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EL 7/74 MOINA

REPORT ON AREAS RELINQUISHED ON 18 JULY 1987

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REPORT NO: 14474

CONTENTS

	<u>Page No</u>
1. SUMMARY	1
2. INTRODUCTION	1
3. CONCLUSIONS	2
4. PREVIOUS EXPLORATION	2
5. EXPLORATION AIMS	3
6. GEOLOGICAL SETTING	4
7. WORK COMPLETED	10
8. RESULTS	10
8.1 Regional Work	10
8.1.1 Stream Sediment Geochemistry	10
8.1.2 Aeromagnetic Survey	11
8.2 Black Bluff-Smith Plains Area	12
8.2.1 Mt Jacob	12
8.2.2 Winterbrook Grids	13
8.2.3 Winterbrook Grid 1986-87	15
8.2.3.1 Soil Geochemistry	15
8.2.3.2 EM Follow-up	15
8.2.3.3 Drilling	16
8.2.3.4 Discussion	20
8.2.4 Aeromagnetic Follow-up	20
8.3 Tin Spur-Olivers Hill-Devonian Area	21
8.3.1 Tin Spur Grid	21
8.3.2 Devonian Grid	22
8.4 Southern Area	22
8.4.1 Lorinna Anomalies	22
8.4.2 Daisy Dell Area	23
8.4.3 Bull Creek Anomalies	23
9. REFERENCES	23
10. LOCATION	26
11. KEYWORDS	26
12. LIST OF PLANS	26
13. LIST OF APPENDICES	29

1. SUMMARY

This report summarises exploration activities within the portion of EL 7/74 (Moina) that is proposed for relinquishment. The report gives a general summary of work from 1974 to 1986 and a detailed coverage of exploration for the 12 months to 18th June 1987.

During the latter period soil sampling was completed over UTEM anomalies on the Winterbrook grid; four anomalies were drill tested. No significant sulphide intersections were found. This prospect is considered to have now been adequately explored within the time constraints.

2. INTRODUCTION

The Moina EL forms part of the Moina Joint Venture between CRAE, Comalco and Billiton Australia. CRAE are manager and operator for the Joint Venture. The licence reaches its due relinquishment date of 18th July 1987. This report covers the work completed by Comalco, Billiton and CRAE on the area to be relinquished.

The Licence consists of two separate areas located approximately 35 kilometres south of Ulverstone. The southernmost area is located immediately to the south and east of Lake Cethana while the other portion includes the Moina-Smith Plains area. (See Plans TASH 2973 & 2998)

The Licence area is dominantly used for forest management and farming.

3. CONCLUSIONS

1. Airborne magnetics, radiometrics have been carried out over the area. Regional stream sediment campaigns have been completed.
2. A number of stream sediment and aeromagnetic anomalies have been followed up with gridding and detailed surface geology, geophysics and geochemistry in the search for skarn related deposits.
3. A similar surface programme to search for base metals and gold has resulted in a number of detailed investigations on a prospect basis.

To this stage, no significant resources have been located on the ground proposed for relinquishment.

4. PREVIOUS EXPLORATION

The area has been actively prospected since the early 1860's when James "Philosopher" Smith discovered alluvial gold in the Forth River, a galena lode near the Devon Mine and galena near the mouth of Claude Creek. In the following 40 years a large number of alluvial gold workings and small hardrock mines for gold, lead, bismuth, tungsten and tin were developed. These were all around the margins of the Dalcoath Granite which seems to have been the source of much of the mineralisation.

General geological investigations in the area have been conducted by Twelvetrees (1913), Reid (1919), Elliston (1953), Jennings (1958, 1963), Baker (1971) and Leaman (1974). Mt Lyell Mining and Railway Company Limited (in

their EL 8/65) carried out a programme including geological mapping, sampling, soil geochemistry, geophysical surveys and diamond drilling. Much of this work was concentrated in the area of the Shepherd and Murphy mine. The Tasmanian Department of Mines also explored the area and did some exploratory drilling at Stormont and Tin Spur.

5. EXPLORATION AIMS

As the result of successful exploration for fluorite rich magnetite skarns in North Queensland it became apparent that similar rocks existed at Moina. An exploration licence was taken out around the skarns and covering all the area where possible skarns were suspected. A number of areas of Cambrian volcanics were included in the EL as they were between areas of prospective Ordovician.

In 1976 a decision was made to explore for volcanogenic copper-lead-zinc bodies in the Cambrian in addition to the skarn search.

Part of the licence was relinquished in mid 1979 prior to the signing of a Joint Venture agreement with the Shell Company of Australia in early 1980.

Shell's major target continued to be skarn mineralisation though tin was the major commodity of interest. Shell also continued to follow-up the low grade gold occurrence outlined by Comalco at Tin Spur and the base metal potential of the Black Bluff-Smith Plains area.

When, in March 1985, CRA Exploration became managers of a Joint Venture with all three partners and after a further reduction of ground, interest in the volcanics was

increased. It was considered that the Winterbrook area had geological similarities with the Hellyer anticline and thus had potential for volcanogenic massive sulphides. CRA Exploration also continued to follow-up the evidence of gold mineralisation in the Ordovician rocks around the Dalcoath Granite.

6. GEOLOGICAL SETTING (After Smyth 1981)

On the Sheffield and Middlesex sheet areas all the units from Precambrian to Devonian age change their geological trends from N-S in the west, to E-W and NW in the east. The licence is located over the E-W, NW trending areas. Superimposed on this is a strong north-west structural trend.

In the south of the licence Precambrian rocks of the Tyennan Nucleus are exposed. These are unconformably overlain to the north by Cambrian volcanics and sediments, which are also overlain unconformably by the Ordovician sequence of the Roland Conglomerate, Moina Sandstone and Gordon Limestone. The Devonian Dalcoath and Dove Granites intrude all these units. Overlying these units with considerable unconformity are Tertiary Basalts and some Jurassic Dolerites.

The Precambrian rocks exposed south of the E.L. consist of quartzites and schists which have been severely deformed. Regionally they have been divided into three units based on lithological characters.

These are:-

- 1) Howell Group - interbedded quartzite, quartz-mica and garnet-mica schists.
- 2) Fischer Group - thinly bedded massive and laminated quartzite with interbedded quartz-mica schists.
- 3) Dove Group - quartz-mica and garnet-mica schists with little or no quartzite.

Limestone/dolomitic units are known in the Precambrian in the Granite Tor area with a possible outcrop near the Lone Pine Granite (Jennings, 1963).

The Cambrian rocks occur mainly in the north of the licence as part of a major E-W anticlinorium (the Winterbrook Inlier), and also as minor exposures throughout the rest of the area. Because of patchy outcrop, some uncertainty exists as to the geological succession. In the south two main units are recognised, the Lorinna Greywacke and the Bull Creek Porphyry.

The Lorinna Greywacke consists of a mixed assemblage of greywacke, chert porphyry, conglomerate and quartzite. The formation is tightly folded and has suffered considerable dynamic and hydrothermal alteration.

The Bull Creek porphyry is a complex assemblage of quartz-feldspar porphyry and sediments. This ~~formation~~ formation also has suffered from dynamic and hydro-thermal alteration.

The Cambrian unit in the Winterbrook area consists of rhyolitic lavas, intrusives, tuffs, dacitic andesitic lavas and tuffs and various volcano-clastic sediments. Parts of this may be equivalent to the Lorinna Greywacke.

In the North-West of this area 3 facings have been obtained. All show a East-North-East strike with a younging direction to the South-East. Only one reliable trend was found in the southern part of this area. This gave a North-east strike and a South-East dip.

The Ordovician rocks occur throughout the central portion of the licence. The Roland Conglomerate is a lenticular body of quartz conglomerate which varies in thickness from a few metres up to a maximum of about 300 metres. The formation consists of thick beds of white, pink and purple quartz conglomerate interbedded with occasional thinner beds of white and pink quartzite. Except for the basal beds, the pebbles are almost exclusively siliceous, consisting of reef quartz, quartzite and quartz schist set in a dense, frequently recrystallised fine-grained siliceous matrix. The conglomerate is well sorted, sometimes showing a rough imbricate texture and rarely cross-bedded. The pebbles are almost always subrounded to rounded.

The basal beds near the unconformity sometimes reflect the composition of the underlying Cambrian rocks.

The Roland Conglomerate is overlain by a sequence of quartz sandstone and shale with minor grit and some conglomerate beds, called the Moina Sandstone. The formation is about 300 metres thick, fine grained, dense and siliceous. It consists largely of quartzite and quartz sandstone with minor bands of shale, conglomerate and grit. Shaly beds are more common and thicker toward the top of the formation and conglomerate beds more common toward the base of the sequence.

Some beds in the Moina Sandstone contain abundant spherulitic pyrite. Characteristic also of the formation is the presence, in certain beds, of abundant worm burrows orientated at right angles to the bedding.

The Gordon Limestone conformably overlies the Moina Sandstone in preserved synclines throughout the area, at Moina, Taylors Flats, Lorinna and Liena.

The maximum thickness of the limestone in this region is about 1000 metres at Gunns Plains. Generally, it consists of thick, massive beds of fairly pure blue-grey fine grained limestone. Occasionally it is highly sheared and somewhat schistose and ranges in composition from 60-95% CaCO_3 , with common impurities of Al_2O_3 , SiO_2 , MgO and iron oxides. Deep weathering in limestone areas is common and outcrop is rare.

Metasomatic and contact metamorphic alteration of the Gordon Limestone and the transition zone beds at its base has resulted in the formation of variable skarn assemblages in the Stormont, Ti-Tree Creek, Moina and Tin Spur Creek areas.

At several localities in the vicinity of Mole Creek and Gunns Plains, the Gordon Limestone is succeeded, apparently conformably, by a sequence of sandstone and quartzite. These rocks are considered to be of Silurian age and probably equivalent to the Crotty Sandstone of the Eldon Group. These rocks appear similar to some members of the Moina Sandstone and contain tubicolar organisms characteristic of that formation.

The Devonian Dove Granite outcrops in three places along or near the Precambrian - Lower Palaeozoic unconformity.

In the Mersey Valley the granite is mostly weathered to depths exceeding 20 metres. Near the contact with the Moina Sandstone the Dove Granite is a medium to coarse grained pinkish weathered rock containing pink feldspar, glassy quartz and a green micaceous mineral.

Aplite and basic dykes up to 2 feet wide occur and usually stand out well as fresher material against the completely weathered enclosing granite.

Granite porphyry and marginal phases of the granite also occur in the vicinity of the Devon Mine higher up on the Dove River. The Devon lead-silver-gold mine is completely enclosed by the granite and several vein-type gold and gold-lead occurrences on 5 Mile Rise are probably associated with this phase of the Dove Granite.

The Devonian Dolcoath Granite outcrops as a small stock about 3km in diameter centred near the Cethana Dam east of Moina.

The Granite outcrops on the steep side of the Forth Valley typically as granite tors intersected by strong but widely spaced joint systems. Narrow aplite veins occur within the granite and intruded along joints in the surrounding Cambrian porphyry.

This granite is the source of numerous tin-tungsten deposits in the area. Narrow quartz veins, infilling joints within the granite, carry chiefly wolframite and molybdenite as well as minor quantities of cassiterite. Some wolframite and molybdenite is disseminated through the granite just below the road at the highest point of the granite on the east side of the Forth River.

In hand specimen the granite is a medium to coarse grained, flesh coloured rock containing abundant glassy quartz crystals up to 5mm across and altered feldspars 3 - 4 mm across and 10 mm long plus some biotite.

Although the outcrop area of the Dolcoath Granite is small, it is known from diamond drilling to extend 3 1/2 km to the west to below the Shepherd and Murphy Mine area. It is thought, from gravity data, to be part of a massive east west trending batholith with possible connections to Granite Tor which outcrops 40 km to the south-west.

Jurassic Dolerite occurs outside the licence to the south and east. The dolerite is generally in the form of discontinuous sills with one major sill intruded at about the top of a Triassic sandstone.

Tertiary basalt crops out over large areas throughout the region and within E.L. 7/74 they occupy approximately a third of the area. These rocks cap thin, freshwater clay, sand and conglomerate deposits of Tertiary age. The flows are mainly valley fill into eroded limestone synclinal areas and originated from numerous small volcanic centres. Two extensive basalt covered areas occur on the licence from Middlesex Plains to the Forth River and from Gads Hill/Lorinna to Liena.

Structurally the region consists of east-west/north-west trending Palaeozoic units bordered to the north and south by Precambrian units. Over the area of E.L. 7/74 the major east-west fold direction has had superimposed a north-west fracture and fold pattern which was probably active from the Ordovician to the Tertiary.

Cambrian rocks in the area were folded and had developed a mild regional schistosity before the beginning of the Ordovician. The Jukesian movement in late Cambrian time which caused this, probably also caused uplift of the Precambrian nucleus leading to the deposition of the Roland Conglomerate and Moina sandstone. Later Tabberaberan movement was associated with folding and the intrusion of granites. Normal and thrust faulting in a mainly North-West system affect most of the area. Normal North-West faulting trend has probably been active since the Ordovician and the thrust faulting was post Tabberaberan.

7. WORK COMPLETED

During the operation of the licence a wide variety of geological, geochemical and geophysical exploration techniques have been used. These include mapping, stream, soil and rock geochemistry, ground and airborne magnetic surveys, gravity surveys, frequency and time domain EM and IP surveys and drilling. A summary of exploration on the various prospects can be found in section 8. For detailed coverage of work performed in the licence area between 1974 and 1986 one should refer to the progress reports written by Askins (1980 a & b), Weite (1978), Smythe (1981, 1982), Wright & Smythe (1984) and Caithness (1986).

8. RESULTS

8.1 REGIONAL WORK

8.1.1 Stream Sediment Geochemistry

Stream sediment geochemistry proved a major tool to highlight prospective areas. The Winterbrook Inlier was anomalous in lead, zinc, gold and silver.

Elsewhere anomalies in tin and tungsten as well as bismuth and molybdenum and some elements of the Rare Earths group were found. Compilation plans of Pb, Zn and Cu results are included with this report.

The CRA Exploration cyanide leach gold sampling program failed to locate any new prospective areas though it did find all the known gold occurrences and help to further highlight the prospectivity of the Winterbrook Inlier.

8.1.2 Aeromagnetic Survey

The aeromagnetics was flown in order to detect magnetite or pyrrhotite skarns. The original interpretation was conducted by geophysical consultant Dr. G. Dickson. A large number of anomalies were detected, of which six were chosen for immediate follow-up. Detailed coverage of the follow-up of these six anomalies and those tested at a later date are given in the Shell Progress Reports by W.D. Smyth.

Prior to relinquishment CRAE conducted a reinterpretation of the aeromagnetics. Some fourteen anomalies were recognised and modelled in the area to be relinquished. (Appendix 1)

Anomalies 27, 33, 34, 36, 37 and 41 have previously been gridded and surveyed with ground magnetics. This work has explained the anomalies. Anomalies 36 and 37 were found to be due to magnetite within Cambrian Volcanics. Anomalies 33 and 34 were also found to be over Cambrian volcanics and these are believed to be the source. Anomaly 27 falls on the northern end of the Mt Jacob grid and has been

attributed to basic Cambrian volcanics. Anomaly 41 lies on the Tin Spur grid over a small basalt outcrop. The source of the airborne anomaly is believed to be a southern extension of the gossanous material which has previously been explored. Anomalies 25, 31, 38, 42 and 43 lie outside the EL area and have not been tested but the aeromagnetic modelling does not indicate a high probability of a skarn source. Anomalies 39 and 40 have not been tested as they were also rated as low order anomalies. Anomaly 35 was tested with two lines. There showed a sharp negative response to the south and a small positive in the north. The anomaly is not likely to be due to a skarn.

8.2 Black Bluff - Smith Plains Area (Winterbrook)

The area consists of an inlier of acid to intermediate Cambrian volcanics overlain by Ordovician conglomerates and sandstones to the north, south and west and by Tertiary basalts to the east. The area was first explored for volcanogenic sulphides by Comalco in 1976. The inlier can be subdivided into two main parts. The Mt Jacob grid and the Winterbrook Grids.

8.2.1 Mt Jacob

A series of IP, magnetic and geochemical anomalies were found in the early Comalco work and together with the stream sediment sampling, this led to the establishment of the Mt Jacob grid.

The Mt Jacob grid straddles the contact between Ordovician Moina Sandstone and Roland Conglomerate to the south and Cambrian volcanics to the north. The prospective Cambrian lithologies dip at 45 to 55 degrees to the southeast. Disseminated galena and sphalerite mineralisation have been found in altered andesites in the area.

The grid has been tested with C horizon soil sampling, ground magnetics and IP. The geochemistry mapped a number of anomalies, the most important of which is a nor-northeast trending lead anomaly (up to 1000ppm) partly associated with a chargeability anomaly.

Comalco drilled two holes on the basis of the IP and geochemistry. Hole MTJ D18 was collared in the Ordovician. This was drilled for 23 metres followed by 324 metres of altered volcanics and three small limestone lenses. Sphalerite and galena occurred in vein and disseminated form from 118 metres to 253 metres. The best intersection was 118-128 metres at 1.3% Pb and 1% Zn. The second hole MTJ D19 drilled through Ordovician into a leached, fractured and sericitised glassy dacite with some pyrite in the upper part.

During 1983 Shell performed a UTEM survey over the reestablished grid. They interpreted no significant anomalies other than one over an outcropping black shale. After reinterpretation of the Shell UTEM, CRAE exploration conducted a gravity survey over a subtle UTEM anomaly on two lines. No evidence of a marked density contrast was detected.

8.2.2 Winterbrook Grids

The Lower and Upper Winterbrook grids were cut by Comalco to explore areas of highly altered volcanics and to follow up soil, stream and IP anomalies detected in their reconnaissance work. Sphalerite, galena and pyrite were found in disseminated and veinlet form in outcropping tuff shale and reworked tuffs. Comalco tested the Lower Winterbrook grid

with A0 soil sampling and IP. The geochemistry appeared unreliable so Shell resurveyed the grid with C horizon sampling. None of the anomalies from these surveys were deemed worthy of follow up except for one IP anomaly which was covered with a 50m dipole-dipole survey. This survey outlined a shallow source. None of the anomalies were drill tested.

The Upper Winterbrook grid had some soil sampling completed over it. The work was inconclusive.

The two grids were joined by the Winterbrook grid. C horizon soil sampling and a VLF survey failed to provide any encouragement.

Following the entry of CRA Exploration into the joint venture a large grid was cut across all three previous Winterbrook grids. A 200m spaced UTEM geophysical survey was conducted over the whole area as well as around a small patch of rhyolite mapped by Comalco to the south of the main Winterbrook grid.

A number of EM anomalies were outlined in the north-eastern part of the grid around the margins of the rhyolite dome mapped by Comalco. Numerous smaller anomalies were found elsewhere on the grid and these were earmarked for soil geochemical follow up, while the anomalies that were interpreted as having sources too deep to be likely to give distinct soil anomalies were proposed for drilling.

8.2.3 Winterbrook Grid 1986-87

8.2.3.1 Soil Geochemistry

All the UTEM anomalies that were considered amenable to the method were covered by lines of 25 metre spaced soil geochemistry, 150-200 metres either side of the interpreted EM anomaly. The results can be seen on Plans TASH 3209 to 3213. Copper values are consistently low with a highest value of 70 ppm just north of the Loongana EM anomaly. Lead values are highest in the south west where an elongate anomaly of maximum 165 ppm lead may extend across 3 lines and is open to the east and west. The anomaly is less defined on the zinc results and in fact appears as if it may be terminated by the Winterbrook Falls UTEM anomaly. A maximum value of 145 ppm zinc can be found at the Loongana anomaly. Close to the Winterbrook anomaly a value of 440 ppm zinc was recorded but this was not mirrored on the lead values. Values of arsenic, silver and gold were generally depressed.

8.2.3.2 EM Follow-up

The anomaly at the eastern end of the grid was interpreted to be one of the most promising anomalies located by the UTEM survey. As it was only present on one line, the eastern most of the grid, a follow-up EM program was recommended. Three short lines, placed at an angle to the original grid after examination of the local geology, were surveyed with the EM37 system. Readings of the horizontal and vertical field were taken every 25 metres. No strong conductors were found. The edge of the basalt was evident as the basalt gave a conductive sheet response. Following this survey no further work is recommended on the EMU anomaly.

PD87 AL3

This hole was a redrill of AL2 using a diamond rig.

Collar Coordinates 13600E 50734N

Azimuth 315^o(m)

Dip -70^o

0.0 - 18.0m	Precollar
18.0 - 68.0m	Shale with lesser sandstone interbeds
68.0 - 92.0m	Limestone - fossiliferous
92.0 - 101.0m	Limestone - sheared and brecciated
101.0 - 110.0m	Limestone
110.0m	EOH

The difference between the logs of AL2 and AL3 is due to the presence of an inexperienced geologist on site during the percussion drilling and the extremely poor sample return from this rig.

DD86 W11

Drilled to test the Winterbrook UTEM anomaly.

Collar Coordinates 12200E 51480N

Azimuth 135^o(m)

Dip -60^o

0.0 - 20.5m	Sandstone and shale with lesser conglomerate
20.5 - 73.7m	Limestone - fossiliferous
73.7 - 104.0m	Breccia - Siltstone clasts set in a black mud matrix
104.0 - 118.4m	Interbedded sandstone and siltstone
118.4 - 125.0m	Sandstone
125.0m	EOH

DD86 WI2

Drilled to test the Winterbrook UTEM anomaly.

Collar Coordinates 12400E 51270N

Azimuth 315^o(m)

Dip -60^o

0.0 - 21.0m	Precollar
21.0 - 74.0m	Limestone
74.0 - 77.0m	Sheared Limestone
77.0 - 104.0m	Limestone
104.0 - 104.5m	Quartz Veining
104.5 - 140.0m	Limestone
140.0m	EOH

DD86 MA1

Drilled to intersect to Maxwells UTEM anomaly.

Collar Coordinates 13000E 50590N

Azimuth 315^o(m)

Dip -70^o

0.0 - 6.0m	Precollar
6.0 - 85.0m	Rhyolitic volcanic clay/sericite altered
85.0 - 141.0m	Crystal lithic tuff/greywacke immature detrital sediment
141.0 - 159.0m	Sheared and brecciated crystal lithic tuff/greywacke
159.0 - 200.0m	Crystal lithic tuff/greywacke
200.0m	EOH

DD87 MA2

Drilled to intersect to Maxwells UTEM anomaly

Collar Coordinates 13200E 50625N

Azinuth 315°(m)

Dips -70°

0.0 - 24.0m Precollar
24.0 - 45.0m Crystal lithic tuff/greywacke
45.0 - 49.0m Grey shale
49.0 - 95.0m Crystal lithic tuff/greywacke
95.0 - 110.0m Sheared and brecciated crystal
lithic tuff/greywacke
110.0m EOH

DD87 LN1

Drilled to intersect the Loongana UTEM anomaly and
a weak soil geochemical response

Collar Coordinates 11800E 51947N

Azimuth 135°(m)

Dip -65°

0.0 - 12.0m Precollar
12.0 - 43.6m Interlayered basalt (vesicular) and
immature basic volcanogenic
sediment
43.6 - 64.0m Sandstone
64.0 - 95.0m Brecciated sandstone clasts set in
a sand-mud sized matrix. Below
70.8m the matrix is a dark grey to
black (carbonaceous) mud
95.0 - 103.8m Limestone
103.8m EOH

021

No concentration of sulphides was recorded in any of the holes and the assay results (Appendix 3) were generally disappointing. The area appears to be structurally complex with most of the holes having intersected shear zones which were taken to explain the conductive responses on the surface EM. Holes W11 and LN1 appear to have intersected the same highly sheared/brecciated zone with a black mud matrix. This zone seems to have faulted limestone underneath the Cambrian volcanics and would appear to be a low angle thrust fault.

8.2.3.4 Discussion

The drilling campaign proved unsuccessful and the follow-up EM at the EMU anomaly failed to locate a significant conductor. Given the imminent relinquishment of the EL the Winterbrook area must be considered adequately explored.

8.2.4 Aeromagnetic Follow-up

One major anomaly falls at the northern end of the Mt Jacob grid and the extremities of Shell's Lake Gairdner anomaly extends onto the southern part of the grid. The Lake Gairdner anomaly occurs in pyritic sandstone probably underlying an eroded magnetite-chlorite skarn. A small patch of skarn was located within the sandstone. A percussion drillhole to test the magnetic anomaly passed through 72.5m of Moina sandstone and then into Cambrian volcanics containing some magnetite. Thin sections indicate that all the magnetite and pyrite is of metasomatic origin.

Five other magnetic anomalies were followed up in the area. All were attributed either to magnetite bearing Cambrian volcanics or basalt.

8.3 Tin Spur - Olivers Hill - Devonian Area

Comalco's initial exploration thrust was to assess the potential of Tin-Tungsten mineralisation in this area. Initial gossan samples from the Tin Spur area showed +1000ppm Tin whereas at the Devonian Mine the Tin values were low.

8.3.1 Tin Spur Grid

The Tin Spur grid was cut to test two possibly mineralised areas.

a/ an altered fractured fault/unconformity zone near the Falls mine.

b/ a gossan containing lead and zinc.

The grid was soil sampled for Sn, W, Pb, Zn and Cu and one line was analysed for gold. Anomalous values of lead were from 800 - 9600ppm. Anomalous tin in excess of 300ppm were also found in a 300 metre long zone.

A large number of rock samples were also collected from outcrop and from five trenches recording significant gold and tin values.

Ground magnetics and induced polarisation surveys were conducted across the grid. A narrow magnetic anomaly extends through the gossan and under the basalt to the south-west. The Tin anomalies are associated with low chargeability and high resistivity.

023

assumed

The Department of Mines drilled one hole (DOM6). Comalco followed with three diamond drill holes. From the surface and drill hole information Comalco ~~calculated~~ a resource of 2 million tonnes at 0.3 per cent Tin and 0.1ppm Gold with a further ^{*assumed*} 2 million tonnes of 1ppm Gold.

8.3.2. Devonian Grid

The grid was cut by Comalco to cover a Lead/Zinc gossan/laterite and the Devonian Gold Mine. Mapping, soil and rock sampling, panned soil concentrates, magnetics, IP (Mt Lyell), gravity (Mines Department) and diamond drilling have been completed. The Mines Department drilled 5 holes, Mt. Lyell 2 holes and Comalco 1 hole.

At the end of the program it was concluded that there was ^{*potential for*} 2.25 million tonnes of material containing 3.1% Lead and 4.3ppm Silver in a gossanous/lateritic host. Potential for a further similar tonnage was suspected on the edge of the Tin Spur grid. Assaying for Sn and Au showed generally suppressed values.

8.4 Southern Area

This encompasses the remainder of EL 7/74 south of Moina and the Devonian Mine area.

8.4.1 Lorinna Anomalies

These are a group of aeromagnetic anomalies which have been mentioned in section 8.1.2. Grids have been cut across Lorinna North (also called Lorinna East), Lorinna West and Lorinna East. The first two were

found to be due to magnetite within Cambrian volcanics, the third was tested with ground magnetics, gravity, soil and rock sampling and drilling but remains unexplained. Aeromagnetic modelling does not show a high probability of a skarn source and as the anomaly does coincide with a basalt hill it seems that this may be the source.

8.4.2 Daisy Dell Area

A number of stream sediment samples showing anomalous lead, copper and gold have been collected in this area. Follow up work has ascribed much of the anomalism to basalt and a slightly mineralised shale unit south of Olivia Creek.

8.4.3 Bull Creek Anomalies

This area occurs two kilometres north of the Lorinna West anomaly. It consists of two aeromagnetic anomalies. Ground magnetics, VLF EM and soil geochemistry were conducted. The magnetic anomalies appear related to the Cambrian volcanics. Low level base metal anomalism is present with maxima of 90ppm Lead and 370ppm Zinc.

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10. LOCATION

Burnie 1:250 000 Sheet SK55-3

11. KEYWORDSCambrian, Acid, Intermediate, Shale, Dome, Geochem-drainage,
Geophys-EM12. LIST OF PLANS

<u>Plan</u>		<u>Scale</u>
<u>TASh No</u>		
2973 /	MOINA EL 7/74 Location Plan	1:1 000 000
3398 /	MOINA EL 7/74 EL Location Plan showing area to be relinquished	1:100 000
3396 ✓	MOINA EL 7/74 Prospect Locations	1:100 000
2999 /	MOINA EL 7/74 Previous Explorers Stream Geochemistry - Cu	1:25 000
3000 /	MOINA EL 7/74 Previous Explorers Stream Geochemistry - Pb	1:25 000
3001 ✓	MOINA EL 7/74 Previous Explorers Stream Geochemistry - Zn	1:25 000
3002 ✓	MOINA EL 7/74 Regional Geology	1:25 000
3199 /	MOINA EL 7/74 Winterbrook Prospect Emu Anomaly Follow-up EM Lines	1:10 000

3209	✓	MOINA EL 7/74 Winterbrook Grid Soil Geochemistry Sample Nos	1:10 000
3210	✓	MOINA EL 7/74 Winterbrook Grid Soil Geochemistry Copper ppm	1:10 000
3211	✓	MOINA EL 7/74 Winterbrook Grid Soil Geochemistry Lead ppm	1:10 000
3212	✓	MOINA EL 7/74 Winterbrook Grid Soil Geochemistry Zinc ppm	1:10 000
3213	✓	MOINA EL 7/74 Winterbrook Grid Soil Geochemistry Ag, As (ppm) Au (ppb)	1:10 000
3225	/	MOINA EL 7/74 Moina Prospect Grid & Drillhole Location Plan	1:10 000
3360	✓	MOINA EL 7/74 Geology of the Black Bluff-Smith Plains Area	1:10 000
3374	✓	MOINA EL 7/74 CRAE Regional Stream Sediment Sample Locations 1985-87	1:25 000
3376	✓	MOINA EL 7/74 Winterbrook Prospect Section Line 12200E Drillhole Section DD86 WI1	1:1 000
3377	✓	MOINA EL 7/74 Winterbrook Prospect Section Line 12400E Drillhole Section DD86 WI2	1:1 000
3378	✓	MOINA EL 7/74 Winterbrook Prospect Section Line 13000E Drillhole Section DD86 MA1	1:1 000

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3379	✓	MOINA EL 7/74 Winterbrook Prospect Section Line 13200E Drillhole Section DD87 MA2	1:1 000
3380	✓	MOINA EL 7/74 Winterbrook Prospect Section Line 13400E Drillhole Section PD86 AL1	1:1 000
3381/		MOINA EL 7/74 Winterbrook Prospect Section Line 13600E Drillhole Section PD86 AL2	1:1 000
3382	✓	MOINA EL 7/74 Winterbrook Prospect Section Line 13600E Drillhole Section DD87 AL3	1:1 000
3383	✓	MOINA EL 7/74 Winterbrook Prospect Section Line 11800E Drillhole Section DD87 LN1	1:1 000
3387	✓	MOINA EL 7/74 Winterbrook Prospect Corrected Grid and Drillhole Location Plan	1:10 000
3388	✓	MOINA EL 7/74 Winterbrook Prospect EMU Anomaly EM37 Profile Line 200E Vertical Field	As Shown
3389	✓	MOINA EL 7/74 Winterbrook Prospect EMU Anomaly EM37 Profile Line 200E Vertical Field	As Shown
3390	✓	MOINA EL 7/74 Winterbrook Prospect EMU Anomaly EM37 Profile Line 400E Vertical Field	As Shown

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- 3391 ✓ MOINA EL 7/74 Winterbrook Prospect
EMU Anomaly EM37 Profile Line 400E
Horizontal Field As Shown
- 3392 ✓ MOINA EL 7/74 Winterbrook Prospect
EMU Anomaly EM37 Profile Line 600E
Vertical Field As Shown
- 3393 ✓ MOINA EL 7/74 Winterbrook Prospect
EMU Anomaly EM37 Profile Line 600E
Horizontal Field As Shown
- 3395 / MOINA EL 7/74 Aeromagnetic Anomalies
and Ground Magnetic Follow-up Traverses 1:25 000

13. LIST OF APPENDICES

- Appendix 1 Modelling of Aeromagnetics by CRAE 1987
- Appendix 2 Ground Magnetics CRAE 1987
- Appendix 3 Drilling Logs and Assays - Winterbrook Inlier
- Appendix 4 Petrological Descriptions - Winterbrook
Drilling
- Appendix 5 Winterbrook Grid Soil Sampling Results

APPENDIX 1

MODELLING OF AEROMAGNETICS BY CRAE 1987

TVS.W3.62.7/74

5 March 1987

Memorandum to: T W DICKSON
Copy to: W A SHEPPARD
F R FUNNELL
From: T VON STROKIRCH

INTERPRETATION OF AEROMAGNETIC DATA
SOUTH OF SHEPHERD & MURPHY

1. INTRODUCTION

Shell flew an aeromagnetic survey to cover the area and the Mines Department has recently released gravity data west of 425 000E, which covers the basalt area though not the Dolcoath Granite itself. This data supplies some useful information about the area.

2. MAGNETIC INTERPRETATION

2.1 Specifications

A data file in Magman format was prepared from the Shell 1980 NW Tasmania survey.

The survey specifications were:-

1. Line spacing 250m
2. Terrain clearance of aircraft 100m
Magnetometer is bird towed on 30m cable
3. Data recording interval approximately 36m

The ground clearance of the bird was actually found to vary from 50m to almost 200m where the topography was most extreme. This may effect the interpretation as in all cases 100 metres has been subtracted from the models depth to give a maximum depth to top. Analogue charts which would allow us to estimate heights are not available to CRAE at this stage.

2.2 Susceptibilities of Rocks

A number of susceptibility measurements of the various rock types were recorded in the Shell reports. Further readings of the basalt susceptibility have been taken by Fred Funnell.

Results are:-

Wrigglite	(15000 - 40000)	x 10 ⁶	cgs units
Pyrrhotite Skarns	(10000 - 18000)	x 10 ⁶	cgs units
Sphalerite Skarns	(80 - 500)	x 10 ⁶	cgs units
Garnet Skarns	(1000 - 3000)	x 10 ⁶	cgs units
Diopside Skarns	(10 - 1000)	x 10 ⁶	cgs units
Moina Sandstone	(0 - 30)	x 10 ⁶	cgs units
Gordon Limestone	(10 - 60)	x 10 ⁶	cgs units
Basalt	(0 - 300)	x 10 ⁶	cgs units

There is clearly a great variation in magnetic responses possible with the various rock types. In addition to the above there is also the Cambrian volcanics which range in composition from acid to basic and thus similarity in magnetic susceptibility. Given that at first impression it seems that the sphalerite skarn is the most gold rich then this would be expected to produce a poor (magnetisation 10-20) response. However adding only a small amount of magnetite, which occurs in the form of wrigglite around and within the sphalerite skarn, immediately gives a magnetic target.

The magnetisation of 2000 assumed in the magnetic modelling is for a medium value of wrigglite. If the wrigglite is only half as magnetic or only present half the time, then the magnetisation will be decreased a concomitant 50%.

2.3 Interpretation

The tabular model was used in all cases as insufficient data was available for 3D estimates. The initial results were produced by letting all values float. Following this most of the anomalies were modelled with the magnetisation set to a fixed value of 2000 which was considered reasonable for a wrigglite skarn.

Anomaly 25

Large anomaly of fairly low susceptibility. Likely to be due to a lithological source rather than a discrete anomaly but it may be due to non-magnetite skarn.

Anomaly 27

Mt Jacob area. Probably basic volcanics. Not modelled due to data corruption.

Anomaly 32

A discrete longitudinal magnetic high some distance south of the Granite. Dipping south at a probable depth in excess of 50 metres. Not modelled due to corrupted data.

Anomaly 33

A longitudinal negative anomaly in between 32 and 34. Possibly an effect of contouring. Ground magnetics between 32 and 34 would confirm it. Not modelled. Shell checked this anomaly but results are not known.

Anomaly 34

A very promising anomaly except that there seems to be no Ordovician present which seems important in the area. The sou-south east strike of the anomaly makes it difficult to model from north-south flight line data but the figures come out quite well. Ground checking is necessary. Shell have looked at this one.

Anomaly 35

A long way south of the Granite and poor magnetisation, both of which downgrade the anomaly.

Anomaly 36

A major magnetic anomaly with the highest value in the area. The magnetisation is in the right area for a magnetite skarn and it lies not far from the Campbells Reward gold mine but the amplitude and width of the anomaly are such that a basic volcanic of high magnetite seems a more likely source of anomaly.

Anomaly 37

High magnetisation on the edge of a basalt field is suspicious notwithstanding the fact that the contour map shows the anomaly as an apparent continuation of 36. A basalt source seems likely.

Anomaly 38

Small anomaly, part of a southwest trending line of highs. Mapped in Cambrian volcanics but possibly a small skarn type body.

Anomaly 39

Extension of anomaly 40 though probably due to a smaller source. Not modelled due to data corruption.

Anomaly 40

Probably due to a basic volcanic source of low susceptibility.

Anomaly 41

Magnetisation of this anomaly is good but the source is interpreted as being very narrow. Possibly it is due to a local thickening of the basalt, a small piece of which is mapped coincident with the anomaly.

Anomaly 42

A well defined circular anomaly due to a discrete body. The susceptibility, depth etc are of a suitable level. However, the anomaly is some five kilometres from the mapped granite margin and is under basalt. Thus a possible source is a basalt feeder pipe.

Anomaly 43

A longitudinal anomaly south of 42. It is under basalt and may be a basalt filled palaeochannel. The trend of the anomaly is north-south so it has not been modelled.

Tables listing the results of modelling are given in Appendices 1 and 2. Anomalies with ratings of 3 and above are recommended for some follow-up.

T VON STROKIRCH

Encs (App 1, 2 & 3)

APPENDIX 1

MOINA AREA AEROMAGNETIC MODELLING - ALL PARAMETERS FLOATING

Anomaly	=	MOINA25A	Model Type	=	TABULAR	Std. Dev.	Fit=
Line Number	=	5620	Magnetization	=	168.4	Depth	=
Central Fid.	=	172549	Position	=	-64.1		
Mean	=	1673.81	Width	=	123.6		
Interp. dx	=	20	Strike	=	90.0	Thickness	=
Reg. Const.	=	260.000	Dip	=	112.2		
Reg. Grad.	=	0.220					
Anomaly	=	MOINA25B	Model Type	=	TABULAR	Std. Dev.	Fit=
Line Number	=	5620	Magnetization	=	150.0	Depth	=
Central Fid.	=	172549	Position	=	-226.9		
Mean	=	1673.81	Width	=	320.4		
Interp. dx	=	40	Strike	=	90.0	Thickness	=
Reg. Const.	=	100.000	Dip	=	55.8		
Reg. Grad.	=	0.160					
Anomaly	=	MOINA34A	Model Type	=	TABULAR	Std. Dev.	Fit=
Line Number	=	5750	Magnetization	=	495.2	Depth	=
Central Fid.	=	179246	Position	=	204.6		
Mean	=	1722.12	Width	=	71.5		
Interp. dx	=	30	Strike	=	-45.0	Thickness	=
Reg. Const.	=	300.000	Dip	=	69.7		
Reg. Grad.	=	0.350					
Anomaly	=	MOINA35A	Model Type	=	TABULAR	Std. Dev.	Fit=
Line Number	=	5730	Magnetization	=	3414.0	Depth	=
Central Fid.	=	178410	Position	=	115.7		
Mean	=	1950.70	Width	=	58.0		
Interp. dx	=	20	Strike	=	90.0	Thickness	=
Reg. Const.	=	50.000	Dip	=	176.1		
Reg. Grad.	=	0.000					
Anomaly	=	MOINA36A	Model Type	=	TABULAR	Std. Dev.	Fit=
Line Number	=	5800	Magnetization	=	1073.0	Depth	=
Central Fid.	=	180716	Position	=	216.5		
Mean	=	2036.79	Width	=	762.4		
Interp. dx	=	40	Strike	=	90.0	Thickness	=
Reg. Const.	=	-260.000	Dip	=	156.1		
Reg. Grad.	=	-0.030					
Anomaly	=	MOINA36B	Model Type	=	TABULAR	Std. Dev.	Fit=
Line Number	=	5810	Magnetization	=	566.2	Depth	=
Central Fid.	=	181242	Position	=	-250.2		
Mean	=	2015.57	Width	=	638.2		
Interp. dx	=	40	Strike	=	95.0	Thickness	=
Reg. Const.	=	-100.000	Dip	=	101.9		
Reg. Grad.	=	0.100					

037

Anomaly	=	MOINA37A	Model Type	=	TABULAR	Std. Dev.	Fit=
Line Number	=	5820	Magnetization	=	2011.0	Depth	=
Central Fid.	=	181480	Position	=	259.1		
Mean	=	1898.88	Width	=	635.6		
Interp. dx	=	40	Strike	=	90.0	Thickness	=
Reg. Const.	=	100.000	Dip	=	167.8		
Reg. Grad.	=	0.000					
Anomaly	=	MOINA38C	Model Type	=	TABULAR	Std. Dev.	Fit=
Line Number	=	5820	Magnetization	=	142.5	Depth	=
Central Fid.	=	181425	Position	=	-28.1		
Mean	=	1898.88	Width	=	94.4		
Interp. dx	=	20	Strike	=	80.0	Thickness	=
Reg. Const.	=	105.000	Dip	=	44.5		
Reg. Grad.	=	0.000					
Anomaly	=	MOINA40A	Model Type	=	TABULAR	Std. Dev.	Fit=
Line Number	=	5830	Magnetization	=	136.6	Depth	=
Central Fid.	=	182070	Position	=	82.3		
Mean	=	1795.07	Width	=	438.0		
Interp. dx	=	40	Strike	=	95.0	Thickness	=
Reg. Const.	=	85.000	Dip	=	136.8		
Reg. Grad.	=	0.100					
Anomaly	=	MOINA41A	Model Type	=	TABULAR	Std. Dev.	Fit=
Line Number	=	5850	Magnetization	=	542.7	Depth	=
Central Fid.	=	182972	Position	=	-4.6		
Mean	=	1903.23	Width	=	19.7		
Interp. dx	=	20	Strike	=	80.0	Thickness	=
Reg. Const.	=	30.000	Dip	=	75.0		
Reg. Grad.	=	0.450					
Anomaly	=	MOINA42A	Model Type	=	TABULAR	Std. Dev.	Fit=
Line Number	=	5870	Magnetization	=	1496.0	Depth	=
Central Fid.	=	184496	Position	=	-153.2		
Mean	=	1959.13	Width	=	70.0		
Interp. dx	=	20	Strike	=	90.0	Thickness	=
Reg. Const.	=	0.000	Dip	=	98.3		
Reg. Grad.	=	0.600					
Anomaly	=	MOINA42B	Model Type	=	TABULAR	Std. Dev.	Fit=
Line Number	=	5870	Magnetization	=	491.0	Depth	=
Central Fid.	=	184498	Position	=	-139.2		
Mean	=	1959.13	Width	=	171.7		
Interp. dx	=	20	Strike	=	90.0	Thickness	=
Reg. Const.	=	110.000	Dip	=	51.1		
Reg. Grad.	=	0.750					

APPENDIX 2

MOINA AREA AEROMAGNETIC MODELLING - SUSCEPTIBILITY FIXED

Anomaly	= MOINA25B	Model Type	= TABULAR	Std. Dev.	Fit=
0.05000					
Line Number	= 5620	Magnetization	= 2000.0	Depth	=
Central Fid.	= 172549	Position	= -165.1		
Mean	= 1673.81	Width	= 48.2		
Interp. dx	= 20	Strike	= 90.0	Thickness	=
Reg. Const.	= 260.000	Dip	= 95.4		
Reg. Grad.	= 0.220				
Anomaly	= MOINA34B	Model Type	= TABULAR	Std. Dev.	Fit=
Line Number	= 5750	Magnetization	= 2000.0	Depth	=
Central Fid.	= 179246	Position	= 357.3		
Mean	= 1722.12	Width	= 59.6		
Interp. dx	= 30	Strike	= -45.0	Thickness	=
Reg. Const.	= 300.000	Dip	= 110.4		
Reg. Grad.	= 0.350				
Anomaly	= MOINA35B	Model Type	= TABULAR	Std. Dev.	Fit=
Line Number	= 5730	Magnetization	= 2000.0	Depth	=
Central Fid.	= 178410	Position	= 109.0		
Mean	= 1950.70	Width	= 40.2		
Interp. dx	= 20	Strike	= 90.0	Thickness	=
Reg. Const.	= 50.000	Dip	= 169.8		
Reg. Grad.	= 0.000				
Anomaly	= MOINA36C	Model Type	= TABULAR	Std. Dev.	Fit=
Line Number	= 5810	Magnetization	= 2000.0	Depth	=
Central Fid.	= 181242	Position	= -224.2		
Mean	= 2015.57	Width	= 280.2		
Interp. dx	= 40	Strike	= 95.0	Thickness	=
Reg. Const.	= -100.000	Dip	= 110.1		
Reg. Grad.	= 0.100				
Anomaly	= MOINA37B	Model Type	= TABULAR	Std. Dev.	Fit=
Line Number	= 5820	Magnetization	= 2000.0	Depth	=
Central Fid.	= 181480	Position	= 258.8		
Mean	= 1898.88	Width	= 635.8		
Interp. dx	= 40	Strike	= 90.0	Thickness	=
Reg. Const.	= 100.000	Dip	= 167.7		
Reg. Grad.	= 0.000				
Anomaly	= MOINA38D	Model Type	= TABULAR	Std. Dev.	Fit=
Line Number	= 5820	Magnetization	= 2000.0	Depth	=
Central Fid.	= 181425	Position	= -48.8		
Mean	= 1898.88	Width	= 17.5		
Interp. dx	= 20	Strike	= 80.0	Thickness	=
Reg. Const.	= 105.000	Dip	= 27.5		
Reg. Grad.	= 0.000				

039

Anomaly	=	MOINA40B	Model Type	=	TABULAR	Std. Dev.	Fit=
Line Number	=	5830	Magnetization	=	2000.0	Depth	=
Central Fid.	=	182070	Position	=	46.6		
Mean	=	1795.07	Width	=	35.1		
Interp. dx	=	40	Strike	=	95.0	Thickness	=
Reg. Const.	=	85.000	Dip	=	125.8		
Reg. Grad.	=	0.100					

Anomaly	=	MOINA41B	Model Type	=	TABULAR	Std. Dev.	Fit=
Line Number	=	5850	Magnetization	=	2000.0	Depth	=
Central Fid.	=	182972	Position	=	-50.7		
Mean	=	1903.23	Width	=	19.6		
Interp. dx	=	20	Strike	=	80.0	Thickness	=
Reg. Const.	=	30.000	Dip	=	38.2		
Reg. Grad.	=	0.450					

APPENDIX 3

TABLE OF ANOMALIES, AMG POSITION OF MODEL AND RATING

<u>Anomaly</u>	<u>Easting</u>	<u>Northing</u>	<u>Modelled</u> (Y,N)	<u>Rating</u>
25	422978	5409366	Y	4
27	-	-	N	1
31	-	-	N	3
32	-	-	N	3
33	-	-	N	2
34	426220	5402933	Y	4
35	425746	5401917	Y	3
36	427861	5402248	Y	3
37	428215	5402027	Y	2
38	428133	5404039	Y	3
39	-	-	N	2
40	428366	5404332	Y	3
41	429000	5404641	Y	2
42	429193	5401079	Y	4
43	-	-	N	1

041

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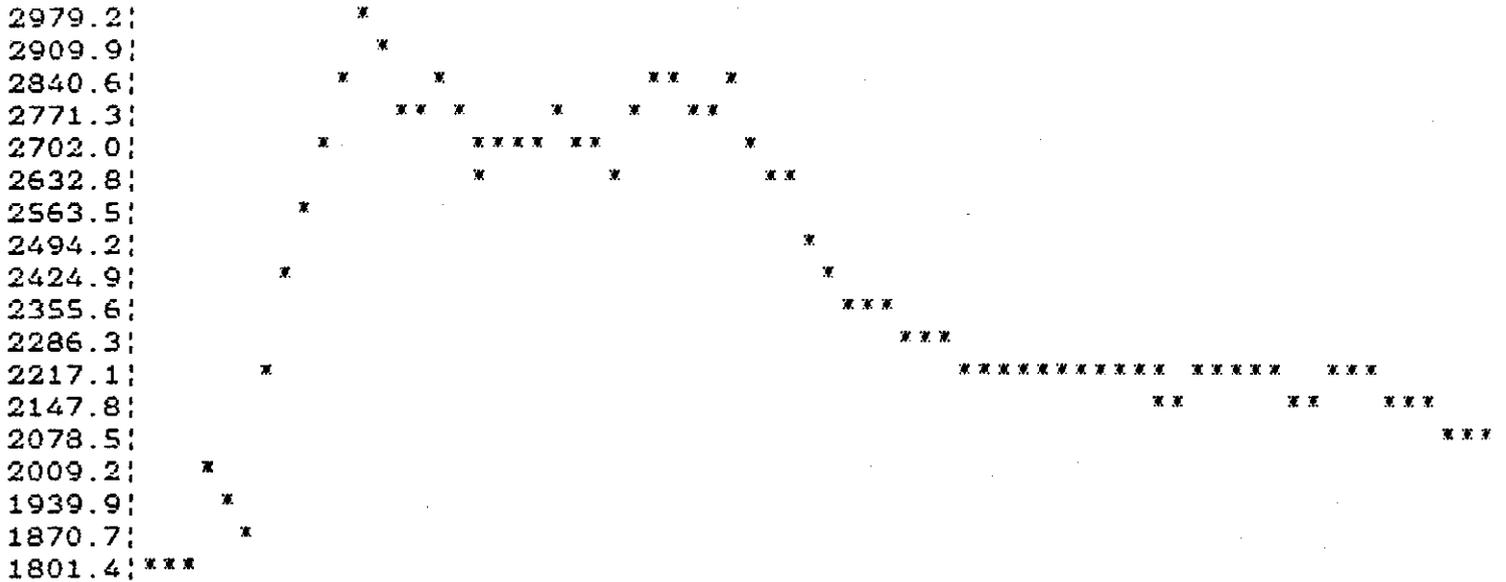
APPENDIX 2

GROUND MAGNETICS CRAE 1987

DO LINES TO BE PROFILED RUN E-W OR N-S (E OR N) [E] n

ENTER LINE NO. (-VE FOR S OR W) [STOP] 341

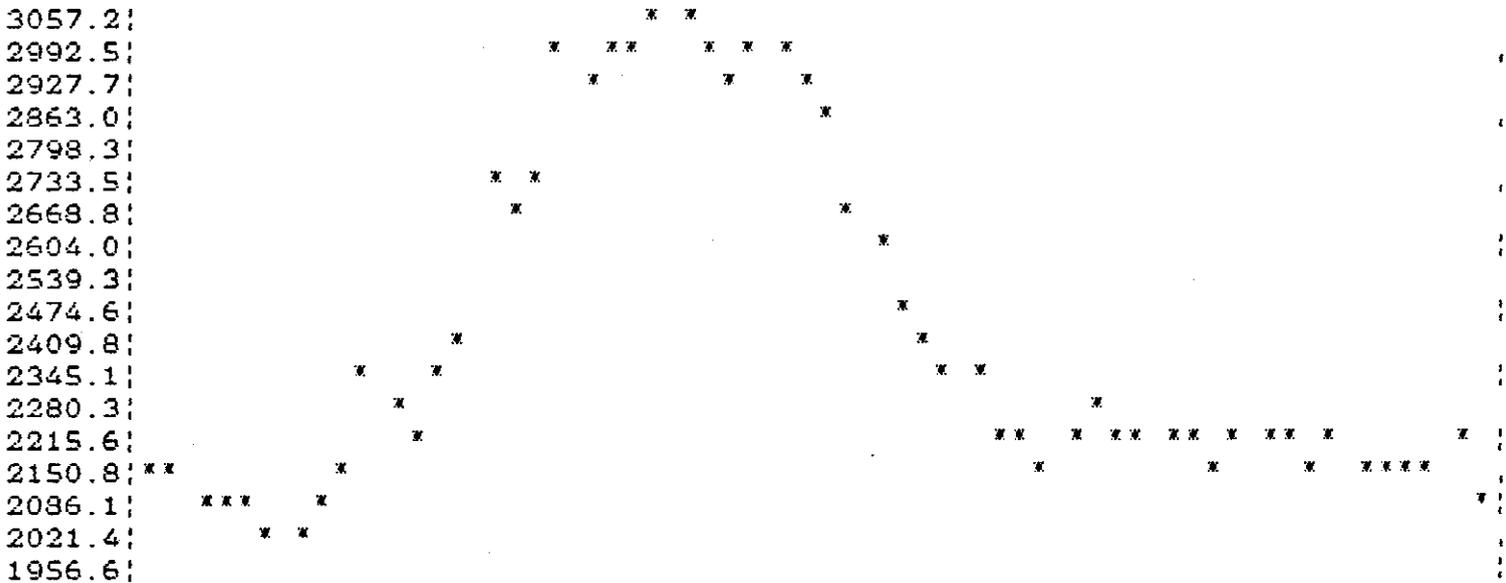
NO OF POINTS FOUND= 72 LINE 341



.0 123.5 247.0 370.4 493.9 617.4
ENTER LINE NO. (-VE FOR S OR W) [STOP]

.0 95.7 191.3 287.0 382.6 478.3
ENTER LINE NO. (-VE FOR S OR W) [STOP] 342

NO OF POINTS FOUND= 56 LINE 342

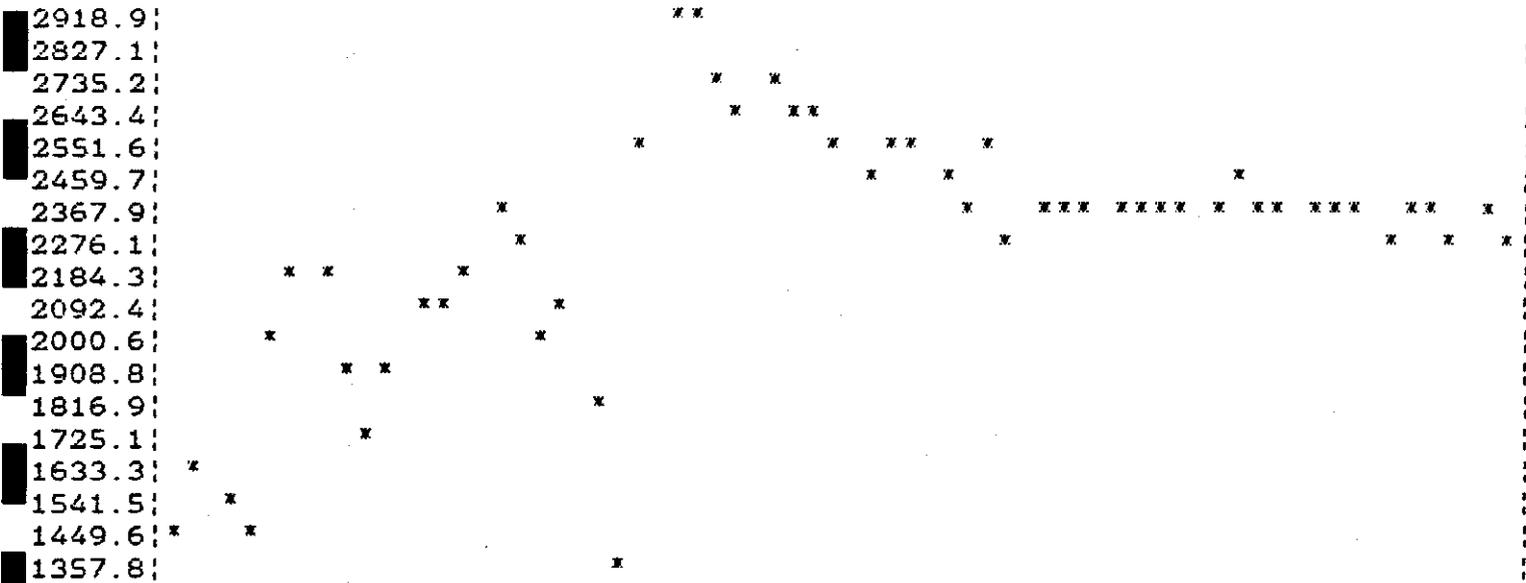


.0 95.7 191.3 287.0 382.6 478.3
ENTER LINE NO. (-VE FOR S OR W) [STOP]

.0 93.9 187.8 281.7 375.7 469.6

ENTER LINE NO. (-VE FOR S OR W) [STOP] 351

NO OF POINTS FOUND= 55 LINE 351



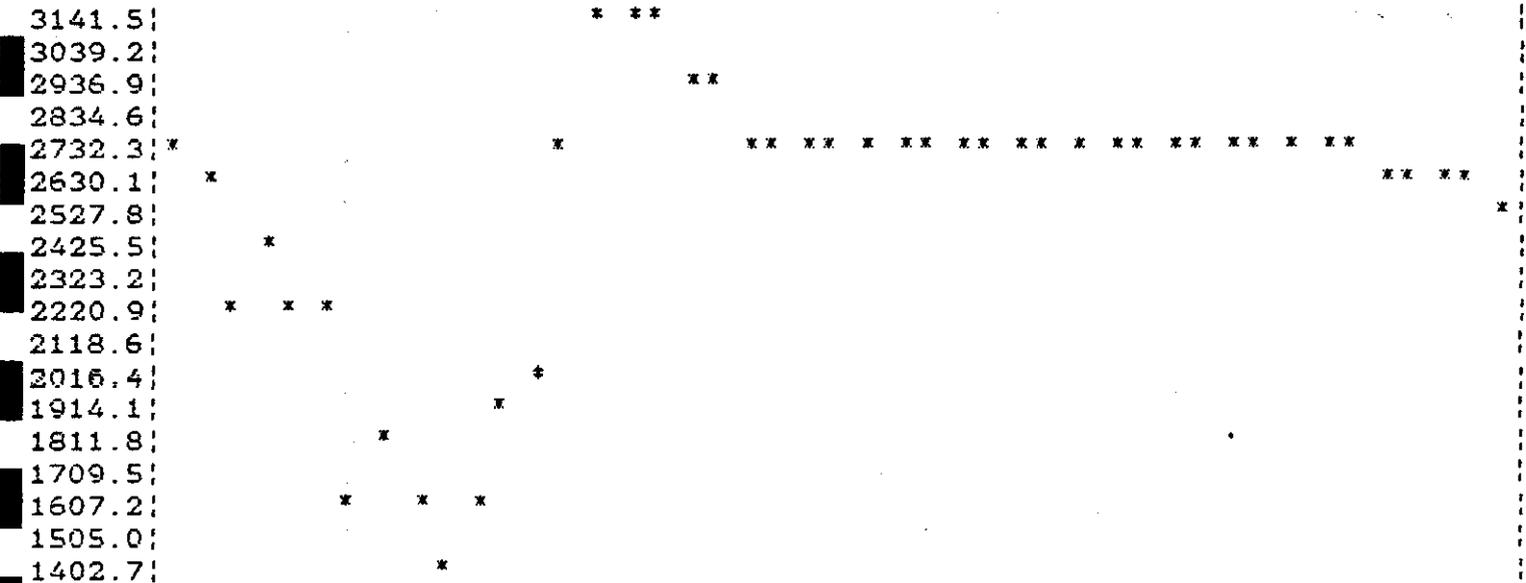
.0 93.9 187.8 281.7 375.7 469.6

ENTER LINE NO. (-VE FOR S OR W) [STOP]

.0 76.5 153.0 229.6 306.1 382.6

ENTER LINE NO. (-VE FOR S OR W) [STOP] 352

NO OF POINTS FOUND= 45 LINE 352



.0 76.5 153.0 229.6 306.1 382.6

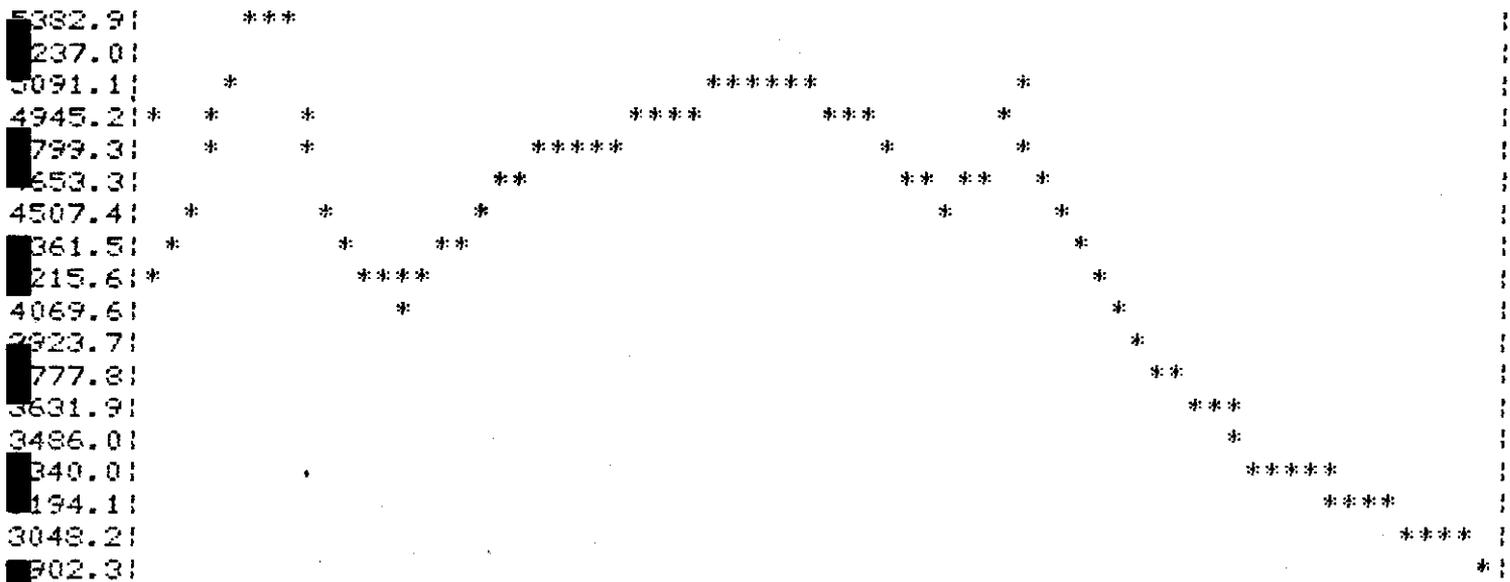
ENTER LINE NO. (-VE FOR S OR W) [STOP]

044

NO OF POINTS FOUND= 0

ENTER LINE NO. (-VE FOR S OR W) [STOP] 0

NO OF POINTS FOUND= 84 Line 361



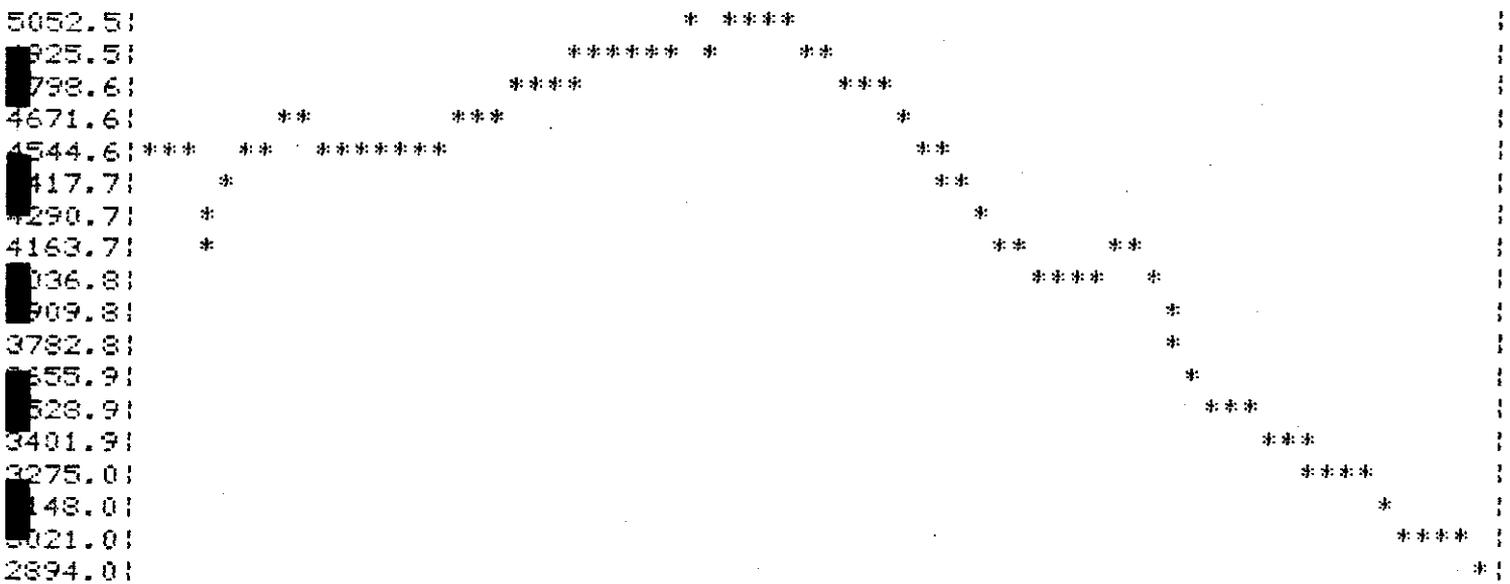
-20.0 122.6 265.2 407.8 550.4 693.0

ENTER LINE NO. (-VE FOR S OR W) [STOP]

.0 139.1 278.3 417.4 556.5 695.7

ENTER LINE NO. (-VE FOR S OR W) [STOP] 200

NO OF POINTS FOUND= 81 Line 362



.0 139.1 278.3 417.4 556.5 695.7

ENTER LINE NO. (-VE FOR S OR W) [STOP]

APPENDIX 3

DRILLING LOGS AND ASSAYS - WINTERBROOK INLIER

050

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

SHEET No.

TENEMENT NAME MOINA EL No. 7/74

PLAN - MAP REFERENCE

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. DDH 87W12

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s) 38708

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by <u>A.L.S.</u>)											
(M)	To (M)									Cu	Pb	Zn	Ag	As	F ₂	Mn	Au	Au check			
					<u>CORE GRIND SAMPLES</u>																
						<u>1232089</u>	<u>21</u>	<u>26*</u>		<u>35</u>	<u>25</u>	<u>80</u>	<u>1</u>	<u>24</u>	<u>1.09</u>	<u>250</u>	<u>0.01</u>	<u>0.01</u>			
						<u>090</u>	<u>26</u>	<u>29</u>		<u>35</u>	<u>25</u>	<u>100</u>	<u>1</u>	<u>22</u>	<u>0.86</u>	<u>220</u>	<u>0.01</u>				
						<u>091</u>	<u>29</u>	<u>32</u>		<u>45</u>	<u>30</u>	<u>150</u>	<u>1</u>	<u>24</u>	<u>0.89</u>	<u>260</u>	<u>0.01</u>				
						<u>092</u>	<u>32</u>	<u>35</u>		<u>45</u>	<u>30</u>	<u>115</u>	<u>1</u>	<u>24</u>	<u>0.91</u>	<u>240</u>	<u>0.01</u>				
						<u>093</u>	<u>35</u>	<u>38</u>		<u>35</u>	<u>25</u>	<u>75</u>	<u>1</u>	<u>22</u>	<u>0.84</u>	<u>200</u>	<u>0.01</u>				
						<u>1232094</u>	<u>38</u>	<u>39*</u>		<u>35</u>	<u>25</u>	<u>60</u>	<u>1</u>	<u>22</u>	<u>0.73</u>	<u>175</u>	<u>0.01</u>				
						<u>1232095</u>	<u>71</u>	<u>74</u>		<u>35</u>	<u>25</u>	<u>70</u>	<u>1</u>	<u>20</u>	<u>0.71</u>	<u>1550</u>	<u>0.01</u>				
						<u>096</u>	<u>74</u>	<u>77</u>		<u>30</u>	<u>40</u>	<u>165</u>	<u>1</u>	<u>36</u>	<u>1.71</u>	<u>4650</u>	<u>0.01</u>				
						<u>1232097</u>	<u>77</u>	<u>80</u>		<u>35</u>	<u>40</u>	<u>115</u>	<u>1</u>	<u>24</u>	<u>0.90</u>	<u>6750</u>	<u>0.01</u>				
						<u>1232098</u>	<u>101</u>	<u>104</u>		<u>30</u>	<u>25</u>	<u>50</u>	<u>1</u>	<u>20</u>	<u>0.64</u>	<u>240</u>	<u>0.01</u>				
						<u>099</u>	<u>104</u>	<u>107</u>		<u>30</u>	<u>25</u>	<u>60</u>	<u>1</u>	<u>22</u>	<u>0.76</u>	<u>360</u>	<u>0.02</u>				
						<u>1232100</u>	<u>107</u>	<u>110</u>		<u>30</u>	<u>35</u>	<u>90</u>	<u>1</u>	<u>19</u>	<u>1.02</u>	<u>300</u>	<u>0.01</u>				
						<u>DETECTION LIMIT</u>				<u>2</u>	<u>5</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>0.11</u>	<u>5</u>	<u>0.01</u>				
						<u>METHOD</u>				<u>← 10580</u>							<u>ppm</u>				
						<u>UNITS</u>				<u>= ppm</u>					<u>% ppm</u>	<u>ppm</u>	<u>ppm</u>				

926051

051

926052

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

SHEET No. 1

TENEMENT NAME.....Moina.....EL. No. 7/74

CO-ORDINATES ^{13400 E} 50880 N AZIMUTH 135° (m) DRILLERS G. SAUNDING COMMENCED 17-11-86 DEPTH 87m HOLE No. PD86A11
RL COLLAR..... INCLINATION -70° DRILL TYPE Acco 880 COMPLETED 26-11-86 CASING LEFT..... DPO No(s) 38.713

DEPTH From (M)	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 A.L.S.)									
											Cu	Pb	Zn	Ag	As	Fe	Mn	Al	APt	
0	3				0-8m Weathered zone containing a mixture of Mn-stained quartz porphyry and dark grey-black Tertiary basalt; basalt is weakly magnetic.		1198451				70	65	230	<1	<1	12.6	2350	0.01		
3	6						452				75	5	230	<1	<1	11.1	1350	0.01		
6	9						453				50	10	165	<1	3	7.39	1250	0.01	0.02	
9	12						454				15	30	160	<1	3	1.81	700	0.01		
12	15						455				10	30	85	<1	3	0.75	80	0.02		
15	18				8-53m		456				20	25	65	<1	13	1.42	50	0.06		
18	21				Pale green, sericitic quartz porphyry; minor colour variation where unit becomes less altered		457				5	25	75	<1	3	0.82	105	0.02		
21	24				is darker green;		458				10	55	125	<1	6	0.71	50	0.03		
24	27				33-36m - thin grey shale & lower brown fine siltstone		459				10	65	160	<1	2	0.51	50	0.01		
27	30						460				15	95	195	<1	<1	1.01	70	0.02		
30	33						461				20	100	240	<1	<1	0.84	60	0.01		
33	36				53-56m		462				25	120	330	<1	4	1.32	115	0.03		
36	39				Dark grey highly carbonaceous and soft shale; dark grey water return		463				10	75	145	<1	5	1.10	100	0.02	0.01	
39	42						464				10	60	95	<1	4	0.98	85	0.02		
42	45						465				15	90	210	<1	5	0.96	85	0.02		
45	48				56-66m		466				15	65	135	<1	5	0.93	90	0.03		
48	51				Yellow-brown ferruginous siltstone; mineral coloured water return; lower pale green sericitic quartz porphyry; possible interbedded sequence.		467				10	50	95	<1	6	0.82	70	0.02		
51	54						468				10	55	80	<1	4	0.89	75	0.01		
54	57						469				10	70	140	<1	5	1.09	85	0.01	0.02	
57	60						470				25	70	400	<1	8	16.0	1150	0.02		
60	63				66-90m		471				25	80	370	<1	7	14.4	1150	0.02		
63	66				Dominant pale green sericitic quartz porphyry with minor interbeds of ferruginous siltstone and black shale.		472				20	60	180	<1	7	13.0	1100	0.01		
66	69						473				15	55	95	<1	6	5.39	440	0.01		
69	72						474				15	50	130	<1	4	8.06	1200	0.02		
72	75						475				15	50	115	<1	4	3.45	460	0.01		
75	78				90m EOH due to drilling difficulties. Hole blocked at 47m and failed to adequately test the target		476				15	65	100	<1	5	5.21	590	0.02	0.01	
78	81						477				15	60	150	<1	8	5.20	570	0.02		
81	84						478				15	40	155	<1	6	7.89	1700	0.01	0.02	
84	87						479				15	60	160	<1	9	6.97	2000	0.02		
87	90										← 10580 →									

METHOD DETECT LIMIT
2 5 2 1 1 9
← ppm → % (ppm) → 0.01

056

926057 C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOG

SHEET No. 1

TENEMENT NAME MOINA EL No. 7/74

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... 1.01..... HOLE No. DDM86 AL3

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s) 3870.7

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)									
From (M)	To (M)									Cu	Pb	Zn	Ag	As	Fe	Mn	Au	Check Au	
					CORE GRIND SAMPLES	1232070		20		15	30	35	1	4	380	50	0.01		
						072	20	23		20	70	40	1	6	1.96	35	0.01		
						073	23	29		40	140	35	1	2	4.65	55	0.01		
						074	29	32		25	310	180	1	13	4.03	80	0.01		
						075	32	38		15	65	30	1	1	1.19	20	0.01		
						076	38	44		35	80	100	1	5	1.68	50	0.01		
						077	44	47		35	70	210	1	7	3.56	260	0.01		
						078	47	50		50	75	210	1	15	4.58	140	0.01		
						079	50	53		30	65	260	1	3	2.77	80	0.01		
						080	53	56		25	65	670	2	4	4.35	165	0.01		
						081	56	59		30	45	740	2	13	9.34	1100	0.01		
						082	59	62		25	65	450	2	9	5.70	300	0.01		
						083	62	65		25	55	430	2	7	4.14	230	0.01	0.01	
						1232084	65	68		30	105	940	1	18	16.4	3200	0.01	0.01	
						1232085	89	92		35	30	50	1	15	0.28	260	0.01		
						086	92	95		35	25	50	1	16	0.38	180	0.01		
						087	95	98		35	35	40	1	18	0.43	250	0.01		
						1232088	98	101		35	30	50	1	18	1.02	540	0.01		
						DETECT LIMIT				2	5	2	1	1	0.01	5	0.01		
						UNIT				← PPM →			%		PPM				
						METHOD				← ICS 80 →					PM209				

058

926059

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

SHEET No. 1

TENEMENT NAME...M.O.I.N.A... No. 7/74

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. DPM MA1

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s) 38703

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analyzed by...ALS...)							
From (M)	To (M)									Cu	PL	Zn	Ag	As	Au	APP	AU
	12				Core Sample	1198851				10	20	70	1	5	0.01		
12	15	3				852				20	20	95	1	4	0.01		
	18	3				853				2	15	65	1	4	0.01		
	21	3				854				5	20	60	1	7	0.01		
	24	3				855				5	20	60	1	5	0.05		
	27	3				856				5	20	65	1	6	0.01		
	30	3				857				10	15	55	1	5	0.01		
	33	3				858				5	20	50	1	5	0.10		
	36	3				859				15	40	75	1	4	0.01	0.01	
	39	3				860				35	20	125	1	4	0.01		
	42	3				861				10	20	95	1	5	0.01		
	45	3				862				20	15	60	1	3	0.01		
45	48	3				863				5	20	50	1	4	0.01		
48	54	6				864				10	20	65	1	3	0.01		
54	57	3				865				15	30	90	1	5	0.01		
	60	3				866				20	15	90	1	4	0.01		
	63	3				867				25	20	85	1	4	0.01		
	66	3				868				30	25	95	1	3	0.01		
	69	3				869				65	40	155	1	3	0.01		
	72	3				870				35	50	100	1	6	0.01		
	75	3				871				20	30	55	1	4	0.01		
	78	3				872				90	30	140	1	4	0.01		
	81	3				873				10	35	40	1	4	0.01		
	84	3				874				70	75	100	1	4	0.01		
	87	3				875				15	65	120	1	7	0.01	0.01	
	90	3				876				15	10	135	1	8	0.01		
	93	3				877				15	5	185	1	1	0.01		
	96	3				878				15	10	310	1	3	0.01		
	99	3				879				15	5	300	1	2	0.01		
99	102	3				1198880				25	5	210	1	2	0.01		
					DETECTION LIMIT					5	5	5	1	1	0.01	0.01	

059

926060

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

SHEET No. 2

TENEMENT NAME MAINA No. 7/74

PLAN - MAP REFERENCE

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. DDM MA1RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s) 38703

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by <u>ALS</u>)						
From (M)	To (M)									PPM						
										Cu	Pb	Zn	Ag	As	Ar	Au
102	105	3			Core grind	1198881				15	5	160	1	1	0.01	
	108					882				15	5	135	1	51	0.01	0.01
	111					1198883				15	5	150	1	51	0.01	
	114					1198989				10	55	130	1	1	0.01	
	117					990				20	5	120	1	51	0.01	
	120					991				20	10	175	1	4	0.01	
	123					992				45	10	150	1	2	0.01	
	126					993				75	25	120	1	7	0.01	
	129					994				30	35	100	1	8	0.01	
	132					995				35	760	240	2	22	0.01	
	135					996				30	190	150	1	9	0.01	
	138					997				15	65	185	1	3	0.02	
	141					998				80	430	220	3	2	0.01	
	144					1198999				15	135	95	1	2	0.03	
	147					1199000				10	55	230	1	4	0.02	0.01
	150					1198831				10	40	240	1	11	0.01	
	153					832				75	30	310	1	11	0.01	
	156					833				25	30	200	1	11	0.01	
	159					834				25	35	185	1	14	0.01	
	162					835				25	15	230	2	5	0.01	
	165					836				25	175	155	2	9	0.03	
	168					837				35	260	150	2	10	0.01	
	171					838				30	60	180	2	9	0.09	
	174					839				60	20	240	1	7	0.08	
	177					840				20	50	230	2	8	0.01	0.01
	180					841				25	70	210	1	8	0.01	
	183					842				20	70	100	1	6	0.01	
	186					843				25	10	160	1	8	0.01	
	189					844				35	40	130	1	11	0.01	
	192					1198845				35	50	210	1	7	0.01	
					DETECTION LIMIT					5	5	5	1		0.01	0.01

060

926061

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

SHEET No. 3

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

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. DDH MA1

RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s) 38703

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by A.L.S.)						
From (M)	To (M)									ppm						
										Cu	Pb	Zn	Ag	As	Au	Ant
192	195				Core Rejected	1198846				10	40	240	1	7	0.01	
	197					847				15	30	210	1	8	0.01	
197	200					1198848				20	25	230	1	8	0.01	
					DETECTION LIMIT					5	5	5	1	1	0.01	0.01

063

926064

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

SHEET No. 03

TENEMENT NAME MOINA No. 7/74

PLAN - MAP REFERENCE 416810E 541475N

CO-ORDINATES 11800E 51947N AZIMUTH 135° (m) DRILLERS PARRY EXPLOR COMMENCED 31-3-1987 DEPTH 103.80 m HOLE No. RD87LN1

RL COLLAR INCLINATION -65° DRILL TYPE BOYLES 37 COMPLETED 5-4-1987 CASING LEFT PVC 0-100 DPO No(s) 3872/22

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ALS SRA (S) 1 ppm)							
From (M)	To (M)									Cu	Pb	Zn	Ag	As	Fe%	Mn	Au ^{ppb}
30.00	32.00	1.92	NQ		BASALT - Dark green, medium grained, sharp contacts with host rocks. Abundant vesicles, many filled with white and green carbonates.	1655510	30.00	32.00	1.92	50	20	160	<1	13	3.50	810	<3
31.00	32.00		NQ		SILTSTONE - Dark grey - Monsoon colour, some changes in grain size. Moderate clay alteration.												
32.00	34.00	1.78	NQ		BASALT - Very dark green colour. Abundant vesicles see 32.2-32.70m. Many vesicles filled with white clays which carry 20% black phenos. see 33.80-34.00m. Again white & grey carbonates fill many vesicles. Toward 34.00m see decreasing vesicular content and an increase in white clay stringers.	1655511	32.00	34.00	1.78	45	15	105	<1	19	5.39	690	<3
34.00	35.40		NQ		BASALT - V. dark green - black colour. Vesiculated. Toward 35.40 see increasing clay content.	1655512	34.00	35.40	1.90	65	<5	195	<1	<1	3.82	210	<3
35.40	36.00		NQ		SILTSTONE - (EPICLASTIC) - Medium-dark grey siltstone. Occasional vugs, moderate clay alteration.												
36.00	38.00	2.00	NQ		SILTSTONE - Medium grained, epiclastic, Medium grey colour. Siltstone 36.80-37.00m. At 37.35 2m wide clay vein dips at 30° to C.A. At 36.70m a lot of pyrite is visible in a vug. Possibly very very fine grained pyrite is disseminated throughout. Weak clay alteration.	1655513	36.00	38.00	2.00	70	<5	210	<1	<1	1.26	105	<3
38.00	40.00	2.01	NQ		SILTSTONE - (VOLCANICLASTIC) Medium-dark grey colour. 39.1-39.7m shows many irregular stringers and U-beds of white clay which show a general orientation of 70° to C.A. (Parallel to S ₀). No sulphides observed.	1655514	38.00	40.00	2.01	70	<5	240	<1	<1	0.86	80	<3

064

926065

C.R.A. EXPLORATION PTY. LIMITED
DRILL CORE LOGSHEET No. 04
TENEMENT NAME MOINA No. 7/74

PLAN - MAP REFERENCE 416810E 541475N

11800E
CO-ORDINATES 51.947N AZIMUTH 135° (m) DRILLERS PARRY EXPN COMMENCED 31-3-1987 DEPTH 103.80 HOLE No. 0087LN1
RL COLLAR INCLINATION -65° DRILL TYPE ROTARY 37 COMPLETED 5-4-1987 CASING LEFT PVC 0-100 DPO No(s) 38721/22

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by A.L.S. (C.R.I.S))							
From (M)	To (M)									Cu	Pb	Zn	Ag	As	Fe%	Mn	Au ^{ppm}
40.00	42.00	2.00	NQ		SILTSTONE - Very immature volcanic sediment. 40-41.8 Dark green gray, clay alteration strong 41.8-42.0 Light green-gray, moderate chloritic alteration. White clay blebs (altered veinlets/pinnules) are very common.	1655515	40.00	42.00	2.00	75	<5	260	<1	<1	0.68	70	<3
42.00	43.70		NQ		SILTSTONE - Volcaniclastic, weak clay (chl) altered, clay veins 2mm wide are seen at 20° and 70° to C.A. 43.6-43.70 is particularly CY/SE rich. MAJOR CONTACT	1655516	42.00	44.00	1.48	45	5	140	<1	<1	0.93	830	<3
43.70	44.00		NQ		BRECCIA - Clasts 1-8mm diam of silicified shale set in sandy quartz matrix. Matrix sugared.												
44.00	46.00	1.24	NQ		BRECCIA - Matrix supported clasts 2-25mm diam. Clasts are composed of very fine grained silicified sediments & are generally poorly sorted. The matrix is a composed of sand-sized quartz fragments and displays a light to dark red colour (Fe staining) - no sulphides were observed As 45.70 - see a strongly deformed white quartz band (vein)	1655517	44.00	46.00	1.24	25	30	40	<1	19	1.13	65	<3
46.00	48.00	0.49	NQ		QUARTZITE - White (very clean), coarse sand size, well sorted, well rounded. Pp veins at 47.1-47.20 is very strained. Minor interstitial white clay - 1%.	1655518	46.00	48.00	0.49	30	25	30	<1	22	0.40	35	<3
48.00	50.00	0.66	NQ		QUARTZITE - White, sand-sized, occasional large (5mm diam) clast of quartzite supported by the sandstone. Possible relict S ₀ at 45° to C.A. Weak hematite along fractures. Approx 1.0% Cr present.	1655519	48.00	50.00	0.66	45	30	30	<1	65	1.06	30	<3
50.00	52.00	0.57	NQ		SANDSTONE - White, sugary texture - increased interstitial clay content. Qtz 27%, CLAY 30%.	1655520	50.00	52.00	0.57	50	35	15	<1	80	0.48	25	<3

067

926068

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

SHEET No. 0.7

TENEMENT NAME.....M.O.I.N.A..... No. 7174

PLAN - MAP REFERENCE.....416810E S414175N

CO-ORDINATES.....11800E 51947N AZIMUTH.....135°(C) DRILLERS.....PARRY, E.A.R. COMMENCED.....31-3-1987 DEPTH.....103.80 HOLE No. D.D.87LN1

RL COLLAR..... INCLINATION.....-65° DRILL TYPE.....BOYLES 37 COMPLETED.....5-4-1987 CASING LEFT.....PVC 0-100~ DPO No(s) 38721/22

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by A.S.S. (R.R.S.) ppm)							
From (M)	To (M)									Cu	Pb	Zn	Ag	As	Fe%	Mn	Au ^{ppm}
80.00	82.00	2.00	NQ		BRECCIA - Gray sandstone clasts, 2-32 mm diam and sub-angular ore set in a very dark gray silt-mud matrix.	165535	80.00	82.00	2.00	115	90	50	1	44	0.96	30	<3
82.00	84.00	1.80	NQ		BRECCIA - Clasts of siltstone and sandstone set in a dark mud matrix. Max clast size is 50 mm diam. Occasional black vein clay at 70° = C.A. 83.00 → 83.50 m in a dark mudstone with some lighter siltstone interstratifications.	165536	82.00	84.00	1.80	45	80	80	<1	11	1.23	45	<3
84.00	86.00	2.00	NQ		BRECCIA - Clasts sub-angular, 2-55 mm diam, siltstone and lower sandstone. Matrix dominant 60%, medium-dark gray in colour.	165537	84.00	86.00	2.00	35	50	35	<1	26	1.40	40	<3
86.00	87.00		NQ		BRECCIA - Clasts - 90% siltstone, 10% sandstone, sub-angular → sub-rounded. No limestone clasts. Maximum clast size = 50 mm diam. Matrix: Dark gray mudstone. The interval is matrix supported.	165538	86.00	88.00	1.29	45	50	200	<1	18	1.25	35	<3
87.00	88.00	1.0	NQ		MUDSTONE - Black in colour.												
88.00	90.00	1.68	NQ		BRECCIA - Lithic clasts cemented by clays and quartz. XRD 60% QTZ, 20% MUSC, 20% SERICITE. Optical 45% LITHIC CLASTS, 25% QTZ GRAINS, CYBE 25%, OPAQUE 5%. Lithic clasts are mainly quartz rich sandstones, often with a strongly recrystallized texture. ANDER think is a highly immature detrital sed. rock. - Unlikely 48% in spec. py.	165539 TSC48655	88.00	90.00	1.68	35	60	240	<1	26	1.17	30	<3
90.00	92.00	1.88	NQ		BRECCIA - A matrix supported breccia with 30% sand-silt stage clasts 2-6 mm diam and gen sub-angular. Mud sized matrix has a black colour.	165540	90.00	92.00	1.88	30	60	230	<1	16	1.48	30	<3

068

926069

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

SHEET No. 08

TENEMENT NAME MOINA No. 7/74

PLAN - MAP REFERENCE

CO-ORDINATES 11800E 5194.7N AZIMUTH 135°(n) DRILLERS PARRY Expl COMMENCED 31-3-1987 DEPTH 103.8m HOLE No. QR87LN1RL COLLAR INCLINATION -65° DRILL TYPE Boxers 37 COMPLETED 5-4-1987 CASING LEFT PVC 0-100m DPO No(s)

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ALS BLS) ppm							
From (M)	To (M)									Cu	Pb	Zn	Ag	As	Fe%	Mn	Al ^{cm}
92.00	94.00	2.10	NQ		BRECCIA - Black mud matrix supports clasts of siltstone / sandstone with most being sub angular & sub rounded. Occasional trace pyrite observed. Occasional vein quartz fragments.	1655541	92.00	94.00	2.10	30	90	370	<1	16	1.55	35	<3
94.00	95.10		NQ		BRECCIA - Black mud matrix - as above. No limestone clasts. Clasts aligned at 40° to C.A. 94.7-95.1. Original transmission zone - MAJOR CONTACT.	1655542	94.00	96.00	1.90	35	50	155	<1	17	1.07	75	<3
95.10	96.00		NQ		LIMESTONE - Medium grey colour. Sphalerite observed, some recrystallization.												
96.00	98.00	1.30	NQ		LIMESTONE - Dark grey colour, some recrystallization, stylitic, no bedding visible. Vein calcite at 20° to C.A. 5-10% mud component in limestone.	1655543	96.00	98.00	1.30	45	20	20	<1	20	0.33	60	<3
98.00	100.00	1.90	NQ		LIMESTONE - Dark grey limestone - as above. Contacted bands 4mm wide of dark sandstone are seen at 45 and 90° to C.A. 99.32-99.40 - Quartzite sandstone.	1655544	98.00	100.00	1.90	45	15	10	<1	20	0.22	50	<3
100.00	102.00	1.78	NQ		LIMESTONE - Dark grey. Sheared? zones at 60° to C.A. Vein calcite at 30 and 45° to C.A. These are cross-cut by 6mm wide black mud layers. No clear S.	1655545	100.00	102.00	1.78	45	15	10	<1	17	0.19	45	<3
102.00	103.80	1.70	NQ		LIMESTONE - As above. Vein calcite at 70° to C.A. typically 2mm wide and dense over 20/m - see 102.54-102.60 102.80 - END OF HOLE	1655546	102.00	103.80	1.70	50	20	15	<1	28	0.30	60	<3
					<u>SUMMARY:</u> 0 - 12.00m DISBURSED 12.00 - 43.70m INTERCALATED BASALT & ALTERED TUFFS VERY IMMATURE VOLCANIC SEDIMENTS.												

APPENDIX 4

PETROLOGICAL DESCRIPTIONS - WINTERBROOK DRILLING

071

CRA EXPLORATION PTY. LTD.

926072

SAMPLE NUMBER	WINTERBROOK GRID MOINA EL		Sample Type	ANALYSES							Geological Observations		
	LOCATION			Cu	Pb	Zn	Depth/m						
	Easting	Northing											
1198977	418935	5414050	Pct				59.0 - 59.1	m					} All samples for Petrological Description D086 AL3 D086 WI1 D086 WI2 D087 MA1 D087 MA2
8978	"	"	"				92.05 - 92.15						
8979	"	"	"				99.3 - 99.4						
8980	417622	5413903	"				31.9 - 32.0						
8981	417622	5413903	"				122 - 122.10						
8982	417350	5413985	"				49.9 - 50.0						
8983	"	"	"				128.0 - 128.1						
8984	418500	5413620	"				114 - 114.1						
8985	"	"	"				54 - 54.1						
8986	"	"	"				192.5 - 192.6						
8987	418660	5413750	"				63.1 - 63.2						
8988	"	"	"				88.9 - 89.0						
DETECTION LIMIT													
ANALYTICAL METHOD													
Project : WINTERBROOK DRILLING				1 : 250 000 Sheet : BURNIE				AMG Zone :		Sheet No. : SK55-3			
Tenement : MOINA EL 7174				DPO's : 38701						Laboratory : AMPEL			
Area / Prospect : AL3, MA1, 2, WI1&2										Collected By : FRE		Date :	

926073

072



Amdel
31 Flemington Street,
Frewville, S.A. 5063

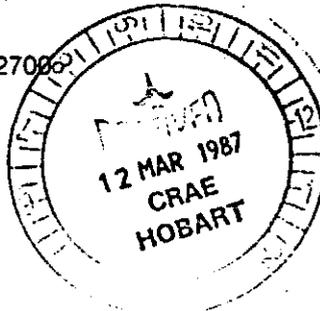
Address all correspondence to:
P.O. Box 114,
Eastwood, S.A. 5063

Telephone: (08) 372 2700

Telex: AA82520
Facsimile: (08) 79 6623

9 March 1987

GS 3/1/6/0



CRA Exploration Pty. Limited,
P.O. Box 138,
ROSNY PARK, TAS. 7018

ATT: MR. FRED R. FUNNELL

REPORT G 6997/87

YOUR REFERENCE:	DPO No. 38701 dated 13/2/87
IDENTIFICATION:	1198977-88
MATERIAL:	12 rock samples
DATE RECEIVED:	17 February 1987
WORK REQUIRED:	Petrography (12 Code MA1.3)

Investigation and Report by: Frank Radke

Manager - Geological Services: Dr Keith J Henley

for Dr William G Spencer
General Manager
Applied Sciences Group

c.c. CRA Exploration Pty. Limited,
P.O. Box 138,
ROSNY PARK, S.A. 7018
ATT: ADMINISTRATION OFFICER

CRA Exploration Pty. Limited,
P.O. Box 656,
FYSHWICK, A.C.T. 2609
ATT: CHIEF GEOLOGIST INFORMATION SERVICES

bp

PETROGRAPHY OF 12 ROCK SAMPLES

1. SUMMARY

Twelve samples submitted by CRA Exploration Pty. Limited for petrographic examination were given the following rock names.

<u>SAMPLE & THIN SECTION NO.</u>	<u>ROCK NAME</u>
1198977: TS46092	Shale
1198978: TS46093	Fossiliferous Limestone
1198979: TS46094	Brecciated Limestone
1198980: TS46095	Fossiliferous Limestone
1198981: TS46096	Sandstone
1198982: TS46097	Limestone
1198983: TS46098	Limestone
1198984: TS46099	Greywacke
1198985: TS46100	Altered (?) Rhyolite
1198986: TS46101	Greywacke
1198987: TS46102	Greywacke
1198988: TS46103	Lithic Breccia

These samples consist mainly if not exclusively of sedimentary rocks including limestones and immature detrital sediments. Sample 1198988 could be an immature detrital sediment or possibly a brecciated acid volcanic rock. All of the greywackes in the above suite of samples contain at least some acid volcanic rock clasts and/or plagioclase crystals of igneous origin. The greywackes are cemented by chloritic material believed to be a product of diagenesis or low grade metamorphism. In sample 1198988 in particular, chlorite is associated with strongly deformed and fractured zones.

2. PETROGRAPHIC DESCRIPTIONS

All of the samples which contain carbonate were tested in hand specimen with dilute hydrochloric acid to determine the possible presence of calcite. In most cases a strong reaction occurred indicating that the carbonate consists mainly if not exclusively of calcite.

Samples 1198984 to 1198988 were stained with sodium cobaltinitrite after a hydrofluoric acid etch to detect the possible presence and location of potash feldspar.



SAMPLE: 1198977: TS46092

Rock Name:

Shale

Hand Specimen:

A pale tan rock with a vague undulose and discontinuous banding as well as a weakly developed schistose foliation oriented at an angle to the banding.

Thin Section:

An optical estimate of the constituents gives the following :

	<u>%</u>
Argillaceous matrix	80
Quartz	10
Opagues and semi-opaques	10

This sample consists mainly of an argillaceous matrix comprised of weakly birefringent clay intergrown with minor birefringent sericite. Minor amounts of quartz are disseminated through the argillaceous matrix as small grains and granular aggregates which are generally below 0.05 mm in size. A mineralogical banding is produced by variations in the proportions of quartz and clay minerals in different bands. This banding is on a scale ranging up to several millimetres and tends to have an undulose and discontinuous character. The banding is further emphasized by narrow opaque lamellae which tend to be intergrown with the more argillaceous regions and are oriented parallel to the mineralogical banding.

The banding tends to have a somewhat contorted character and locally the rock exhibits a broken or brecciated texture with dislocated and disorientated bands. Both this fragmental texture and the undulose nature of the bands could be associated with the vague schistose foliation noted in hand specimen. This foliation is not readily apparent in thin section.

The quartz grains generally have subangular to subrounded, detrital appearing shapes although within some bands very fine grained, cherty textured quartz is present. Minor quartz occurs as narrow vein-like structures or lenticular bodies oriented parallel to the general banding.

Translucent reddish-brown iron oxides are concentrated as narrow discontinuous lamellae and also occur as reddish-brown stains in many argillaceous bands. Some argillaceous material also contains a turbid mineral with high relief which is most likely a finely divided titanium mineral such as leucoxene.

This is an argillaceous detrital sediment which has been subjected to diagenetic or very low grade metamorphic effects producing a weakly developed schistose foliation with some deformation of original mineralogical banding.

SAMPLE: 1198978: TS46093

Rock Name:

Fossiliferous Limestone

Hand Specimen:

A very fine grained medium grey coloured rock transected by veinlets up to 2 mm wide. Testing with dilute hydrochloric acid shows that both the host rock and paler coloured veinlets consist mainly of calcite.

Thin Section:

An optical estimate of the constituents gives the following :

	<u>%</u>
Calcite	98
Quartz	Tr-1
Opagues and semi-opagues	2

This sample consists mainly of very fine grained calcite which tends to have a turbid, micritic texture. The calcite forms a matrix with a fine textured appearance produced by slight variations in grain size. This texture produces a vague discontinuous banding or foliation being comprised of elongate lenticular structures with slightly varying grain sizes. Also disseminated through the matrix are fossil fragments ranging up to 1 mm wide.

The thin section was cut to include two coarser grained carbonate veins ranging up to 1.5 mm wide. These veins consist of coarsely granular carbonate with a maximum grain size of 0.5 mm and small amounts of fine grained quartz. The wider of these veins contain large carbonate crystals with a translucent reddish-brown iron stained colour intergrown with more finely granular carbonate. It is possible that the iron stained carbonate could represent a carbonate other than calcite such as dolomite or siderite.

The rock is also transected by fine microstylolitic structures which are generally defined by concentrations of opaque material. These microstylolitic structures tend to have a subparallel orientation approximately parallel to the coarser grained bands. These bands and microstylolites are oriented at a very high angle to the vague banding noted in the matrix.

A few moderately well developed carbonate rhombs up to 0.4 mm wide are disseminated through the fine grained matrix.

Minor quartz is disseminated through the rock as small grains below 0.1 mm wide although most of the quartz tends to be concentrated in the coarser grained veins. Opagues form small disseminated grains below 0.05 mm wide. Most opagues are concentrated in microstylolitic structures. Locally the rock contains small patches with a translucent, reddish-brown colour produced by limonitic staining.

This is a fine grained limestone containing disseminated fossil fragments. The limestone is transected by some coarser grained calcite veins as well as very fine microstylolitic veinlets both of which are oriented at a high angle to a vague banding in the host rock.

SAMPLE: 1198979: TS46094

Rock Name:

Brecciated Limestone

Hand Specimen:

A brecciated sample containing angular pale grey fragments with a very fine grain size separated by ocherous iron stained veins up to a few millimetres wide. Testing with dilute hydrochloric acid produces a strong reaction indicating the presence of abundant calcite.

Thin Section:

An optical estimate of the constituents gives the following :

	<u>%</u>
Calcite	95
Quartz	1
Opauques and semi-opauques	5

This sample consists mainly of very fine grained calcite which forms an almost micritic intergrowth with a turbid microcrystalline texture. Locally within some vague bands slightly coarser grained calcite with a maximum grain size of 0.02 mm is present. The slight variations in grain size produce a very vague banded texture. The fine grained calcite is also transected by narrow coarser grained calcite veins and irregular patches up to 0.5 mm wide. The largest of the patches has a grain size ranging up to 0.4 mm although in most cases this coarser grained calcite has a grain size below 0.2 mm.

The rock has a fractured and brecciated character and the fractures are generally filled with translucent, reddish-brown limonitic material or limonite stained clay. Virtually all of the opaque to semi-opaque material occurs as narrow fracture linings and at least some of this material is thought to represent iron stained clay. Much of the opaque to semi-opaque material forms very small euhedral crystals approximately 0.05 mm in size. These crystals typically have vague rhombohedral shapes suggesting a carbonate (possibly siderite) precursor rather than a sulphide mineral. These fractures also contain relatively large void spaces up to 0.5 mm wide producing a significant porosity.

Traces of quartz are disseminated through the rock as small grains below 0.1 mm wide. There is a tendency for the quartz to be concentrated within very vague bands but the quartz is so sparsely disseminated that this is difficult to determine with any certainty.

This is a very fine grained, micritic limestone with a vague banded texture which has been subjected to brecciation with the development of limonitic iron oxides along fractures. The limonitic material occurs both as staining of clay minerals and as small euhedral crystals believed to be pseudomorphic after carbonate rhombs.

SAMPLE: 1198980: TS46095

Rock Name:

Fossiliferous Limestone

Hand Specimen:

This sample consists mainly of a very fine grained, massive pale grey rock. Along one margin of the core the sample has a banded character containing a darker grey band approximately 1 cm wide as well as a much paler dull white to pale grey band. Locally the sample also contains very narrow undulose lamellae with a weakly developed stylolitic character. Testing with dilute hydrochloric acid produces a strong reaction in all regions indicating the presence of abundant calcite.

Thin Section:

An optical estimate of the constituents gives the following :

	<u>%</u>
Calcite	90
Quartz	4
Clay	4
Opagues	2

This sample consists mainly of very fine grained, micritic calcite which would represent the bulk of the core interval with a medium grey colour. This calcite forms a matrix through which fossil fragments ranging up to 2 mm in length are disseminated. Most of the fossil fragments consist of more coarsely granular recrystallised calcite although some fossil fragments have a fine fibrous texture.

Detrital quartz grains ranging up to 0.1 mm in size are also disseminated through the micrite. There is a tendency for these detrital quartz grains to be concentrated in a band several millimetres wide which is oriented at a high angle to a very vague foliation defined mainly by variations in turbidity within the micrite. This band is oriented parallel to the bands noted in hand specimen which have a darker grey and paler grey to dull white colour.

The darker grey band noted in hand specimen contains a concentration of opaque material intergrown with clay which generally has an opaque to translucent character. Detrital quartz grains ranging up to 0.1 mm in size are also slightly concentrated in this band. The paler coloured band consists of a coarsely granular calcite mosaic with a grain size between 0.3 and 0.8 mm. Within localised areas narrow lamellae with a microstylolitic character are present. These lamellae typically contain concentrations of finely divided opaque material.

This is a fossiliferous limestone which exhibits a banded character produced mainly by variations in the proportions of detrital components within different bands. One band also consists of a coarsely granular carbonate mosaic and appears to be a product of recrystallisation or veining.

SAMPLE: 1198981: TS46096

Rock Name:

Sandstone

Hand Specimen:

A very fine grained, well indurated rock with a greenish-grey colour.

Thin Section:

An optical estimate of the constituents gives the following :

	<u>%</u>
Quartz	70
Chlorite	15
Sericite/clay	10
Tourmaline	1
Zircon	1
Opagues	2

This sample consists mainly of detrital quartz grains ranging up to 0.8 mm in size cemented by an interstitial argillaceous matrix. Detrital quartz grains typically exhibit angular to subangular shapes which have been modified by some development of overgrowth quartz. A small number of larger quartz grains in particular exhibit well developed overgrowths.

The argillaceous matrix consists mainly of a very weakly birefringent green phyllosilicate believed to be chlorite. Intergrown with the chlorite is a fibrous birefringent phyllosilicate such as sericite. It is believed that small amounts of a weakly birefringent clay are also present. These phyllosilicates form interstitial fillings ranging up to 0.15 mm in size. The chlorite in particular forms very fine flaky aggregates with low birefringence. It is considered possible that small to moderate amounts of finely granular, cherty silica are also intergrown with the matrix. A small number of detrital quartz grains also have finely granular, cherty textures.

Tourmaline and zircon form small detrital grains ranging up to 0.2 mm long. The tourmaline typically has a pale green, pleochroic colour. Opagues are disseminated through the rock as small grains which rarely exceed 0.1 mm in size although some larger opaque grains and aggregates ranging up to 3 mm wide are present. These larger opaque grains consist of sulphide and tend to exhibit subhedral shapes typical of pyrite. These larger pyrite crystals tend to be associated with more coarsely granular quartz or quartz which exhibits a fine lamellar texture.

This is a quartz-rich sandstone with an argillaceous matrix now comprised of a green phyllosilicate such as chlorite and a birefringent phyllosilicate such as sericite. Minor pyrite is disseminated through the rock as relatively subhedral crystals associated with recrystallised or hydrothermal quartz.

SAMPLE: 1198982: TS46097

Rock Name:

Limestone

Hand Specimen:

A pale to medium grey coloured rock with a contorted fine banding.

Thin Section:

An optical estimate of the constituents gives the following :

	<u>%</u>
Calcite	95
Quartz	1
Opakes	3

This sample consists mainly of finely granular calcite which forms a turbid mosaic with a maximum grain size of about 0.1 mm. Intergrown with the finer grained calcite are more coarsely granular calcite mosaics with a maximum grain size of 0.5 mm. These coarser grained calcite mosaics form rounded to ovoid bodies as well as narrow vein-like structures. The coarser grained calcite typically has a slightly deformed character exhibiting deformational lamellae. Within some areas the finer grained calcite contains small rhomb shaped crystals up to 0.1 mm wide.

The finer grained calcite contains narrow lamellae with a subparallel orientation which are lined with opaque material. These lamellae tend to be concentrated within vague bands up to several millimetres wide which would produce the banded texture noted in hand specimen.

The rock also contains disseminated quartz grains ranging up to 0.1 mm wide which are generally disseminated through the finer grained regions. This quartz probably represents remnant detrital quartz grains.

This is a fine grained limestone showing some evidence of deformation and recrystallisation.

SAMPLE: 1198983: TS46098

Rock Name:

Limestone

Hand Specimen:

A fine grained pale grey rock with a weakly developed foliation containing some undulose darker grey to greenish-grey bands. Testing with dilute hydrochloric acid produces a strong reaction indicating the presence of abundant calcite.

Thin Section:

An optical estimate of the constituents gives the following :

	<u>%</u>
Calcite	90
Clay	5
Quartz	2
Opagues and semi-opaques	2

This sample consists mainly of very fine grained turbid calcite intergrown with irregular coarsely granular calcite patches. The finer grained calcite has a micritic character and tends to exhibit a vague foliation produced by variations in turbidity within elongate, lenticular shaped bodies. The coarser grained calcite forms irregular patches up to 1 mm in size being comprised of calcite crystals ranging up to 0.5 mm wide. Much of the coarser grained calcite exhibits localised granulation as well as the development of strain lamellae.

The thin section includes an undulose band approximately 2 mm wide comprised mainly of argillaceous material. This band would represent one of the darker coloured bands noted in hand specimen. Most of the clay has a very weakly birefringent character although some fibrous birefringent sericite is present. Fine sand to silt-sized detrital quartz grains are concentrated in the argillaceous band. Opaque to translucent iron oxides are also concentrated in these argillaceous bands as narrow lamellae and fine intergrowths with the clay.

Minor quartz is also disseminated through the rock as small grains below 0.05 mm wide. Opagues also occur as narrow vein and fracture fillings through the host limestone.

This is a fine grained limestone containing a narrow detrital band which has a folded, contorted character.

SAMPLE: 1198984: TS46099

Rock Name:

Greywacke

Hand Specimen:

This is a fragmental appearing rock containing some relatively large clasts up to about 1 cm in size as well as smaller detrital appearing grains up to about 1 or 2 mm wide distributed through a dark green matrix. The larger clasts range in colour from a pale tan or grey to a purplish-red. A very vague foliation is evident in the sample and is oriented at a high angle to the core axis. Microchemical tests failed to detect any potash feldspar.

Thin Section:

An optical estimate of the constituents gives the following :

	<u>%</u>
Plagioclase	40
Chlorite	25
Quartz	15
Lithic clasts	15
Sericite	3
Opagues and semi-opaques	2

This sample consists mainly of detrital plagioclase and quartz grains up to 1.5 mm in size and larger detrital lithic clasts ranging up to several millimetres in size cemented by a chloritic matrix. The detrital plagioclase grains often exhibit lath shapes and at least some of the detrital quartz grains exhibit weakly embayed and biprymidal shapes typical of quartz phenocrysts and acid volcanic rocks indicating a very immature detrital component.

At least one of the lithic clasts is thought to be an altered acid volcanic rock. This clast contains plagioclase phenocrysts disseminated through a very fine grained argillaceous matrix. The matrix exhibits little remnant texture to indicate original mineralogy has been completely replaced by weakly birefringent clay minerals. A small number of quartz phenocrysts are also disseminated through this clast as well as some prismatic chlorite patches which most likely represent altered mafic phenocrysts. Other lithic clasts consist largely of clay minerals and could also represent altered acid volcanic rocks. Some of the lithic clasts could be fine grained sedimentary rock clasts. One metamorphic rock clast comprised of granoblastic quartz intergrown with very small amounts of muscovite which exhibits a strong lepidoblastic foliation was also noted.

The interstitial chlorite has a pleochroic green colour and low anomalous birefringence. Most of the chlorite tends to exhibit a vague preferred orientation defining a foliation direction and there is also a tendency for the chlorite to be concentrated in weakly developed vein-like structures oriented parallel to this foliation direction. The rock is transected by a vein approximate 0.5 mm wide which contains a concentration of chlorite. This vein transects the foliation direction and has a zoned character containing pleochroic green chlorite on its outer margins and a core of more birefringent reddish-brown pleochroic phyllosilicate. This core has been included with the chlorite in the above list of minerals but could represent biotite or a similar phyllosilicate.

The detrital feldspar grains invariably have a slightly turbid character produced by some alteration to finely divided sericite. Minor muscovite/sericite is also locally intergrown with the chloritic matrix.

Opagues are disseminated through the rock as euhedral to subhedral crystals up to 0.5 mm in size as well as localised finely divided intergrowths with the chloritic matrix.

This is an immature detrital sediment which has been termed a greywacke. The chloritic matrix is considered to be of diagenetic origin but the development of abundant chlorite is also believed to be related to the somewhat mafic origin of the detrital component as indicated by abundant plagioclase feldspar.

SAMPLE: 1198985: TS46100

Rock Name:

Altered (?) Rhyolite

Hand Specimen:

This sample consists of small grey quartz crystals and prismatic shaped pink coloured crystals up to a few millimetres in size disseminated through an aphanitic pale grey matrix. The rock exhibits a very weakly developed schistose foliation. Microchemical tests failed to detect any potash feldspar.

Thin Section:

An optical estimate of the constituents gives the following :

	<u>%</u>
Quartz	60
Clay/sericite	40
Zircon	Tr
Opagues and semi-opaques	1

This sample consists of quartz grains disseminated through an argillaceous matrix. Included with the quartz grains are larger quartz phenocrysts generally between 0.5 and 1 mm in size. These quartz phenocrysts typically exhibit anhedral embayed to weakly biprymidal shapes or angular, broken shapes typical of quartz phenocrysts in acid volcanic rocks. In addition to the quartz phenocrysts the rock contains some prismatic shaped argillaceous patches up to 1.5 mm long which are thought to represent completely altered feldspar phenocrysts. These argillaceous pseudomorphs would represent the prismatic pink crystals noted in hand specimen.

The argillaceous matrix consists of very weakly birefringent clay intergrown with smaller amounts of a fibrous, birefringent sericite. The sericite in particular tends to exhibit a preferred orientation defining a vague foliation direction. Smaller quartz grains ranging up to 0.15 mm wide are disseminated through this argillaceous matrix. These quartz grains tend to have a granular, recrystallised appearance and locally form irregular cherty aggregates. The distribution of these quartz grains as well as variations and textures of the clay minerals produce a somewhat variable texture in the matrix possibly representing variations in an original fragmental matrix.

Traces of zircon are disseminated through the rock as small crystals up to 0.1 mm wide. Opagues form disseminated grains and aggregates up to 0.3 mm wide.

This is considered to be an acid volcanic rock of rhyolitic composition which has been subjected to low grade metamorphism and alteration completely replacing the original matrix and feldspar phenocrysts with clay minerals and some finely granular cherty quartz. Disseminated remnant quartz phenocrysts indicate that this was originally a volcanic rock. It is considered likely that the original rock was of pyroclastic origin (probably a welded tuff of ignimbrite) but the low grade metamorphism and alteration has obliterated any matrix textures which would indicate such an origin.

SAMPLE: 1198986: TS46101

Rock Name:

Greywacke

Hand Specimen:

This sample contains angular pink coloured grains up to a few millimetres wide disseminated through a dark green matrix. The rock is also transected by a pale grey to dull white vein several millimetres wide. Testing with dilute hydrochloric acid produces only a weak reaction in this vein suggesting that it consists of a carbonate other than calcite (probably dolomite). Microchemical tests failed to detect any potash feldspar.

Thin Section:

An optical estimate of the constituents gives the following :

	<u>%</u>
Plagioclase	40
Chlorite	35
Quartz	15
Carbonate (dolomite)	5
Sericite/clay	3
Opagues	2

This sample consists mainly of angular plagioclase crystals up to 1.5 mm wide distributed through a chloritic matrix. The feldspar crystals tend to exhibit prismatic lath shapes which have been modified by fracturing. Most of the plagioclase also shows alteration to finely divided sericite/clay producing a turbid character.

Detrital quartz grains ranging up to 0.5 mm in size are also disseminated through the rock and typically have angular broken shapes. Quartz also occurs as finely granular, cherty textured intergrowths with the chloritic matrix. Some of these cherty textured intergrowths have angular shapes and are thought to represent chert clasts.

The matrix chlorite has a pale green weakly pleochroic colour ranging to a darker green more pleochroic chlorite with very low anomalous birefringence. Within some areas the chlorite contains fine intergrowths of a fibrous birefringent mineral. Within these regions a vague foliation direction is defined by this fibrous mineral.

The rock is transected by carbonate veins ranging up to a few millimetres wide. Minor amounts of granular quartz are intergrown with some of the carbonate veins. The widest of these carbonate veins contain localised intergrowths of prismatic shaped quartz crystals. Testing of the hand specimen suggests that the carbonate is dolomite.

Opaque to translucent iron and titanium oxides form disseminated grains and aggregates up to 0.5 mm wide.

This is an immature detrital sediment somewhat similar to sample 1198984 although this sample has a higher proportion of chlorite. The chlorite is thought to be a diagenetic or low grade metamorphic feature and at least in part could be associated with the development of quartz and carbonate veins.

SAMPLE: 1198987: TS46102

Rock Name:

Greywacke

Hand Specimen:

This is a weakly foliated rock with a dark green colour containing irregular patches up to about 1 cm wide with a pale pink colour. Microchemical tests failed to detect any potash feldspar.

Thin Section:

An optical estimate of the constituents gives the following :

	<u>%</u>
Plagioclase	35
Lithic clasts	25
Quartz	15
Chlorite	13
Sericite/clay	10
Opagues	2

This sample consists mainly of detrital feldspar grains and large detrital lithic clasts along with a smaller proportion of detrital quartz grains cemented by a chloritic matrix. The detrital feldspar grains typically range between 0.15 and 1 mm in size and exhibit angular shapes. Many of the detrital feldspar grains have vague prismatic lath shapes but this tends to have been modified by fracturing and brecciation some of which is thought to have been produced during sediment deformation. The plagioclase crystals show moderate alteration to finely divided sericite/clay.

The interstitial matrix is comprised largely of chlorite which has a bright green pleochroic colour and low anomalous birefringence. This chloritic matrix tends to have a strongly foliated character produced both by a preferred orientation of the chlorite flakes and a tendency for the chlorite to be concentrated in interstitial vein-like bands. Intergrown with the chlorite is localised aggregates of finely granular, cherty quartz as well as localised fibrous sericite.

The rock contains a significant number of large lithic clasts most of which are acid volcanic rock clasts containing feldspar phenocrysts and minor quartz phenocrysts distributed through a granular felsic matrix. These clasts for the most part would represent the pink coloured patches noted in hand specimen. The matrix of these clasts now consists mainly if not exclusively of very finely granular cherty quartz but it has replaced a felsic matrix which once contained abundant feldspar. Some of the fine intergrowths of cherty quartz and chlorite noted as matrix material could represent altered lithic clasts as well. Most of the lithic clasts have elongate shapes and are oriented parallel to the general foliation direction.

Detrital quartz grains ranging up to 0.5 mm in size are disseminated through the rock and tend to have angular, broken shapes. Only a small proportion of the quartz in this sample consists of detrital quartz grains.

Opaques are disseminated through the rock as euhedral grains ranging up to 1 mm in size. The shapes of many of these disseminated opaque grains suggest that they represent pyrite crystals but they now consist of reddish-brown iron oxides and are most likely limonitic pseudomorphs after pyrite.

This is an immature detrital sediment with a somewhat deformed and foliated texture.

SAMPLE: 1198988: TS46103

Rock Name:

Lithic Breccia

Hand Specimen:

A mottled rock containing irregular pale tan to orange patches up to a few centimetres wide in a darker green matrix which at least locally exhibits a vague foliation. Microchemical tests failed to detect any potash feldspar.

Thin Section:

An optical estimate of the constituents gives the following :

	<u>%</u>
Felsic matrix	45
Plagioclase phenocrysts	25
Sericite/clay	10
Chlorite	10
Quartz phenocrysts	8
Opaques	2

This is a fragmental rock containing angular clasts of a porphyritic acid volcanic rock. These angular clasts range up to several millimetres in size and contain plagioclase and quartz phenocrysts disseminated through a finely granular, felsic matrix. There is some variation in some matrix texture between different clasts produced mainly by finely intergrown phyllosilicates comprised of both fibrous sericite and minor chlorite.

The plagioclase phenocrysts tend to exhibit angular broken to prismatic shapes and range up to 1 mm in size. The quartz phenocrysts have rounded to very weakly embayed or angular shapes and are generally below 0.5 mm in size. The plagioclase phenocrysts show localised moderate alteration to finely divided sericite/clay.

Within localised areas the sample has a much more brecciated character containing concentrations of interstitial chlorite ranging up to several millimetres wide. Within these areas angular fragments of plagioclase are present. The chlorite in these regions has a bright green pleochroic colour and low anomalous birefringence. Some of the chlorite in these areas also exhibits a fibrous foliated texture. Minor chlorite also occurs as irregular patches up to 1 mm in size which occur within some lithic clasts.

Opaques are disseminated through the rock as euhedral to subhedral crystals up to 0.4 mm wide. It is thought that these opaques represent limonite pseudomorphs after original disseminated pyrite crystals.

This is a fragmental rock containing angular acid volcanic rock clasts and it is difficult to determine whether the rock represents a brecciated acid volcanic rock or a very immature detrital breccia. Within localised areas the rock has a much more fractured and brecciated character and these regions also contain concentrations of chlorite.

088

CRA EXPLORATION PTY. LTD.

926089

SAMPLE NUMBER	LOCATION		Sample Type	ANALYSES										Geological Observations	
	Easting	Northing		Cu	Pb	Zn									
1655508	27.2	27.3m													Siltstone - Basic volcanogenic sediment
1655526	63.2	63.3m													Tectonic Breccia - white clay altered
1655539	89.8	89.9m													Tectonic Breccia - black clay matrix white sandstone/siltstone clasts
DETECTION LIMIT															
ANALYTICAL METHOD															
Project : DD87LN1 (Pat.)				1 : 250 000 Sheet : BURNE & 555-3 AMG Zone :										Sheet No. : 01	
Tenement : MOINA EL 7174				DPO's : 38722										Laboratory : AMOEL	
Area / Prospect :														Collected By : FRF Date : 8-4-1987	

089

926000



Amdel
31 Flemington Street,
Frewville, S.A. 5063

Address all correspondence to:
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Eastwood, S.A. 5063

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Facsimile: (08) 79 6623

16 April 1987

GS 3/1/6/0

CRA Exploration Pty. Limited,
P.O. Box 138,
ROSNY PARK, TAS. 7018



ATT: F.R. FUNNELL

REPORT G 7039/87

YOUR REFERENCE:	DPO No. 38722 dated 8/4/87
IDENTIFICATION:	1655508, 1655526, 1655539
MATERIAL:	Rock and core samples
DATE RECEIVED:	9 April 1987
WORK REQUIRED:	Petrography (3 Code MA1.3) and X-Ray Diffraction (2 Code MB5)

Investigation and Report by: Frank Radke and Dr Roger Brown
Manager - Geological Services: Dr Keith J Henley

for Dr William G Spencer
General Manager
Applied Sciences Group

c.c. CRA Exploration Pty. Limited,
P.O. Box 138,
ROSNY PARK, TAS. 7018
ATT: ADMIN. OFFICER

CRA Exploration Pty. Limited,
P.O. Box 656,
FYSHWICK, A.C.T. 2609
ATT: CHIEF GEOLOGIST INFORMATION SERVICES

bp

PETROLOGY OF THREE ROCKS

SAMPLE: 1655508: TSC48653

Rock Name:

Altered Tuff

Hand Specimen:

An argillaceous, pale grey rock which contains some paler grey to dull white elongate patches up to several millimetres long. Some of these patches have a parallel orientation defining a weakly developed foliation.

Thin Section:

An optical estimate of the constituents gives the following :

	<u>%</u>
Clay	90
Opagues and semi-opagues	10

In thin section this rock can be seen to consist completely of very weakly birefringent clay intergrown with opaque to translucent reddish-brown iron oxides. The clay typically has a weakly translucent brown to tan colour produced by finely intergrown iron oxides.

Despite the complete alteration of this rock the secondary clay minerals and smaller amounts of limonitic iron oxides a well preserved vitrophyric texture of pyroclastic origin is still evident. Within some areas the clay pseudomorphs shards which are generally outlined by limonitic material. The rock also exhibits a foliated character produced by concentrations of clay within irregular elongate patches with a parallel orientation. This foliation is considered to represent a compaction foliation within the welded tuff. The paler coloured clay patches noted in hand specimen would represent larger clay-rich patches believed to represent flattened pumice lapillae. Some clay patches have more irregular and less flattened shapes and could represent altered glassy nodules within the tuff.

This is a tuffaceous rock which has been completely altered to weakly birefringent clay and limonitic iron oxides but which still retains a well preserved pyroclastic texture.

SAMPLE: 1655526: TSC48654

Rock Name:

Sandstone

Hand Specimen:

This is a pale grey to dull white rock with a finely granular texture. Although most of the rock has a very fine grain size some larger detrital grains up to a few millimetres wide are disseminated through the rock and include grey quartz and white argillaceous clasts.

X-Ray Diffraction:

An X-ray diffraction trace shows that this rock consists mainly of quartz with minor (probably 10-20%) muscovite and a trace of possible rutile.

Thin Section:

An optical estimate of the constituents gives the following :

	<u>%</u>
Quartz	75
Clay/sericite	20
Chert	3
Zircon	Tr-1
Rutile	Tr-1
Muscovite	Tr
Tourmaline	Tr
Opagues and semi-opaques	1

This sample consists of detrital quartz grains with a typical grain size between 0.1 and 1 mm intergrown with an interstitial argillaceous matrix comprised of weakly birefringent clay and fibrous sericite. The detrital quartz grains typically exhibit angular to subangular or rarely subrounded shapes although some have been modified by recrystallisation producing weakly sutured grain margins where they are in contact with each other. In addition to the detrital quartz grains some detrital chert clasts up to 1 mm in size are also disseminated through the rock.

The interstitial matrix consists mainly of very weakly birefringent clay which has a fine flaky to granular texture. Intergrown with this clay is fibrous sericite which locally exhibits a weakly developed foliation direction. Minor muscovite was also noted locally as small flakes up to 0.3 mm long which could be of detrital origin. X-ray diffraction analysis indicates muscovite is the major clay mineral.

The rock contains small amounts of detrital heavy minerals as grains ranging up to 0.2 mm wide. These heavy minerals consist mainly of zircon and an orange to translucent reddish-brown rutile. Traces of tourmaline were also noted as small detrital grains. Opagues occur as disseminated grains which are also thought to be of detrital origin. Minor opagues also form very fine intergrowths with the interstitial matrix and could represent finely divided iron or titanium oxides.

Although most of the detrital grains are below 1 mm in size a very small number of much larger detrital grains up to several millimetres in size are disseminated through the rock. Some of these grains consist of highly deformed quartz mosaics with polycrystalline textures, sutured grain margins and granulation along grain margins. At least one of these larger grains is surrounded by a concentration of cherty textured quartz which locally has a fibrous character. Minor finely divided sericite is locally intergrown with this cherty quartz.

This is a medium grained, quartz-rich detrital sedimentary rock with a somewhat recrystallised appearing texture.

SAMPLE: 1655539: TSC48655

Rock Name:

Breccia

Hand Specimen:

A fragmental rock containing large grey to brown clasts up to about 1 cm in size cemented by a medium to dark grey argillaceous matrix which has a friable character.

X-Ray Diffraction:

An X-ray diffraction trace shows that this rock consists mainly of quartz with smaller amounts (possibly about 20% each) of muscovite and sericite. Trace (<5%) amounts of pyrite and possible rutile were also detected.

Thin Section:

An optical estimate of the constituents gives the following :

	%
Lithic clasts	45
Quartz grains	25
Clay/sericite	25
Opagues and semi-opaques	5

In thin section this rock can be seen to consist mainly of fine to medium grained sedimentary lithic clasts up to several millimetres in size cemented by a matrix comprised largely of weakly birefringent clay and fine grained quartz. The matrix contains abundant disseminated quartz grains ranging up to 0.2 mm wide intergrown with a very weakly birefringent clay. Minor amounts of fibrous sericite and very small muscovite/sericite flakes are also intergrown with this matrix. Locally the matrix also contains irregular bands up to 0.5 mm wide comprised mainly of very weakly birefringent, fibrous textured clay. X-ray diffraction analysis shows that the weakly birefringent clay is mainly kaolinite.

The detrital lithic clasts consist of quartz-rich sandstones with varying amounts of an interstitial argillaceous matrix. Some of these clasts consist mainly of quartz which forms an interlocking mosaic with a strongly recrystallised texture. Other clasts consist of quartz grains with moderate amounts of interstitial clay and fibrous sericite. Some of these clasts are very similar to sample 1655526. These quartz-rich sandstones also contain minor amounts of zircon, tourmaline and rutile as small detrital grains. Opagues are also present as disseminated grains possibly of detrital origin.

Opaque to translucent iron oxides tend to be concentrated in irregular patches and bands. In particular they are concentrated marginal to some large lithic clasts. Minor opaque to translucent iron oxides also form finely disseminated grains intergrown with the argillaceous matrix.

This rock has been termed a breccia and is thought to be a highly immature detrital sedimentary rock containing abundant sedimentary lithic clasts as well as small quartz grains. Neither the lithic clasts nor the matrix quartz grains exhibit any deformational textures.

APPENDIX 5

WINTERBROOK GRID SOIL SAMPLING RESULTS



C.R.A. EXPLORATION PTY. LIMITED

(INC IN NSW)

1207 TASMAN HIGHWAY, CAMBRIDGE, TASMANIA 7170

TELEGRAMS
 TELETYPE
 TELEPHONE 45522
 AREA CODE 082

IN REPLY PLEASE QUOTE

SJC.W2.9

7 July 1986

Memorandum to: T W DICKSON
 Copy to: W A SHEPPARD
 T von STROKIRCH
 From: S J CAITHNESS

SOIL GEOCHEMISTRY AT WINTERBROOK

A programme of soil geochemistry is proposed to test contact and near surface UTEM anomalies within the Winterbrook prospect. The sampling will be C-horizon at 25m spacings.

The programme is designed to detect any anomalous base metal levels within soils which correspond with UTEM responses. If base metal concentrations are associated with the UTEM anomalies caused by contacts, then leakage up the contact zones is likely, thereby giving a geochemical surface expression. Similarly, UTEM anomalies which are not contact effects and are near surface (<50m depth) are also likely to give a soil geochemical response.

The soil geochemistry is considered to be an adequate test of these UTEM anomalies. If no geochemical response is detected then no further work is proposed.

The following table details the proposed soil sampling at the Winterbrook Prospect:-

<u>Line No.</u>	<u>Sampling Co-Ords</u>	<u>No. of Samples</u>	<u>Anomalies Tested</u>
8 600E	50 000N-50 900N	37	Winterbrook Falls, Kookaburra
✓ 8 800E	50 000N-50 950N	39	Winterbrook Falls, Kookaburra
	51 250N-51 550N	13	Icon
✓ 9 000E	50 000N-50 950N	39	Winterbrook Falls, Kookaburra
	51 150N-51 450N	13	Icon

<u>Line No</u>	<u>Sampling Co-Ords</u>	<u>No of Samples</u>	<u>Anomalies Tested</u>
9 200E	51 100N-51 800N	29	Icon, Horse
9 400E	50 200N-50 500N 51 100N-51 700N	13 25	9/6 * Icon, Horse
9 600E	51 100N-51 700N	25	Goanna, Horse
9 800E	51 150N-51 450N	13	Goanna
10 000E	✓ 50 300N-50 600N ✓ 51 200N-51 950N	13 31	Mongoose Goanna, Desmond, Leven
10 200E	✓ 50 300N-50 600N ✓ 51 400N-52 000N	13 25	Mongoose Desmond, Leven
10 400E	51 400N-51 700N	13	Foxtrot
10 600E	51 550N-51 850N	13	Foxtrot
✓ 10 800E	✓ 50 200N-50 500N 51 550N-51 850N	13 13	5/65 Foxtrot
11 000E	50 000N-50 300N 50 850N-51 150N	13 13	8/35 8/140
✓ 11 200E	51 600N-51 900N	13	Winterbrook
✓ 11 400E	51 500N-51 800N	13	Winterbrook
✓ 11 600E	51 300N-51 900N	25	Winterbrook, Loongana
✓ 11 800E	50 050N-50 350N 51 300N-51 550N 51 750N-51 900N	13 13 13	7/39 Winterbrook Loongana
✓ 12 000E	51 250N-51 550N 51 700N-51 900N	13 9	Winterbrook Loongana
✓ 12 200E	51 250N-51 550N	13	Loongana
✓ 12 400E	51 150N-51 450N	13	Loongana
✓ 13 800E	50 350N-50 750N	13	Mostyn Road
✓ 14 000E	50 350N-50 750N	13	Mostyn Road
	Total	570	

Scott Caithness

SCOTT CAITHNESS

CRA EXPLORATION PTY. LTD.

SAMPLE NUMBER	GRID		Sample Type	ANALYSES									Geological Observations				
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz.	Depth.	colour.	Makeup.	Geography
1056401	9000	50000	Soil.	<2	10	50	3	70	6.33	240	360	20	C	1.0m	Orange/olive.	clay/RFs	
402		025	"	<2	20	60	3	20	6.18	195	470	<3	C	1.1m	Tan	Gritty clay	
403		050	"	<2	25	50	5	11	1.43	25	740	<3	C	95cm	Fawn	Grit	Gravel/Scree
404		075	"	2	<5	25	2	10	1.01	40	570	<3	C	1.4m	Greeny Grey	Gritty clay	
405		50100	"	2	10	65	3	17	0.57	20	480	<3	C	95cm	Cream/Orange	Gritty clay	
406		125	"	<2	20	105	3	15	0.87	30	940	<3	C	85cm	Pale Turquoise	Gritty clay	
407		150	"	5	105	175	2	16	1.58	130	1100	<3	C	65cm	Khaki	Gritty clay	
408		175	"	5	165	35	2	14	1.04	35	1050	<3	C	75cm	cream/orange	Gritty/clay (25/25)	
409		50200	"	<2	25	50	2	10	1.74	65	590	<3	C	65cm	Fawn/Tan	Gritty/clay (25/25)	
410		225	"	<2	20	75	2	14	2.93	105	840	<3	C	80cm	Khaki	Gritty/clay (30/20)	
411		250	"	<2	20	40	2	11	1.47	105	530	<3	C	55cm	Pale Blue/Tan	Gritty clay	
412		275	"	<2	25	50	2	12	1.92	115	530	<3	C	55cm	Khaki	Grit/clay/RFs (40/45/15)	
413		50300	"	<2	10	20	1	2	1.18	70	530	<3	A/B/C	65cm	Grey	Grit clay	scree
414		325	"	<2	45	85	2	17	3.48	90	750	<3	C	45cm	Khaki	clay/grit/RFs (50/10/40)	
415		350	"	<2	30	50	1	8	1.77	75	670	<3	C	35cm	Khaki/Light Brown	clay/RFs	
416		375	"	<2	20	25	1	7	3.33	60	250	<3	B/C	30cm	Brown	silty clay	off Redrock
417		50400	"	<2	25	60	3	19	5.20	110	270	<3	B/C	65cm	Tan/Olive.	clay/RFs (95/5)	scree
418		425	"	<2	15	30	1	7	1.97	65	420	<3	C	60cm	Fawn	Gritty clay	
419		450	"	<2	90	60	2	40	4.20	100	470	<3	C	1.0m	Khaki/Tan	Gritty/clay (30/20)	
1056420	9000	50475	Soil	<2	25	40	2	7	2.01	50	1050	<3	C	35cm	Khaki/Tan	Grit/clay (30/20)	
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3					
ANALYTICAL METHOD				←			IC580	→			XRF	PT205					

Project : SHEFFIELD - MOINA	1 : 250 000 Sheet : BURNIE	AMG Zone :	Sheet No. : 1 / 22
Tenement : MOINA EL 7/74	DPO's : 32043, 32047		Laboratory : ALS BRISBANE
Area / Prospect : WINTERBROOK GRID			Collected By : J. HORAK Date : OCTOBER 1984

926099

098

CRA EXPLORATION PTY. LTD.

SAMPLE NUMBER	GRID		Sample Type	ANALYSES										Geological Observations			
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	An (ppb)	Horiz	Depth	colour	Make up	Geography
1056421	9000	50500	Soil	<2	35	70	3	15	3.21	115	570	<3	c	1.0m	Khaki	Grit/clay (30/70)	
422		525	"	<2	20	50	2	9	1.49	85	470	<3	c	95cm	Tan/green	Gritty clay	
423		550	"	<2	15	30	1	6	1.43	65	700	<3	c	45cm	Tan/green	Gravelly clay	
424		575	"	<2	20	50	2	16	4.01	80	340	<3	c	70cm	Tan	Grit/clay (10/90)	
425		600	"	<2	30	60	3	15	2.88	110	400	<3	c	70cm	Khaki	Gritty clay/RFi (75/25)	
426		625	"	<2	25	40	2	11	2.14	80	350	<3	c	60cm	Orange/Fawn	Grit/clay/RFi (40/50/10)	
427		650	"	<2	20	35	2	12	3.52	80	340	<3	c	65cm	Tan	Gritty clay	
428		675	"	<2	15	30	2	11	3.84	60	340	<3	c	50cm	Tan	clay	
429		700	"	<2	20	35	2	7	1.60	60	380	<3	c	55cm	Tan/Fawn	clay	
430		725	"	<2	15	40	2	14	1.05	25	600	<3	c	65cm	Green/Fawn	Grit/clay (30/70)	
431		750	"	<2	20	35	1	8	0.54	10	740	<3	c	55cm	Greeny/cream	Grit/clay (30/70)	
432		775	"	<2	20	25	1	9	0.49	<5	1550	<3	c	90cm	Cream/Fawn	Grit/clay (40/60)	
433		800	"	<2	25	30	1	10	1.01	60	620	<3	c	95cm	Cream/Fawn	Grit/clay (95/5)	
434		825	"	<2	25	30	1	8	0.85	50	600	<3	c	90cm	Grey Green	clay	
435		850	"	<2	30	30	1	6	0.62	50	570	<3	B+	90cm	Grey/olive	Gritty clay	
436		875	"	<2	25	95	2	11	2.72	35	700	<3	c	65cm	Fawn/Tan	Gritty/clay (20/80)	
437		900	"	<2	25	65	2	16	1.64	25	850	<3	c	60cm	Khaki/Tan	Gritty/clay (30/70)	
438		925	"	<2	20	40	1	8	0.88	15	1000	<3	c	50cm	Khaki	Gritty sand	
1056439	9000	50950	"	<2	<5	40	2	7	1.12	25	850	<3	c	75cm	Brown	Gritty clay	
1056120	9000	51150	"	<2	<5	25	1	4	0.78	30	340	<3	B/c	50cm	Grey/Fawn	Grit/gravel/RFi/clay	
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3					
ANALYTICAL METHOD				← IC 580 →								XRF PM205					
Project: SHEFFIELD - MOINA				1: 250 000 Sheet: BURNIE				AMG Zone:				Sheet No. 2/22					
Tenement: MOINA EL 7/74				DPO's: 32043, 32047				Laboratory: ALS BRISBANE				Collected By: J. HORAK Date: Oct 1986					
Area / Prospect: WINTERBROOK GRID																	

099

CRA EXPLORATION PTY. LTD.

926100

SAMPLE NUMBER	GRID		Sample Type	ANALYSES										Geological Observations			
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth.	Colour	Makeup.	Geography
1056121	9000	51175	Soil	<2	10	35	1	6	0.84	25	450	<3	B	60cm	Grey/Fawn	Grit/Gravel/RF's	
122		200	"	<2	<5	15	1	7	0.54	15	300	<3	C	10m	Light brown	Grit	
123		225	"	<2	<5	20	1	4	0.84	30	480	<3	C	60cm	Fawn	Grit/RF's	
124		250	"	<2	10	35	1	3	0.56	25	480	<3	C	80cm	Fawn	Grit/RF's	
125		275	"	<2	5	15	1	4	0.51	20	520	<3	C	1.2 m	Fawn/cream	Sand/clay (85/15)	
126		300	"	<2	20	10	1	10	0.57	20	430	<3	C	70cm	Fawn	Sand/clay (80/20)	
127		325	"	<2	10	70	2	10	5.11	470	560	<3	C	75cm	Tan/olive	Grit/clay/RF's (30/40/30)	
128		350	"	<2	15	45	2	11	7.05	150	240	<3	B/C	1.0 m	Tan/Yellow	Clay/RF's	Heavy Scree
129		375	"	<2	<5	75	3	13	5.37	240	300	<3	C	1.5m	Brown/yellow	Sandy clay	
130		400	"	<2	5	40	1	5	2.16	170	300	<3	C	70cm	Brown/orange	Sandy clay	
131		425	"	<2	10	65	2	8	4.68	430	410	<3	C	90cm	Tan/yellow	Gritty clay	
1056132	9000	51450	"	<2	<5	45	2	10	4.66	105	340	<3	C	1.0 m	Tan/Olive cream	clay/RF's (95/5)	
1230501	9200	51100	Soil	5	20	30	1	2	1.20	70	620	5	C	70cm	Khaki/Olive	Gritty/clay (40/60)	
502		125	"	5	25	20	2	<1	2.00	60	400	<3	C	70cm	Khaki	Clay	
503		150	"	2	35	20	2	<1	1.45	35	460	<3	C	1.0 m	Khaki/Tan	Gritty/clay	
504		175	"	2	20	30	1	<1	1.75	40	480	<3	C	75 cm	Khaki	Gritty Dry clay	
505		200	"	2	20	40	2	<1	2.35	65	620	<3	C	45cm	Khaki	Gritty Dry clay	
506		225	"	<2	10	15	1	<1	0.75	30	500	<3	C	45cm	Grey/Brown	Gravel/clay (70/30)	Bedrock.
1230507	9200	51250	"	5	20	15	1	<1	1.45	35	400	<3	C	50cm	Khaki	Gritty/Dry clay (20/80)	
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3					
ANALYTICAL METHOD				IC580								XRF PT205					

Project	SHEFFIELD - MOINA	1:250 000 Sheet	BURNIE	AMG Zone		Sheet No.	3/22
Tenement	MOINA EL 2/24	DPO's	32043, 32047	Laboratory	ALS BRISBANE	Collected By	J HORAK
Area / Prospect	WINTERBROOK GRID					Date	Oct 1986

SAMPLE NUMBER	GRID			ANALYSES									Geological Observations				
	Easting	Northing	Sample Type	Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	Colour	Makeup	Geography
1230508	9200	51275	Soil	5	20	20	2	1	3.70	60	270	<3	C	80cm	Tan	clay	
509		300	"	15	20	65	3	1	5.00	420	430	3	C	75cm	Khaki	Gritty/clay (30/70)	
510		325	"	15	50	50	2	10	4.50	300	200	<3	C	65cm	Tan/Olive	Gritty clay / RE's (85/15)	
511		350	"	5	25	50	2	1	3.30	140	320	<3	C	75cm	Khaki/Tan	Gritty clay / RE's (85/15)	
512		375	"	10	25	45	2	2	4.15	270	240	5	C	60cm	Khaki/Tan	Gritty clay / RE's (85/15)	scree
513		400	"	20	40	95	3	6	6.05	480	400	<3	C	1.0m	Tan/Olive	Gritty clay / RE's (80/20)	
514		425	"	10	35	85	3	2	7.45	760	680	5	C	95cm	Khaki	Dry sandy clay	scree
515		450	"	15	40	80	3	3	6.85	560	180	<3	C	85cm	Olive/Tan	Grit/clay (20/80)	
516		475	"	15	30	40	2	1	5.00	760	430	<3	C	1.4m	Khaki/Tan	Gritty clay / RE's (85/15)	
517		500	"	15	30	70	2	2	6.90	370	360	10	C	95cm	Tan/Olive	Grit/clay (15/85)	
518		525	"	10	25	80	3	2	6.40	320	330	<3	B/C	—	Tan/Fawn	Gritty/clay (85/15)	shallow Bedrock
519		550	"	5	20	40	2	3	2.80	130	370	<3	C	60cm	Fawn/Orange	Gritty clay	
520		575	"	5	20	40	2	<1	2.60	110	410	<3	C	70cm	Fawn/Orange	clay/rocks (85/15)	
521		600	"	5	30	45	2	1	2.25	430	300	<3	B/C	75cm	Fawn/Tan	Gritty/clay (20/80)	Base scree
522		625	"	2	10	15	1	<1	0.50	20	430	<3	C?	80cm	Light Fawn	Gravelly gritty clay	scree Bottom
523		650	"	2	10	20	1	<1	0.75	20	560	<3	C	75cm	cream/Tan	Grit/clay (50/50)	
524		675	"	5	10	20	1	<1	0.60	20	460	<3	B/C	60cm	cream/Fawn	Gravel/clay (50/50)	scree Base
525		700	"	15	30	95	2	1	5.95	190	670	<3	C	75cm	Khaki/Olive	Gritty/clay (50/50)	Creek bank
526		725	"	15	35	70	1	<1	4.50	110	590	<3	C	90cm	Tan/Cream	Gritty clay / RE's (85/15)	Creek bank
1230527	9200	51750	"	5	30	30	1	<1	1.75	35	430	<3	C	75cm	Fawn/Tan	Gravelly/clay 50/50	
DETECTION LIMIT																	
ANALYTICAL METHOD																	

Project: SHEFFIELD - MOINA

1:250 000 Sheet: BURNIE

AMG Zone:

Sheet No.: 4/22

Tenement: MOINA EL 7/74

DPO's: 32043, 32047

Laboratory: ALS BRISBANE

Area / Prospect: WINTERBROOK GRID

Collected By: J HORAK

Date: Oct 1986.

SAMPLE NUMBER	G-RID		Sample Type	ANALYSES										Geological Observations				
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	Colour	Make up	Geography	
1230528	9200	51775	Soil	5	30	30	1	<1	1.50	30	440	<3	C	70cm	Fawn	Gravelly/clay (20/80)		
1230529	9200	51800	"	5	50	60	2	<1	4.95	75	600	<3	C	85cm	Fawn/Tan	Gravelly/clay (20/80)		
1230530	9400	51100	Soil	5	20	35	2	<1	2.15	65	610	<3	C	45cm	Khaki	Gritty clay		
531		125	"	5	30	40	2	<1	2.65	60	570	<3	C	85cm	Khaki/Tan	Gritty clay		
532		150	"	2	20	35	2	<1	1.40	45	810	<3	C	60cm	Khaki/olive	Gritty/clay (45/55)		
533		175	"	2	20	30	2	<1	1.75	40	480	<3	C	75cm	Khaki/olive	Gritty/clay (25/75)		
534		200	"	5	40	40	2	2	3.20	50	620	<3	C	65cm	Khaki	clay/grit/RF's (80/20)		
535		225	"	5	35	30	2	1	2.80	40	350	<3	C	65cm	Tan/Khaki	Gritty Dry clay		
536		250	"	10	20	45	2	3	4.25	40	310	<3	C	50cm	Tan/Khaki	Gritty clay		
537		275	"	5	15	15	1	<1	1.75	30	270	<3	C	50cm	Light Brown/Tan	Gritty clay/RF's 90/10		
538		300	"	20	50	100	2	1	5.70	240	470	<3	C	60cm	Tan/Olive	clay/RF's		
539		325	"	20	35	70	2	<1	4.75	470	570	<3	C	1.0m	Pinky Tan	Dry Gritty clay/RF's (80/20)		
540		350	"	20	45	80	3	1	5.25	230	480	<3	C	95cm	Pinky Tan	Gritty clay		
541		375	"	15	30	60	2	2	5.80	600	540	<3	C	1.0m	Tan Orange	clay/RF's (95/5)		
542		400	"	30	145	60	3	<1	5.40	1000	690	<3	C	1.0m	Tan/orange	Gritty/clay (20/80)		
543		425	"	15	30	50	2	<1	6.05	290	280	<3	C	70cm	Tan/Olive	clay/RF's (90/10)		
544		450	"	15	25	55	2	<1	5.20	380	400	3	C	40cm	Tan/Olive	Gray clay/RF's (90/10)		
545		475	"	25	35	110	3	2	7.45	640	330	<3	C	70cm	Tan/olive	clay/RF's (70/30)		
1230546	9400	51500	"	15	50	40	2	3	5.80	360	230	<3	C	75cm	Tan/Olive/Brick red	Gritty clay/RF's (80/20)		
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3						
ANALYTICAL METHOD				←			ICSB0		→			XRF PM205						

Project: SHEFFIELD - MOINA	1: 250 000 Sheet: BURNIE	AMG Zone:	Sheet No: 5/22
Tenement: MOINA EL 7/74	DPO's: 32043, 32047		Laboratory: ALS BRISBANE
Area / Prospect: WINTERBROOK GRID			Collected By: J HORAK Date: Oct 1986

SAMPLE NUMBER	GRID		Sample Type	ANALYSES										Geological Observations			
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	Colour	Make up	Geography
1230547	9400	51525	Soil	15	35	60	3	<1	7.15	720	450	<3	C	85cm	Tan/Olive	Gritty clay/RE's (80/20)	
548		550	"	20	40	75	3	1	6.20	320	450	<3	C	1.1m	Tan/Olive	Gritty clay/RE's (60/40)	
549		575	"	20	40	75	3	1	6.25	400	490	<3	C	90cm	Tan/Olive	Gritty clay/RE's (70/30)	
550		600	"	10	20	35	2	<1	3.60	95	580	<3	C	60cm	Fawn/Red/Tan	clay/RE's (50/50)	
551		625	"	5	30	40	3	<1	4.60	130	370	<3	C	50cm	Green/Tan	clay/grit (90/10)	
552		650	"	5	20	30	1	<1	3.20	105	540	<3	C	45cm	Fawn/Tan	Gravelly clay	
553		675	"	5	25	35	2	<1	2.85	100	480	<3	C	45cm	Fawn/Tan	Gravelly clay	
1230554	9400	51700	"	10	30	45	2	<1	4.00	140	460	<3	C	65cm	Tan/Olive	Gritty clay	
1230555	9600	51100	Soil	2	15	20	1	<1	1.00	70	340	<3	B/c	60cm	Light Brown/Cream	Silty/clay 50/50	
556		125	"	2	20	30	1	<1	1.60	40	700	<3	C	70cm	L. Brown/Orange	Gritty clay/RE's (70/30) Scree	
557		150	"	2	10	20	1	<1	0.65	25	760	<3	B/c	50cm	Cream	Grit/clay/RE's (30/30/40) Scree	
558		175	"	2	15	20	1	<1	1.00	25	1150	<3	B/c	60cm	Cream	clay/grit (70/30) Scree	
559		200	"	2	10	25	1	<1	1.15	35	710	<3	B/c	60cm	L. Brown	Grit/RE's (70/30) Scree	
560		225	"	2	10	20	1	<1	0.95	30	600	<3	C	30cm	L. Brown	Grit/clay/RE's (50/20/20)	
561		250	"	2	10	15	1	<1	0.75	30	330	<3	C	25cm	Grey/L. Green	Grit/clay/RE's (40/30/30)	
562		275	"	2	10	20	1	<1	1.05	30	720	<3	C	50cm	Cream/Orange	Gritty clay/RE's (80/20)	
563		300	"	5	15	40	1	1	0.65	30	510	<3	C	75cm	Cream/Tan	Gritty clay	
564		325	"	5	20	45	2	1	1.25	55	550	<3	B/c	95cm	Grey	clay/RE's (70/30)	
1230565	9600	51350	"	10	35	40	3	<1	4.65	70	290	<3	C	1.2m	Tan/Orange	clay	
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3					
ANALYTICAL METHOD				←			IC 580	→			XRF	PM205					

Project: SHEFFIELD - MOINA.	1:250 000 Sheet: BURNIE	AMG Zone:	Sheet No.: 6/22
Tenement: MOINA EL 7/24	DPO's: 32043, 32047		Laboratory: ALS BRISBANE
Area / Prospect: WINTERBROOK GRID			Collected By: J HORAK Date: Oct 1986

CRA EXPLORATION PTY. LTD.

SAMPLE NUMBER	GRID		Sample Type	ANALYSES										Geological Observations			
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth.	Colour	Make up.	Geograp.
1230566	9600	51375	Soil	20	30	65	3	3	5.30	220	500	<3	B	1.45m	L Tan	Gritty/clay (5/95)	
67		400	"	15	30	50	2	1	5.35	470	700	<3	B/c	65cm	Tan/cream	clay/RE's (80/20)	scree
68		425	"	15	30	60	3	2	5.65	280	480	<3	C	1.0m	Tan/olive	Gritty clay/RE's (90/10)	
69		450	"	35	25	55	3	1	4.75	840	980	<3	C	1.0m	Khaki/olive	Gritty clay/RE's (90/10)	
70		475	"	25	40	90	2	1	4.40	185	300	<3	C	60cm	Khaki	Gritty clay/RE's (80/20)	
71		500	"	20	35	80	2	<1	4.30	320	750	<3	C	80cm	Khaki	Gritty clay/RE's (80/20)	
72		525	"	30	45	80	3	2	6.25	240	390	<3	C	1.0m	Khaki/olive/red	clay/RE's (85/15)	
73		550	"	15	40	65	3	1	7.70	130	170	<3	C	1.2m	Tan/Fawn	Gritty clay	
74		575	"	15	40	70	2	1	5.75	220	390	<3	C	1.0m	Tan/olive/red	Gritty clay/RE's	
75		600	"	15	40	70	2	2	6.20	170	350	<3	C	70cm	Tan/olive	Gritty clay/RE's (80/20)	
76		625	"	15	35	40	2	4	6.50	70	150	<3	C	85cm	khaki	Gritty clay/RE's (75/25)	
77		650	"	15	35	85	2	1	6.45	230	450	<3	C	60cm	Tan/olive	clay/grit (90/10)	
78		675	"	10	30	50	2	1	5.35	80	250	<3	C	80cm	Tan/olive	Gritty clay/RE's (70/30)	
1230579	9600	51700	"	15	40	65	2	1	6.90	350	630	<3	C	80cm	Tan/olive	Gritty/clay (60/40)	
1230580	9800	51150	Soil	2	10	30	<1	<1	0.90	45	410	<3	B/c	80cm	Grey	Grit/clay/RE's (65/35) Rock outcrop/scree	
581		175	"	2	10	20	<1	<1	1.00	45	200	<3	B/c	30cm	Grey	Gritty/clay/RE's (60/40) Rock outcrop/scree	
582		200	"	2	20	25	<1	1	2.45	75	330	<3	C	90cm	Brown	Silty clay	
583		225	"	2	10	25	<1	1	0.90	80	250	<3	B/c	45cm	Grey	clay/RE's (80/20) Rock outcrop/scree	
1230584	9800	51250	"	2	10	35	<1	1	1.05	110	380	<3	B/c	1.3m	Grey/Tan	Gritty clay/RE's (90/10) Rock outcrop/scree	
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3					
ANALYTICAL METHOD				←				IC580	→				XRF PM205				
Project SHEFFIELD - MOINA			1: 250 000 Sheet: BURNIE			AMG Zone			Sheet No. 7/22								
Tenement: MOINA EL 7/74			DPO's: 32043, 32047			Laboratory: ALS BRISBANE											
Area / Prospect: WINTERBROOK GRID			Collected By: J HORAK			Date: Oct 1986											

CRA EXPLORATION PTY. LTD.

SAMPLE NUMBER	GRID		Sample Type	ANALYSES										Geological Observations				
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	Colour	Make up	Geography	
1230585	9800	51275	Soil	2	20	30	2	1	1.70	70	430	<3	C	50cm	Tan/Brown	Gritty clay		
86		300	"	2	30	20	1	3	3.60	30	390	<3	C	95cm	Tan	Gritty clay		
87		325	"	5	40	15	1	2	1.95	60	710	<3	C	65cm	Tan/Brown	Gravelly clay / RF's (80/20)		
88		350	"	5	40	30	1	1	2.95	80	600	<3	C	70cm	Tan	Gritty clay / RF's (70/30)		
89		375	"	10	20	55	3	<1	3.28	400	610	<3	C	40cm	Brown/Tan	Sandy/clay (15/85)		
90		400	"	15	40	65	2	1	3.31	290	550	<3	C	95cm	Khaki	clay / RF's		
91		425	"	15	50	60	2	1	3.82	170	470	3	C	1.4m	Brown/Tan	clay / RF's (90/10)		
1230592	9800	51450	"	20	45	55	1	<1	2.90	400	430	3	C	90cm	Olive	Dry clay		
1230593	10000	50300	Soil	5	15	65	1	<1	0.93	90	820	<3	C	75cm	Blue/Green	Clay		
594		325	"	5	15	30	1	<1	0.61	80	570	5	B/c	50cm	Brown/cream/Bl/Gc	clay		
595		350	"	5	20	35	1	<1	0.50	25	590	<3	C	80cm	Cream	clay		
596		375	"	2	15	30	1	<1	0.50	25	770	<3	C	80cm	cream/Tan	Gritty/clay		
597		400	"	2	15	20	1	<1	0.36	20	1150	<3	C	1.4m	cream	Gritty clay		
598		425	"	2	20	35	2	<1	0.94	60	810	<3	C	1.0m	creamy green	Gritty clay		
599		450	"	5	25	25	1	<1	0.38	25	450	<3	C	1.5m	cream	Gritty clay		
600		475	"	5	45	35	1	<1	0.70	40	800	<3	C	1.1m	creamy blue	clay		
601		500	"	2	30	50	<1	<1	0.77	50	460	<3	C	50cm	creamy blue	clay/gravel (30/70)	stream SED	
602		525	"	5	35	40	1	<1	0.60	55	540	3	C	50cm	creamy khaki	Grit/clay (25/25)		
1230603	10000	50575	"	5	35	30	<1	1	1.77	40	550	<3	C	40cm	Fawn/Tan	Grit/clay / RF's (50/30/20)		
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3						
ANALYTICAL METHOD				←	—	—	IC 580	—	—	—	→	XRF	PM 105					
Project SHEFFIELD - MOINA				1 250 000 Sheet BURNIE				AMG Zone				Sheet No. 8 / 22						
Tenement MOINA EL 7/74				DPO's 32043 / 32047				Laboratory ALS BRISBANE										
Area / Prospect WINTERBROOK GRID				Collected By J HORAK				Date Oct 1986										

SAMPLE NUMBER	GRID		Sample Type	ANALYSES									Geological Observations				
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	colour	Make up	Geography
1230604	10000	50600	Soil	5	70	55	1	1	2.56	35	370	<3	C	60cm	Tan/Yellow	Grit/clay/RF's (50/20/20)	
605		51200	"	2	20	40	1	<1	1.37	55	350	<3	C	45cm	Fawn/Orange	clay/RF's	
606		225	"	2	20	30	1	<1	1.92	55	370	<3	C	60cm	Tan	Gritty/clay	
607		250	"	5	20	35	1	<1	1.88	75	720	<3	C	45cm	Fawn/Tan	Grit/clay/RF's (20/20/10)	
608		275	"	5	25	45	2	<1	2.31	75	400	<3	C	80cm	Brown	Gritty clay	
609		300	"	2	20	35	1	<1	1.62	65	460	<3	C	60cm	Fawn	Grit/clay (20/80)	
610		325	"	2	20	50	1	<1	1.54	120	500	<3	C	50cm	Brown/Orange	Grit/clay/RF's (10/80/10)	
611		350	"	5	25	40	1	<1	2.08	65	440	<3	C	95cm	Fawn/Tan	Grit/clay/RF's (20/60/10)	
612		375	"	5	20	20	1	<1	1.10	40	230	<3	C	75cm	Brown/Fawn	Sandy clay	
613		400	"	5	25	10	1	<1	0.64	25	1000	<3	C	95cm	cream/orange	clay	
614		425	"	5	20	15	<1	<1	0.43	45	440	<3	B/c	30cm	Fawn/orange	Grit/clay/RF's (10/70/20)	
615		450	"	25	50	75	1	7	4.98	180	400	<3	C	1.0m	Tan/Khaki	clay/RF's (80/20)	
616		475	"	35	50	55	2	<1	6.03	80	260	<3	C	1.2m	Tan/Orange	clay	
617		500	"	20	40	45	1	<1	4.57	120	330	<3	C	60cm	Tan/Olive	clay/RF's (85/15)	
618		525	"	10	30	45	1	<1	2.10	95	470	3	C	90cm	Brown	clay/RF's (60/40)	
619		550	"	15	50	45	1	<1	2.31	130	500	<3	C	95cm	Brown/Tan	Gritty clay/RF's (80/20)	
620		575	"	15	35	45	1	<1	1.45	120	560	<3	C	1.0m	Cream/Tan/Olive	Gritty clay/RF's (90/10)	
621		600	"	15	30	90	2	<1	1.40	90	310	<3	C	1.0m	Turquoise	clay	
622		625	"	5	30	30	1	<1	2.94	45	260	3	C	70cm	Tan/cream	Grit/clay (5/95)	
1230623	10000	51650	"	15	75	80	1	<1	2.41	200	480	3	C	1.0m	Turquoise	Gritty clay/RF's (80/20)	
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3					
ANALYTICAL METHOD				← IC580 →								XRF PM205					
Project SHEFFIELD - MOINA				1: 250 000 Sheet : BURNIE				AMG Zone :				Sheet No. : 9/12					
Tenement : MOINA EL 7/74				DPO's : 32043 , 32047								Laboratory : ALS BRISBANE					
Area / Prospect WINTERBROOK GRID												Collected By : J HORAK Date : Oct 1986					

SAMPLE NUMBER	GRID		Sample Type	ANALYSES										Geological Observations			
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	colour	Make up	Geography
1230624	10 000	51675	Soil	10	35	35	1	<1	2.10	60	260	<3	C	1.0m	Tan/Brown	clay/RE's (20/20)	
625		700	"	10	25	40	<1	<1	0.60	45	200	<3	C	1.1m	Grey/Brown/yellow	Sand	
626		725	"	10	50	50	1	1	4.21	80	190	<3	B/c	70cm	Tan/Brown	clay/RE's (60/60)	scree
627		750	"	10	35	25	1	<1	2.63	40	170	<3	C	60cm	Tan	Gritty clay/RE's (90/10)	
628		775	"	10	20	90	1	<1	2.60	290	400	<3	C	1.0m	Greeny Grey	Dry clay	
629		800	"	5	20	20	<1	<1	1.06	40	180	<3	C	80cm	Fawn/Brown/Khaki	Gritty clay	
630		825	"	5	15	25	<1	<1	0.60	30	50	<3	B/c	35cm	Pink/Grey	Gravel/RE's	scree
631		850	"	5	15	30	<1	<1	0.43	25	30	<3	B/c	50cm	Pink	Gravel/RE's	scree
632		875	"	5	20	20	<1	<1	0.60	30	80	<3	B/c	40cm	Grey	Sand/RE's	scree
633		900	"	5	15	15	<1	<1	0.54	30	<10	3	B/c	25cm	Grey	Sand/RE's (85/15)	Rock outcrop
634		925	"	5	10	10	<1	<1	0.53	25	100	3	C	45cm	P. Grey	clay/sand	Rock outcrop
1230635	10 000	51950	"	10	5	20	<1	<1	0.29	20	<10	3	B/c	55cm	P. Grey	Sand/RE's	Rock outcrop
1230636	10 200	50 300	Soil	2	30	30	1	<1	1.88	80	810	<3	C	70cm	Fawn/Orange	Gritty/clay	
637		350	"	2	15	30	1	<1	0.98	95	910	<3	C	50cm	Cream/Orange	Gritty clay/RE's (80/20)	
638		375	"	2	20	50	1	<1	0.96	130	800	3	C	70cm	Khaki	Gritty clay/RE's (70/30)	
639		400	"	5	15	50	1	<1	1.36	135	630	<3	C	65cm	Khaki	Grit/clay/RE's (40/40/20)	
640		425	"	5	15	20	<1	<1	0.59	50	630	<3	B/c	30cm	cream/orange	clay/RE's (60/40)	scree
641		450	"	5	15	25	<1	<1	1.70	25	910	<3	C	50cm	Orange	Grit/RE's	
1230642	10 200	50 500	"	5	25	45	1	<1	0.95	110	610	5	B/c	70cm	Grey green	Grit/Gravel/clay (30/30/40)	
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3					
ANALYTICAL METHOD				← 1CS80 →								XRF PM205					
Project : SHEFFIELD - MOINA				1 : 250 000 Sheet : BURNIE				AMG Zone :				Sheet No. : 10/ 22					
Tenement : MOINA EL 7/74				DPO's : 32043 , 32047				Laboratory : ALS BRISBANE				Collected By : J HORAK Date : Oct 1986					
Area / Prospect : WINTERBROOK GRID																	

SAMPLE NUMBER	LOCATION			ANALYSES									Geological Observations				
	Easting	Northing	Sample Type	Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	colour	Make up	Geography
1230643	10200	50525	Soil	5	25	45	1	<1	1.62	70	510	<3	C	75cm	Fawn/Tan	Gritty/clay	
1230644		550	"	5	25	45	1	1	2.76	30	350	<3	C	70cm	Tan/orange	Gritty/clay	
646		575	"	10	10	15	<1	1	0.46	25	730	<3	B/C	70cm	Grey	Gritty clay/RFs	Scree
647		50600	"	5	25	25	1	<1	2.01	30	380	<3	C	1.0m	Tan	Gritty clay	
648		51400	"	10	40	60	1	<1	3.02	120	540	<3	C	55cm	Orange/cream	clay	
649		425	"	5	20	30	1	<1	0.97	50	460	<3	C	90cm	Brown/orange	clay/RFs (80/20)	
650		450	"	10	30	25	1	<1	0.89	35	410	3	C	90cm	Fawn/yellow/Red	clay	
651		475	"	10	40	55	1	<1	3.61	145	420	<3	C	1.0m	Cream/Tan	clay	
652		500	"	10	30	65	2	<1	4.28	95	390	5	C	1.1m	Khaki	Gritty/clay (20/80)	
653		525	"	5	30	35	1	<1	4.11	45	350	<3	C	80cm	Tan	clay/RFs (95/5)	
654		550	"	5	40	40	1	<1	3.66	90	450	<3			Tan	Gritty clay/RFs (90/10)	
655		575	"	15	60	30	1	<1	1.13	45	480	<3	C	90cm	Tan	Gritty clay/RFs (25/75)	
656		600	"	10	30	30	1	<1	0.71	35	500	<3	B/C	1.5m	Grey/Fawn	Grit/clay (10/90)	
657		625	"	5	35	35	1	<1	4.48	95	360	<3	B/C	95cm	cream	clay	
658		650	"	10	35	25	1	<1	0.62	40	230	<3	C	75cm	Tan/Khaki	Gritty clay	
659		675	"	10	25	25	<1	<1	0.81	30	170	<3	C	1.1m	Fawn/olive	Grit/clay (20/80)	
660		700	"	10	25	25	1	<1	0.71	35	150	<3	C	1.1m	Grey/Brown	clay/gravel (80/20)	
661		725	"	10	35	30	1	<1	1.79	50	210	<3	C	95cm	Grey/Pink	clay/gravel (50/50)	
662		750	"	10	30	30	1	<1	1.71	60	220	<3	C	90cm	Brown/Orange	clay/grit (85/15)	
1230663	10200	51775	"	10	15	40	<1	<1	0.49	115	310	<3	C	90cm	L. Brown/D. Brown	Gritty clay	
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3					
ANALYTICAL METHOD				← IC580 →									XRF PM205				
Project : SHEFFIELD - MOINA				1 : 250 000 Sheet : BURNIE				AMG Zone :				Sheet No. : 11/22					
Tenement : MOINA EL 7/74				DPO's : 32043 , 32047				Laboratory : ALS BRISBANE				Collected By : J HORAK Date : Oct 1996					
Area / Prospect : WINTERBROOK GRID																	

SAMPLE NUMBER	GRID		Sample Type	ANALYSES									Geological Observations				
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	colour	Make up	Geography
1230680	10600	51350	Soil	20	35	55	2	<1	5.18	1040	260	<3	C	70cm	Tan/olive	gritty clay / RF's	(90/10)
681		375	"	15	40	50	1	<1	4.91	320	200	<3	B/c	90cm	Tan olive	clay particles	
682		400	"	20	35	40	1	<1	4.80	1040	250	<3	C	80cm	Tan/olive red	clay / RF's	score
683		425	"	15	30	40	1	<1	4.85	400	200	<3	C	80cm	Tan/brown red/olive	clay	
684		450	"	10	30	30	1	<1	4.49	260	310	<3	C	70cm	Tan	clay	
685		475	"	15	35	40	1	<1	4.86	75	320	<3	C	75cm	Tan olive	clay	
686		500	"	10	25	20	1	<1	1.09	35	520	<3	C	80cm	Fawn	clay	
687		525	"	10	15	15	<1	<1	0.73	55	110	<3	C	85cm	Grey pink	Sand/grit/clay (30/20/40)	
688		550	"	10	30	20	1	<1	0.93	50	110	<3	C	80cm	Fawn	gritty clay / RF's	(20/10)
689		575	"	10	20	20	<1	<1	0.78	45	130	<3	C	70cm	Brown	Gravel/clay / RF's	(20/30/20)
690		600	"	10	20	15	1	<1	0.78	50	90	<3	C	80cm	Fawn	Gravel/clay (40/60)	
691		625	"	5	20	15	1	<1	0.64	40	90	<3	C	75cm	Fawn	Gravel/clay (50/50)	
1230692	10600	51650	"	5	10	10	1	<1	0.60	40	110	<3	C	50cm	Grey/Pink	Gravel/grit/clay (40/40/30)	
1230693	10800	51550	Soil	20	30	35	1	<1	2.60	90	180	<3	C	70cm	Tan	clay	
94		575	"	10	10	10	1	<1	0.93	60	120	<3	B	50cm	Gray	Sandy clay	Bedrock
95		600	"	10	20	15	1	<1	0.80	45	240	<3	C	70cm	Fawn	gritty clay	
96		625	"	10	20	15	1	<1	1.10	60	280	<3	C	60cm	Grey/orange	gritty clay / RF's	(85/15)
97		650	"	15	25	20	<1	<1	3.10	80	340	<3	C	65cm	orange	clay	
1230698	10800	51675	"	10	70	15	<1	<1	1.60	50	370	<3	C	65cm	orange	gritty clay / RF's	(85/15)
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3					
ANALYTICAL METHOD				←			IC580	→			XRF	PM205					

Project : SHEFFIELD - MOINA	1 : 250 000 Sheet : BURNIE	AMG Zone :	Sheet No. : 13 / 24
Tenement : MOINA EL 7/74	DPO's : 32043, 32047		Laboratory : ALS BRISBANE
Area / Prospect : WINTERBROOK GRID			Collected By : J HORAK Date : Oct 1986

SAMPLE NUMBER	GRID		Sample Type	ANALYSES										Geological Observations				
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	colour	Make up	Geograph	
1230699	10800	51700	Soil	20	45	50	1	<1	6.50	180	290	<3	C	85cm	Tan	clay/RF's (95/5)		
700		725	"	10	15	10	<1	<1	1.06	50	120	<3	B	30cm	Grey	Sandy soil some RF's	scree	
701		750	"	5	15	10	<1	<1	0.23	15	20	<3	A/B/C	30cm	Grey	Sand/RF's	heavy scree	
1230702	10900	51725	"	10	10	10	<1	<1	0.58	40	30	<3	B	40cm	Grey	clay/RF's	heavy scree	
														51800	→	51850	rock outcrop	
1230703	11000	50850	Soil	5	25	40	1	<1	1.90	55	220	<3	C	1.1m	Brown/Tan	Grit/clay/RF's (25/60/15) ^{scree}		
704		875	"	5	20	30	<1	<1	1.45	65	690	<3	C	75cm	Fawn	Dry Fine Grit/RF's (90/10)		
705		900	"	5	20	40	<1	<1	1.40	80	500	<3	B/C	65cm	Brown/Fawn	Gritty clay/RF's (80/20)		
706		925	"	5	40	45	1	<1	2.12	80	360	<3	C	85cm	Brown	Gritty clay/RF's (80/20)	scree	
707		950	"	10	25	35	<1	<1	1.70	55	340	<3	B/C	80cm	Khaki	Gritty clay/RF's (80/20)	scree	
708		50975	"	5	15	30	<1	<1	1.10	70	390	<3	B/C	45cm	Grey/Fawn	Grit/clay/RF's (40/20/40)	scree	
709		51000	"	5	15	20	<1	<1	1.20	50	490	<3			Fawn/Tan/Red	Grit/clay/RF's (40/40/20)		
710		025	"	5	15	15	<1	<1	1.80	60	490	<3	C	50cm	Fawn	Gritty/clay (35/65)	scree	
711		050	"	2	20	30	1	<1	1.71	50	440	<3	C	70cm	Fawn/orange	Grit/clay (20/80)		
712		075	"	10	15	30	1	1	2.20	45	640	<3	C	80cm	Fawn/Tan	Gritty clay		
713		100	"	10	20	15	<1	<1	1.39	20	950	<3	C	95cm	Fawn/orange	clay		
714		125	"	30	25	20	<1	19	3.12	10	700	<3	C	60cm	Fawn/orange	clay		
1230715	1100	150	"	20	50	75	1	4	5.18	110	280	<3	B	1.3m	Brown	clay/RF's (95/5)	heavy scree	
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3						
ANALYTICAL METHOD				← IC580 → XRF PM205														
Project SHEFFIELD MOINA			1: 250 000 Sheet: BURNIE			AMG Zone:			Sheet No.: 14/22									
Tenement MOINA EL 2/74			DPO's: 32043, 32047			Laboratory: ALS BRISBANE												
Area / Prospect WINTERBROOK GRID			Collected By: J HORAK			Date Oct 1986												

SAMPLE NUMBER	GRID		Sample Type	ANALYSES									Geological Observations				
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	colour	Make up	Geography
1230716	11 200	51600	Soil	10	50	50	<1	2	9.42	290	550	<3	B/c	85cm	Tan/Brown	clay	
717		625	"	10	25	90	1	2	6.08	560	670	<3	C	75cm	Tan	grit/clay (20/80)	
718		650	"	5	20	10	<1	<1	0.80	40	230	<3	C	70cm	P. Pink	grit/clay (40/60)	
719		675	"	5	15	10	<1	<1	0.58	25	150	<3	C	75cm	Tan	gritty clay/RF's (25/25)	
720		700	"	10	15	10	<1	<1	0.59	40	60	<3	B/c	60cm	Grey/Brown	grit/clay (50/50)	
721		725	"	5	10	15	<1	1	0.35	20	50	<3	B/c	60cm	Pink/gray	Gravel/RF's	scree
722		750	"	5	10	10	<1	<1	0.60	40	40	<3	B/c	60cm	Grey	gritty gravel	scree
723		775	"	5	15	15	<1	<1	0.25	15	50	<3	B/c	50cm	Pink/white	Gravel/RF's	conglom scree
724		800	"	5	15	10	<1	<1	0.30	20	40	<3	B/c	50cm	Pink/white	Gravel/RF's (90/10)	conglom scree
725		825	"	5	10	15	<1	<1	0.26	20	30	<3	B/c	60cm	Pink/white	Gravel/RF's (90/10)	conglom scree
726		850	"	5	5	15	<1	<1	0.50	35	90	<3	C	90cm	Pink/white	grit/clay (90/10)	
727		875	"	5	50	5	1	<1	0.20	10	200	<3	B/c	85cm	Grey/Tan	Sand/clay (65/35)	
1230728	11 200	51900	"	10	30	10	<1	<1	0.60	40	90	<3	B/c	65cm	Brown	Sand	
1230729	11 400	51500	Soil	20	35	55	2	<1	5.20	310	430	<3	C	1.5m	Red/Khaki	clay/RF's	
730		525	"	10	25	55	2	<1	4.20	155	360	5	C	1.3m	Khaki	clay	
731		550	"	10	30	25	2	<1	4.65	220	360	<3	B/c	1.4m	Olive	clay/RF's	
732		575	"	5	25	25	1	<1	8.20	75	480	<3	C		Tan	grit/clay (20/80)	
733		600	"	5	20	20	1	<1	2.25	50	400	<3	C	90cm	Grey/Tan	gritty clay/RF's (20/80)	scree
1230734	11 400	51 625	"	5	20	10	1	<1	1.40	25	360	<3	C	95cm	Grey/Tan	grit/clay (20/80)	
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3					
ANALYTICAL METHOD				←			16580	→			XRF	PM205					
Project SHEFFIELD MOINA				1 250 000 Sheet BURNIE				AMG Zone				Sheet No. 16/22					
Tenement MOINA EL 7/74				DPO's 32043, 32047								Laboratory ALS BRISBANE					
Area / Prospect WINTERBROOK GRID												Collected By J HORAK Date Oct 1986					

SAMPLE NUMBER	G-RID		Sample Type	ANALYSES									Geological Observations				
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	Colour	Make up	Geography
1230735	11400	51650	SO11	5	30	15	1	1	4.05	35	670	3	C	1.25m	Grey/Tan	Grit/clay (20/80)	
736		675	"	5	15	5	<1	<1	0.60	10	640	3	C	1.2m	Grey/Tan	Grit/clay (20/80)	
737		700	"	10	10	5	<1	<1	0.50	40	30	5	B/c	45cm	Grey/Pink	Grit/RF's	scree
738		725	"	5	10	20	<1	<1	0.35	20	60	<3	B/c	50cm	Grey/Pink	Grit/RF's	scree
739		750	"	10	20	10	<1	<1	0.45	40	40	<3	B/c	80cm	Grey/Pink	Grit	scree
740		775	"	15	35	30	2	<1	5.75	175	60	<3	C	55cm	Fawn/Tan	Grit/clay (70/30)	
1230741	11400	51800	"	5	10	30	<1	<1	0.50	35	80	<3	C	60cm	Fawn	Grit/clay (70/30)	
1230742	11600	51300	Soil	5	35	10	<1	<1	0.55	20	130	<3	C	1.25m	Tan/Yellow	Grit/clay (10/90)	
743		325	"	15	30	30	1	<1	5.40	560	140	<3	B/c	70cm	Brown/Olive	clay/RF's (90/10)	
744		350	"	15	35	40	1	<1	5.05	320	130	<3	C	80cm	Brown/Olive	gritty clay/RF's (85/15)	
745		375	"	15	30	40	1	<1	4.65	320	280	<3	B/c	70cm	Brown Olive	clay	scree
746		425	"	10	30	50	2	<1	7.40	460	350	<3	B/c	1.4m	Tan/Olive	Gritty/clay (10/90)	
747		450	"	15	30	40	2	1	5.90	290	460	<3	B/c	1.1m	Tan/Red/Olive	clay/RF's (90/10)	
748		475	"	10	25	80	2	<1	6.25	480	780	<3	C	1.1m	Tan/Khaki	clay	
749		500	"	15	95	40	2	9	6.50	80	470	<3	B/c	80cm	Tan	clay	
750		525	"	20	20	50	2	<1	6.30	140	570	<3	C	1.0m	Tan/Khaki	Gritty/clay (20/80)	
751		550	"	5	20	40	1	<1	4.15	220	240	<3	C	35cm	Olive	Gritty/clay (10/90)	
752		575	"	15	25	80	2	<1	5.10	600	410	<3	C	30cm	Olive	clay/RF's (80/20)	
1230753	11600	51600	"	40	40	60	2	9	4.25	400	290	15	B/c	50cm	Tan/Yellow	clay/RF's (80/20)	
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3					
ANALYTICAL METHOD																	
Project SHEFFIELD - MOINA				1 : 250 000 Sheet : BURNIE				AMG Zone :				Sheet No. : 17 / 22					
Tenement MOINA EL 7/74				DPO's 32043, 32047								Laboratory : ALS BRISBANE					
Area / Prospect WINTERBROOK GRID												Collected By : J HORAK Date Oct 1986					

SAMPLE NUMBER	G-GRID		Sample Type	ANALYSES										Geological Observations					
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	Colour	Make up	Geography		
1230754	11600	51625	Soil	20	30	70	1	<1	4.05	220	380	<3	B/C	1.2m	Tan/red/Olive	clay/RFs	(90/10)		
755		650	"	20	15	95	1	<1	3.75	200	310	<3	C	1.0m	Khaki	sand/clay	(10/90)		
756		675	"	5	20	20	1	1	1.50	40	310	<3	C	90cm	Grey/Tan	grit/clay	(20/80)		
757		700	"	5	40	15	1	<1	0.30	15	150	<3	C	80cm	Grey/yellow	grit/clay	(30/70)		
758		725	"	5	25	15	<1	<1	0.40	30	80	<3	C	90cm	Grey/Orange/white	grit/clay/RFs	(40/60/20)		
759		750	"	5	20	15	<1	1	0.35	20	70	<3	C	80cm	Grey/Orange	sand/clay	(50/50)		
760		775	"	5	15	10	<1	<1	1.25	35	220	<3	C	90cm	Grey/orange	sand/clay/RFs	(60/30/10)		
761		800	"	5	20	10	<1	<1	1.00	20	410	<3	C	1.2m	Grey yellow	sand/clay	(20/80)		
762		825	"	5	30	15	<1	<1	0.45	35	80	<3	C	1.2m	Grey/Tan	grit/clay/RFs	(20/70/10)		
763		850	"	5	40	10	<1	1	0.70	25	70	<3	C	1.25m	Tan/Yellow	gritty/clay	(15/85)		
764		975	"	20	50	20	1	1	3.60	55	60	<3	C	95cm	Tan	gritty/clay	(10/90)		
1230765	11600	51900	"	10	35	25	1	<1	2.50	60	90	<3	B	1.5m	Tan	clay/RFs			
1230801	11500	50050	Soil	50	30	95	2	<1	11.0	1800	180	<3	B/C	70cm	Brown	gritty clay	scree		
802		075	"	65	25	95	2	<1	9.00	1080	170	<3	C	1.0m	Tan/Olive	gritty clay/RFs	(90/10) scree		
803		100	"	40	25	90	2	1	9.40	3600	170	<3	B	70cm	Brown	clay/RFs	(80/20) scree		
804		125	"	50	25	90	2	<1	10.5	960	150	<3	B/C	90cm	Tan/Olive	grit/clay/RFs	(5/85/10) scree		
805		150	"	20	40	60	1	<1	3.35	320	340	<3	B/C	80cm	Tan/orange	clay	scree		
806		175	"	5	30	40	1	<1	1.65	155	290	<3	B/C	70cm	Grey/yellow	sand/clay	(10/90) scree		
1230807	11800	50200	"	5	25	55	1	<1	2.40	70	640	<3	C	70cm	Orange	grit/clay	(20/80)		
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	B							
ANALYTICAL METHOD				<	14580							>	XRF	PA205					

Project	SHEFFIELD MOINA	1:250 000 Sheet	BURNIE	AMG Zone	Sheet No.	18/22
Tenement	MOINA EL 7/24	DPO's	32043, 32047	Laboratory	ALS BRISBANE	
Area / Prospect	WINTERBROOK GRID	Collected By	J HORAK	Date	Oct 1986	

SAMPLE NUMBER	GRID		Sample Type	ANALYSES									Geological Observations				
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	Colour	Make up	Geography
1230808	11800	50225	Soil	10	35	70	1	<1	3.90	60	290	<3	C	60cm	Orange	Gritty clay	
809		250	"	10	35	70	1	<1	3.60	90	320	<3	C	70cm	Orange	gritty clay / RE's (85/15)	
810		275	"	10	40	105	1	<1	2.75	180	500	<3	B/c	10m	Khaki/orange	clay	scree
811		50325	"	10	115	60	1	10	3.40	200	400	<3	C	70cm	Tan	gravelly clay / RE's (60/40)	scree
812		51300	"	5	15	10	1	2	0.95	15	270	<3	C	80cm	yellow	gravelly clay	
813		325	"	5	5	10	<1	1	0.24	10	10	<3	C	50cm	Grey/red	Sandy gravel	
814		350	"	5	5	10	<1	1	0.55	15	70	<3	C	90cm	L. Brown	Sandy clay	
815		400	"	10	25	40	2	3	5.40	150	330	<3	B/c	90cm	Tan/yellow	Gritty clay	
816		425	"	10	30	45	2	4	5.35	310	300	<3	C	1.4m	Tan/olive	clay / RE's (80/20)	
817		450	"	15	25	65	2	4	5.15	350	520	<3	C	1.5m	Tan/olive	clay	
818		475	"	15	30	55	2	3	6.00	225	380	<3	C	1.5m	Tan/olive	clay / RE's	
819		500	"	10	20	35	1	2	5.40	155	610	<3	C	10m	Tan/yellow	Gritty clay	
820		525	"	20	35	60	2	4	6.00	345	450	<3	C	1.25m	Tan/olive	Gritty clay / RE's (90/10)	
821		550	"	20	30	100	2	4	8.55	1120	490	<3	C	1.25m	Brown/Red/Yellow	Gritty clay / RE's (80/20)	
800		575	"	10	45	85	1	1	4.03	480	310	<3	C	70cm	Brown	Grit/clay / RE's (5/90/5)	
822		600	"	20	45	115	1	2	4.15	640	320	<3	C	70cm	Brown/yellow	Grit/clay (10/90)	
823		750	"	5	25	20	2	2	5.15	10	310	<3	C	1.1m	Brown/Pink	clay	
824		775	"	25	35	20	1	1	3.75	20	600	<3	C	50cm	Tan/Pink	clay	
825		800	"	10	75	25	1	1	3.10	35	250	<3	C	1.2m	L. Brown	gritty clay / RE's	
1230826	11800	51825	"	5	85	15	1	<1	0.45	20	150	<3	B/c	60cm	Grey/yellow	gritty clay / RE's (90/10)	
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3					
ANALYTICAL METHOD																	
Project : SHEFFIELD - MOINA				1 : 250 000 Sheet : BURNIE				AMG Zone :				Sheet No. : 19/22					
Tenement : MOINA EL 7/74				DPO's : 32043, 32047								Laboratory : ALS BRISBANE					
Area / Prospect : WINTERBROOK GRID												Collected By : J HORAK Date : Oct 1986					

SAMPLE NUMBER	GRID		Sample Type	ANALYSES										Geological Observations				
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (ppb)	Mn	Ba	Au (ppb)	Horiz	Depth	Colour	Make up	Geography	
1230827	11800	51850	Soil	70	30	140	3	1	12.5	370	270	<3	B/c	96cm	Tan	clay		
828	1	875	"	65	25	135	2	2	11.0	720	360	<3	B/c	1.0m	Tan	clay		
1230829	11800	51900	"	45	25	120	2	<1	9.00	1480	290	<3	B/c	46cm	Brown/Olive	RF's		
1230830	12000	51250	Soil	5	10	40	<1	<1	1.05	50	100	<3	C	80cm	Grey/Pink	Sandy Gravel		
831		275	"	10	20	15	<1	1	0.50	25	20	<3	B/c	1.0m	D. Grey	Soil/RF's	Bad screen	
832		300	"	5	30	15	<1	1	0.35	20	50	<3	B/c	1.2m	Grey	Sandy Gravel	screen	
833		325	"	5	20	20	<1	<1	0.35	10	30	<3	B/c	1.0m	Grey	Gravel	Bedrock (outcrop)	
834		350	"	10	80	20	1	<1	3.00	15	350	<3	C	1.2m	Tan	Gravelly clay/RF's (20/20)		
835		375	"	10	15	20	1	1	0.40	55	80	<3	C	96cm	L. Grey	Sand	screen	
836		400	"	10	40	10	<1	<1	1.90	40	190	<3	C	1.4m	Tan	Sandy/clay (15/95)		
837		425	"	10	50	20	1	<1	1.15	40	120	<3	C	1.5m	Grey/white	grit/clay (60/40)		
838		450	"	5	30	10	1	<1	0.80	30	90	<3	C	1.5m	Grey/orange	gravel/clay (60/40)		
839		475	"	10	45	20	1	<1	1.45	20	190	<3	C	96cm	L. Orange	Sandy/clay (10/90)		
840		500	"	35	35	30	1	8	1.65	40	200	<3	C	1.2m	L. Tan	Gritty clay		
841		525	"	20	35	45	1	1	2.45	205	280	<3	C	45cm	Tan	clay/gritty/RF's		
842		550	"	15	30	45	1	2	4.00	280	200	<3	B/c	1.0m	Brown	clay/RF's	screen	
843		700	"	45	30	125	2	<1	3.90	600	220	<3	B/c	1.5m	Brown	clay		
844		725	"	40	30	115	2	<1	4.55	600	240	<3	B	1.0m	Brown	clay	SCREEN	
1230845	12000	51750	"	15	20	45	1	<1	2.35	210	270	<3	C	1.0m	Orange	Sandy/clay (10/90)		
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	5						
ANALYTICAL METHOD				← 14580 →								XRF PM205						

Project	SHEFFIELD MOINA	1 250 000 Sheet	BURNIE	AMG Zone	Sheet No	20/22
Tenement	MOINA EL 7/74	DPO's	32043	32047	Laboratory	ALS BRISBANE
Area / Prospect	WINTERBROOK GRID			Collected By	J HORAK	Date Oct 1986

SAMPLE NUMBER	GRID		Sample Type	ANALYSES										Geological Observations			
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	Colour	Makeup	Geography
1230846	12000	51775	Soil	50	20	190	2	<1	2.30	840	280	<3	B/c	90cm	Brown/Tan	clay/RE's	
847		800	"	50	20	95	1	<1	3.40	880	240	<3	B/c	20cm	Brown	soil/RE's	Bedrock
848		825	"	35	20	110	2	<1	8.35	1840	360	<3	B/c	25cm	Brown/Khaki	Gritty clay	scree
849		850	"	50	20	130	2	1	9.45	1200	290	<3	B/c	90cm	Khaki	Gritty clay	scree
850		875	"	50	20	110	2	<1	9.05	840	340	3	C	90cm	Tan Khaki	clay	
1230851	12000	51900	"	50	20	145	2	<1	8.00	760	240	<3	C	90cm	Khaki	clay	
1230852	12200	51250	Soil	10	10	30	<1	<1	1.80	80	90	<3	B/c	1.0m	Grey	Sand/RE's	scree
853		275	"	10	30	20	1	4	1.85	45	180	<3	C	80cm	Orange	Gritty clay/RE's (85/15)	
854		300	"	10	20	10	<1	<1	0.45	20	160	<3	C	85cm	Brown	Gritty/clay (10/90)	
855		325	"	10	35	25	1	5	3.10	60	210	<3	C	75cm	Tan/Tan	Grit/clay (20/80)	
856		350	"	10	25	10	<1	<1	0.55	30	70	<3	C	80cm	Grey/yellow	Sandy grit	scree
857		375	"	10	40	10	<1	<1	0.85	20	130	<3	B/c	1.4m	Grey/Pink	Sandy clay/RE's (90/10)	
858		400	"	20	40	20	1	2	3.55	225	150	<3	C	1.2m	Tan	Gritty clay	
859		425	"	15	30	45	1	3	3.00	80	80	<3	C	55cm	Tan	clay	
860		450	"	15	20	40	1	1	2.40	75	70	<3	C	40cm	Tan	clay	
861		475	"	15	35	65	1	1	3.40	315	90	<3	C	70cm	Orange	clay/RE's (80/20)	
1230862	12200	51500	"	10	40	20	<1	<1	1.95	55	130	<3	C	60cm	Brown/yellow	Gritty clay/RE's	
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3					
ANALYTICAL METHOD				← 12580 →								XRF 111205					
Project SHEFFIELD - MOINA			1:250 000 Sheet: BURNIE			AMG Zone:			Sheet No: 21/22								
Tenement MOINA FL 7/24			DPO's 32043, 32047			Laboratory: ALS BRISBANE											
Area / Prospect: WINTERBROOK GRID			Collected By: J HORAK			Date: Oct 1986											

SAMPLE NUMBER	GRID		Sample Type	ANALYSES									Geological Observations				
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	Horiz	Depth	Colour	Make up	Geography
1230863	12400	51150	Soil	5	15	10	<1	<1	0.75	20	220	<3	B	95cm	Grey/Brown.	Gravel/clay (20/30)	Rhydic scree
864		175	"	10	20	10	<1	2	1.15	40	190	<3	B	95cm	Grey/Brown	gravel/clay (20/10)	Rhy scree
865		200	"	5	35	10	<1	1	0.70	20	170	<3	B/c	65cm	Grey/Brown	gravel/soil (90/20)	scree
866		225	"	10	10	5	<1	<1	0.55	40	30	<3	B/c	1.0m	Brown	grit/clay (80/20)	scree
867		250	"	5	5	5	<1	<1	0.30	20	40	<3	B/c	75cm	Grey/Brown	Gravel/sand/RF's (20/25/15)	scree
868		275	"	5	10	5	<1	<1	0.45	25	30	<3	c	60cm	Grey/Brown	grit/gravel/RF's (60/20/10)	scree
869		300	"	5	10	5	<1	<1	0.30	20	80	<3	B/c	50cm	Grey/Brown	grit/gravel/RF's (20/20/10)	scree
870		325	"	10	20	10	<1	<1	0.85	40	200	<3	B/c	45cm	Grey/Brown	Sand/clay/RF's (15/10/5)	scree
871		350	"	10	40	35	1	2	5.25	110	370	<3	c	95cm	Yan	Sandy clay	
872		375	"	5	40	40	1	1	3.50	125	400	<3	c	95cm	Yan	Silty clay	
873		400	"	20	50	115	1	3	4.45	340	340	<3	c	1.2m	Brown/Yan	clay/RF's (95/5)	
874		425	"	20	45	90	1	1	5.25	680	260	<3	B'	30cm	Brown	soil/RF's (60/40)	scree
1230875	12400	51450	"	20	50	440	1	3	4.35	5200	420	<3	B'	1.5m	Brown	clay/RF's (95/5)	
DETECTION LIMIT				2	5	2	1	1	0.01	5	10	3					
ANALYTICAL METHOD																	
Project SHEFFIELD - MOINA				1 250 000 Sheet : BURNIE				APM Zone				Sheet No 22/22					
Tenement MOINA EL 7/74				DPO's 32043, 32047								Laboratory ALS Brisbane.					
Area / Prospect WINTERBROOK GRID												Collected By J HORAK Date Oct 1986					

CRA EXPLORATION PTY. LTD.

SAMPLE NUMBER	AMG LOCATION		Sample Type	ANALYSES									Geological Observations
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au	
1231691	417610	5413680	r.c.	10	40	40	<1	3	1.97	90	160	<3	limonite pitted and pyritic, ferruginous quartz porphyry
1231692	417740	5413680	r.c.	10	70	420	1	<1	8.93	5550	720	<3	Highly ferruginous and orange brown rock → green?? Flint on bank beside creek.
989049	417750	5414110	ss.	10	50	40	1	<1	1.93	400		3	Non active stream sediments sample → virtually soil sample. No flow; high organics; logged eucalypt forest; 5% gravel, 15% sand, 80% silt. Minor sericitic quartz porphyry float; limestone % on northern side of valley. Large valley for the size of stream → fault??
DETECTION LIMIT													
ANALYTICAL METHOD													
Project : SHEFFIELD - MOINA				1 : 250 000 Sheet : BURNIE				AMG Zone :				Sheet No. : 1	
Tenement : MOINA EL 7/74				DPO's : 32041								Laboratory : ALS BRISBANE	
Area / Prospect : WINTERBROOK GRID - DRAINAGE CHECK												Collected By : S.J.C. Date : Aug. 1986	

CRA EXPLORATION PTY. LTD.

SAMPLE NUMBER	GRID			ANALYSES									Geological Observations
	LOCATION		Sample Type	Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	
	Easting	Northing											
989048	12400	51200	r.c.	5	50	5	<1	20	1.13	15	260	<3	Weakly Fe stained (limonitic), sericitic conglomerate?
989050	12200	51300	r.c.	10	190	5	<1	22	4.57	20	170	<3	Fe stained + limonitic fine sandstone
1231693	11800	51395	r.c.	10	20	40	<1	5	2.66	70	120	<3	Feruginous rock and orange-brown conglomeratic sandstone
1231694	11793	51485	r.c.	<2	50	185	1	<1	15.6	2500	110	<3	Extremely hard brown ironstone boulders from stream
DETECTION LIMIT													
ANALYTICAL METHOD													

Project : SHEFFIELD - MOINA	1 : 250 000 Sheet : BURNIE	AMG Zone :	Sheet No. : 1
Tenement : MOINA EL 7/7A	DPO's : 32041		Laboratory : ALS BRISBANE
Area / Prospect : WINTERBROOK GRID - WINTERBROOK ANOMALY			Collected By : S.J.C. Date : Aug. 1986

CRA EXPLORATION PTY. LTD.

SAMPLE NUMBER	GRID LOCATION		Sample Type	ANALYSES									Geological Observations
	Easting	Northing		Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Ba	Au (ppb)	
1055649	13200	50610	r.c.	10	35	160	1	18	7.89	950		50	Strongly magnetic, dark green iron-rich tuff.
990800	13000	50595	r.c.	<2	30	35	1	<1	1.89	35	660	<3	Ferrous quartz porphyry
989845	13000	50963	r.c.	<2	50	165	4	<1	56.6	310	50	3	Ironstone float
DETECTION LIMIT				2	3	2	1	1	0.01	5	3		
ANALYTICAL METHOD				IC580 → PL205									

Project: SHEFFIELD - MOINA	1:250 000 Sheet: BURNIE	AMG Zone:	Sheet No.: 1
Tenement: MOINA EL 7/74	DPO's: 32036 + 32041	Laboratory: ALS BRISBANE	Collected By: S.J.C.
Area / Prospect: WINTERBROOK GRID - MAXWELLS ANOMALY		Date: JULY 1986	

CRA EXPLORATION PTY. LTD.

SAMPLE NUMBER	Grid		Sample Type	ANALYSES										Geological Observations
	LOCATION			Cu	Pb	Zn	Ag	As	Fe (%)	Mn	Au (ppb)	Ba	Pb	
	Easting	Northing												
1055647	13400	50795	c.c.	5	60	185	1	14	3.27	90	20			Fe stained quartz porphyry; sericitic and chloral
1055648	13600	50600	c.c.	<2	10	<5	<1	8	0.34	10	3			Dark grey, siliceous and weakly ferruginous quartz porphyry
				10.580										→ PM205
1055650	13200	50812	c.c.	<5	<5	80	3	<1	48.5	2800	5	90	25	Ironstone / gossam
989041	13200	50815	c.c.	<5	<5	360	3	<1	46.1	1750	10	80	30	Ironstone / gossam
989042	13200	50818	c.c.	<5	<5	860	3	<1	48.5	1350	5	90	20	Ironstone / gossam
989043	13200	50821	c.c.	<5	<5	165	3	<1	46.4	850	<3	100	15	Ironstone / gossam
989044	13200	50825	c.c.	<5	<5	195	3	<1	46.8	840	15	80	15	Ironstone / gossam
DETECTION LIMIT				2/5	5	2/5	1	1	0.01	5/10	3	10	4	
ANALYTICAL METHOD				10.586										→ PM205 XRF XRF

Project	SHEFFIELD - MOINA	1 : 250 000 Sheet	BURNIE	AMG Zone	Sheet No. : 1
Tenement	MOINA EL 7/74	DPO's	32036		Laboratory : ALS BARRBANE
Area / Prospect	WINTERBROOK GRID - ALBATROSS ANOMALY				Collected By : S.J.C. Date : JULY 1986



Ref. No.

TITLE: E.L. 7/74 MOINA

REPORT ON AREAS RELINQUISHED

ON 18 JULY, 1987.

Vol. 2 (Plans)

AUTHOR: T. von Strokirch

OPEN FILE

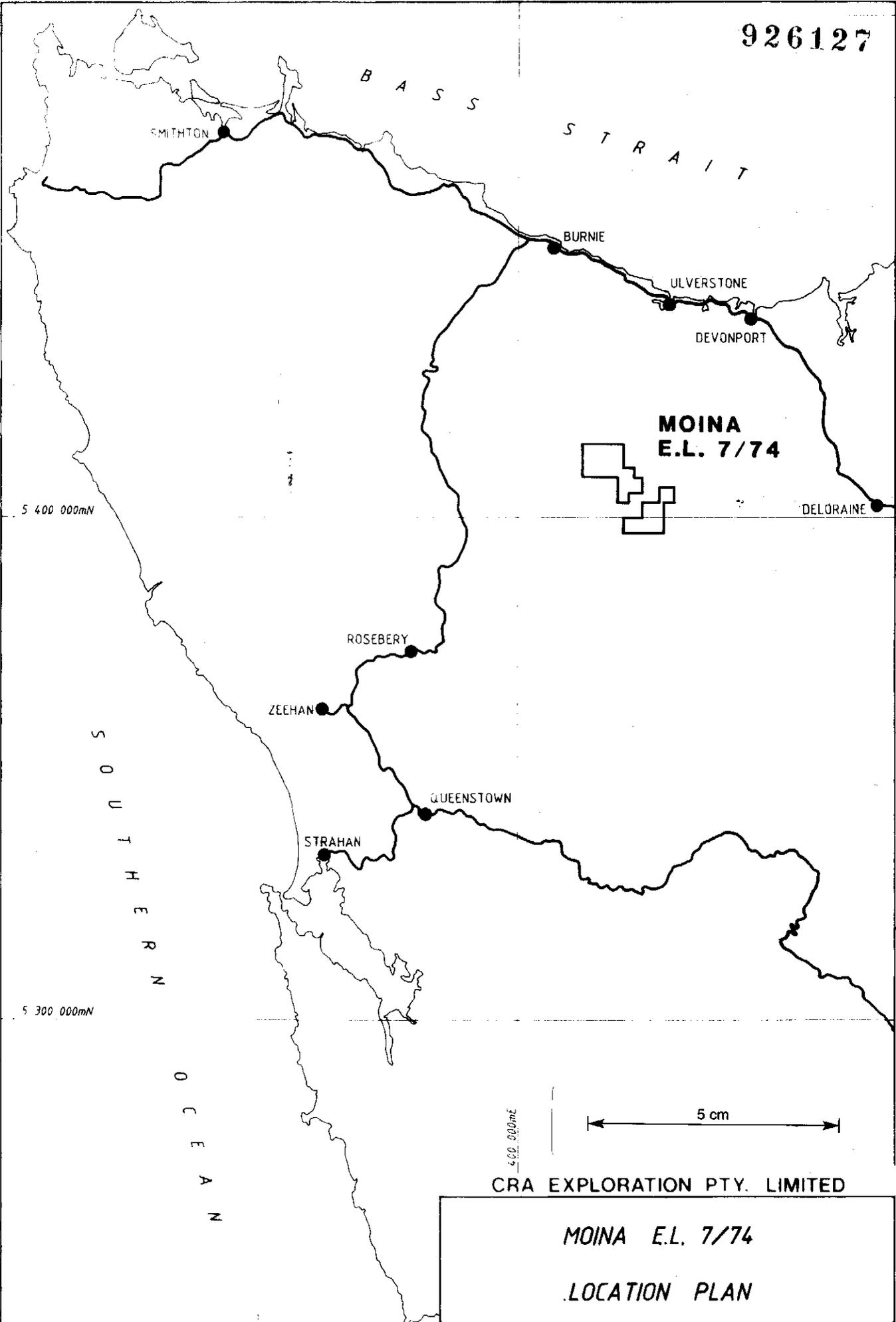
DATE: 29th. April, 1987.

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9268/2

CRA REPORT NO.: 14474

87-2660 V.2/2



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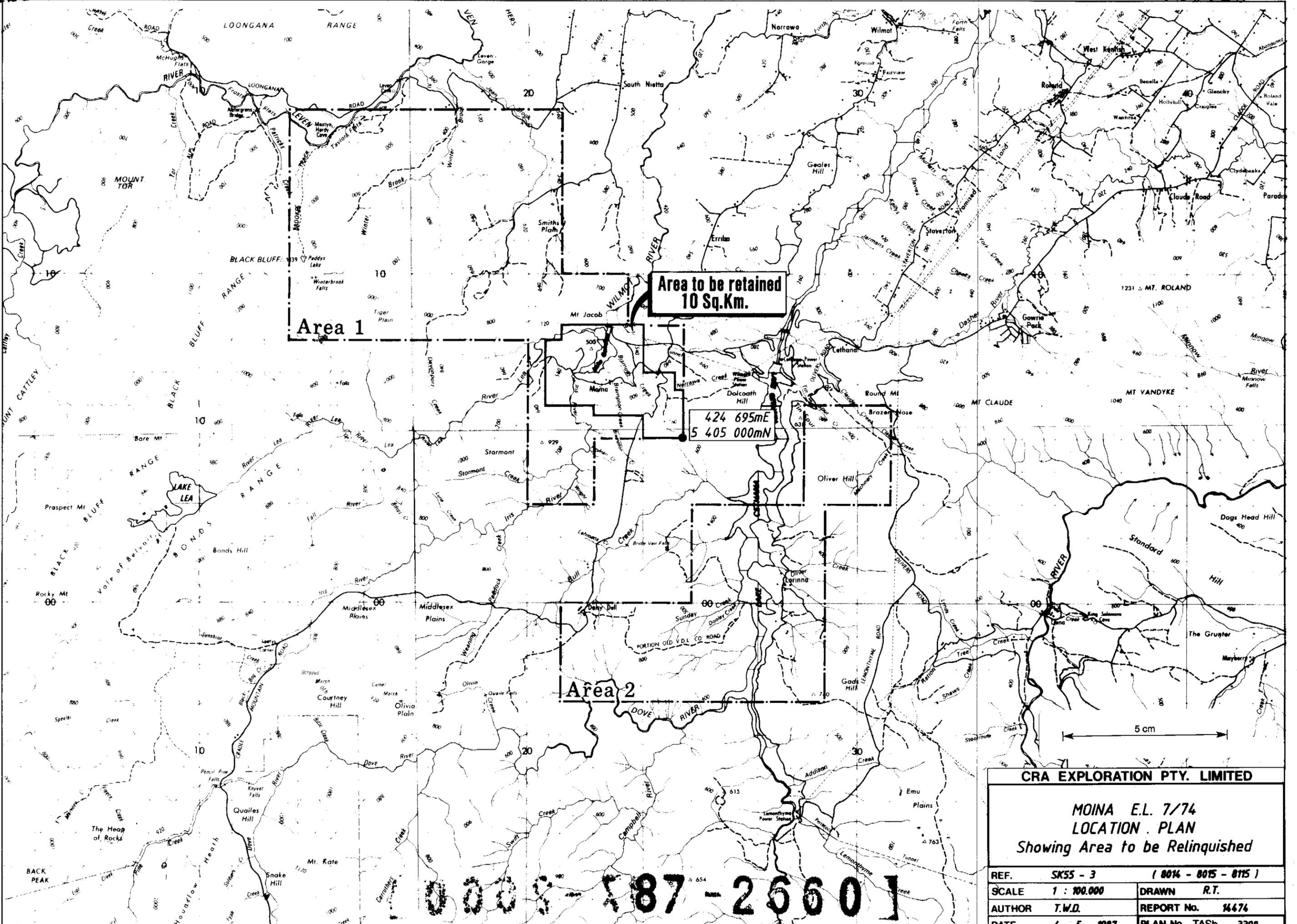
MOINA E.L. 7/74

LOCATION PLAN

REF	SK55 - 3	(8104-8114-8115)
SCALE	1 : 1 000 000	DRAWN R.T.
AUTHOR	S.J.C.	REPORT No. 14474
DATE	11 - 6 - 1986	PLAN No. 2973

300 000mE

87-2660



Area to be retained
10 Sq.Km.

Area 1

424 695mE
5 405 000mN

Area 2

5 cm

CRA EXPLORATION PTY. LIMITED			
MOINA E.L. 7/74 LOCATION PLAN			
<i>Showing Area to be Relinquished</i>			
REF.	SK55 - 3	(8014 - 8015 - 8115)	
SCALE	1 : 100,000	DRAWN R.T.	
AUTHOR	T.W.D.	REPORT No. 14474	
DATE	4 - 5 - 1987	PLAN No. TASH 3398	

0005-187-2660

127

926129

415 000mE

420 000mE

425 000mE

430 000mE

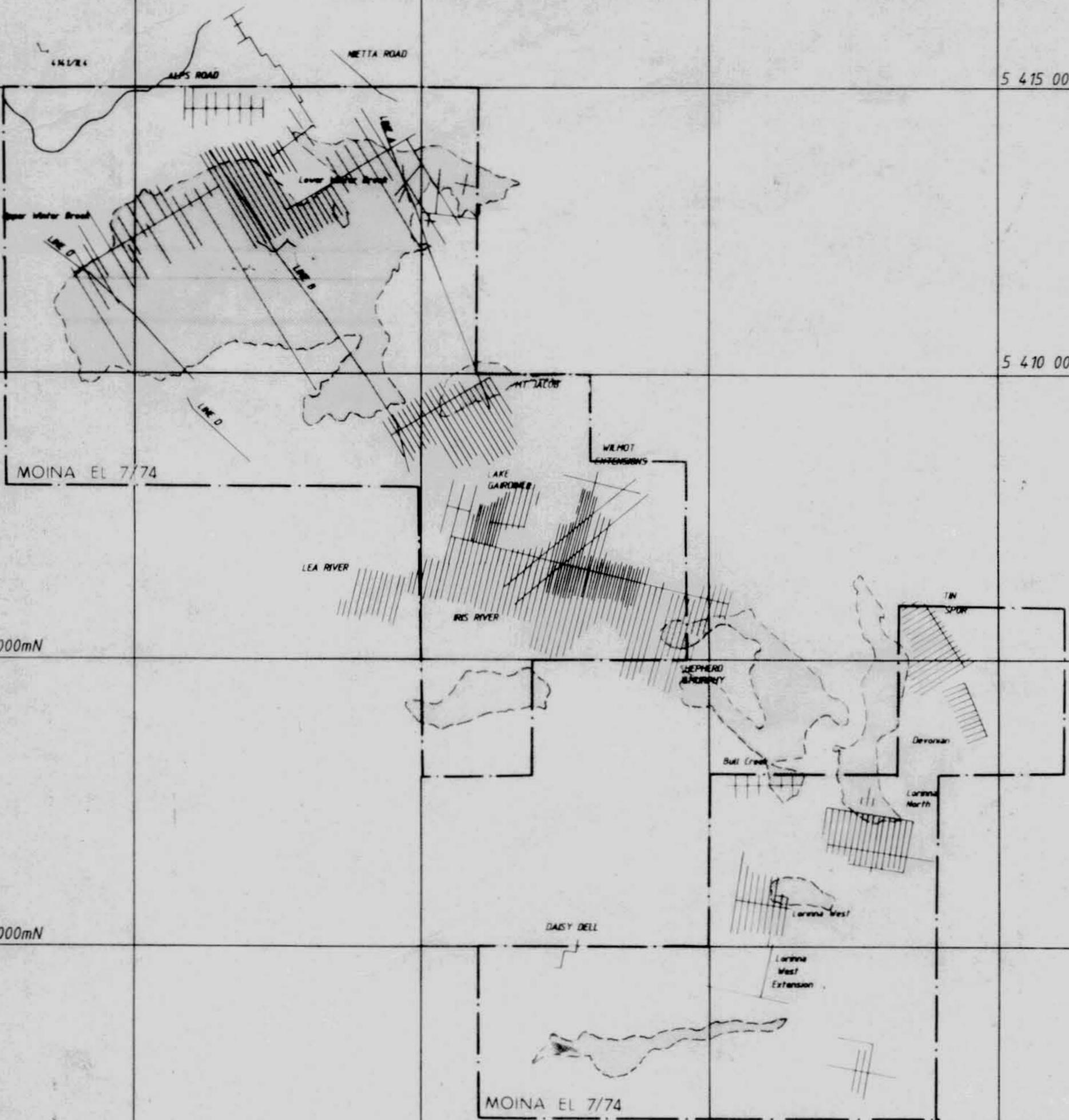
5 415 000mN

5 410 000mN

5 405 000mN

5 400 000mN

5 395 000mN



CRA EXPLORATION PTY. LIMITED

MOINA E.L. 7/74

PROSPECT LOCATIONS

REF. SK55 - 3 (8014 - 8015 - 8115)

SCALE 1 : 100.000

DRAWN A.R. R.T.

AUTHOR I.M.C. T.v.S.

REPORT No. 14474

DATE 29 - 4 - 1987

PLAN No. TASH 3396



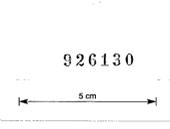
Cambrian Volcanics

--- E.L. 7/74 Boundary

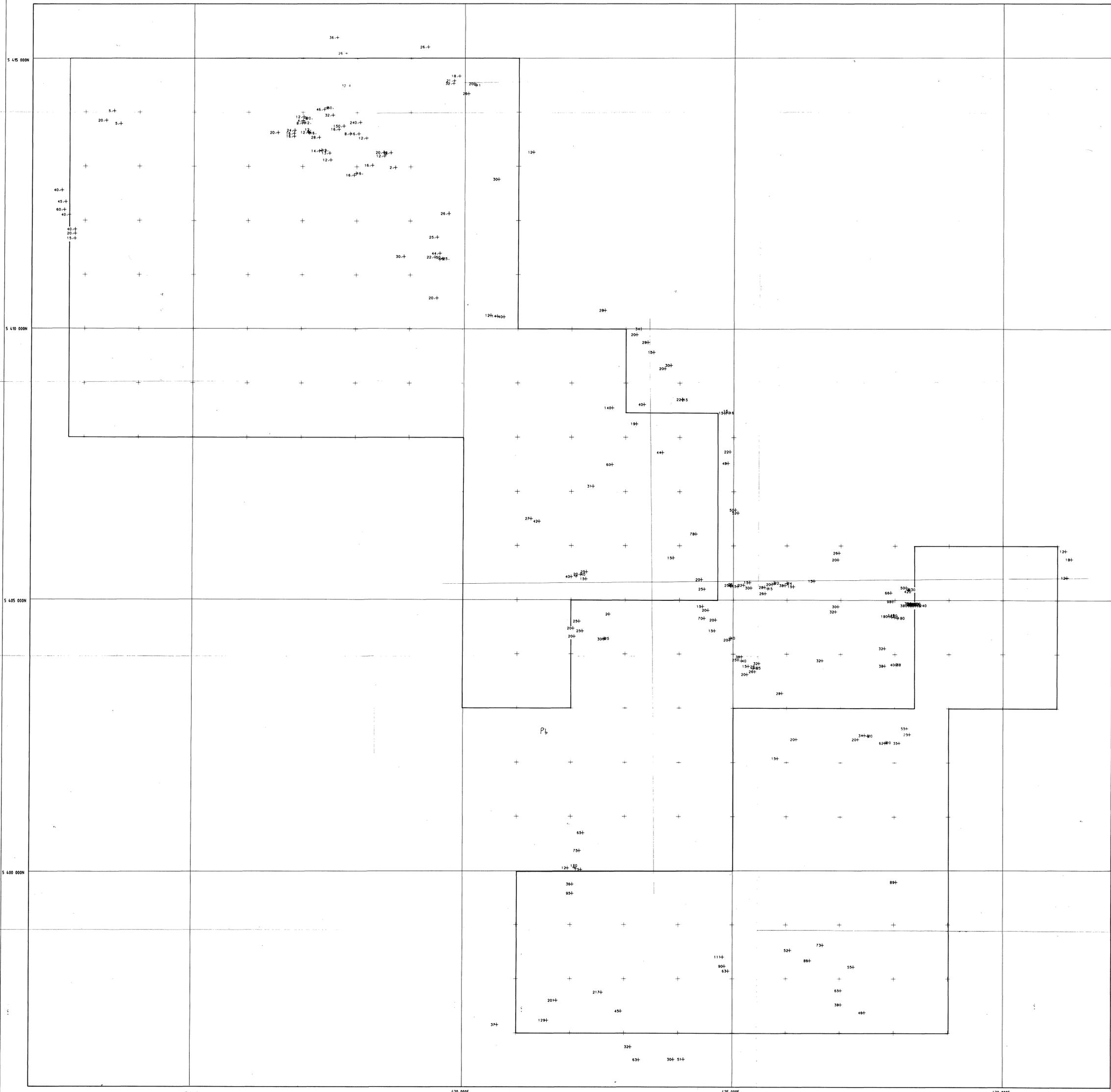
87-26801



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CRA EXPLORATION PTY. LIMITED	
MOINA E.L. 7/74	
PREVIOUS EXPLORERS	
STREAM GEOCHEMISTRY - Cu	
REF. SK55 - 3 (80% , 81% , 81S)	
SCALE 1 : 25000	DRAWN R.T.
AUTHOR S.J.C.	REPORT NO. 1474
DATE 11 - 6 - 1986	PLAN NO. TASH 2999



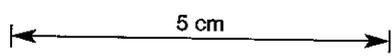
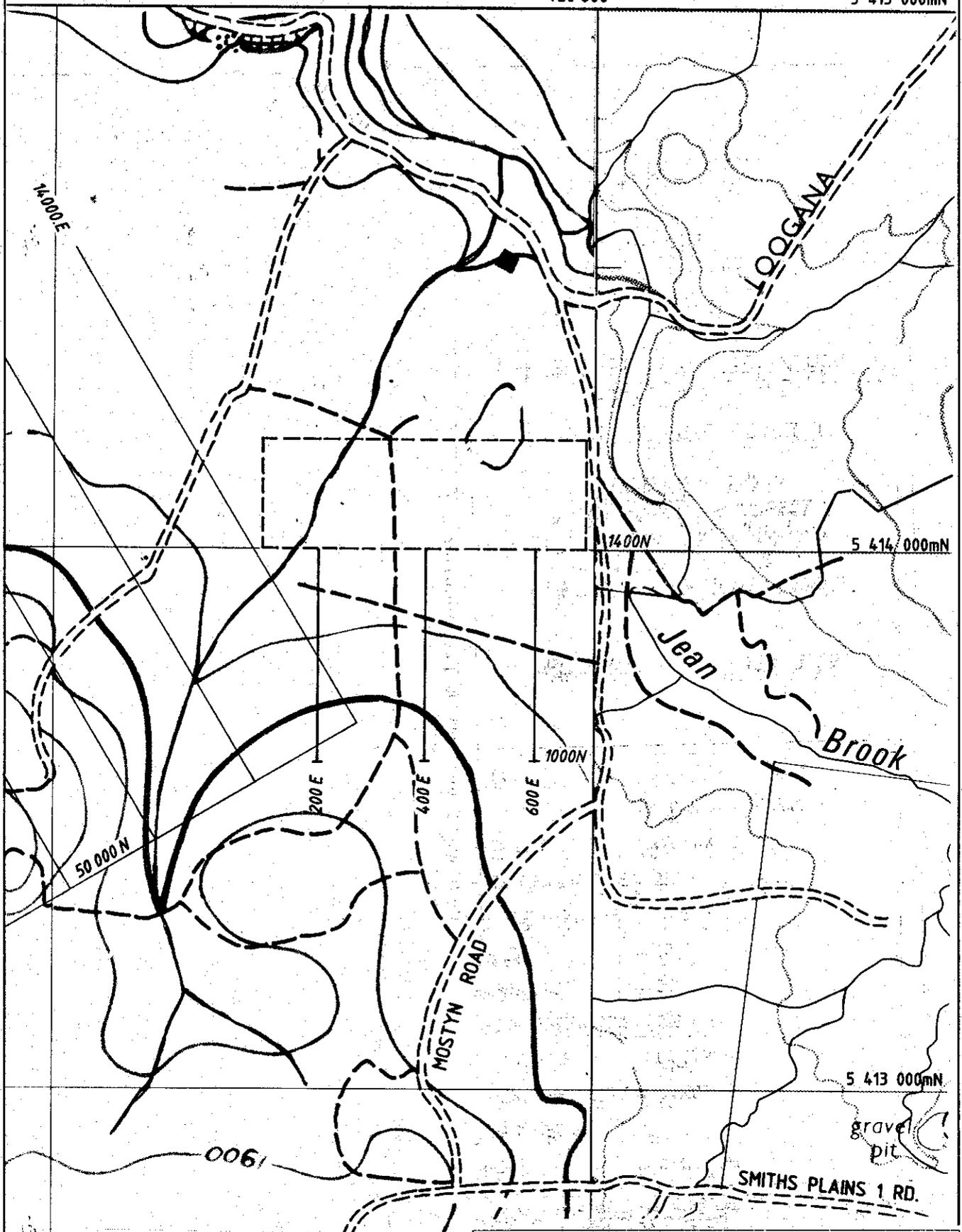
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7165

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CRA EXPLORATION PTY. LIMITED	
MOINA E.L. 7/74	
PREVIOUS EXPLORERS	
STREAM GEOCHEMISTRY - Pb	
REF. SK35 - 3	(80% , 81% , 815)
SCALE 1 : 25 000	DRAWN R.T.
AUTHOR S.J.E.	REPORT NO. 3474
DATE 11 - 6 - 1986	PLAN NO. TASH 3000



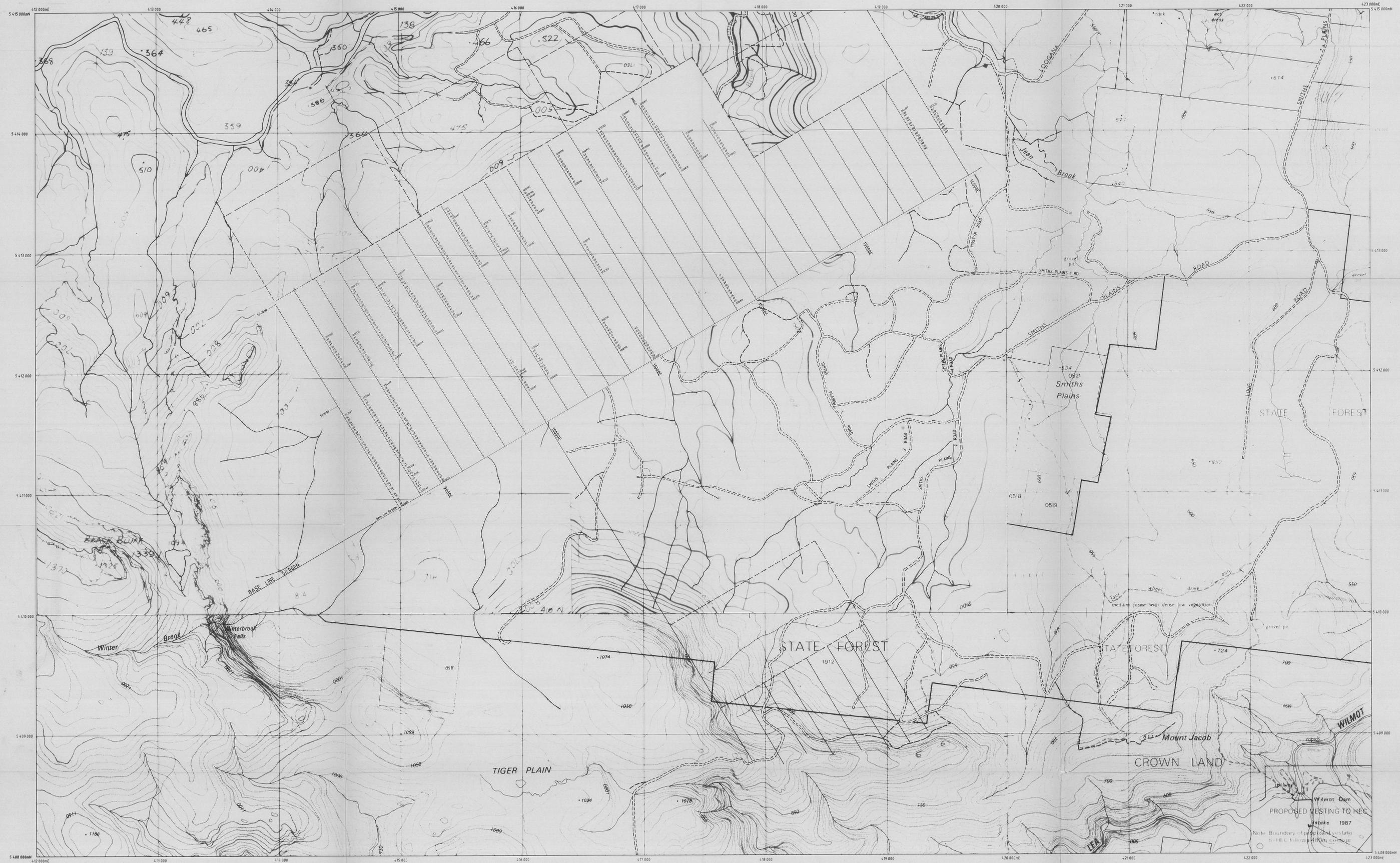
——— U.T.E.M. LINES (Corrected)
 ——— E.M. 37 LINES
 - - - E.M. 37 LOOP POSITIONS

CRA EXPLORATION PTY. LIMITED

MOINA E.L. 7/74
 WINTERBROOK PROSPECT
 EMU ANOMALY
 FOLLOW UP E.M. LINES

REF.	SK55 - 3	(8014 - 8114 - 8115)
SCALE	1 : 10000	DRAWN ... R.T.
AUTHOR	T.v.S.	REPORT No. 14474
DATE	1 - 12 - 1986	PLAN No. TASH 3199

87-26601



926135

5cm

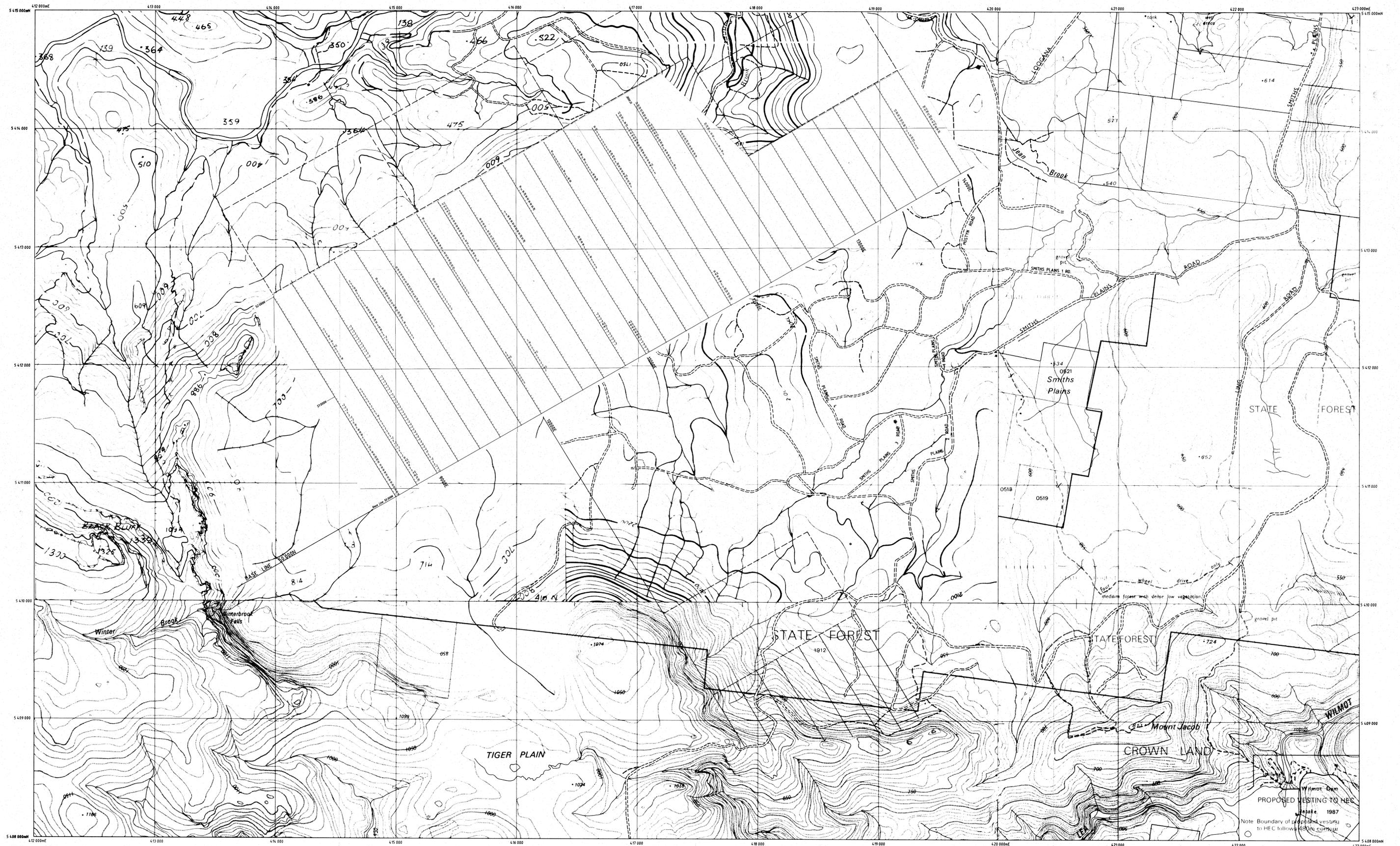
87-2660 7168

CRA EXPLORATION PTY. LIMITED

MOINA EL 7/74
MT. JACOB & WINTERBROOK AREA
SOIL GEOCHEMISTRY
SAMPLE LOCATIONS

REF: SKS - 3	(RHS - 816)
SCALE: 1:10,000	DRAWN: R.T.
AUTHOR: S.J.C.	REPORT NO: 1474
DATE: 16 - 1 - 1987	PLAN NO: TASH 229

Note: Boundary of proposed vesting to HEC follows 480m contour



PROPOSED VESTING TO HEC
 State 1987
 Note: Boundary of proposed vesting to HEC follows 400m contour

926136

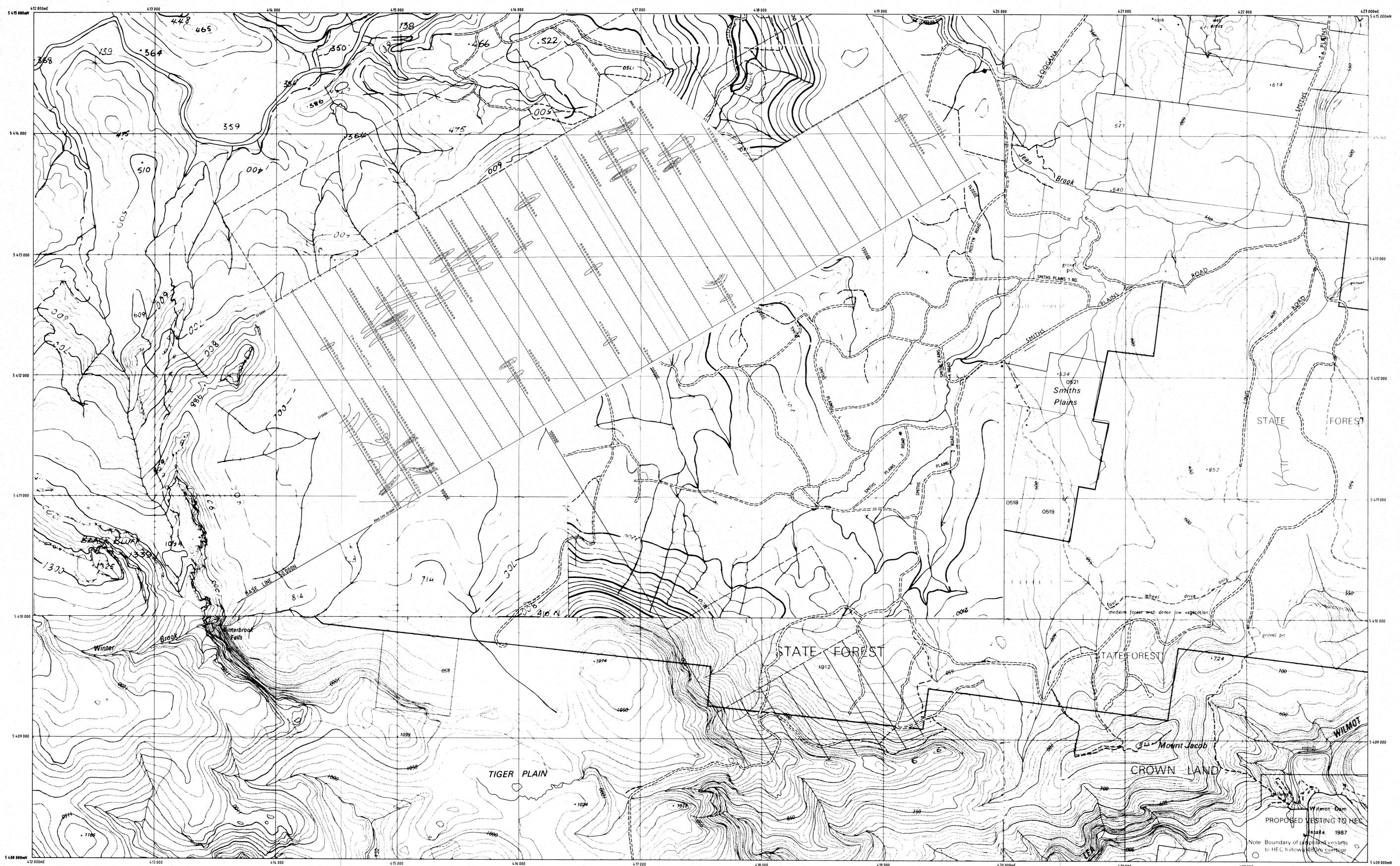
8cm

87-2660 7169

CRA EXPLORATION PTY. LIMITED

MOINA E.L. 7/74
 MT. JACOB & WINTERBROOK AREA
 SOIL GEOCHEMISTRY
 COPPER (DDP)

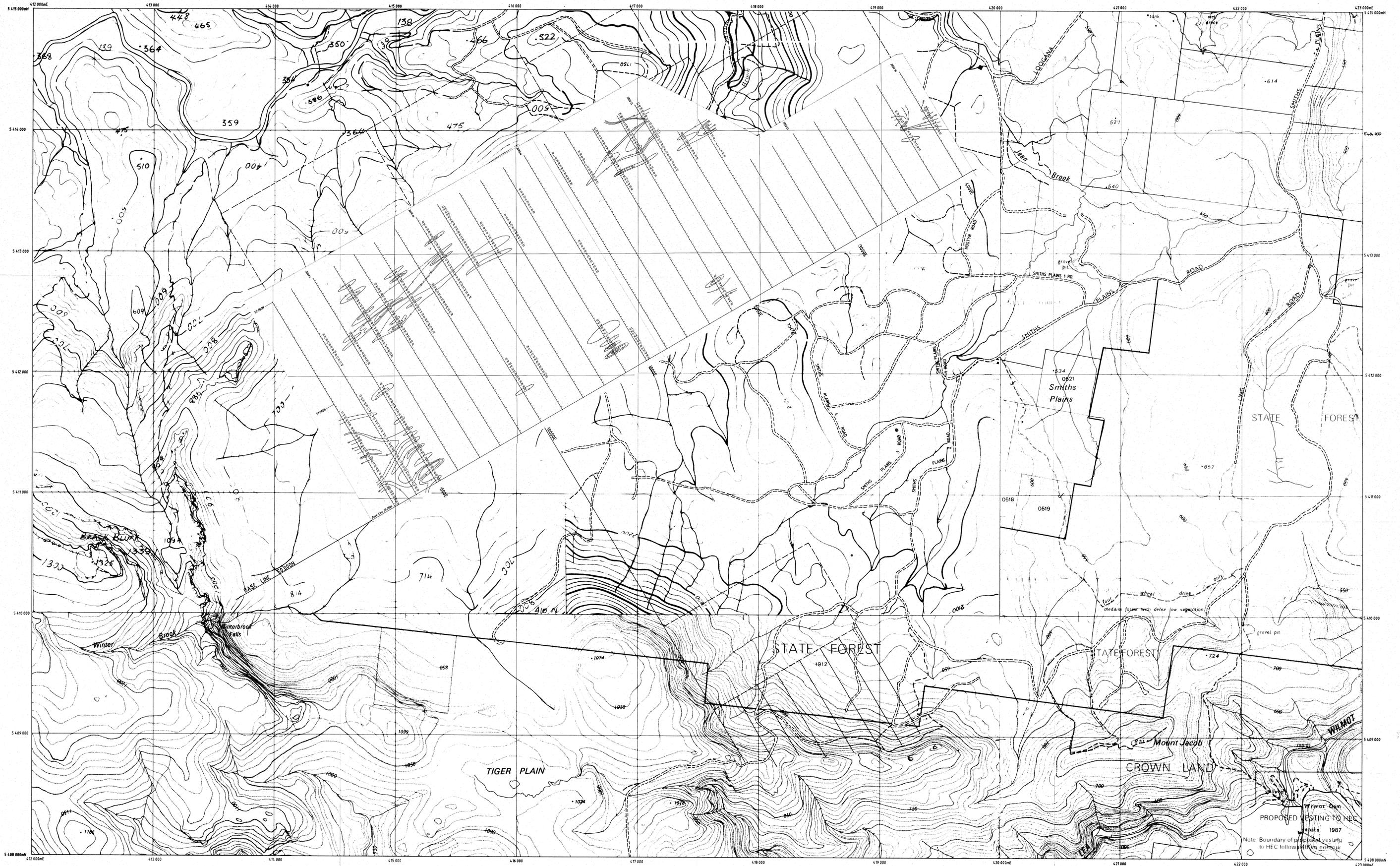
REF. SPSL 2	1. SWS - 87/1
SCALE 1 : 20 000	DRAWN R.T.
AUTHOR S.J.C.	REPORT No. 14474
DATE 11 - 1987	PLAN No. TASH 3270



926137 7170
87-26801

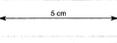
CRA EXPLORATION PTY. LIMITED			
MOINA EL. 7/74 MT. JACOB & WINTERBROOK AREA SOIL GEOCHEMISTRY LEAD (ppm)			
REF:	SK55 - 3	(8115 - 8115.1)	
SCALE:	1 : 20 000	GRAPHIC: A.T.	
AUTHOR:	S.J.C.	REPORT NO:	16474
DATE:	16 - 1 - 1987	PLAN NO:	TASD - 327





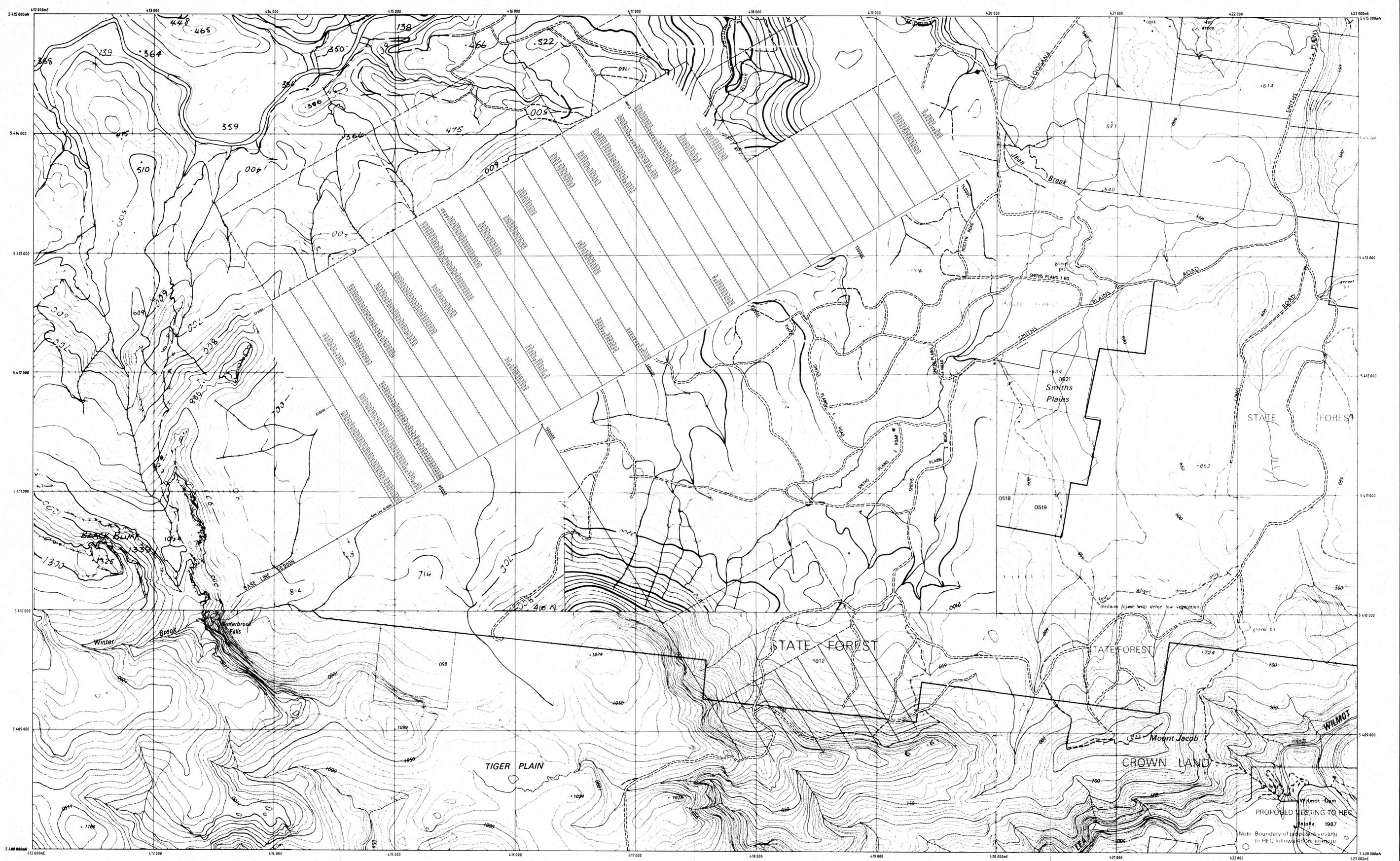
PROPOSED VESTING TO HEC
 Note: Boundary of proposed vesting to HEC follows 480m contour

926138



87-2660 17171

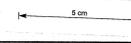
CRA EXPLORATION PTY. LIMITED			
MOINA E.L. 7/74			
MT. JACOB & WINTERBROOK AREA			
SOIL GEOCHEMISTRY			
ZINC (ppm)			
REF.	SS5-3	(SITE - 87C)	
SCALE	1:10 000	DRAWN	R.T.
AUTHOR	S.J.C.	REPORT NO.	SL74
DATE	8-1-1987	PLAN NO.	TASD-322



Note: Boundary of plots as surveyed to HE C follows 1:500m contour

926139 7172
87-2660

CRA EXPLORATION PTY. LIMITED			
MOUNT JACOB & WINTERBROOK AREA			
SOIL GEOCHEMISTRY			
Ag (Asppm) & Au (ppb)			
REF:	8552 - 3	(8015 - 8115)	
SCALE:	1 : 10 000	DRAWN:	R.T.
AUTHOR:	S.T.	REPORT NO.:	1473
DATE:	16 - 1 - 1987	PLAN NO.:	TASH 3273





926140

5 cm

7173

Mag. Nth.
A.M.G. North
87-2660

CRA EXPLORATION PTY. LIMITED	
MOINA E.L 7/74 MOINA PROSPECT GRID & DRILLHOLE LOCATION PLAN	
REF. SK55 - 3	(8014 - 8114 - 8115)
SCALE 1 10 000	DRAWN RT
AUTHOR T.v.S	REPORT No. 14474
DATE 3 - 3 - 1987	PLAN No. TASH 3225



<p>RECENT</p> <p>FLEISTOCENE</p> <p>TERTIARY</p> <p>ORDOVICIAN</p>	<p>SEDIMENTS</p> <p>CAMBRIAN</p>	<p>ACID VOLCANICS</p>	<p>INTERMEDIATE VOLCANICS</p>	<p>FAULT</p> <p>GEOLOGICAL BOUNDARY</p> <p>sericite</p> <p>chlorite</p> <p>galeua, sphalerite</p> <p>gph, sh</p> <p>COMALCO DIAMOND DRILL HOLE</p> <p>ROAD</p> <p>JEEP TRACK</p> <p>CLIFF</p> <p>QUARRY</p>
<p>alluvium, talus</p> <p>colluvium</p> <p>basalt</p> <p>limestone</p> <p>sandstone</p> <p>intermediate vesicular lava flow ??</p> <p>conglomerate</p> <p>unconformity</p> <p>strongly cleaved sericitised sericite altered volcanics</p>	<p>limestone</p> <p>siltstone, tuff, shale</p> <p>volcaniclastic conglomerate sericite tuff, minor tuff, shale, sandstone, minor lithic & crystal tuffs</p>	<p>undifferentiated acid tuffs</p> <p>litic tuff, aprill agglomerate</p> <p>litic vitric tuff</p> <p>litic crystal tuff</p> <p>crystal tuff</p> <p>crystal lithic tuff</p> <p>crystal vitric tuff</p> <p>vitric crystal tuff</p> <p>vitric lithic tuff</p> <p>vitric crystal welded ash flow</p> <p>hyalite lava, minor rhyodacite, minor dacite</p>	<p>undifferentiated intermediate tuffs</p> <p>litic tuff, aprill agglomerate</p> <p>litic crystal tuff</p> <p>crystal tuff</p> <p>crystal lithic tuff</p> <p>andesite lava</p>	<p>geological boundary</p> <p>dip and strike, measured, facing observed</p> <p>dip and strike, measured, facing unknown</p> <p>dip and strike inferred from air photo</p> <p>strongly sheared in direction of symbol</p> <p>strongly sericitised</p> <p>strongly chloritised</p> <p>galeua, sphalerite</p> <p>comalco diamond drill hole</p> <p>road</p> <p>jeep track</p> <p>cliff</p> <p>quarry</p>

926141

50m

7174

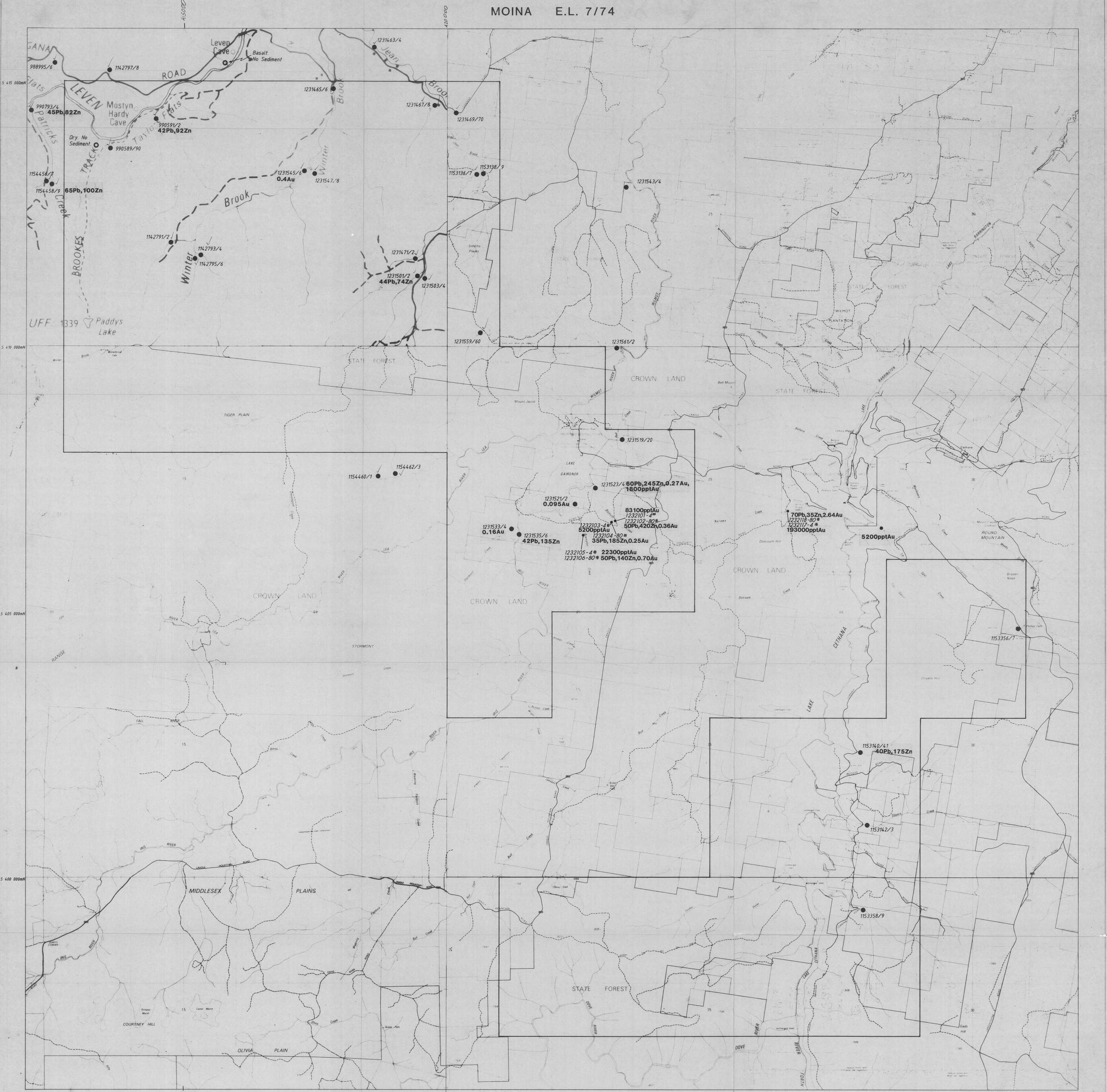
87-26601

CRA EXPLORATION PTY. LIMITED

MOINA AREA

GEOLOGY OF THE BLACK BLUFF SMITHS PLAIN AREA

REF: SK55-5 (1804, 8114, 8151)	EL: 7/74
SCALE: 1:10,000	DRAWN: RT, TN
AUTHOR: SJC	REPORT NO.: 34/74
DATE: 25-3-87	PLAN NO.: 100: 3320



5 415 000m
5 410 000m
5 405 000m
5 400 000m

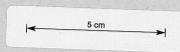
415 000m 420 000m 425 000m 430 000m

926142 7175
87-2660

CRA EXPLORATION PTY. LIMITED
MOINA E.L. 7/74
CRAE REGIONAL STREAM SEDIMENT
SAMPLE LOCATIONS 1985-87

REF: SK55-3	(8014-8015-8115)
SCALE: 1:25 000	DRAWN: R.T.
AUTHOR: F.R.F.	REPORT NO: 14474
DATE: 6-4-1987	PLAN NO: 3374

* N.B. * EVEN No. --- 4 mesh CYANIDE LEACH SAMPLE.
ODD No. --- 80 mesh SAMPLE.



51500N

51400N

51300N

5 cm

DD86W11

Crystal lithic tuff float

Pale green crystalline limestone

Elevation 1320m (approx.)

20.5m

73.7m

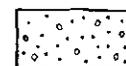
X Interpreted UTEM anomaly

X 104.0m

X 118.4

E.O.H 125.0m

LEGEND

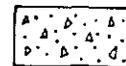


Interbedded sandstone and shale with lesser conglomerate - Pre collar

ORDOVICIAN



Limestone - Fossiliferous



Breccia - siltstone clasts set in a block mud matrix



Interbedded sandstone and siltstone



Sandstone

Collar Co-ords 12200E
51480N

AMG Co-ords 417 350mE
5 413 985mN

Azimuth 135° (m)

Dip -60°

Total Depth 125m

87-2660

926143

CRA EXPLORATION PTY. LIMITED

MOINA EL 7/74

WINTERBROOK PROSPECT

SECTION LINE 12200E

DRILLHOLE SECTION DD86W11

REF. SK 55-3

(8014, 8114, 8115)

SCALE 1:1000

DRAWN TN

AUTHOR FRF

REPORT NO. 14474

DATE 9-4-87

PLAN NO. TASH 3376

130

87-2660

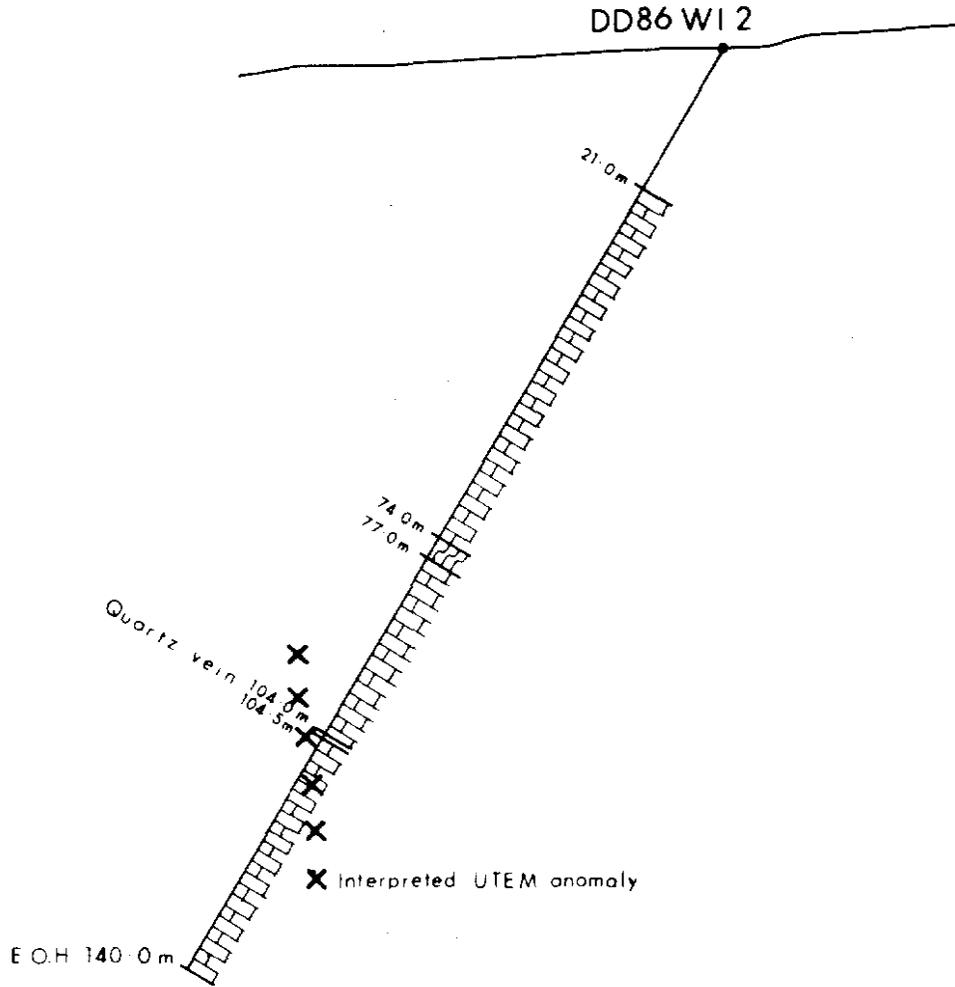
51300N

51200N

5 cm

DD86 W1 2

Elevation 1370m (approx)



LEGEND

Overburden - soil & float

ORDOVICIAN

Limestone
Limestone sheared

Collar Co-ords : 12400E
 : 51270N

A.M.G. Co-ords : 417622mE
 : 5413903mN

Azimuth : 315°(m)

Dip : -60°

Total Depth : 140.0m

X Interpreted UTEM anomaly

Quartz vein 104.0m
 104.5m

E.O.H. 140.0m

926144

CRA EXPLORATION PTY. LIMITED

MOINA EL 7/74

WINTERBROOK PROSPECT

SECTION LINE 12400E

DRILLHOLE SECTION DD86W12

REF. SK55-3

(8014, 8114, 8115)

SCALE 1:1000

DRAWN TN

AUTHOR FRF

REPORT NO. 14474

DATE 9 4 87

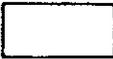
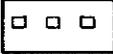
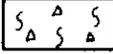
PLAN No TASH 3377

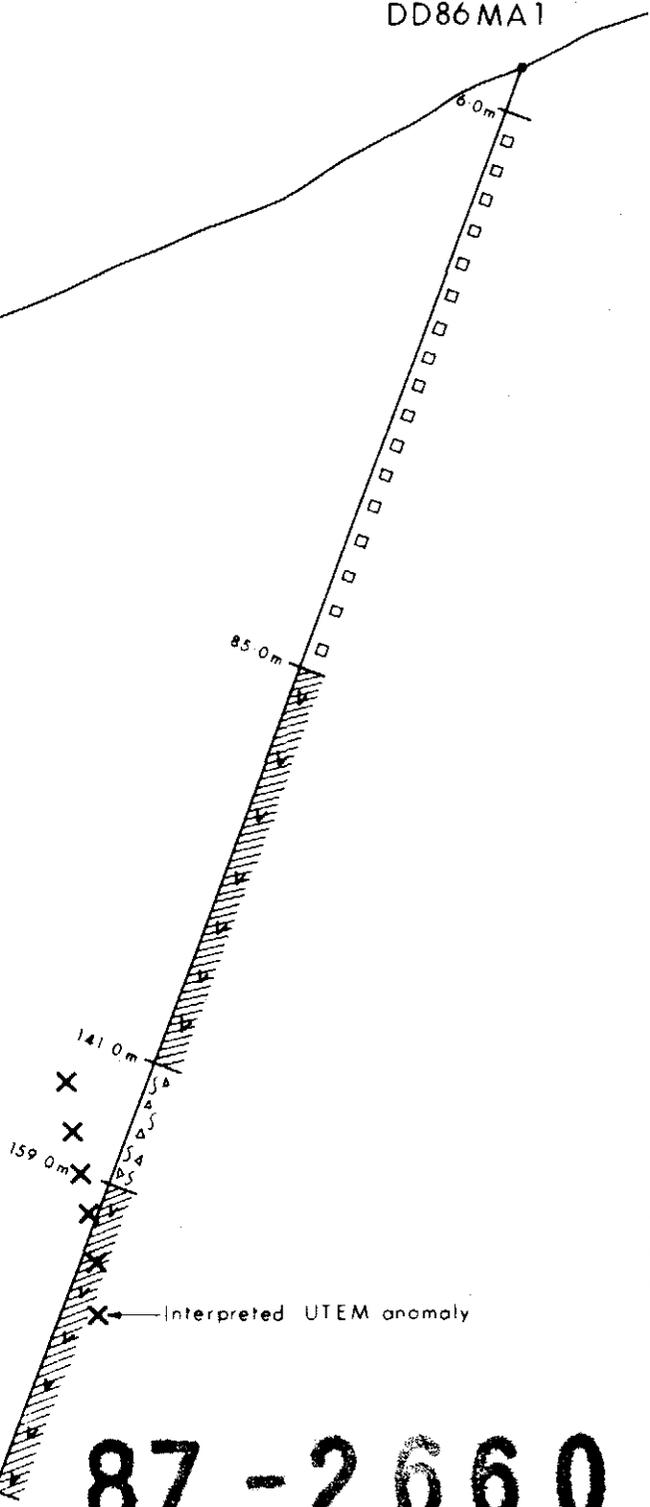
50700N

50600N

DD86MA1

Elevation 1900m(approx.)

- LEGEND**
-  Overburden - soil & float
 - CAMBRIAN**
 -  Rhyolitic Volcanic clay/sericite altered
 -  Crystal lithic tuff/greywacke immature detrital sediment.
 -  Sheared & brecciated crystal lithic tuff/greywacke



926145

87 - 2660

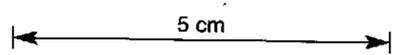
Collar Co-ords : 13000 E
 50590 N

A.M.G. Co-ords : 418500mE
 5413620mN

Azimuth : 315° (m)

Dip : -70°

Total Depth : 200m



CRA EXPLORATION PTY. LIMITED	
MOINA EL. 7/74	
WINTERBROOK PROSPECT	
SECTION LINE 13000 E	
DRILLHOLE SECTION DD86MA1	
REF. SK55-3	(804, 8114, 8115)
SCALE 1:1000	DRAWN TN
AUTHOR FRF	REPORT No. 14474
DATE 9-4-87	PLAN No. TASH 3378

131

133

97

2660

50700 N

50600 N

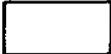
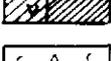
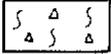
50500 N

5 cm

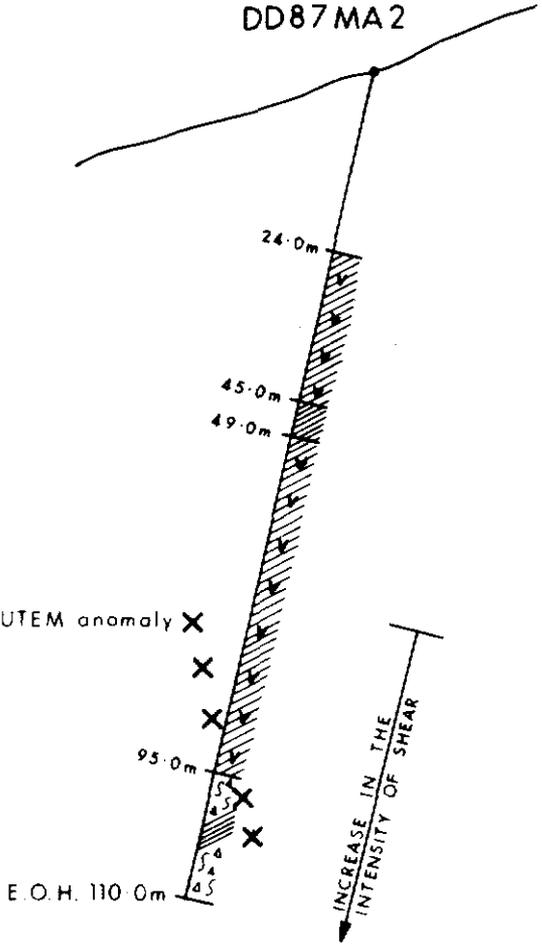
DD87 MA2

— Elevation 1800m (approx.)

LEGEND

-  Overburden - soil & float
- CAMBRIAN**
-  Crystal lithic tuff / greywacke sericite / clay & chlorite - many acid clasts
-  Grey shale
-  Sheared and brecciated crystal lithic tuff / greywacke

Collar Co-ords : 13200E
 50625N
 AMG Co-ords : 418660mE
 5413750mN
 Azimuth : 315° (m)
 Dip : -70°
 Total Depth : 110.0m



CRA EXPLORATION PTY. LIMITED	
MOINA EL 7/74	
WINTERBROOK PROSPECT	
SECTION LINE 13200E	
DRILLHOLE SECTION DD87MA2	
REF: SK55-3	(8014, 8114, 8115)
SCALE 1:1000	DRAWN TN
AUTHOR FRF	REPORT NO. 14474
DATE 9-4-87	PLAN NO TASH 3379

926146

50900N

50800N

5 cm

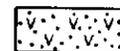
PD 86 AL 1

Tertiary basalt soil and float

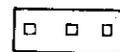
8.0m

Sericitic Rhyolite Volcanic

LEGEND



Tertiary basalt soil and float



Rhyolitic Volcanic clay/sericite altered



Black carbonaceous shale



Rhyolitic Volcanic with interbedded shales and siltstones

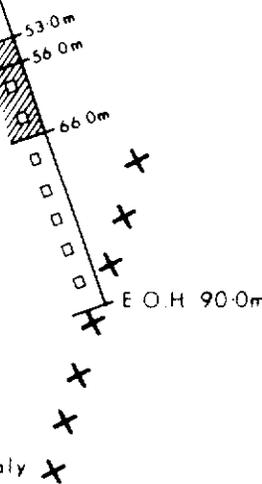
Collar Co-ords : 13400E
50880N

AMG Co-ords : 418 700mE
5 414 070mN

Azimuth 135°(m)

Dip -70°

Total Depth 90.0m



Interpretation of TEM anomaly

87-2660

926147

CRA EXPLORATION PTY. LIMITED

MOINA EL 7/74

WINTERBROOK PROSPECT

SECTION LINE 13400E

DRILLHOLE SECTION PD86AL1

REF. SK 55-3

(8014, 8114, 8115)

SCALE 1:1000

DRAWN TN

AUTHOR FRF

REPORT No. 14474

DATE 9-4-87

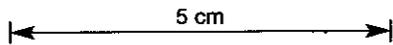
PLAN No TASH 3380

50800N

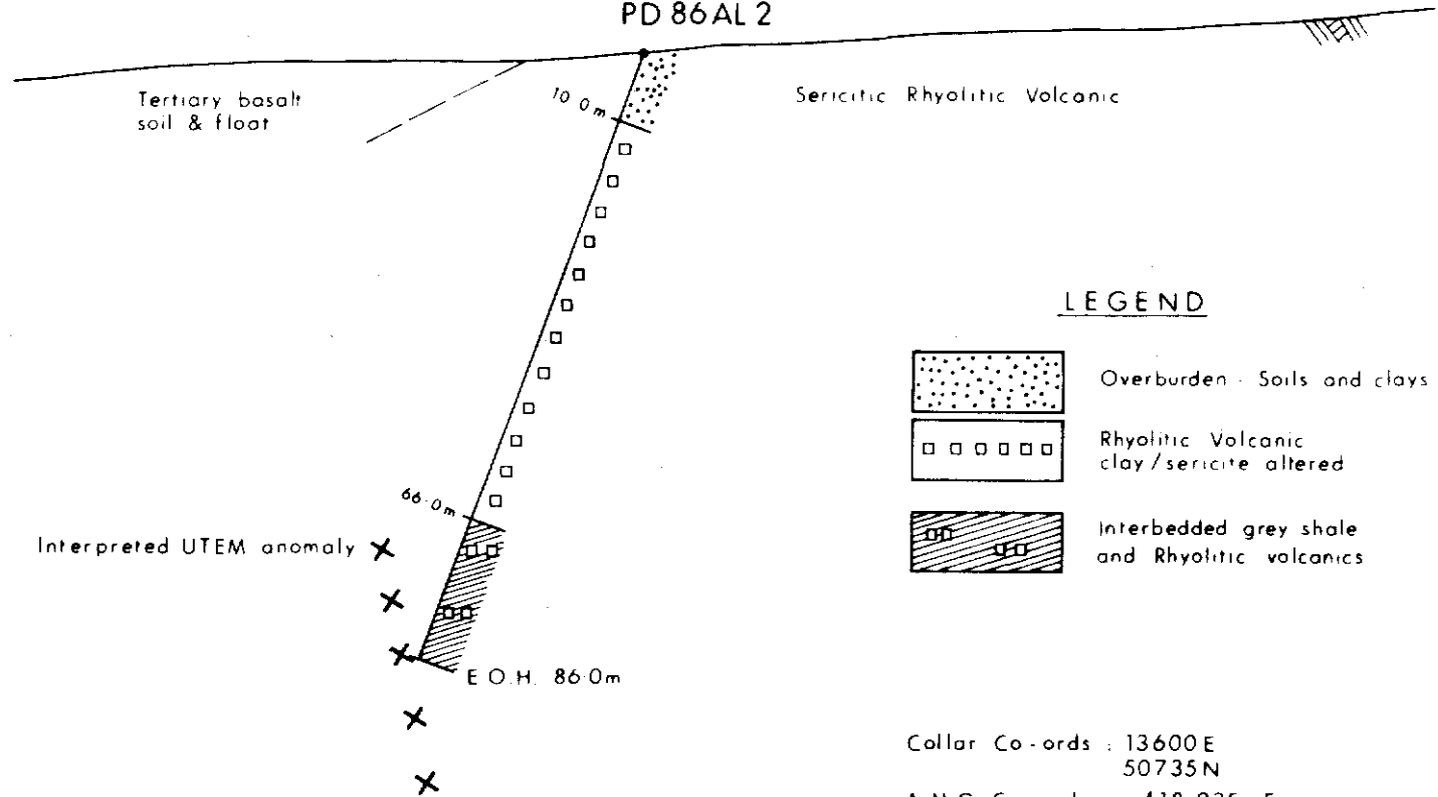
50700N

**** NOTE ****

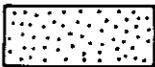
Logged Section Inaccurate
Redrilled by DD.87 AL.3
For correct lithologies
see plan No. TASH 3382



PD 86AL 2



LEGEND

-  Overburden - Soils and clays
-  Rhyolitic Volcanic clay/sericite altered
-  Interbedded grey shale and Rhyolitic volcanics

Collar Co-ords : 13600 E
50735 N
A M G Co-ords : 418 935 mE
5414 050 mN
Azimuth : 315° (m)
Dip : -70°
Total Depth : 86.0 m

CRA EXPLORATION PTY. LIMITED	
MOINA EL 7/7A	
WINTERBROOK PROSPECT	
SECTION LINE 13600E	
DRILLHOLE SECTION PD 86AL2	
REF. SK55-3	(8014, 8114, 8115)
SCALE 1:1000	DRAWN TN
AUTHOR FRF	REPORT NO. 14474
DATE 9-4-87	PLAN No TASH 3381

87-26601

926148

87-26301

50800N

50700N

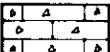
50600N

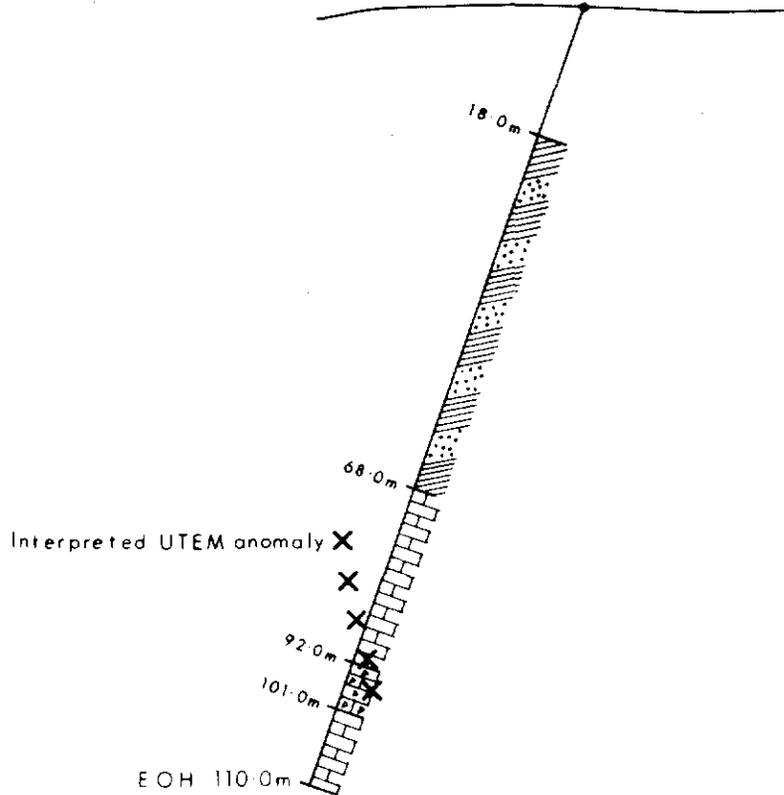
5 cm

DD87AL3

— Elevation 1780m (approx.)

LEGEND

-  Overburden - soil & float
- ORDOVICIAN
-  Shale with lesser sandstone interbeds - weakly schistose
-  Limestone - fossiliferous
-  Limestone - sheared & brecciated



Collar Co-ords : 13600E
: 50734N

A.M.G. Co-ords : 418935 mE
: 5414049 mN

Azimuth : 315° (m)

Dip : -70°

Total Depth : 110.0m

926149

CRA EXPLORATION PTY. LIMITED

MOINA EL 7/74

WINTERBROOK PROSPECT

SECTION LINE 13600E

DRILLHOLE SECTION DD87AL3

REF. SK55-3

(8014, 8114, 8115)

SCALE 1:1000

DRAWN TN

AUTHOR FRF

REPORT NO. 14474

DATE 9-4-87

PLAN NO. TASH 3382

50900N

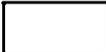
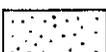
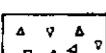
51000N

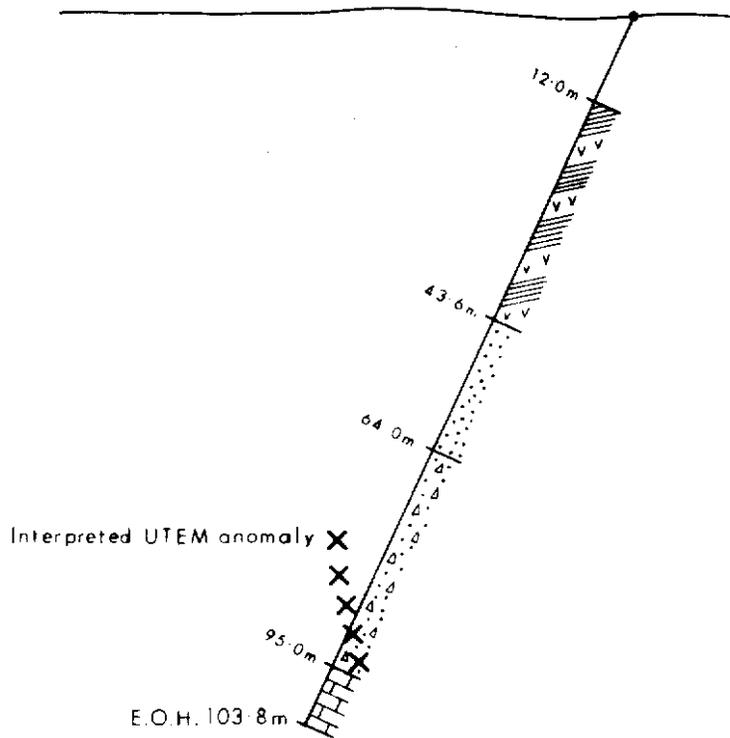
5cm

DD87LN1

— Elevation 1730m (approx)

LEGEND

-  Overburden - soil & float
- ORDOVICAN**
-  Limestone
-  Interlayered basalt (vesicular) and immature basic volcanogenic sediment - age uncertain
-  Sandstone - predominately quartzite, some clay/sercite rich zones
-  Brecciated - sandstone clasts set in a sand-mud sized matrix
Below 70.8m dark grey - black (carbonaceous?) matrix



Collar Co-ords : 11800E
51947N

AMG. Co-ords : 416 810mE
5414 175mN

Azimuth : 135°(m)

Dip : -65°

Total Depth : 103.8m

926150

CRA EXPLORATION PTY. LIMITED

MOINA EL 7/74

WINTERBROOK PROSPECT

SECTION LINE 11800E

DRILLHOLE SECTION DD87LN1

REF. SK55-3

(8014, 8114, 8115)

SCALE 1:1000

DRAWN TN

AUTHOR FRF

REPORT NO. 14474

DATE 9-4-87

PLAN No TASH 3383



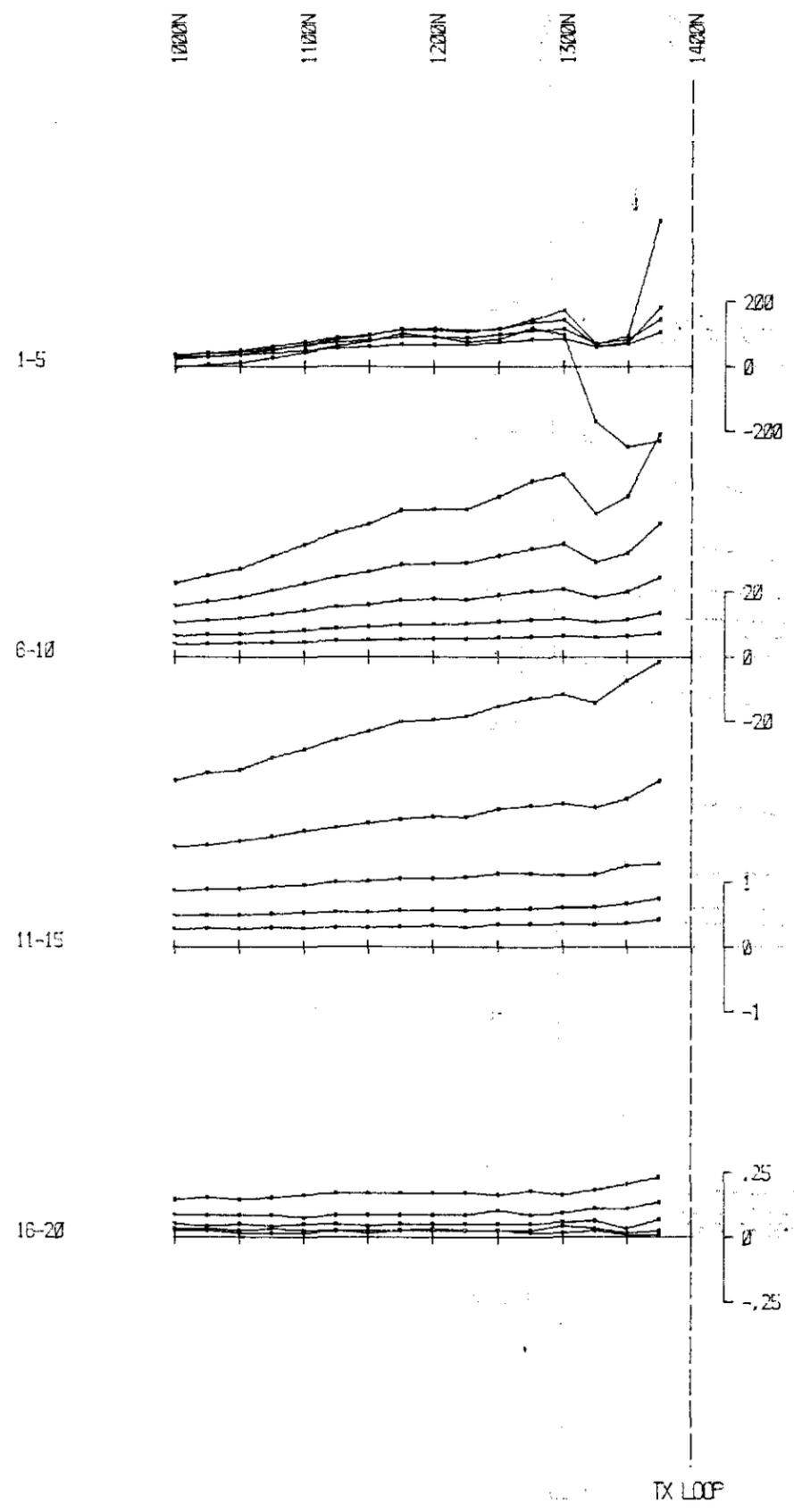
PROPOSED VESTING TO HEC
 Intake 1987
 Note: Boundary of proposed vesting to HEC follows 480m contour

191926 7176
87-2660

CRA EXPLORATION PTY. LIMITED	
MOINA EL. 7/74	
WINTERBROOK PROSPECT	
CORRECTED GRID AND	
DRILL HOLE LOCATION PLAN	
REV: SKS-3	(89N - 89S - 89T)
SCALE: 1:5000	DRAWN: RT
AUTHOR: TWS	REPORT NO: 4474
DATE: 27-4-1987	PLAN NO: TASH 3387



VERTICAL COMPONENT B (Z)



5 cm

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

MOINA E.L. 7/74
WINTERBROOK PROSPECT
EMU Anomaly follow-up
EM-37 PROFILE
LINE 200E VERTICAL FIELD

PLAN No. TASH. 3388

926152

nanovolts per amp metre squared

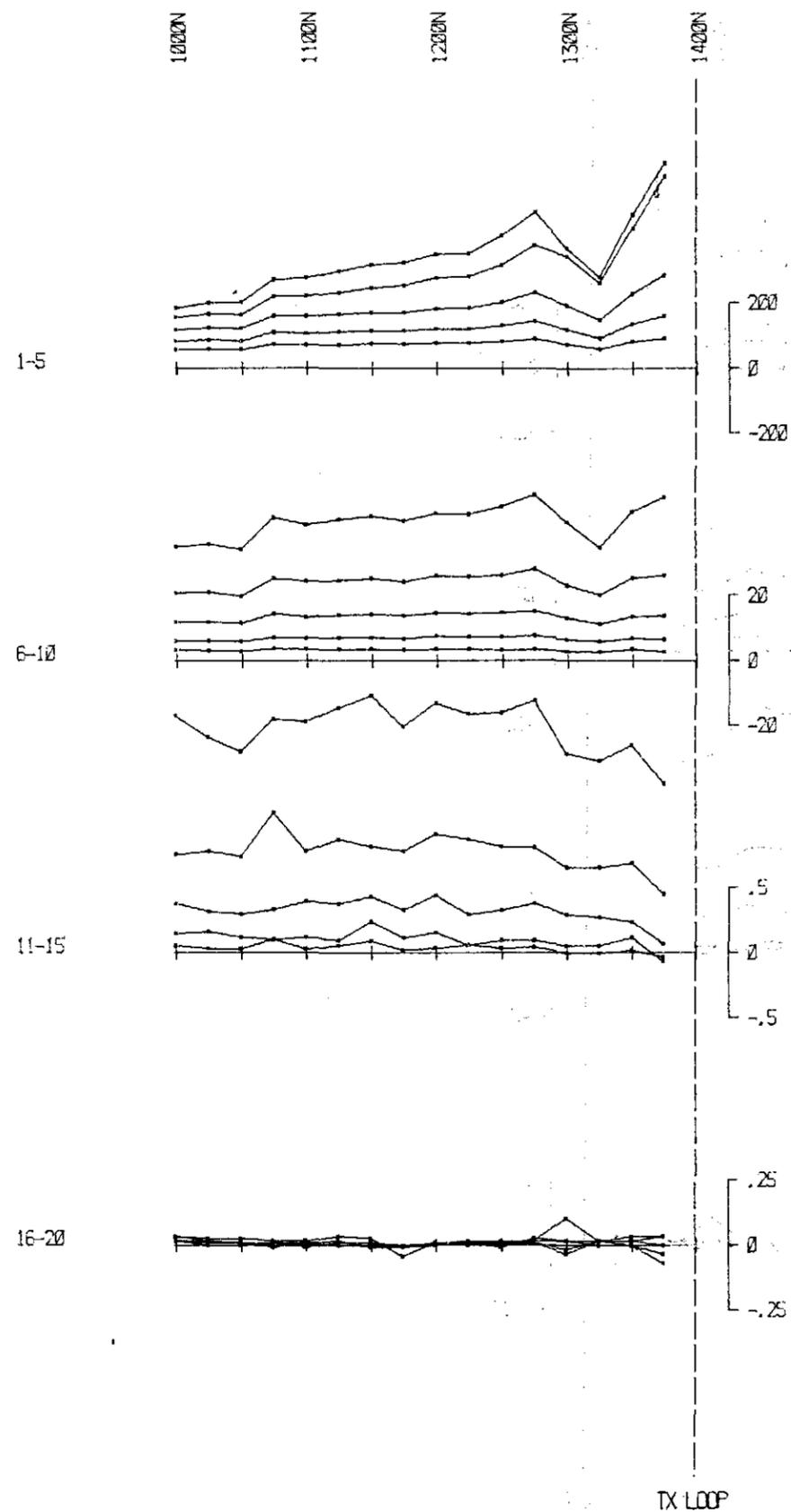
TX LOOP SIDES : 01400N 00100E
 : 01600N 00700E
TX LOOP SIZE : 600 m X 200 m
TX TURN OFF TIME : 260 microseconds
FIRST GATE TIME : 88.5 microseconds
CURRENT : 17.5 amps
FREQUENCY : 25 Hz.
INTEGRATION TIME : 256 cycles
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : CHSD
DATE : 07/11/1996

	SURVEYED AND COMPILED BY GEOTREX PTY. LTD.	PROJECT NO. 4-914
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CLIENT : CRA Exploration
PROJECT : Winterbrook
AREA : Nietta Tas.
LINE : 00200E Z
TX LOOP : 1

87-2660

HORIZONTAL COMPONENT \dot{B} (X)



5 cm

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (\dot{B})

MOINA E.L. 7/74
WINTERBROOK PROSPECT
EMU Anomaly follow-up
EM-37 PROFILE
LINE 200E HORIZONTAL FIELD

PLAN No. TASh. 3389

926153

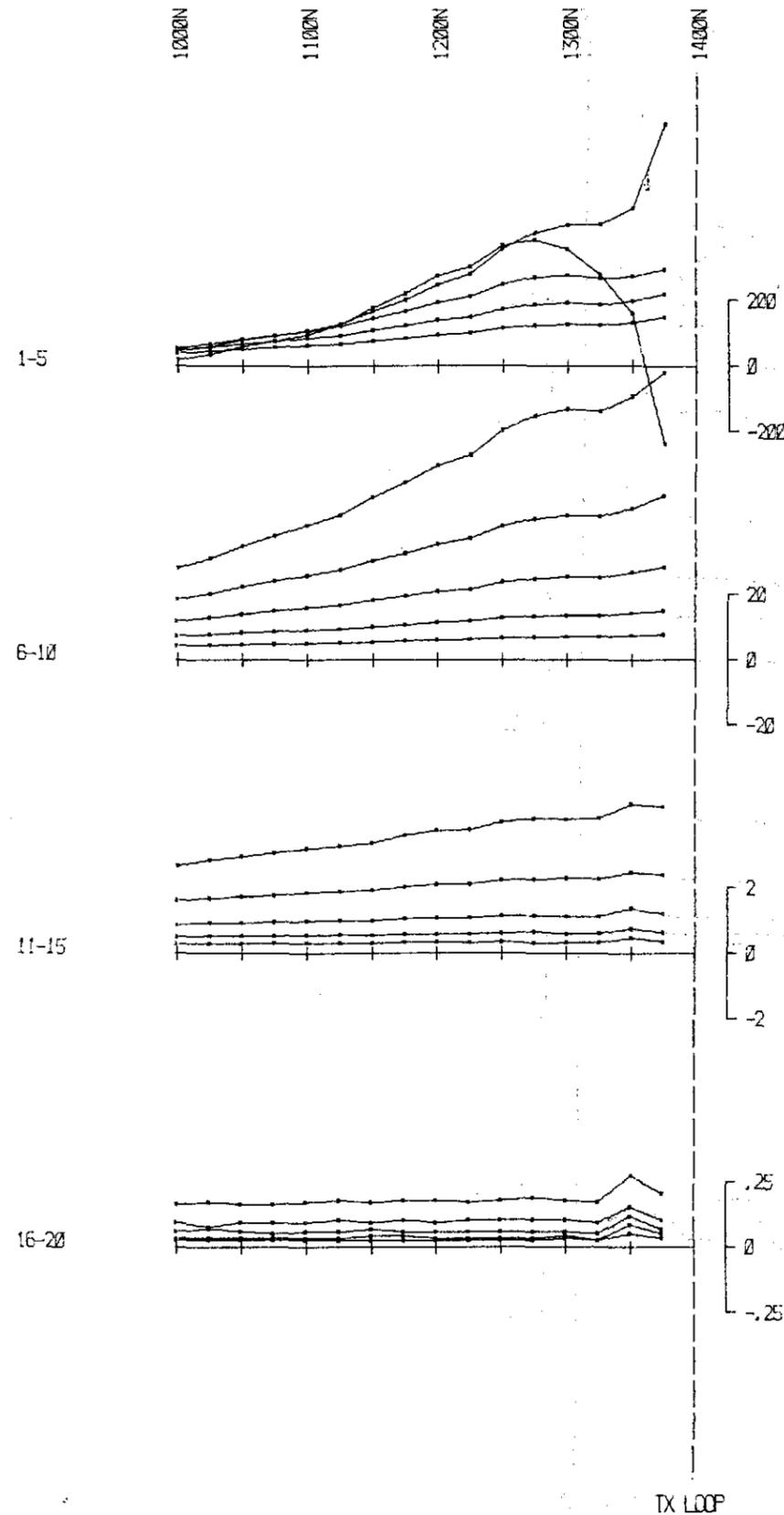
nanovolts per amp metre squared

TX LOOP SIDES : 01400N 00100E
: 01600N 00700E
TX LOOP SIZE : 500 m X 200 m
TX TURN OFF TIME : 260 microseconds.
FIRST GATE TIME : 88.5 microseconds.
CURRENT : 17.5 amps
FREQUENCY : 25 Hz.
INTEGRATION TIME : 256 cycles
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : CHSD
DATE : 07/11/1986

	SURVEYED AND COMPILED BY GEOTREX PTY. LTD.	PROJECT NO. 4-914
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CLIENT : CRA Exploration
PROJECT : Winterbrook
AREA : Niatta Tas.
LINE : 00200E X
TX LOOP : 1

VERTICAL COMPONENT \dot{B} (Z)



5 cm

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD
TIME DERIVATIVE OF FLUX DENSITY (B)

MOINA E.L. 7/74
WINTERBROOK PROSPECT
EMU Anomaly follow-up
EM-37 PROFILE
LINE 400E VERTICAL FIELD

PLAN No. TASH. 3390

926154

nanovolts per amp metre squared

TX LOOP SIDES : 01400N 00100E
 : 01600N 00700E
TX LOOP SIZE : 600 m X 200 m
TX TURN OFF TIME : 260 microseconds.
FIRST GATE TIME : 93.5 microseconds.
CURRENT : 17.5 amps
FREQUENCY : 25 Hz.
INTEGRATION TIME : 256 cycles
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : SLCH
DATE : 03/11/1986

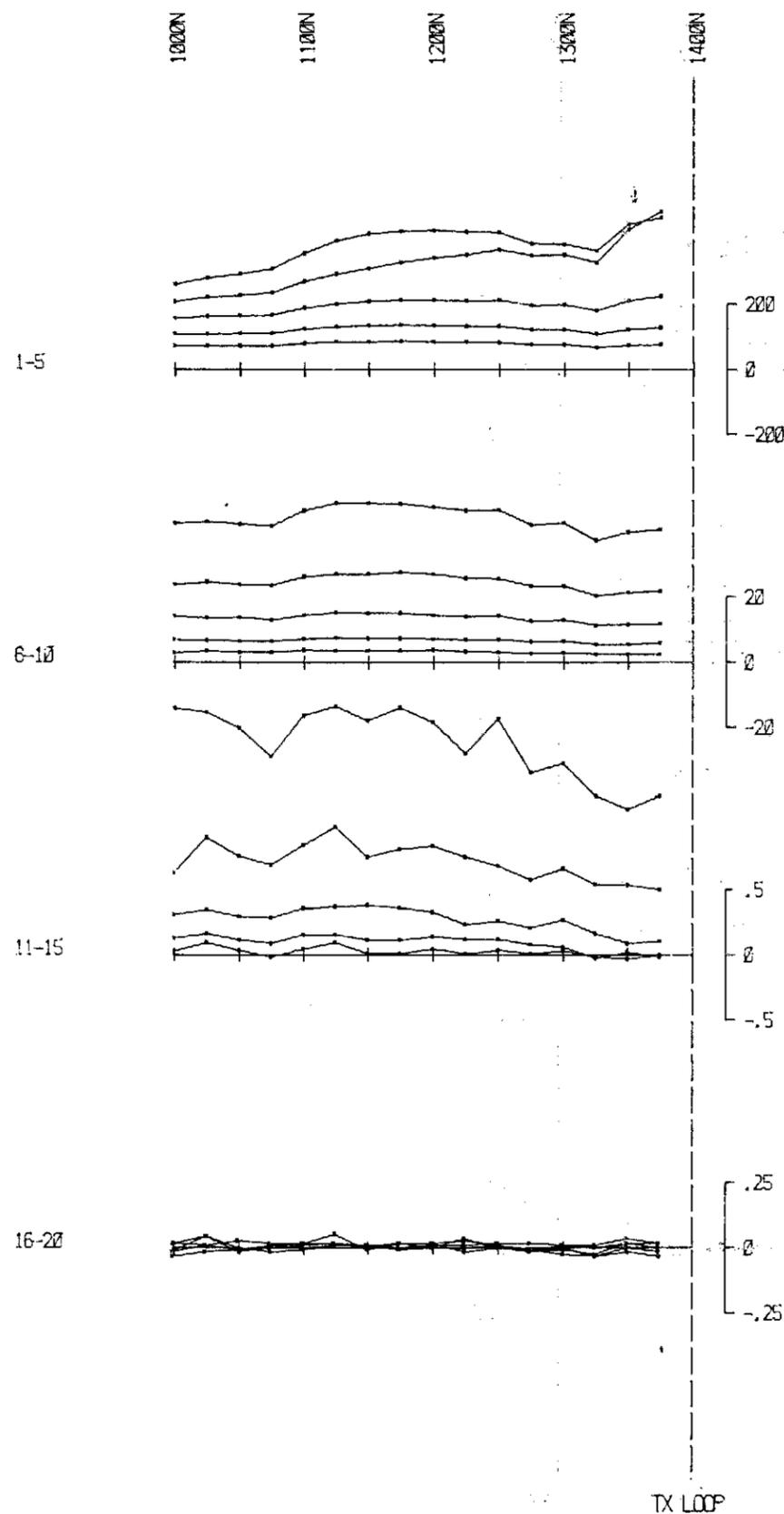


SURVEYED AND COMPILED BY
GEOTREX PTY. LTD.

PROJECT NO.
4-914

CLIENT : CRA Exploration
PROJECT : Winterbrook
AREA : Niotta Tas.
LINE : 00400E
TX LOOP : 1

HORIZONTAL COMPONENT B (X)



5 cm

EM-37

FIXED
TRANSMITTER
SURVEY

ELECTROMOTIVE FORCE INDUCED BY
SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

MOINA E.L. 7/74
WINTERBROOK PROSPECT
EMU Anomaly follow-up
EM-37 PROFILE
LINE 400E HORIZONTAL FIELD

PLAN No. TASH. 3391

926155

nanovolts per amp metre squared

TX LOOP SIDES : 01420N 00100E
 : 01620N 00700E
TX LOOP SIZE : 600 m X 220 m
TX TURN OFF TIME : 260 microseconds
FIRST GATE TIME : 88.5 microseconds
CURRENT : 17.5 amps
FREQUENCY : 25 Hz
INTEGRATION TIME : 256 cycles
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : SOCH
DATE : 03/11/1996



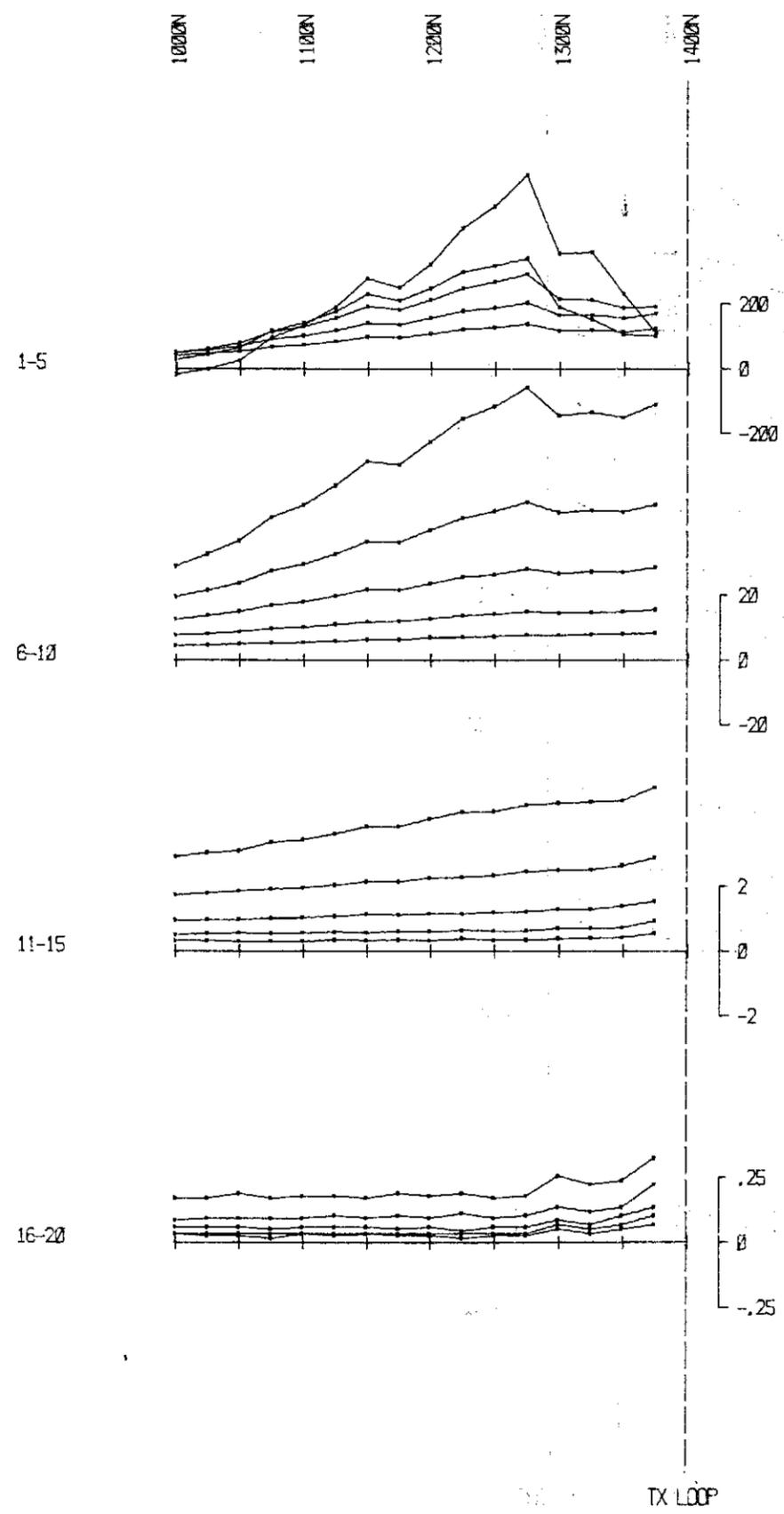
SURVEYED AND COMPILED BY
GEOTREX PTY. LTD.

PROJECT NO.
4-914

CLIENT : CRA Exploration
PROJECT : Winterbrook
AREA : Niatta Tas.
LINE : 00420E X
TX LOOP : 1

87-2660

VERTICAL COMPONENT B (Z)



5 cm

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

MOINA E.L. 7/74
WINTERBROOK PROSPECT
EMU Anomaly follow-up
EM-37 PROFILE
LINE 600E VERTICAL FIELD

PLAN No. TASH. 3392

926156

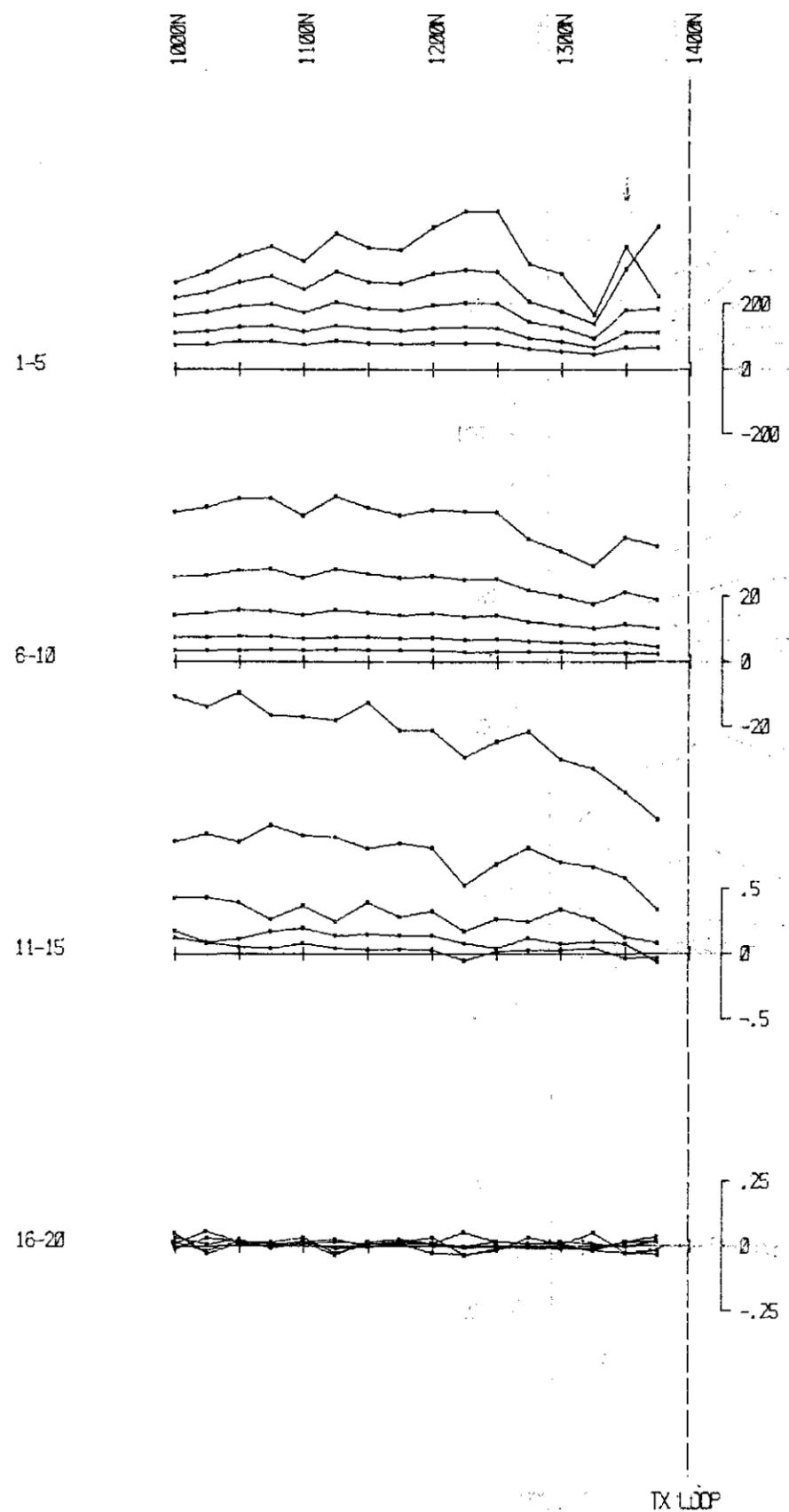
nanovolts per amp metre squared

TX LOOP SIDES : 01400N 00100E
: 01200N 00700E
TX LOOP SIZE : 600 m X 200 m
TX TURN OFF TIME : 260 microseconds.
FIRST GATE TIME : 98.5 microseconds.
CURRENT : 17.5 amps
FREQUENCY : 25 Hz.
INTEGRATION TIME : 256 cycles
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : SDCH
DATE : 08/11/1986

	SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.	PROJECT NO. 4-914
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CLIENT : CRA Exploration
PROJECT : Winterbrook
AREA : Nietta Tas.
LINE : 00600E Z
TX LOOP : 1

HORIZONTAL COMPONENT B (X)



5 cm

EM-37

FIXED TRANSMITTER SURVEY

ELECTROMOTIVE FORCE INDUCED BY SECONDARY FIELD

TIME DERIVATIVE OF FLUX DENSITY (B)

MOINA E.L. 7/74
WINTERBROOK PROSPECT
EMU Anomaly follow-up
EM-37 PROFILE
LINE 600E HORIZONTAL FIELD

PLAN No. TASH. 3393

926157

nanovolts per square metre squared

TX LOOP SIDES : 01400N 00100E
 : 01600N 00700E
TX LOOP SIZE : 600 m X 200 m
TX TURN OFF TIME : 260 microseconds.
FIRST GATE TIME : 88.5 microseconds.
CURRENT : 17.5 amps
FREQUENCY : 25 Hz.
INTEGRATION TIME : 256 cycles
SYNC MODE : CRYSTAL
HORIZONTAL SCALE : 1:5000
SURVEYED BY : SDCH
DATE : 08/11/1986

	SURVEYED AND COMPILED BY GEOTERREX PTY. LTD.	PROJECT NO. 4-914
	CLIENT : CRA Exploration PROJECT : Winterbrook AREA : Niatta Tas. LINE : 00600E X TX LOOP : 1	

87-2660

