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E.L. 10/76, NORTHERN TASMANIA  
EXPLORATION AT EASTERN CETHANA  
SEPTEMBER 1976 - SEPTEMBER 1977

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## 1. SUMMARY

This report outlines the results of exploration on E.L. 10/76 at Eastern Cethana, Northern Tasmania, during the period September 1976 - September 1977.

The Eastern Cethana prospect embraces part of the northern extension of the Cambrian acid volcanic belt which hosts the Mt. Lyell and Rosebery Cu-Pb-Zn orebodies. The rocks comprise a sequence of strongly-altered tuffaceous debris and the sedimentary derivatives of such debris.

Sulphides, predominantly pyrite, are ubiquitous.

Work during the past year included geochemical soil and rock chip sampling; geological mapping; IP, EM and magnetic geophysical surveys and the diamond drilling of two holes totalling 314 metres.

A zone of generally coincident anomalous IP and geochemistry, 1300 metres long and 250 metres wide, has been outlined at the eastern end of the prospect. The zone continues eastwards onto the Gowrie Park grid (see later report).

The zone has chargeabilities up to 60 msec and soil values up to 2640 ppm Pb and 1720 ppm Zn.

Two diamond drillholes put down across this zone encountered significant concentrations of sulphides including one metre intersections of 1.18% Cu, 0.8% Pb, 3.88% Zn and 185 ppm Ag, within a chloritic tuff shale. Elsewhere in the holes there were several intersections of 0.5-1% combined Pb-Zn over 2-3 metres.

A programme of approximately nine percussion drillholes totalling 1200 metres is recommended to further test the zone of anomalous IP and geochemistry.

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## 2. CONCLUSIONS

- 2.1 The syngenetic basemetal mineralisation within the chloritic tuff shale in drillhole 77CC5, is the most significant result gained from the exploration to date. The one metre intersection assayed 1.18% Cu, 0.8% Pb, 3.88% Zn and 185 ppm Ag.

The style of mineralisation and the fact that it has an IP response, are favourable pointers for future exploration at Eastern Cethana.

- 2.2 The IP signature of the intersection extends at least 300 metres to the east and 200 metres to the west of drillhole 77CC5.
- 2.3 The results of drillholes 77CC4 and 5 show that significant accumulations of sulphides within the altered volcanics do have an IP expression. The extensive zone of generally coincident anomalous IP and geochemistry in the eastern part of the prospect is thus a prime exploration target.

## 3. RECOMMENDATIONS

- 3.1 The zone of anomalous IP and geochemistry in the eastern part of the prospect, be tested by an extensive programme of percussion drilling.
- 3.2 Drill target selection to be based on consideration of all data available. The following targets and drillsites are recommended, but target selection should be flexible to allow changes to be made as the programme proceeds:

<u>DRILLSITE</u>	<u>COLLAR</u>	<u>AZIMUTH</u>	<u>ANGLE</u>	<u>DEPTH</u>	<u>TARGET</u>	<u>COMMENTS</u>
D	21450E/3505S	180°	60°	100m	21450E/3535S	Secondary target
E	21600E/3720S	"	"	130m	21600E/3755-75S	Primary
F	21600E/3600S	"	"	120m	21600E/3615-50S	Primary
G	21600E/3540S	"	"	130m	21600E/3560-95S	Primary
H	21700E/3500S	"	"	130m	21700E/3540/65S	Primary
I	21700E/3700S	"	"	200m	21700E/3735-90S	Reserve hole*
J	21800E/3495S	"	"	200m	21800E/3545-80S	Reserve hole*
K	21800E/3730S	"	"	110m	21800E/3745-85S	Secondary
L	21900E/15N	"	"	150m	21900E/35S	Primary
M	21900E/60S	"	"	140m	21900E/65-125S	Primary
N	22100E/3530S	"	"	200m	22100E/3565-3625S	Primary
				TOTAL	1210m	

\* The drilling of these targets depends on the results of adjacent holes and surface surveys yet to be carried out.

3.3 Further surface work at this stage be limited to soil sampling of lines 21600E, 21775E (yet to be cut) and 22300E. Line 21775E to be surveyed by IP.

3.4 All percussion drillholes to be logged by downhole IP as the drilling proceeds.

#### 4. INTRODUCTION

The Eastern Cethana grid extends eastwards from the abandoned township of Cethana, 18 km south west of Sheffield in Northern Tasmania. The grid covers part of a belt of Cambrian altered acid volcanics considered prospective for Cu-Pb-Zn mineralisation of the Mt. Lyell and Rosebery types.

The area is covered by E.L. 10/76 of 10 sq km, which was pegged and granted in March 1976 when the Department of Mines relinquished part of a Reserve within E.L. 7/73 (Asarco-CRAE Joint Venture).

CRAE's interest in the area stems from T.M. Porter's recognition of the altered volcanics in road cuts during his Tasmanian regional study in 1974.

Asarco obtained anomalous values in drainage sampling of the volcanics within the Reserve, as part of their overall coverage of E.L. 7/73. The only follow-up work key attempted was a limited amount of more detailed drainage sampling which produced inconclusive results (see Asarco Reports).

Exploration by CRAE at Eastern Cethana commenced in September 1976 and work completed up to September 1977 is the subject of this report.

All geological and geochemical work was undertaken or supervised by G. Purvis. Initial geophysical surveys were carried out by M. Kirton; later surveys were done by Scintrex Pty. Ltd. and supervised by M. Kirton. Diamond drilling was done by Longyear (Australia) Pty. Ltd.

## 5. GEOLOGY

A detailed geological description of the rock units present, and an outline of the stratigraphy, is given in the legend of the Geological Plan.

The prospect area comprises a suite of altered acid volcanics. The volcanics predominantly comprise tuffaceous debris and the reworked derivatives of such debris. Welded and lava-like rocks are not common.

The alteration is expressed by the mineral assemblage quartz-sericite + chlorite + ankerite, and the development of weak to very strong schistosity. The alteration is considered to be caused by hydrothermal solutions generated by the volcanism, and the schistosity to be the imprint of a later regional stress acting on the soft altered volcanics. In places the strike of the volcanics varies significantly from the direction of the schistosity.

Facing evidence at Western Cethana (see CRAE Report 9041), suggests the near-vertical volcanics are northside upwards, but no facing evidence has been seen at Eastern Cethana.

Dispersed sulphides are ubiquitous within most of the altered volcanics. Pyrite predominates with lesser galena, sphalerite and chalcopyrite. The basemetal sulphides give rise to extensive soil and drainage anomalies.

At the southern end of lines 21600-21750E, a clean recrystallised quartzite outcrops. The rock is obviously much older than the volcanics and is therefore considered to be Precambrian. It is identical to the quartzite in the pebbles making up most of the Roland Conglomerate. The IP shows it has a sharp contact with the volcanics - probably a fault.

## 6. GEOCHEMISTRY

The results of soil and rock sampling for Pb, Zn, Cu and Mn are shown on the plans at the back of the report.

Some important points can be made regarding the geochemistry:

1. Basemetal values, including lead, have been moved downslope by soil creep and slopewash, producing transported anomalies as much as 1 km distant from their sources. At 3480S on line 21500E such downslope movement has produced a 'false gossan' - a capping of cellular limonite over a subsurface drainage channel. This 'gossan' produced a soil anomaly of 2900 ppm Pb, 780 ppm Zn and 210 ppm Cu.

Deposition of transported gossanous limonite was also noted in the vicinity of drillhole 77CC5.

2. Some soils on steep slopes are grey in colour and show clear evidence of leaching. Basemetal values in these soils are very low. Undoubtedly the moderate or low basemetal content

of the underlying rocks contributes to the degree of leaching possible, but the soils do not reflect the true basemetal levels in the rocks.

3. There is a relationship between elevated manganese and basemetal values which appears to be due to the style of primary mineralisation within the volcanics. In unoxidised drillcore this relationship is more subtle than in the soil where it is enhanced by the scavenging effects of manganese. Some basemetal soil anomalies are associated with 'pans' of soft manganese and iron oxides (see geological plan).
4. Because of the points outlined above, particularly (1), soil geochemistry has limitations when it comes to defining targets for drilling. It has to date been best used to discriminate between geophysical anomalies.

## 7. GEOPHYSICS

The results of geophysical surveys conducted at Eastern Cethana are the subject of separate reports by M. Kirton, and A. Howland-Rose of Scintrex Pty. Ltd. (see References).

An initial gradient array IP survey, and downhole IP in drillhole 77CC4, was carried out by M. Kirton. Scintrex later completed detailed gradient array IP over the main chargeable zone; ground EM (largely abortive due to the proximity of high voltage power lines); reconnaissance gradient array IP over the western end of the grid; and a detailed magnetometer survey.

The following comments are made regarding the geophysical results:

1. The main zone of chargeability (approximately 1300m x 250m), corresponds fairly well with the zone of anomalous soil geochemistry (when soil creep is allowed for). Outcrop and drillhole evidence shows that pyrite is the major contributor to the zone of chargeability.

2. The one metre intersection of 25% sulphides in a tuff-shale in drillhole 77CC5 was detected on surface by the IP, particularly during the detailed survey with IPR8 receiver where it showed up as a sharp rise in chargeability from 12.5 msec. This IP signature extends eastwards to line 22000E and westwards to line 21600E.
3. The drilling results at both Eastern and Western Cethana show that coincident IP/geochemical anomalies must be regarded as highly favourable for the occurrence of significant concentrations of basemetal sulphides within the altered volcanics.
4. In some places (e.g.: lines 21400 and 21500E), chargeability highs occur over weakly altered, massive lavas and tuffaceous grits. These rocks have little or no signs of sulphides and very low geochemical backgrounds.
5. IP is important in defining drilling targets but has also been an effective reconnaissance exploration tool in outlining those areas of the altered volcanics most likely to be of interest. It is the only technique that can be usefully applied in areas covered by Roland conglomerate scree (over 50% of the Eastern Cethana grid is scree-covered).
6. Magnetics, along with the IP, has assisted in the delineation of the geology in scree-covered areas.

## 8. DRILLING

Two diamond drillholes, 77CC4 and 5, were drilled in April 1977 at IP anomalies outlined in the initial survey by M. Kirton. The anomalies coincided with the strongest soil geochemistry - 2640 ppm Pb and 1720 ppm Zn.

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The holes were sited along line 21750E so as to provide a complete geological section across the zone of anomalous IP. 77CC4 was specifically aimed at a 36 msec chargeability anomaly (the maximum reading obtained by the initial survey). 77CC5 was directed at a discrete 18 msec peak on the northern flank of the larger response.

Results are shown in detail on the drillsection (Plan No. Tc52).

Both holes were drilled in altered tuffaceous acid volcanic debris with ubiquitous sulphides.

77CC4 (149.7 m), encountered significant amounts of pyrite throughout, locally + 10% over 2m and averaging approximately 3% over the whole hole. However basemetal values were generally of a low tenor - the whole hole average being 180 ppm Pb, 350 ppm Zn and 21 ppm Cu.

77CC5 (164.2m), by contrast encountered widespread basemetal sulphides averaging 680 ppm Pb, 1240 ppm Zn and 200 ppm Cu over the whole hole. This included a 1m intersection from 37.8-38.8 m of 0.8% Pb, 3.88% Zn, 1.18% Cu and 185 ppm Ag, comprising bands of pyrite, sphalterite, chalcopyrite and galena in a dark chloritic tuff-shale. The mineralisation appeared to be remobilised after bedded sulphides.

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REFERENCES

Barker, R.G. February 1974 Stream Sediment Sampling Survey E.L. 7/73 Paradise, Tasmania. Asarco (Australia) Pty. Ltd. Report.

Barker, R.G. March 1975 E.L. 7/73 Paradise, Tasmania. Report for the Year Ending March 15, 1975. Asarco (Australia) Pty. Ltd., Report.

Howland-Rose, A.W. August 1977 A Report on Gradient Array Electrical Induced Polarization MMR, and Total Magnetic Field Surveys over the East Cethana Grid, near Devonport, Tasmania on behalf of CRA Exploration Pty. Ltd. Scintrex Pty. Ltd. Report.

Kirton, M. August 1977 Phase I Induced Polarization Surveys Cethana, E.L. 10/76, Tasmania 1976-77. CRAE Report 8960.

Purvis, J.G. September 1977 E.L.'s 7/73 & 10/76, Northern Tasmania. Exploration at Western Cethana August 1976 - August 1977. CRAE Report 9041.

KEYWORDS

Copper, lead, zinc, acid volcanics, pyroclastics, Cambrian, alteration, geol. mapping - detailed, geochem. - soil, geochem. - rock, geophys. - I.P., drill - diamond.

Location: Burnie SK 55-3 1:250,000 map sheet.

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LIST OF PLANS

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
Tc89	Location Map	1:250 000
Tc84	Geological Map - Cethana East E.L. 10/76 N.W. Tasmania	1: 5 000 approx
Tc93	Sample Location Map - Cethana East E.L. 10/76 N.W. Tasmania	1: 5 000
Tc94	Geochemical Map ppm Lead Cethana East	1: 5 000
Tc 95	Geochemical Map ppm Zinc Cethana East	1: 5 000
Tc 96	Geochemical Map ppm Copper Cethana East	1: 5 000
Tc. 97	Geochemical Map ppm Manganese Cethana East	1: 5 000
Tc52	Diamond Drill Section 77-C.C. 4 & 5	1: 500

APPENDIX 1

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DIAMOND DRILL CORE LOG

CO-ORDINATES 21750E / 139S AZIMUTH 180 DRILLERS LONGYEAR CORE LOG NO. 6-4-77 DEPTH 149.70m HOLE No. 77CC4  
 RL COLLAR \_\_\_\_\_ INCLINATION \_\_\_\_\_ DRILL TYPE LONGYEAR 38 CORE LOG NO. 12-4-77 CASING LEFT 2.00m DPO No(s) \_\_\_\_\_

DEPTH FROM (M)	DEPTH TO (M)	CORE REC. (M)	CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	REC (M)	ASSAY VALUES								
											Pb	Zn	Cu	Ag	Mn	Si	WO <sub>3</sub>		
0.00	3.00	-	NQ		Triconed - no core														
3.00	4.50	0.60	"		Sheared qb-sericite-chlorite schist. Weathered with limonite along shears. Schistosity 40°/axis.	5% pyrite, minor hematite. Pyrite concentrated / schistosity	603481	3.00	4.50	0.60	280	190	45	4	25				
4.50	9.90	4.00	"		Gray greasy qb-sericite-chlorite schist. Highly sheared and broken. Schistosity at 4m 45°/axis.	3-5% medium grained pyrite, 1-5% hematite. 1.20m lost core 81-99m	603482 603483	4.50 6.00	6.00 10.00	1.30 2.80	130 150	310 570	15 15	1 1	15 40				
9.90	37.20	24.90	"		Pale greenish-grey qb-sericite-chlorite schist, after strongly altered acid volcanic & qb phenocrysts up to 2mm. Some feldspar or glass fragments. Probably originally a xyl tuff. Badly sheared and broken & clayed py zones, generally becoming less broken towards 37.20m. Schistosity 40°/axis at 11m, 27m + 37m. Acid tube test at 30m - gives true angle 57°. Color change gradually at 33m to pale dirty green.	Partly pyrite mineralization throughout - overall 3-5%. Pyrite disseminated but thin in near-vertical striae. up to 2cm thick // schistosity in zone of 1.5m layer alteration. 10% pyrite. 2% dark red-black hematite generally in small stringers & clots. Minor traces of arsenic - best in associated with several qb veins 2-5cm wide 9.9-12.5m	603484 603485 603486 618111 603487 603488 618112 618113 603489 618114 603490	10.00 12.50 13.50 14.00 17.00 17.40 20.00 25.00 30.00 32.00 36.50	12.50 13.50 14.00 17.00 17.40 20.00 25.00 30.00 32.00 36.50	2.30 0.90 0.50 0.40 0.40 2.20 2.00 4.00 2.00 0.50	250 500 940 100 250 120 30 40 40 50 360	390 780 710 230 150 230 190 180 320 220 250	15 20 25 15 85 15 10 15 20 15 45	1 4 9 4 17 1 1 1 1 10	70 1150 4700 1200 500 1800 1500 3050 2800 1400				
37.20	47.00	9.60	"		Pale khaki green-grey qb-sericite-chlorite schist. Badly sheared and broken & clayed py zones. Rock is highly fractured and incipiently brecciated. Alter acid volcanic & many 'knobs' and phenocrysts up to 5mm - probably a xyl tuff. Rare glass shards. Schistosity 40°/axis.	37.20-39m 5% fine py. mostly in bands and stringers. Minor hematite trace arsenic? 39-41.8m 1% py - scattered stringers 9 py in rock < 1% py. Minor hematite & trace arsenic 41.8-46.4m 2% py - scattered stringers. Trace hematite 46.4-46.9m Crph zone < 10% py in bands // schistosity	603491 618115 618116	37.00 39.00 43.00	39.00 43.00 46.40	2.00	110 50 30	200 190 270	25 15 10	2 1 ND	2150 2300 2500				
47.00	64.60	17.10	"		As above. Pale dirty green & pink tinge qb-sericite schist with minor chlorite alteration and schistosity only moderate. Very prominent abundant qb 'eyes' knots and phenocrysts - up to 1cm. Glass shards visible in pieces. Many xyl tuff or lapillite. Core has broken than before - especially below 55m. Much internal brecciation and veining with crush zones. Altered & sericite core & sheared & broken: 47-50m, 54.5-55.5m, 57.8m, 58.6-60.0m. At 49m schistosity 30°/axis; at 55m glass shards 30°/axis schistosity ditto; at 61m indistinct foliation zone 45°/axis schistosity 30°/axis. At 47.20 quartzitic band is 30°/axis. Acid tube test at 60m - true angle 56°.	47.20-51.50 2% py in scattered stringers of fine py. Minor porphyry red material - possibly hematite. 51.50-60.00 < 1% py trace arsenic trace hematite 60.00-62.00 11-15% py in stringers and near-macroch. breccia to 1.5cm thick. Some thick almost massive band of py breccia core 61.6-61.8m. Trace arsenic. 62-61.9: 1-2% py, trace arsenic. 62.9-64.6: 2-3% py, trace arsenic.	603492 618117 618118 618119 618120 618121 618122 618123	46.40 46.90 57.00 55.50	46.90 57.00 55.50 60.00	0.50	450 30 30 50	570 160 170 250	45 10 15 30	6 ND ND 1	1650 1600 2300 4200				
64.60	77.50	12.90	BQ		Highly altered qb-sericite-chlorite schist after xyl tuff becoming silty tuff at depth. 3-5% py hematite trace arsenic. Much of pyrite has a heavy pyrrhotite and may be mixed & tiny grains of hematite.	64.6-65.8m 3% py, trace arsenic. 65.8-66.05m - qb vein - barren. 66.05-69.5m - minor py & minor arsenic up in rare small clots. Alter associated & cubic alteration thoraxite esp 65.5-68. 69.5-73.5m - 2% py 2% hematite. Trace arsenic for whole hole.	618124 618125 618126 618127	64.60 65.80 66.05 69.50	65.80 66.05 69.50 73.50	2.00	340 60 100 130	130 160 180 290	30 30 10 20	1 1 ND 1	1120 1700 2300 2500				

SUMMARY AND SPECIAL COMMENTS: Strongly altered qb-sericite schist after xyl tuff becoming silty tuff at depth. 3-5% py hematite trace arsenic. Much of pyrite has a heavy pyrrhotite and may be mixed & tiny grains of hematite. LOGGED BY: GP DATE: 8/4/77 SHEET 1 OF 2

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**DIAMOND DRILL CORE LOG**

CO-ORDINATES \_\_\_\_\_ AZIMUTH \_\_\_\_\_ DRILLERS \_\_\_\_\_ COMPLETED \_\_\_\_\_ DEPTH \_\_\_\_\_ HOLE No. **77 CC4**  
 RL COLLAR \_\_\_\_\_ INCLINATION \_\_\_\_\_ DRILL TYPE \_\_\_\_\_ CASING LEFT \_\_\_\_\_ DPO No(s) \_\_\_\_\_

DEPTH FROM (M)	DEPTH TO (M)	CORE REC. (M)	CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	REC (M)	ASSAY VALUES								
											Pb	Zn	Cu	Ag	Mer	Sn	Wb <sub>2</sub>		
					Same as before. Cox sheared and broken. 66-66.6; 73; 75.4-75.5	gn sp. cp.													
					77, 80.8-82.2. Most shearing associated with quartz veins up to 2.5cm thick. Lineation of glass fragments in tuff: 65.5m 35°/axis, 70m 43°/axis; 77.5m 33°/axis	73.5-75: 2% py 1% sp. gn - no frgt. clts. and from 74.5-74.9 as 3-4 bedded? decrease up to 3mm 38°/axis in a variable, disrupted tuff (5° sp)	603493	73.50	75.00	1.50	70	230	10	2	1150				
						75-77.5: 5% py 1% sp. gn in clts, frgt patches and stringers. (clts of) gn - sp in qtz veins 76.4-76.9. sp stringed 15°/axis 76.9-77.1 (5° sp)	603494	75.00	77.50	2.50	2150	560	30	4	1300				
77.50	82.50	4.90	BQ		Red and greenish-grey fine grained, moderately-strongly altered tuff. Some qtz bits, small qtz phenos, and glass + pyrite fragments. Numerous qtz veins & calcite and minor chlorite. Fine laminar bedding (?) at 78m 45°/axis 2 to 80.5m 40°/axis	3-5% py, 77.5-79.5m 1% sp. gn. in 8° or dissemination, small clots and stringers 79.5-81m. Minor sp. gn. No chlorite in qtz veins. 81-82.9m 2-3% py. Trace sp. gn.	603495	77.50	79.50	2.00	210	800	30	ND	1570	ND	ND		
							603496	79.50	82.00	2.50	190	240	25	1	2550				
							618124	82.00	83.00		50	670	15	1	2800				
82.50	90.70	7.80	"		2 1/2 to above. Greenish-grey frgt vitric tuff - sandy texture in places. Fine glass shards and small qtz grains to 2mm - some are qtz 'eyes'. Moderately qtz-sericite altered & minor chlorite. Weak-moderately schistose. Several qtz-calcite-chlorite veins up to 10cm @ 40°/axis. Badly broken-sheared 83.1-83.5; 83.8-84.3; 89.4-90.7. Rock lineation (after bedding?) 83.5m 30°/axis, 85m 40°/axis, 87m 43°/axis	82.9-87.50: 5-10% py in bedded? stringers - patches & 1% sp. gn. cp. 87.5-90.7: 2% py - very patchy - up to 5% over 10-20mm. Minor sp. gn. Minor hematite	603497	83.00	85.50	2.50	140	550	35	1	1570	ND	ND		
							603498	85.50	87.50	2.00	160	600	20	1	1800				
							618125	87.50	91.00		100	290	15	1	2900				
							618126	91.00	94.00		30	400	10	1	2100				
90.70	120.50	28.8	"		Vitric and siliceous tuff & prominent glass shards and pyrite fragments up to 1cm average 1-2mm. Occasional quartz grains up to 1-2mm. Weak to moderately altered - sericite, chlorite and calcite. Glow dark greenish-grey to light creamy green due to bleaching. Badly sheared 90.7-93.90. Qtz-calcite-chlorite veins common 98-105m up to 10cm thick. Angles (after bedding) 93m - 55°/axis; 100m 48°/axis; 116m 50-55°/axis. Gradual change towards base.	Minor py < 1% overall. 2-4% hematite. From 94-94.5 10-15% py in bands; 102-10-102-70m 3-5% py, minor gn > sp > cp.	603499	94.00	94.60	0.60	530	210	120	10	1150				
							618127	94.60	98.00		50	280	10	1	2300				
							618128	98.00	102.00		60	450	15	1	2300				
							603500	102.00	102.50	0.50	3520	530	490	20	2450				
							618129	102.50	107.00		50	390	10	1	2200				
							603428	107.00	108.00	1.00	70	400	15	1	2750				
							618130	108.00	112.00		60	350		1	2200				
							618131	112.00	116.00		90	350	30	1	2300				
120.50	131.00	10.50	"		Pale pinkish-grey fine grained vitric and siliceous tuff - sandy in places. Indistinctly bedded - clearly quartz rich. Occasional very small qtz grains and small glass shards. Alteration weak-moderate - sericite, minor calcite and chlorite. Bedding: 121m - 50°/axis; 127m 60-65°/axis	3-5% py in consolidated stringers after bedded laminae up to 5cm. Generally pure. Bismutite (sp > gn > cp) 1% overall. 127.8-128.3: 15% py 1-2% sp > gn > cp. Best py and bismutite min is associated & stringers and bands of calcite material - possibly original limy tuff beds.	618132	116.00	120.50	4.50	40	380	10	1	2300				
							603429	120.50	122.00	1.50	70	250	35	1	3650				
							603430	122.00	124.00	2.00	230	250	25	1	1800				
							603431	124.00	126.00	2.00	290	160	15	1	2000				
							603432	126.00	127.80	1.80	190	270	25	1	2550				
							618133	127.80	128.30	0.50	980	310	90	5	3000	ND	ND		
							603433	128.30	129.60	1.30	440	570	40	1	2650				
							603434	129.60	131.00	1.40	280	770	20	1	2050				
							603435	131.00	133.00	2.00	370	570	15	ND	1500				
							603436	133.00	135.00	2.00	250	630	30	1	3950				
131.00	149.70	18.70	"		Orange-brown, grey and green colored fragmental tuff with interbedded fine grained tuff. Hard and siliceous - cherty below 149m. Moderately altered - sericite - calcite - chlorite. Fragmental tuff massive & glass and qtz frags to 4mm. Fine grained tuff is indistinctly bedded. Badly sheared 131.3; 137.80-138.90. Bedding 137m 55-60°/axis	131-139 3-5% py. Minor sp. gn. 136-138 - 5-10% py in massive bedded bands up to 5cm thick. 139-148 < 1% py trace sp. gn. 1% hematite. 148-149.70 2% py. Minor gn > sp > cp. in clts. Bronze in core from barrel.	603437	135.00	136.00	1.00	250	300	10	1	1750				
							603438	136.00	138.00	2.00	880	1170	40	5	2220				
							603439	138.00	139.00	0.10	500	1000	55	2	1850				
							618134	139.00	143.20		60	200	15	1	2900				
							618135	143.20	148.00		90	200	15	1	3000				
							603440	148.00	149.70	1.70	150	310	280	25	1	2900			

77 CC4

014

290015

SUMMARY AND SPECIAL COMMENTS

Moderately altered tuff & 3-5% py overall and local concentrations of 5-10% py over 2-4 metres. Mineralization is recombined after bedding. Minor bismutite - locally 1% sp > gn > cp.

LOGGED BY GP

DATE 11.4.77

SHEET 2 OF 2

DEPTH FROM (M)	DEPTH TO (M)	CORE REC. (M)	CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	REC (M)	ASSAY VALUES												
											Pb	Zn	Cu	Ag	Mn	Au	WO <sub>3</sub>	SuF					
0.00	1.20	-	NQ		framed - no core																		
1.20	9.00	2.90	"		Silvery-grey slightly siliceous qtz-sericite schist ± biotite boxworks and stringers. Possibly also xyl. Very broken and sheared. Schistosity 30°/axis.	Weathered. Limonite after sulphides. 5-10% crushed py in core below 8.50m.	618001	1.20	7.50		1210	50	30	ND	15								
							618002	7.50	9.30		310	170	115	1	15								
							618003	9.30	12.60		440	550	10	ND	15								
							618004	12.60	15.60		490	850	15	1	25								
9.00	15.00	3.40	"		Grey-green qtz-sericite-chlorite schist after kiff ± qtz rhomboids and glass fragments. Highly sheared and broken. Possibly slightly silicified.	Small clots of qn + sp → 1%. Trace py.	603478	15.60	19.70		470	270	85	ND	150								
							603479	19.70	25.20	Highly	550	1250	1000	ND	300								
15.00	17.40	2.40	"		Pale greenish-fawn, soft silty porphyritic kiff. Weakly chloritized. Glass shards 40°/axis. No schistosity.	Trace kaomafite.																	
17.40	25.20	0.90	"		Green qtz-sericite-chlorite schist after fine grained kiff. Schistosity 30°/axis. Major fault zone from 19.70-24.00 - all core lost. Clean water-washed sand in return water 10cm vein qtz. 24-25.20m. Water flow from hole in this zone 2-3000 gallon/hour.	Minor py, qn, sp → 1% each																	
25.20	31.20	4.50	"		Pale green qtz-ser-chlorite schist. Slightly leached and bleached - especially at top. Highly sheared and clayey ± abundant strands of sericite. Schistosity 35°/axis. After xyl kiff? - prominent qtz xyla to 4mm.	1% sp, qn > cp. 1% py. 1 fragment of massive sp 1cm square at 29m. 1 chert fragment also.	618005	25.20	28.20		250	420	55	1	4300								
							618006	28.20	30.00		470	1550	45	1	3950								
							618007	30.00	32.00		500	1180	35	1	7120								
							618008	32.00	34.00		40	670	10	1	1450								
							618009	34.00	36.00		310	870	15	1	335								
							618010	36.00	36.90		120	750	20	ND	3900								
31.20	37.80	6.50	change to 84 at 35.90		Highly chloritic schist after blfaceous slump breccia(?) Clasts of kiff ± glass shards, up to 5x10cm. Qtz fragments ± phenocrysts to 4mm. Sheared and broken especially at base. Lamination 33°/axis.	37-37.80 5-10% bronze brassy fine grained py ± 1-2% cp. 2% qn, minor sp. Elsewhere 2% py, minor qn, trace cp.	618011	36.90	37.80		330	2450	1200	6	270	0.2							
							618012	37.80	38.80		0.82	3387	1182	185	2450	0.7							
							618013	38.80	41.00		1050	2350	75	4	4000	ND							
							618014	41.00	43.00		590	1300	110	2	605								
							618015	43.00	45.00		390	1130	215	2	1420								
37.80	38.80	1.00	BQ		Mineralized zone.		618016	45.00	46.50		270	1300	120	4	2900								
					Dark green highly chloritic vitric and graphitic kiff-shale ± disrupted bedding. 25% sulphides in bands probably remobilized after bedding. Includes a central 35cm zone of 35% sulphides - 15% bronze py, 7-10% sp + qn, 7-10% cp. Angles 33°/axis. Slightly schistose.	Overall: 15% py, 10% sp + cp + qn.	618017	46.50	47.50		1150	1320	80	4	3820								
							603480	47.50	49.00		9x	570	50	11	4750								
							618018	50.90	51.80		1180	3170	116	2	>1%								
							618019	51.80	53.00		790	1250	75	ND	3500								
							618020	53.00	55.00		540	870	55	ND	3700								
							618021	55.00	57.00		350	4100	100	1	2300								
38.80	50.90	12.10	"		Dark green, highly chloritic blfaceous breccia/grit. Virtually no bedding. Fragments of qtz up to 7mm, numerous small glass shards, Octahedral clasts up to 5cm of vitric pyroclastic kiff ± glass shards. Minor qtz veins.	2% py, 1-2% qn + cp + sp from 38.8-43.50 elsewhere minor qn + cp. Some qn + cp clots in qtz veins.	618022	57.00	59.30		350	4100	100	2	2500								
							618102	59.30	63.00		690	930	130	ND	2150								
							618101	49.00	50.90		170	660	70	2	5600								
							618023	63.00	64.50		320	1270	40	ND	1820								
							618024	64.50	66.00		450	1130	45	ND	2700								
							618103	66.00	68.00		980	1160	60	1	3650								
50.90	51.80	0.90	"		Fault breccia. Rock fragments up to 3cm in pale creamy-green sericitic rock flour matrix. Core hard and unbroken.	2% qn + cp in clots. Minor py.	618104	68.00	70.00		450	660	40	ND	2300								
							618105	70.00	70.80		220	580	40	ND	3400								
							618106	70.80	72.60		70	430	20	ND	4250								
							618025	72.60	75.00		440	2750	75	ND	2170								
51.80	64.50	11.90	"		Dark green chloritic and sericitic, siliceous and vitric kiff and kiff-shale. Possibly graphitic in places. Interbeds of coarse sandy kiff at top. Rock is	50-59.30 2-3% qn + sp + cp. 2% py. Elsewhere minor sulphides	618026	75.00	77.00		480	2170	85	ND	2120								
							618027	77.00	79.00		440	810	145	ND	2270								
							618028	79.00	80.00		70	500	165	ND	3520								

77/CCS

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290016

DEPTH FROM (M)	DEPTH TO (M)	CORE REC. (M)	CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	REC (M)	ASSAY VALUES													
											Pb	Zn	Cu	Ag	Mn	WO <sub>3</sub>	Sn	F(%)						
			80		disrupted and brecciated by stamping. Moderately schistose. Calcic veining common at top. Core badly broken in places. Bedding 30-35° axis.																			
64.50	70.80	6-10	"		Slump breccia? Rather confused Rock type. Dark green chloritic and sericitic xyl fill breccia - grey vitric chert interbeds at top of interval. Fragment of fragments and xyls to 6mm. Large dark fill & glass shards up to 5x10cm. Indistinct dark margins suggest these were still glass when brecciated. Other clasts of grey vitric chert, purple and glass. Chlorite and carbonate veins. Bedding at top 53° axis. Bad shear at 66-60. 1cm wide mafic dyke at 67.5 to bedding at 68.50m.	1-2% gn - sp overall. 1% py. Trace cp.	618029	80.00	82.50	1000	3330	540	1	2750	10	ND							02	
							618030	82.50	83.20	620	4420	260	ND	3300	ND	ND							05	
							618031	83.20	85.00	1570	3420	1020	ND	4420	ND	ND							ND	
							618032	85.00	87.00	300	1250	35	ND	2550	ND	45							02	
							618033	87.00	89.00	650	770	460	ND	2570	ND	ND							02	
							618034	89.00	91.00	350	850	150	ND	1440	30	ND								
							618035	91.00	92.00	270	710	285	ND	2320	10	ND							04	
							618036	92.00	94.00	290	390	75	ND	720	ND	5							04	
							618037	94.00	96.00	500	570	25	ND	1000	10								05	
							618038	96.00	98.00	420	510	20	ND	470	85	5							05	
70.80	72.60	0-30	"		Light green soft and clayey andesitic dyke. Minor Qtz and feldspar phenocrysts. Weakly altered. 40° axis.	No mineralization.	618039	100.00	104.00	110	250	20	ND	700	35	35							04	
							618040	101.00	103.00	120	250	20	ND	500	10	20							04	
							618041	103.00	105.00	200	2080	20	ND	670	ND	35							06	
72.60	92.00	17.50	"		Dark green chloritic xyl fill - prominent glass shards some fine grained vitric and some breccia. Moderately altered and schistose. Prominent Qtz phenocrysts to 4mm. Rock appears welded above 80m below this rock becomes more buffaceous. At 83.50 Qtz cobbles (PE) 4cm across, rare Qtz pebbles. Core badly broken throughout. Bedding at 88m 43° axis. Shearing at base 25° axis.	82.5-93.20 5% gn, sp > cp. Overall 12% gn, sp cp 1% py. Mineralization stringers and clots.	618042	105.00	107.00	190	310	15	ND	800	ND	ND								05
							618043	107.00	109.00	270	580	40	1	1970	ND	10							05	
							618044	109.00	111.00	270	580	45	ND	1300	ND	ND							04	
							618045	111.00	113.00	260	1070	30	ND	550	ND	10							02	
							618046	113.00	115.00	470	1660	55	ND	1800	ND	ND								
							618047	115.00	117.00	340	770	20	ND	1070	ND	ND							05	
							618048	117.00	118.30	270	410	15	ND	1440	ND	ND								
							618049	118.30	121.00	110	560	35	ND	1470	ND	35							02	
							618050	121.00	123.00	40	560	20	ND	2000	ND	60							02	
92.00	101.00	6.80	"		Dark grey-green coarse buffaceous breccia. Chloritic and sericitic fill & xyls and fragments of Qtz up to 1cm in matrix of glass shards. Within this, clasts up to 15x5cm of buffaceous vitric pyroclastics. Rock probably a slump breccia - matrix badly disrupted. Silicification in places towards base - core much less broken than before.	Best mineralization associated with strongest chloritization. 5-7% py, minor gn, py aggregated into patches up to 1-2cm.	618051	123.00	126.00	260	1230	45	ND	2000	ND	10								04
							618052	126.00	128.00	360	1330	60	ND	1370	ND	45							04	
							618053	128.00	130.00	410	210	55	ND	950	20	10							01	
							618054	130.00	132.00	170	90	15	ND	780	ND	10								
							618055	132.00	134.00	30	110	10	ND	1650	70	20							01	
							618056	134.00	136.00	60	100	10	ND	1050	ND	10							02	
							618057	136.00	138.40	30	160	15	ND	800	10	30							02	
							618058	138.40	140.00	80	310	15	ND	1300	ND	35							02	
101.00	117.80	17.80	"		Uniform, hard, fine buffaceous breccia/Qtz. Dark green, moderately altered chloritic and sericitic, weakly silicified. Tuff composed largely of fragments of Qtz, purple, and volcanic rocks up to 1cm. Generally 2mm xylite mineral at 103m. Bedding very indistinct.	3-5% py, locally 10%. Minor gn & sp > cp. Translucent yellow-green xylite mineral at 103m.	618059	140.00	142.00	950	360	65	1	1300	ND	10							02	
							618060	142.00	144.00	920	300	55	1	870	ND	10							05	
							618061	144.00	146.00	270	230	30	ND	600	ND	20							05	
							618062	146.00	148.00	120	150	65	ND	600	ND	60							02	
							618063	148.00	149.50	130	200	10	ND	450	ND	5							04	
							618064	149.50	150.50	40	120	15	ND	870	ND	45							02	
118.80	138.20	16.30	"		Ditto - slightly more fine grained. Silicified vitric gritty fill & Qtz fragments to 1cm. Colour pinkish-grey due to bleaching - chlorite removed, increased schistosity. Slightly schistose. Bedding 53° axis at top, 40° axis at base. Core very broken. Bad shear at 139.20.	126-130 5-10% py 2-3% sp. Minor cp. 5% sp at 129.50 - 1220 core lost here. Overall 3% py, minor sp, trace gn, cp and haematite.	618065	150.50	152.00	60	240	30	ND	1000	ND	65								04
							618066	152.00	153.00	40	110	115	ND	2000	ND	10							02	
							618067	153.00	154.10	170	190	100	1	1220	20	10							02	
							618068	154.10	154.80	750	600	45	ND	1500	ND	15							01	
							618069	154.80	156.00	140	280	210	1	1580	50	10							04	
138.20	154.10	15.90	"		Sequence of variable tuffs. Finer grained and more water-worked than above. Most common is dark green chloritic tuff & prominent sub-rounded Qtz elsewhere. 1-2% py minor sp.	138.20-147.50 5% py → 1% sp. 153-154.10 5% py → 1% sp.	618070	156.00	157.60	1400	210	1450	2	1470	10	ND							02	
							618071	157.60	159.00	290	220	15	ND	1900	ND	ND							02	
							618072	159.00	163.70	40	150	75	ND	1500	10	10								

CRAE 17  
PLAN No M44

016  
290017



APPENDIX 2

PETROGRAPHIC DESCRIPTION OF  
SIX DRILL CORE SPECIMENS

C.R.A. Exploration Pty. Limited  
Burnie, Tasmania

3/1/6/0-MP3495/77

May, 1977

**amdel****The Australian Mineral Development Laboratories**

Flemington Street, Frewville, South Australia 5063  
 Phone Adelaide 79 1662, telex AA 82520

Winner of Award for Outstanding Export Achievement 1970

Pilot Plant: Osman Place, Thebarton, Sth. Aust.  
 Phone Adelaide 43 8053

Branch Offices: Perth and Sydney  
 Associated with: Professional Consultants Australia Pty. Ltd.

Please address all correspondence to Frewville.  
 In reply quote: MP 3/1/6/0

26th May, 1977

C.R.A. Exploration Pty. Limited,  
 PO Box 138,  
BURNIE, TAS. 7320.

REPORT MP 3495/77

YOUR REFERENCE:

DPO No. 20633

MATERIAL:

Six drill core specimens

LOCALITY:

Drill hole 77CC5 Tasmania

IDENTIFICATION:

Samples 618136 - 618141

DATE RECEIVED:

4/5/77

WORK REQUIRED:

Petrographic description (MA1.3)  
 with particular reference to  
 rock type and alteration

Investigation and Report by: Sylvia Whitehead

Officer in Charge, Mineralogy/Petrology Section: Dr K.J. Henley

*K. J. Henley*

for Brian S. Hickman  
 Acting Managing Director

c.c. C.R.A. Exploration Pty. Limited,  
 Box 384D G.P.O.,  
MELBOURNE, Vic. 3001.

SUMMARY OF SPECIMENSSample and  
TS No.

- 618136  
TSC17948  
77CC4 - 53.30m  
Weakly metamorphosed acid volcanic (quartz-sericitic metavolcanic) probably derived from a crystal-vitric tuff of rhyolitic composition. Sideritic carbonate has been deposited in numerous small, intersecting fractures and shearing planes.
- 618137  
TSC17949  
77CC4 - 115.50m  
Weakly metamorphosed volcanic containing a lower proportion of quartz and more abundant sericite than sample 618136. It also has minor chlorite and slightly more leucoxene. Tectonic stress has resulted in fracturing and shearing and sideritic carbonate and chlorite are concentrated along the shearing planes and veins. There is a trace of migratory sulphide probably pyrite.
- 618138  
TSC17950  
77CC4 - 149.40m  
Metavolcanic composed of quartz and sericitic with minor sulphide and migratory, sideritic carbonate. It was probably a rhyolite. Original textures are not preserved in the matrix and its origin cannot be determined with certainty (a crystal-vitric tuff is perhaps more likely).
- 618139  
TSC17951  
77CC5 - 75.75m  
Weakly metamorphosed, acid pyroclastic possibly of dacitic composition. There are a few small veins of sideritic carbonate.
- 618140  
TSC17952  
77CC5 - 106.10m  
Metavolcanic of acid composition probably a pyroclastic. It has 3-5% of pyrite, some partly surrounded by pressure-shadow quartz indicating that it was present when the rock was subjected to tectonic stress.
- 618141  
TSC17953  
77CC5 - 162.50m  
Metavolcanic of acid composition which originally had fragments or phenocrysts of quartz, feldspar and iron-titanium oxide. Original textures in the matrix have been completely obliterated and the matrix has been partly replaced by sideritic carbonate. It is more likely to have been a pyroclastic than a lava flow but conclusive evidence is lacking.

PETROGRAPHIC DESCRIPTION OF SIX DRILL CORE SPECIMENSSample: 618136; TSC17948

53 30m 77cc4

**Hand Specimen:**

A slightly yellowish-grey, fine-grained rock cut by numerous, intersecting fractures or veinlets which contain a pale yellowish-orange mineral found to be sideritic carbonate.

Staining tests show no evidence of feldspar.

**Thin Section:**

A visual estimate of the constituents is as follows:

	<u>%</u>
Quartz	60-65
Sericite/muscovite	30-35
Sideritic carbonate	3-5
Leucoxene	trace-1
Apatite	minute trace
Goethite	trace

This is a weakly metamorphosed, acid volcanic rock containing some fragments or phenocrysts of quartz, a few crystals which have been replaced by leucoxene and a few patches of sericite in a fine-grained matrix now composed almost entirely of quartz and sericite. Most of the quartz phenocrysts are between 1 and 2 mm in size and all of them show evidence of tectonic stress in that they have undulose (strain) extinction between crossed-nicols and most of them have been fractured and the fragments displaced. There are a few larger aggregates up to 5 mm in size composed of partly granulated and recrystallized quartz and it is uncertain whether or not these represent aggregates of phenocrysts or deformed quartz veins and segregations. Most of the leucoxene grains are between 0.2 and 0.5 mm in size and, although they are now slightly porous the external shape of the former crystal of iron-titanium oxide is moderately well preserved. Sericitic patches vary in size up to about 2 mm and most of them show no recognisable evidence of relict textures or definite external shapes from which to determine their origin however there are a few smaller, subrectangular patches of sericite which probably represent completely altered crystals of feldspar.

The matrix is composed of fine-grained quartz with an average grain size of about 0.05 mm intergrown with varying proportions of sericite much of which shows a preferred orientation defining a direction of weak or incipient schistosity. No evidence of original textures could be found in this matrix but variations in composition suggest that it is more likely to have been derived from a pyroclastic than a lava flow.

Subsequent alteration has been confined mainly to numerous small fractures along which there are now concentrations of very fine-grained sideritic carbonate. In some zones this fine-grained carbonate has penetrated parts of the matrix forming very small, porous aggregates and patches.

023

**Conclusion:**

This is a weakly metamorphosed, acid volcanic rock which could be described as a quartz-sericite metavolcanic. It was probably derived from a crystal-vitric tuff of rhyolitic composition. It has been extensively fractured and permeating solutions have deposited sideritic carbonate in the numerous fractures and small shearing planes.

There has been very slight staining by ferric oxide probably as a result of sub-surface alteration.

Sample: 618137; TSC17949

115.5m 77CC4.

**Hand Specimen:**

A fine-grained, pale green rock with a weak schistosity or foliation at a moderate angle to the direction of the drill hole. The rock tends to split along some small shearing planes, some of which are not parallel to the schistosity.

Staining tests do not show any evidence of feldspar.

**Thin Section:**

A visual estimate of the constituents is as follows:

	%
Quartz	25-30
Sericite/muscovite	55-60
Chlorite	2-3
Sideritic carbonate	10-15
Leucoxene	1-2
Sulphide (probably pyrite)	trace

This is a fine-grained, weakly metamorphosed volcanic rock which differs from sample 618136 in that it contains a much lower proportion of quartz phenocrysts and/or fragments and a higher proportion of sericite and fine-grained muscovite. It contains less than 2% of recognisable quartz phenocrysts or fragments about 1 mm in size and these are now deformed or strained, locally granulated and recrystallized and also appear to have reacted with, and been partly replaced by matrix material. There are numerous irregularly shaped and elongate patches of sericite in which evidence of origin has not been preserved and there are a few subrectangular patches of sericite which probably represent completely altered feldspar. Sericitic material is also concentrated along numerous small shearing planes some of which are subparallel. Crystals or fragments which have been replaced by leucoxene are slightly more abundant than in sample 618136 and average about 0.5 mm in size. Many of these have been deformed but some still show evidence of an internal lamellar structure suggesting former ilmenite.

The matrix is composed of very fine-grained quartz intergrown with small patches of sericitic material and some small patches which contain chlorite. Original features have not been preserved and, although sericite in some zones shows preferred orientation there has clearly been some complex shearing under conditions of tectonic stress.

Most of the chlorite in this rock is concentrated along two main, subparallel shearing planes and numerous, smaller, locally intersecting and irregular shearing planes and veins. The chlorite is almost invariably closely associated with fine-grained, sideritic carbonate which is also present along the numerous small veins and shearing planes. Chlorite and sideritic carbonate also surround many of the altered crystals now composed of leucoxene.

The two larger shearing planes included in the thin section contain a few, very small crystals or aggregates of yellowish sulphide which is probably pyrite, but examination of a polished section would be necessary to confirm this. This sulphide is associated with sideritic carbonate and chlorite and a trace of migratory quartz.

**Conclusion:**

A weakly metamorphosed volcanic rock which contains a lower proportion of quartz and a higher proportion of sericite than sample 618136. It also has some chlorite and slightly more abundant leucoxene suggesting that the rock from which it was derived may have had a slightly more basic composition and could therefore have been a dacite. Original textures have not been preserved but it is more likely to have been derived from a crystal-vitric tuff than a lava flow.

It has been subjected to tectonic stress resulting in some fracturing and shearing and sideritic carbonate associated with chlorite have accumulated along most of the small fractures and shearing planes. A trace of sulphide probably pyrite is present in some of the main shearing planes or veins.

Sample: 618138; TSC17950

14940

77CC4

**Hand Specimen:**

A pale greyish-brown, fine-grained rock showing less evidence of schistosity than the previous two specimens. A few veins containing pale-coloured, sideritic carbonate are visible and there are numerous, smaller fractures.

Some fine-grained, yellow sulphide is disseminated throughout the rock and is also concentrated along a few veins or joints.

**Thin Section:**

A visual estimate of the constituents is as follows:

	<u>%</u>
Quartz	60-65
Sericite/muscovite	35-40
Sideritic carbonate	2-3
Sulphide	2-3
Leucoxene	trace
Zircon	trace
Chlorite	trace
Apatite	trace

This is a weakly metamorphosed volcanic rock containing about 3-5% of quartz phenocrysts, a few sericitic patches which were clearly derived from phenocrysts or fragments of feldspar, a few crystals now composed of leucoxene and scattered groups and aggregates of fine-grained sulphide. These are scattered through a very fine-grained matrix composed of quartz with an average grain size of about 0.03 mm intergrown with very fine-grained muscovite or sericite. There are a few small grains of zircon in the matrix and also a few associated with some of the leucoxene. A trace of apatite was found in one aggregate containing leucoxene, slightly coarser-grained muscovite, zircon and a trace of siderite.

The quartz phenocrysts and/or fragments vary in size from about 0.2 mm to about 2 mm but most are between 0.5 and 1 mm. The larger fragments or phenocrysts of quartz about 2 mm in size show evidence of strain and incipient or partial granulation and some have been fractured and deformed. The former phenocrysts or fragments of feldspar which have been completely replaced by sericite were about 0.5 to 1.5 mm long and, although most of these have been deformed and are barely recognisable a few still retain evidence of a rectangular shape and these tend to be subparallel. There are other patches and streaks of sericite of undetermined origin some of which could have originally been fragments of volcanic glass but this cannot be confirmed.

The very fine-grained matrix does not show any recognisable evidence of original textures and, except for some small patches containing concentrations of sericite it has a fairly uniform composition and grain size. There are however some very thin lines defined by slight concentrations of minute dark particles and fine-grained mica which are subparallel but curve around phenocrysts and locally these merge with small shearing planes.

Small crystals and crystalline aggregates of opaque sulphide with a grain size of 0.05 to 0.3 mm are scattered sporadically throughout the rock occurring mainly with patches of slightly coarser-grained sericite or muscovite and along small ?shearing planes.

In the area sectioned there are some very small, discontinuous veins and irregular patches containing fine-grained, sideritic carbonate associated with some slightly coarser-grained and migratory quartz and traces of coarser-grained muscovite. In one area there is a much larger vein of sideritic carbonate about 2 mm thick which has almost certainly filled an open fracture.

In general there appears to be no spatial relationships between the sulphide and the sideritic carbonate and it is of interest to note that a few of the crystals and aggregates of sulphide (probably pyrite) are partly surrounded by pressure-shadow quartz indicating that these sulphide crystals were already present at the time this quartz recrystallized under conditions of tectonic stress.

#### Conclusion:

This is a metavolcanic of acid composition (quartz-sericite metavolcanic) with disseminated sulphide and some late, migratory, sideritic carbonate. Original textures have not been preserved in the matrix and therefore the origin of the rock cannot be determined with certainty but it very

026

probably had a rhyolitic composition.

Sample: 618139; TSC17951

75-70m 77CC5

**Hand Specimen:**

A fine-grained, green rock containing scattered crystals or fragments of paler-coloured mineral a few millimetres in size. There are a few poorly defined and discontinuous veins of pale-coloured quartz and traces of carbonate in a few small fractures.

**Thin Section:**

A visual estimate of the constituents is as follows:

	<u>%</u>
Quartz	60-65
Chlorite	20-25
Sericite	15-20
Leucoxene	trace-1
Zircon	minute trace
Apatite	minute trace
Sideritic carbonate (veins)	trace

This is a weakly metamorphosed volcanic rock which is similar to the other specimens in that it contains a high proportion of fine-grained quartz in the matrix and also a few quartz phenocrysts but it differs from the previous specimens in that it contains a higher proportion of chlorite and less sericite.

The rock contains less than 2% of quartz phenocrysts which vary in size from about 0.5 mm to about 4 mm and there are a few patches of sericite about 1 mm long which probably represent completely altered feldspar crystals or fragments. There are a few opaque crystals averaging 0.5 mm in size now composed of leucoxene and a few crystals of apatite up to 0.8 mm long.

The recrystallized matrix is composed predominantly of quartz, chlorite and sericite but it varies in composition and this variation together with indistinct relict textures strongly suggest that it was originally composed of vitric and possibly lithic fragments 1 to 2 mm in size. Some deformed fragments are now composed almost entirely of chlorite and it is uncertain whether these represent completely altered fragments of glass or completely altered crystals or fragments of a ferromagnesian mineral. There are a few elongated patches composed largely of sericite and there are a few which show indistinct relict textures suggesting that they were lithic fragments.

One zone in the section is cut by small fractures containing fine-grained, sideritic carbonate.

027

**Conclusion:**

This is a weakly metamorphosed acid, pyroclastic rock which possibly had a dacitic composition although this cannot be determined with certainty. It may have been a crystal-vitric or crystal-lithic tuff.

Sample: 618140; TSC17952 106.10 m 77cc5

**Hand Specimen:**

A greyish green rock which has a finely mottled or patchy appearance suggesting that it once contained grains or fragments 1 to 2 mm in size. There are a few larger quartz crystals or fragments and also some scattered aggregates of fine-grained pyrite.

**Thin Section:**

A visual estimate of the constituents is as follows:

	<u>%</u>
Quartz	50-55
Sericite	25-30
Chlorite	15-20
Sulphide (pyrite)	3-5
Recrystallized leucoxene	trace-1
Zircon	trace
Carbonate	minute trace

This is a metavolcanic containing a higher proportion of quartz fragments or phenocrysts than the previous specimen. It contains at least 20% of quartz phenocrysts or fragments 0.5 to 2 mm in size and most of these have been extensively fractured and deformed. The surrounding matrix is composed of very fine-grained quartz, fine-grained muscovite or sericite and fine-grained chlorite and locally it contains traces of dispersed leucoxene. The relative proportions of the constituent minerals vary and, although relict textures are not recognisable the variation in composition suggests that it originally contained fragments of glass or volcanic rock 1 to 2 mm in size. There are a few sericitic patches which could have been crystals of feldspar but these are not conspicuous or clearly defined. There are a few irregular patches now composed predominantly of fine-grained quartz with minor sideritic carbonate and there are a few small patches composed of chlorite with traces of leucoxene. Larger leucoxene grains in this specimen have been recrystallized to aggregates of very small crystals of titanium oxide.

The rock contains some groups and aggregates of pyrite crystals with an average grain size of about 0.3 to 0.5 mm and these are scattered sporadically through the rock generally associated with some coarser-grained muscovite. Some of this pyrite is associated with, or partly surrounded by pressure-shadow quartz which has crystallized against the pyrite and this is an indication that the pyrite was already present when the rock was subjected to a period of tectonic stress.

There are traces of sideritic carbonate in a few fractures but no evidence to suggest any relationship between the carbonate and the pyrite.

**Conclusion:**

A metavolcanic containing minor pyrite. It was probably an acid pyroclastic.

Sample: 618141; TSC17953

162.5m 77CC5

**Hand Specimen:**

A very pale greyish-green rock with a weak schistosity or foliation at a moderately high angle to the direction of the drill hole. A freshly cut surface when wet shows elongate patches or aggregates of darker material up to 5 mm long most of which are parallel to the direction of foliation and also some elongate aggregates of paler-coloured mineral.

**Thin Section:**

A visual estimate of the constituents is as follows:

	%
Quartz	45-50
Sericite/muscovite	30-35
Chlorite	1-2
Sideritic carbonate	15-20
Leucoxene	trace
Pyrite	trace
Zircon	trace

The rock contains less than 2% of quartz phenocrysts up to 2 mm in size, a few iron-titanium oxide crystals which have been replaced by leucoxene and 30-40% of elongated patches or aggregates now composed of sericite which are parallel to the weak foliation noted in the hand specimen. Most of the quartz phenocrysts have been fractured and deformed and some of these fractures have been invaded by carbonate. The sericitic aggregates vary in size but are commonly 2 to 5 mm long. Most of them do not show any recognisable relict textures but a few are clearly subrectangular and probably represent completely altered and deformed feldspar crystals.

The matrix contains quartz crystals 0.05 to 0.5 mm in size intergrown with small patches of sericite and minor chlorite and in many zones in the matrix there is moderately abundant, interstitial carbonate which is closely intergrown with, or has replaced chlorite and sericite. Much of the sericitic material in the matrix shows preferred orientation and some is concentrated along numerous small shearing planes which are at a moderate angle to the direction of foliation as defined by the elongated aggregates of sericite. The matrix has completely recrystallized and there is no evidence of original textures from which to determine its origin.

Some small pyrite crystals occur in groups and aggregates along one sheared and deformed zone where much of it is associated with sericitic material and fine-grained muscovite. Some coarser-grained muscovite and a trace of quartz which have crystallized against one of the larger pyrite crystals show pressure-shadow textures in that small crystals are elongated in a common direction which is subparallel to the small shearing planes noted in the section and at an angle to the foliation as defined by the elongated aggregates of sericite.

029

**Conclusion:**

A metavolcanic of acid composition which contained phenocrysts or fragments of quartz, feldspar and iron-titanium oxide. Original textures in the matrix have been completely obliterated and this matrix has been partly replaced by sideritic carbonate. There is no conclusive evidence from which to determine whether it was a pyroclastic or a lava flow but, from the general appearance in hand specimen a pyroclastic is more likely.

It contains a trace of pyrite which does not appear to be associated with, or related to the secondary, sideritic carbonate.

APPENDIX 3

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## GEOCHEMICAL ROCK SAMPLING LEDGER

Page No. 1

TENEMENT EL 10/76

D.P.O. No. ....

AREA/PROSPECT EAST CETHANA SAMPLE No's. ....GEOLOGIST GP DATE. ....

PLAN REFERENCE. ....

ANALYSED BY ZC + ROBERTSON RES.

Sample No.	Metal Content in ppm.						Geological observations
	Pb	Zn	Cu	Ag	Mn		
603147	58	27	5	<1	30		Scree: qtz-ser schist & limonite
603148	100	1000	13	<1	1.32%		etc: qtz-ser schist & limonite
603149	570	1690	28	1	380		scree: highly limonitic schist-gossanous.
603150	170	5	15	1	30		Scree: silic schist & limonite after sulphides.
603151	90	20	28	<1	18		Scree: Black schist
603152	290	28	20	3	20		Scree: Black schist & limonite after sulphides.
603153	15	360	15	<1	320		Scree: Vitric schist & fine sulphides
603154	45	15	20	<1	15		Scree: siliceous black schist after shale.
603155	10	60	35	<1	200		etc: silic schist & limonite
603156	790	900	48	<1	48		Scree: Heavy ferruginous av.
603157	1940	3000	110	<1	1.26%		Scree: " " "
603158	930	1240	22	<1	2.60%		Scree: Gossanous iron.
603159	580	460	60	<1	1430		Scree: Ferruginous qtz-ser schist.
603160	720	28	55	<1	65		scree: silic schist & 1-2% pyrite
603201	28	10	22	<1	10		Scree: Feltric schist & 1-2% pyrite.
603202	22	12	10	<1	15		etc: Altered lapilli top & limonite
603203	420	18	90	2	12		Scree: silic schist & limonite in fractures
603204	1270	8	8	<1	22		etc: Altered av grit
603209	30	20	8	4	30		Scree: schist & several % pyrite.
603210	85	15	38	<1	18		etc: Schist & limonite after sulphides.
603211	450	8	15	2	15		etc: silic schist & limonite after sulphides
603212	330	38	38	1	45		Scree: gossan.
603216	120	12	18	<1	22		Scree: Altered av & 5% limonite after sulphides
603217	770	32	140	16	18		Scree: Lapilli top & limonitic fractures
603218	200	1360	60	<1	1.9%		Scree: Red ferruginous rock.
603295	450	5500	35	<1	63%		Scree: Gossanous limonite
603342	330	1550	75	<1	1200		Scree: qtz & chlorite and haematite
603344	30	252	8	<1	6100		Scree: Iron pan balders.
603345	150	50	15	1	75		Scree: altered av & limonite after py.
603346	365	180	35	1	140		Scree: Ferruginous av

## GEOCHEMICAL ROCK SAMPLING LEDGER

Page No. 2

TENEMENT EL 10/76

D.P.O. No. ....

AREA/PROSPECT EAST CATHANA SAMPLE No's: ..... GEOLOGIST GP DATE .....

PLAN REFERENCE ..... ANALYSED BY ZC &amp; ROBERTSON RES.

Sample No.	Metal Content in ppm.						Geological observations
	Pb	Zn	Cu	Ag	Mn		
603347	600	160	35	<1	110		Scree: Ferruginous av.
603401	380	60	80	1	25		30m chip. Schist after tuff.
603402	230	28	65	1	25		30m chip. Schist ± limonite after pyrite.
403	120	45	38	<1	35		30m chip. Altered lapilli tuff.
404	200	55	120	<1	40		30m chip. Altered tuffaceous gnt.
603405	250	100	55	<1	65		20m chip. Schist ± limonite after 5-10% py.
406	240	40	10	<1	28		30m chip. Schist - a vitric tuff.
407	110	28	18	<1	28		30m chip. Schist after crystal tuff.
408	200	38	38	<1	80		30m chip. Schist ± limonite after py.
409	110	22	15	<1	18		30m chip. Schist ± limonite after py.
603410	130	18	15	<1	15		22m chip. Schist ± limonite after py.
411	60	22	2	<1	15		30m chip. Schist after xyl tuff.
412	35	15	2	<1	12		30m chip. Schist.
413	110	110	30	1	15		30m chip. Schist ± 5% sulphides - py, gn, cp.
414	25	38	28	<1	12		20m chip. Vitric schist. Trace py, cp, gn.
603415	3410	1990	90	<1	5.05%		gc: Limonitic band in schist.
416	970	2310	110	<1	750		gc: Very limonitic schist.
417	1010	2370	65	<1	8200		Scree: Highly limonitic schist.
418	440	120	170	<1	95		Sub gc: Altered lapilli tuff ± limonite.
419	570	710	15	<1	1.3%		Scree: Limonitic schist.
603420	210	3920	18	<1	5.6%		gc: Gossan-cellular limonite.
421	5600	140	70	1	1.66%		gc: Schist with manganese staining.
603423	860	1140	130	<1	1.26%		gc: Gossanous cellular limonite.
424	190	95	42	<1	270		Scree: Schist after tuff ± 5% limonite.
603425	220	22	80	9	60		Scree: Red ferruginous av.
426	160	18	25	<1	35		Scree: Schist ± 5-10% limonite after py.
427	1290	70	200	2	55		Scree: Gossanous gnt - ser schist.
<del>428</del>							
<del>429</del>							
<del>430</del>							
603441	50	230	5	<1	-		30m chip. } Altered fine grained 25m chip. } vitric lapilli tuff. 30m chip. }
442	40	30	5	<1	15		
443	50	20	5	<1	-		

GEOCHEMICAL ROCK SAMPLING LEDGER

TENEMENT EL 10/76

D.P.O. No. \_\_\_\_\_

AREA/PROSPECT EAST CETHANA SAMPLE No's \_\_\_\_\_

GEOLOGIST G.P. DATE \_\_\_\_\_

PLAN REFERENCE \_\_\_\_\_

ANALYSED BY ZC + ROBERTSON RES

Sample No.	Metal Content in ppm.						Geological observations
	Pb	Zn	Cu	Ag	Mn		
603444	40	20	10	<1	-		30m chip.
603445	40	30	15	<1	-		30m chip.
446	20	20	10	<1	-		30m chip.
447	40	60	15	1	15		33m chip.
448	20	20	5	<1	-		30m chip.
449	230	190	25	1	125		30m chip.
603450	120	260	10	1	1600		30m chip.
451	70	20	5	<1	5		28m chip.
452	40	30	5	1	-		30m chip.
453	50	90	5	1	40		30m chip.
454	20	30	5	<1	-		28m chip.
603455	20	20	5	<1	-		30m chip.
601561	710	35	8	<1	28		etc: Weakly altered quartzitic av.
601935	1460	470	55	<1	4.2%		limonite and manganese pan.
936	770	360	190	<1	6300		etc: Limonite and manganese gossan.
601937	510	1280	160	<1	6940		etc: " " " "
<del>601</del> 60143	1.17%	1485	125	10	>1%		30m chip. All xyl kipp & black Fe/Mn veins.
618148	60	30	15	2	40		etc: Lens of hematitic shale in Island Cong.

APPENDIX 4

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TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 1  
 AREA/PROSPECT EAST CETHANA SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE I SOIL SAMPLING GEOLOGIST GP. TE DATE November 1976  
 ANALYSED BY ZC

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.				Geological observations
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con- creted	Est. Depth to	Pb	Zn	Cu	Ag	
Line 20200E																	
3000S	No sample - road fill.																
2980S	603706	100											23	74	30	<1	No sample: Hand altered massive av.
60S	603707						B	60	Brown				22	2	<1		Screen: " " " "
2940S	603708						C	60	Yellow				19	19	3	<1	Screen: " " " "
2920S	603709						C	70	Yellow				2	9	<1	<1	Sub 4c: Weakly altered av.
2900S	603710						B	70	Brown				8	13	1	1	Min. fragments: Unaltered ignimbrite.
2880S	603711						C	50	Yellow				13	22	2	1	Min. frags: " " "
2860S	603712						C	60	Yellow				10	27	4	<1	Min. frags: v. weakly altered ignimbrite.
2840S	603713						B	70	Yellow				5	12	1	<1	Min. frags: " " " "
2820S	603714						C	60	Yellow				15	25	3	<1	Min. frags: Unaltered ignimbrite or lava.
2800S	603715						C	60	Yellow				4	13	2	<1	Min. frags: " " " "
2780S	603716						C	60	Yellow				8	16	1	<1	Min. frags: " " " "
2760S	603717						B	60	Grey				2	9	6	<1	Min. frags: Weakly altered " " " "
2740S	603718	10	-	40	10	40	C	50	Yellow				7	15	9	<1	Min. frags: Qtz-sericite schist.
2720S	603719	10	5	35	20	30		50	Brown				4	13	4	<1	HOLE FRAGS: MOD. AV., WK. SER., SCALDLOSE
2700S	603720	20	-	30	20	30	B	40	Brown				3	9	5	<1	HOLE FRAGS: WK. SERICITISED AV.
2680S	603721	20	-	40	10	30	B	60	Brown				6	16	4	<1	HOLE FRAGS: " " " E GLASS
2660S	603722	10	-	30	20	40	B	60	Brown				6	15	2	<1	HOLE FRAGS: " " " " "
2640S	603723	10	-	40	20	30		60	Brown				2	7	2	<1	HOLE FRAGS: DITTO? WEATH., WK. SCHISTOSE.
620S	603724	20	-	30	10	40	B	50	Brown				6	11	3	<1	HOLE FRAGS: AV, WEATH., WK. SER., WK. SCHISTOSE
2600S	603725	40	5	20	15	20	B	40	Brown				4	11	4	<1	HOLE FRAGS & SCREEN: DITTO.
END OF LINE TO NORTH																	
3020S	603726	30	5	20	30	15	B/A	50	GREY				2	7	6	<1	HOLE FRAGS: AV, MOD. SER., WK. SCHISTOSE.
3040S	603727	30	-	20	20	30	B	60	Brown				15	29	7	1	HOLE FRAGS: MOD. ALT. QTZ-SER. SCHIST.
3060S	603728	20	5	20	20	35	B	60	YELLOW				110	54	23	1	HOLE FRAGS: MOD. ALT. AV, MOD. SILIC., Qtz. FRAGS, UN. SER.
3080S	603729	10	10	20	40	20	B	100	BROWN				78	10	12	1	HOLE FRAGS: SANDY LAYER BELOW ROLAND CONGL. SCREEN
3100S	603730						C	70					7				SCREEN: ROLAND CONGL. + SOME MOD. ALT. AV SCHIST.
3120S	603731						C	70									HOLE FRAGS: ROLAND CONGL.
3140S	603732							50									SCREEN: ROLAND CONGL., HOLE IN PEAT BOG.
3160S	603733							30									SCREEN: " " " " " "
3180S	603734							30									SCREEN: " " " " " "
3200S	603735							40									SCREEN: " " " " " "
3220S	603736							40									SCREEN: ROLAND CONGLOMERATE
3240S	603737							30									SCREEN: " " " " " "

\* Check assay value.

TENEMENT EK 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 2  
 AREA/PROSPECT EAST CETHANA SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE I SOIL SAMPLING GEOLOGIST GP & TE DATE NOV. 1976  
 ANALYSED BY EC

Grid Co-ordinate LINE 20200E (CONT.)	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.				Geological observations		
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con- tacted	Est.	Depth to	Pb	Zn	Cu		Ag	
3260S	603738							20										NOT ASSAYED	SCREEN: ROLAND CONGL.
3280S	603739							30										NOT ASSAYED	SCREEN: " "
3300S	603740	15	5	10	30	40	B	50	BROWN				15	7	1	1			HOLE FRAGS: SILK ALT. AV (TUFTS?) + ROLAND CONGL.
3320S	603741						B	30										NOT ASSAYED	HOLE FRAGS: ROLAND CONGL.
340S	603742	40	-	10	40	10	B	40	GREY				2	2	1	<1			HOLE FRAGS: MOD. ALT. QTZ-SER. SCHIST.
3360S	603743	10	-	20	30	40		60	"				1	3	2	<1			HOLE FRAGS: MAINLY ROLAND CONGL. & SOME AV.
3380S	603744	35	5	20	10	30	B	50	"				2	5	1	<1			HOLE FRAGS: MOD. ALT. AV, MOD. SILIC, NON-SCHIST.
3400S	603745						B	50											HOLE FRAGS: 80% ROLAND CONGL., 20% AV.
3420S	603746						A	30											HOLE FRAGS: ROLAND CONGL.
3440S	603747							30											HOLE FRAGS: " "
3460S	603748	20	-	10	30	40	B	90	GREY				6	4	1	<1			HOLE FRAGS: WK-MOD. ALT. AV TUFF.
3480S	603749						B	40											ROLAND CONGL.
3500S	603923							30											" "
3520S	603924							30											" "
								END OF LINE											

\* Check assay value.

087

TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 3  
 AREA/PROSPECT EAST CETHANA SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE I SOIL SAMPLING ANALYSED BY ZC GEOLOGIST EP & TE DATE NOV. 1976  
 A 9006

Grid Co-ordinate LINE	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.				Geological observations	
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Concealed	Ext. Depth to	Pb	Zn	Cu	Ag		
3200S	603853	20	-	20	30	30		60	BROWN						SAMPLE REJECTED	IN ALLUVIALS OF CK. BED		
3180S	603881														" "	ROAD FILL.		
3160S	603882	10	5	25	20	40	B	60	BROWN	✓			54	14	5	1	O/C & HOLE FRAGS: V. WK. ALT. MOD. SCHISTOSE AV.	
3140S	603883	10	5	15	40	30	B	60	"				2	4	1	<1	HOLE FRAGS: DITTO, E FRAGS. VEIN QTZ	
20S	603884	10	10	20	30	30	B	40	"				33	10	2	<1	HOLE FRAGS: MOD. WK. ALT. QTZ-SER. AV. PYRO.	
3100S	603885	20	5	20	25	30	B	60	YELLOW				130 140	13 14	8 8	1 1	HOLE FRAGS: AS ABOVE, E LIM. STAINS	
3080S	603886	20	5	10	30	35	B	40	GREY				1	3	3	<1	HOLE FRAGS & SCREF: AV. AS ABOVE, E LIM. STAINS	
3060S	603887	20	5	10	30	35	B	30	"				45	5	1	<1	HOLE FRAGS: WK. ALT. AV. E LIM. STAINS & VEINS	
3040S	603888	100	-	-	-	-		-		✓			11	34	12	<1	O/C: AV, WK. ALT, E AROUND QTZ VEINS	
3020S	603889	100	-	-	-	-		GREY	✓				4	3	4	<1	O/C: DITTO, E MINOR LIMONITE	
3000S	603890	30	-	20	20	30	B	70	"				<1	3	5	<1	HOLE FRAGS: SILIC, HIGHLY ALT. QTZ-SER. SCHIST.	
2980S	603891	20	-	30	20	30	C	70	"				<1	3	<1	<1	HOLE FRAGS: " " " " " "	
2960S	603892	40	-	10	20	30	B	80	"				<1	3	<1	<1	HOLE FRAGS: QTZ-SER. SCHIST.	
2940S	603893	20	10	20	30	20	B/A	50	"				<1	5	<1	<1	HOLE FRAGS: " " " "	
2920S	603894	10	5	10	40	35	B	80	BROWN				23	20	8	1	HOLE FRAGS: " " " " MOD. ALT. GRAU.	
2900S	603895	20	10	10	30	30	B	60	"				15	26	5	1	HOLE FRAGS: AV, WK. ALT, WK. SCHISTOSE, MOD. ALT. GR.	
2880S	603896	20	5	10	25	40	B	90	"				13	28	5	<1	HOLE FRAGS: AV, MOD. SCHISTOSE, V. WEATH.	
2860S	603897	20	-	20	30	30	B	70	"				29	57	8	1	HOLE FRAGS & SCREF: QTZ-SER. SCHIST. MOD. ALT. SUBS. PK.	
2840S	603898	20	5	10	30	35	B	60	"				23	41	5	<1	HOLE FRAGS: V. WEATH. AV.	
2820S	603899	20	-	10	30	40	B	70	"				27	34	5	1	HOLE FRAGS: V. WEATH. AV. SCHIST. + ROLAND CONG.	
2800S	603900	10	-	10	30	50	B	80	"				32	57	10	1	HOLE FRAGS: STR. ALT. AV. SCHIST.	
2780S	601001	15	5	30	30	30	C	80	YELLOW				25	11	4	<1	HOLE FRAGS: MOD. STR. ALT. QTZ-SER. SCHIST.	
2760S	601002						B	60							SAMPLE REJECTED	HOLE FRAGS: ROLAND CONG.		
2740S	601003	15	5	10	35	35	B	60	BROWN				53	68	14	1	HOLE FRAGS: 80% V. WEATH. ALT. AV, 20% ROLAND CONG.	
2720S	601004							30							SAMPLE REJECTED	ROLAND CONGL.		
2700S	601005						B	30							" "	" "		
2680S	601006						B	30							" "	" "		
2660S	601007						B/A	40							" "	" "		
2640S	601008	5	5	25	30	35	B	70	YELLOW				8	24	4	1	HOLE FRAGS: AV. PYROCLASTIC, QTZ-SER. MOD. ALT.	
2620S	601009	10	5	15	40	30	C	100	GREY				10	17	22	1	HOLE FRAGS: AV (QTZ-SER. SCHIST?). SCREF-COARCT.	
2600S	601010						A/B	20							SAMPLE REJECTED	BASALT		
2580S	601011	100								✓					" "	" "		
2560S	601012						B	60							" "	" "		
2540S	601013						B	50							" "	" "		
		END OF LINE TO NORTH																
3220S	603854	20	10	20	20	30			BROWN						SAMPLE REJECTED	CREEK ALLUVIUM		

\* Check assay value.

008

TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 4  
 AREA/PROSPECT EAST CETHANA SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE I SOIL SAMPLING GEOLOGIST GP DATE OCT. 1976  
 ANALYSED BY PC

Grid Co-ordinate LINE 20600 E (CONT.)	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.					Geological observations	
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Conf. sealed	Est. Depth to	Pb	Zn	Cu	Ag			
3240S	603855	15	5	30	30	20		50	GREY									ROLAND CONGLOMERATE	
3260S	603856	30	5	30	30	5		30	"									" "	
3280S	603857	20	-	20	30	30		20	"									" "	
3300S	603858	10	5	15	40	30		30	"									" "	
320S	603859	20	-	20	50	10		50	"									" "	
3340S	603860	10	-	20	40	30		30	"									" "	
3360S	603861	30	-	20	30	20		40	"									PEAT BOG	
3380S	603862	30	5	20	30	15		30	"									DK GREY SAND	
3400S	603863	30	10	20	35	5		30	"									ROLAND CONGLOMERATE	
3420S	603864	10	5	25	30	30		20	"									" "	
3440S	603865	10	-	25	35	30		20	"									" " E PEAT	
3460S	603866	10	-	25	35	30		20	"									" " " "	
3480S	603867	20	-	20	30	30		50	"									" "	
3500S	603868	25	5	20	40	10		30	"					2	4	1	<1	HOLE FRAGS: ROLAND CONGL & QUITZ-S&R SCHIST	
3520S	603869	15	15	25	30	15		20	"									HOLE FRAGS: 50% ROLAND CONG, 50% AN. QUITZ-S&R SCHIST	
3540S	603870							50	"									ROLAND CONGL SCREE	
3560S	603871							50	"									" " "	
3580S	603872							30	"									" " "	
3600S	603873							40	"									" " "	
3620S	603874							30	"									" "	
3640S	603875							50	"									NOT ASSAYED	
3660S	603876							50	"									- SAMPLES REJECTED	
3680S	603877							30	"									" " "	
3700S	603878							20	"									" " "	
3720S	603879							30	"									" " "	
3740S	603880							20	"									" " "	
		END OF LINE																	

\* Check assay value.

009

TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 5  
 AREA/PROSPECT EAST CETHANA SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE I SOIL SAMPLING GEOLOGIST EP DATE OCT., 1976  
 ANALYSED BY ZC

Grid Co-ordinate LINE	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.				Geological observations		
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth (cm)	Colour	Outcrop	Con- called	Est. Depth to	Pb	Zn	Cu	Ag			
21000 E																			
3100 S	603925	10	15	20	15	40	B	70	BROWN					29	174	22	<1	HOLE FRAGS: QTZ-SER SCHIST, AV, MOD. ALT, TRANS <sup>SP</sup>	
3080 S	603926	10	10	20	25	35	B	30	"					24	19	6	1	HOLE FRAGS - SCREE: QTZ-SER SCHIST, MOD. ALT, LIMIN. FAS.	
3060 S	603928	20	-	20	25	35	C	100	YELLOW					25	26	15	1	HOLE FRAGS: TRONSTONE + FERROUS QTZ-SER. SCHIST (WEATH)	
3040 S	603928	15	-	20	30	35	C	90	BROWN					17	21	5	<1	SCREE: QTZ-SERICITE SCHIST, VITRIC	
3020 S	603929	15	5	20	30	30	B	50	"					24	54	8	1	HOLE FRAGS & SCREE: WEATH. QTZ-SER. SCHIST.	
3000 S	603930	20	5	15	30	30	B	50	"					74	210	34	1	HOLE FRAGS & SCREE: GRAP. SCHIST + QTZ-SER SCHIST.	
2980 S	603931	15	5	10	30	40	B	40	"					* 110 120	134 <sup>85</sup>	32 <sup>22</sup>	2 <sup>1</sup>	HOLE FRAGS: MN. SCHISTOSE & ALT. VITRIC TUFF-SH.	
2960 S	603932	20	5	10	35	30	B/A	20	"					72	200	31	<1	HOLE FRAGS - SCREE: MN. ANHYD. BKH. TUFFSH & QTZ-SER SCHIST	
2940 S	603933	20	5	15	30	30	B	30	"					49	138	24	1	HOLE FRAGS: MAINLY MN. ALT SCHISTOSE SILIC TUFF, VITRIC	
2920 S	603934	20	5	15	30	30		30	"					10	34	22	<1	HOLE FRAGS & SCREE: AS ABOVE + SOME QTZ-SER SCHIST.	
2900 S	603935	20	5	10	30	35	B	40	"					29	80	74	1	HOLE FRAGS: QTZ-SER SCHIST AFTER VITRIC TUFF	
2880 S	603936	20	5	10	30	35	B	30	"					17	31	15	<1	HOLE FRAGS & SCREE: AS ABOVE BUT MORE HEAVY ALT	
2860 S	603937	25	5	5	20	35	B	50	"					15	57	16	<1	HOLE FRAGS: QTZ-SER SCHIST, SILIC, VITRIC, PYROCLASTIC	
2840 S	603938	25	5	15	30	30	C	50	"					31	54	16	<1	HOLE FRAGS & SCREE: QTZ-SER. SCHIST CRACKY IN PLACE	
2820 S	603939	20	5	10	30	35	B	40	"					17	79	16	<1	HOLE FRAGS: QTZ-SER SCHIST, V. STR. ALT. SOIL CRACKY	
2800 S	603989	20	10	20	20	30	B	30	"					16	81	10	<1	HOLE FRAGS: QTZ-SERICITE SCHIST.	
2780 S	603990	10	5	25	25	35	C	40	YELLOW					9	22	9	<1	SCREE: SCHIST AND BASALT COBBLES	
2760 S		NO	SAMPLE																BASALT SOIL AND SCREE.
2740 S	603991	10	10	30	30	20	B	30	YELLOW					* 270 270	29 28	7 <sup>7</sup>	<1	HOLE FRAGS - SCHIST; SCREE - BASALT	
2720 S	603992	15	5	20	25	35	B	30	BROWN					8	112	19	1	BASALT SOIL AND SCREE	
END OF LINE TO NORTH																			
120 S	603940	20	10	10	20	40	B	50	BROWN					24	197	19	1	HOLE FRAGS: QTZ-SER. SCHIST, DISTURBED	
3140 S	603941	20	10	10	20	40	B	60	"					31	77	11	1	HOLE FRAGS: QTZ-SER SCHIST, STR. ALT.	
3160 S	603942	10	5	15	30	40	B	80	"					27	60	14	1	ALLUVIUM OF AV, MAINLY QTZ-SER SCHIST.	
3180 S	603943	20	10	15	25	30	B	30	"					29	49	11	1	HOLE FRAGS: QTZ-SER SCHIST, MOD. ALT. SCHISTOSE AV	
3200 S	603944	15	5	25	25	30	B	50	"					92	73	18	<1	HOLE FRAGS: MAINLY QTZ-SER. SCHIST	
3220 S	603945							100						SAMPLE REJECTED				ROLAND CONGLOMERATE ALLUVIUM.	
3240 S	NOT SAMPLED																		CREEK FLAT.
REMAINDER OF LINE TO 3800 S	NOT SAMPLED																		DERIVATIVES OF ROLAND CONGL.

\* Check assay value.

TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 6  
 AREA/PROSPECT EAST CETHANA SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE I SOIL SAMPLING GEOLOGIST GP DATE OCT., 1976  
 ANALYSED BY ZC

Grid Co-ordinate <u>LINE</u> <u>21400 E</u>	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock				Metal Content in ppm.				Geological observations
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth (cm)	Colour	Outcrop	Con- creted	Est. Depth to	Pb	Zn	Cu	Ag		
3000S	603770	10	5	15	30	40	B	90	BROWN					180	95	44	<1	HOLE FRAGS: AV SCHIST, V. WEATH & SOME ROLAND CONG.
3020S	603771	10	-	10	40	40	B	60	YELLOW					220	112	41	1	HOLE FRAGS: MAINLY AV SCHIST + SOME R.G.
3040S	603772	20	-	20	20	40	B	50	"					280	142	23	<1	HOLE FRAGS: 90% R.G., 10% AV (SCHIST?)
3060S	603773	20	-	20	30	30	B	80	"					* 450 440	330 310	48 52	<1	HOLE FRAGS: " " " " "
3080S	603774	10	15	20	30	25	B	70	"					SAMPLE REJECTED				HOLE FRAGS: 60% R.G., 40% AV
3100S	603775	5	5	20	35	35		60	BROWN					"	"			HOLE FRAGS: MAINLY R.G., MINOR FRAGS AV
3120S	603776	15	5	20	30	30	B	40	YELLOW					"	"			HOLE FRAGS: 80% R.G., 20% QZ-FER SCHIST
3140S	603777	20	-	10	30	40	B	30	"					350	250	71	<1	HOLE FRAGS: 80% R.G., 20% MOD. ALT. LHM, AV
3160S	603778	20	10	10	20	40	B	30	"					110	38	17	1	HOLE FRAGS: 60% R.G., 40% AV SCHIST
3180S	603779	20	-	20	20	40	B	80	"					350	147	58	2	HOLE FRAGS: 80% AV, 20% ROLAND CONG.
3200S	603780	20	-	20	20	40	B	110	"					220	125	42	1	HOLE FRAGS: AV, WEATH, SCHISTOSE, MOD. ALT.
3220S	603781	20	-	20	30	30	B	40	"					85	28	9	<1	HOLE FRAGS: 70% AV, MOD. ALT. QZ-FER SCHIST 70% R.G.
3240S	603782	10	5	25	50	10		30	GREY					SAMPLE REJECTED				ROLAND CONGLOMERATE SCREE
3260S	603783	10	-	20	50	20		40	"					"	"			" " "
3280S	603784	5	-	30	60	5		30	"					"	"			" " "
3300S	603785							50						"	"			" " "
3320S	603786							60						"	"			" " "
3340S	603787							20						"	"			" " "
3360S	603788							50						"	"			" " "
3380S	603789							60						"	"			" " "
3400S	603901	20	-	10	40	30		60	GREY					"	"			" " "
3420S	603902	20	-	20	40	20		40	"					"	"			" " "
3440S	603903	20	-	20	30	30		40	"					"	"			" " "
3460S	603904	30	-	20	30	20		40	"					"	"			" " "
3480S	603905	10	-	20	30	40	B	80	BROWN					310	260	79	1	HOLE FRAGS: AV, MOD. SCHISTOSE, FERRUGINOUS
3500S	603906	10	-	20	30	40	B	50	"					220	200	48	1	HOLE FRAGS & SCREE: AV, FERRUG. FRAGS, SCHISTOSE.
3520S	603907	10	-	30	30	30		20	GREY					SAMPLE REJECTED				ROLAND CONGLOMERATE SCREE
3540S	603908	10	5	20	30	35	B	80	BROWN					* 1470 1460	650 620	67 70	2 2	HOLE FRAGS: 50% AV SCHIST, 50% ROLAND CONG.
3560S	603909	5	10	15	30	40	B/A	30	"					940	520	32	1	HOLE FRAGS: 60% " " " 40% " "
3580S	603910	10	5	20	35	30		40	GREY					4	5	1	<1	HOLE FRAGS & SCREE: AV, SCHISTOSE.
3600S	603911	20	-	10	35	35	C	40	BROWN	✓				33	31	2	1	O/C: UNALTERED AV LAVA F. QZ PHENOS
3620S	603912	20	5	20	30	25	C	20	GREY	✓				4	5	1	<1	O/C: AS ABOVE + GLASS FRAGMENTS
3640S	603913	20	-	10	30	40	B	60	BROWN					54	112	16	<1	HOLE FRAGS & SCREE: AV, FAIR E. LINED QZ-FER
3660S	603914	20	-	20	30	30		50	GREY					SAMPLE REJECTED				ROLAND CONGLOMERATE SCREE
3680S	603915	20	-	20	30	30		60	"					"	"			" " "
3700S	603916	20	5	25	30	20		50	"					"	"			" " "

\* Check assay value.

041

TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 7  
 AREA/PROSPECT EAST CETHANA SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE I SOIL SAMPLING GEOLOGIST GP DATE OCT., 1976  
 ANALYSED BY ZC

Grid Co-ordinate LINE 21400 E (CONT.)	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.					Geological observations			
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con- cealed	Est. Depth to	Pb	Zn	Cu	Ag					
3720S	603917	20	5	25	35	15		40	GREY											ROLAND CONGLOMERATE SCREE	
3740S	603918	20	-	20	30	30		40	"											" " "	
3760S	603919	20	-	20	30	30		30	"											" " "	
3780S	603920	30	-	25	35	10		50	"											" " "	
3800S	603921	10	10	20	30	30	B	80	Brown				140	112	3	1				HALE FRASS - MAINLY RC, SOME GOSSANOUS AREAS (A1?)	
3820S	603922	10	-	30	30	30		80	GREY											GREY QTB SAND - ROLAND CONGL. DEBRIS	
		END OF LINE																			

\* Check assay value.

TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 8  
 AREA/PROSPECT EAST CETHANA SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE I SOIL SAMPLING GEOLOGIST EP DATE OCT. 1976  
 ANALYSED BY ZC

Grid Co-ordinate LINE 21800 E	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.				Geological observations
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Cont. sealed	Est. Depth to	Pb	Zn	Cu	Ag	
2900S	601014	10	-	20	30	40	C	110	BROWN				110	93	70	2	HOLE FRAGS: QTZ-SER. SCHIST
2920S	601015							30									ROLAND CONGLOMERATE SCREE
2940S	NO SAMPLE																" " "
2960S	601016	30	5	15	30	40	B	60	GREY				50	19	5	1	HOLE FRAGS: 60% QTZ-SER. SCHIST, 40% RC
2980S	601017	20	10	20	25	25	B	70	BROWN				100	44	18	1	HOLE FRAGS: MOSTLY MOD. ALT. QTZ-SER. SCHIST
3000S	601018							40									SAMPLE REJECTED ROLAND CONGLOMERATE SCREE
3020S	601019	10	-	20	30	40	B	80	WHITE				53	41	12	<1	HOLE FRAGS: 60% AV, 40% ROLAND CONGL.
3040S	601020	10	5	20	30	35	B	90	BROWN				79	96	14	1	HOLE FRAGS: AV, SOME IRON STAINING.
3060S	601021	10	-	25	30	35	B	70	"				49	67	14	1	HOLE FRAGS: 60% AV, ST. ALT. SINC. QTZ-SER. SCHIST, 40% RC
3080S	601022							70									SAMPLE REJECTED ROLAND CONGLOMERATE SCREE
3100S	601023	20	5	15	30	30	B	90	BROWN				240	220	33	1	HOLE FRAGS: 90% AV, MAINLY QTZ-SER. SCHIST, 10% RC
3120S	601024	15	10	15	30	30	B	90	"				330	250	48	1	HOLE FRAGS: AS ABOVE + SOME FERRIC FRAGS.
3140S	601025	15	5	15	30	35	B	80	"				390	310	55	1	HOLE FRAGS: AV, MOD. ALT. QTZ-SER. SCHIST.
3160S	601026	15	5	10	30	40	B	80	"				460	460	53	2	AV SOIL - NO FRAGS OR SCREE
3180S	601027	15	5	10	30	40	B	130	"				* x30 440	510 <sup>510</sup>	65 <sup>65</sup>	2 <sup>2</sup>	FERRIC AV SOIL - NO FRAGS OR SCREE
3200S	601028	15	5	10	30	40		160	"				240	182	51	2	TRANSPORTED ALUMINUM, LARGELY AV, QTZ-SER. SCHIST
3220S	601029	10	-	10	30	50	B	140	"				330	152	58	2	TRANSPORTED SOIL, LARGELY AV, SOME CRACKLY SCHIST
3240S	601030	15	-	15	30	40		120	"				180	83	24	1	HOLE FRAGS: 90% QTZ-SER. SCHIST, 10% QTZITE & QTZ
3260S	601031						B	50									NOT ASSAYED HOLE FRAGS: 70% RC, 30% AV, QTZ-SER. SCHIST.
3280S	601032							40									- SAMPLES REJECTED HOLE FRAGS: ROLAND CONGLOMERATE
3300S	601033							30									HOLE FRAGS: " "
3320S	601034	15	-	10	30	40	B	60	BROWN				180	114	16	2	HOLE FRAGS: QTZ-SER. SCHIST, MOD. ALT. LIM. BOXWORKS
3340S	601035	20	5	20	30	25		60	"				310	270	19	1	HOLE FRAGS: ALLUV. GRIT MAINLY FERRIC QTZ-SER. SCHIST
3360S	601036	10	-	25	30	35		60	GREY				19	7	<1	<1	HOLE FRAGS: QTZ SAND & GRIT ± MINOR AV.
3380S	601037	10	-	20	30	40	C	80	BROWN				72	21	19	1	HOLE FRAGS: QTZ-SERICITE SCHIST
3400S	601038							90									SAMPLE REJECTED HOLE FRAGS: MAINLY ROLAND CONGLOMERATE
3420S	601039	15	-	20	30	35	B	100	BROWN				240	77	35	2	HOLE FRAGS: QTZ-SER. SCHIST ± QTZ. PHENOLS
3440S	601040	20	-	30	30	20	C		"				* 1170 1160	154 <sup>154</sup>	30 <sup>30</sup>	1 <sup>1</sup>	Q/C: QTZ-SER. SCHIST, ABUND. Mn SINS, ST. ALT.
3460S	601041	20	15	20	30	20	C	90	GREY				60	28	4	<1	HOLE FRAGS & SCREE: QTZ-SER. SCHIST
3480S	601042	20	10	20	30	20	C	30	BROWN				110	43	10	<1	HOLE FRAGS: QTZ-SER. SCHIST, SILIC.
3500S	601043	30	5	25	20	20		10	"				330	250	32	1	HOLE FRAGS: AS ABOVE + LIM. BOXWORKS
3520S	601044	25	5	20	30	20	C	50	"				240	125	58	1	HOLE FRAGS: QTZ-SER. SCHIST, SILIC.
3540S	601045	15	10	15	30	30	B	50	"				460	100	70	2	HOLE FRAGS & SCREE: AS ABOVE
3560S	601046	15	-	20	30	35	C	110	"				410	59	47	2	Q/C & HOLE FRAGS: QTZ-SER. SCHIST.
3580S	601047	10	20	10	30	30	B	50	"				160	36	45	1	Q/C: QTZ-SER. SCHIST ± MINOR LIMONITE
3600S	601048	10	-	10	30	40	C	110	"				350	21	36	2	HOLE FRAGS: QTZ-SERICITE SCHIST.

\* Check assay value.

043

TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 9  
 AREA/PROSPECT EAST CETHANA SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE I SOIL SAMPLING GEOLOGIST GP DATE OCT., 1976  
 ANALYSED BY ZC

Grid Co-ordinate <u>L1NE</u> <u>21800 E</u> <u>(CONT.)</u>	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.					Geological observations	
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con-creased	Est. Depth to	Pb	Zn	Cu	Ag	Mn		
3620S	601049	20	5	15	25	35	B	50	GREY				27	7	5	1		HOLE FRAGS: QTZ-SERKITE SCHIST	
3640S	601050	15	-	15	30	40	C	60	BROWN				94	17	21	<1		SCREE: QTZ-SER SCHIST, FELSIC LIM.	
3660S	601051	15	5	20	30	30	C	50	GREY				32	7	9	<1		HOLE FRAGS: QTZ-SER SCHIST; SCREE LIM BEDROCKS	
3680S	601052	30	5	15	30	20	C	50	BROWN				120	10	11	<1		HOLE FRAGS: QTZ-SER SCHIST, SOME FELSIC W/C	
3700S	601053	100	-	-	-	-							78	17	27	1		O/C: QTZ-SER SCHIST, SOME LIM. FRACTURES	
3720S	601054	20	5	15	30	30	C	30	BROWN	✓			460	12	9	<1		O/C: " " " " " "	
3740S	601055	20	-	20	30	30	B	90	"				650	31	83	2		HOLE FRAGS: SCREE OF QTZ-SER SCHIST	
3760S	601056						B	50					SAMPLE REJECTED				HOLE FRAGS: SCREE OF 50% AV SMT, 50% RC		
3780S	NO SAMPLE																	ROLAND CONGLOMERATE SCREE	
3800S	" "																	" " "	
3820S	" "																	" " "	
3840S	" "																	" " "	
3860S	601057							60					SAMPLE REJECTED				" " "		
3880S	NO SAMPLE																	" " "	
3900S	" "																	" " "	
3920S	" "																	" " "	
3940S	" "																	" " "	
3960S	603204	100	-	-	-	-				✓			1270	8	8	<1	22	O/C: TUFFACEOUS AV GRIT, REWORKED	
3980S	NO SAMPLE																	ROLAND CONGLOMERATE SCREE	
4000S	" "																	SCREE: MAINLY ROAD FILL OF CHLOR QTZ-SER SCHIST	
4020S	" "																	ROAD FILL - CHLORITIC SCHIST	
4040S	601058	100	-	-	-	-				✓			6	21	4	<1		O/C: CHLORITIC QTZ-SER SCHIST, VITRIC PROCLASTIC	
		END OF LINE																	

\* Check assay value.

TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 10  
 AREA/PROSPECT EAST CETHANA SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE I SOIL SAMPLING GEOLOGIST GP DATE OCT., 1976  
 ANALYSED BY ZC

Grid Co-ordinate LINE	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.				Geological observations		
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con- cealed	Est. Depth to	Pb	Zn	Cu	Ag			
22200E	3500S	603946						50										SAMPLE REJECTED	ROAD FILL: QTZ-SER. SCHIST
	3480S	603947	20	5	15	30	30	20	BROWN					85	19	9	<1		HOLE FRAGS: QTZ-SER. SCHIST, ROAD DEP. DISTURBED
	3460S	603948	15	5	10	30	40	C	10	"	✓			48	14	10	<1		%: QTZ-SER. SCHIST, SILIC. LIM. BOXWORKS
	3440S	603949	20	5	15	30	30	20	"					86	14	4	<1		ROAD SCREE: QTZ-SER. SCHIST, MOD. STR. ALT.
	3420S	603950	30	5	10	25	30	C	10	"	✓			42	12	12	<1		%: QTZ-SER. SCHIST & PITS AFTER SULPHIDES
	3400S	603951	40	5	10	25	20	C	20	"	✓			78	17	8	<1		HOLE FRAGS: QTZ-SER. SCHIST & VEIN QTZ.
	3380S	603952	20	-	15	25	40	B	50	"				59	19	14	<1		HOLE FRAGS: AV SCHIST, LIM. VEIN QTZ.
	3360S	603953	20	10	10	30	30	B	40	"				22	10	15	<1		HOLE FRAGS: QTZ-SER. SCHIST, MINOR LIM. VEIN QTZ.
	3340S	603954	20	5	15	30	30	B	70	"				41	14	21	<1		HOLE FRAGS: QTZ-SER. SCHIST, VITRIC, LIM.
	3320S	603955	20	5	15	30	30	B	40	"				80	19	13	<1		HOLE FRAGS: QTZ-SER. SCHIST, MOD. ALT.
	3300S	603956	20	10	20	25	25	B	50	"				72	30	13	<1		HOLE FRAGS: " " " " "
	3280S	603957						B	30	GREY									ROLAND CONGLOMERATE SAND DEBRIS
	3260S	603958						B	20										" " " "
	3240S	603959						B	30										AS ABOVE + MINOR QTZ-SER. SCHIST.
	3220S	603960	10	10	15	25	40	B	70	BROWN				230	250	81	1		HOLE FRAGS: STR. ALT. QTZ-SER. SCHIST.
	3200S	603961	15	5	10	30	40	B	50	"				160	73	26	1		HOLE FRAGS: QTZ-SER. SCHIST, MOD. ALT. AV. E. QTZ.
	3180S																		
	3160S																		
	3140S																		
	3120S	603962	20	-	30	40	10	40	GREY					28	3	1	<1		HOLE FRAGS: AV. SCHIST & LARGE QTZ FRAGS (X2)
	3100S	603963	30	-	20	30	30	30	BROWN	✓				86	10	3	<1		HOLE FRAGS: QTZ-SER. SCHIST, QTZ PHENOS.
	3080S	603964	10	-	30	30	30	40	GREY	✓				14	6	1	<1		%: AV, VERY LEACHED (UNALTERED?)
	3060S	603965	20	5	20	25	30	30	BROWN	✓				100	22	2	<1		%: AS ABOVE & SOME SOIL STAS. OF MIN. Fe.
	3040S	603966																	SAMPLE REJECTED
	3020S	603967						20						"		"			" " "
	END OF LINE TO NORTH																		
	3520S	603968	25	5	10	30	30	C	20	BROWN				* 330	19	33	<1		%: QTZ-SER. SCHIST & MIN. LIM. AFTER SULPHIDES
	3540S	603969	40	-	20	20	20	C	20	GREY				94	7	4	<1		%: QTZ-SERICITE SCHIST & LIMONITE
	3560S	603970	30	-	20	30	20	10	BROWN	✓				160	6	18	<1		%: QTZ-SERICITE SCHIST.
	3580S	603971	30	5	20	25	20	40	"	✓				* 500	5	2	1		%: QTZ-SER. SCHIST, MINOR LIM. BOXWORKS
	3600S	603972	20	5	15	30	30		GREY	✓				60	5	2	<1		HOLE FRAGS: QTZ-SER. SCHIST, SOME RC.
	3620S	603973	20	10	15	25	30	20	BROWN	✓				67	8	2	<1		HOLE FRAGS: " " " , TRACES RC.
	3640S	603974	25	5	20	20	30	B	30	"	✓			31	5	1	<1		% & HOLE FRAGS: QTZ-SER. SCHIST
	3660S	603975	30	5	20	25	20	40	GREY					19	3	1	<1		HOLE FRAGS: SCREE OF QTZ-SER. SCHIST
	3680S	603976	25	5	20	20	30	20	"	✓				14	3	<1	<1		BULDOZED MATERIAL: QTZ-SER. SCHIST
	3700S	603977	40	-	10	30	20	20	"					19	17	<1	<1		SUB %: QTZ-SERICITE SCHIST.

\* Check assay value.

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TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 11  
 AREA/PROSPECT EAST CETHANA SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE I SOIL SAMPLING GEOLOGIST GP DATE OCT., 1976  
 ANALYSED BY ZC

Grid Coordinate LINE 22200 E (CONT.)	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.				Geological observations	
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con- cealed	Est. Depth to	Pb	Zn	Cu	Ag		
3720 S	603978							20					SAMPLE REJECTED				HOLE FRAGS: MOSTLY AV, FELSIC, 40% RC	
3740 S	603979							20									" "	HOLE FRAGS: 40% " " 60% "
3760 S	603980	30	10	10	30	20		20	GREY	✓			<1	3	1	<1	" "	HOLE FRAGS: 70% " " 30% "
3780 S	603981	30	5	20	20	25	C	70	"				9	3	<1	<1	" "	HOLE FRAGS: QTZ-SERICITE SCHIST
3800 S	603982	40	-	10	30	20	B	20	"				1	3	<1	<1	" "	HOLE FRAGS: AV, VITRIC, TUFF, FELSIC.
3820 S	603983	20	-	20	30	30		20	"				4	3	<1	<1	" "	HOLE FRAGS: QTZ-SER. SCHIST, FELSIC.
3840 S	603984	30	-	20	30	20	C	40	"				35	4	<1	<1	" "	HOLE FRAGS: QTZ-SER. SCHIST, (TUFF/GRAIT)
3860 S	NO SAMPLE																	MAIN ROAD
3875 S	603985	20	5	15	30	30			GREY				11	5	6	<1	" "	IN RC SCREE; OVERLIES % CHOR, FELSIC INC
3895 S	603986							60									" "	ROLAND CONGLOMERATE SCREE
3915 S	603987							60									" "	" "
3925 S	603988							40									" "	SCREE: RC; SOME QTZ-SER. SCHIST.
3955 S	NO SAMPLE																" "	SCREE: 50% RC, 50% QTZ-SER. SCHIST
		END OF LINE																

\* Check assay value.

046

TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 12  
 AREA/PROSPECT EAST CETHANA SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE I SOIL SAMPLING GEOLOGIST GP DATE OCT., 1976  
 ANALYSED BY ZC

Grid Co-ordinate <b>LNE</b> 22 600 E	Sample No.	Soil Composition					Soil Horizon	Sample			Bedrock			Metal Content in ppm.				Geological observations		
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con- cealed	Est. Depth to	Pb	Zn	Cu	Ag				
3600 S	601063	100	-	-	-	-									13	10	4	<1	% : QTZ-SER. SCHIST, MOD-STR. ALTERATION	
3575 S	601064	100	-	-	-	-									53	19	4	<1	% : " " " " " "	
3560 S	601065	100	-	-	-	-									75	10	5	<1	ROCK CHIPS: QTZ-SERICITE SCHIST	
3540 S	NO SAMPLE																		ROAD FILL	
3520 S	601066	20	-	15	30	35	B	90	GREY						25	5	2	<1	HOLE FRAGS: QTZ-SERICITE SCHIST	
3500 S	601067	20	5	20	25	30	B	70	"						25	5	1	<1	HOLE FRAGS: QTZ-SER. SCHIST & GLASS SHARDS	
3480 S	601068	20	5	20	20	35	B	50	"						5	4	<1	<1	HOLE FRAGS: QTZ-SERICITE SCHIST	
3460 S	601069	20	5	20	20	35	B	40	"						17	4	1	<1	HOLE FRAGS & SCREE: AV PYROCLASTIC	
3440 S	601070	20	5	20	20	35	B	60	"						47	5	<1	<1	HOLE FRAGS & SCREE: " "	
3420 S	601071	10	10	30	25	25	B	60	BROWN						140	35	2	1	HOLE FRAGS & SCREE: AV & QTZ PHENOS & GLASS FRAGS	
3400 S	601072	10	5	20	30	35	B	60	"						* 260 240	45 46	5	2	HOLE FRAGS: AV, SCHISTOSE, MINOR LIM.	
3380 S	601073	10	10	20	30	30	C	40	GREY						40	12	5	<1	HOLE FRAGS & SCREE: AV, 1% LIM. AFTER PYRO.	
3360 S	601074	10	5	20	25	30	C	80	BROWN						99	31	11	1	HOLE FRAGS & SCREE: " " " "	
3340 S	601075	30	-	20	30	20	C	110	"						250	26	28	1	HOLE FRAGS: QTZ-SER. SCHIST, STR. ALT.	
3320 S	601076	20	5	20	25	30	B	40	"						66	14	5	1	HOLE FRAGS: " " " " E LIM	
3300 S	601077	20	5	20	25	30	B	50	"						47	12	6	<1	HOLE FRAGS: AV, SCHISTOSE, E QTZ	
3280 S	601078	10	5	20	25	40	B	50	"						96	35	19	1	HOLE FRAGS & SCREE: AV & LIM. CARBONATES	
3260 S	601079	10	5	20	30	35	B	50	"						64	31	14	<1	HOLE FRAGS: AV, WEAK SCHISTOSITY	
3240 S	601080	15	5	20	30	30	C	90	"						180	71	45	1	HOLE FRAGS: AS ABOVE E GLASS SHARDS	
3220 S	601081	15	10	15	25	35	B	40	"						* 70 70	24 <sup>22</sup>	9 <sup>9</sup>	<1 <sup>&lt;1</sup>	HOLE FRAGS: AV, SCREE-E.G. PYROCLASTIC	
3200 S	601082	15	5	20	25	35	B	60	"						120	71	41	1	HOLE FRAGS: TRANSPORTED SCREE, AV.	
3180 S	601094	10	5	25	30	30	B	60	"						120	108	32	1	HOLE FRAGS: AV & QTZ PHENOS.	
3160 S	601095	15	10	20	25	30	B	30	"						53	31	10	<1	HOLE FRAGS: 80% AV, WK. ALT, 20% RC.	
		END OF LINE																		

\* Check assay value.

APPENDIX 5

TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 1  
 AREA/PROSPECT CETHANA EAST SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE II SOIL SAMPLING GEOLOGIST G.P. DATE DEC. 1976  
 ANALYSED BY ROBERTSON RESEARCH.

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.					Geological observations
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con- cealed	Est. Depth to	Pb	Zn	Cu	Ag	Mn	
<u>LINE</u>	<u>21200 E</u>																	
<u>3100 S</u>	<u>601620</u>	<u>30</u>	<u>10</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>B</u>	<u>160</u>	<u>BROWN</u>	-	✓		<u>280</u>	<u>250</u>	<u>70</u>	<u>2</u>	<u>300</u>	<u>WET CLAYEY ALUMINIUM - MOSTLY ACID VOLC.</u>
<u>3120 S</u>	<u>601621</u>	<u>10</u>	-	<u>20</u>	<u>20</u>	<u>50</u>	<u>B</u>	<u>120</u>	<u>BROWN</u>	-	✓		<u>340</u>	<u>260</u>	<u>50</u>	<u>2</u>	<u>930</u>	<u>" " " " " "</u>
<u>3140 S</u>	<u>601622</u>	<u>10</u>	<u>5</u>	<u>30</u>	<u>30</u>	<u>25</u>	<u>B</u>	<u>90</u>	<u>BROWN</u>	-	✓		<u>540</u>	<u>320</u>	<u>50</u>	<u>2</u>	<u>7300</u>	<u>CLAYEY ACID VOLC. ILLUMIUM</u>
<u>3160 S</u>	<u>601623</u>	<u>20</u>	-	<u>20</u>	<u>20</u>	<u>40</u>	<u>B</u>	<u>140</u>	<u>BROWN</u>	-	✓		<u>670</u>	<u>400</u>	<u>80</u>	<u>2</u>	<u>8000</u>	<u>CLAYEY ACID VOLC. ILLUMIUM &amp; ROLAND PEGRAS</u>
<u>3180 S</u>	<u>601624</u>	<u>30</u>	-	<u>10</u>	<u>20</u>	<u>40</u>	<u>B</u>	<u>170</u>	<u>YELLOW</u>	-	✓		<u>200</u>	<u>220</u>	<u>60</u>	<u>1</u>	<u>690</u>	<u>WET SANDY CLAY - MOSTLY ACID VOLC. DEGRAS</u>
<u>3200 S</u>	<u>601625</u>	<u>10</u>	-	<u>20</u>	<u>30</u>	<u>40</u>	<u>B</u>	<u>160</u>	<u>BROWN</u>	-	✓		<u>310</u>	<u>430</u>	<u>80</u>	<u>2</u>	<u>1400</u>	<u>" " " " " "</u>
<u>3220 S</u>	<u>601626</u>	<u>20</u>	-	<u>10</u>	<u>30</u>	<u>40</u>	<u>B</u>	<u>130</u>	<u>BROWN</u>	-	✓		<u>550</u>	<u>430</u>	<u>90</u>	<u>2</u>	<u>2750</u>	<u>" " " " " "</u>
<u>3240 S</u>	<u>601627</u>	<u>15</u>	<u>5</u>	<u>20</u>	<u>25</u>	<u>35</u>	<u>B</u>	<u>170</u>	<u>BROWN</u>	-	✓		<u>230</u>	<u>260</u>	<u>65</u>	<u>2</u>	<u>450</u>	<u>WET SANDY ALUMINIUM - 60% AL, 40% ROLAND</u>
<u>3260 S</u>	<u>601628</u>	<u>10</u>	-	<u>20</u>	<u>30</u>	<u>40</u>	<u>B</u>	<u>170</u>	<u>BROWN</u>	-	✓		<u>270</u>	<u>250</u>	<u>40</u>	<u>2</u>	<u>880</u>	<u>" " " " " "</u>
<u>3280 S</u>	<u>601629</u>	<u>10</u>	-	<u>20</u>	<u>30</u>	<u>40</u>	<u>B</u>	<u>170</u>	<u>YELLOW</u>	-	✓		<u>180</u>	<u>210</u>	<u>35</u>	<u>2</u>	<u>200</u>	<u>WET SATTY SAND &amp; CLAY - LARGELY ROLAND</u>
<u>3280 S</u>	<u>601630</u>	<u>10</u>	<u>5</u>	<u>30</u>	<u>30</u>	<u>25</u>	<u>B</u>	<u>120</u>	<u>BROWN</u>	-	✓		<u>270</u>	<u>150</u>	<u>20</u>	<u>2</u>	<u>1820</u>	<u>SAME HOLE AS ABOVE - ACID VOLC. CLAY</u>
<u>3470 S</u>	<u>601631</u>	<u>20</u>	<u>5</u>	<u>10</u>	<u>20</u>	<u>35</u>	<u>C</u>	<u>140</u>	<u>YELLOW</u>	-	✓		<u>90</u>	<u>30</u>	<u>35</u>	<u>2</u>	<u>50</u>	<u>ACID VOLC. SOIL + FRAGMENTS</u>
<u>3500 S</u>	<u>601632</u>	<u>20</u>	<u>5</u>	<u>10</u>	<u>20</u>	<u>35</u>		<u>90</u>	<u>YELLOW</u>	-	✓		<u>80</u>	<u>40</u>	<u>5</u>	<u>1</u>	<u>60</u>	<u>YELLOW CLAY UNDER ROLAND DEGRAS</u>
<u>3540 S</u>	<u>601633</u>	<u>10</u>	<u>10</u>	<u>20</u>	<u>25</u>	<u>35</u>		<u>60</u>	<u>GREY</u>	-	✓		<u>ND</u>	<u>10</u>	<u>5</u>	<u>1</u>	<u>20</u>	<u>FRAGMENTS MOSTLY UNALTERED ACID LAVA</u>
																		<u>END OF LINE</u>

\* Check assay value.

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TENEMENT <u>EL 10/76</u>		GEOCHEMICAL SOIL SAMPLING LEDGER										Page No. <u>2</u>							
AREA/PROSPECT <u>CETHANA EAST</u>		SAMPLE Nos.										D.P.O. No.							
PLAN REFERENCE <u>PHASE II SOIL SAMPLING</u>												GEOLOGIST <u>GP</u> DATE <u>DEC. 1976</u>							
A 9005												ANALYSED BY <u>ROBERTSON RESEARCH</u>							
Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.					Geological observations	
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ag	Mn		
<u>LINE</u>	<u>21400 E</u>																		
3000S	601597	20	5	15	20	40	B	170	YELLOW	-	✓			250	170	60	2	70	WET ALLUVIUM FROM ACID VOLCS.
3020S	601598	10	-	20	20	50	B	170	BROWN	-	✓			260	160	50	2	130	" " " " "
3040S	601599	10	-	20	20	50	B	120	YELLOW	-	✓			286	230	55	2	240	" " " " "
3060S	601600	30	-	10	30	30	B	170	YELLOW	-	✓			260	160	45	2	70	WET CLAYEY SAND LARGELY FROM AV.
3080S	601601	20	5	15	20	40	B	170	YELLOW	-	✓			630	340	85	2	260	CLAYEY AV ALLUVIUM ± ROLAND PEBBLES
3100S	601602	20	-	10	20	50	B	150	YELLOW	-	✓			310	200	5	2	100	" " " " " "
3120S	601603	30	-	10	25	35	B	140	YELLOW	-	✓			340	190	5	2	70	" " ELLUVIUM " " "
3140S	601604	20	5	20	10	45	B	100	YELLOW	-	✓			380	280	75	2	150	CLAYEY AV ALLUVIUM
3160S	601605	10	-	10	40	40	B	140	YELLOW	-	✓			420	210	65	4	100	CLAYEY AV ELLUVIUM ± ROLAND PEBBLES
3180S	601606	10	-	10	30	50	B	170	YELLOW	-	✓			360	160	45	2	70	CLAYEY AV ELLUVIUM
3200S	601607	10	-	20	30	40	B	170	KHAKI	-	✓			80	30	15	1	10	SANDY ALLUVIUM - MOSTLY ROLAND MAT ±
3220S	601608	-	-	20	30	50	B	100	GREY	-	✓			50	30	5	1	20	" ELLUVIUM " " "
3480S	601609	10	5	20	30	35	C	130	YELLOW	-	✓			270	230	70	4	70	MUCH FERROUGINOUS SCHIST IN SCREE
3500S	601610	20	5	20	25	30	C	110	BROWN	-	✓			260	230	70	4	70	LIMONITIC SCHIST IN SCREE
3520S	601611	10	5	20	20	45	B	90	BROWN	-	✓			350	240	180	4	80	SOME ROLAND PEBBLES IN AV SOIL
3540S	601612	20	10	20	20	30	B	170	BROWN	-	✓			560	760	90	4	320	CLAYEY AV ELLUVIUM
3560S	601613	20	5	30	25	20	B	90	BROWN	-	✓			720	600	40	2	8200	LIMONITIC BOSSAN FLOAT IN CREEK HERE
3580S	601614	10	-	30	20	40	C	70	GREY	-	✓	100		40	30	5	1	60	SCREE: WEAKLY ALT. AV LAVA.
3600S	601615	20	30	10	10	30	C	10	BROWN	✓				40	40	10	1	630	D/C: UNALTERED AV LAVA (?)
3620S	601616	40	5	5	30	20	C	20	GREY	✓				20	20	5	ND	130	" " " "
3640S	601617	20	10	20	25	25	C	120	YELLOW	-	✓	150		90	140	20	2	200	SCREE: WEAKLY ALT. LAPILLI TUFF
3660S	601618	15	5	30	25	20	B	100	BROWN	-	✓			130	70	10	2	250	AV SOIL ± MUCH ROLAND MATERIAL
3800S	601619	10	10	20	25	35	C	90	YELLOW	-	✓			250	130	5	2	3250	SCREE: WEATHERED AV ± Mn STAIN.
																			END OF LINE

\* Check assay value.

TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 3  
 AREA/PROSPECT LETHANA EAST SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE II SOIL SAMPLING GEOLOGIST G.P. DATE DEC. 1976  
 A 9006 ANALYSED BY \_\_\_\_\_

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.					Geological observations	
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth (cm)	Colour	Outcrop	Cont. sealed	Est. Depth to	Pb	Zn	Cu	Ag	Mn		
LINE 21500 E																			
2900 S	601575	10	10	20	30	30		80	BLACK					40	190	5	1	30	ALUMINUM F FRAGMENTS OF QTZ-SERICITE SCHIST
3000 S	601576	10	5	20	25	40	C	130	BROWN					90	60	25	2	60	AV CLAY F FRAGMENTS OF QTZ-SERICITE SCHIST
3320 S	601577	10	10	20	30	30	C	100	BROWN					100	60	25	4	40	" " " " " " " "
3340 S	601578	20	-	10	30	40	C	70	BROWN					50	40	20	2	20	BEDROCK - MOD. ALT. PYROCLASTIC
3360 S	601579	30	-	30	20	20	C	90	BROWN					170	70	30	2	30	BEDROCK - MOD. ALT. AV.
3380 S	601580	10	-	10	20	60	C	90	BROWN	✓				480	60	90	2	130	O/C : QTZ-SERICITE SCHIST F QTZ KYLS
3400 S	601581	10	5	20	30	35	C	90	BROWN	✓				280	40	125	2	330	O/C : " " " " " "
3420 S	601582	20	-	20	25	35	C	90	BROWN	✓				160	30	30	2	50	O/C : MEND. ALT. SCHIST F MARIPATITE
3440 S	601583	20	-	20	25	35	C	90	BROWN					470	450	175	4	140	BEDROCK - SCHIST. SCRIP - LIMONITIC SCHIST.
3480 S	601584	10	10	20	20	40	B	110	BROWN					2900	780	210	4	21%	CLAMP ALLUVIUM F R.F. PEBBLES
3500 S	601585	20	-	20	25	35		120	YELLOW					730	300	145	6	530	AV CLAY F R.F. PEBBLES
3520 S	601586	20	5	20	20	35	B	100	BROWN					400	90	20	2	140	AV SOIL
3540 S	601587	-	-	20	20	60	C	80	BROWN					170	90	25	2	300	BEDROCK - QTZ-SERICITE SCHIST
3560 S	601588	10	-	10	40	40	C	160	BROWN					220	60	15	2	60	FRAGMENTS - MOD. ALT. AV.
3580 S	601589	20	5	20	20	35	C	50	BROWN					130	490	10	2	70	BEDROCK - " " "
3600 S	601590	20	10	20	20	30	B	60	YELLOW					180	390	10	1	110	FRAGMENTS - " " "
3620 S	601591	20	10	20	20	30	B	100	YELLOW					180	390	10	1	40	FRAGMENTS - " " "
3640 S	601592	20	-	10	20	50	C	110	WHY					400	190	10	1	40	FRAGMENTS - MOD. ALT. ASH.
3660 S	601593	40	-	-	20	40	C	100	BROWN					200	390	25	2	40	FRAGMENTS - WEAKLY ALT. ASHY CHERT
3680 S	601594	40	-	-	20	40	C	60	GREY					90	290	5	1	20	FRAGMENTS - WEAKLY ALT. VITRIC TUFF-SHALE
3700 S	601595	30	10	20	20	20	C	60	BROWN					140	290	10	1	20	FRAGMENTS - MOD. ALT. TUFF
3720 S	601596	10	20	20	20	30	B	90	GREY					40	190	5	1	20	FRAGMENTS - WEAKLY ALTERED LAPILLI TUFF
3740 S	601597	10	10	20	20	40	C	20	BROWN	✓				85	20	6	1	35	O/C : LIMONITIC CHLORITIC ALT. AV.
3760 S	601598	30	10	10	20	30	B	60	BROWN					255	64	16	1	30	SCRIP - SCHIST
3780 S	601599	15	20	20	20	25	B	30	BROWN					290	100	40	2	620	SCRIP - SCHIST F 3-5% QTS OF R.F. PEBBLES
3800 S	601960	10	20	20	20	30	B	40	BROWN					840	140	186	3	3200	SOIL
3820 S	601961	20	10	10	20	40	B	40	BROWN					800	136	34	2	21%	Mn + LIMONITE PAN.
END OF LINE																			
25 m EAST OF 3500 S:																			
	603422						B	10	BROWN					1080	276	116	4	1600	LIMONITIC SOIL IN R.F. LANDSLIDE DEBRIS

\* Check assay value.

TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 4  
 AREA/PROSPECT CETHANA EAST SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE II SOIL SAMPLING GEOLOGIST G.P. DATE DEC 1976  
 ANALYSED BY ROBERTSON RESEARCH

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.					Geological observations
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con- cealed	Est.	Depth to	Pb	Zn	Cu	Ag	
<u>LINE</u>	<u>21700 E</u>																	
<u>2900 S</u>	<u>601564</u>	<u>5</u>	<u>-</u>	<u>20</u>	<u>35</u>	<u>40</u>		<u>120</u>	<u>YELLOW</u>								<u>CLAYEY AV ELLUVIUM + ALLUVIUM</u>	
<u>2920 S</u>	<u>601565</u>	<u>-</u>	<u>-</u>	<u>10</u>	<u>30</u>	<u>60</u>		<u>60</u>	<u>RED</u>								<u>CLAYEY SOIL ? LANTHANIC IRON CONCRETES</u>	
<u>340 S</u>	<u>601566</u>	<u>15</u>	<u>5</u>	<u>20</u>	<u>30</u>	<u>30</u>		<u>110</u>	<u>BROWN</u>								<u>SCAPE : MOD. ALT. AV ? PITS AFTER PY</u>	
<u>3660 S</u>	<u>601567</u>	<u>10</u>	<u>5</u>	<u>30</u>	<u>30</u>	<u>25</u>	<u>C</u>	<u>90</u>	<u>YELLOW</u>								<u>FRAGMENTS : MOD. ALT. AV ? LIMONITE</u>	
<u>3680 S</u>	<u>601568</u>	<u>10</u>	<u>5</u>	<u>20</u>	<u>25</u>	<u>40</u>	<u>B</u>	<u>60</u>	<u>BROWN</u>								<u>FRAGMENTS : QUartz-SERICITE SCHIST</u>	
<u>3700 S</u>	<u>601569</u>	<u>10</u>	<u>5</u>	<u>10</u>	<u>20</u>	<u>55</u>	<u>C</u>		<u>YELLOW</u>								<u>FRAGMENTS : MOD. ALT. AV</u>	
<u>3720 S</u>	<u>601570</u>	<u>10</u>	<u>-</u>	<u>20</u>	<u>30</u>	<u>40</u>		<u>120</u>	<u>YELLOW</u>								<u>YELLOW AV CLAY - NO FRAGMENTS</u>	
<u>3760 S</u>	<u>601571</u>	<u>20</u>	<u>-</u>	<u>20</u>	<u>25</u>	<u>35</u>	<u>C</u>	<u>100</u>	<u>GREY</u>								<u>BEDROCK - MOD. ALT. VITRIC ASH.</u>	
<u>3780 S</u>	<u>601572</u>	<u>10</u>	<u>5</u>	<u>25</u>	<u>25</u>	<u>35</u>	<u>C</u>	<u>90</u>	<u>GREY</u>								<u>BEDROCK - " " " "</u>	
<u>3800 S</u>	<u>601573</u>	<u>20</u>	<u>10</u>	<u>10</u>	<u>30</u>	<u>30</u>	<u>C</u>	<u>60</u>	<u>GREY</u>								<u>BEDROCK - " " " "</u>	
<u>21650 E/205</u>	<u>601574</u>	<u>30</u>	<u>5</u>	<u>10</u>	<u>25</u>	<u>30</u>	<u>B</u>	<u>20</u>	<u>YELLOW</u>								<u>FRAGMENTS : QUartz-SERICITE SCHIST.</u>	

\* Check assay value.

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TENEMENT EL 10/76 - TASMANIA GEOCHEMICAL SOIL SAMPLING LEDGER

Page No. 5

AREA/PROSPECT CETHANA EAST SAMPLE Nos. \_\_\_\_\_

D.P.O. No. \_\_\_\_\_

GEOLOGIST GP DATE DEC. 1976

PLAN REFERENCE PHASE II SOIL SAMPLING

ANALYSED BY ROBERTSON RESEARCH

A 9006

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.					Geological observations
		Flocc %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con- cealed	Est. Depth to	Pb	Zn	Cu	Ag	Mn	
<b>LINE</b>	<b>21750E</b>																	
140 N	601972	20	10	20	20	30	B	90	Brown				1275	340	74	3	1760	FRAGMENTS: SCHIST AFTER FINE XYL TUFF.
120 N	601971	40	-	10	20	30	B	90	Brown				365	520	136	3	3240	FRAGMENTS: " " " " "
100 N	601970	20	15	20	35	10	C	30	Brown				350	200	26	1	2440	O/C: SCHIST AFTER FLGR. VITRIC TUFF.
80 N	601969	25	15	20	20	20	B	70	Brown				530	250	66	1	360	FRAGMENTS: SCHIST AFTER FINE XYL TUFF.
60 N	601968	30	10	20	20	20	C	100	Brown				825	640	94	3	1240	FRAGMENTS: SCHIST AFTER FLGR. VITRIC TUFF.
40 N	601967	10	10	10	30	40	B	70	Brown				1075	1060	78	2	1%	FRAGMENTS: " " " " "
20 N	601966	20	-	20	20	40	C	100	Yellow				240	80	30	2	440	SCREE: " " " " "
0	601923	10	30	20	20	20			Brown				665	160	54	2	3100	SCREE: SCHIST AFTER FINE XYL TUFF ± PY.
20 S	601924	25	15	20	15	25			Yellow				520	124	216	3	410	SCREE: MOD. ANT. CHLORITIC AV GRIT.
40 S	601934	40	20	25	15	-			Brown				45	20	6	ND	100	BROWN SOIL
60 S	601925	-	10	25	40	25			Brown				1750	680	68	3	>1%	AV SOIL + RG PEBBLES.
80 S	601926	5	20	30	30	15			Brown				1200	1720	76	2	>1%	AV SOIL
100 S	601927	5	25	30	30	10			Brown				420	720	38	1	>1%	AV SOIL.
120 S	No sample taken																	AV SOIL + RG PEBBLES.
140 S	No sample taken																	RG SAND + PEBBLES?
160 S	601928	5	10	25	30	30			Grey				10	8	2	ND	30	" " " " ?
180 S	601929	10	15	20	25	30			Grey				10	8	2	1	110	FRAGMENTS: WEAKLY ANT. AV GRIT.
200 S	601930	5	15	20	30	30			Grey				10	8	2	ND	270	FRAGMENTS: SCHIST AFTER TUFF ± UMONITE.
220 S	601931	25	20	25	25	5			Grey				20	12	4	ND	680	FRAGMENTS: " " " " " SAIT " "
240 S	601932	30	20	25	15	10			Brown				640	256	44	2	4350	RG SCREE Mn PAN HERE
260 S	601933	20	20	25	20	15			Brown				340	204	38	1	7250	RG SCREE
280 S	No sample taken																	RG BOULDERS.
300 S	No sample taken																	RG SCREE
25m east of 90S:																		
	601956	-	15	20	20	45	B	10	Brown				2160	376	58	5	>1%	UMONITIC SOIL ± Mn.
Cross line bearing 090° from 140S 21750E:																		
20E	601962	10	15	20	25	30	B	30	Brown				1400	880	54	2	>1%	BROWN SOIL AMONGST RG BOULDERS
40E	601963	5	10	20	30	35	B	40	Brown				2640	960	86	4	>1%	" " " " "
60E	601964	20	10	20	20	30	B	20	Brown				1160	510	46	3	420	" " " " " PEBBLES
Cross line bearing 090° from 200S 21750E:																		
60E	601965						B	60	Brown				NOT ASSAYED					BROWN SOIL AMONGST RG BOULDERS

\* Check assay value.

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TENEMENT EL 10/76 - TASMANIA GEOCHEMICAL SOIL SAMPLING LEDGER

Page No. 6

AREA/PROSPECT CETHANA EAST SAMPLE Nos. \_\_\_\_\_

D.P.O. No. \_\_\_\_\_

GEOLOGIST G.P. DATE DEC. 1976

PLAN REFERENCE PHASE II SOIL SAMPLING

ANALYSED BY ROBERTSON RESEARCH

A 9005

Grid Co-ordinate	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.					Geological observations	
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con- cealed	Est. Depth to	Pb	Zn	Cu	Ag	Mn		
<u>LINE</u>	<u>21800E</u>																		
<u>2900S</u>	<u>601539</u>	<u>20</u>	<u>5</u>	<u>20</u>	<u>20</u>	<u>35</u>		<u>140</u>	<u>BROWN</u>					<u>200</u>	<u>80</u>	<u>60</u>	<u>5</u>	<u>110</u>	<u>CLAYEY ELLUVIUM / ALLUVIUM</u>
<u>2980S</u>	<u>601540</u>	<u>25</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>30</u>	<u>B</u>	<u>140</u>	<u>YELLOW</u>					<u>100</u>	<u>80</u>	<u>20</u>	<u>4</u>	<u>40</u>	<u>SCREE - MODERATELY ALT. AV.</u>
<u>3000S</u>	<u>601541</u>	<u>50</u>	<u>-</u>	<u>15</u>	<u>15</u>	<u>20</u>		<u>100</u>	<u>YELLOW</u>					<u>50</u>	<u>90</u>	<u>15</u>	<u>2</u>	<u>40</u>	<u>CLAYEY AV ELLUVIUM</u>
<u>3020S</u>	<u>601542</u>	<u>5</u>	<u>-</u>	<u>20</u>	<u>25</u>	<u>50</u>		<u>160</u>	<u>YELLOW</u>					<u>70</u>	<u>110</u>	<u>20</u>	<u>2</u>	<u>40</u>	<u>CLAYEY AV ELLUVIUM / ALLUVIUM</u>
<u>3040S</u>	<u>601543</u>	<u>15</u>	<u>5</u>	<u>20</u>	<u>25</u>	<u>35</u>		<u>110</u>	<u>YELLOW</u>					<u>50</u>	<u>130</u>	<u>20</u>	<u>2</u>	<u>90</u>	<u>" " " "</u>
<u>3060S</u>	<u>601544</u>	<u>10</u>	<u>-</u>	<u>20</u>	<u>20</u>	<u>50</u>		<u>120</u>	<u>BROWN</u>					<u>80</u>	<u>110</u>	<u>20</u>	<u>2</u>	<u>140</u>	<u>" " " "</u>
<u>3080S</u>	<u>601545</u>	<u>10</u>	<u>10</u>	<u>20</u>	<u>20</u>	<u>40</u>		<u>150</u>	<u>YELLOW</u>					<u>200</u>	<u>170</u>	<u>25</u>	<u>4</u>	<u>200</u>	<u>" " " "</u>
<u>3100S</u>	<u>601546</u>	<u>10</u>	<u>-</u>	<u>10</u>	<u>20</u>	<u>60</u>		<u>170</u>	<u>YELLOW</u>					<u>250</u>	<u>260</u>	<u>40</u>	<u>4</u>	<u>290</u>	<u>" " " " WET</u>
<u>3120S</u>	<u>601547</u>	<u>30</u>	<u>10</u>	<u>20</u>	<u>20</u>	<u>20</u>		<u>140</u>	<u>YELLOW</u>					<u>230</u>	<u>200</u>	<u>35</u>	<u>2</u>	<u>300</u>	<u>" " " " WET</u>
<u>3140S</u>	<u>601548</u>	<u>10</u>	<u>-</u>	<u>30</u>	<u>30</u>	<u>30</u>		<u>160</u>	<u>YELLOW</u>					<u>550</u>	<u>480</u>	<u>75</u>	<u>5</u>	<u>1730</u>	<u>" " " " WET</u>
<u>3160S</u>	<u>601549</u>	<u>-</u>	<u>-</u>	<u>10</u>	<u>30</u>	<u>60</u>		<u>170</u>	<u>YELLOW</u>					<u>860</u>	<u>630</u>	<u>70</u>	<u>5</u>	<u>3970</u>	<u>" " " " 3 Mn</u>
<u>3180S</u>	<u>601550</u>	<u>20</u>	<u>-</u>	<u>20</u>	<u>30</u>	<u>30</u>		<u>170</u>	<u>YELLOW</u>					<u>530</u>	<u>650</u>	<u>75</u>	<u>4</u>	<u>1320</u>	<u>" " " " WET</u>
<u>3200S</u>	<u>601551</u>	<u>10</u>	<u>10</u>	<u>20</u>	<u>30</u>	<u>30</u>		<u>170</u>	<u>WHISK</u>					<u>400</u>	<u>300</u>	<u>90</u>	<u>4</u>	<u>170</u>	<u>" " " " WET</u>
<u>3220S</u>	<u>601552</u>	<u>5</u>	<u>-</u>	<u>20</u>	<u>25</u>	<u>50</u>		<u>180</u>	<u>YELLOW</u>					<u>190</u>	<u>120</u>	<u>45</u>	<u>2</u>	<u>60</u>	<u>" " " " WET</u>
<u>3240S</u>	<u>601553</u>	<u>10</u>	<u>10</u>	<u>20</u>	<u>30</u>	<u>30</u>	<u>C</u>	<u>170</u>						<u>220</u>	<u>100</u>	<u>45</u>	<u>4</u>	<u>50</u>	<u>FRAGMENTS : HEAVILY ALT. SCHIST</u>
<u>3260S</u>	<u>601554</u>	<u>10</u>	<u>10</u>	<u>20</u>	<u>30</u>	<u>30</u>	<u>B</u>	<u>70</u>	<u>BROWN</u>					<u>50</u>	<u>40</u>	<u>10</u>	<u>2</u>	<u>40</u>	<u>FRAGMENTS : QTZ-SERICITE SCHIST</u>
<u>3320S</u>	<u>601555</u>	<u>10</u>	<u>-</u>	<u>30</u>	<u>30</u>	<u>30</u>	<u>C</u>	<u>110</u>	<u>BROWN</u>					<u>180</u>	<u>110</u>	<u>15</u>	<u>4</u>	<u>40</u>	<u>FRAGMENTS : QTZ-SERICITE SCHIST</u>
<u>3340S</u>	<u>601556</u>	<u>30</u>	<u>-</u>	<u>20</u>	<u>20</u>	<u>30</u>		<u>160</u>	<u>BROWN</u>					<u>360</u>	<u>310</u>	<u>45</u>	<u>2</u>	<u>100</u>	<u>AV ALLUVIUM + FRAGMENTS OF SCHIST</u>
<u>3360S</u>	<u>601557</u>	<u>15</u>	<u>-</u>	<u>25</u>	<u>30</u>	<u>30</u>	<u>C</u>	<u>120</u>	<u>GREY</u>					<u>40</u>	<u>20</u>	<u>5</u>	<u>1</u>	<u>10</u>	<u>AV FRAGMENTS - SCHIST + SOME RG SAND</u>
<u>3380S</u>	<u>601558</u>	<u>10</u>	<u>5</u>	<u>30</u>	<u>25</u>	<u>30</u>	<u>C</u>	<u>110</u>	<u>YELLOW</u>					<u>50</u>	<u>20</u>	<u>5</u>	<u>1</u>	<u>20</u>	<u>FRAGMENTS : SCHIST + RG SAND</u>
<u>3400S</u>	<u>601559</u>	<u>5</u>	<u>10</u>	<u>25</u>	<u>25</u>	<u>35</u>		<u>80</u>	<u>GREY</u>					<u>70</u>	<u>20</u>	<u>5</u>	<u>1</u>	<u>190</u>	<u>AV DEBRIS + RG SAND 50/50</u>
<u>3420S</u>	<u>601560</u>	<u>20</u>	<u>-</u>	<u>15</u>	<u>30</u>	<u>35</u>	<u>C</u>	<u>160</u>	<u>YELLOW</u>					<u>220</u>	<u>70</u>	<u>30</u>	<u>4</u>	<u>140</u>	<u>FRAGMENTS : DARK GRAY SCHIST</u>
<u>3620S</u>	<u>601563</u>	<u>10</u>	<u>-</u>	<u>10</u>	<u>20</u>	<u>60</u>	<u>B</u>	<u>60</u>	<u>GREY</u>					<u>40</u>	<u>20</u>	<u>5</u>	<u>1</u>	<u>20</u>	<u>FRAGMENTS : AV SCHIST + RG SAND</u>
<u>3760S</u>	<u>601562</u>	<u>10</u>	<u>-</u>	<u>10</u>	<u>30</u>	<u>50</u>	<u>C</u>	<u>110</u>	<u>BROWN</u>					<u>600</u>	<u>50</u>	<u>40</u>	<u>4</u>	<u>20</u>	<u>FRAGMENTS : MODERATELY ALT. AV</u>
<u>3960S</u>	<u>601561</u>	<u>100</u>												<u>710</u>	<u>35</u>	<u>8</u>	<u>&lt;1</u>	<u>28</u>	<u>O/C CHIP : WEAKLY ALT. QZOSE AV</u>

\* Check assay value.



055

TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER Page No. 8  
 AREA/PROSPECT CETHANA EAST SAMPLE Nos. \_\_\_\_\_ D.P.O. No. \_\_\_\_\_  
 PLAN REFERENCE PHASE II SOIL SAMPLING GEOLOGIST G.P. DATE DEC. 1976  
 ANALYSED BY ROBERTSON RESEARCH

Grid Co-ordinate LINE	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.					Geological observations		
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Con- creted	Est. Depth to	Pb	Zn	Cu	Ag	Mn			
2200E																				
2900S	601501	10	-	30	20	40		100	YELLOW					80	70	20	2	40	AV ELLUVIUM. SOME ROLAND PEBBLES	
2920S	601502	15	5	10	30	40		120	"					100	90	25	4	50	" " " " "	
2940S	601503	20	-	10	30	40		70	"					100	80	25	4	50	ELLUVIUM/ALLUVIUM. " " "	
2960S		ALLUVIUM						130												
2980S		ALLUVIUM						110												
3000S	601504	10	-	20	30	40		160	YELLOW					90	120	20	4	180	AV ELLUVIUM. SOME ROUNDED AV PEBBLES	
3020S	601505	10	-	20	30	40		170	"					120	160	25	4	180	" " " " " "	
3040S	601506	10	-	20	20	50		160	"					90	120	20	4	140	CLAYEY AV ELLUVIUM - NOT ROUNDED	
3060S	601507	10	-	20	20	50		160	"					100	200	30	5	170	CLAYEY ELLUVIUM/ALLUVIUM.	
3080S		ROLAND CONGL. SCREE						70												
3100S	"	"	"	"	"	"		110												
3120S	"	"	"	"	"	"		120												
3140S	601508	15	-	30	20	35		130	YELLOW					80	100	10	4	70	CLAYEY ELLUVIUM/ALLUVIUM. ROUNDED QTZ PEBBLES + A	
3160S	601509	10	5	20	15	50		90	"					40	30	5	2	40	CLAYEY ELLUVIUM UNDER ROLAND CONG. DEBRIS.	
3180S	601510	20	-	20	25	35			"					220	550	55	4	450	CLAYEY ALLUVIUM FROM CREEK BED.	
3200S	601511	5	-	20	35	40		120	"					80	110	15	2	130	AV ELLUVIUM	
3220S	601512	10	10	20	30	30		110	BROWN					310	240	30	4	1730	WEATHERED AV FRAGMENTS & Mn STAIN	
3240S	601513	20	-	20	30	30		130	YELLOW					170	220	35	4	340	FRAGMENTS: HIGHLY ALT. QTZ-SERICITE SCHIST	
3260S	601514	-	-	10	20	70		170	"					170	350	35	4	530	ALLUVIAL CLAY FROM UNDERGROUND STREAM	
3280S	601515	20	10	10	30	30		140	"					280	380	35	2	2900	" " " " "	
3300S		CREEK BED																		
3320S	601516	10	20	10	30	30		170	GREY					390	730	45	4	3570	MUDDY SILTY ALLUVIUM	
3340S	601517	15	5	30	30	20	B/A	160	BROWN					420	430	30	4	2050	DEEP AV TOPSOIL & CHARCOAL	
3360S	601518	20	-	20	30	30	C	100	GREY		✓	110		50	10	5	1	30	FRAGMENTS FROM UNWASHING O/C - QTZ-SER SCHIST.	
3380S		ROADSIDE - DISTURBED GROUND																		
3400S	601519	100									✓			120	10	5	2	10	V. HIGHLY ALT. SILICEOUS QTZ-SER. SCHIST.	
3420S		ROLAND CONGL. SCREE						90												
3440S	"	"	"	"	"	"		60												
3460S	601520	20	-	20	30	30	C	90	GREY		✓	100		40	10	5	2	10	FRAGS FROM O/C BENEATH: QTZ-SER. SCHIST	
3480S	601521	30	10	20	10	30	B	40	"					30	10	5	1	20	FRAGS: QTZ-SER. SCHIST - SOME ROLAND SAND	
3500S	601522	15	5	15	15	50	C	80	ORANGE					120	50	15	4	40	FRAGMENTS: QTZ-SERICITE SCHIST	
3520S	601523	20	-	20	30	30	C	110	YELLOW					80	40	15	2	30	" " " " (?)	
3540S	601524	20	5	25	20	30	C	130	BROWN					190	50	25	4	50	" " " " - SOME PITS AFTER	
3560S	601525	20	5	25	30	20	C	130	YELLOW					220	50	45	2	40	" " " " "	
3580S	601526	20	5	25	25	25	B/C	90	BROWN					220	20	30	2	40	" " " " "	
3600S		CENTRE OF SEALED ROAD																		

\* Check assay value.

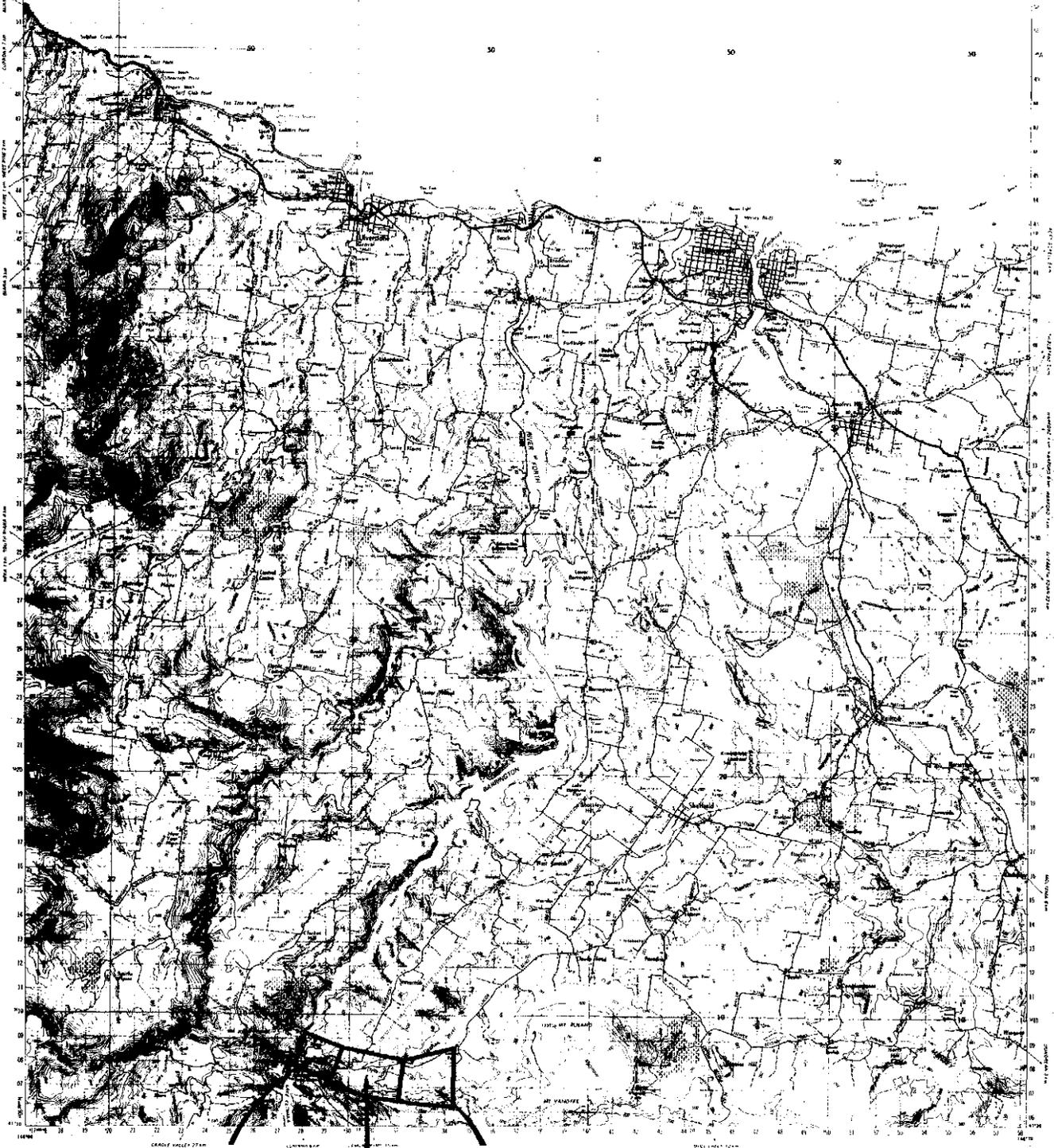
TENEMENT EL 10/76 GEOCHEMICAL SOIL SAMPLING LEDGER  
 AREA/PROSPECT CETHANA EAST SAMPLE Nos. \_\_\_\_\_  
 PLAN REFERENCE PHASE II SOIL SAMPLING

Page No. 9  
 D.P.O. No. \_\_\_\_\_  
 GEOLOGIST GP DATE DEC. 1976  
 ANALYSED BY ROBERTSON RESEARCH

Grid Co-ordinate LINE 22000E (cont.)	Sample No.	Soil Composition					Soil Horizon	Sample		Bedrock			Metal Content in ppm.					Geological observations
		Rock %	Organic %	Sand %	Silt %	Clay %		Depth cm.	Colour	Outcrop	Com- pacted	Est. Depth to	Pb	Zn	Cu	Ag	Mn	
3620S	601527	10	10	20	30	30	C	60	GREY				30	10	10	1	20	FRAGS : QTZ-SER. SCHIST.
3640S	601528	20	5	25	30	20	B	40	YELLOW				250	20	25	4	40	FRAGS : MOD. ALT. PYROCLASTIC.
3660S	601529	10	10	20	25	35	C	160	ORANGE				250	40	40	4	40	" " " "
3680S	601530	20	-	30	20	30	C	50	GREY				40	10	10	2	20	" " " "
3700S	601531	50	5	15	15	15	C	20		✓			30	20	10	2	20	O/C : MOD. ALT. SILICEOUS AV. F. LIMONITE AFTER SULPH.
3720S	601532	15	-	25	25	35	C	150	YELLOW				160	110	30	2	130	FRAGS : QTZ-SER. SCHIST.
3740S	601533	10	10	20	30	30	C	80	BROWN				280	50	50	4	40	FRAGS : DARK QTZ-SER. SCHIST. (AFTER BLACK TOPS?)
3760S	601534	20	-	20	30	30	C	70	"				100	40	25	2	30	FRAGS : QTZ-SER. SCHIST.
3780S	601535	10	10	20	30	30	B	70	"				670	60	55	4	30	WEATHERED AV.
3800S	601536	20	-	25	30	25	C	120	YELLOW				500	50	35	4	20	FRAGS : QTZ-SER. SCHIST.
3820S	601537	20	-	25	30	25	C	110	GREY				130	10	5	2	30	FRAGS : HIGHLY ALT. QTZ-SER. SCHIST.
3840S	601538	20	5	25	25	25	B	150	"				30	10	5	1	20	FRAGS : " " " " "

\* Check assay value.

BASS STRAIT

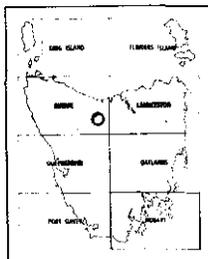


WEST CETHANA      EAST CETHANA      GOWRIE PARK

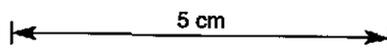
C.R.A. EXPLORATION PTY. LIMITED

LOCATION MAP

BURNIE SK 55-3



INDEX TO 1:250 000 SHEETS



geologist: J.G.P.	scale: 1:250 000	report no: 9041,44
drawn: N.A.P.	date: Nov. '77	plan no: Tc 89



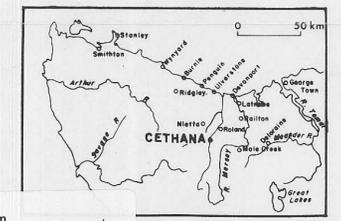
**LEGEND**

- QUATERNARY
  - Qrc - *Screen, alluvium and landslide debris composed predominantly of Roland Conglomerate detritus*
  - Qov - *Screen and alluvium composed predominantly of acid volcanic detritus*
- TERTIARY
  - Tb - *Basalt*
- ORDOVICIAN
  - Roland CONGLOMERATE
    - Qrc - *Coarse, poorly sorted conglomerate composed largely of Precambrian quartzite pebbles and cobbles*
- ACID VOLCANIC AND ASSOCIATED SEDIMENTARY UNITS (Not listed in stratigraphic order)
 

Important Note: Most of these rocks have been hydrothermally altered to quartz-sericite schists. The level of alteration is indicated on the map by the following suffixes:

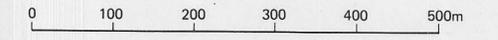
  - g - moderately or highly altered
  - w - weakly altered
  - u - essentially unaltered
- RYHOLITE LAVA?
  - Cr - *Hard, dense igneous rock with small euhedral quartz crystals. Generally weakly altered or unaltered, and non-schistose*
- IGNIMBRITE?
  - Cl - *Semi-massive, welded(?) acid volcanic. Linedated pumice fragments and glass shards. Porphyritic quartz crystals 1-5 mm. Generally moderately altered and slightly schistose*
- LAPILLI TUFF
  - Cl - *Fine pyroclastic composed of airfall, debris 2-25 mm in diameter. Flattened pumice fragments, glass shards, fragments and crystals of quartz, in a fine grained vitric matrix. Usually highly altered.*
  - Ev - *Fine grained, highly vitric sub unit with prominent porphyritic quartz*
- CAMBRIAN
  - GRIT
    - cg - *Variable rock type composed of acid volcanic debris showing some evidence of deposition or transport by water. Most commonly a re-worked lapilli tuff containing angular or sub-rounded fragments of quartz and pumice from 2-25 mm in a sandy matrix. Often contains lithic clasts, including pebbles of Precambrian quartzite, generally 2-10 mm rarely up to 150 mm. Bedding rarely distinguishable. Usually moderately or highly altered*
  - CRYSTAL TUFF
    - cx - *Fine grained vitric tuff with porphyritic quartz crystals from 1-5 mm. Numerous glass shards <2 mm. Generally highly altered and schistose*
  - TUFF
    - ct - *Very fine grained highly altered tuff. Less commonly sandy. Usually at least partly sedimentary but indistinct bedding rarely seen due to alteration. Generally vitric but in places highly siliceous possibly after sinter or cherts. Rare black schists after black shale interbeds. c1w - Tuff shale. Bedded tuffaceous siltstones and shales with rare sandstone and quartz-pebble conglomerate interbeds. Generally weakly to moderately altered and schistose. Largely unaltered where exposed on old Lorinna Road south of Cethana. c1u - Monotonous sequence of coarsely sandy tuffs north of Cethana. Indistinct bedding. Moderately to weakly altered.*
- PRECAMBRIAN
  - QUARTZITE
    - pcq - *Clean, white, recrystallised*
- GEOLOGICAL SYMBOLS
  - // - *Limonite, probably after sulphides*
  - py - *pyrite*
  - gn, cp - *traces of galena and chalcocyprite*
  - f - *ferruginous rocks*
  - s - *silicification*
  - c - *highly chloritic rocks*
  - Mn - *manganese and iron pan material*
  - — — — — *Fault*
  - — — — — *Inferred Fault*
  - ↘ ↙ - *Dip and strike of bedding*
  - ↘ ↙ - *Vertical dip and strike of bedding*
  - ↘ ↙ - *Dip and strike of schistosity*
  - ↘ ↙ - *Vertical dip and strike of schistosity*
  - — — — — *Costean*
  - 77-C.C.5 ↗ ↘ - *Diamond drill hole showing azimuth, dip and depth in metres 180°/55°/164.2m*
  - — — — — *Geological boundary*
  - - - - - *Inferred geological boundary*
  - — — — — *Geochemical grid lines*
  - — — — — *Drainage*

**LOCALITY MAP**



**C.R.A. EXPLORATION PTY. LTD.**  
**GEOLOGICAL MAP**  
**CETHANA EAST — E.L. 10/76**  
**NORTH - WEST TASMANIA**  
**BURNIE SK 55 - 3**

SCALE 1:5000 (approx.) 290059



Geologist: J.G.P.      Date: Sept 77      Report No.: 9044  
 Drawn: Cangraphics Pty Ltd      Plan No.: Tc 84 4840

77-1235



ASARCO - CRAE JV  
 EL 7/73 CRAE  
 EL 10/76 CRAE

Cethana

Sealed road  
 Unsealed road  
 Grid line with soil sample sites at 20m int

LEGEND

- 2972475(1) Drainage sample (A) Asarco (C) CRAE
- 601050 Soil sample
- 603203 Grab rock sample (float or outcrop see ledger for details)
- 603404(A) Rock chip sample over interval shown - outcrop

CRA EXPLORATION PTY LIMITED  
 SAMPLE LOCATION MAP  
 CETHANA EAST - EL. 10/76  
 NORTH - WEST TASMANIA  
 BURNIE SK 55-3  
 SCALE 1:5000 (approx.)

5 cm

Geologist J.G.P.  
 Drawn N.A.P.  
 Report No 9044  
 Plan No Tc 93

4841  
 290060



Sealed road  
 Unsealed road  
 Grid line with soil sample sites at 20m int

LEGEND  
 2300(C) Drainage sample (A) = Asarco (C) = CRAE  
 330 Soil sample  
 330(A) Grab rock sample - float or outcrop  
 330(A) Rock chip sample over interval shown - outcrop  
 Contouring based on soil samples  
 Only reliable soil samples shown

CRA EXPLORATION PTY LIMITED  
 GEOCHEMICAL MAP - ppm LEAD  
 CETHANA EAST - EL. 10/76  
 NORTH - WEST TASMANIA  
 BURNIE SK 55-3  
 SCALE 1:500 (approx)

5 cm

Geologist J.C.P.  
 Drawn N.A.P.  
 290001 4842 Report No 9044 Plan No Tc94



ASARCO - CRAE JV  
 EL 7/73  
 EL 10/76  
 CRAE

Cethana

M N  
 APPROX

Sealed road  
 Unsealed road  
 Grid line with soil sample sites at 20m int

LEGEND  
 (A) Drainage Sample (A) = Asarco (C) = CRAE  
 (S) Soil sample  
 (G) Grab rock sample - float or outcrop  
 (R) Rock chip sample over interval  
 (O) Outcrop  
 Contouring based on soil samples  
 Only reliable soil samples shown

CRA EXPLORATION PTY LIMITED  
 GEOCHEMICAL MAP - ppm ZINC  
 CETHANA EAST - EL. 10/76  
 NORTH - WEST TASMANIA  
 BURNIE SK 55-3  
 SCALE 1 5000 (approx)

5 cm

Geologist J.G.P.  
 Drawn N.A.P.  
 Report No 9044  
 Plan No Tc95

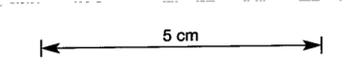
290062 4843



Sealed road   
 Unsealed road   
 Grid line with soil sample sites at 20m int 

**LEGEND**  
 30(A) Drainage sample (A) - Asarco (C) - CRAE  
 30 Soil sample  
 30(R) Grab rock sample - float or outcrop  
 30(R) Rock chip sample - outcrop over interval shown  
 Only reliable soil samples shown

CRA EXPLORATION PTY LIMITED  
 GEOCHEMICAL MAP - ppm COPPER  
**CETHANA EAST - EL. 10/76**  
 NORTH - WEST TASMANIA  
 BURNIE SK 55-3

5 cm 

SCALE 1 5000 (approx.)  
 Geologist J.G.P. Report No 9044  
 Drawn N.A.P. Plan No Tc 96

**290063 4844**



ASARCO - CRAE JV  
 EL. 7/73  
 CRAE  
 EL. 10/76

Cethana

Sealed road  
 Unsealed road  
 Grid line with soil sample sites at 20m int.

LEGEND  
 40 Soil sample  
 40(R) Grab rock sample - float or outcrop  
 40(R) Rock chip sample over interval shown - outcrop  
 ND None detected  
 Only reliable soil samples shown

CRA EXPLORATION PTY LIMITED  
 GEOCHEMICAL MAP - ppm MANGANESE  
 NORTH - WEST TASMANIA  
 BURNIE SK 55-3  
 SCALE 1 5000 (approx.)

5 cm

Geologist J G P  
 Drawn N A P  
 Report No 9044  
 Plan No Tc 97  
 4845  
 290064

SOUTH

NORTH



PROJECT CETHANA EAST, TASMANIA

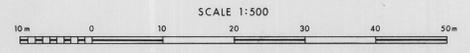
Drill Hole	Depth (m)	Soil Sample No.	Pb (ppm)	Zn (ppm)	Cu (ppm)
77-C.C.4	10.8	so 10.8.1	...	...	...
77-C.C.4	10.8	so 10.8.2	...	...	...
77-C.C.4	10.8	so 10.8.3	...	...	...
77-C.C.4	10.8	so 10.8.4	...	...	...
77-C.C.4	10.8	so 10.8.5	...	...	...
77-C.C.4	10.8	so 10.8.6	...	...	...
77-C.C.4	10.8	so 10.8.7	...	...	...
77-C.C.4	10.8	so 10.8.8	...	...	...
77-C.C.4	10.8	so 10.8.9	...	...	...
77-C.C.4	10.8	so 10.8.10	...	...	...
77-C.C.4	10.8	so 10.8.11	...	...	...
77-C.C.4	10.8	so 10.8.12	...	...	...
77-C.C.4	10.8	so 10.8.13	...	...	...
77-C.C.4	10.8	so 10.8.14	...	...	...
77-C.C.4	10.8	so 10.8.15	...	...	...
77-C.C.4	10.8	so 10.8.16	...	...	...
77-C.C.4	10.8	so 10.8.17	...	...	...
77-C.C.4	10.8	so 10.8.18	...	...	...
77-C.C.4	10.8	so 10.8.19	...	...	...
77-C.C.4	10.8	so 10.8.20	...	...	...
77-C.C.4	10.8	so 10.8.21	...	...	...
77-C.C.4	10.8	so 10.8.22	...	...	...
77-C.C.4	10.8	so 10.8.23	...	...	...
77-C.C.4	10.8	so 10.8.24	...	...	...
77-C.C.4	10.8	so 10.8.25	...	...	...
77-C.C.4	10.8	so 10.8.26	...	...	...
77-C.C.4	10.8	so 10.8.27	...	...	...
77-C.C.4	10.8	so 10.8.28	...	...	...
77-C.C.4	10.8	so 10.8.29	...	...	...
77-C.C.4	10.8	so 10.8.30	...	...	...
77-C.C.4	10.8	so 10.8.31	...	...	...
77-C.C.4	10.8	so 10.8.32	...	...	...
77-C.C.4	10.8	so 10.8.33	...	...	...
77-C.C.4	10.8	so 10.8.34	...	...	...
77-C.C.4	10.8	so 10.8.35	...	...	...
77-C.C.4	10.8	so 10.8.36	...	...	...
77-C.C.4	10.8	so 10.8.37	...	...	...
77-C.C.4	10.8	so 10.8.38	...	...	...
77-C.C.4	10.8	so 10.8.39	...	...	...
77-C.C.4	10.8	so 10.8.40	...	...	...
77-C.C.4	10.8	so 10.8.41	...	...	...
77-C.C.4	10.8	so 10.8.42	...	...	...
77-C.C.4	10.8	so 10.8.43	...	...	...
77-C.C.4	10.8	so 10.8.44	...	...	...
77-C.C.4	10.8	so 10.8.45	...	...	...
77-C.C.4	10.8	so 10.8.46	...	...	...
77-C.C.4	10.8	so 10.8.47	...	...	...
77-C.C.4	10.8	so 10.8.48	...	...	...
77-C.C.4	10.8	so 10.8.49	...	...	...
77-C.C.4	10.8	so 10.8.50	...	...	...
77-C.C.4	10.8	so 10.8.51	...	...	...
77-C.C.4	10.8	so 10.8.52	...	...	...
77-C.C.4	10.8	so 10.8.53	...	...	...
77-C.C.4	10.8	so 10.8.54	...	...	...
77-C.C.4	10.8	so 10.8.55	...	...	...
77-C.C.4	10.8	so 10.8.56	...	...	...
77-C.C.4	10.8	so 10.8.57	...	...	...
77-C.C.4	10.8	so 10.8.58	...	...	...
77-C.C.4	10.8	so 10.8.59	...	...	...
77-C.C.4	10.8	so 10.8.60	...	...	...
77-C.C.4	10.8	so 10.8.61	...	...	...
77-C.C.4	10.8	so 10.8.62	...	...	...
77-C.C.4	10.8	so 10.8.63	...	...	...
77-C.C.4	10.8	so 10.8.64	...	...	...
77-C.C.4	10.8	so 10.8.65	...	...	...
77-C.C.4	10.8	so 10.8.66	...	...	...
77-C.C.4	10.8	so 10.8.67	...	...	...
77-C.C.4	10.8	so 10.8.68	...	...	...
77-C.C.4	10.8	so 10.8.69	...	...	...
77-C.C.4	10.8	so 10.8.70	...	...	...
77-C.C.4	10.8	so 10.8.71	...	...	...
77-C.C.4	10.8	so 10.8.72	...	...	...
77-C.C.4	10.8	so 10.8.73	...	...	...
77-C.C.4	10.8	so 10.8.74	...	...	...
77-C.C.4	10.8	so 10.8.75	...	...	...
77-C.C.4	10.8	so 10.8.76	...	...	...
77-C.C.4	10.8	so 10.8.77	...	...	...
77-C.C.4	10.8	so 10.8.78	...	...	...
77-C.C.4	10.8	so 10.8.79	...	...	...
77-C.C.4	10.8	so 10.8.80	...	...	...
77-C.C.4	10.8	so 10.8.81	...	...	...
77-C.C.4	10.8	so 10.8.82	...	...	...
77-C.C.4	10.8	so 10.8.83	...	...	...
77-C.C.4	10.8	so 10.8.84	...	...	...
77-C.C.4	10.8	so 10.8.85	...	...	...
77-C.C.4	10.8	so 10.8.86	...	...	...
77-C.C.4	10.8	so 10.8.87	...	...	...
77-C.C.4	10.8	so 10.8.88	...	...	...
77-C.C.4	10.8	so 10.8.89	...	...	...
77-C.C.4	10.8	so 10.8.90	...	...	...
77-C.C.4	10.8	so 10.8.91	...	...	...
77-C.C.4	10.8	so 10.8.92	...	...	...
77-C.C.4	10.8	so 10.8.93	...	...	...
77-C.C.4	10.8	so 10.8.94	...	...	...
77-C.C.4	10.8	so 10.8.95	...	...	...
77-C.C.4	10.8	so 10.8.96	...	...	...
77-C.C.4	10.8	so 10.8.97	...	...	...
77-C.C.4	10.8	so 10.8.98	...	...	...
77-C.C.4	10.8	so 10.8.99	...	...	...
77-C.C.4	10.8	so 10.8.100	...	...	...

PROJECT CETHANA EAST, TASMANIA

Drill Hole	Depth (m)	Soil Sample No.	Pb (ppm)	Zn (ppm)	Cu (ppm)
77-C.C.5	10.8	so 10.8.1	...	...	...
77-C.C.5	10.8	so 10.8.2	...	...	...
77-C.C.5	10.8	so 10.8.3	...	...	...
77-C.C.5	10.8	so 10.8.4	...	...	...
77-C.C.5	10.8	so 10.8.5	...	...	...
77-C.C.5	10.8	so 10.8.6	...	...	...
77-C.C.5	10.8	so 10.8.7	...	...	...
77-C.C.5	10.8	so 10.8.8	...	...	...
77-C.C.5	10.8	so 10.8.9	...	...	...
77-C.C.5	10.8	so 10.8.10	...	...	...
77-C.C.5	10.8	so 10.8.11	...	...	...
77-C.C.5	10.8	so 10.8.12	...	...	...
77-C.C.5	10.8	so 10.8.13	...	...	...
77-C.C.5	10.8	so 10.8.14	...	...	...
77-C.C.5	10.8	so 10.8.15	...	...	...
77-C.C.5	10.8	so 10.8.16	...	...	...
77-C.C.5	10.8	so 10.8.17	...	...	...
77-C.C.5	10.8	so 10.8.18	...	...	...
77-C.C.5	10.8	so 10.8.19	...	...	...
77-C.C.5	10.8	so 10.8.20	...	...	...
77-C.C.5	10.8	so 10.8.21	...	...	...
77-C.C.5	10.8	so 10.8.22	...	...	...
77-C.C.5	10.8	so 10.8.23	...	...	...
77-C.C.5	10.8	so 10.8.24	...	...	...
77-C.C.5	10.8	so 10.8.25	...	...	...
77-C.C.5	10.8	so 10.8.26	...	...	...
77-C.C.5	10.8	so 10.8.27	...	...	...
77-C.C.5	10.8	so 10.8.28	...	...	...
77-C.C.5	10.8	so 10.8.29	...	...	...
77-C.C.5	10.8	so 10.8.30	...	...	...
77-C.C.5	10.8	so 10.8.31	...	...	...
77-C.C.5	10.8	so 10.8.32	...	...	...
77-C.C.5	10.8	so 10.8.33	...	...	...
77-C.C.5	10.8	so 10.8.34	...	...	...
77-C.C.5	10.8	so 10.8.35	...	...	...
77-C.C.5	10.8	so 10.8.36	...	...	...
77-C.C.5	10.8	so 10.8.37	...	...	...
77-C.C.5	10.8	so 10.8.38	...	...	...
77-C.C.5	10.8	so 10.8.39	...	...	...
77-C.C.5	10.8	so 10.8.40	...	...	...
77-C.C.5	10.8	so 10.8.41	...	...	...
77-C.C.5	10.8	so 10.8.42	...	...	...
77-C.C.5	10.8	so 10.8.43	...	...	...
77-C.C.5	10.8	so 10.8.44	...	...	...
77-C.C.5	10.8	so 10.8.45	...	...	...
77-C.C.5	10.8	so 10.8.46	...	...	...
77-C.C.5	10.8	so 10.8.47	...	...	...
77-C.C.5	10.8	so 10.8.48	...	...	...
77-C.C.5	10.8	so 10.8.49	...	...	...
77-C.C.5	10.8	so 10.8.50	...	...	...
77-C.C.5	10.8	so 10.8.51	...	...	...
77-C.C.5	10.8	so 10.8.52	...	...	...
77-C.C.5	10.8	so 10.8.53	...	...	...
77-C.C.5	10.8	so 10.8.54	...	...	...
77-C.C.5	10.8	so 10.8.55	...	...	...
77-C.C.5	10.8	so 10.8.56	...	...	...
77-C.C.5	10.8	so 10.8.57	...	...	...
77-C.C.5	10.8	so 10.8.58	...	...	...
77-C.C.5	10.8	so 10.8.59	...	...	...
77-C.C.5	10.8	so 10.8.60	...	...	...
77-C.C.5	10.8	so 10.8.61	...	...	...
77-C.C.5	10.8	so 10.8.62	...	...	...
77-C.C.5	10.8	so 10.8.63	...	...	...
77-C.C.5	10.8	so 10.8.64	...	...	...
77-C.C.5	10.8	so 10.8.65	...	...	...
77-C.C.5	10.8	so 10.8.66	...	...	...
77-C.C.5	10.8	so 10.8.67	...	...	...
77-C.C.5	10.8	so 10.8.68	...	...	...
77-C.C.5	10.8	so 10.8.69	...	...	...
77-C.C.5	10.8	so 10.8.70	...	...	...
77-C.C.5	10.8	so 10.8.71	...	...	...
77-C.C.5	10.8	so 10.8.72	...	...	...
77-C.C.5	10.8	so 10.8.73	...	...	...
77-C.C.5	10.8	so 10.8.74	...	...	...
77-C.C.5	10.8	so 10.8.75	...	...	...
77-C.C.5	10.8	so 10.8.76	...	...	...
77-C.C.5	10.8	so 10.8.77	...	...	...
77-C.C.5	10.8	so 10.8.78	...	...	...
77-C.C.5	10.8	so 10.8.79	...	...	...
77-C.C.5	10.8	so 10.8.80	...	...	...
77-C.C.5	10.8	so 10.8.81	...	...	...
77-C.C.5	10.8	so 10.8.82	...	...	...
77-C.C.5	10.8	so 10.8.83	...	...	...
77-C.C.5	10.8	so 10.8.84	...	...	...
77-C.C.5	10.8	so 10.8.85	...	...	...
77-C.C.5	10.8	so 10.8.86	...	...	...
77-C.C.5	10.8	so 10.8.87	...	...	...
77-C.C.5	10.8	so 10.8.88	...	...	...
77-C.C.5	10.8	so 10.8.89	...	...	...
77-C.C.5	10.8	so 10.8.90	...	...	...
77-C.C.5	10.8	so 10.8.91	...	...	...
77-C.C.5	10.8	so 10.8.92	...	...	...
77-C.C.5	10.8	so 10.8.93	...	...	...
77-C.C.5	10.8	so 10.8.94	...	...	...
77-C.C.5	10.8	so 10.8.95	...	...	...
77-C.C.5	10.8	so 10.8.96	...	...	...
77-C.C.5	10.8	so 10.8.97	...	...	...
77-C.C.5	10.8	so 10.8.98	...	...	...
77-C.C.5	10.8	so 10.8.99	...	...	...
77-C.C.5	10.8	so 10.8.100	...	...	...



C.R.A. EXPLORATION PTY. LIMITED  
**DIAMOND DRILL SECTION 77-C.C.4+5**  
 ALONG LINE 21750 E LOOKING W.  
 CETHANA EAST - E.L. 10/76  
 NORTH - WEST TASMANIA  
 BURNIE SK 55-3



Geologist: J.G.P. Date: May 1977 Report No. 9044  
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