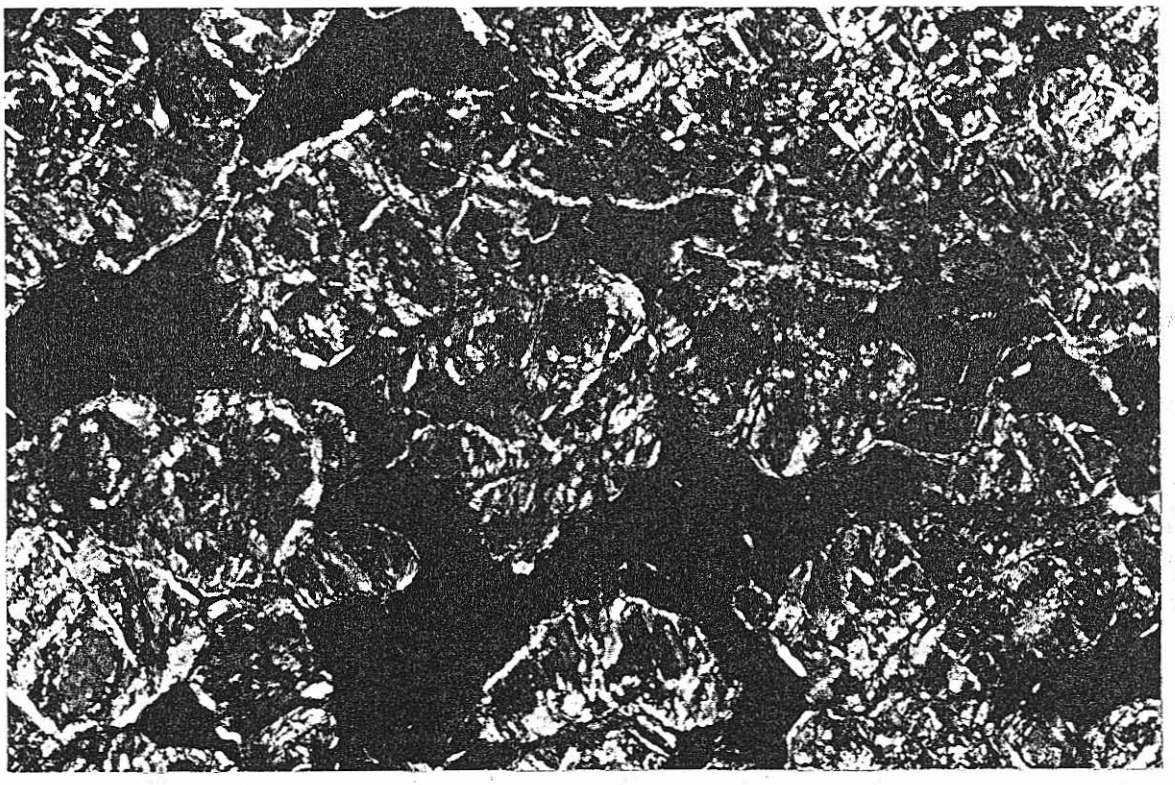

Figure 3 : Sample 3093088. Relict olivine (blue, red) and serpentine define rounded to anhedral grains with sulphide and chromite (both black) filling intergranular space. Width of field is 2.6mm. Cross nicols.

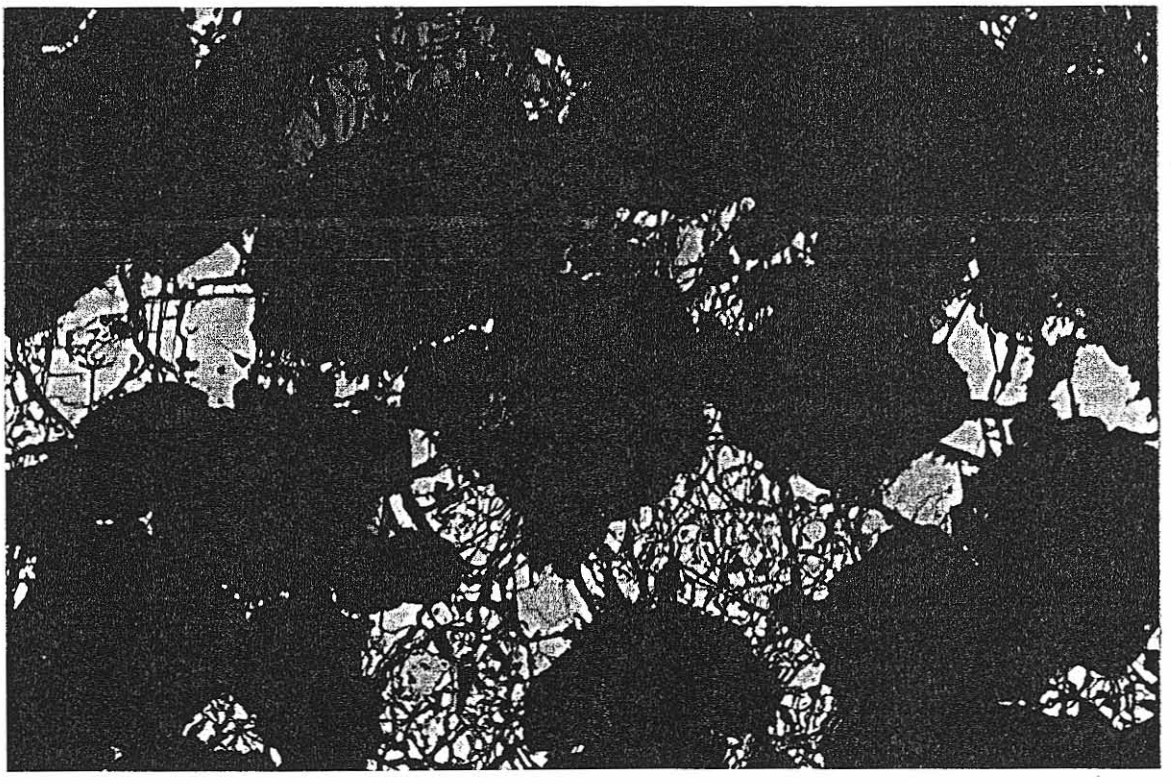

Figure 4 : Sample 3093088. Same field as Figure 3 showing pentlandite (strongly veined by silicates), heazlewoodite (clear, clean grains) and chromite (grey) moulding around former olivine grains. Reflected light.

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11th March 1993

957253

Dr M. Gole,
c/- CRA Exploration Pty. Limited,
21 Wynyard St
BELMONT W.A. 6104

SAMPLES SUBMITTED FOR PETROLOGICAL EXAMINATION

Dear Martin,

Please find enclosed 11 outcrop and dump samples that I would like thin-sectioned for petrological examination. Samples are from ultramafic/mafic bodies in western Tasmania.

Please provide a lithological and textural description for each sample, including photomicrographs if relevant. Sample 3528488 appears to show mineral layering on the weathered surface. Can you confirm whether this is primary igneous layering or a later structural/metamorphic modification?

Could you please return the sections and offcuts to me for our reference collection?

Thankyou for your help.

Yours sincerely,

ROBERT PARKINSON
(Project Geologist)

DPO 71541

Trial r Cuni

Martin Gole and Associates
Geological and Petrological Services

8 Landor Road
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957254

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.

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 3528485 Polished thin section

SERPENTINISED OLIVINE MESOCUMULATE

Mineralogy	mode %
Lizardite	80
Chlorite	10
Magnetite/ chromite	4
Tremolite	3
Brucite	3
Clinopyroxene	mtr

Partly weathered serpentine, all of which appears to have been lizardite, and very fine-grained chlorite forms mesh lines and cell-like structures throughout the rock. Patchy colour and relief variations within the lizardite and seen particularly in the centres of the cell-like structures are probably due to different generations of serpentine formed at various stages during the alteration of olivine. The cell centres appear to be where the last olivine was altered as these centres are composed of extremely fine-grained and even near-amorphous lizardite.

Very fine-grained tremolite and some brucite and rare relict clinopyroxene form cuspate shaped aggregates that may pseudomorph former intergranular areas between olivine. Apart from these structures no igneous textures are discernable.

Magnetite occurs as very fine grains throughout the lizardite. Chromite forms blocky to lobate aggregates that are strongly veined and rimmed by magnetite.

The current mineralogy, the apparant low igneous porosity, the lack of relict igneous olivine textures, the shape and low abundance of chromite all suggest that the rock was an olivine mesocumulate.

SAMPLE 3528486 Polished thin section

SERPENTINISED OLIVINE CHROMITE ORTHOCUMULATE

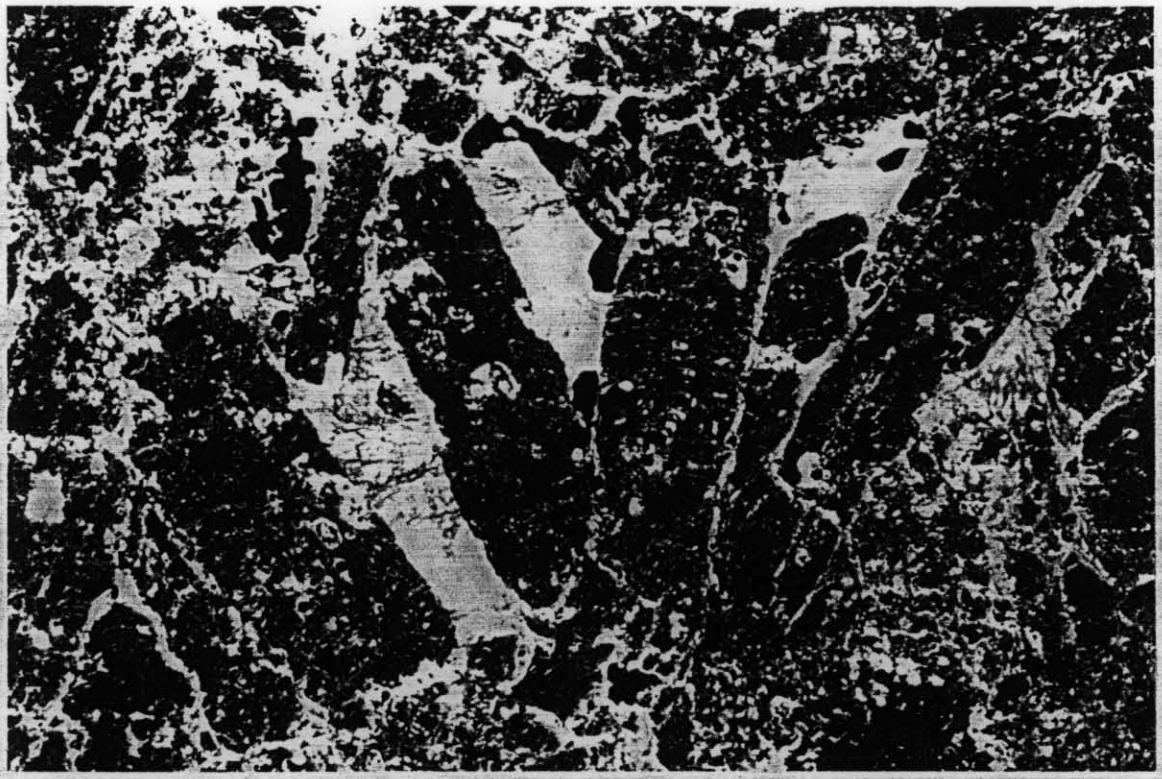
Mineralogy	mode %
Lizardite	55
Tremolite	15
Chlorite	10
Talc	7
Chromite	7
Pyroaurite	3
Magnetite	3

Weathered serpentine, all of which appears to have been lizardite, forms mesh lines throughout the rock. Chlorite, talc, some tremolite and pyroaurite occur as small patches and along the mesh lines. The identification of the pyroaurite is not certain due to very fine grain size. Its' general appearance suggests that it is pyroaurite and it is an expected mineral in such serpentinised rocks.

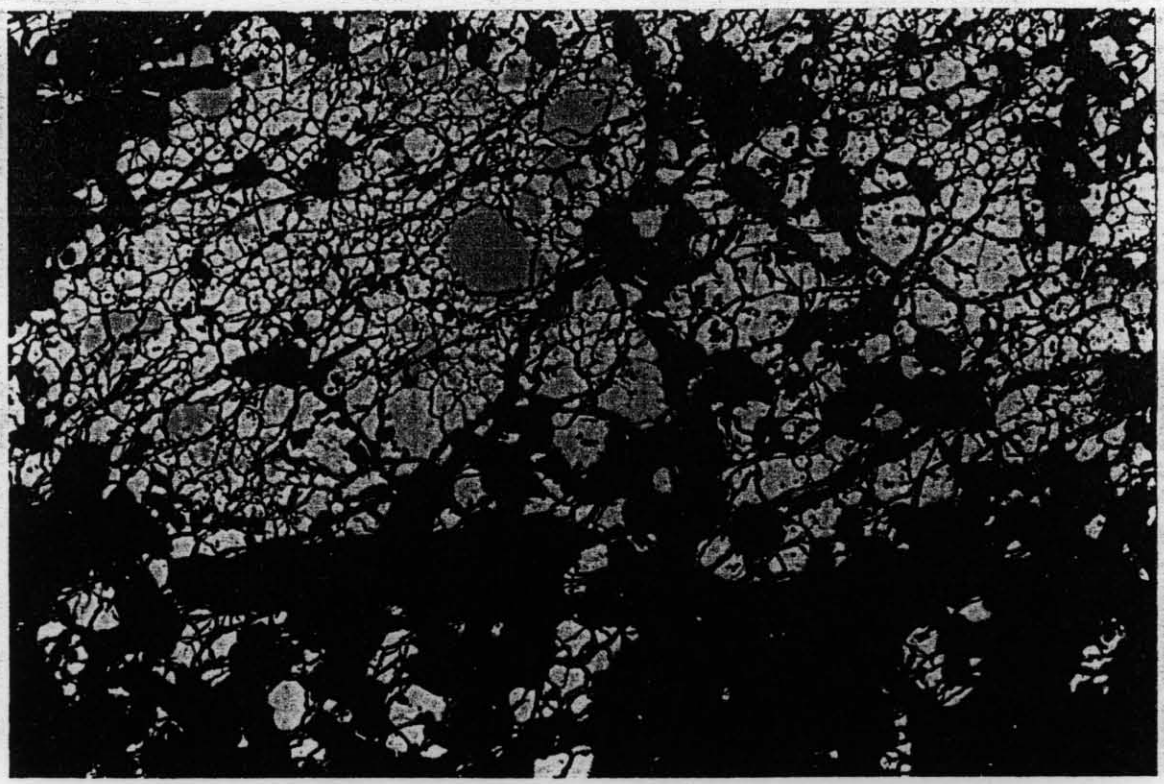
Over most of the slide no relict igneous textures are apparent. In one patch however pseudomorphed, tabular igneous olivine grains up to 4 mm long are well preserved. The intergranular space is filled by fine-grained fibrous tremolite and minor talc and pyroaurite.

Chromite is very unevenly distributed with most concentrated in crude bands or schlieren with some scattered grains throught the rock. The bands have up to 40% chromite with the chromite grains appearing to occur around the margins of former rounded to oval olivine grains 0.1-0.2 mm across. Chromite is strongly veined and rimmed by magnetite such that most grains are now probably Cr-rich magnetites with darker coloured chromite only preserved in the cores of the larger grains. Such textures are common in serpentinsed ultramafic rocks.

Based on the relict textures are current mineralogy the rock is a metamorphosed (serpentinised) olivine chromite orthocumulate.



Sample 3528486. Serpentinised tabular olivine grains pseudomorphed by lizardite with intergranular areas composed of tremolite, minor pyroaurite and chlorite. Crossed nicols. FOV = 8.7 mm.



Sample 3528486. Chromite and Cr-rich magnetite veined by silicates in chromite-rich band. In places olivine pseudomorphs can be seen within the chromite-rich areas. Reflected light. FOV = 2.6 mm.

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SAMPLE 3528487 Polished thin section

SERPENTINISED OLIVINE MESOCUMULATE

Mineralogy	mode %
Lizardite	85
Chlorite	5
Magnetite	4
Brucite	3
Tremolite	2
Chromite	tr

Mesh-textured weathered serpentine, all of which appears to have been lizardite, forms the bulk of the rock. Chlorite, brucite and tremolite are fine grains in small patches and isolated grains throughout the rock. Magnetite occurrs as small ragged grains and 'dust' scattered throughout the rock. Chromite is present as a few large grains strongly veined and rimmed by magnetite with the chromite as relict cores in only the largest opaque grains.

No relict igneous textures are apparent. Based on the current mineralogy the rock is identified as an serpentinised olivine mesocumulate with originally 90-95% olivine and 5-10% pyroxene and chromite.

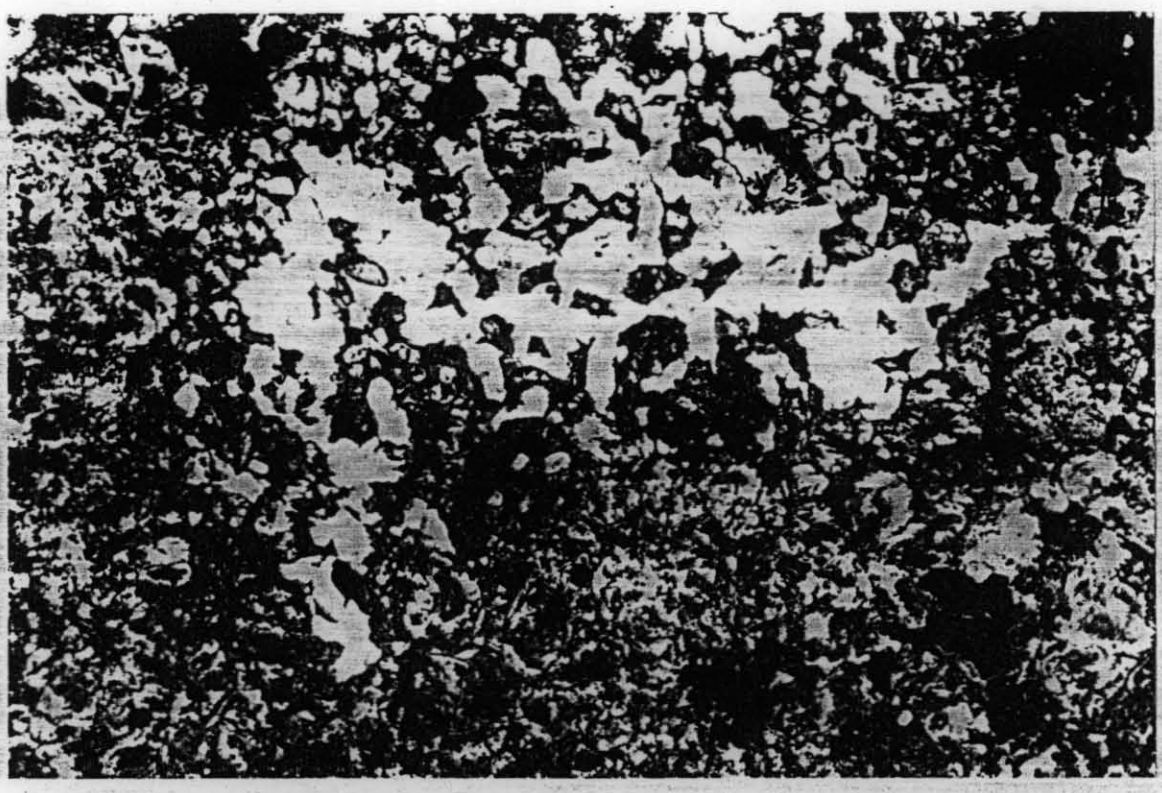
Sample 3528487. Mesh-textured lizardite and minor to trace magnetite, brucite and chlorite showing no recognisable relict igneous texture. Crossed nicols. FOV = 2.6 mm.

SAMPLE 3528488 Polished thin section

SERPENTINISED OLIVINE PYROXENE CUMULATE

Mineralogy	mode %
Lizardite	40
Talc	35
Chlorite	15
Magnetite	4
Tremolite	3
Chromite	tr

Well preserved igneous textures with 0.1-0.3 mm sized olivine grains pseudomorphed by weathered, murky lizardite and similar sized pyroxene pseudomorphed by fine-grained intergrown talc, chlorite and minor tremolite. Based on the pseudomorphing minerals being low in CaO, and asuming no calcium loss during alteration, the pyroxene was probably orthopyroxene. The rock has a crude igneous layering defined by bands of pyroxene and minor olivine interlayered with olivine and minor pyroxene. Chromite forms lobate aggregates that were interstitial to the cumulate-textured olivine and pyroxene grains. Chromite is strongly veined and rimmed by magnetite.



Sample 3528488. Patch of talc-pyroaurite pseudomorphing fine-grained somewhat tabular pyroxene within weathered, murky lizardite after olivine. Plane light. FOV = 2.6 mm.

Sample 3528488. Magnetite after chromite with smooth grey areas of lizardite after olivine and mottled grey areas of talc and chlorite (lath-like in places) after pyroxene. Reflected light. FOV = 2.6 mm.

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SAMPLE 3528489 Polished thin section

SERPENTINISED OLIVINE MESOCUMULATE

Mineralogy	mode %
Serpentine	75
Chlorite	15
Olivine	6
Magnetite	4
Tremolite	tr

This rock has two distinctly different serpentine types distributed in irregular patches 0.5-1 cm across. One is murky green and consists of mesh textured lizardite. The other is mostly colourless and consists of clear, more bladed serpentine, minor murky serpentine and small relict olivine grains up to 0.2 mm across. Original igneous olivine grains were probably up to 0.5 mm across although igneous textures are poorly preserved and it is mostly not possible to recognise former olivine grain boundaries. The two serpentine types probably represent different serpentinisation events.

Magnetite (probably Cr-rich magnetite) represents altered chromite which is scattered as equant grains throughout the rock.

Based on the current mineralogy and the lack of apparent relict igneous textures the rock is a serpentinised, fine-grained olivine mesocumulate.

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SAMPLE 3528490 Polished thin section

SERPENTINISED OLIVINE ADCUMULATE

Mineralogy	mode %
Lizardite	85
Brucite	5
Magnetite	5
Chromite	2
Olivine	3
Pyroaurite	tr

The rock consists of very fine-grained, mesh-textured lizardite with scattered relict olivine. In contrast to most other rocks described in this report this rock is relatively fresh with lizardite being mostly colourless. Igneous textures are moderately well preserved and occassional shapes of former olivine grains, 2-3 mm across, can be recognised. Brucite occurs as irregular patches throughout the rock and pyroaurite in veinlets and patches. Chromite is concentrated in a patch of equant to lobate to partly sheletal grains that are strongly veined by silicates and magnetite.

The current mineralogy and the tight packed relict igneous texture suggest that the rock is a serpentinised olivine adcumulate.

Sample 3528490. Mesh-textured lizardite with scattered relicts of igneous olivine. Crossed nicols. FOV = 2.6 mm.

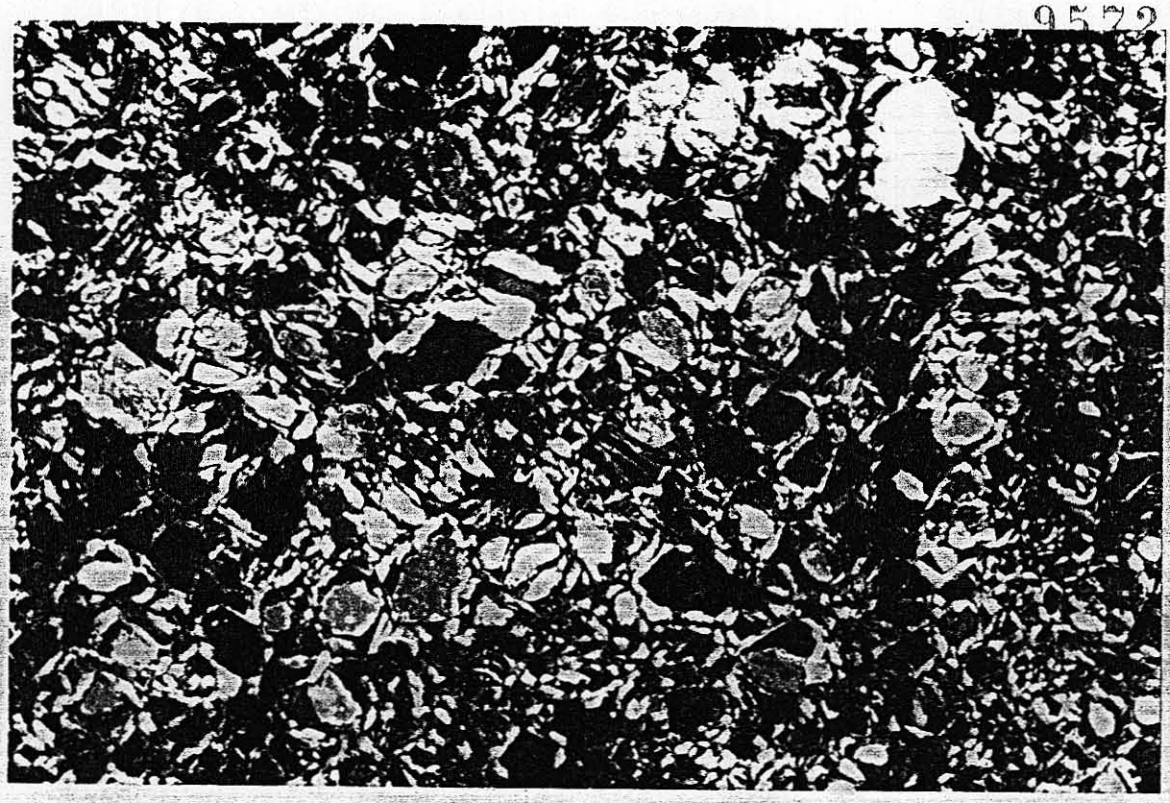
SAMPLE 3528491 Polished thin section

PARTLY SERPENTINISED OLIVINE ADCUMULATE

Mineralogy	mode %
Lizardite	60
Olivine	30
Chlorite	3
Magnetite	2
Chromite	tr
Pyroaurite	tr

Igneous olivine partly altered to weathered, murky, mesh-textured lizardite. In places the original size and shape of the igneous olivine can be recognised showing them forming a polygonal aggregate with a grain size of about 0.6-1 mm. Chromite occurs as lobate grains strongly veined and rimmed by magnetite.

The mineralogy and relict igneous texture shows the rock to be a weathered, partly serpentinised, fine-grained olivine adcumulate.



Sample 3528491. Abundant relict igneous olivine partly altered to mesh-textured lizardite. Crossed nicols. FOV = 2.6 mm.

Sample 3528491. Same field of view as above. Plane light. FOV = 2.6 mm.

957268

SAMPLE 3528492 Polished thin section

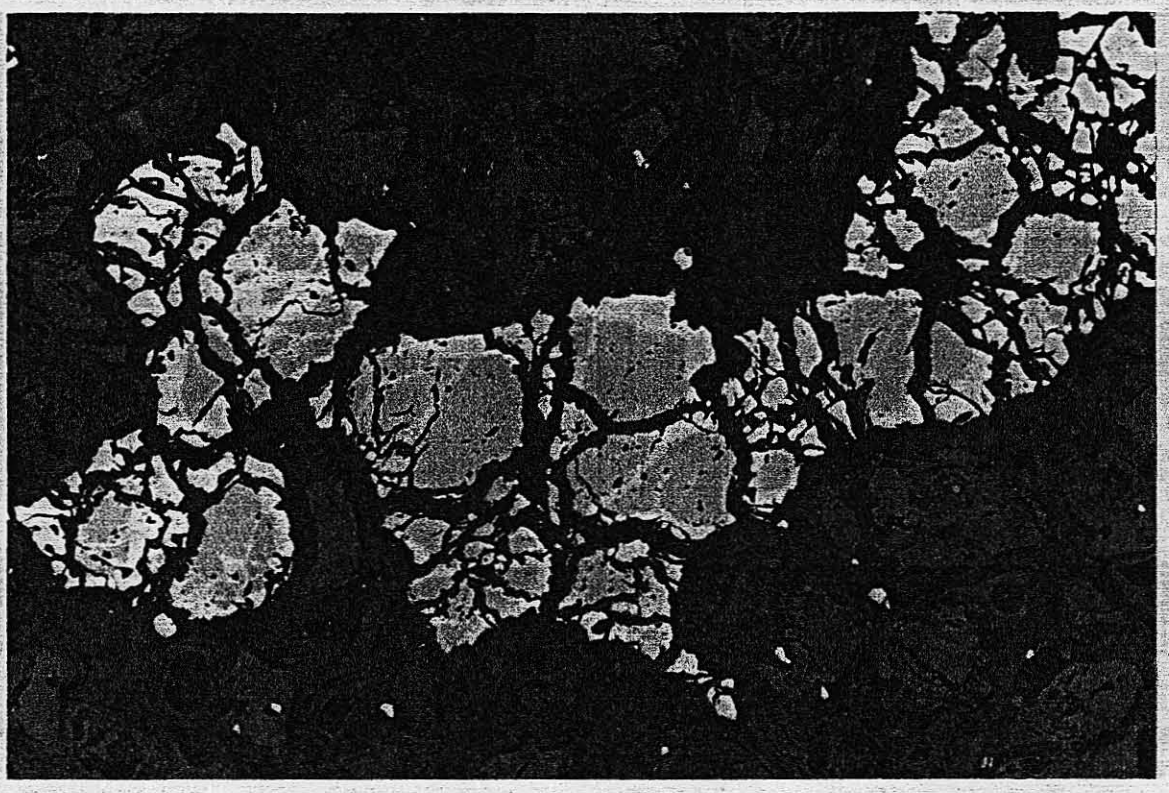
SERPENTINISED OLIVINE MESOCUMULATE

Mineralogy	mode %
Lizardite	60
Carbonate	15
Chlorite	10
Tremolite	9
Magnetite	4
Chromite	2
Olivine	tr

Igneous textures are moderately well preserved in several patches although over most of the slide they are not recognisable. The patches are up to 1 cm across and consist of loosely packed tabular to oval shaped olivine grains pseudomorphed by carbonate and weathered murky lizardite. Intergranular areas are composed of very fine-grained fibrous tremolite and chlorite after pyroxene. Carbonate occupies the centres of serpentine-rich cell-like structures. This carbonate may be pedogenic in origin as it has a colloform habit in places.

Over most of the slide no igneous textures are recognisable as presumably the olivine was tightly packed with no intergranular space. Thus the relict igneous textures are seen only where there was intergranular pyroxene.

The rock is identified as a serpentinised olivine mesocumulate with small patches of orthocumulate texture. Such patches are common in olivine mesocumulates.



Sample 3528492. Relict lobate chromite (darker grey) veined and rimmed by magnetite (lighter grey) and by silicates. The chromite is in a matrix of lizardite (poor polish, darker grey) and carbonate (good polish, slightly lighter grey). Reflected light. FOV = 1.3 mm.

SAMPLE 3528493 Polished thin section

WEATHERED SERPENTINISED OLIVINE MESO/ADCUMULATE

The rock consists of murky brown clay after lizardite. No discernable igneous textures are apparent except for one large magnetite/chromite aggregate. This is 3 mm long and has a lobate shape typical of chromites in olivine adcumulates. The chromite is strongly veined and rimmed by magnetite.

The absence of any relict igneous texture and the lobate shape of the chromite suggest that the rock is a serpentinised olivine mesocumulate or adcumulate. Further description of the rock would not clarify its character further.

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957271

23rd June 1993

Dr M. Gole,
Martin Gole and Associates,
8 Landor Rd,
GOOSEBERRY HILL W.A. 6076

SAMPLES SUBMITTED FOR PETROLOGICAL EXAMINATION

Dear Martin,

Please find enclosed assay results for the intervals covering the 23 drill core samples that I sent to you for examination.

The samples come from eight 60m deep holes drilled across the Trial Harbour ultramafic to get a feel for the "stratigraphy" of the body. Based on outcrop mapping and trying to relate this to what I've seen in drill core, I have divided the body into three broad zones:-

1. lower ol adcumulate
2. middle ol-mt orthocumulate
3. upper ol (+/-mt) mesocumulate

The ortho- meso- adcumulate terms may be just artistic licence as I can't really see individual ol grains. It is more based on mt content. i.e. no mt = adcum, lot mt = orthocum.

Samples 3530281-90 are from holes drilled beneath old Ni workings, and are interpreted to be from the upper mesocumulate zone. They appear to be richer in sulphide than the rest of the samples.

Samples 3530291,92,94 are from the ol-mt orthocumulate zone and contain abundant mt. Samples 93,95-98 are also from this zone, but are "oddball" rocks that I had trouble identifying.

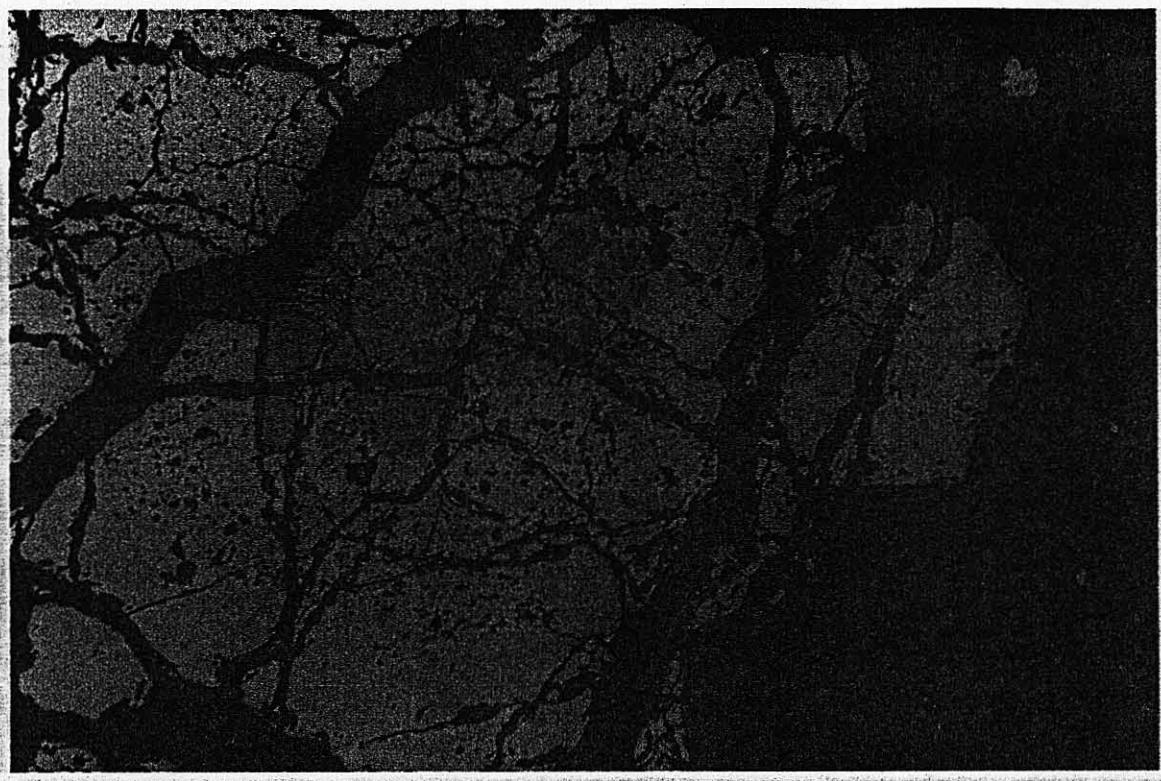
Sample 3530299 is from the lower adcum zone

Sample 3530300 is from the upper mesocumulate zone.. Samples 3528494-96 are also from the upper mesocumulate zone, but are rocks not really characteristic of the unit. Some sulphides are visible in the intervals from which 494-496 were taken.

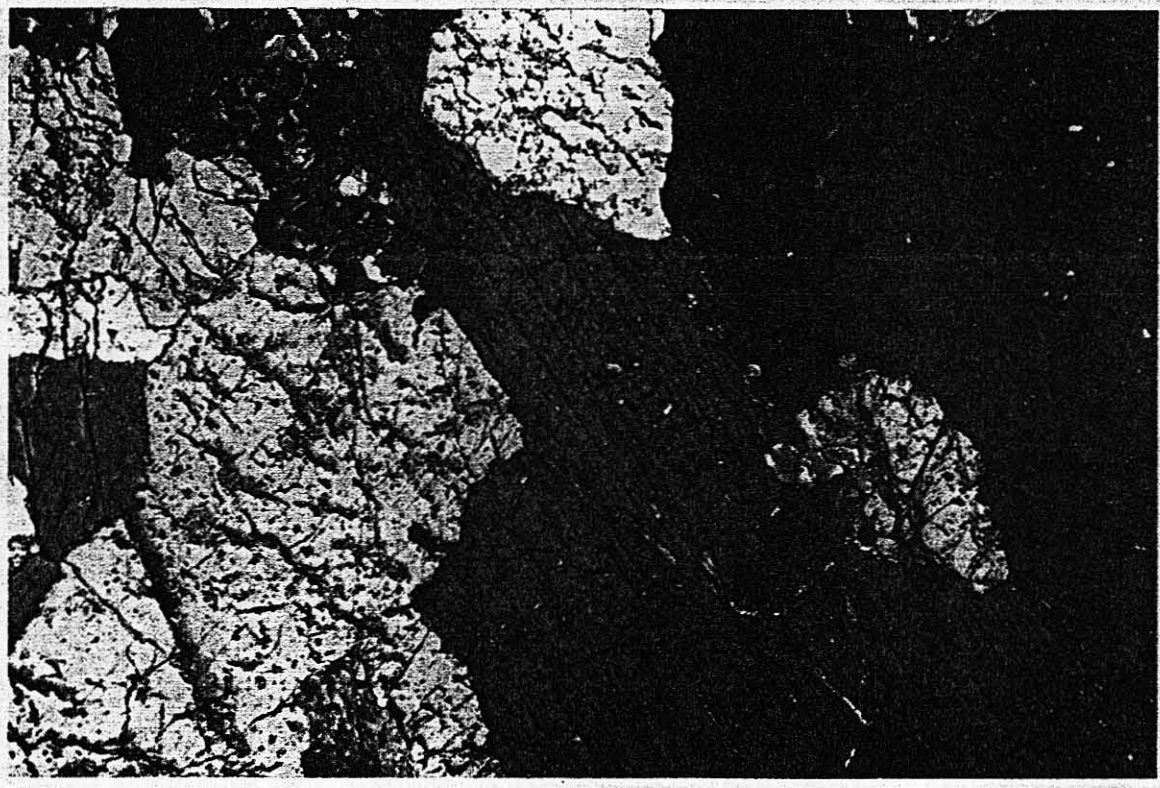
I have also enclosed a sketch map showing the rough geology and sample locations.

Yours sincerely,

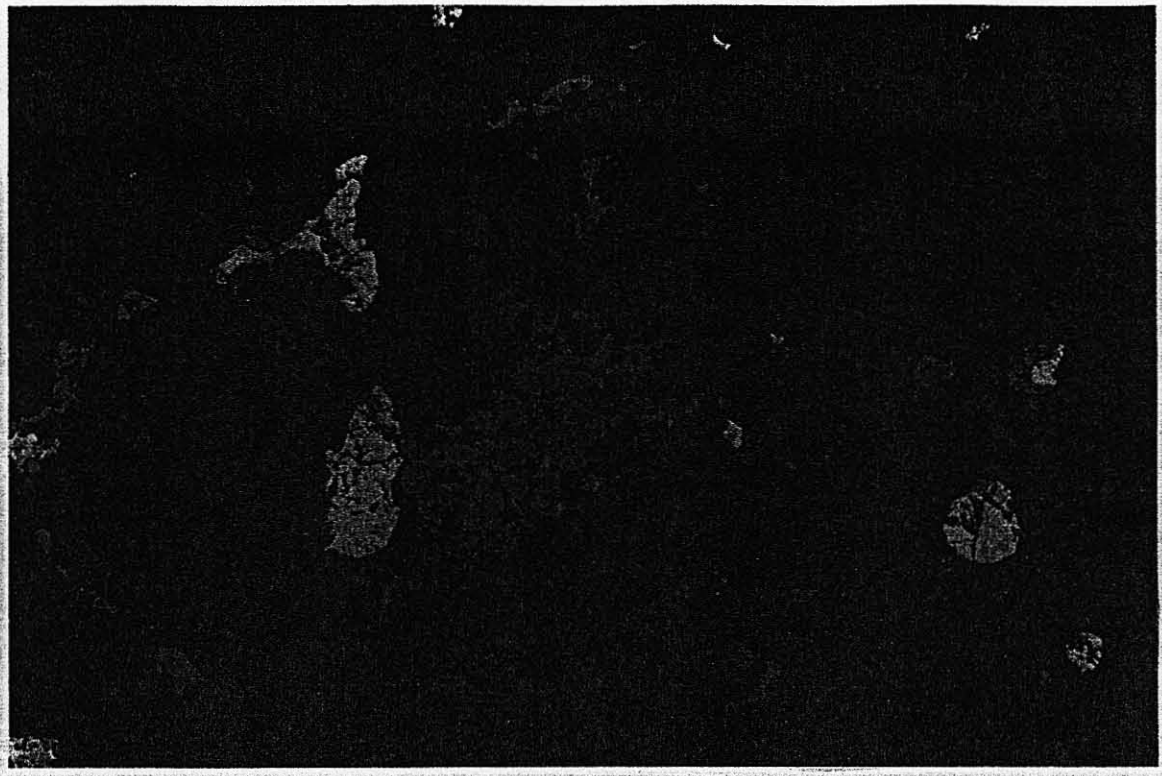
ROBERT PARKINSON
(Project Geologist)



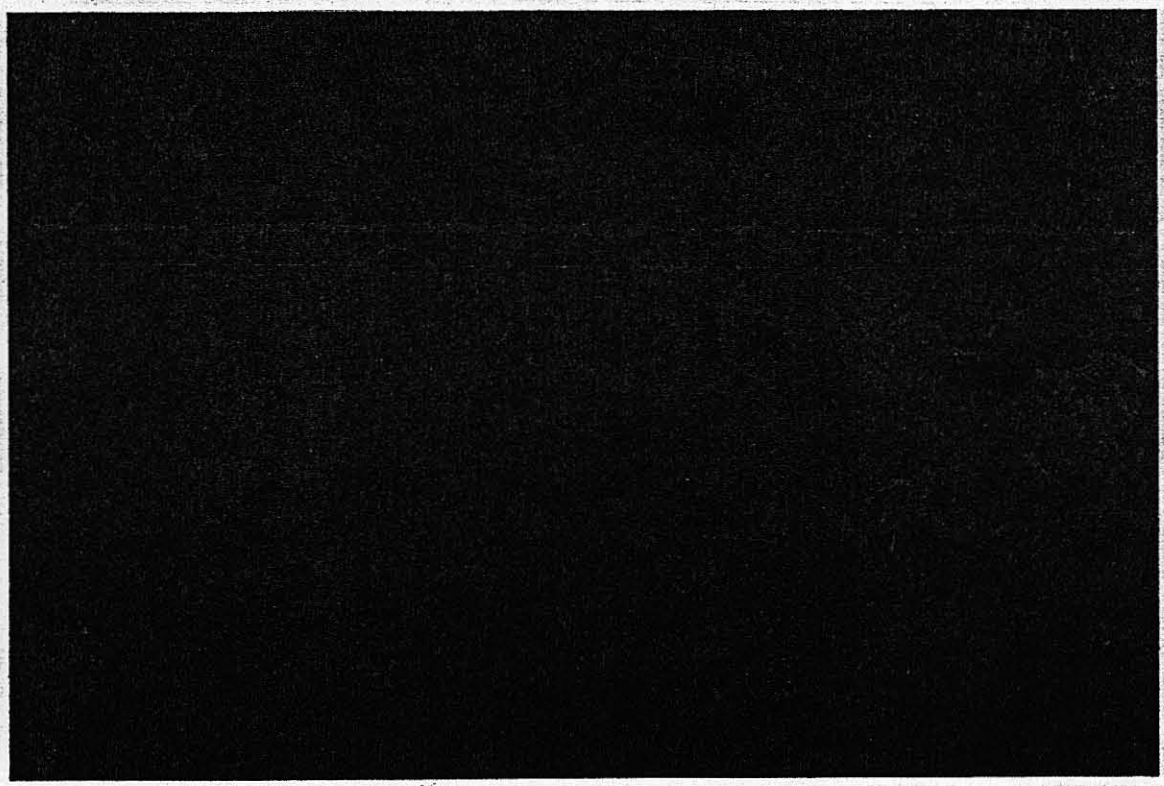
Sample 3530292. Blocky magnetite (light grey) and inclusions of chromite (darker grey). In this texture the chromite looks like a relict phase but sharp mutual boundaries may suggest otherwise (see Summary). Width = 2.6 mm.



Sample 3530293. Fresh, anhedral augite with small patch of srepentine and chlorite after olivine in upper left corner. Width = 2.6 mm.



Sample 3530293. Sulphide aggregates with smooth, curved grains boundaries against augite. Other opaques are chromite (dark grey) and fine grained magnetite (lighter grey). Width = 2.6 mm.



Sample 3530293. Patch of chromite intergrown with augite with thin rims and veins of retrograde magnetite. Width = 2.6 mm.

Sample 3530294

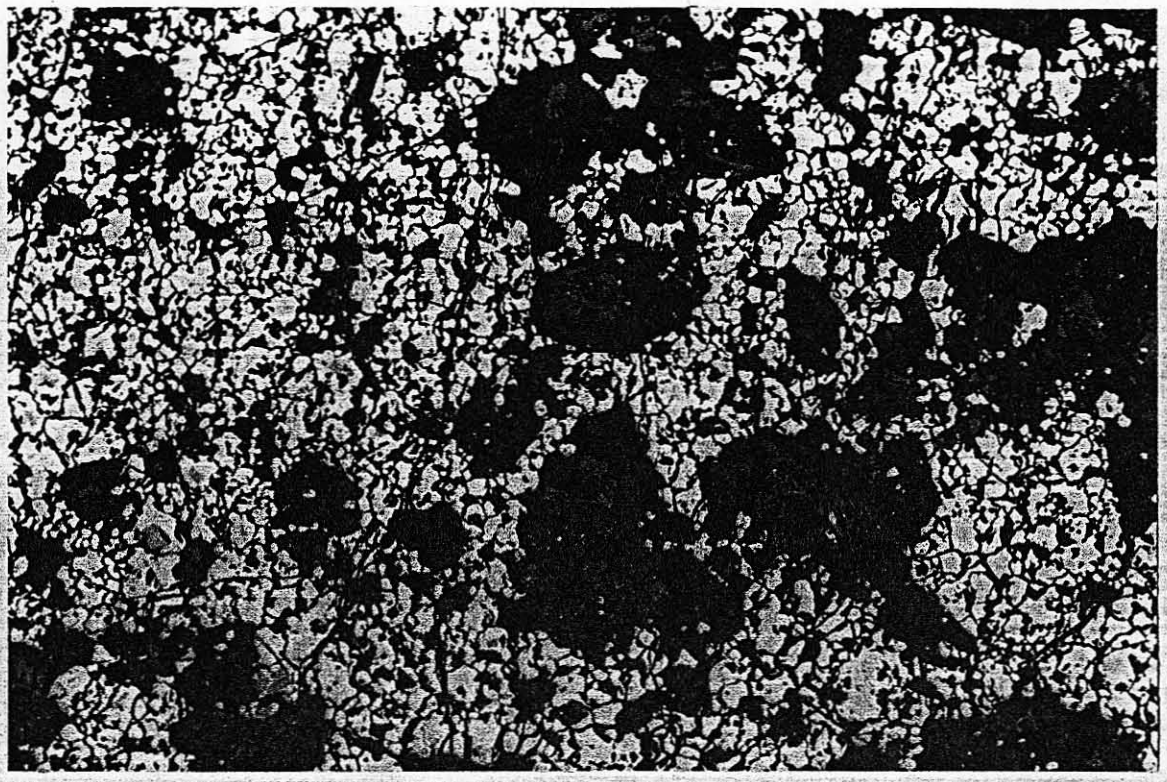
MAGNETITE OLIVINE PYROXENE HORNFELS

Mineralogy	mode %
Magnetite	50
Carbonate	15
Serpentine	10
Tremolite	10
Chromite	8
Chlorite	5
Talc	2

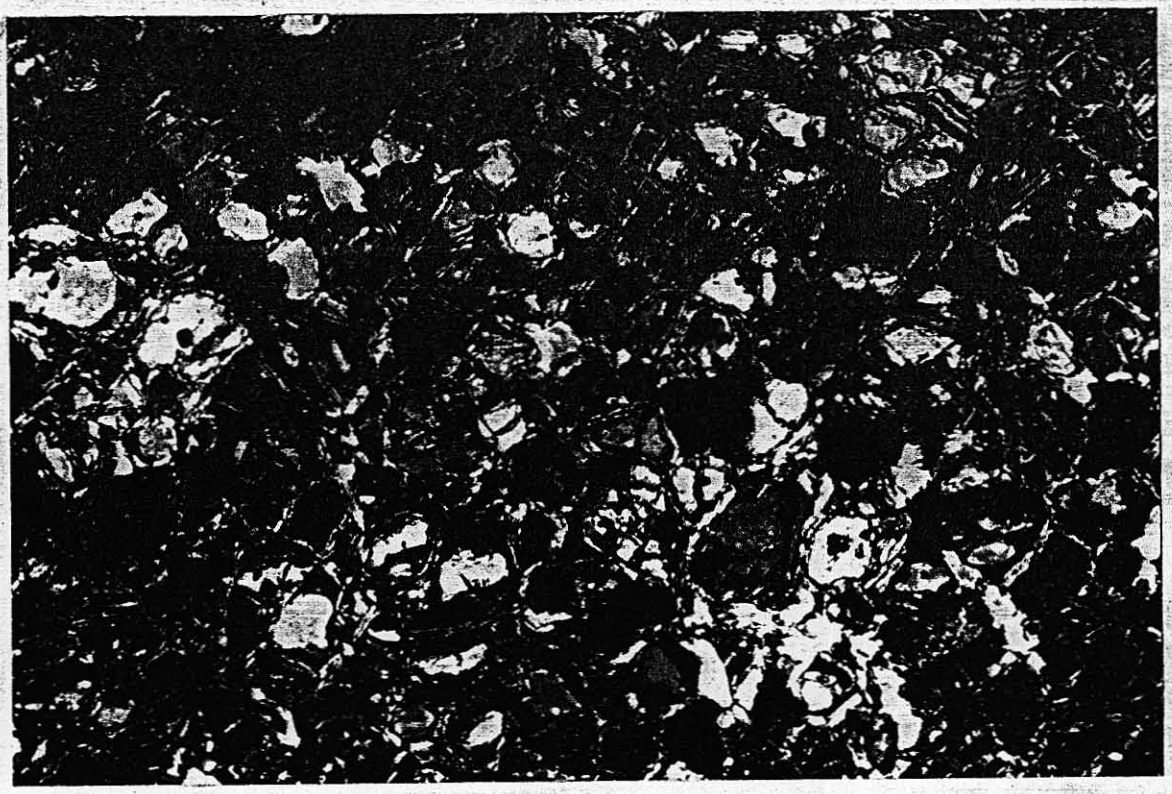
Magnetite aggregates form an interconnected network throughout the rock with patches of fine grained, entirely recrystallised silicates and carbonate. The silicate patches range in size from 50 um representing single grains to what were originally large aggregates of silicates that formed texturally well adjusted grains against magnetite aggregates. Based on the current mineralogy these silicates were olivine and pyroxene. Chromite is intergrown with but has very sharp grains boundaries against magnetite and both these minerals appear to part of the same mineral asemblage with olivine and pyroxene. Chromites show some minor, probable retrograde alteration and veining by magnetite.

The rock is layered with variations in mode and grain size. This layering is cut by veins of tremolite, chlorite and serpentine.

The assemblage of magnetite, olivine, pyroxene and chromite is not an igneous assemblage. Chromite and magnetite are incompatable under magmatic conditions and igneous magnetite occurs in fractionated rocks, not ultramafic cumulates. The presence of such a high proportion of magnetite with well adjusted grain boundaries against olivine, pyroxene and minor chromite must be a function of high grade metamorphism.



Sample 3530294. Fine grained aggregate of well formed magnetite with patches of serpentine after olivine. Width = 2.6 mm.



Sample 3530295. Partly serpentinised olivine. Note fine grain size reflected by different pleochroic colours. Width = 2.6 mm.

957276

Sample 3530295

PARTLY SERPENTINISED OLIVINE MAGNETITE CHROMITE HORNFELS

Mineralogy	mode %
Serpentine	45
Olivine	33
Chlorite	10
Magnetite	6
Carbonate	3
Tremolite	1.5
Chromite	1
Pyrrhotite	0.5

Relict olivine partly altered to murky, weathered serpentine define an original texture of closely packed, very fine grained (0.2 - 0.7 mm) mosaic. In a few places there appears to have been intergranular space between olivine grains which is now filled by very fine grained fibrous chlorite. The original proportion of such space is difficult to estimate due to the weathering but it probably amounted to about 5%. It is not clear what this chlorite pseudomorphs but it could be Mg spinel, a common phase in high grade metamorphosed ultramafic rocks.

Magnetite ranges from equant, well formed grains some of which are intergrown with and have sharp grain boundaries with chromite to very fine, wispy grains. These latter appear to be related to retrograde serpentinisation.

Two generations of carbonate veins cut the rock. Within and along the margin of the earliest vein are some pyrrhotite grains.

There are no clear cut textures in this rock to indicate that the rock is either igneous or metamorphic except for the presence of both magnetite and chromite within the pre-serpentinisation olivine-rich assemblage.

Sample 3530296

PARTLY SERPENTINISED OLIVINE MAGNETITE CHROMITE HORNFELS

Mineralogy	mode %
Serpentine	70
Olivine	15
Chlroite	5
Magnetite	5
Chromite	4
Carbonate	1
Pyroaurite	tr
Sulphide	mtr

Despite extensive alteration to serpentine, sufficient olivine is preserved in places to see that the original texure consisted of a fine grained mosaic of 0.2 - 0.4 mm olivine grains. Chromite and magnetite are intergrown with sharp contacts and both have equilibrium, curved grain boundaries against pseudomorphed olivine. Chromite does not occur as cores in the larger magnetite grains as is common in many sample of this rock suite. However most of the chromite grains have fine rims and veinlets of magnetite, probably of retrograde (serpentinisation) origin.

Veins of late carbonate are present.

A few specks of ragged, complexly intergrown pentlandite, millerite, violarite and pyrrhotite. These grains appear to be metamorphic in origin.

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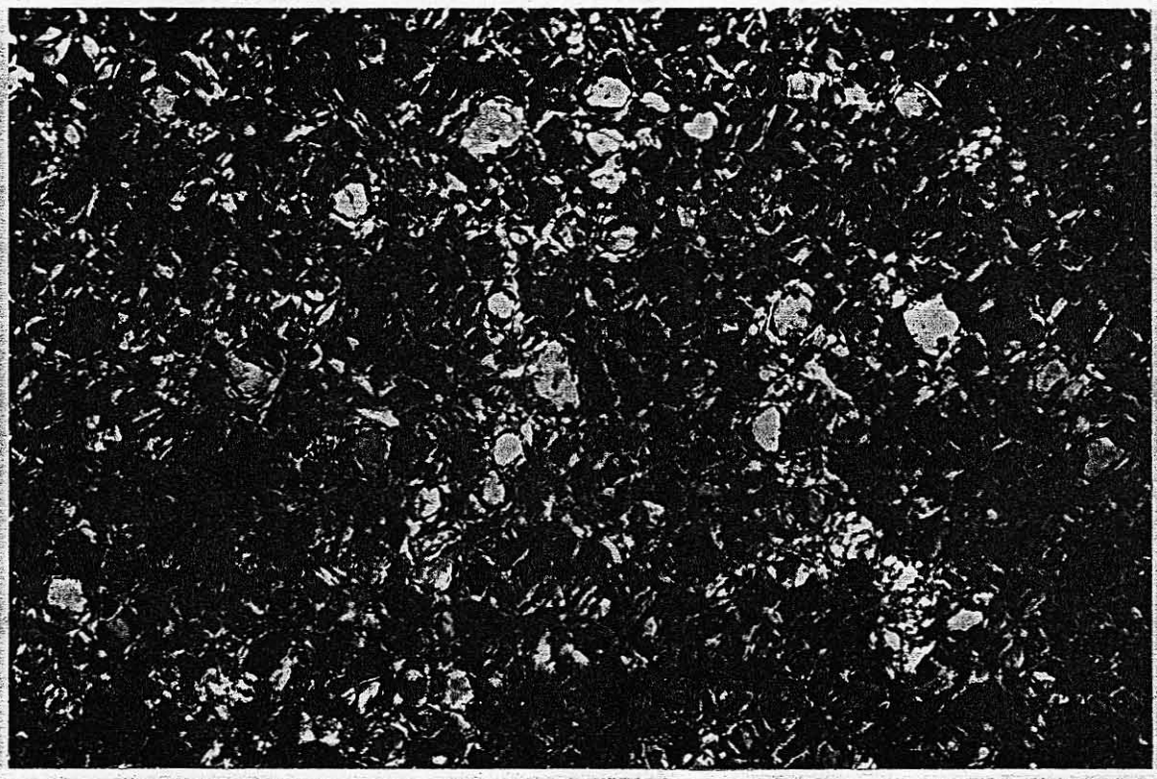

Sample 3530296. Relict olivine surrounded by serpentine.
Width = 2.6 mm.

Sample 3530297

PARTLY SERPENTINISED OLIVINE HORNFELS

Mineralogy	mode %
Serpentine	70
Olivine	15
Magnetite	5
Brucite	4
Chlorite	3
Chromite	2
Carbonate	1
Pyrrhotite	mtr

Relict textures are moderately well preserved. Original olivine grains shapes and sizes are shown by scattered relict olivine with similar extinction. Two distict olivine grain sizes are present. Most of the rock was composed of a mosaic of fine grained, tight packed granular olivine. At one end of the slide are pseudomorphed blades or tabular grains up to 5 x 1 mm that are present within the fine grained granular olivine. The blades are now composed of carbonate, serpentine and minor relict olivine. The reason for the different alteration mineralogy of the bladed and granular olivine is not known but may be due to slight differences in composition.

Equant to oval, well formed opaque grains form lobate aggregates that filled original triple-point junctions between olivine grains. Opaques consist of magnetite and intergrown chromite which is present in the cores of some of the larger magnetite grains.

Pyrrhotite grains are moulded around altered olivine grains and appears to have been part of the olivine, magnetite and chromite assemblage.

Sample 3530297. Carbonate-rich psesudomorphs of tabular olivine in matrix of mostly serpentinised granular olivine. Width = 8.7mm.

Sample 3530297. Close up of above showing olivine blade pseudomorph containing trace of relict olivine and serpentinised granular olivine matrix. Width = 2.6 mm.

957281

Sample 3530298

BRECCIATED METASOMATISED ULTRAMAFIC ROCK

Mineralogy	mode %
Serpentine	25
Talc	25
Chlorite	20
Tremolite	10
Carbonate	10
Magnetite	7
Chromite	3
Sulphide	mtr

The rock consists of breccia fragments composed of serpentine, granular magnetite and minor chromite, similar to many of the other rocks in this suite, separated by talc-carbonate and tremolite-chlorite veins and shears. The vein and shear minerals have a different compostion to those forming the rock fragments and suggest that the breccia has been metasomatised by the introduction of Ca, Si and CO_2 along the shears. This suggests that the rock is probably near or within a fault zone.

Complex intergrowths of pyrrhotite partly altered to pyrite occur in the veins and shears.

Sample 3530299

SERPENTINISED OLIVINE HORNFELS

Mineralogy	mode %
Serpentine	70
Olivine	10
Chlorite	8
Magnetite	7
Carbonate	2
Tremolite	1
Chromite	1
Brucite	1

Relict olivine partly altered to murky, weathered serpentine define an original texture of closely packed, very fine grained (0.2 - 0.7 mm) mosaic of granular olivine. In a few places there appears to have been intergranular space between olivine grains amounting to about 5% which is now filled by very fine grained fibrous chlorite. It is not clear what this chlorite pseudomorphs but it could be Mg spinel, a common phase in high grade metamorphosed ultramafic rocks.

Magnetite ranges from lobate to equant, well formed grains some of which are intergrown with and have sharp grain boundaries with chromite to very fine, wispy grains. These latter appear to be related to retrograde serpentinisation.

The rock is cut by diffuse 4 mm wide veins of serpentine and brucite with recrystallise and destroy the relict texture along the vein margins.

There are no clear cut textures in this rock to indicate that the rock is either igneous or metamorphic except for the presence of both magnetite and chromite within the pre-serpentinisation olivine-rich assemblage.

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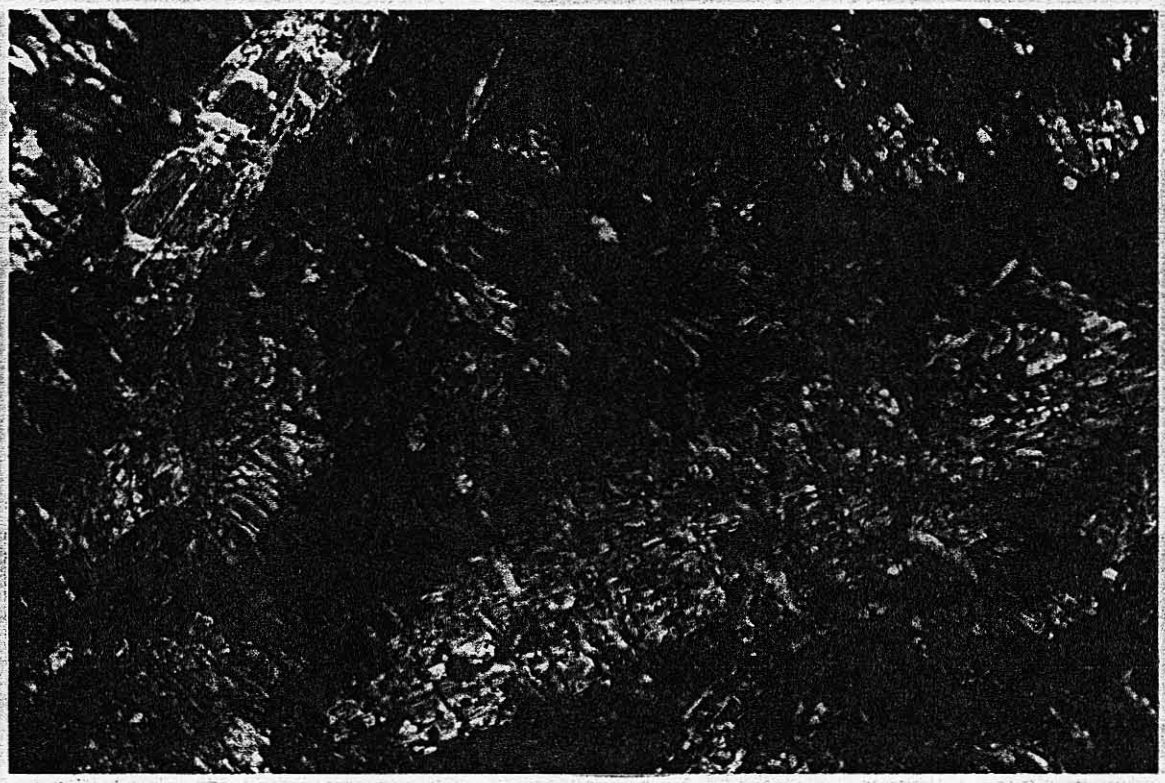
Sample 3530300

SERPENTINISED OLIVINE PYROXENE AMPHIBOLE HORNFELS

Mineralogy	mode %
Serpentine	65
Tremolite/ cummingtonite	15
Chlorite	12
Chromite	5
Magnetite	3

Pre-serpentinisation textures are well preserved and allow a good estimate of the original mineralogy to be made. This consisted of olivine, tremolite/cummingtonite and minor chromite and magnetite. The original mode was approximately 65% olivine, 28% tremolite/cummingtonite, 5% chromite and 2% magnetite. Olivine is totally altered to serpentine and chlorite and tremolite/cummingtonite is strongly altered to serpentine and chlorite. Olivine pseudomorphs are moderately well preserved due to preferred alignment of serpentine within individual grains. Olivine shapes were tabular to polygonal grains up to 1.3 mm but with a wide range in sizes ranging down to 0.4 mm. Intermately intergrown tremolite/cummingtonite forms randomly oriented needles and sprays of needles up to 1.4 mm long. Texturally these amphiboles are part of the pre-serpentine assemblage along with olivine and opaques.

The pseudomorphed textures and mineral assemblage is without doubt that of a relatively high grade metamorphic rock. The lack of preferred orientation in the amphiboles may suggest that the rock formed by contact metamorphism and the rock is thus an ultramafic hornfels.



Sample 3530300. Tremolite/cummingtonite needles surrounded by serpentine after olivine. Width = 2.6 mm.

957285

Sample 3528494

METASOMATISED ALTERED ULTRAMAFIC

Mineralogy	mode %
Serpentine	40
Talc	15
Carbonate	15
Tremolite	10
Chlorite	10
Chromite	6
Magnetite	4

This rock is mineralogically similar to sample 3530298 except it is not brecciated. The rock is strongly recrystallised with the non-opaque minerals not retaining any relict textures of the original rock. The opaques form granular aggregates of separate magnetite as well as chromite-magnetite intergrowths similar to those in other rocks of this suite. Carbonate, tremolite and minor talc occur in diffuse veins and patches and it mostly appears that the components for these minerals have been introduced into the rock.

957286

Sample 3528495

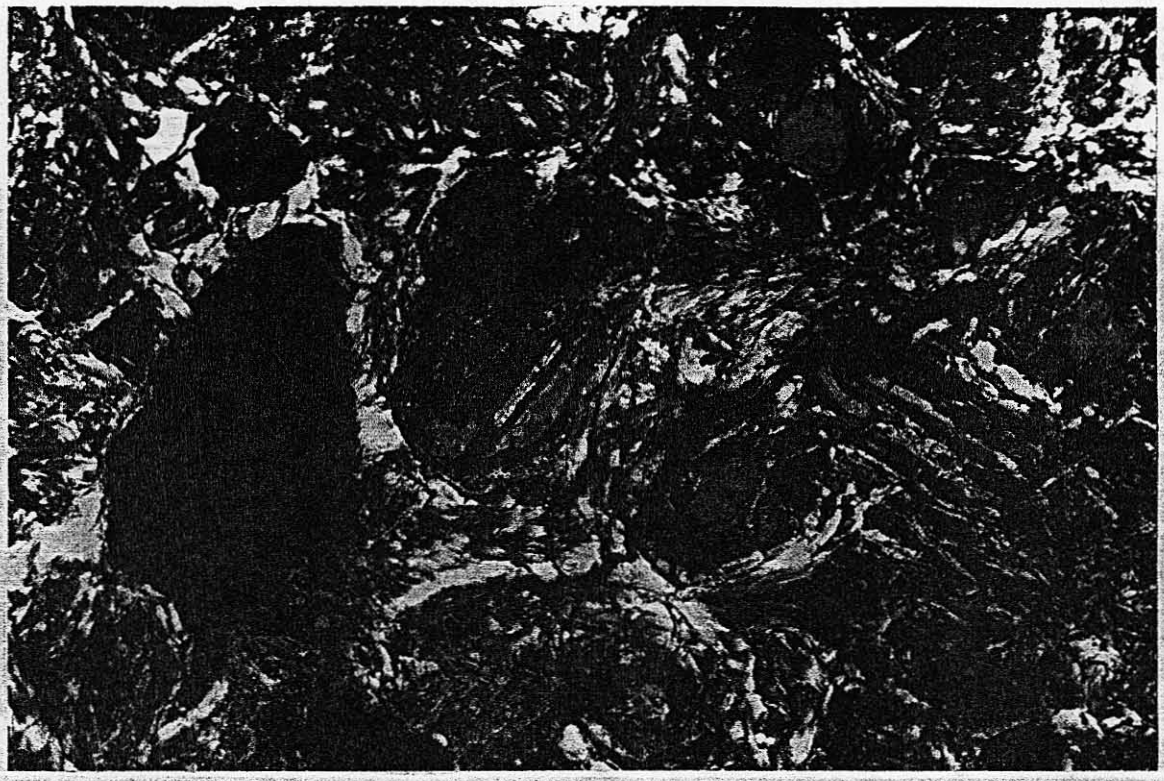
SERPENTINISED OLIVINE HORNFELS

Mineralogy	mode %
Serpentine	60
Chlorite	15
Olivine	8
Tremolite	5
Magnetite	5
Brucite	5
Chromite	2
Sulphide	mtr

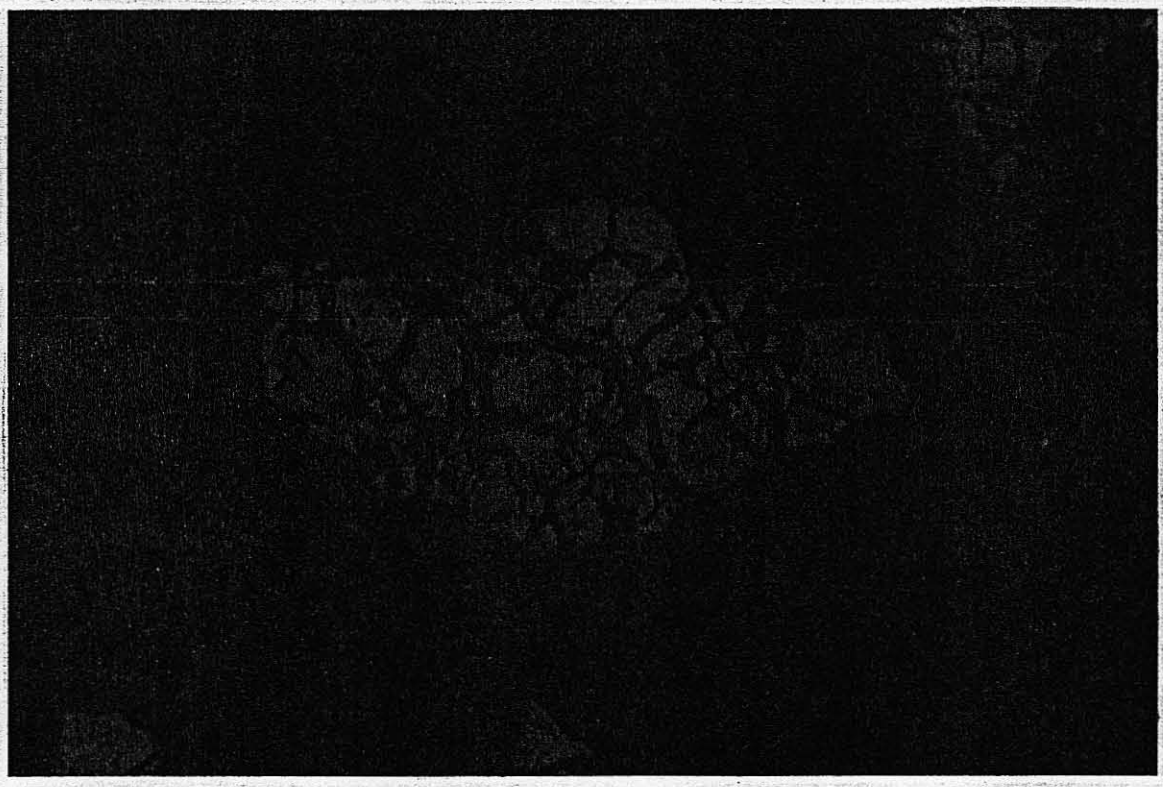
Relict textures are poorly to moderately well preserved. Serpentine has a murky appearance due to weathering. Isolated relicts of olivine and patches of aligned serpentine fibres define former olivine grains 0.3 - 0.6 mm across in a granular aggregate with abundant mutual grain boundaries. Chlorite occurs as scattered patches throughout the rock that define intergranular positions between former olivine grains. It is not clear what mineral the chlorite pseduomorphs but it could have been Mg spinel. Such space probably amounted to 10% of the rock. Brucite is mostly observed in fine stringers and veinlets.

Opaques consist of magnetite with, in the larger grains, cores of chromite. Grain boundaries between these grains are sharp. The opaques form large blocky aggregates and also occur as small scattered grains that appear to have smooth, curved contacts with the former olivine grains. Ragged, very fine grained magnetite occurs intergrown with serpentine and probably formed at the same time as the serpentine.

A few small aggregates of lobate sulphide are present that appear to have been in textural equilibrium with olivine. The sulphide is heazlewoodite and it is finely intergrown with retograde silicates. The heazlewoodite may have altered from pentlandite during serpentinisation.



Sample 3528495. Relict olivine and chromite grains with intergranular space filled by very fine grained chlorite. This texture is similar to those in olivine orthocumulate rocks. Width = 2.6 mm



Sample 3528495. Magnetite (light grey) and chromite (dark grey) intergrowth. Note sharp mutual grain boundaries. Texture is taken to indicate these minerals are part of same assemblage. Width = 1.3 mm.

957288

Sample 3528496

SERPENTINISED OLIVINE HORNFELS

Mineralogy	mode %
Serpentine	60
Chlorite	15
Olivine	10
Magnetite	5
Brucite	5
Tremolite	3
Chromite	2
Sulphide	mtr

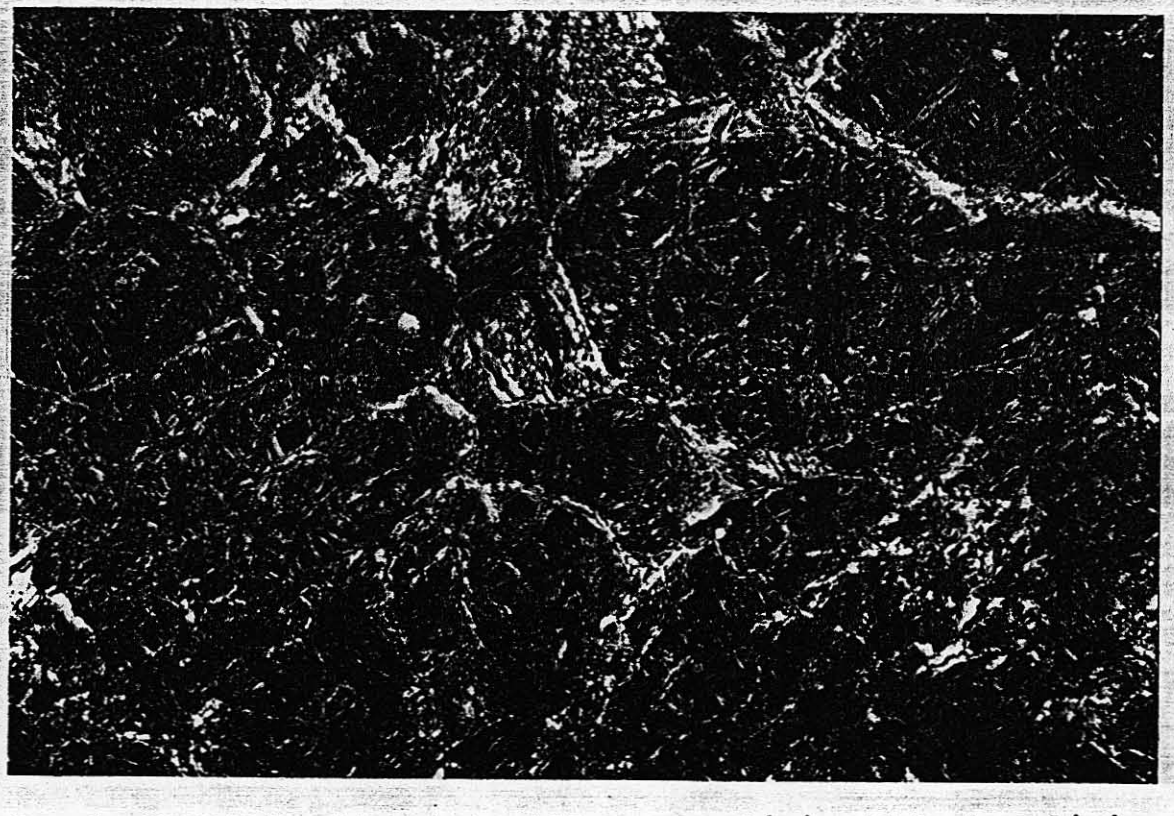
Relict olivine textures are moderately well preserved. Isolated relicts of olivine and areas of aligned serpentine fibres define former olivine grains with a variety of shapes from very corase elongate grains up to 4 mm long to more blocky grains 2 mm across in an aggregate with abundant mutual grain boundaries. Chlorite and minor brucite occur in scattered patches amounting to about 10% of the rock that define intergranular space between former olivine grains. It is not clear what mineral the chlorite and brucite pseduomorph but it could have been Mg spinel. The absence of tremolite or carbonate strongly suggests that the mineral was not pyroxene as is expected in an igneous assemblage. Brucite is also observed in fine stringers and veinlets.

The tabular olivines with broad sutured grain boundaries are distinctly metamorphic in nature.

Opaques consist of magnetite with, in the larger grains, cores of chromite. Grain boundaries between these grains are sharp. The opaques form large blocky aggregates and also occur as small scattered grains that appear to have smooth, curved contacts with the former olivine grains. Ragged, very fine grained magnetite occurs intergrown with serpentine and probably formed at the same time as the serpentine.

A few small aggregates of lobate sulphide are present that appear to have been in textural equilibrium with olivine. The sulphide is heazlewoodite and it is finely intergrown with retograde silicates. The heazlewoodite may have altered from pentlandite during serpentinisation.

Sample 3528496. Partly serpentinised bladed olivines. Note elongate olivine lower left (yellow) with broad sutured grain boundaries. Width = 8.7 mm.



Sample 3528496. Almost toatlly serpentinised blocky olivines with intergranular area composed of chlorite and minor brucite. Width = 8.7 mm.

APPENDIX 11:

FIREWOOD SIDING PROSPECT WACKER SAMPLING LEDGERS AND GEOCHEMISTRY.

FIREWOOD SIDING (NORTH). WACKER SAMPLING LEDGER																		
Results in ppm except Fe (in %).				DPO 71545														
SAMPNO	LOCALE	LOCALN	AMGE	AMGN	DEPTH	BEDROCK?	BMRLITH	FIELDID	TEXTURE	ALT/MIN	COLOUR	Ag	As	Cu	Fe%	Pb	Zn	COMMENTS
3528566	59500	44800	361067	5350503	5.5	Y	Sc	Mq			LG	-1	3	5	0.42	7	16	Logged by Mike.
3528567	59500	44775	361042	5350499	4.5	N	Q	Ccy			LB	-1	2	5	0.65	22	30	Logged by Mike.
3528568	59500	44750	361017	5350496	0.7	Y	Sc	Mq			LG	-1	2	4	0.19	-3	11	Logged by Mike.
3528569	59600	44725	360993	5350492	5	Y	OgSc?	SlsMq?			DB	-1	26	23	1.1	593	617	Logged by Mike.
3528570	59500	44700	360968	5350489	2.5	Y	OgSc?	SlsMq?			DB	-1	2	4	0.2	18	9	Logged by Mike.
3528571	59500	44675	360943	5350485	11.5	N	Q	Ccy			DG	-1	3	6	2.1	379	302	Logged by Mike.
3528572	59500	44650	360918	5350482	3.5	?	Sc	Mq			WLB	-1	1	8	0.58	30	29	Logged by Mike.
3528573	59500	44625	360894	5350478	2.5	Y	Sc	Mq			WLB	-1	1	6	0.33	20	12	Logged by Mike.
3528574	59500	44600	360869	5350475	11.5	Y	Sc	Mq			G	1	250	27	1.66	2724	4833	Logged by Mike.
3528575	59500	44575	360844	5350471	8	Y	Sc	Mq			LGB	-1	130	17	2.05	1017	35	Logged by Mike.
3528576	59500	44550	360819	5350468	2	Y	Sc	Mq			WLB	-1	2	5	0.33	11	17	Logged by Mike.
3528577	59600	44800	361081	5350404	7.5	?	Og?	SshCcy	Ds	Py	DBN	1	240	1043	1.62	23400	1239	Logged by Mike.
3528578	59600	44775	361056	5350400	6	?	Og?	Sls?			LGDB	-1	2	10	0.49	122	24	Logged by Mike.
3528579	59600	44750	361031	5350397	6.5	?	Og?	SshCcy			WKR	-1	5	10	0.98	263	593	Logged by Mike.
3528580	59600	44725	361007	5350393	5	Y	Og	Sls			G	-1	4	3	0.49	52	122	Logged by Mike.
3528581	59600	44700	360982	5350390	10	Y	Og	Sls			WLB	-1	5	2	0.22	330	254	Logged by Mike.
3528582	59600	44675	360957	5350386	9	N	Q	Ccy			BN	-1	33	13	1.31	346	552	Logged by Mike.
3528583	59600	44650	360932	5350383	6.3	?	Og?	SlsCcy	Ds	Py	DG	-1	38	24	2.4	345	1119	Logged by Mike.
3528584	59600	44625	360908	5350379	8.5	Y	Og	Sls			B	-1	5	13	0.53	50	18	Logged by Mike.
3528585	59600	44600	360883	5350376	8.5	?	Og?	SlsCcy	Ds	Py	DBN	2	400	67	1.93	8100	5700	Logged by Mike.
3528586	59600	44575	360858	5350372	3.5	?	Sc?	MqCcy			DBLG	-1	1	5	0.43	19	13	Logged by Mike.
3528587	59600	44550	360833	5350369	3.5	?	Og?	Sls?			ABDB	-1	30	21	0.76	1409	1789	Logged by Mike.
3528588	59600	44525	360809	5350365	2.5	?	Og?	Sls?			ABDB	-1	4	6	0.51	38	30	Logged by Mike.
3528589	59600	44500	360784	5350362	5.5	?	Og?	Sls?			ABDB	1	11	116	0.67	2554	880	Logged by Mike.
3528590	59800	44800	361109	5350208	15	N	Q	Ccy			G	-1	7	15	0.72	267	150	Logged by Mike.
3528591	59800	44775	361084	5350202	1	Y	Og	Sls			WLG	-1	2	4	0.69	40	20	Subcrop?
3528592	59800	44750	361059	5350199	6.8	Y	Og	Sls			WG	-1	2	-2	0.4	7	12	Logged by Mike.
3528593	59800	44725	361034	5350195	2	Y	Og	Sls			DG	-1	4	4	1.12	37	76	Logged by Mike.
3528594	59800	44700	361010	5350192	5.2	Y	Og	Sls			G	-1	5	7	1.27	19	70	Logged by Mike.
3528595	59800	44675	360985	5350188	6.2	Y	Og	Sls			DG	-1	3	2	0.68	8	28	Logged by Mike.
3528596	59800	44650	360960	5350185	2.8	Y	Og	Sls			G	-1	4	5	0.97	21	102	Logged by Mike.
3528597	59800	44625	360935	5350181	4.5	?	Og?	SlsCcy			DGB	-1	3	12	0.68	352	238	Logged by Mike.
3528598	59800	44600	360911	5350178	7.8	Y	Og	Sls			LBG	-1	7	7	0.26	321	558	Logged by Mike.
3528599	59800	44575	360886	5350174	14	Y	Og	Sls			G	-1	7	3	0.97	176	175	Logged by Mike.
3528600	59800	44375	360688	5350146	11.2	N	Q	Ccy			LGLB	2	6	28	0.43	350	39	Logged by Mike.
3529912	59800	44550	360861	5350171	13	N	Q	Ccy			DG	1	24	59	1.65	482	778	Logged by Mike.
3529913	59800	44525	360836	5350167	11	Y	Og	Sls			DG	-1	8	7	1.07	147	349	Logged by Mike.
3529914	59800	44500	360812	5350164	20.5	Y	Og	Sls			DG	-1	6	3	0.9	1013	1308	Logged by Mike.
3529915	59800	44475	360787	5350160	1.5	N	Q	Cg			LG	-1	-1	4	0.34	5	10	Logged by Mike.
3529916	59800	44450	360762	5350157	7.8	?	Og?	SlsCcy			DBDG	2	480	31	2.43	1103	4980	Logged by Mike.
3529917	59800	44425	360737	5350153	7.8	N	Q	Ccy			DG	-1	2	6	0.51	21	53	Logged by Mike.
3529918	59800	44400	360713	5350150	9	N	Q	Ccy			LBG	1	430	92	2.17	5600	6900	Logged by Mike.
3529919	60000	44800	361137	5350007	2.5	N	Q	Ccy			LBG	-1	11	5	0.44	139	395	Logged by Mike.
3529920	60000	44775	361112	5350004	3	Y	Og	Sls	Vn	Cc	DG	-1	2	3	0.63	123	149	Logged by Mike.
3529921	60000	44750	361087	5350000	19.2	Y	Og	Sls	Vn	Cc	G	-1	15	2	0.95	9	32	Logged by Mike.

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957292

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REPORT TO: CRA EXPLORATION LTD

PETROLOGICAL DESCRIPTIONS OF SAMPLES FROM THE TRIAL HARBOUR ULTRAMAFIC COMPLEX, TASMANINA

Martin Gole
August 1993

SUMMARY

Twenty three polished thin sections of ultramafic rocks from Trial Harbour, Tasmania are herein described. In all the rocks, with one exception, the primary silicalte minerals, which consisted mostly of olivine, have been partly to totally altered by retrograde serpentinisation. The exceptional sample is composed of very fresh clinopyroxene.

All the rocks are interpreted to be high grade metamorphosed ultramafic hornfels derived from preiviously serpentinised olivine chromite mesocumulates and adcumulates. This interpretation is not striaght forward for all samples and requires some explaination. Nevertheless the weight of petrographic evidence is to me convincing as to the metamorphic character of these rocks.

Four samples (3530288, 289, 290, 300) provide definitive evidence of a metamorphic parentage as they contain the metamorphic assemblage of olivine-tremolite/cummingtonite-magnetite-chromite. Finely intergrown tremolite and cummingtonite form coarse-grained needles that are texturally part of the olivine-rich assemblage thus implying that the whole mineralogy of the rock is metamorphic. The lack of preferred orientation of the amphiboles and the fine-grained granular habit of olivine suggest that the rock is a hornfels although similar textures may also develop during regional metamorphism.

The olivine textures in these hornfels are not at all dissimilar to those in the remainder of this suite of rocks raising the possibility that all the rocks may be metamorphic. However textures are to varying degrees obsecured by serpentinisation and textures in olivine-rich rocks can not always be used to differentiate between slowly cooled igneous rocks and slowly cooled metamorphic rocks.

Of critical importance, however, is the presence of both magnetite and chromite in the high grade metamorphic assemblage of the hornfels. Equilibrium coexistance of magnetite and chromite is not possible under normal magmatic conditions but is in high grade metamorphic environments. In almost all the Trial Harbour rocks magnetite occurs in aggregates of well-formed, equant to granular grains with sharp grains boundaries against chromite. The textures leave little doubt that both minerals were part of the olivine-rich assemblage.

The interpretated history of these rocks is:

1. Igneous protolith. Olivine chromite mesocumulate and adcumulate.

2. Serpentinisation. Olivine altered to serpentine, magnetite and brucite, chromite partly altered to chromite core and zoned Cr-magnetite rim.

3. Metamorphism. Deserpentinisation and formation of metamorphic olivine, minor pyroxene, tremolite/cummingtonite, possibilly Mg spinel with mode depending on bulk composition. Recrystallisation of magnetite into granular grains, chromite core/magnetite intergrowths recrystallised with sharp grain boundaries.

4. Serpentinisation to produce present assemblage. Olivine and pyroxene altered to serpentine and minor magnetite, Mg spinel altered to chlorite giving orthocumulate-like textures in some rocks, chromite veined and rimed by magnetite.

Generally similar textures and a similar sequence of alteration in seen in ultramafic rocks that have been contact metamorphosed by Proterozoic Dykes in the Yilgarn Block of Western Australia.

Sulphide in the Trial Harbour rocks probably formed from S that was introduced during serpentinisation. The equilibrium textures seen (eg 3530293) reflect metamorphic equilibration and have no implications for magmatic S-saturation of the igneous protolith. Many of the sulphides appear to have been affected by the late serpentinisation and/or weathering.

The rocks, with the exception of the clinopyroxene rock, are all very olivine-rich and probably were all derived from olivine mesocumulates and adcumulates. The modal range in interpreted metamorphic mineralogy, particularly the very wide range in magnetite contents, may reflect considerable mobility of components during the initial serpentinisation. Mg, Si, Ca and Fe are all highly mobile during serpentinisation and rocks in or near fluid pathways (ie faults and shears) may be strongly metasomatised leading to markedly different mineral proportions in the subsequent metamorphic assemblage.

Sample 3530281

SERPENTINISED OLIVINE HORNFELS

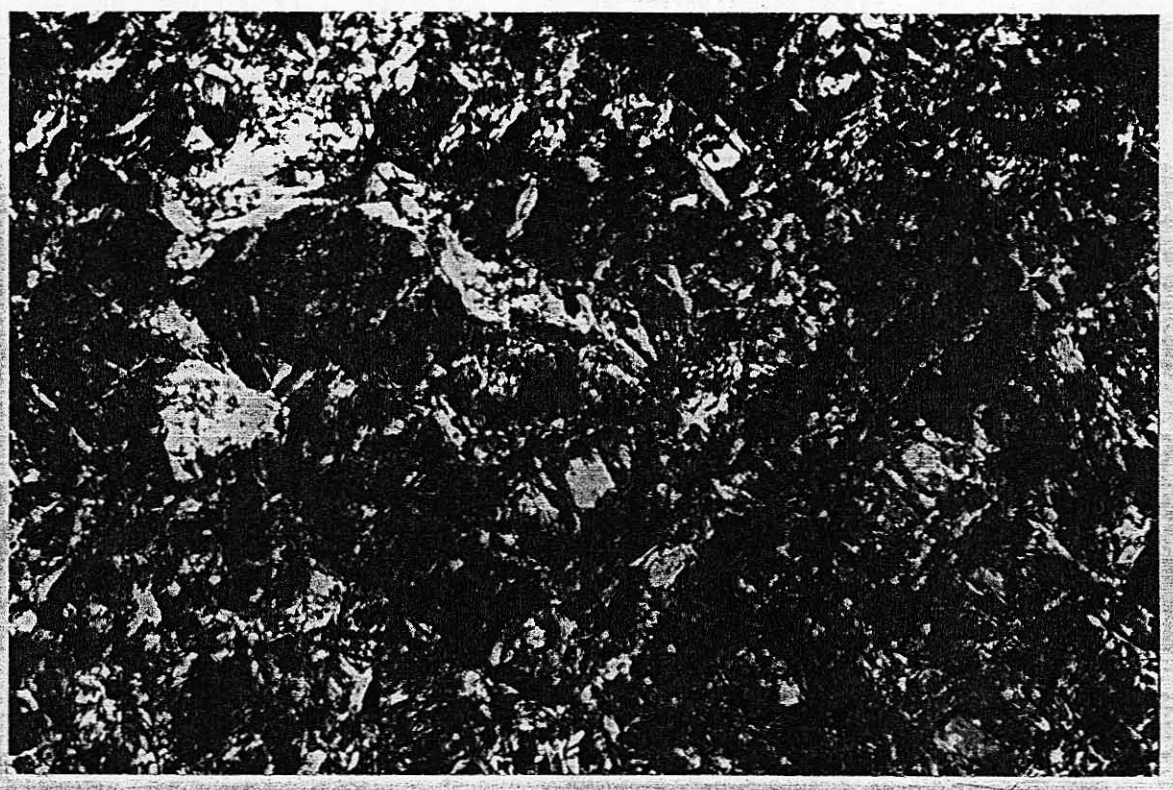
Mineralogy	mode %
Serpentine	70
Pyroaurite	10
Olivine	10
Brucite	4
Magnetite	4
Chromite	2
Chlorite	tr
Pentlandite	tr

Relict textures are poorly to moderately well preserved partly because the serpentine has a murky appearance due to weathering. Isolated relicts of olivine and patches of aligned serpentine fibres define former olivine grains 0.8-1.2 mm across in a granular aggregate with abundant mutual grain boundaries. Pyroaurite and minor chlorite occur in scattered patches throughout the rock and defines former intergranular space between olivine grains. Brucite is mostly observed in fine stringers and veinlets.

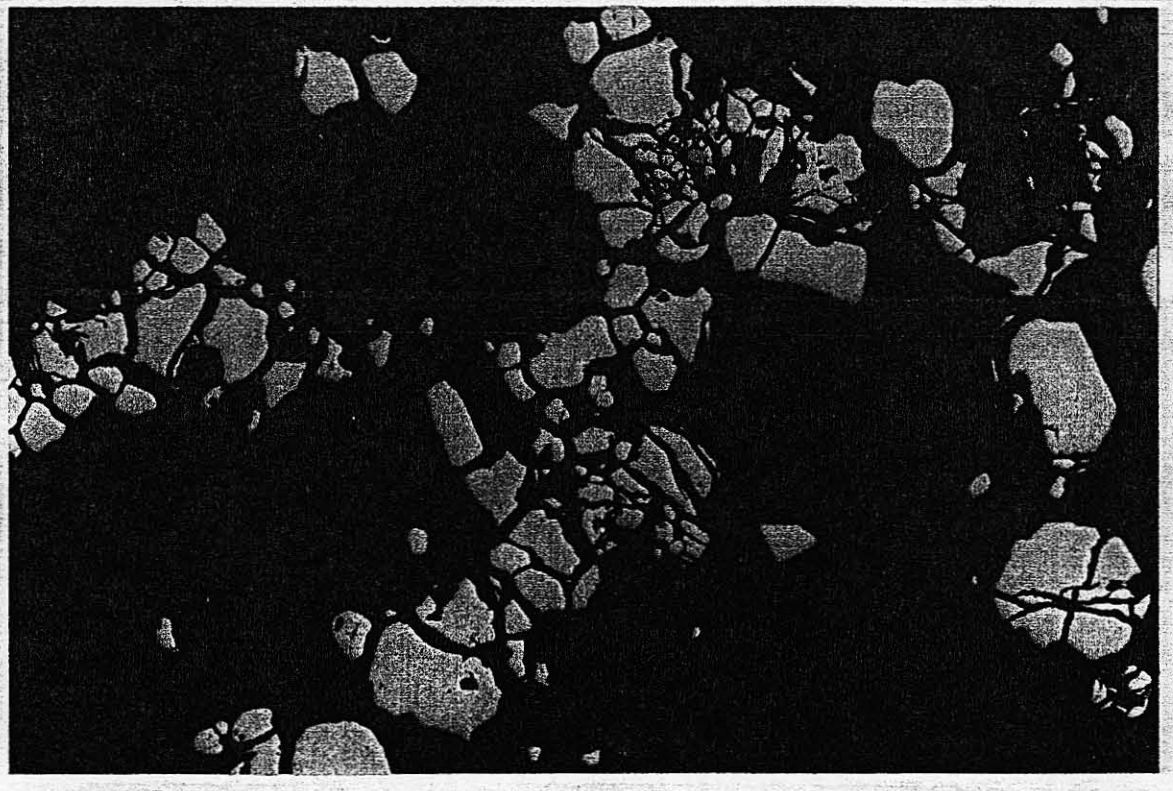
Opaques consist of magnetite with, in the larger grains, cores of chromite. The magnetite-chromite grain boundaries are sharp and both minerals appear to have been part of the same mineral assemblage. The opaques form large blocky aggregates and also occur as small scattered grains. The small scattered opaque grains are reasonably equant, well formed grains and many appear to have been chromite inclusions in olivine. Ragged, very fine grained magnetite occurs intergrown with serpentine and is clearly formed at the same time as the serpentine.

Most of the pentlandite occurs in one large aggregate that is strongly veined by silicates. The textures do not distinguish whether the sulphides are part of the serpentine assemblage or are modified earlier sulphides.

The olivine textures as preserved are not diagnostic of an igneous or metamorphic parentage. However the presence of both magnetite, chromite and olivine in what appears to be the same mineral assemblage strongly suggests that the rock is metamorphic. The rock is called a hornfels because of its fine grained granular nature.



Sample 3530281. Relict olivine in fine grained mixture of serpentine, minor magnetite and chlorite. Patch of chlorite, bright upper left, shows intergranular space. Width = 2.6 mm.



Sample 3530282. Aggregate of well formed equant magnetite grains occuring around margins of pseudomorphed olivine. Texture taken to indicate olivine and magnetite co-existed. Width = 2.6mm.

957297

Sample 3530282

SERPENTINISED OLIVINE MAGNETITE HORNFELS

Mineralogy	mode %
Serpentine	65
Talc	13
Chlorite	10
Magnetite	7
Tremolite	5
Olivine	tr
Brucite	tr

The present mineral proportions are difficult to estimate due to their intergrown, fine-grained nature and their murky appearance due to weathering. The silicates do not preserved any readly apparent relict igneous textures. The only clue to relict textures are, a) in places magnetite outline generally rounded grains shapes up to 1.2 mm across, and b) rare patches of isolated, relict grains of olivine which extinguish together and indicate grain sizes of 1 - 1.3 mm across. The present silicate assemblage is similar throughout the rock suggesting that it orginally almost all consisted of closely packed olivine grains. The presence of tremolite and chlorite indicates that the rock contained some pyroxene.

Magnetite occurs as well formed oval to equant grains in aggregates that define rough lobate shapes that probably occurred along former olivine grain boundaries and filled triple-point junctions. The smooth curved, well texturally adjusted grain boundaries strongly indicate that magnetite was in equilibrium with former olivine grains. Although not uniquely diagnostic this assembalge strongly suggests that the rock is metamorphic. Such an assemblage may form by metamorphism of a serpentinised ultramafic with magnetite formed during the early altered recrystallising into well formed grains. The rock has susequently been reserpentinised during retrograde metamorphism.

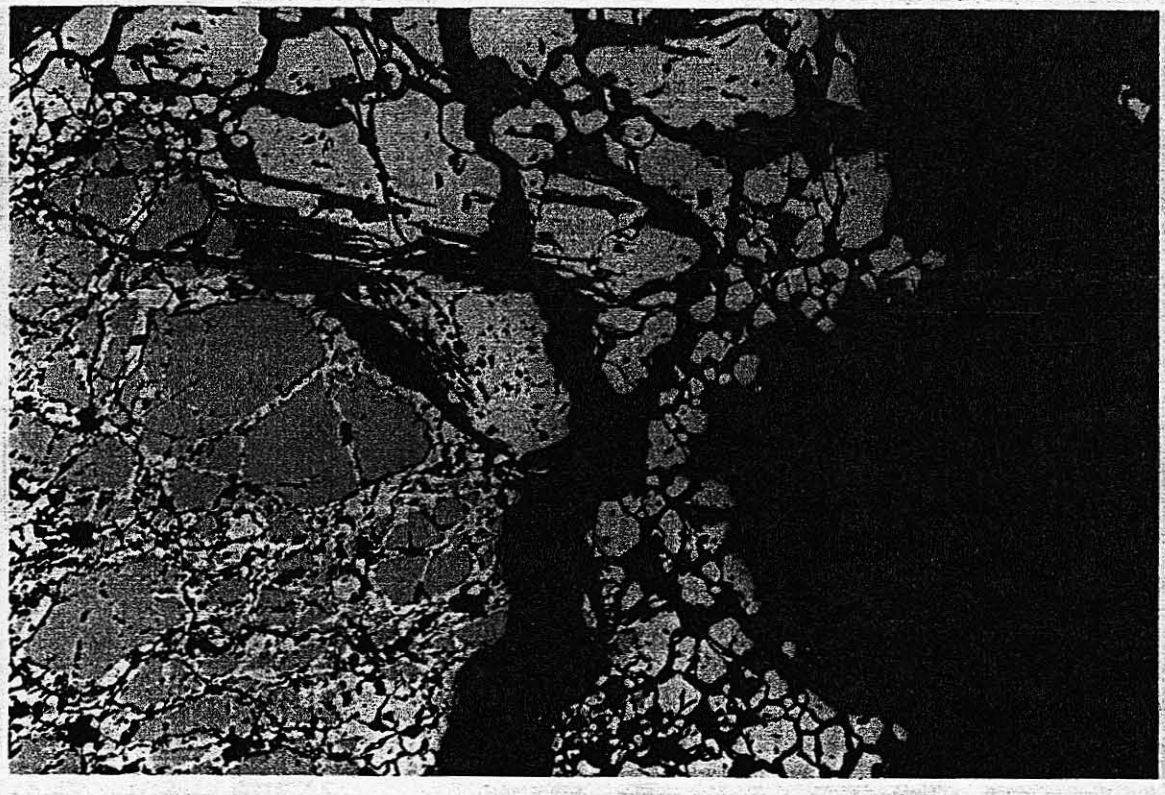
Sample 3530283

SERPENTINISED OLIVINE MAGNETITE CHROMITE HORNFELS

Mineralogy	mode %
Serpentine	65
Olivine	10
Magnetite	10
Brucite	6
Chlorite	4
Tremolite	3
Chromite	2

Relict textures are well preserved. Original olivine grains shapes and sizes are shown by scattered relict olivine with similar extinction and common alignment of serpentine within individual olivine pseudomorphs. Olivines were tigh packed, polygonal shaped grains 1 - 1.3 mm across. Equant to oval opaques forming lobate aggregates filled original triple-point junctions between olivine grains. Opaques consist of magnetite with relict chromite cores in the larger grains. Magnetite and chromite have sharp grain boundaries and appear to part of the same mineral assemblage. The presence of tremolite and some of the chlorite represent altered, original minor interstitial pyroxene.

Sample 3530283. Partly serpentinised olivine with well preserved closepacked relict texture. Width = 2.6 mm.



Sample 3530284. Well formed granular and blocky magnetite (light grey) and chromite (pinkisk grey) rimmed and veined by retrograde magnetite. Width = 2.6 mm.

Sample 3530284

SERPENTINISED OLIVINE MAGNETITE HORNFELS

Mineralogy	mode %
Serpentine	50
Magnetite	20
Tremolite	10
Brucite	7
Chlorite	5
Pyroaurite	5
Chromite	3
Olivine	tr

The proportion of present silicate minerals is difficult to estimate due to their murky, weathered appearance. It is probable that the original mineralogy consisted of interlocking olivine and a low proportion of pyroxene intergrown with well formed, granular magnetite and minor but very coarse-grained chromite. The opaqaues form patches and perhaps crude layers. The chromite occurs as cores in some of the larger magnetite grains.

The relict textures are not sufficiently well preserved to be diagnostic as to igneous or metamorphic origin. However the very high proportion of magnetite in the interpreted assemblage is difficult to explain by igneous processes. Its well formed granular habit and the nature of the intergrowths with chromite strongly suggest that the assemblage is metamorphic.

Sample 3530285

SERPENTINISED OLIVINE MAGNETITE HORNFELS

Mineralogy	mode %
Serpentine	75
Magnetite	12
Brucite	10
Chlorite	5
Olivine	3
Pyroaurite	2
Talc	1

Weathering has destroyed much of the serpentinisation mineralogy and only patches of recognisable mineralogy remain from which the mode was obtained. The rock is strongly recrystallised with bladed brucite and coarse-grained chlorite, minor talc and pyroaurite veins. The recrystaillisation has destroyed relict textures. The opaques and minor relict olivine provide a poor guide to the original textures. These suggest a tight packed, relatively fine-grained (0.4 - 0.6 mm) olivine-magnetite granular aggregate with patches of possible intergranular, fine-grained chlorite. These patches may, however be due to the recrystallisation.

The magnetite occurs as well formed granular grains with curved, texturally well adjusted grain boundaries. These grains apear to have been in equilibrium with former olivine grains and thus be part of the olivine-rich mineral assemblage.

The textures are not diagnostic but the olivine-magnetite assemblage suggests a metamorphic derivation.

Sample 3530285. Minor relict olivine (red), bladed brucite, serpentine and granular magnetite. Width = 2.6 mm.

Sample 3530286. Plane light microphotograph of serpentinised, euhedral olivine, equant magnetite and intergranular space (light) filled with chlorite. Texture could be of olivine orthocumulate or be metamorphic. Width = 8.7 mm.

Sample 3530286

SERPENTINISED OLIVINE HORNFELS

Mineralogy	mode %
Serpentine	70
Chlorite	15
Brucite	10
Tremolite	5
Magnetite	4
Chromite	3
Olivine	tr
Carbonate	tr
Pentlandite	mtr

Moderately well preserved relict texture of fine to medium grained olivine (0.3 - 1 mm) with variable packing density. The larger olivine grains formed tighter packed aggregates whereas the smaller grains are oval shaped with a matrix of chlorite and minor tremolite and serpentine. Magnetite occurs as ragged, very fine-grains intergrown with serpentine, as granular grains and as rims on chromite grains. the intergranular material is composed of very fine grained chlorite and minor tremolite. It is not at all clear what mineral has been pseudomorphed in this intergranular space. It could be expected to have been pyroxene but the present textures does not suggest this. An outside possibility is that it was Mg spinel which is commonly retogressed to chlorite in such rocks.

Sulphide occurs as very fine grains, 10 - 50 um across, scattered throughout the rock. The larger grains are pentlandite but the smaller grains can not be identified optically although they are likely also to be pentlandite.

The texture of this rock could be that of an igneous textured olivine orthocumulate. However several features suggest that the mineralogy and texture is instead metamorphic. The presence of both magnetite and chromite along with olivine in the same mineral assemblage strongly suggests a metamorphic parentage. The intergranular space filled with dominantly chlorite does not suggest the former presence of pyroxene as would be expect if the assemblage was igneous.

Sample 3530287

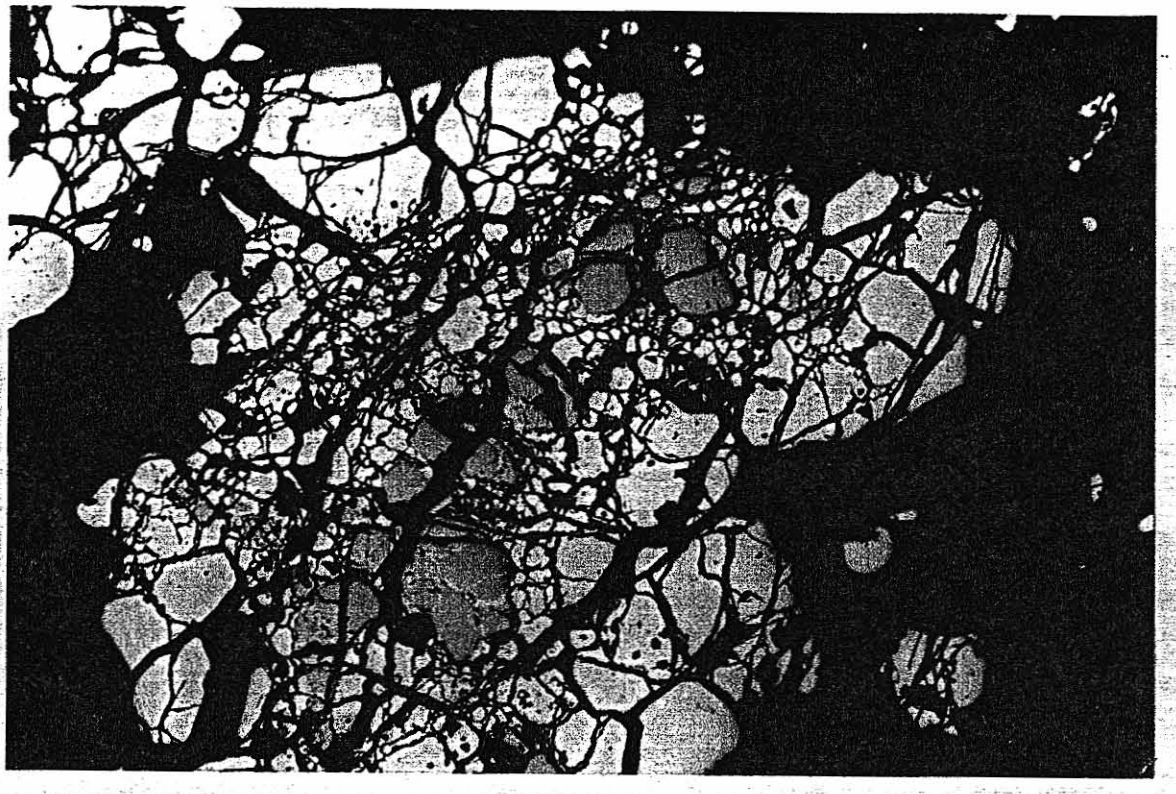
SERPENTINISED OLIVINE HORNFELS

Mineralogy	mode %
Serpentine	70
Pyroaurite	10
Olivine	10
Brucite	4
Magnetite	4
Chromite	2
Chlorite	tr
Pentlandite	tr

Serpentine has a murky appearance due to weathering and partly as a result the relict textures are only poorly to moderately well preserved. Brucite is mostly observed in fine stringers and veinlets and pyroaurite occurs as scattered patches throughout the rock. Olivine as isolated relict grains and patches of aligned serpentine fibres define former olivine grains 0.8-1.2 mm across in a granular aggregate with mutual grain boundaries.

Opaques consist of magnetite with, in the larger grains, cores of chromite. The chromite-magnetite grain boundaries are sharp and the minerals appear to be part of the same mineral assemblage. The opaques form large blocky aggregates which are very unevenly distributed in the thin section. Opaques also occur as small scattered grains. Ragged, very fine grained magnetite occurs intergrown with serpentine and are clearly formed at the same time as the serpentine. The small scattered magnetite grains are reasonably equant, well formed grains and many appear to have been inclusions in olivine.

Most of the pentlandite occurs in one large aggregate that is strongly veined by silicates. The textures do not distinguish whether the sulphides are related to serpentinisation or were inherited from the earlier assemblage.



Sample 3530287. Intergrowth of well formed magnetite (light grey) and chromite (pinkisk grey). Note mutual boundaries are sharp. Width = 2.6 mm.

Sample 3530288. Partly altered tremolite/cummingtonite surrounded by serpentine after olivine. This assemblage is clearly metamorphic. Width + 2.6 mm.

Sample 3530288

SERPENTINISED OLIVINE PYROXENE AMPHIBOLE HORNFELS

Mineralogy	mode %
Serpentine	65
Tremolite/ cummingtonite	15
Chlorite	14
Talc	3
Magnetite	2
Chromite	1

Pre-serpentinisation textures are well preserved and allow a good estimate of the original mineralogy to be made. This consisted of olivine, pyroxene, tremolite/cummingtonite and minor chromite and magnetite. The distribution of olivine and pyroxene is very uneven with pyroxene concentrated in layers. Olivine and pyroxene are totally altered to serpentine and chlorite. The absence of any Ca-bearing minerals in this alteration assemblage suggests that the pyroxene was orthopyroxene. Tremolite/cummingtonite is partly altered to serpentine and chlorite. Talc veinlets occur through the rock.

The olivine pseudomorphs are moderately well preserved due to preferred alignment of serpentine within individual grains. Olivine shapes were tabular to polygonal grains up to 1.3 mm but with a wide range in sizes ranging down to 0.4 mm. Pyroxene pseudomorphs which have a murky appearance due to weathering are roughly tabular to anhedral and up to 1.4 mm long. Intermately intergrown tremolite/cummingtonite forms randomly oriented needles and sprays of needles up to 1.4 mm long. Texturally these amphiboles are part of the pre-serpentine assemblage along with olivine and pyroxene. The mode of this assemblage was approximimately 50% olivine, 30% pyroxene, 18% tremolite/cummingtonite, 1% chromite and 1% magnetite.

The pseudomorphed textures and mineral assemblage is distinctly that of a relatively high grade metamorphic rock. The lack of preferred orientation in the amphiboles may suggest that the rock formed by contact metamorphism and the rock is thus an ultramafic hornfels.

An important feature of this high grade metamorphic assemblage is the presence, even if relatively minor of both magnetite and chromite as part of that assemblage. Chromite and magnetite are incompatible in igneous rocks but may coexist under metamorphic condition as in these rocks. The occurrance of these minerals in a mineral assemblage is strong evidence that it is metamorphic.

Sample 3530289

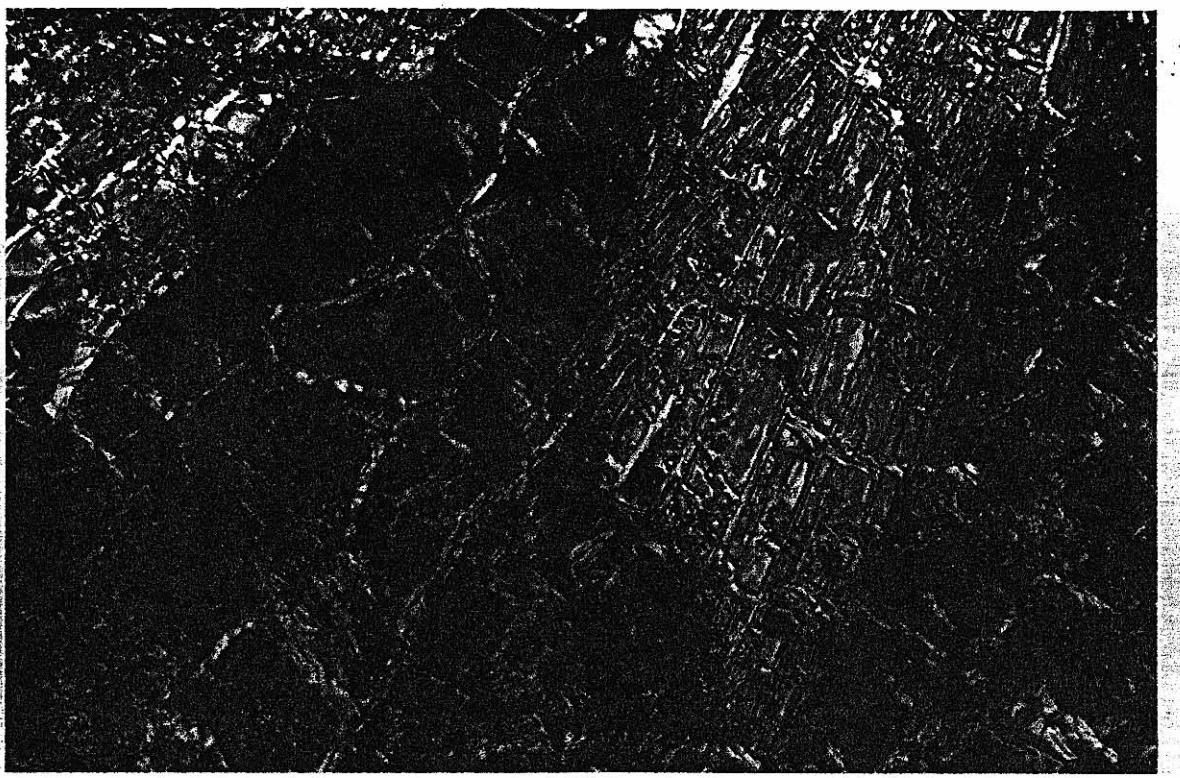
SERPENTINISED OLIVINE PYROXENE AMPHIBOLE HORNFELS

Mineralogy	mode %
Serpentine	70
Tremolite/ cummingtonite	13
Chlorite	10
Talc	3
Magnetite	2
Chromite	1
Olivine	1

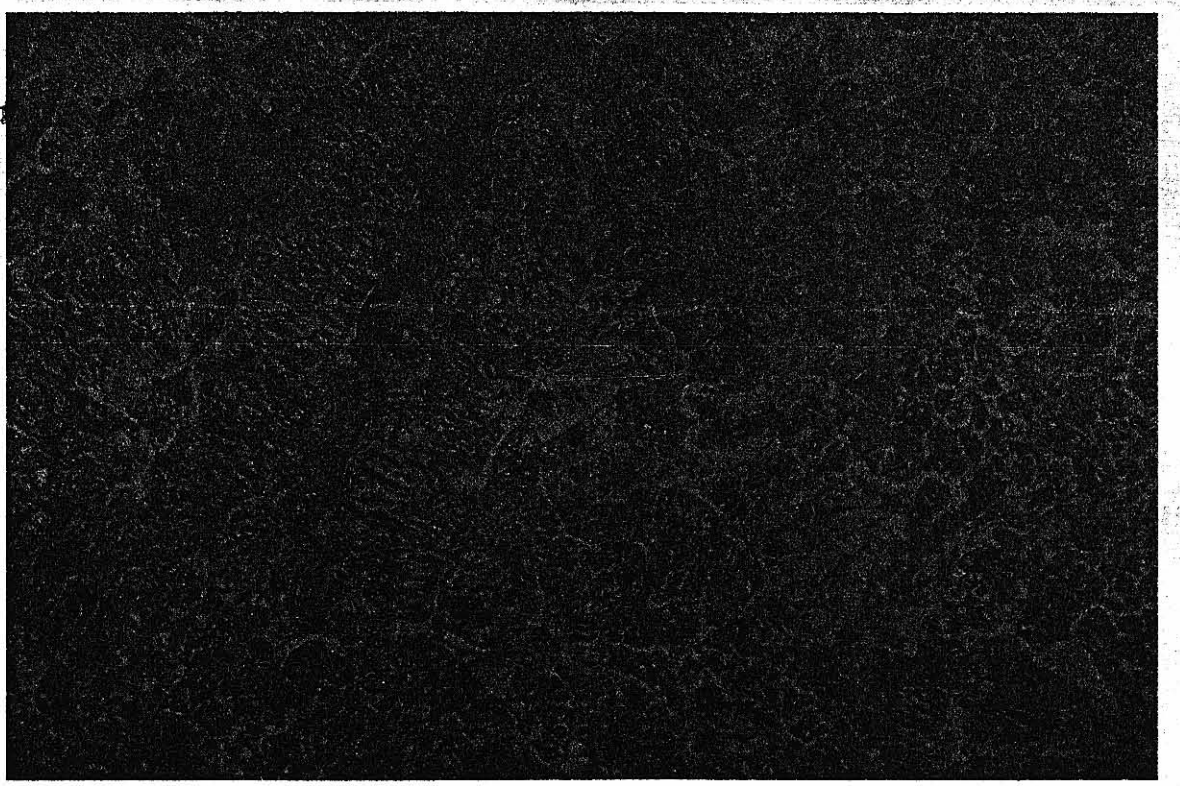
Pre-serpentinisation textures are well preserved and allow a good estimate of the original mineralogy to be made. This consisted of olivine, pyroxene, tremolite/cummingtonite and minor chromite and magnetite. These minerals are distributed into olivine-rich and pyroxene-amphibole-rich areas. In olivine-rich areas olivine pseudomorphs show polygonal, interlocking grains 0.5 mm across. Olivine and pyroxene are totally altered to serpentine and chlorite. The absence of any Ca-bearing minerals in this alteration assemblage suggests that the pyroxene was orthopyroxene. Tremolite/cummingtonite is partly altered to serpentine and chlorite. Talc veinlets occur through the rock.

Pyroxene pseudomorphs which have a murky appearance due to weathering are roughly tabular to anhedral and up to 1.4 mm long. Intermately intergrown tremolite/cummingtonite form randomly oriented needles and sprays of needles up to 1.4 mm long. Texturally these amphiboles are part of the pre-serpentinisation assemblage along with olivine and pyroxene. The mode of this assemblage was approximimately 60% olivine, 20% pyroxene, 18% tremolite/cummingtonite, 1% chromite and 1% magnetite.

The rock is very similar to sample 3530288. The serpentinised textures and mineral assemblage is distinctly that of a relatively high grade metamorphic rock. The lack of preferred orientation in the amphiboles may suggest that the rock formed by contact metamorphism and that the rock is an ultramafic hornfels.



Sample 3530289. Bladed tremolite/cummingtonite surrounded by partly weathered, serpentine after olivine. Width = 2.6 mm.



Sample 3530291. Pseudomorphed olivine with highly variable grain sizes and shapes. Light, intergranular areas are chlorite. Grey high relief mineral is carbonate. Width = 8.7 mm.

Sample 3530290

SERPENTINISED OLIVINE AMPHIBOLE HORNFELS

Mineralogy	mode %
Serpentine	70
Tremolite/ cummingtonite	20
Chlorite	6
Magnetite	2
Chromite	1
Olivine	1

Pre-serpentinisation textures are moderately well preserved and allow a good estimate of the original mineralogy to be made. This consisted of olivine, finely intergrown tremolite/cummingtonite and minor chromite and magnetite. Olivine is totally altered to serpentine and minor chlorite. Tremolite/cummingtonite is partly altered to serpentine and chlorite. Along the side of the slide is a vein of relatively coarse-grained tremolite that is weakly altered to chlorite and serpentine.

The olivine pseudomorphs are moderately well preserved due to preferred alignment of serpentine within individual grains. Olivine shapes were tabular to polygonal grains up to 1.3 mm but with a wide range in sizes ranging down to 0.4 mm. Intermately intergrown tremolite/cummingtonite forms randomly oriented needles and sprays of needles up to 1.4 mm long. Texturally these amphiboles are part of the pre-serpentine assemblage along with olivine. The mode of this assemblage was approximimately 80% olivine, 18% tremolite/cummingtonite and 1% each of chromite and magnetite.

The rock is very similar to samples 3730288 and 289. The pseudomorphed textures and mineral assemblage is distinctly that of a relatively high grade metamorphic rock. The lack of preferred orientation in the amphiboles may suggest that the rock formed by contact metamorphism and the rock is thus an ultramafic hornfels.

Sample 3530291

SERPENTINISED OLIVINE PYROXENE MAGNETITE HORNFELS

Mineralogy	mode %
Serpentine	35
Carbonate	15
Tremolite	15
Chlorite	15
Magnetite	15
Olivine	3
Chromite	1
Goethite	1

Moderately well preserved textures of oval to tabular olivine, mostly 0.2 - 0.6 mm across with a few larger tabular grains up to 4 mm long with about 30% interstitial space now filled by very fine-grained tremolite and chlorite. Tremolite and chlorite probably pseudomorph fprmer pyroxene. Minor relict olivine is present but most is altered to serpentine with carbonate replacing the original centres of the olivine grains. The carbonate may be pedogenic. Magnetite occurs as well formed grains with some chromite present as cores in the larger magnetite grains. the magnetite and chromite have sharp mutual grain boundaries and appear to be part of the same mineral assemblage. The silicates have a murky appearance due to weathering and some goethite occurs as very fine veinlets.

Sample 3530292

SERPENTINISED OLIVINE MAGNETITE PYROXENE HORNFELS

Mineralogy	mode %
Serpentine	35
Magnetite	20
Carbonate	15
Tremolite	13
Chlorite	12
Olivine	3
Chromite	1

Moderately well preserved textures of oval to tabular olivine, mostly 0.2 - 0.6 mm across with a few larger tabular grains up to 4 mm long. The rock has about 30% intergranular space now filled by very fine-grained tremolite and chlorite probably pseudomorphing clinopyroxene. Minor relict olivine is present but most is altered to serpentine with carbonate replacing the original centres of the olivine grains. The carbonate may be pedogenic. Magnetite occurs as well formed grains with chromite cores in the larger magnetite grains. The silicates have a murky appearance due to weathering.

The rock is very similar to sample 3530291.

Sample 3530293

AUGITE OLIVINE HORNFELS

Mineralogy	mode %
Clinopyroxene	93
Chromite	3
Magnetite	2
Serpentine	1
Chlorite	1
Carbonate	tr
Sulphide	tr

Granualr aggregate of anhedral, very fresh clinopyroxene with grains up to 1.6 mm across. Small patches of serpentine, chlorite and ragged magnetite represent altered olivine that made up only about 2-3% of the original assemblage. Minor amounts of magnetite and separate chromite (most of which occurs in a single patch) and trace amounts of sulphide form equilibrium textured grains with smooth, curved grain boundaries with clinopyroxene and are clearly part of the assemblage with the pyroxene. Chromite has very thin rims and veinlets of magnetite which appear to be retrograde. The sulphides consist of pentlandite partly altered to millerite and violarite. Some sulphide also occurs associated with a retrograde carbonate, chlorite and serpentine vein.

The clinopyroxene textures of anhedral interlocking grains are not typical of igneous rocks in which pyroxenes are generally more equant to tabular. The presence of both chromite and magnetite in the assemblage together with the clinopyroxene textures strongly suggest that the rock is a high grade metamorphic hornfels.