

CRA EXPLORATION PTY. LIMITED

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EL 43/70 ARTHUR RIVER AREA,

REPORT ON EXPLORATION FOR

12 MONTHS TO 15th OCTOBER, 1984.

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CONTENTS

	<u>Page No.</u>
1. SUMMARY	1
2. INTRODUCTION	1
3. CONCLUSIONS	2
4. RECOMMENDATIONS	3
5. LOCATION AND ACCESS	4
6. PREVIOUS EXPLORATION	5
7. GEOLOGY	6
8. 1983 - 1984 WORK PROGRAMME	7
8.1 Diamond Drilling	7
8.1.1 Drilling at the Lyons River Prospect	7
8.1.2 Drilling at Keith-Arthur River Prospect	15
8.1.3 Drilling at the Cann Creek Prospect	21
8.2 Detailed Geological Evaluation	22
8.2.1 Geological mapping at the Keith-Arthur River Prospect	22
8.2.2 Geophysics Keith-Arthur River Prospect	23
8.2.3 Geological mapping of North Lyons River Prospect	23
8.2.4 Geological mapping, Cann Creek Prospect	24
8.3 Bulk sampling at Pinner Magnesite	24
8.4 Biogeochemical survey at Lyons River Prospect	25
9. REFERENCES	26
10. KEYWORDS	26
11. LIST OF APPENDICES	26
12. LIST OF PLANS	27

002

1. SUMMARY

Exploration has continued for magnesite and dolomite layered bodies in EL 43/70. Two bodies have been outlined, the Keith - Arthur Rivers prospect and the Lyons River prospect. A third zone has also been identified at Cann Creek.

The Keith - Arthur River prospect contains a carbonate body occurring over a 3,500m strike length with a thickness from 150 to 400 metres. Four kilometres south along strike is the Lyons River prospect. It has magnesite body over 2000m long and up to 400 metres thick which grades to dolomite to the south.

About seven kilometres north of the Keith - Arthur prospect occurs the Cann Creek prospect which varies laterally, in about 500m, from magnesite to dolomite. The width of the carbonate is up to 200 metres.

Magnesite commonly constitutes 70% of the rock in the carbonate bodies and in parts may be as rich as 98%. Dolomite is usually associated with the magnesite at about 20% but in some bands may be 95%. Silica forms the remaining accessory at 10%. Overburden on the magnesite is silica after carbonate, clay and or basalt and gravels.

2. INTRODUCTION

Exploration work carried out between December 1982 and October 1983 consisted of detailed mapping and the development of 6 diamond drill holes for a total of 1594 metres. Two major magnesite bodies - the Lyons River deposit and the Arthur River were outlined.

Over the past 12 months period the following exploration work has been carried out:-

- * One hole DD83 LR5 at Lyons River drilled midway between LR1 and LR2 to test continuity of magnesite body.

- * A bulk sample of approximately 8 tonne from the Pinner outcrops in the northern section of the Lyons River deposit to provide material for initial beneficiation tests.
- * Drilling out of Arthur River deposit on 400 metre centres, 5 drill holes for 1255 metres.
- * A six hole evaluation drilling programme in the northern section of Lyons River deposit. To test lateral and vertical continuity, provide additional samples for test work and outline a possible initial mining area.
- * Detailed mapping and the development of one diamond drill hole to test the Cann Creek magnesite horizon - a separate horizon 4km north-west of the Lyons River - Arthur River horizon.

3. CONCLUSIONS

- * A major magnesite body has been outlined at the Lyons River deposit. The zone is over 2000 metres long by up to 400 metres wide and at least 270 metres deep and contains an estimated thirty million tonnes ¹ of plus 40% MgO with 1.10% Fe₂O₃, 2.55% CaO and 5.53% SiO₂ down to the level of the Lyons River.
- * Within the deposit there are large zones of plus 35% MgO with average Fe₂O₃ 1.09, CaO 3.39 and SiO₂ 7.20. Dolomite is relatively minor and occurs as distinct grey bands.
- * Much of the low grade (+35% MgO) consist of angular magnesite breccia with white magnesite and grey dolomite. This material can be easily beneficiated by floatation to remove the dolomite (and most of the SiO₂) leaving high grade magnesite with low iron. Other impurities such as boron and sulphur are low.

1 Calculated by the sectional method.

- * Control drilling in the Pinner section of the deposit (believed to be a higher grade area) has raised problems of lateral and vertical correlation of individual dolomite / magnesite units and indicates potential grade control difficulties.
- * A second magnesite body exists under alluvial cover between the Keith and Arthur Rivers. This deposit is still poorly defined but at least is 3500 metres long by 150 to 400m wide and a depth of over 165 metres. Average overburden is 15 metres and some thirty million tonnes of plus 40% magnesite are indicated to a depth of 100 metres.
- * High grade zones of +40% magnesite within the deposit have average Fe2O3 1.57%, CaO 2.17% and SiO2 6.35%.
- * There are a greater number of cavities in the deposit than at Lyons River. These may present a mining problem.
- * Cann Creek magnesite occurs as an outcrop of limited extent as indicated by a diamond drill hole which failed to intersect magnesite.

4. RECOMMENDATIONS

1. No further exploration work is required at the Lyons or Arthur River deposits. Because sufficient resource has been outlined future work is of development nature. This development work should be carried out by Mineral Resource Studies section.
2. Further work is required to define the extension of magnesite along the Cann Creek horizon, but this work should be postponed until the future of the Lyons River deposit is decided.

3. Regional mapping should be continued to define the southern extension of the Lyons River deposit and to search for additional horizons east of the Lyons River.

5. LOCATION AND ACCESS

A map showing the location of EL 43/70 is presented in Plan TASH 1510.

Access to the main areas of interest is via the Waratah Highway to Henrietta then by sealed and gravelled minor roads to the former sawmilling centre at West Takone. An all-weather forestry road continues beyond West Takone, over the Arthur and Keith Rivers and almost to the Lyons River. This road ends at the Lyons River prospect. Numerous logging tracks beyond this area generally only accessible by foot.

Topography in the area is rugged with relief up to 400m and slopes locally up to 50°. Vegetation consists of horizontal scrub on valley slopes and myrtle and hardwood forests on ridge tops. Ground conditions during winter are very boggy, severely hampering normal exploration and siting of drill rigs.

Outcrop throughout the region is generally poor with most exposures being restricted to road cuttings. The magnesite outcrops are bold but widely scattered. Road cuttings over the known magnesite commonly expose a distinctive yellow sandy clay with magnesite or silica fragments. Where present this is regarded as an indication of underlying magnesite.

6. PREVIOUS EXPLORATION

Magnesite was first identified in 1925 by P.B. Nye (Nye 1925) who assayed "dolomite" outcrops from the northern banks of the Arthur River while assessing the suitability of the area for a dam site. These samples returned MgO values of 45 - 47.6% showing the material to be nearly pure magnesite.

Nye subsequently reported outcrops of dolomite and magnesite in Cann Creek some 6km north of the Arthur River occurrence.

Since Mineral Holdings Australia obtained EL 43/70 numerous companies have explored the area under joint venture arrangements. B.H.P. examined and sampled outcrops at the Arthur River prospect (Flood et al; 1971). A.O. (Australia) drilled two percussion holes there and Osterreichish Amerikanische Magnesite AG (OAMAG) followed this work up with four shallow diamond drillholes (relogged and presented in Appendix VIII in Williams; 1983). CRAE explored parts of the area in 1971 for basemetals associated with the Keith River gossan zone (Porter 1971). Two diamond holes were drilled, however, no significant basemetal concentrations were identified.

During the tenure of EL 43/70 Mineral Holdings Australia located three groups of magnesite outcrops in the Lyons River area and carried out minor trenching and sampling. Magnesite was located in the Lyons River, on the northern slopes of a tributary of the Lyons River north of B.A. Creek, and on the high slopes east of the Lyons River. The last mentioned group of outcrops is referred to as the Pinner outcrops.

In the first year the EL 43/70 magnesite exploration joint venture, of CRAE with Mineral Holdings Australia, two potentially large deposits of moderate - high grade magnesite were identified by geological mapping and diamond drilling.

Three drillholes in the Lyons River prospect gave encouraging results and outlined a major body of magnesite at least 1000m long and from 200m - 400m wide.

Mapping at the Keith - Arthur prospect suggested a body of magnesite covered by alluvium. One of the two diamond drill holes put down intersected magnesite and more drilling was planned.

7. GEOLOGY

The magnesite deposits in the Arthur River region are situated in a north-northeast striking belt of highly deformed Precambrian rocks known as the Arthur Lineament. The Arthur Lineament varies from 8km to 15km wide and extends from Wynyard on the northwest coast to an area north of Granville Harbour on the west coast of Tasmania. The Savage River iron ore and magnesite deposits occur within the Arthur Lineament and along with their host rocks are thought to be correlatives of similar rocks within the Arthur River E.L.

The area north of the Arthur River within EL 43/70 is largely underlain by Permian conglomerate - mudstone and Tertiary basalt. These rocks effectively bury the Precambrian rocks of the Arthur Lineament. A block of down-faulted Permian rocks also occurs to the west of Lyons River - Arthur River magnesite deposits. (See Plan TASH 1435).

The area abutting the magnesite zone to the east is underlain by quartz schists and quartz-mica schists known as the Keith Schists. These rocks are regarded as the hanging wall sequence. The western footwall sequence is dominated by amphibolite and pyritic siltstone. The Keith River gossan zone is situated within this sequence and is possibly a correlative of the Savage River pyrite - magnetite deposits. The magnesite horizon is thought to be a conformable stratigraphic unit.

In view of the poor outcrop in the area detailed structural information is not available. However drilling suggest that the magnesite is dipping vertically or up to 70 degrees to the south east.

8. 1983 - 1984 WORK PROGRAMME

The exploration programme consisted of diamond drilling and chemical analyses of core, detailed geological evaluation by geological mapping, bulk sampling and testing, plus some biogeological sampling.

8.1 Diamond Drilling

Fourteen (14) diamond drill holes were put down to a total of 2963 metres. Eight (8) holes were developed in the Lyons River prospect, totalling 1419 metres. Five (5) holes in the Keith - Arthur River prospect, totalling 1255 metres. One hole near Cann Creek was drilled to a depth of 289 metres.

8.1.1 Drilling at the Lyons River Prospect

DD83 LR5 mentioned by Williams (1983; CRA Report 12283) was completed. The collar position is 450 metres south of DD83 LR2, approximately midway between DD83 LR2 and DD82 LR1. Aim of the drilling was to test the continuity of the magnesite between these holes. It intersected a carbonate zone totalling 334 metres and terminated in pyritic calc-siltstones and amphibolite footwall rocks. Samples approximately five metres in length were taken from split core and analysed by Zinc Corporation, Broken Hill. The results (see Appendix 1 for log and analyses) confirmed that the magnesite is continuous.

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- 8 -

DD83 LR5 Summary Log

From (m)	To (m)	
0	24.0	Tricone
24.0	102.4	Sandy dolomite
102.4	118.3	Sandy dolomite with 40% magnesite patches
118.3	133.6	Sandy dolomite
133.6	205.2	(71.6) Magnesite
205.2	262.6	Complex mixture of magnesite and siliceous sandy dolomite
262.6	444.5	(181.9) Magnesite
444.5	446.5	Sandy dolomite
446.5	447.7	Pyritic calc. siltstone
447.7	452.5	Amphibolite

E.O.H.

Plus 40% MgO analyses in DD83 LR5

from	to	length	Fe2O3	CaO	SiO2	Al2O3	LOI	
			MgO					
155.30	157.30	2.00	41.70	0.47	0.62	9.65	0.06	46.50
164.00	168.00	4.00	41.40	0.24	1.90	9.60	0.07	45.60
181.00	195.00	14.00	42.34	0.32	1.42	9.02	0.08	46.04
197.00	203.20	6.20	41.49	1.10	2.02	6.84	0.03	47.66
230.00	236.60	6.60	43.53	0.45	1.24	5.36	0.07	48.28
297.00	302.00	5.00	40.50	0.81	3.10	9.60	0.06	46.40
335.00	339.30	4.30	40.10	0.38	2.88	8.90	0.07	46.60
340.40	345.50	5.10	40.60	0.43	4.00	8.10	0.03	46.00
358.00	363.00	5.00	41.00	0.42	3.78	6.80	0.10	47.40
383.74	353.00	391.50	41.73	0.27	4.12	5.93	0.04	47.79
400.00	405.00	5.00	40.20	0.41	4.70	5.70	0.07	47.90
415.00	418.80	3.80	40.30	0.83	4.22	6.95	0.07	47.30
438.40	441.20	2.80	42.30	2.64	3.44	1.97	0.08	49.70
	Average	(72.3)	41.50	0.57	2.78	7.39	0.06	47.06

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A plan of the section is shown on plan no. TASH 1516, and a graphic plot of the analyses on TASH 1526.

Pinner Grid - A grid for six drill holes was laid out near Pinner magnesite outcrop and centered over the section of DD83 LR2. Two holes were on the DD83 LR2 section and two pairs either side on parallel sections 200 metres north and south. The aim of the drilling was to test the continuity of high grade magnesite found in the lower part of DD83 LR2, to provide material for beneficiation tests and outline a potential high grade mining area.

DD84 LR6 Collar position is located 115 metres west of DD83 LR2 collar and on the same section line. Carbonate thickness, mixed magnesite and dolomite was 188 metres with a weathered carbonate top covered by basalt float.

DD84 LR6 was completed at 223 metres in footwall schists. A summary log is as follows :-

From (m)	To (m)	
0	15.5	Clay
15.5	56.2	Cryptocrystalline magnesite in sandy to sparry matrix
56.2	76.8	Dolomite
76.8	106.8	Cryptocrystalline magnesite in sandy and dolomitic matrix
106.8	134.6	Dolomite
134.6	196.5	Cryptocrystalline magnesite
196.5	205.5	Sand filled cavity
205.5	223	Schist

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- 10 -

Analyses for +40% MgO in DD84 LR6

from	to	interval	MgO	Fe2O3	CaO	SiO2	LOI
81.00	104.50	23.50	42.64	1.55	1.26	7.07	47.36
144.50	150.00	5.50	40.40	1.26	1.59	11.00	45.18
160.00	180.00	20.00	41.70	1.91	3.14	6.77	45.98
185.00	194.50	9.50	40.41	2.31	4.98	3.97	47.73
Average		(58.5)	41.75	1.77	2.54	6.83	46.74

Drill logs are in Appendix 2, section shown on plan no. TASH 1779 and graphic assay log on TASH 1775.

DD84 LR7 Collar position is 200 metres north of LR6. Carbonate consisting of magnesite and dolomite totaled 137 metres thickness. Basalt float and weathered carbonate was at the top. The footwall was weathered schist, and a summary log is as follows :-

From (m)	To (m)	
0	6	Basalt float
6	27	Weathered magnesite
27	158	Cryptocrystalline magnesite with sparry veins and dolomite matrix
158	164	Yellow-brown clay - cavity fill
164	176	Schist and quartzite

E.O.H.

Analyses for plus 40% MgO in DD84 LR7 are :-

from	to	interval	MgO	Fe2O3	CaO	SiO2	LOI
55.00	107.80	52.80	42.10	0.44	1.62	8.40	47.18
120.00	130.00	10.00	41.05	0.53	2.31	9.20	46.59
132.70	146.00	13.30	43.45	0.82	2.65	3.27	49.57
Average		(76.1)	42.20	0.52	1.89	7.61	47.52

Drill logs are in Appendix 3, section shown on plan no. TASH 1777, and graphic analyses log on TASH 1776.

DD84 LR8 Collar position was 75 metres west of LR7. No fresh carbonate was intersected. Basalt float and a weathered schist footwall were encountered.

A summary log of DD84 LR8 is :-

From (m)	To (m)	
0	2	Basalt
2	49	Weathered magnesite
49	59	Weathered schist and quartzite

E.O.H.

Drill log is in Appendix 4 and section on plan no. TASH 1777.

DD84 LR9 Collar position was 200 metres south of LR6. Carbonate, consisting of magnesite and dolomite beds, totalled 174 metres. Weathered carbonate covered the magnesite and the footwall was fresh pyritic schists and amphibolite.

A summary log is :-

From (m)	To (m)	
0	3	Soil
3	22	Weathered magnesite
22	92.8	Cryptocrystalline magnesite with sparry and dolomite matrix
92.8	128	Dolomite
128	131.3	Magnesite
131.3	134	Yellow sandy clay
134	143	Dolomite

143	151.6	Magnesite
151.6	156.6	Grey dolomite
156.6	176.1	Magnesite
176.1	180.9	Dolomite
180.9	189.5	Magnesite
189.5	192.2	Dolomite
192.2	196.7	Magnesite
196.7	205.6	Banded pyritic schist
205.6	209.0	Pyritic amphibolite

E.O.H.

Plus 40% MgO analyses are :-

from	interval		Fe2O3		SiO2	
	to	MgO		CaO		LOI
68.00	73.90	5.90	42.27	0.82	1.38	47.44
83.50	89.30	5.80	41.70	0.65	1.67	46.71
125.00	139.10	14.10	42.00	1.59	2.19	48.19
139.80	148.60	8.80	41.07	4.15	3.42	48.71
Average	(34.6)	41.76	1.95	0.87	5.84	47.95

Drill log is in Appendix 5, a section shown on plan no. TASH 1778, and graphic analyses log in TASH 1780.

DD84 LR10 Collar position in 82 metres west of LR9. Carbonate, consisting of magnesite and dolomite beds, totaled 103 metres. There was weathered carbonate cover and a weathered schist footwall. A summary log is as follows :-

From (m)	To (m)	
0	22	Weathered magnesite
22	41.4	Massive grey dolomite
41.4	47	Cavity
47	50	Magnesite
50	71	Sandy grey dolomite

- 13 -

71	86.7	Magnesite
86.7	98	Magnesite strong iron staining on cavities
98	101	Yellow clay and dolomite
101	103	Cavity
103	119	Dolomite with minor magnesite
119	122	Magnesite
122	125	Cavity
125	138	Chloritic schist and quartzite

E.O.H.

Analyses for plus 35% MgO are :-

from	to	interval	MgO	Fe2O3	CaO	SiO2	LOI
38.00	44.00	6.00	40.53	2.36	3.48	5.97	47.03
71.00	86.70	15.70	38.83	1.92	4.37	11.74	43.02
91.70	98.00	6.30	36.71	3.26	6.81	7.10	45.94
119.00	122.00	3.00	36.57	2.26	7.88	7.59	45.48
Average		(31.0)	38.51	2.31	5.03	9.28	44.63

Drill logs are in Appendix 6, section on plan No. TASH 1778 and graphic analyses log in TASH 1781.

DD84 LR11 & LR11A LR11 was 109 metres west of DD83 LR2 collar but was abandoned at 37 metres depth because of ground slump. Eleven (11) metres of carbonate were drilled, see section on plan no. TASH 1913. LR11A was collared 185 metres west of LR2 and along the LR2 section. It traversed 95 metres of carbonate as magnesite and dolomite beds. Cavities with sand-clay fill were prominent. The footwall was weathered schist.

- 14 -

A summary of LR11A drill log is :-

From (m)	To (m)	
0	23	Weathered magnesite
23	49.6	Grey dolomite commonly with yellow brown clay
49.6	89.0	Cryptocrystalline magnesite 'clasts' in sparry and dolomite matrix. Numerous clay bands.
89.0	98.3	Clay with minor magnesite sections
98.3	101.0	Cavity
101.0	128.0	Clay and weathered schist

E.O.H.

Analyses for the +40% MgO intervals are as follows :-

from	to	interval	MgO	Fe2O3	CaO	SiO2	Al2O3	LOI
41.20	41.40	0.20	42.17	0.50	3.87	4.94	0.05	48.56
85.30	88.00	0.70	42.72	0.92	0.57	8.69	0.05	47.02
91.30	92.00	0.70	42.92	0.79	1.63	6.88	0.05	47.66
Average		(1.6)	42.79	0.81	1.45	7.53	0.05	47.49

Drill logs are in Appendix 7, section on plan no. TASH 1913, and graphic log and analyses on plan no. TASH 1991.

Results of the drilling and analyses proved dissappointing. The high grade magnesite occurring in the lower part of DD83 LR2 was absent, the carbonate encountered being more dolomitic. However LR7 to the north contained good grades of magnesite.

The footwall area of the Pinner grid exhibits deeper weathering than other parts of the section. The weathering can be up to 30 metres deep.

8.1.2 Drilling at Keith - Arthur River Prospect

Between the confluence of the Arthur and Keith Rivers occurs an alluvium area which has much less relief than the surrounding valleys. The area is south west of the Victory Springs magnesite (Nye, 1925) and regional mapping (described in section 8.2.1) suggested that the magnesite continued beneath the alluvium.

A diamond drill hole confirmed the presence of good widths of magnesite beneath the alluvial cover at the Keith - Athur River prospect (Williams, 1983). Consequently it was decided to drill the prospect on 400 metre centres. The drilling is described below.

DD83 AR3 Collar position was midway between DD83 AR1 and DD83 AR2, approximately 1050 metres south west of AR1. Total carbonate thickness was 317 metres including some sandstone bands plus an inferred sink hole to 76.8 metres depth. The footwall rock was pyritic siltstone.

The results confirmed that the sequence is continuous, but that krastic features may be prominent. A summary of the drill log is as follows :-

- 16 -

From (m)	To (m)	
0	78	Weathered magnesite possible sink hole
78	125	Magnesite - dolomite mix
125	130.5	Quartz sandstone
130.5	132.5	Magnesite - dolomite mix
132.5	134	Quartz sandstone
134	161.2	Magnesite - dolomite mix
161.2	163.6	Quartz sandstone
163.6	393.2	Magnesite - dolomite mix
393.2	399.7	Schist - siltstone
399.7	408	Possible amphibolite

E.O.H.

Analyses of +40% MgO are :-

from	to	interval	MgO	Fe2O3	CaO	SiO2	LOI
78.00	90.00	12.00	41.67	3.63	0.36	8.47	45.59
139.00	144.00	5.00	40.48	1.47	5.28	4.31	48.21
159.00	161.20	2.20	40.27	1.27	1.19	12.27	44.48
167.00	176.00	9.00	41.48	1.53	2.17	7.33	47.31
184.00	225.00	41.00	42.90	2.36	2.28	3.19	49.08
235.00	242.60	7.60	44.13	0.74	2.64	2.71	49.68
243.00	249.10	6.10	43.51	1.07	2.70	2.85	49.19
251.30	256.00	4.70	41.29	0.93	2.31	8.38	46.63
Average		(86.6)	42.44	2.06	2.05	4.84	48.18

The drill logs are in Appendix 8, section on plan no. TASH 1560 and graphic analyses log in TASH 1559.

DD83 AR4 and AR5 Collared midway between DD83 AR1 and DD83 AR3, about 660 metres southwest of AR1, AR4 was abandoned at a depth of 32 metres. AR5 was spudded in nearby. Quarternary alluvium 33 metres (downhole) thick covered carbonate 115 metres thick. The carbonate was pyritic from 100.8 to 142.9 metres and footwall rock consisted of pyritic calc siltstone. A summary of DD83 AR5 log :-

From (m)	To (m)	
0	32.9	Alluvium
32.9	87.0	Magnesite (54.1m)
87.0	110.0	Magnesite - dolomite mix
110.0	119.4	Sandy dolomite
119.4	123.0	Pale green slate
123.0	126.3	Magnesite - dolomite mix
126.3	130.0	Pale green slate
130.0	142.9	Pyritic angular magnesite breccia
142.9	146.2	Magnesite with minor sandy dolomite patches
146.2	150.0	Pyritic magnesite - dolomite mix
150.0	155.0	Fault gouge

E.O.H.

Plus 35% MgO analyses are :-

from	interval	Fe2O3	SiO2				
to	MgO	CaO	LOI				
32.95	48.00	15.05	41.94	1.23	2.47	6.44	47.69
60.00	68.50	8.50	37.42	1.75	6.25	8.77	45.60
135.00	139.00	4.00	35.46	2.30	11.73	2.00	47.99
Average	(27.55)	39.60	1.55	4.98	6.51		47.09

Drill logs are in Appendix 9, section on plan no. TASH 1564 and graphic analyses log in TASH 1563. The results confirm that the sequence is continuous.

DD83 AR6 Collared position is midway between DD83 AR2 and DD83 AR3, approximately 1400 metres south west of DD83 AR1. Total carbonate thickness was 279 metres with cavities up to 30 metres wide and fault gouging at the bottom of the hole. Hanging wall schists cover the carbonate to 71 metres. The log is summarized as :-

From (m)	To (m)	
0	71.0	No core. Alluvium and weathered hanging wall schist
71.0	76.4	Angular magnesite breccia
76.4	114.0	Cavity rubble filled
114.0	271.0	Magnesite massive and brecciated
271.0	282.0	Cuneiform magnesite
282.0	352.3	Massive magnesite
352.3	382.0	Open cavity

E.O.H.

Analyses of plus 40% MgO are :-

from	to	interval	MgO	Fe2O3	CaO	SiO2	LOI
114.20	116.30	2.10	42.41	0.22	1.75	8.13	47.29
124.00	125.80	1.80	41.03	0.45	2.83	9.05	46.56
130.30	132.40	2.10	43.02	0.55	1.66	6.61	47.55
133.00	143.00	10.00	41.92	0.37	2.18	8.41	46.99
163.00	166.40	3.40	41.15	0.81	2.42	8.96	46.23
179.30	189.00	9.70	40.80	0.57	2.99	8.82	46.73
194.00	208.00	14.00	41.07	3.87	3.03	7.98	46.84
224.00	229.00	5.00	40.09	3.42	2.74	5.16	47.52

280.00	287.00	7.00	41.07	1.14	2.93	7.59	47.21
293.40	298.00	4.60	42.63	0.77	1.81	7.09	47.68
303.00	313.00	10.00	42.89	0.31	3.05	5.10	48.69
318.00	323.00	5.00	41.34	1.06	1.46	10.15	45.89
328.00	336.40	8.40	41.75	1.26	2.03	7.97	46.91
338.00	348.00	10.00	41.09	0.77	2.41	9.27	46.46
Average		(93.1)	41.51	1.33	2.50	7.86	47.06

The drill logs are in Appendix 10, section on plan no. TASH 1565 and graphic analyses log in TASH 1638.

DD83 AR7 Collared position was 400 metres west south west of DD83 AR2. Total carbonate thickness was 263 metres with some slate bands totaling 5.5 metres. The footwall rock was pyritic calc sandstone.

DD83 AR7 Summary Log :-

From (m)	To (m)	
0	12.6	Tricone - Alluvium
12.6	69.8	(57.2m) Magnesite
69.8	154.8	Magnesite dominated by numerous cavities
154.8	176.0	(21.2m) Magnesite
176.0	210.0	Talc magnesite rock
210.0	238.2	(28.2m) Magnesite
238.2	248.5	Sandy dolomite and pale green slate
248.5	258.6	(10.1m) Magnesite
258.6	264.7	Sandy dolomite
264.7	275.5	Angular magnesite breccia
275.5	278.1	Banded pyrite - calc. sandstone (F.W.)
278.1	282.1	Cavity

E.O.H.

Plus 40% MgO analysed :-

from	to	interval	MgO	Fe2O3	CaO	SiO2	LOI
12.6	40.8	28.2	42.01	1.56	1.99	6.83	47.53
43.7	48	4.3	41.75	1.07	5.17	2.57	49.38
57.3	68.8	11.5	43.15	0.63	3.53	3.48	49.37
79.5	82.9	3.4	44.32	0.64	1.43	3.89	49.65
121.0	144.7	23.7	43.59	1.47	0.75	4.35	48.24
148.0	154	6.0	43.42	1.00	0.33	8.17	47.04
160.0	171.5	11.5	42.03	4.63	0.83	10.87	46.86
177.0	238.0	55.0	43.49	2.52	1.49	4.49	48.08
250.3	251.8	1.5	41.86	2.38	5.11	0.50	49.26
254.4	259.0	4.5	40.71	2.11	6.54	0.50	49.46
265.6	269.0	3.4	40.52	2.69	5.68	1.41	49.06
Average		(153)	42.90	2.05	1.90	5.16	48.11

Drill logs are in Appendix 11, section on plan no. TASH 1566, and graphic analyses log in TASH 1639.

The drilling in the Keith - Arthur River prospect confirmed that the carbonate occurs as magnesite in a laterally continuous layer. There are some karstic features such as cavities and sinkholes interrupting the sequence. Some noncarbonate layers are present, and a considerable thickness of alluvial cover overlies the magnesite. Overall the MgO content appears lower than at the Lyons River deposit and iron, calcium and silica contents are correspondingly higher. A large tonnage of magnesite dominated carbonate occurs in the Keith - Arthur River area, but grade and potential mining problems suggest that this is of lesser importance than the Lyons River deposit.

8.1.3 Drilling at the Cann Creek Prospect

The Cann Creek prospect occurs in a parallel zone 4 kilometres to the west of the Keith - Arthur prospect. High grade magnesite outcrop has been discovered in Cann Creek and regional mapping (section 8.2.4) indicated the horizon extended to the south. Testing was required to see if the Cann Creek prospect was a larger and higher grade resource than the major Lyons River deposit. A diamond drill hole tested the horizon and is described below.

DD84 CCl Collared about 450 metres south of the Cann Creek magnesite outcrops (on Bird 5 road), east of Hilders Bridge over the Arthur River. The drill hole was adjacent to a silica gravel pit. Aim of the drilling was to test the thickness and grade of the carbonate sequence and the depth of silica after carbonate capping. The carbonate zone was 227m thick consisting mostly of massive to banded dolomite with interbedded slates and schists. Talc schist rock constituted in the upper portion of the drill hole. Footwall rock was banded schist. Samples up to one metre length were analysed by Zinc Corporation, Broken Hill. Results suggest that siliceous weathering of carbonate and complete removal of carbonate is restricted to a depth of less than 25 metres, and the carbonate is dolomite which appears to be stromatolitic.

A summary log is :-

From (m)	To (m)	
0	37	Talc schist
37	52	Dolomite talc schist
52	197	Dolomite

197	210	Banded schist
210	265	Dolomite
265	290	Schist

E.O.H.

Drill logs are in Appendix 12 and a section is shown on plan no. TASH 1912.

The drilling indicates that the Cann Creek magnesite is very restricted in extent. The area is not an alternative source of supply to the Lyons River deposit.

8.2 Detailed Geological Evaluation

The programme of geological mapping reported in Williams (1983) was continued. Detailed mapping covered the Keith - Arthur River prospect, the northern extension of the Lyons River deposit and Cann Creek deposit.

8.2.1 Geological mapping at the Keith - Arthur River Prospect

Mapping fieldwork was undertaken in September 1983. The area covered started in the north at the Victory magnesite outcrops, 1.5km north east of Farquhars Bridge over the Arthur River, and stretched to two km south west of the bridge.

The aim of the mapping was to delineate the magnesite horizon on a 1:2,000 scale plan.

Undifferentiated Permian sedimentary rock abuts the magnesite sequence in the west. It appears to be block faulted with at least some of the magnesite removed. An amphibolite "dyke" transects the

carbonate near drill hole AR2, and the hole was actually terminated within the dyke. Quarternary alluvium covers most of the area and almost completely masks the magnesite. The geology is shown in plan no. TASH 1940 and TASH 1941.

8.2.2 Geophysics Keith - Arthur River Prospect

Because of the thick alluvial cover considerable difficulty was experienced in siting of drill holes. A small programme of auger drilling failed because of boulders and a programme of back hole pitting was also unsuccessful as the alluvial material proved too deep.

Three lines of gravimetry were therefore tried over drill section AR3 and the proposed sections AR4/5 and AR6. The result proved extremely successful and full details are appended to this report in Appendix 13.

8.2.3 Geological mapping of North Lyons River Prospect

Mapping fieldwork was conducted in May 1983, at 1 : 2000 scale. The area covered was from 600 metres north of DD83 LR2 to 200m south of LR2. Much of this area is covered with basalt and basalt scree and detailed mapping was required to fully outline the northwards extent of the Lyons River body.

Laterally the magnesite changes to shales and siltstones with some thin carbonate bands. Undifferentiated Permian sedimentary rock is block faulted into contact with the footwall rocks on the western side of the carbonate. Tertiary basalts and gravels cover part of the carbonate. A cross cutting fault is evident in the north of the sequence. The geological map is plan no. TASH 1951.

025

8.2.4 Geological Mapping, Cann Creek Prospect

Mapping at 1 : 2000 scale was conducted in January 1984 to outline the southern extent of the Cann Creek magnesite. The area covered included the Cann Creek magnesite outcrops, approximately three km north east of Hilders Bridge over the Arthur River and extended southwards for two kilometres.

The carbonate horizon is marked by patches of silica rich material which forms a residual "silica cap". Outcrop is extremely poor but the "silica caps" can be found adjacent to several road cuttings.

The host rock is a talc schist, and talc schists are interbedded with the carbonate. The outcrop width of the carbonate is from 40 to 80 metres, and doleritic and basaltic rock cover some parts of the sequence. Quarternary alluvium is also present. For geology see plan no. TASH 1992 and appendix 14 contains geochemical ledger.

8.3 Bulk sampling at Pinner Magnesite

The Pinner Magnesite outcrop occurs near the Lyons River diamond drill holes DD83 LR2, DD84 LR6 and LR11A. Bulk sampling and assaying was undertaken to find a surface outcrop of high grade magnesite to provide samples for beneficiation testing.

Eleven (11) outcrops were located in a 0.3 hectare area. They were named alphabetically 'A' to 'K'. Plan no. TASH 1952 illustrates their position and approximate shape. Analyses of composite chip samples by AMDEL, South Australia, gave a range of MgO percentage from 21.8 to 44.5. Appendix 15 contains the analyses results.

026

Outcrop 'I' was selected for bulk sampling, it was large in size and the MgO was 43.6% and CaO 0.97%. Twenty (20) drums (200 litre capacity) of blasted lumps were collected. AMDEL analysed subsamples from each drum, and the MgO percentage ranged from 41.3 to 44.8. See Appendix 15 for analyses.

8.4 Biogeochemical survey at Lyons River Prospect

A biogeochemical survey was conducted in the area of DD83 LR2, Lyons River. The aim of the test was to determine the suitability of a plant geochemistry survey as a mapping tool.

Two species of plant leaves and wood were sampled, myrtle and sassafrass. The positions of trees are shown on plan no. TASH 1952. Plant selected were growing on either magnesite, dolomite, basalt (float) or footwall schist. ANALABS, W.A. performed ICP scans on the ashed plant material.

Results of the survey indicate that the percentage of MgO in the ash is higher for plants growing on magnesite. However other relationships are not clear. The plants growing on footwall schist are not anomalously different to samples of plants growing on the carbonate. Further assessment is required.

027

9. REFERENCES

Flood, B.; van Wees, H.; 1971 Magnesite deposits - Arthur River area, Tasmania - Preliminary Investigations B.H.P. Report.

Nye, P.B.; 1925 Dolomite & Magnesite deposit near the Victory Mine Arthur River. Government Geologist Report dated 14/4/25.

Porter, M.; 1971 Final Report on the Keith River prospect EL 43/70 North - West Tasmania. CRAE Report 3793.

Williams, V.A.; 1983 EL 43/70 Arthur River, Tasmania Report on Exploration for the year ending 15th October, 1983. CRAE Report 12283.

10. KEYWORDS

Magnesite, carbonate, stratabound, Precambrian Drill - diamond, Mineral processing, Biogeochemistry, gravimetry.

Burnie 1: 250,000 Sheet SK55-3.

11. LIST OF APPENDICES

APPENDIX	1	DD83 LR5	Log
APPENDIX	2	DD84 LR6	Log
APPENDIX	3	DD84 LR7	Log

APPENDIX 4	DD84 LR8 Log
APPENDIX 5	DD84 LR9 Log
APPENDIX 6	DD84 LR10 Log
APPENDIX 7	DD84 LR11 & DD84 LR11A Log
APPENDIX 8	DD83 AR3 Log
APPENDIX 9	DD83 AR5 Log
APPENDIX 10	DD83 AR6 Log
APPENDIX 11	DD83 AR7 Log
APPENDIX 12	DD84 CC1 Log
APPENDIX 13	Test gravity survey, Arthur River EL 43/70, N.W. Tasmania
APPENDIX 14	Cann Creek prospect geochemical ledger
APPENDIX 15	Pinner outcrop geochemistry ledger
APPENDIX 16	Lyons River deposit biogeochemistry ledger

12. LIST OF PLANS

<u>Plan No.</u>	<u>Subject</u>	<u>Scale</u>
TASh 1510	EL 43/70 Location	1 : 500 000
TASh 1435	Geological Sketch Map Arthur River - Lyons River Magnesite Deposits	1 : 20 000
TASh 1516	DD83 LR5 Drill Section	1 : 1000
TASh 1526	DD83 LR5 Analyses Results	1 : 1000
TASh 1779	DD84 LR6 Drill Section	1 : 1000
TASh 1775	DD84 LR6 Analyses Results	1 : 1000
TASh 1777	DD84 LR7 & LR8 Drill Section	1 : 1000
TASh 1776	DD84 LR7 Analyses Results	1 : 1000

TASh 1778	DD84 LR9 & LR10 Drill Section	1 : 1000
TASh 1780	DD84 LR9 Analyses Results	1 : 1000
TASh 1781	DD84 LR10 Analyses Results	1 : 1000
TASh 1913	DD84 LR11 & LR11A Drill Section	1 : 1000
TASh 1991	DD84 LR11A Analyses Results	1 : 1000
TASh 1559	DD83 AR3 Drill Section	1 : 1000
TASh 1560	DD83 AR3 Analyses Results	1 : 1000
TASh 1563	DD83 AR5 Drill Section	1 : 1000
TASh 1564	DD83 AR5 Analyses Results	1 : 1000
TASh 1565	DD83 AR6 Drill Section	1 : 1000
TASh 1638	DD83 AR6 Analyses Results	1 : 1000
TASh 1566	DD83 AR7 Drill Section	1 : 1000
TASh 1639	DD83 AR7 Analyses Results	1 : 1000
TASh 1912	DD84 CC1 Drill Section	1 : 1000
TASh 1940	Geological Map Keith - Arthur River Prospect - North Sheet	1 : 2000
TASh 1941	Geological Map Keith - Arthur River Prospect - South Sheet	1 : 2000
TASh 1951	Geological Map Lyons River Prospect Northern	1 : 2000
TASh 1992	Geological Map Cann Creek Prospect	1:2000

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TASh 1952	Drill Hole and sample location, map Lyons River - Pinner outcrop	1 : 2000
TASh 1767	Gravity profile over DD83 AR6 Section	1 : 5000
TASh 1768	Gravity profile over DD83 AR3 Section	1 : 5000
TASh 1769	Gravity profile over DD83 AR5 Section	1 : 5000
TASh 1770	Contour of Bouguer Anomaly Residuals over Keith - Arthur River Prospect	1 : 2000

APPENDIX 1

DD83 LR5 LOG

034

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

SHEET No. 2/19

TENEMENT NAME... ARTHUR RIVER ELN No. 13/70

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH 300° AMG DRILLERS K. PARRY COMMENCED 12.8.83 DEPTH 452.45m HOLE No. DD83LR5
RL COLLAR..... INCLINATION 46° DRILL TYPE BOYLES 37 COMPLETED 19.9.83 CASING LEFT..... DPO No(s) 30364

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by... AMDEL)							
From (M)	To (M)										MgO	CaO	SiO ₂	Al ₂ O ₃	FeO	LOI		
94.10	95.00	0.55	NQ			Buff												
95.00	95.80	0.80				White												
95.80	101.00	1.36			102.60m - 106.7m	Magnesite												
101.00	104.00	2.32			Angular magnesite breccia	Buff												
104.00	104.36	0.36			Approx 40% magnesite patches.													
104.36	107.00	1.750																
107.00	110.00	2.24			106.7m - 114.5m	Buff												
110.00	113.00	2.70			Sandy dolomite with													
113.00	113.45	0.45			angular magnesite patches.	Buff												
113.45	116.00	2.51																
					114.5m - 116.1m													
					Angular magnesite breccia.	Buff												
					Approx 40% magnesite patches.													
116.00	118.00	1.67	NQ		116.1m - 133.4m	Buff												
118.00	122.00	3.06	BQ		Sandy dolomite with rare													
122.00	125.00	1.80			angular magnesite patches	"												
125.00	125.37	0.36			only. Laminated in places.													
125.37	127.00	1.40				"												
127.00	128.00	0.92				"												
128.00	131.00	2.47				"												
131.00	131.35	0.20				"												
131.35	133.40	2.00				"												
133.40	134.00	0.55			133.4m - 205.2m	Buff												
134.00	137.00	2.92			Massive magnesite. Spotted.	Buff												
137.00	140.00	3.00				Buff												
140.00	142.80	2.68																
142.80	143.20	0.40				Leached zone. Cavities												
143.20	146.00	2.60																
146.00	148.90	1.02	BQ															

346033

036

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

SHEET No. 4/9

TENEMENT NAME... ARTHUR... RIVER EL No. 13/26

CO-ORDINATES..... AZIMUTH... 300° AMG... DRILLERS... K. PARRY... COMMENCED... 12.8.83

PLAN - MAP REFERENCE.....

RL COLLAR..... INCLINATION... 46°... DRILL TYPE... BOYLES 37... COMPLETED... 19.9.83

DEPTH... 452.45m... HOLE No. DD831R5

CASING LEFT..... DPO No(s)... 30364

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by... AMDEL...)							
From (M)	To (M)										H ₂ O	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	L.O.I.		
205.6	206.0	0.39	BQ		Buff/White Magnesite	% Crystalline Magnesite												
206.0	209.0	2.90																
209.0	212.0	3.00																
212.0	215.0	3.00																
215.0	215.95	0.92			White	95%	1056377	197.00	202.00		41.3	2.16	6.80	0.03	1.22	47.6		
215.95	218.0	2.56																
					Buff	95%	1056378	202.00	203.20		42.3	1.43	7.00	0.05	0.62	47.9		
					Heavily weathered 203.2m-203.7m - Buff	95%	1056379	203.20	205.20		35.4	5.45	15.4	0.03	0.87	42.6		
					205.2m - 216.5m													
					Sandy dolomite													
							1056380	205.20	212.00		21.1	2.66	6.65	0.09	0.24	43.5		
							1056381	212.00	216.50		23.2	23.5	7.30	0.08	0.33	43.9		
					216.5m - 228.0m													
218.00	221.00	3.00			Angular magnesite breccia	B	1056382	216.50	221.00		22.2	14.0	27.4	0.04	0.15	34.5		
221.00	224.00	3.00			Matrix is extremely siliceous													
224.00	225.36	1.26			(chalcedonic silica) between	✓	1056383	221.00	226.00		25.2	8.60	32.6	0.04	0.12	33.1		
225.36	227.00	1.75			221.0m and 228.0m.													
227.00	230.00	3.00				W	1056384	226.00	230.00		34.0	1.78	24.9	0.06	0.12	37.9		
					228.0m - 230.0m													
					Cuneiform magnesite.													
					Strongly sharry. Siliceous matrix.													
230.0	233.0	3.00			230.0m - 236.6m	W	1056385	230.0	233.25		41.4	1.44	8.95	0.08	0.60	46.5		
233.0	235.22	2.25			Massive magnesite.													
235.22	236.0	0.77			Strongly spotted.	W	1056386	233.25	236.6		45.6	1.04	1.88	0.07	0.30	50.0		
236.0	239.0	3.00																
239.0	242.0	2.95	BQ															

346037

037

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

SHEET No. 5/9

TENEMENT NAME... ARTHUR RIVER EL No. 13/10

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH... 300° AMG DRILLERS... K. PARRY COMMENCED... 12.8.83 DEPTH... 452.45m HOLE No. DD83LR5

RL COLLAR..... INCLINATION... 46° DRILL TYPE... BOYLES 37 COMPLETED... 19.9.83 CASING LEFT..... DPO No(s) 30364

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by... AMDEL...)								
om (M)	To (M)										MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	L.O.I.			
					236.6m - 237.2m Angular magnesite breccia	White Buff	% Cryptocrystalline magnesite	1056387	236.6	240.0		36.0	6.45	12.9	0.05	0.37	43.3		
					237.2m - 237.6m Massive magnesite. Heavily spotted.														
					237.6m - 238.0m Waxy magnesite breccia														
					238.0m - 240.0m Cuneiform magnesite.														
242.0	245.0	3.00	BQ		240.0m - 254.8m Massive sandy dolomite siliceous and cherty in places.														
245.0	245.32	0.20																	
245.32	248.00	2.79																	
248.00	251.00	3.00																	
251.00	251.00	3.00																	
251.00	256.19	1.13			254.8m - 255.8m Angular magnesite breccia.	B	50%	1056391	254.8	258.0		33.7	8.05	15.3	0.01	0.38	42.9		
256.19	257.0	1.90																	
257.0	260.0	2.94	BQ		255.8m - 258.0m Massive magnesite Heavily spotted.														

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

SHEET No. 7/9

TENEMENT NAME ARTHUR RIVER No. 13/78

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH 300° AMG DRILLERS K. PARRY COMMENCED 12.8.83

DEPTH 452.45m HOLE No. DD83LR5

RL COLLAR..... INCLINATION 46° DRILL TYPE BOYLES 37 COMPLETED 19.9.83

CASING LEFT..... DPO No(s) 30364

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization		Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by <u>AMDEL</u>)					
om (M)	To (M)					Weath	Alteration					MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	L.O.I.
317.0	320.0	3.01	BQ		Massive magnesite cont'd.	Buff/White	% Cryptocrystalline magnesite										
320.0	323.0	3.02															
323.0	323.58	0.51				B	80%	1056905	322.0	327.0		38.9	4.30	11.2	0.07	0.28	45.7
323.58	326.0	2.44															
326.0	329.0	2.94				B	75%	1056906	327.0	332.0		38.8	3.70	12.6	0.04	0.42	44.8
329.0	332.0	2.96															
332.0	333.66	1.61			Weathered interval.	B	50%	1056907	332.0	335.0		24.9	17.0	17.1	0.09	0.71	40.1
333.66	335.0	1.40															
335.0	338.0	3.05				B	80%	1056908	335.0	339.3		40.1	2.88	8.90	0.07	0.38	46.6
338.0	339.2	1.10															
339.2	341.0	1.54			Cemented cavity fill breccia.	B	25%	1056909	339.3	340.4		14.0	20.4	29.4	0.69	2.88	31.9
341.0	343.66	2.70															
343.66	344.0	0.34				B	85%	1056910	340.4	345.5		40.6	4.00	8.10	0.03	0.47	46.0
344.0	347.0	2.96															
347.0	350.0	2.01			Intensely leached. Numerous cavity-fill breccia zones.			1056911	345.5	350.0		25.2	17.2	13.3	0.97	1.89	41.6
350.0	353.0	3.00			" " " "	" "	" "	1056912	350.0	354.7		18.2	26.4	10.3	0.87	2.62	41.7
353.0	354.4	1.17															
354.4	356.0	1.69															
356.0	359.0	2.89			Partly leached & weathered.	B	30%	1056913	354.7	358.0		22.3	19.5	15.6	0.39	1.14	40.1
359.0	362.0	3.10															
362.0	364.44	2.40				B	85%	1056914	358.0	363.0		41.0	3.78	6.80	0.10	0.42	47.4
364.44	365.0	0.66															
365.0	368.0	3.00				B	85%	1056915	363.0	368.0		39.0	4.24	10.1	0.06	0.30	45.6
368.0	371.0	3.00															
371.0	374.0	3.04				B	85%	1056916	368.0	373.0		39.5	4.46	9.00	0.07	0.17	46.0
374.0	374.33	0.25															
374.33	377.0	2.665				W	85%	1056917	373.0	378.0		39.8	4.98	6.00	0.08	0.18	47.2
377.0	380.0	2.98															
380.0	383.0	2.99			Highly siliceous cherty zones	W	80%	1056918	378.0	383.0		38.9	5.40	6.95	0.05	0.21	46.7
383.0	384.33	1.26															
384.33	386.0	1.56	BQ			B	90%	1056919	383.0	388.0		42.1	4.14	5.70	0.02	0.25	42.1

46010

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

SHEET No. 8/9

TENEMENT NAME... ARTHUR RIVER No. 13/78

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH 300° AMG DRILLERS K. PARRY COMMENCED 12.8.83 DEPTH 452.45m HOLE No. DD83LR5

RL COLLAR..... INCLINATION 4.6° DRILL TYPE BOYLES 37 COMPLETED 19.9.83 CASING LEFT..... DPO No(s) 30364

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by AMDEL.....)							
From (M)	To (M)										MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	L.O.I		
386.0	389.0	3.06	BQ		Masseine magnesite cont'd.	Buff/white	% Cryptocrystalline magnesite											
389.0	392.0	3.16																
392.0	394.1	2.00																
394.1	395.0	0.90				B	90%	1056920	388.0	391.5		41.2	4.10	6.25	0.07	0.30	47.5	
395.0	398.0	3.05																
398.0	401.0	3.02			Strongly siliceous shaly zones → W		75%	1056921	391.5	395.0		39.1	6.00	9.15	0.06	0.22	45.6	
401.0	404.0	3.00																
404.0	407.0	3.07				B	60%	1056922	395.0	400.0		37.3	7.30	8.05	0.17	0.34	46.0	
407.0	410.0	2.96																
410.0	413.0	3.02				B	95%	1056923	400.0	405.0		40.2	4.70	5.70	0.07	0.41	47.9	
413.0	414.0	0.91																
414.0	416.0	2.09				B	90%	1056924	405.0	410.0		38.5	6.20	6.55	0.07	0.56	47.1	
416.0	419.0	3.10																
419.0	422.0	2.85				B	90%	1056925	410.0	415.0		36.3	8.45	7.35	0.08	0.60	46.4	
422.0	423.75	1.69																
423.75	425.0	1.07				W	95%	1056926	415.0	418.8		40.3	4.22	6.95	0.07	0.86	47.3	
425.0	428.0	2.10																
428.0	429.30	1.09			Partly weathered & leached → B		50%	1056927	418.8	423.5		34.9	8.50	8.95	0.16	1.73	45.2	
429.3	429.98	0.11																
429.98	431.0	0.59			Intensely leached and cavernous.			1056928	423.5	430.0		21.0	23.9	8.10	0.17	3.56	41.8	
431.0	434.0	2.97																
434.0	434.59	0.48			" " " "			1056929	430.0	434.0		27.1	17.6	4.78	0.12	4.76	44.5	
434.59	437.0	2.30																
437.0	440.0	3.09			" " " "			1056930	434.0	438.4		31.8	4.4	1.82	0.08	5.00	44.9	
440.0	443.0	2.18																
443.0	444.57	1.43				B	85%	1056931	438.4	441.2		42.3	3.44	1.97	0.08	2.64	49.7	
444.57	446.0	1.46			441.2m - 442.4m													
446.0	448.13	2.20	BQ		Fault zone. Elongate patches of sandy dolomite (≤ 2cm across) in an anastomosing matrix of magnesite and talc schist.	—	—	1056932	441.2	442.4		24.4	20.3	17.8	0.27	1.11	36.6	

346041

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

TENEMENT NAME ARTHUR RIVER No. 13/70

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH 300° AMG DRILLERS K. PARRY COMMENCED 12.8.83 DEPTH 452.45m HOLE No. DD83LR5

RL COLLAR..... INCLINATION 46° DRILL TYPE BOYLES 37 COMPLETED 19.9.83 CASING LEFT..... DPO No(s) 30364

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by... <u>AMDEL</u>)								
om (M)	To (M)										H ₂ O	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	TOTAL O.I.			
<u>448</u>	<u>449.0</u>	<u>0.79</u>	<u>BQ</u>		<u>442.4m - 445.6m</u>														
<u>449.0</u>	<u>451.3</u>	<u>2.14</u>																	
<u>451.3</u>	<u>452.45</u>	<u>1.18</u>	<u>BQ</u>		<u>Weathered magnesite</u>		<u>1056933</u>	<u>442.4</u>	<u>445.6</u>		<u>35.7</u>	<u>12.3</u>	<u>1.27</u>	<u>0.08</u>	<u>1.65</u>	<u>48.8</u>			
				<u>E.O.H.</u>	<u>445.6m - 446.6m</u>														
					<u>Sandy dolomite</u>		<u>1056933</u>	<u>445.6</u>	<u>446.6</u>		<u>25.2</u>	<u>21.9</u>	<u>4.70</u>	<u>0.50</u>	<u>1.86</u>	<u>44.5</u>			
					<u>446.6m F.W. CONTACT</u>														
					<u>446.6m - 447.9m</u>														
					<u>Contorted laminated pyritic calcareous siltstone.</u>														
					<u>447.9m - 452.45m</u>														
					<u>Amphibolite.</u>														
					<u>E.O.H.</u>														

346042

APPENDIX 2

DD84 LR6 LOG

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

TENEMENT NAME ARTHUR RIVER EL. No. 43/70

CO-ORDINATES..... AZIMUTH 300° AMG DRILLERS K. Parry COMMENCED 1.4.84 DEPTH 219.0m HOLE No. DDB4LR6
RL COLLAR..... INCLINATION 46° DRILL TYPE BOYLES 37 COMPLETED 25.4.84 CASING LEFT nil DPO No(s) 30178

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ZC Amel 5.2m)						
From (M)	To (M)										MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	LOI	
0	12				TRICONE												
12	15	1.73	NQ														
15	18	1.44															
18	21	2.73			18m - 31.5m		1197635	18	21		27.92	7.72	26.32	0.050	1.171	36.74	
21	24	0.06			Brecciated magnesite												
24	27	0.3			with sparry infill												
27	31.5	4.5					1197636	27	31.5		33.97	2.48	22.80	0.050	1.434	39.15	
31.5	34.5	3.0					1197747	31	31.1		38.1	0.50	15.6	0.02	2.36	43.0	
34.5	37.5	3.0			31.5m - 40.2m		1197601	31.5	36.0		36.63	1.558	20.03	0.420	0.894	60.43	
37.5	40.5	2.95			magnesite clasts in												
40.5	43.5	3.0			sandy to sparry matrix	and silica band (0.5m thick)	1197602	36	41		37.96	1.422	17.38	0.095	0.733	62.33	
43.5	46.5	2.96															
46.5	49.5	3.0			41.2 - 49.8m		1197603	41	46		31.60	1.410	17.92	0.050	0.871	62.04	
49.5	52.5	2.83			magnesite clasts in												
52.5	55.5	3.04			sandy to sparry matrix		1197604	46	51		35.13	1.961	21.71	0.134	1.013	39.55	
55.5	58.5	3.03					1197748	50.7	50.8		32.9	3.74	23.4	0.01	0.57	39.2	
58.5	61.5	2.85			49.8 - 56.2m		1197605	51	56.2		38.24	1.766	16.28	0.050	0.582	62.91	
61.5	64.5	2.77			magnesite with grey		1197749	52.8	52.9		38.8	1.28	15.2	0.01	0.54	43.8	
64.5	67.5	2.86			dolomite veins		1197606	56.2	61		26.84	18.92	13.91	0.050	0.462	47.76	
67.5	70.5	2.02					1197751	56.6	56.7		20.7	2.83	4.16	0.04	0.22	45.2	
70.5	73.5	2.51			56.2 - 66.2m		1197607	61	66		23.84	15.58	21.64	0.050	0.58	38.12	
73.5	76.5	2.39			massive grey dolomite with	magnesite clasts	1197752	61.7	61.8		17.7	24.7	16.8	0.04	0.40	39.0	
76.5	79.5	2.14			66.2 - 75.8m		1197608	66	71		23.09	13.31	27.04	0.077	0.621	35.54	
79.5	82.5	1.53			banded to massive												
82.5	85.5	1.96			grey dolomite		1197609	71	75.8		20.84	28.47	5.01	0.108	0.391	44.82	
85.5	88.5	1.77															
88.5	91.5	2.24			75.8m - 76.8m		1197610	85.8	76.8		23.99	4.26	44.01	0.050	0.725	29.63	
91.5	94.5	1.60			Banded to massive dolomite with	magnesite 'clasts'											
94.5	97.5	2.97			76.8m - 87m		1197611	76.8	81		38.11	1.118	17.50	0.050	0.789	42.38	
97.5	100.5	3.0			magnesite 'clasts' in	sparry matrix											
100.5	103.5	2.98					1197612	81	86		41.94	2.14	6.80	0.050	1.513	47.44	

346042

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

TENEMENT NAME.....
PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. LR6
RL COLLAR..... INCLINATION..... DRILL TYPE..... COMPLETED..... CASING LEFT..... DPO No(s).....

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)									
From (M)	To (M)										MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	LOI				
103.5	106.5	2.90			87m - 106.6m		1197613	86	91		4.16	2.03	8.39	0.050	1.695	46.77				
106.5	109.5	1.86			magnesite in sparry															
109.5	112.5	3.04			to massive grey dolomite matrix		1197614	91	96		4.28	0.662	7.47	0.050	1.683	47.34				
112.5	115.5	2.96																		
115.5	118.5	2.9					1197615	96	101		4.382	0.522	6.16	0.050	1.504	47.91				
118.5	121.5	1.17					1197753	99.7	99.85		4.48	0.90	2.60	0.02	1.04	50.2				
121.5	124.5	3.09					1197616	101	104.5		4.402	0.816	6.28	0.050	1.231	47.34				
124.5	127.5	2.56																		
127.5	130.5	2.95					1197617	104.5	106.6		3.331	6.47	18.05	0.050	0.688	41.34				
130.5	133.5	2.76																		
133.5	136.5	2.75			106.6 - 136.5m		1197618	106.6	111		17.93	23.89	19.55	0.050	0.343	38.05				
136.5	139.5	2.13			massive grey dolomite															
139.5	142.5	1.68					1197619	111	116		22.79	27.89	1.624	0.050	0.888	46.38				
142.5	145.5	.23																		
145.5	148.5	3.04					1197620	116	121		21.82	27.25	5.40	0.050	0.544	44.15				
148.5	151.5	3.08																		
151.5	154.5	2.90					1197621	121	126		21.76	27.15	5.07	0.050	0.467	45.00				
154.5	157.5	3.45																		
157.5	160.5	2.46					1197622	126	131.5		19.87	25.99	11.01	0.050	0.511	42.88				
160.5	163.5	.93																		
163.5	166.5	.78			131.5 - 137.4m		1197623	131.5	137.4		31.90	10.16	14.02	0.050	0.865	42.71				
166.5	169.5	2.08			magnesite clasts in massive grey dolomite															
169.5	172.5	2.79			137.4 - 144.5m		1197624	137.4	144.5		19.85	21.24	17.65	0.050	2.64	38.00				
172.5	175.5	2.99			banded dolomite with pyrite and silica patches															
175.5	178.5	2.0			144.5 - 165.9m		1197625	144.5	150		10.40	1.587	11.00	0.050	1.257	45.18				
178.5	181.5	2.92			cloudy to spotty magnesite															
181.5	184.5	3.05			with sparry matrix		1197626	150	155		39.22	6.06	5.48	0.050	1.357	47.66				
184.5	187.5	2.95																		
187.5	190.5	3.0					1197627	155	160		39.44	6.47	5.13	0.050	1.366	47.16				
190.5	193.5	2.88																		
193.5	196.5	4.8					1197628	160	165.9		41.31	3.47	9.24	0.050	1.172	44.44				

346046

046

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

SHEET No. 3

TENEMENT NAME..... No.

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH..... DRILLERS..... COMMENCED..... DEPTH..... HOLE No. L.R.6

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

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath. Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by.....)							
From (M)	To (M)										MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	LOI		
196.5	199.5	-			165.9 - 180.5 m		1197629	165.9	170		40.47	4.49	7.81	0.08	1.68	45.09		
199.5	202.5	-			magnesite with sparry veins													
202.5	205.5	.04			and minor talc		1197630	170	175		43.37	1.60	4.55	0.05	2.14	47.44		
205.5	208.5	.1																
208.5	211.5	.47					1197631	175	180		41.50	3.19	5.24	0.05	2.74	46.84		
211.5	214.5	.13																
214.5	217.5	.23			180.5 m - 194.5 m		1197632	180	185		37.93	8.48	4.54	0.05	1.66	46.75		
217.5	220.5	.07			cuneiform to cloudy magnesite		1197754	180.6	180.65		22.5	24.3	6.80	0.01	0.53	46.4		
220.5	222.5	.14			with sparry matrix		1197633	185	190		40.05	5.62	4.02	0.05	2.69	47.17		
							1197634	190	194.5		40.81	4.26	3.92	0.05	2.12	48.35		
					194.5 - 205.5 m													
					sand and clay filled cavity.													
					205.5 - 219 m													
					Schist and yellow brown clay													
					with quartz													
					219 - 223 m													
					Schist and yellow brown clay													
					E.O.H.													
							1197750	55.9	56.0		44.5	0.61	3.50	0.02	0.65	49.7		

34504

047

346048

APPENDIX 3

DD84 LR7 LOG

346050

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

TENEMENT NAME ARTHUR RIVER EL. No. 43/20

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH 300° AMG DRILLERS K. Parry COMMENCED 26:4:84 DEPTH 176 m HOLE No. DD84 LR.7

RL COLLAR..... INCLINATION 46° DRILL TYPE Boyles COMPLETED 9:5:84 CASING LEFT nil DPO No(s) 30179

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES - Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ZC 8H)							
From (M)	To (M)										MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	LOI		
0	6				0-6m Basalt float													
6	27				6-27m weathered magnesite													
27	30	3-25	NQ		27-30m		1197637	27	30		37.71	2.96	14.94	0.050	0.290	43.52		
30	33	2.6			magnesite clasts in dolomite													
33	37.5	3.5			30-60m		1197638	30	35		37.78	2.47	15.83	0.051	0.169	43.24		
37.5	39	1.35			magnesite with													
39	40.5	0.63			sparry matrix and		1197639	35	40		36.63	2.33	18.70	0.050	0.133	41.96		
40.5	42	1.47			silica patches													
42	44	0.17					1197640	40	45.0		38.13	2.41	15.57	0.050	0.302	43.34		
44	47	1.4																
47	50	3					1197641	45	50		38.24	1.868	15.99	0.050	0.306	43.22		
50	53	3																
53	56	3.5					1197642	50	55		39.37	1.64	14.59	0.050	0.281	44.11		
56	59	2.5																
59	62	3					1197643	55	60		41.84	1.405	9.62	0.050	0.271	46.66		
62	65	3																
65	68	2.5			60-89.8		1197644	60	65		40.71	1.731	10.85	0.050	0.515	45.80		
68	71	3			magnesite with													
71	74	2.9			sparry veins and		1197645	65	70		42.09	1.819	8.17	0.050	0.267	47.23		
74	77	2.5			minor pyrite veins													
77	80	3					1197646	70	75		44.07	1.660	10.97	0.050	0.266	45.86		
80	83	2.85																
83	86	2.85					1197647	75	80		41.86	1.357	9.30	0.050	0.411	46.70		
86	89	3																
89	92	3					1197648	80	85		42.25	1.496	8.90	0.050	0.300	47.02		
92	95	2.7																
95	98	2.9					1197649	85	89.8		43.18	1.573	5.84	0.050	0.387	48.65		
98	101	3.1																
101	104	3			89.8-94.5m magnesite		1197650	89.8	94.5		43.96	1.562	4.52	0.050	0.418	49.30		
104	107	3			with sparry veins													
107	110	2.85			94.5-100.6m magnesite & dolomite.		1197651	94.5	100.6		44.07	2.38	8.20	0.050	1.144	46.92		

APPENDIX 4

DD84 LR8 LOG

APPENDIX 5

DD84 LR9 LOG

056

346057

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

SHEET No. 11/5

TENEMENT NAME ARTHUR RIVER ELNo. 43/7

PLAN - MAP REFERENCE

CO-ORDINATES AZIMUTH 300° AMG DRILLERS K. Parry COMMENCED 18th May '84 DEPTH 209 m HOLE No. DD84 LR
 RL COLLAR INCLINATION -4.6° DRILL TYPE Boyles 37 COMPLETED 29 May '84 CASING LEFT nil DPO No(s) 30180

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by <u>ZC</u> Amdel 5.2m)								
From (M)	To (M)										MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	L.O.I.			
0	2				TRICONE sand														
2	23				weathered magnesite														
23	26	0.89	NQ		23-27.8m		1197664	23	27.8			37.80	1.147	18.34	0.050	0.697	4.158		
26	29	1.52			magnesite with talc veins		1197755	27.2	27.3			36.3	0.53	20.4	0.01	0.60	4.12		
29	32	1.85			27.8 - 38.1m		1197665	27.8	33			37.73	1.581	17.54	0.050	0.68	4.21		
32	35	2.51			magnesite with minor pyrite														
35	38	1.41					666	33	38.1			33.40	2.57	25.34	0.050	0.67	3.74		
38	41	2.19																	
41	44	4.2			28.1 - 48.2m		667	38.1	44			31.76	9.65	16.35	0.050	0.44	4.70		
44	47	2.95			cloudy magnesite in massive grey dolomite matrix														
47	50	2.94					668	44	48.2			29.88	11.84	16.13	0.050	0.62	4.36		
50	53	2.79																	
53	56	2.28			48.2 - 52.6m		669	48.2	52.6			19.35	21.58	20.27	0.050	0.41	3.81		
56	59	3.01			massive grey dolomite		1197756	49.2	49.3			20.5	28.5	3.28	0.02	0.37	4.56		
59	62	1.37			52.6 - 57.7m		670	52.6	57.7			36.4	3.85	17.06	0.050	0.68	4.37		
62	65	1.98			magnesite in dolomite		1197757	54.5	54.6			42.6	2.70	4.40	0.02	0.43	4.91		
65	68	2.38			57.7 - 63m		671	57.7	63			35.75	1.415	21.87	0.050	0.52	4.03		
68	71	2.65			magnesite with sparry matrix + silica														
71	74	3			63 - 73.9m		672	63	68			38.99	1.036	16.01	0.050	0.715	4.313		
74	77	2.96			magnesite with sparry veins														
77	80	2.71					673	68	73.9			42.27	1.378	8.06	0.050	0.87	4.74		
80	83	1.65					1197758	73.6	73.7			44.5	0.50	3.86	0.01	0.67	4.98		
83	86	2.23			73.9 - 93.9m		674	73.9	79			30.95	10.61	14.85	0.050	0.90	4.37		
86	89	2.91			magnesite with sparry matrix and veins														
89	92	2.49					675	79	83.5			39.71	2.01	12.06	0.050	1.011	4.506		
92	95	2.24																	
95	98	2.15					676	83.5	89.3			44.70	1.673	9.17	0.050	0.68	4.71		
98	101	2.86					1197760	85.0	85.1			43.0	1.24	6.95	0.01	0.88	4.77		
101	104	2.34					1197677	89.3	93.9			39.31	3.95	9.39	0.050	1.05	4.60		
104	107	2.53					1197760	89.4	89.5			46.1	0.76	0.38	0.01	0.59	5.16		

060

346061

APPENDIX 6

DD84 LR10 LOG

064

346065

APPENDIX 7

DD84 LR11 & DD84 LR11A LOG

CO-ORDINATES..... AZIMUTH 301.5° AMG..... DRILLERS K. PARRY..... COMMENCED 24.9.83..... DEPTH 408.0m..... HOLE No. DD83AR3
 RL COLLAR..... INCLINATION -46°..... DRILL TYPE BOYLES 37..... COMPLETED 19.10.83..... CASING LEFT..... DPO No(s) 30366

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by... Z.F.B.H.)						
From (M)	To (M)										MgO	CaO	SiO ₂	Al ₂ O ₃	FeO	LOI	
130.48	132.0	1.37	BQ		130.48m - 132.5m												
132.0	134.0	1.08			Weathered magnesite-dolomite mix. Spotted texture.	Badly weathered ~ 50% cryptocryst	1056606	130.48	132.5		3.91	3.56	8.24	0.05	3.01		45.92
134.0	135.0	1.62															
135.0	138.0	0.45				Quartz sandstone.	No sample	132.5	134.0								
138.0	141.0	0.97			132.5m - 134.0m												
141.0	143.0	2.00			Coarse quartz sandstone	Badly weathered ~ 95% cryptocryst.	1056607	134.0	139.0		35.64	5.22	10.37	0.209	3.20		42.45
143.0	144.0	1.12			as in above interval 125.0m - 130.48m.												
144.0	146.55	2.50				Weathered in part. ~ 50% cryptocryst	1056608	139.0	144.0		40.48	5.28	4.31	0.05	1.471		48.21
146.55	148.20	1.08															
148.20	150.00	1.18			134.0m - 161.2m	Badly weathered " "	1056609	144.0	149.0		33.95	13.44	2.73	0.05	2.04		47.64
150.0	151.60	1.15			Variably weathered magnesite												
151.60	154.59	2.02			-dolomite mix. Spotted to	" " " "	1056610	149.0	154.0		30.44	14.97	7.49	0.100	1.610		44.35
154.59	157.59	1.31			fully sharry texture.												
157.59	160.00	2.38				Fresh 100% sharry	1056611	154.0	159.0		37.14	5.46	10.18	0.146	1.639		44.89
160.00	162.00	1.92				" " "											
162.00	164.00	1.32			161.2m - 163.6m	" " "	1056612	159.0	161.2		40.27	1.142	12.27	0.108	1.267		44.48
164.00	165.20	0.59			Coarse quartz sandstone as in												
165.20	167.00	0.17			above intervals.	Coarse quartz sandstone.	No sample	161.2	163.6								
167.00	170.01	1.08															
170.01	171.35	0.465			163.6m - 242.6m	Badly weathered 100% sharry	1056613	163.6	165.5		26.76	8.38	26.43	0.779	1.648		34.27
171.35	176.00	0.83			Variably weathered magnesite												
176.00	179.00	0.00			-dolomite mix. Spotted -	Sand and rubble filled cavity	No sample	165.5	167.0	No	CORE						
179.00	182.80	2.01			fully sharry textures.												
182.80	184.40	0.85				Very badly weathered 100% sharry	1056614	167.0	176.0		41.48	2.17	7.33	0.05	1.535		47.31
184.40	185.43	0.43															
185.43	189.20	0.96	BQ			Sand and rubble filled cavity	No sample	176.0	179.0	No	CORE						
						Badly weathered ~ 20% cryptocryst	1056615	179.0	184.0		36.63	6.42	10.28	0.05	1.432		45.11
						" " ~ 80% cryptocryst	1056616	184.0	189.0		40.35	1.552	5.67	0.05	5.12		46.69

068

DD83AR3

346069

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

SHEET No. 3/6

TENEMENT NAME.....ARTHUR RIVER EL. No. 43/76

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH...301.5° AM9..... DRILLERS...K.PARRY..... COMMENCED...24.9.83..... DEPTH...408.0m..... HOLE No. DD83AR3

RL COLLAR..... INCLINATION...-46°..... DRILL TYPE...BOXLES 37..... COMPLETED...19.10.83..... CASING LEFT..... DPO No(s)...30366

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath. Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by...Z.C.B.H.)							
From (M)	To (M)										MnO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃			LOI
189.20	191.00	0.44	BQ		Badly weathered - 100% sharry	1056617	189.0	194.0		42.70	1.231	4.28	<0.05	3.12			48.42	
191.00	194.00	1.28			" " ~20% cryptocryst.	1056618	194.0	200.0		44.13	0.633	1.859	<0.05	3.67			49.51	
197.00	200.00	0.71			" " " "	1056619	200.0	205.0		44.04	0.443	4.24	<0.05	1.704			48.89	
200.00	203.00	0.85			Weathered in part " "	1056620	205.0	210.0		42.74	3.73	2.76	<0.05	1.314			49.32	
203.00	205.50	1.23			" " ~85% cryptocryst.	1056621	210.0	215.0		45.02	0.814	3.57	<0.05	0.843			49.70	
205.50	208.60	2.18			" " 100% sharry.	1056622	215.0	220.0		43.15	3.52	1.735	<0.05	1.309			50.08	
208.60	211.70	2.51			" " ~10% cryptocryst.	1056623	220.0	225.0		40.79	6.14	1.700	<0.05	1.529			49.64	
211.70	213.60	1.09			" " " "	1056624	225.0	230.0		39.43	6.53	3.57	0.134	1.773			48.05	
213.60	214.60	0.34			" " ~50% cryptocryst.	1056625	230.0	235.0		38.85	6.48	5.24	<0.05	1.731			47.57	
214.60	216.60	0.67			" " ~10% cryptocryst.	1056626	235.0	240.0		44.99	1.647	2.71	<0.05	0.689			49.86	
216.60	218.00	1.11			" " " "	1056627	240.0	242.6		42.47	4.54	2.71	<0.05	0.832			49.33	
218.00	219.50	1.98			242.6m - 243.0m Massive sandy dolomite.													
219.50	221.50	0.40			~2% pyrite. Shaley in places.	Sandy dolomite	1056628	242.6	243.0		5.29	3.38	70.37	6.86	1.999			7.46
221.50	224.00	1.31																
224.00	225.20	0.34																
225.20	228.26	0.14																
228.26	230.00	1.02																
230.00	234.00	0.36																
234.00	237.00	2.35																
237.00	240.40	2.44			243.0m - 249.1m Fresh ~30% cryptocryst.	1056629	243.0	249.0		43.26	2.40	3.91	0.440	1.053			49.08	
240.40	242.80	2.37			Fresh magnesian-dolomite mix. Spotted - fully sharry textures.	" ~20% cryptocryst.	1056630	248.0	249.1		44.63	1.784	2.11	0.221	1.138			49.41

690

DD83AR3

346070

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

SHEET No. 4/6

TENEMENT NAME.....ARTHUR RIVER EL. No. 43/1

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH...301.5° AMG..... DRILLERS...K. PARRY..... COMMENCED...24.9.83..... DEPTH...408.0m..... HOLE No. DD83AR3

RL COLLAR..... INCLINATION...-46°..... DRILL TYPE...BOXES 37..... COMPLETED...19.10.83..... CASING LEFT..... DPO No(s)...30366

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by...Z.C.B.H.)							
From (M)	To (M)										NaO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃			
251.00	254.00	2.56	BQ		249.1m - 251.3m	Sharry carbonate with pyritic shale.	1056631	249.1	251.3		25.44	3.18	28.59	4.26	4.92			2512
254.00	257.00	3.07			Magnesite - dolomite mix with ~40% pyritic shale patches.	Fresh	1056632	251.3	256.0		41.24	2.31	8.38	0.095	0.927			4663
257.00	260.00	2.99																
260.00	263.00	2.79																
263.00	266.00	3.00			251.3m - 261.0m	" ~20% cryptocryst	1056633	256.0	261.0		35.87	4.15	15.53	0.127	1.987			4242
266.00	269.00	2.50			Fresh magnesite - dolomite mix													
269.00	272.00	1.18			Spotted to fully sharry textures.	" ~60% Sharry 20% sandy dolomite ~20% cryptocryst.	1056634	261.0	266.0		35.04	9.89	5.96	0.05	1.724			4656
272.00	275.00	0.21																
275.00	278.00	0.31			261.0m - 271.0m	" ~30% Sharry 20% sandy dolomite ~50% cryptocryst.	1056635	266.0	271.0		31.33	13.40	7.35	0.05	1.724			4496
278.00	281.00	0.86			Sharry magnesite - dolomite mix													
281.00	284.00	1.58			with approx 20% sandy dolomite	Badly weathered 100% Sharry.	1056636	271.0	279.0		31.91	12.20	8.46	0.05	2.23			4491
284.00	287.00	0.24			and 20% cryptocrystalline magnesite patches.													
287.00	290.00	0.08			Probably a relic angular magnesite breccia.													
290.00	293.00	0.55																
293.00	296.00	2.96																
296.00	297.80	1.70																
297.80	298.60	0.72			271.0m - 330.0m	" " " "	1056637	279.0	284.0		38.71	1.869	13.66	0.05	1.684			4343
298.60	301.50	2.80			Variably weathered magnesite - dolomite mix. Spotted -	" " " "	1056638	284.0	290.0		32.74	1.072	21.46	0.05	5.22			3867
301.50	304.50	3.04			fully sharry textures.	" " " "	1056639	290.0	295.0		29.01	15.54	10.76	0.05	1.098			4345
304.50	308.00	2.64																
308.00	310.30	1.68																
310.30	312.00	2.65																
312.00	317.00	2.78	BQ			" " ~40% Cryptocryst.	1056640	295.0	299.5		37.29	5.46	8.21	0.05	1.340			4617
						Fresh	1056641	299.5	304.5		39.75	5.40	6.25	0.05	0.955			474
						Weathered in part, ~40% Cryptocryst.	1056642	304.5	309.5		37.50	6.21	9.53	0.05	1.068			4553
						" " " ~20% Cryptocryst.	1056643	309.5	314.5		37.24	7.92	6.04	0.05	1.532			4649

072

346073

APPENDIX 8

DD83 AR3 LOG

DD83AR3

346079

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

TENEMENT NAME.....ARTHUR RIVER EL. No. 41

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH 301.5° AMG..... DRILLERS K. PARRY..... COMMENCED 24.9.83..... DEPTH 408.0m..... HOLE No. 2283A

RL COLLAR..... INCLINATION - 46°..... DRILL TYPE BOYLE'S 37..... COMPLETED 19.10.83..... CASING LEFT..... DPO No(s) 3036

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by ZC 8)					
From (M)	To (M)										MoO	CaO	SiO ₂	Al ₂ O ₃	FeO	
317.00	320.00	3.00	B&G		330.0m	Fresh ~10% Cryptocryst.	1056644	314.5	320.5		32.03	13.23	7.81	0.05	1.633	45
320.00	323.00	2.97				" " "	1056645	320.5	325.0		34.85	10.02	8.22	0.05	1.312	45
323.00	325.00	2.00				" " "										
325.00	327.00	1.19				" " "										
327.00	328.50	1.42				" ~5% Cryptocryst.	1056646	325.0	330.0		37.00	7.09	7.53	0.05	1.958	46
328.50	330.70	2.01			330.0m - 338.5m											
330.70	332.20	1.55			Fresh magnesite - dolomite mix	Partly weathered 100% Sharry	1056647	330.0	335.0		25.11	23.27	4.27	0.05	1.524	45
332.20	335.00	2.71			Completely sharry texture	Trace py.										
335.00	338.00	3.00			1% - 5% pyrite disseminated.	Fresh 100% Sharry	1056648	335.0	338.5		28.46	16.57	11.53	0.05	1.839	40
338.00	339.50	1.62				~5% Py.										
339.50	342.50	3.00			338.5m - 361.5m	Badly weathered ~10% Cryptocryst.	1056649	338.5	339.2		30.08	9.83	15.16	0.073	2.00	41
342.50	345.00	2.37			Variably weathered magnesite											
345.00	347.00	1.90			dolomite mix. Spotted sharry texture.	Fresh ~40% Cryptocryst.	1056650	339.2	343.0		33.47	9.14	12.85	0.05	1.115	43
347.00	348.80	1.59														
348.80	351.80	3.04				Fresh ~10% Cryptocryst.	1056651	343.0	348.0		31.93	11.92	10.38	0.05	1.462	44
351.80	354.00	2.23														
354.00	356.00	1.39				" " "	1056652	348.0	353.0		33.25	7.70	14.41	0.05	1.700	42
356.00	359.00	2.84														
359.00	361.00	1.96				Fresh but broken ~100% Sharry.	1056653	353.0	358.0		25.75	21.70	5.69	0.05	1.576	45
361.00	362.00	0.79														
362.00	365.00	2.91				" " " ~40% Cryptocryst.	1056654	358.0	361.5		26.53	19.51	7.12	0.061	1.853	44
365.00	368.00	2.47	B&G		361.5m - 366.0m											
					Sharry carbonate with ~20% pyritic shale patches.	" " " ~80% Sharry ~20% pyrite & shale.	1056655	361.5	366.0		28.45	17.73	4.00	0.157	3.41	44

APPENDIX 9

DD83 AR5 LOG

085

346086

APPENDIX 10

DD83 AR6 LOG

287

DD83AR6

346088

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

SHEET No. 1/6

TENEMENT NAME ARTHUR RIVER EL. No. 43/75

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH 310°AMG DRILLERS OVERLAND COMMENCED 19/11/83 DEPTH 332.2 m HOLE No. DD83AR6RL COLLAR..... INCLINATION -46° DRILL TYPE LARMAN 500-U COMPLETED 28/11/83 CASING LEFT 73m N/A DPO No(s) 30369

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by <u>Z.C.B.H.</u>)							
From (M)	To (M)										MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	L.O.I.		
					0-71.0m TRICONE Alluvium overlying deeply weathered H.W. Schist.	% Cryptocryst. Magnesite												
71.0	74.0	1.90	NQ															
74.0	114.0	0	CAVITY		71.0m - 73.0m Angular magnesite breccia; spotted.	50%	1056746	71.0	73.0			28.76	4.71	31.04	0.068	0.454		
					73.0m - 114.2m Sand and rubble filled cavity.	No SAMPLE - CAVITY.		73.0	114.2									
					114.2m - 116.3m Massive white magnesite; spotted.	90%	1056747	114.2	116.3			42.41	1.748	8.13	<0.050	0.225		
116.0	119.0	0.22																
119.0	122.0	2.10			116.3m - 119.9m Cavity.	No SAMPLE - CAVITY		116.3	119.9									
122.0	125.0	3.24																
125.0	128.0	3.05																
128.0	131.0	3.09			119.9m - 125.8m Partially weathered white massive magnesite. Spotted.	85%	1056748	119.9	124.0			39.55	2.55	12.40	<0.050	0.488		
131.0	134.0	3.24				80%	1056749	124.0	125.8			41.03	2.83	9.05	<0.050	0.446		
					125.8m - 130.3m Angular magnesite breccia Strongly recrystallized. Weak pyrite talc in dolomite zones.	5%	1056750	125.8	130.3			31.53	12.24	10.85	0.400	1.027		
					130.3m - 132.4m Massive white magnesite. Spotted.	90%	1056751	130.3	132.4			43.02	1.658	6.61	0.066	0.553		
					132.4m - 133.0m Angular magnesite breccia. Weakly pyritic.	30%	1056752	132.4	133.0			33.28	9.48	11.04	0.624	1.305		

093

346094

APPENDIX 11

DD83 AR7 LOG

DD83AR7

346095

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

SHEET No. 1/1

TENEMENT NAME... ARTHUR RIVER... EL... No. 43/

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH... 330° AMG..... DRILLERS... OVARLAND..... COMMENCED... 2-12-83..... DEPTH... 282.9m..... HOLE No. DD83AR

RL COLLAR..... INCLINATION... -7.6°..... DRILL TYPE... LARMAN 500-11..... COMPLETED... 10-12-83..... CASING LEFT... 3m NR 39m NR... DPO No(s) 30370

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by... ZCBH)							
From (M)	To (M)										MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	LOI		
					0-12.5m TRICONE	% Cryptocryst Magnesite.												
12.5	19.3	0.82	NQ		12.5m - 12.6m													
19.3	22.0	0.54			Coarse gravel.													
22.0	25.00	0.86																
25.0	27.3	0.69			12.6m - 28.0m	90%	1056662	12.6	19.3	6.20	40.55	13.32	13.96	10.05	0.05	1.08		44.13
27.3	28.0	0.42			Fresh-weathered massive magnesite - spotted.	90%	1056663	19.3	28.0	8.7	41.48	0.585	7.65	10.05	0.336			46.28
28.0	31.0	3.02			Numerous cavities.													
31.0	33.0	2.26				60%	1056664	28.0	33.0	5	43.75	2.91	3.08	10.05	0.65			47.56
33.0	34.0	0.96			28.0m - 40.8m													
34.0	37.0	3.06			Massive magnesite. Spotted	95%	1056665	33.0	38.0	5	43.76	3.37	1.99	10.05	0.425			50.41
37.0	40.0	2.98																
					40.8m - 43.7m	80%	1056666	38.0	40.8	2.8	44.01	6.24	2.59	10.05	0.789			47.32
40.0	43.0	2.91			Sandy dolomite.													
43.0	45.8	2.80				5%	1056667	40.8	43.7		45.65	2.97	2.64	10.05	2.05			46.18
45.8	49.0	2.86			43.7m - 57.0m													
49.0	52.0	0.96			Massive magnesite. Spotted.	90%	1056668	43.7	48.0	4.3	41.75	5.17	2.57	10.05	0.46			49.38
52.0	53.5	0.68																
53.5	55.0	1.40				90%	1056669	48.0	53.0		29.66	17.10	3.44	10.05	2.98			46.72
55.0	58.0	2.87																
						80%	1056670	53.0	57.0		38.3	4.11	11.26	10.05	1.198			45.08
					57.0m - 57.3m													
58.0	60.70	2.70			Angular magnesite breccia	20%	1056671	57.0	57.3		28.04	21.97	0.62	10.05	1.418			47.86
60.7	63.8	2.98																
63.8	66.3	2.51			57.3m - 68.8m	75%	1056672	57.3	62.0	4.7	44.74	1.65	3.70	10.05	0.81			49.50
66.3	68.4	2.10			Massive magnesite. Spotted.													
68.4	70.0	0.91				80%	1056673	62.0	67.0	5	42.20	4.87	2.83	10.05	0.788			49.29
						90%	1056674	67.0	68.8	1.1	44.64	4.71	3.88	10.05	0.585			49.21

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DD83AR7

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

SHEET No. 3/5

TENEMENT NAME... ARTHUR RIVER... EL... No. 43/7

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH... 330° AMG..... DRILLERS... OVKALAND..... COMMENCED... 2.12.83..... DEPTH... 282.9m..... HOLE No. DD83AR7

RL COLLAR..... INCLINATION... -76°..... DRILL TYPE... LARMAN 5.99-U..... COMPLETED... 10.12.83..... CASING LEFT... 3m NA 39m NA..... DPO No(s) 30370.....

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by... Z.C.B.H.)						
From (M)	To (M)										MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	Lot.	
163.0	165.8	2.20	BQ			% Cryptocryst Magnetite.											
165.8	169.0	2.92															
169.0	171.5	2.53															
171.5	173.1	0.79															
173.1	174.9	1.15															
174.9	177.0	1.62			177.0m - 183.0m												
177.0	180.0	3.24			Talc magnesite rock. Approx 10% - 50% talc.		1056687	177.0	183.0	5	40.79	4.12	11.15	0.050	1.098		42.78
180.0	183.0	2.08			Weathered. Poor recovery												
183.0	187.0	1.37			183.0m - 195.2m												
187.0	190.0	1.32			Talcosse magnesite. Talc decreasing down hole.		1056688	183.0	190.0	7	42.86	0.775	12.90	0.050	0.871		42.57
190.0	193.0	2.56			Weathered. Poor recovery.		1056689	190.0	195.2	5.2	40.89	0.939	14.98	0.050	2.63		40.67
193.0	195.2	0.76			195.2m - 238.0m												
195.2	196.7	0.97			Massive magnesite. Spotted to shaly. Weathered.		1056690	195.2	202.0	6.8	43.19	0.208	2.93	0.050	4.68		48.79
196.7	198.9	0.93			Numerous cavities. Poor recovery. Core varies from partly weathered to completely disaggregated.		1056691	202.0	220.0	18	44.21	0.242	2.71	0.050	3.67		49.50
198.9	202.0	1.99					1056692	220.0	227.2	7.2	46.95	0.350	0.500	0.050	0.936		51.36
202.0	205.0	0.98					1056693	227.2	231.8	4.6	40.70	6.78	0.692	0.050	1.583		50.09
205.0	210.0	1.06					1056694	231.8	238.0	6.2	42.65	5.20	0.500	0.050	1.362		50.34
210.0	220.0	0.96															
220.0	222.0	0.87															
222.0	224.6	1.33															
224.6	225.0	0.94															
225.0	226.0	0.52															
226.0	227.2	0.51															
227.2	230.1	0.56															
230.1	231.2	1.08															
231.2	231.8	0.86															
231.8	233.3	1.42															
233.3	234.1	0.94															

224.6 225.0 0.94

160

DD83AR7

346098

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

SHEET No. 4/5

TENEMENT NAME... ARTHUR RIVER... EL... No. 43/7

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH 330° AMG DRILLERS OVERLAND COMMENCED 2.12.83 DEPTH 282.9m HOLE No. DD83AR7

RL COLLAR..... INCLINATION -76° DRILL TYPE WARRIAN 500-U COMPLETED 10.12.83 CASING LEFT 3m NB 39m NB DPO No(s) 30370

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by... Z.C.B.H.)						
From (M)	To (M)										MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	LOI	
235.1	238.2	1.31	BQ			% Cryptocryst Magnetite.											
238.2	240.7	2.47			238.0m - 242.4m Weathered magnesite passing down hole into fresh angular magnesite breccia. End of weathered zone at 242.4m.		1056695	238.0	242.4		38.18	9.60	0.926	0.050	1.355		47.42
242.1	243.2	1.04			242.4m - 243.3m Sandy dolomite		1056696	242.4	243.3		20.56	23.46	12.66	0.050	1.847		40.63
243.2	245.0	1.66			243.3m - 248.5m Pale green slate.	Pale green slate no sample		243.3	248.5	No sample							
248.1	250.0	2.11			248.5m - 250.3m Apatitic sandy dolomite		1056697	248.5	250.3		36.26	8.69	1.288	0.053	5.13		42.09
250.3	251.8	3.11	BQ		250.3m - 251.8m Massive grey magnesite. Spotted	90%	1056698	250.3	251.8	1.5	44.86	5.11	0.500	0.050	2.38		49.26
251.8	252.3				251.8m - 252.3m Sandy dolomite. Gradational upper and lower contacts.		1056699	251.8	252.3		35.05	12.51	0.722	0.050	2.62		47.43
252.3	254.4				252.3m - 254.4m Grey massive magnesite with minor sandy dolomite patches.		1056700	252.3	254.4		39.06	7.92	1.580	0.050	2.17		48.46
254.4	259.0				254.4m - 259.0m Grey massive magnesite with minor sandy dolomite patches.		1056496	254.4	259.0	1.5	40.71	6.54	0.500	0.050	2.11		47.66

860

DD83AR7

346099

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

SHEET No. 5/5

TENEMENT NAME... ARTHUR RIVER EL... No. 93/7

PLAN - MAP REFERENCE.....

CO-ORDINATES..... AZIMUTH... 330° AMG..... DRILLERS... OVERLAND..... COMMENCED... 2-12-83..... DEPTH... 282.9m..... HOLE No. DD83AR7

RL COLLAR..... INCLINATION... -16°..... DRILL TYPE... WARRIAN 500-H..... COMPLETED... 10-12-83..... CASING LEFT... 3m NA 39m NA..... DPO No(s) 30370.....

DEPTH		Core Rec. (M)	Core Size	Graphic Log	CORE DESCRIPTION	SPECIAL FEATURES Weath, Alteration, Fracturing, Veining, Mineralization	Sample No.	From (M)	To (M)	Rec (M)	ASSAY VALUES (Analysed by... Z.C.B.H.)								
From (M)	To (M)										MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	LOI			
						% Cryptocryst Magnetite.													
259.0	262.0	3.03	BQ		259.0m - 269.0														
262.0	265.0	3.09			Pyritic sandy dolomite with minor magnesite patches		1056457	259.0	264.0			32.4	15.4	1.273	0.050	2.55		47.38	
265.0	267.7	1.90					1056458	264.0	265.6			36.8	10.3	0.884	0.050	2.59		48.45	
267.7	269.0	2.06					1056459	265.6	269.0	3.4		60.5	5.8	1.408	0.050	2.69		49.06	
					269.0m - 271.6m														
269.0	272.1	3.02			Massive magnesite. Spotted. Talcose.		1056460	269.0	271.6			39.2	5.63	6.58	0.050	1.89		45.87	
272.1	273.6	1.37																	
273.6	274.6	1.00																	
274.6	276.2	1.51			271.6m - 275.5m		1056461	271.6	275.5			35.16	8.60	3.67	0.075	5.25		46.87	
276.2	278.1	1.92			Sandy dolomite.														
278.1	282.1	0																	
282.1	282.9	0.70	BQ		275.5m - 276.7m														
					Banded pyritic calc siltstone. ie. Probable Faultwall units														
					276.7m - 278.1m														
					Banded pyritic calc-quartz sandstone.														
					278.1m - 282.1m														
					Cavity.														
					282.1m - 282.9m														
					Mica-dolomite schist.														

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APPENDIX 12

DD84 CCl LOG

APPENDIX 13

TEST GRAVITY SURVEY, ARTHUR RIVER EL 43/70,
N.W. TASMANIA

104

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

LEVEL 4, BELLERIVE QUAY,
CAMBRIDGE ROAD, BELLERIVE, 7018, TASMANIA, AUSTRALIA

P.O. BOX 138
BELLERIVE 7018
TELEGRAMS: CRAEX
TELEX: AA57144
TELEPHONE: 44 3533
AREA CODE: (002)

IN REPLY PLEASE QUOTE

18th June, 1984.

Memroandum To: P.MACKENZIE
Copy: T.W.DICKSON
From: M.FLIS
Subject: TEST GRAVITY SURVEY, ARTHUR RIVER
EL 43/70, N.W.TASMANIA

INTRODUCTION

On the 26th of October and the 18th of November, 1983, three lines of gravimetry were completed over the positions, and projected position of the magnesite deposit at Arthur River E.L. 43/70 (Location Plan TASH 1510). The surveys were done to:

- a) Ascertain if the magnesite was directly detectable by the gravity technique,
- b) Ascertain whether geological complications, such as dykes and sink holes could be detected prior to further drilling, and
- c) Compute an excess mass to obtain an idea on the tonnage present.

A line of gravity was read over each of drill sections DD83 AR3 (line 19600mN - 800 metre length), DD83 AR5 (line 20000mN - 750 metre length) and the then proposed hole DD83 AR6 (line 19250mN - 800 metre length). The lines were surveyed at a 25 metre station spacing using CRAE La Coste and Romberg gravity meter number G-649. The lines were optically levelled to an accuracy better than 3.0 millimetres (the maximum loop misclosure).

Field data was reduced using the PDP 11/23 programme GRAVPACK. A Bouguer density of 2.67 gm/cc was used - although other values were tried. No terrain corrections were applied, nor were the surveys tied in to either the National Gravity Network or the Australian Height Datum, due to survey area remoteness.

CONCLUSIONS AND RECOMMENDATIONS

The survey successfully detected the presence of magnesite on the three lines surveyed. Whilst, in general, the anomalies agree well with drill sections, there are discrepancies. These discrepancies are most probably caused by fluctuations in the thickness of overburden (alluvium and weathered horizon) and structural complications. The eastern (hanging wall) contact is generally diffuse in a density sense. This may reflect the significantly more weathered nature of the schists that occur here and/or the deeper accumulation of overburden at this contact.

A minimum excess mass estimate of 53.8 million tonnes, from a body of, say, dimensions 210m x 1000m x 92m at 2.78gm/cc was calculated. These figures infer that this block of material would contain a significant portion of low density (and thus sub-standard) magnesite. For example, assuming good quality magnesite has a density of 2.9 gm/cc and sub-standard magnesite has an average 2.66 gm/cc density the ratio of high grade to low grade would be around 1 to 3 by weight.

The excess mass estimation is extremely sensitive to the density contrasts used. Without more accurate density information the above should be used as a guide only, and not "in esse".

It is recommended that:

1. Future exploration for magnesite of similar style should seriously consider reconnaissance gravity profiling. This could be applied to the southern extensions of the Arthur-Lyons River deposits into Rapid River EL 1/79. A station spacing of 50 metres could be used however, as minimum levelling distances would fall way below this, an interval of 25 metres could be accommodated;
2. The gravity method could be applied to the entire Arthur-Lyons River magnesite areas to facilitate the evaluation of this deposit. In particular, a profile between lines 19600mN and 20000mN would elucidate the ambiguous situation existing there. A minimum requirement of such a survey would be a more detailed and accurate knowledge of density distribution.
3. Seismic refraction surveys should be considered for this area and any other areas covered by alluvium. This would provide details of alluvial overburden which could be used in gravity interpretation as well as deposit assessment and mine planning, should it get to that stage, and,

106

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4. A programme of density determinations on all available core should be carried out to modify any interpretations made here, to assist in the planning of future surveys, and to facilitate the computation of an accurate excess mass.

DISCUSSION

The Bouger Anomaly profiles are attached as Plans TASH 1767, 1768, and 1769. These plans include the regional gradient, drill sections and interpreted geologic sections. A "Table of Principle Facts" is included as Attachment I.

Regional Gradient

The gradient is derived from the B.M.R.'s regional gravity survey. It is attributable to a major linear gravity high trending nor'-nor'-east along the eastern margin of the Arthur Lineament. Speculation on the cause of this feature ranges from a thin sedimentary pile (thinned continental crust) to the presence of a major amphibolite unit.

Forward Modelling and Density Measurements

Forward modelling prior to field work was carried out to determine if the method was likely to be successful. Using densities of 3.0 gm/cc (average density of magnesite), 2.7 gm/cc (average for siltstone, schists and amphibolites), and 1.8 gm/cc (unconsolidated wet sands) and magnesite dimensions of 200m x 2000m x 600m at 20m depth with variable overburden, an anomaly in the order of 2 milligals was obtained.

Actual density measurements on core samples (Table I), however proved that the density contrasts are not as great as expected with the result that observed gravity anomalies were only of the order of 0.5 to 0.7 milligals.

A useful conclusion found from modelling is that the shape and amplitude of any anomaly could be drastically altered by the configuration of low density, surface alluvium found over the area.

LINE BY LINE DISCUSSION

a) Line 19,250mN (TASH 1767)

The residual anomaly of around 0.5 milligals defines quite accurately the magnesite's position as drilled. A cavity encountered in the hole at the hanging wall contact may serve to "enhance" the anomaly here. A second cavity encountered at the bottom of the hole may be linked to the gravity low at around 9850mE. If so this would suggest that a more continuous feature extending to surface would be present as the cavity at that depth, would not be so visible in the gravity area.

On the evidence of gravity alone, the magnesite has a width of some 220m.

A small (0.1 mgal) anomaly at around 9625mE probably reflects the presence of the amphibolite unit which outcrops about 30m south of the line.

The smooth character of this profile indicates a relatively homogenous and uniform overburden.

b) Line 19,600mN (TASH 1768)

An 0.7 milligal residual anomaly is attributable to the magnesite. Whilst the western side of this anomaly is quite abrupt, the eastern side is far more diffuse. This may reflect a thicker alluvial section on the hanging wall contact or the dense-wise diffuse nature of that contact. The western gradient may be enhanced due to the absence of alluvium at that location.

A quartz sandstone horizon occurring within the magnesite would appear to be a continuous feature extending to surface.

Once again, the amphibolite manifests itself by a small (0.25 milligal) anomaly at around 9700mE.

From this data the amphibolite is interpreted to be much thicker than that encountered in the hole.

The small one-station negative anomaly at 9624mE may reflect the fault separating the Permian and Precambrian sequences.

c) Line 20,000mN (TASH 1769)

The residual anomaly has broadened out considerably. In addition it becomes more difficult to reconcile the observed gravity with outcrop geology. The anomaly due to the amphibolite has got larger in both magnitude and extent with the result that it is now part of the (smaller) magnesite anomaly.

The drastic thinning of the magnesite and the way it has been brought into contact with the amphibolite unit suggests major structural complications between this line and 19,600mN.

Excess Mass Estimation

Residual gravity anomalies were obtained by subtracting the regional gradient described above. The absolute value of this gradient was adjusted so as to make that part of the gravity profile attributable to the magnesite wholly positive. The residuals were contoured and discretized into 20 x 20 metre elements over a kilometre strike length (see plan TASH 1770). The formula for excess mass was applied:

$$M = \frac{\sigma}{2\pi\gamma\Delta\sigma} \sum \Delta\bar{g} S$$

108

where

- σ = density of anomalous mass
- $\Delta\sigma$ = density contrast between anomalous mass and host rocks
- γ = $6.67 \times 10^{-11} \text{ Nm}^2/\text{Kg}^2$, the gravitational constant
- Δg = mean residual anomaly within a specified element
- S = area of element

Although the gravity field is not well enough defined to allow a rigorous application of this formula, and the contribution of the amphibolite to the anomaly on line 20,000mN is only conjecture, an idea of the excess mass involved can be obtained.

If the density of magnesite is taken to be 2.81 gm/cc, and that of the host rocks as 2.51 gm/cc (averages, see Table I) then the above calculation yields a mass of 19.9 million tonnes, or a body 210m x 1000m x 34m. (assuming 50% of the anomaly on line 20,000mN is amphibolite-caused).

Drilling and mapping indicate that a generalized magnesite body on the three lines would have dimensions of about 210m x 1000m x 200m or 118.9 million tonnes, a figure at least six times greater than that obtained above. Probable reasons for this discrepancy are:-

- a) The host rock density is greater than that shown in Table I. The values obtained for the hanging wall schists are low due to weathering. One would expect fresh samples to be denser. The amphibolite density, on the other hand, is well determined as these samples were obtained at depth. If a bulk density of 2.67 gm/cc is assumed for the host rocks the excess mass increases to about 42.7 million tonnes or a 2.81 gm/cc body of dimensions 210 x 1000m x 72m.
- b) The bulk density of magnesite may be less than 2.81 gm/cc. This would be the case if a greater volume of the magnesite body is composed of weathered material or features. The magnesite samples on which density determinations were made were typically high magnesium ore. If the representation of low density weathered material was doubled in Table I (i.e. the 2.59 gm/cc sample) the mean density would drop to 2.78 gm/cc with a subsequent increase in excess mass to 53.8 tonnes or a body of dimensions 210m x 1000m x 92m.
- c) The magnesite horizon does not have dimensions of 210m x 1000m x 200m, and finally
- d) The effects of low density alluvial cover is expected to markedly decrease the magnitude of the anomaly. For a charge D in overburden thickness, where the density contrast is $\Delta\sigma$

$$\Delta g = 2.89 \times 10^{-3} \Delta\sigma D$$

Assuming $\Delta\sigma = -0.98 \text{ gm/cc}$ (for alluvium at 1.8 gm/cc) and D as large as 70m (see for example sink hole on DD83 AR3 section) $g = 0.27 \text{ milligals}$.

Thus a change in low density cover thickness in the order of 70m will decrease the observable magnesite anomaly by about one third, causing a proportionate decrease in the excess mass.

If, on average, the alluvium cover is assumed to be 20m thick, a decrease in the observable gravity anomaly of 0.08 milligals would apply. This translates to an excess mass of around 1 million tonnes.

MARCUS FLIS

110

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DENSITIES OF SELECTED CORE FROM ARTHUR RIVER MAGNESITE PROSPECT

<u>SAMPLE</u>	<u>HOLE</u>	<u>DEPTH</u>	<u>Wt (gm)</u>	<u>VOL (cc)</u>	<u>DENSITY (gm/cc)</u>
Magnesite (good)	AR3	301.5	135.02	48.5	2.78 ± 0.12
" (recryst)	"	330.0	109.92	39.0	2.82 ± 0.15
" (" low qual)	"	257.8	143.52	49.0	2.93 ± 0.12
" (weathered)	"	197.0	179.86	61.0	2.95 ± 0.1
" (")	"	93.0	107.6	41.5	2.59 ± 0.13
Mean = 2.81gm/cc					St.dev. = 0.14
Amphibolite (F.W.)	"	406.0	369.49	129.0	2.86 ± 0.04
"	"	400.5	233.96	88.0	2.66 ± 0.06
"	"	"	41.73	16.0	2.61 ± 0.33
Mean = 2.71gm/cc					St.dev. = 0.13
Schist H.W. (weathered)	AR2	91.0	211.95	84.0	2.52 ± 0.06
" (v. ")	"	96.0	211.75	115.0	1.84 ± 0.03
Mean = 2.18gm/cc					St.dev. = 0.48
Permian fresh foliated siltstones	KR2	164.9	333.96	127.0	2.63 ± 0.04
Mean = 2.63gm/cc					St.dev. = 0.0

ERRORS

Error in weight is ± 0.05gm

Error in volume is ± 2.0cc

Error in density is ± $\rho \left[\frac{\Delta Wt}{Wt} + \frac{\Delta vol}{vol} \right]$

Listings of File : GAR19250

Title : ARTHUR RIVER MAGNESITE LINE 19250mN GRAVITY PROFILE

L&R IG-649 GRAVITY METER READ BY M.FLIS
 SURVEY NOT TIED TO NATIONAL GRAVITY NETWORK
 LEVELLED BY L.MACKENZIE TO ARBITRARY DATUM (200m ON LINE
 20000mN AT 10000mE).
 FINE WEATHER , 15 DEG. C, LIGHT WINDS.

The IGSN 71 gravity formula has been used to compute the latitude correction.
 Bouguer density used = 2670.00 kg/cubic metre.
 Meter constant used 1.01571 mGal/div.
 Free air correction computed from $2.g(PHI).h/R(PHI)$
 where $g(PHI)$ is the IGSN 71 value for latitude PHI
 $R(PHI)$ is the earth radius at latitude PHI
 h is the station elevation above the reference datum.
 Gravitational constant $6.672 \text{ E-11 S.I. units.}$

Station Number	Co-ordinates Eastings Northings	Elevation	Time	Date	Meter Readings	Bouguer Anomaly	Residual Anomaly
8302.9525	369422.8 5439787.5	174.85	12:15	18.11.83	43.4450	16.0696	-0.0296
8302.9550	369442.0 5439771.4	175.91	12:18	18.11.83	43.2370	16.0823	-0.0402
8302.9575	369461.1 5439755.3	177.49	12:28	18.11.83	42.9400	16.1342	0.0004
8302.9600	369480.3 5439739.3	180.82	12:32	18.11.83	42.3390	16.1983	0.0639
8302.9625	369499.4 5439723.2	187.87	12:35	18.11.83	40.9520	16.1923	0.0575
8302.9650	369518.6 5439707.1	193.07	12:39	18.11.83	39.8940	16.1602	0.0252
8302.9675	369537.7 5439691.0	195.21	12:43	18.11.83	39.4110	16.1099	-0.0251
8302.9700	369556.9 5439675.0	197.22	12:49	18.11.83	39.0730	16.1892	0.0555
8302.9725	369576.0 5439658.9	195.74	12:53	18.11.83	39.5630	16.4149	0.2927
8302.9750	369595.2 5439642.8	195.98	12:56	18.11.83	39.6590	16.5749	0.4816
8302.9775	369614.3 5439626.8	200.61	13:00	18.11.83	38.7040	16.5353	0.4835
8302.9800	369633.5 5439610.7	207.43	13:05	18.11.83	37.1900	16.3628	0.3636
8302.9825	369652.6 5439594.6	211.01	13:09	18.11.83	36.3470	16.2303	0.2854
8302.9850	369671.8 5439578.6	211.69	13:11	18.11.83	36.1170	16.1419	0.2518
8302.9875	369690.9 5439562.5	210.68	13:13	18.11.83	36.3690	16.2105	0.3813
8302.9900	369710.1 5439546.4	210.33	13:15	18.11.83	36.4110	16.1957	0.4401
8302.9925	369729.2 5439530.3	207.09	13:18	18.11.83	36.9360	16.1067	0.4317
8302.9950	369748.4 5439514.3	199.92	13:22	18.11.83	37.7950	15.5874	0.0003
8302.9975	369767.5 5439498.2	199.42	13:25	18.11.83	37.8110	15.5207	0.0258
8302.0000	369786.7 5439482.1	199.38	13:29	18.11.83	37.7170	15.4365	0.0415
8302.0025	369805.8 5439466.1	197.64	13:32	18.11.83	37.9800	15.3766	0.0895
8302.0050	369825.0 5439450.0	197.65	13:34	18.11.83	37.8710	15.2792	0.1103
8302.0075	369844.2 5439433.9	197.71	13:38	18.11.83	37.7340	15.1601	0.1164
8302.0100	369863.3 5439417.9	199.60	13:42	18.11.83	37.2630	15.0583	0.1544
8302.0125	369882.5 5439401.8	204.29	13:46	18.11.83	36.1600	14.8655	0.1091
8302.0150	369901.6 5439385.7	209.42	13:50	18.11.83	34.9370	14.6375	0.0434
8302.0175	369920.8 5439369.7	214.56	13:54	18.11.83	33.7020	14.3993	-0.0262
8302.0200	369939.9 5439353.6	220.50	13:57	18.11.83	32.3880	14.2379	-0.0100
8302.0225	369959.1 5439337.5	229.79	14:02	18.11.83	30.2790	13.9288	-0.1289
8302.0250	369978.2 5439321.4	243.46	14:07	18.11.83	27.4560	13.7564	-0.0969
8302.0275	369997.4 5439305.4	257.59	14:13	18.11.83	24.5900	13.6312	0.0010

Base Stations

8302.0050	369825.0 5439450.0	197.65	11:59	18.11.83	38.2530
8302.0050	369825.0 5439450.0	197.65	13:35	18.11.83	37.8710
8302.0050	369825.0 5439450.0	197.65	14:22	18.11.83	37.8810

Conversion Parameters

Nominal Gravity 978106.86590 Meter Constant 1.01571
 Eastings/Longitude 369825.00000 Northings/Latitude 5439450.00000 AMG Zone 55.000
 Free Air Constant 0.30872
 Bouguer Density 2670.00000

Regional Data

Co-ordinates	Regional Gravity
369403.60000 5439803.50000	16.07600
369461.10000 5439755.50000	16.13400
369556.90000 5439675.00000	16.13500
369671.80000 5439578.50000	15.89000
369748.40000 5439514.50000	15.58700
369825.00000 5439450.00000	15.17000
369901.60000 5439385.50000	14.59500
369997.40000 5439305.50000	13.63100
370016.60000 5439289.50000	13.33500

Listing of File : GAR19400

Title : ARTHUR RIVER MAGNESITE LINE 19.600mN GRAVITY PROFILE

L&R 40-449 GRAVITY METER READ BY M.FLIS
 SURVEY NOT TIED TO NATIONAL NETWORK
 LEVELLED BY L. MACKENZIE TO ARBITRARY DATUM (200m ON LINE
 20,000mN AT 10,000mE)
 FINE WEATHER, 15 DEG. C, WINDY

The IGSN 71 gravity formula has been used to compute the latitude correction.
 Bouguer density used = 2670.00 kg/cubic metre.
 Meter constant used 1.01571 mGal/div.
 Free air correction computed from $2.g(\text{PHI}).h/R(\text{PHI})$
 where $g(\text{PHI})$ is the IGSN 71 value for latitude PHI
 $R(\text{PHI})$ is the earth radius at latitude PHI
 h is the station elevation above the reference datum.
 Gravitational constant $6.672 \text{ E-11 S.I. units.}$

Station Number	Co-ordinates Eastings Northings	Elevation	Time	Date	Meter Readings	Bouguer Anomaly	Residual Anomaly
8302.9525	369547.4 5440004.3	186.39	09:25	18.11.83	40.8620	15.5303	-0.0526
8302.9550	369548.7 5439991.2	192.44	09:30	18.11.83	39.6540	15.4974	-0.0484
8302.9575	369590.0 5439978.2	200.08	09:36	18.11.83	38.1880	15.5152	0.0020
8302.9600	369611.3 5439965.1	207.46	09:40	18.11.83	36.7410	15.5011	0.0140
8302.9625	369632.6 5439952.1	211.95	09:43	18.11.83	35.7050	15.3356	-0.1282
8302.9650	369653.9 5439939.0	210.94	09:47	18.11.83	36.0020	15.4417	0.0038
8302.9675	369675.3 5439925.9	205.85	09:52	18.11.83	37.0390	15.4967	0.0884
8302.9700	369696.6 5439912.9	200.66	09:59	18.11.83	38.0940	15.5504	0.1739
8302.9725	369717.9 5439899.8	192.37	10:03	18.11.83	39.5430	15.3941	0.0537
8302.9750	369739.2 5439886.8	184.23	10:08	18.11.83	41.0300	15.3059	0.0059
8302.9775	369760.5 5439873.7	184.11	10:15	18.11.83	41.3590	15.6201	0.3681
8302.9800	369781.8 5439860.6	184.87	10:19	18.11.83	41.3840	15.7983	0.6021
8302.9825	369803.2 5439847.6	186.22	10:22	18.11.83	41.0910	15.7695	0.6336
8302.9850	369824.4 5439834.5	186.17	10:25	18.11.83	41.1250	15.7974	0.7255
8302.9875	369845.8 5439821.4	188.35	10:31	18.11.83	40.6500	15.7473	0.7433
8302.9900	369867.1 5439808.4	193.84	10:36	18.11.83	39.4020	15.5634	0.6300
8302.9925	369888.4 5439795.3	199.27	10:40	18.11.83	38.0620	15.2742	0.4151
8302.9950	369909.7 5439782.3	201.72	10:43	18.11.83	37.4760	15.1643	0.3830
8302.9975	369931.1 5439769.2	202.70	10:47	18.11.83	37.1610	15.0406	0.3417
8302.0000	369952.4 5439756.1	205.72	10:50	18.11.83	36.2510	14.7138	0.1006
8302.0025	369973.7 5439743.1	204.59	10:53	18.11.83	36.3380	14.5829	0.0632
8302.0050	369995.0 5439730.0	204.16	10:56	18.11.83	36.2980	14.4609	0.0418
8302.0075	370016.3 5439716.9	205.38	11:01	18.11.83	35.9410	14.3428	0.0284
8302.0100	370037.6 5439703.9	207.56	11:05	18.11.83	35.3820	14.2081	0.0013
8302.0125	370058.9 5439690.8	213.01	11:11	18.11.83	34.1340	14.0178	-0.0788
8302.0150	370080.3 5439677.8	220.94	11:17	18.11.83	32.5600	13.9843	-0.0008
8302.0175	370101.6 5439664.7	226.28	11:21	18.11.83	31.3530	13.8134	-0.0578
8302.0200	370122.9 5439651.6	231.81	11:25	18.11.83	30.2780	13.8139	0.0576
8302.0225	370144.2 5439638.6	239.27	11:29	18.11.83	28.6880	13.6711	0.0310
8302.0250	370165.5 5439625.5	240.59	11:34	18.11.83	28.3660	13.6083	0.0858
8302.0275	370186.8 5439612.4	252.40	11:41	18.11.83	25.8710	13.4032	0.0010

Base Stations

8302.0050	369995.0 5439730.0	204.16	09:05	18.11.83	36.3070
8302.0050	369995.0 5439730.0	204.16	10:56	18.11.83	36.2980
8302.0050	369995.0 5439730.0	204.16	11:50	18.11.83	36.2820

Conversion Parameters

Nominal Gravity 978104.87410 Meter Constant 1.01571
 Eastings/Longitude 369995.00000 Northings/Latitude 5439730.00000 AMG Zone 55.00000
 Free Air Constant 0.30872
 Bouguer Density 2670.00000

Residual Data

Co-ordinates Eastings Northings	Residual Gravity
369526.10000 5440017.50000	15.62000
369590.00000 5439978.00000	15.51300
369653.90000 5439939.00000	15.43800
369739.20000 5439887.00000	15.30100
369824.40000 5439834.50000	15.07200
369952.40000 5439756.00000	14.61400
370037.60000 5439704.00000	14.20700
370186.80000 5439612.50000	13.40200
370208.10000 5439599.50000	13.27800

Listings of File : GAR20000

Title : ARTHUR RIVER MAGNESITE LINE 20,000mN GRAVITY PROFILE

L&R #G-649 GRAVITY METER READ BY M.FLIS
SURVEY NOT TIED TO NATIONAL NETWORK
LEVELLED BY V.WILLIAMS AND M.FLIS TO ARBITRARY DATUM (200m AT
10,000mE)
FINE WEATHER, 17 DEG. C

The IGSN 71 gravity formula has been used to compute the latitude correction.
Bousguer density used = 2670.00 kg/cubic metre.
Meter constant used 1.01571 mGal/div.
Free air correction computed from $2 \cdot s(\text{PHI}) \cdot h/R(\text{PHI})$
where $s(\text{PHI})$ is the IGSN 71 value for latitude PHI
 $R(\text{PHI})$ is the earth radius at latitude PHI
h is the station elevation above the reference datum.
Gravitational constant 6.672 E-11 S.I. units.

Station Number	Co-ordinates Eastings Northings	Elevation	Time	Date	Meter Reading	Bousguer Anomaly	Residual Anomaly
8301.0100	370245.6 5440063.1	189.89	12:44	26.10.83	36.9700	13.1141	-0.0479
8301.0075	370224.0 5440075.6	195.37	12:39	26.10.83	36.0290	13.2402	-0.0249
8301.0050	370202.3 5440088.0	198.25	12:34	26.10.83	35.6730	13.4492	0.0810
8301.0025	370180.7 5440100.5	200.61	12:29	26.10.83	35.2320	13.4687	0.0002
8301.0000	370159.0 5440113.0	200.00	10:00	26.10.83	35.5010	13.5975	0.0317
8301.9975	370137.3 5440125.5	198.58	10:03	26.10.83	35.8100	13.6298	-0.0303
8301.9950	370115.7 5440138.0	196.95	10:04	26.10.83	36.2110	13.7132	-0.0407
8301.9925	370094.0 5440150.4	191.56	10:10	26.10.83	37.3870	13.8443	0.0002
8301.9900	370072.4 5440162.9	187.33	10:15	26.10.83	38.4930	14.1317	0.2006
8301.9875	370050.7 5440175.4	188.04	10:19	26.10.83	38.5650	14.3417	0.3242
8301.9850	370029.0 5440187.9	188.62	10:23	26.10.83	38.5610	14.4497	0.3480
8301.9825	370007.4 5440200.4	188.39	10:27	26.10.83	38.7210	14.5636	0.3803
8301.9800	369985.7 5440212.8	187.16	10:31	26.10.83	39.0580	14.6606	0.3979
8301.9775	369964.0 5440225.3	180.50	10:36	26.10.83	40.6440	14.9589	0.6208
8301.9750	369942.4 5440237.8	178.27	10:41	26.10.83	41.1080	14.9873	0.5776
8301.9725	369920.7 5440250.3	176.00	10:45	26.10.83	41.5200	14.9565	0.4771
8301.9700	369899.1 5440262.8	175.48	10:49	26.10.83	41.5910	14.9236	0.3766
8301.9675	369877.4 5440275.3	179.83	11:16	26.10.83	40.6780	14.8541	0.2427
8301.9650	369855.7 5440287.7	185.73	11:21	26.10.83	39.6120	14.9314	0.2572
8301.9625	369834.1 5440300.2	188.18	11:25	26.10.83	39.0710	14.8636	0.1295
8301.9600	369812.4 5440312.7	190.33	11:28	26.10.83	38.6670	14.8746	0.0850
8301.9575	369790.8 5440325.2	192.68	11:32	26.10.83	38.2690	14.9296	0.0892
8301.9550	369769.1 5440337.7	194.57	11:36	26.10.83	37.8610	14.8871	-0.0001
8301.9525	369747.4 5440350.1	194.58	11:40	26.10.83	37.8820	14.9087	-0.0250
8301.9500	369725.8 5440362.6	194.54	11:43	26.10.83	37.9790	14.9966	0.0171
8301.9475	369704.1 5440375.1	195.62	11:46	26.10.83	37.7600	14.9846	-0.0403
8301.9450	369682.4 5440387.6	196.21	11:49	26.10.83	37.7110	15.0494	-0.0195
8301.9425	369660.8 5440400.1	195.30	11:54	26.10.83	37.9640	15.1250	0.0126
8301.9400	369639.1 5440412.5	191.44	11:58	26.10.83	38.7710	15.1834	0.0278
8301.9375	369617.5 5440425.0	187.77	12:02	26.10.83	39.5380	15.2400	0.0424
8301.9350	369595.8 5440437.5	188.86	12:07	26.10.83	39.2900	15.2003	-0.0398

Base Stations

8301.0000	370159.0 5440113.0	200.00	10:00	26.10.83	35.5010
8301.0000	370159.0 5440113.0	200.00	10:59	26.10.83	35.5010
8301.0000	370159.0 5440113.0	200.00	12:25	26.10.83	35.4760
8301.0000	370159.0 5440113.0	200.00	12:51	26.10.83	35.5050

Conversion Parameters

Nominal Gravity 978105.00000 Meter Constant 1.01571
 Eastings/Lonsitude 370159.00000 Northings/Latitude 5440113.00000 AMG Zone 55.00000
 Free Air Constant 0.30872
 Bousguer Density 2670.00000

Resional Data

Co-ordinates	Resional Gravity
370245.60000 5440063.00000	13.16200
370180.70000 5440100.50000	13.46900
370094.00000 5440150.50000	13.84400
369985.70000 5440213.00000	14.26300
369899.10000 5440263.00000	14.54700
369812.40000 5440312.50000	14.79000
369769.10000 5440337.50000	14.88700
369682.40000 5440387.50000	15.06900
369595.80000 5440437.50000	15.24000
369509.20000 5440487.50000	15.41100

APPENDIX 14

CANN CREEK PROSPECT GEOCHEMICAL LEDGER

C.R.A. EXPLORATION . GEOCHEMICAL SAMPLE LEDGER

Tenement name.....ARTHUR RIVER..... E.L. No. 43/70. Sample numbers.....1056801 - 1056806..... Collected by.....VAL PT..... Sheet no. 1/2
 Area / Prospect.....CANN CREEK..... Date.....18-1-84.....
 Map / Photo reference..... Analysed by.....AMDEL..... DPO no. 30371

Sample No.	Type	ss channel **						Carbon	Metal content ppm or %						Grid ref	Geological Observations	
		ss *	fl	wi	al	co	ca		pH	MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃			L.O.I.
		oc															
1056801	oc								42.4	4.30	0.63	0.08	0.06			50.4	Grey magnesite on bluffy outcrop above northern bank of Cann Creek.
1056802	oc								45.5	1.11	0.35	0.09	0.04			51.2	Grey non effervescent carbonate (dolomite - magnesite) downstream from 1056801
1056803	oc								45.7	0.37	0.44	0.07	0.20			51.5	
1056804	oc								0.98	0.03	97.5	0.03	<.01			1.03	White granular carbonate - silica rock exposed by earthworks on Cann Creek near access road.
1056805	oc								0.33	0.04	96.9	0.17	0.29			0.56	Silica carbonate rock from Arthur River approx 500m upstream from R16
Duplicate of 1056805 for Petrography.																	
1056806	oc								44.6	2.44	1.13	0.12	0.16			50.4	Grey magnesite on bluffy outcrop as for 1056801.

* Sample type ss = stream sediment oc = outcrop f = float s = soil
 ** Stream sed. sample description fl = flow m3/sec wi = width m al = alluvial co = colluvial ca = catchment km2
 *** Outcrop sample type gs = grab sample rc = rock chip (state interval & length) cs = channel sample (state length)
 **** Soil sample type auger hole or pit depth m A B or C horizon

C.R.A. EXPLORATION . GEOCHEMICAL SAMPLE LEDGER

Tenement name ARTHUR RIVER EL 43/70 No. Sample numbers..... Collected by VAW Sheet no. 2/2
 Area / Prospect CANN CREEK Date 31.1.84
 Map / Photo reference..... Analysed by AMDEL DPO no. 30373

Sample No.	Type	ss channel **						Carbon	Metal content ppm or %							Grid ref	Geological Observations	
		ss *	fl	wl	al	co	ca		pH	MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	L.O.I.			
		oc	o/c sample type ***															
		f	s sample type ****															
1056807	oc							42.9	1.11	12.0	0.18	0.05					43.3	STN 4230 Cann creek map. Grey carbonate.
1056808	oc							44.7	1.84	2.12	0.12	0.07					49.5	STN 4230 Cann creek map. Grey magnesite - dolomite
1056809	oc							40.5	1.53	18.9	0.16	0.18					36.7	STN 4230 4321 Cann creek map Angular magnesite breccia with chlorites schist - dolomite matrix.
1056811	oc							40.7	5.80	2.90	0.23	0.19					48.2	STN 4336 Cann creek map. Grey magnesite
1056812	oc							0.43	0.03	99.4	0.06	0.04					0.55	STN 4408 Cann creek map Massive silica (after carbonate?)

* Sample type ss = stream sediment oc = outcrop f = float s = soil
 ** Stream sed. sample description fl = flow m³/sec wl = width m al = alluvial co = colluvial ca = catchment km²
 *** Outcrop sample type gs = grab sample rc = rock chip (state interval & length) cs = channel sample (state length)
 **** Soil sample type auger hole or pit depth m A, B or C horizon

116

346117

APPENDIX 15

PINNER OUTCROP GEOCHEMISTRY LEDGER

SUBSAMPLE ANALYSES OF PINNER MAGNESITE BULK SAMPLE

SAMPLE NO.	DRUM NO.	MgO	CaO	SiO2	Al2O3	Fe2O3	MnO	Na2O	K2O	P2O5	L.O.I.	TOTAL
1056302	1	43.4	1.15	6.70	0.14	0.45	0.08	< 0.01	< 0.05	0.02	48.2	100.1
1056303	2	42.9	2.06	5.60	0.06	0.41	0.08	< 0.01	< 0.05	< 0.01	48.9	99.9
1056304	3	43.4	0.99	6.90	0.03	0.43	0.08	< 0.01	< 0.05	< 0.01	47.9	99.7
1056305	4	44.5	1.19	3.90	0.04	0.43	0.09	< 0.01	< 0.05	< 0.01	49.7	99.8
1056306	5	44.3	1.30	4.06	0.04	0.37	0.08	< 0.01	< 0.05	< 0.01	49.6	99.8
1056307	6	42.3	1.51	8.30	0.05	0.40	0.08	< 0.01	< 0.05	0.01	47.5	100.2
1056308	7	43.5	1.25	6.90	0.07	0.47	0.09	< 0.01	< 0.05	0.25	47.8	100.3
1056309	8	42.6	2.02	6.50	0.06	0.47	0.09	0.01	< 0.05	0.03	48.3	100.1
1056310	9	43.8	1.60	5.05	0.08	0.42	0.08	0.01	< 0.05	0.02	49.1	100.1
1056311	10	43.3	1.74	6.75	0.09	0.41	0.09	0.02	< 0.05	< 0.01	48.1	100.5
1056312	11	44.6	0.76	4.58	0.10	1.19	0.09	0.03	< 0.05	0.03	49.3	101.7
1056313	12	43.9	1.56	4.88	0.07	0.35	0.07	0.01	< 0.05	< 0.01	49.1	99.9
1056314	13	43.9	1.71	5.60	0.11	0.45	0.08	0.01	< 0.05	< 0.01	48.7	100.5
1056315	14	44.8	1.66	3.78	0.11	0.40	0.08	0.02	< 0.05	< 0.01	49.5	100.3
1056316	15	44.1	1.17	5.90	0.11	0.42	0.08	0.02	0.05	< 0.01	48.4	100.3
1056317	16	43.1	1.19	6.80	0.11	0.44	0.08	0.02	< 0.05	< 0.01	48.2	99.9
1056318	17	41.3	1.87	10.0	0.11	0.49	0.09	0.01	< 0.05	0.75	46.1	100.7
1056319	18	43.7	1.20	6.50	0.12	0.41	0.08	0.01	< 0.05	0.04	48.4	100.4
1056320	19	43.9	1.42	5.70	0.10	0.42	0.08	0.02	< 0.05	0.01	48.7	100.3
1056321	20	43.0	1.35	7.75	0.10	0.46	0.08	0.10	< 0.05	0.02	47.6	100.3

346120

C.R.A. EXPLORATION . GEOCHEMICAL SAMPLE LEDGER

Tenement name ARTHUR RIVER EL No. 93/70 Sample numbers 1056586 - 1056596 Collected by VAW Sheet no. 1/1
 Area / Prospect LYONS RIVER Date 15.6.83
 Map / Photo reference..... Analysed by AMDEL DPO no. 30356

Sample No.	Type	ss channel **						Carbon	Oxide content %							Grid ref	Geological Observations			
		fl	wi	al	co	ca	pH		MgO	CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	LOI						
		o/c sample type ***																		
		s sample type ****																		
1056586	o/c	Composite chip samples							21.8	29.6	1.93	0.32	0.22	45.0					A	All samples collected from the Pinner group of "magnesite" outcrops Lyons River area. See attached map for locations.
1056587	o/c							23.9	25.9	5.25	0.27	0.21	44.1					B		
1056588	float							35.6	1.29	24.4	0.26	0.48	38.9					C		
1056589	o/c							41.1	1.86	13.2	0.30	0.41	44.1					D		
1056590	o/c							36.4	8.65	9.6	0.29	0.74	45.3					E		
1056591	o/c							38.5	1.50	18.0	0.32	0.50	42.2					F		
1056592	o/c							39.1	2.10	14.7	0.32	0.29	43.6					H		
1056593	o/c							36.3	5.20	14.9	0.31	1.19	42.9					G		
1056594	o/c							44.5	0.51	6.55	0.34	0.83	48.2					K		
1056595	o/c							43.6	0.97	7.85	0.35	0.47	47.6					I		
1056596	o/c							22.4	28.5	2.16	0.24	0.47	45.0					J		

* Sample type ss = stream sediment oc = outcrop f = float s = soil
 ** Stream sed. sample description fl = flow m3/sec wi = width m al = alluvial co = colluvial ca = catchment km2
 *** Outcrop sample type gs = grab sample rc = rock chip (state val & length) cs = channel sample (state length)
 **** Soil sample type auger hole or pit depth m A, B or C horizon

APPENDIX 16

LYONS RIVER DEPOSIT BIOGEOCHEMISTRY LEDGER

121

SAMPLE NUMBER	SAMPLE LOCATION			SAMPLE DESCRIPTION										OBSERVATIONS	
	East	North	Zone/UG	Sample Type	Plant Organ	Veget.	Aspect	Species	Soil Type	Exposure Type	Depth to Bedrock	Rock Type	Alteration		Look
119700			55		L	R	W	K	C	E	0	BASL	ARGL	Y	sassafras <i>Atherosperma moschatum</i> 1/2m diam.
7002			55		L	R	W	K	C	E	1	MGST	SILC	Y	sassafras " " 1/2 m diam.
7003			55		L	R	W	K	C	N	10	MGST	SILC	Y	myrtle <i>Nothofagus cunninghamii</i> fnd.
7004			55		L	R	W	K	C	N	10	MGST	SILC	Y	myrtle " " 1/2 m diam
7005			55		L	R	W	K	C	S	0	DOLM	DOLM	Y	myrtle " " 1 m diam
7006			55		L	R	W	K	C	E	0	MGST	-	Y	myrtle " " 1/2 m diam
7007			55		L	R	W	K	C	N	10	MGST	SILC	Y	myrtle " " 1 m diam & TALC alteration
7008			55		W	R	N	K	C	N	10	MGST	SILC	Y	myrtle " " & TALC
7009	366275	5435990	55		L	R	W	K	C	S	1	MSFN	ARGL	Y	myrtle " " 0.3m diameter
7010	366475	5436265	55		L	R	N	K	C	S	1	MSFN	ARGL	Y	myrtle " " 1.5 m diameter

346122

PROJECT ARTHUR RIVER TAS 1:250000 SHEET BURNIE COLLECTED BY P.C.M. DATE 9&10 April '80
 TENEMENT EL 43/70 SAMPLE NO.S 1197001 - 1197010 LOCAL GRID CROSS REF _____
 INVESTIGATION LYONS RIVER DPO'S 3 0 1 7 7 _____



KEY TO GEBOTANICAL SAMPLE FIELD SHEET

(C), Alluvial (A), Transported
rit.

122

- Sample Number - CRAE 6 or 7 digit No.
- East - AMG or Local Grid Co-ordinate in m.
- North - AMG or Local Grid Co-ordinate in m.
- Zone/LC - AMG Zone or L for Local Grid.
- Sample Type - DERS Code.
- Exposure - Outcrop (O), Float (F), Uncertain (U), Core of Cuttings (C).
- Rock Types - Rock Type Code.
- Alteration - Alteration Code.
- Vegetation - Open heath (O), Eucalypt forest (F), Rain forest (R), Ti Tree (T) Cultivation (C), Arid grassland (A), Desert (D).

Look - Other item of interest recorded in the Geological observations column (Y/N).

ROCK TYPE CODE

<u>Sediments - Clastic</u>		<u>Sediments - Chemical</u>		<u>Volcanics</u>	
<u>Sedimentary Rock</u>		<u>Carbonate</u>		<u>Agglomerate</u>	
Conglomerate	SDAC	Undiff	CRUD	Lapilli Tuff	AGLM LPTT
Brachiopods	BRAC	Limestone	LIMS	Ash Flow Tuff	APT
Grit	GRIT	Dolomite	DOLM	Igneous	IGNM
Sandstone		Travertine	TRAV	Crystal Tuff	CRTP
Undiff	SSUD	Argillaceous		Vitric Tuff	VTF
Graywacke	GRAY	Limestone	ARLM	Obsidian	OSPD
Arkose	ARKA	Chert	CNER	Mudflows	MUDF
Calcareous	CLAR	Jasperoid	JASP	Tuffaceous	
Siltstone	SILT	Evaporite	EVAP	Sandstone	TFSS
Shale	SMAL	Phosphate Rock	PHRC	Tuffaceous	
Calcareous		Magnesite	MGST	Shale	TFSM
Shale	CLSM	Iron Formation	IRFM	Basic Volc.	
Black Shale/ Carb/graphite	BLSM			Undiff	BVUD
Oil Shale	OLSM	<u>Miscellaneous</u>		Basalt	BASL
Lignite	LIGM	Silcrete	SLAT	Basic Lava	BSLV
Coal-Black	CLBL	Calcrete	CLAT	Basic Pyroclast	BSPP
Coal-Brown	CLBR	Rauite	BAUX	Interned Volc.	
Mudstone	MUDS	Ironstone	IRST	Undiff	IVUD
Mud	MUDL	Laterite	LATR	Andesite	ANDE
Clay	CLAY	Gossan	GOSS	Interned. Lava	INLV
Tillite	TILL	Sulphides	SULP	Interned.	
		Quartz Vein	QTVN	Pyroclastic	PNPY
		Green	GRGN	Acid Volc.	
		Ferberite	FUBR	Undiff	AVUD
				Rhyolite	RHYL
				Rhyodacite	RHDC
				Dacite	DACT

Trachyte	ACLV	Andesite	ANDE
Acid Lava	ACLV	Basalt	BASL
Acid Pyroclast	ACPY	Basalt Lava	BSLV
		Basic Pyroclast	BSPP
		Interned Volc.	
		Undiff	IVUD
		Andesite	ANDE
		Interned. Lava	INLV
		Interned.	
		Pyroclastic	PNPY
		Acid Volc.	
		Undiff	AVUD
		Rhyolite	RHYL
		Rhyodacite	RHDC
		Dacite	DACT

Metasomphics

Metasomphic Rock		Granite	GRAM
Undiff	MUD	Fine Acid Intr.	FAIN
Breccia	BRAC	Granite	GRAM
Mylonite	MLOW	Aplite	APLT
Gouge	GOUG	Adenolite	ADAM
Marble	MARB	Granodiorite	GRDR
Calc Silicate	CLSL	Quartz Porphyry	QUPR
Skarn	SKAR	Quartz Feldspar Porphyry	QFPR
Hornfels	HORN	Granophyre	GRPH
Slate/Phyllite	SLAT	Fegmatite	FEOM
Quartzite	QTZT	Glass	GLAS
Meta Sediment			
Fine	MSFN		
Meta Sediment			
Course	MCCR		

ALTERATION CODE

Argillization	ARGL
Albitization	ALBT
Calc Silicate	CLSL
Carbonatization	CAAB
Chloritization	CHLR
Dolomitization	DOLM
Ferruginization	FERR
Kaolinization	KAOL
Potassic	POTS
Propylitization	PROP
Pyritization	PYRT
Southernization	SAUS
Sericitization	SERC
Silicification	SILC
Talcosse	TALC
Tourmalinization	TOUR
Sulfitization	SULF
Other	OTHR

- Exposure Type - (ie. Bedrock) Exposed (E), Subcrop (S), None (N).
- Depth to Bedrock - (estimated) in m.
- Plant Organ - Bark (B), Wood (W), Twigs (T), Leaves (L), Leaf litter (E).

Aspect - direction that slope is facing

Species - Known (K) or Unknown (U).
Details of known species in observations.

346123

ANALABS

346124

Phone (09) 458 7999

A division of MacDonald Hamilton & Co. Pty. Ltd.
52 Murray Road, Welshpool, W.A. 6106

Telex AA92560

ANALYTICAL REPORT No. 15.2 08 2482

THIS REPORT MUST BE READ IN CONJUNCTION WITH THE ACCOMPANYING ANALYTICAL DATA

CRA Exploration Pty Ltd
PO Box 138
Rosny Park
Tasmania 7018

ORDER No.	PROJECT
38177	2073
DATE RECEIVED	RESULTS REQUIRED
3.5.84	

No. OF PAGES OF RESULTS	DATE REPORTED	No. OF COPIES	TOTAL No. OF SAMPLES
		3	10

STATE OF SAMPLES	REFER BELOW	SAMPLE NUMBERS	PRE-TREATMENT						ANALYSIS				
			DRY	CRUSH	SPLIT	PUL-VERISE	SIEVE	OTHER SEE REMARKS	NONE	REFER TO ANALYSIS SECTION	PREPARATION	METHOD	
	PL	1197001-10							1		ICP Scan On Plant Material After Ashing.		201

RESULTS TO
Phillip MacKenzie
C.R.A.E
P.O. Box 138
Burnie 7320

RESULTS TO

REMARKS
Grind Samples Before
Ashing.

STATE OF SAMPLES	ANALYSIS — PREPARATION	ANALYSIS — METHOD
whole core WC	perchloric acid A1	atomic absorption AAS
split core SC	hydrochloric acid A2	x-ray fluorescence XRF
cutting CU	nitric acid A3	spectrophotometry SPEC
rock Ro	aqua regia A4	colorimetry COL
soil SO	nitric-perchloric A5	chromatography CHR
pulp PU	HF mixture A6	titration ITN
water WA	HF under pressure A7	other chemical means CHEM
tissue TI	fusion A8	miscellaneous MISC
stream sediment SS		fluorescence FLUOR
heavy mineral HM		inductively coupled plasma ICP

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124

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346125

ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

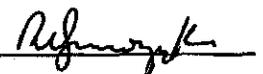
CLIENT ORDER No.

PAGE

		15.2 08 2482				31.5.84		30177		1 OF 5	
TUBE No.	SAMPLE No.	Co	Mo	Ta	Ni	V	U	Nb	Cu	Ti	
1	1197001	X	X	X	62	12	X	X	103	259	
2	1197002	X	X	X	68	8	X	X	123	211	
3	1197003	6	X	X	94	18	X	X	128	427	
4	1197004	X	X	X	61	14	X	X	164	486	
5	1197005	5	X	X	168	14	X	X	146	336	
6	1197006	5	X	X	203	19	X	X	140	409	
7	1197007	5	X	X	106	12	X	X	143	251	
8	1197008	72	37	X	3950	87	X	X	519	2280	
9	1197009	X	X	X	65	14	X	X	119	256	
10	1197010	5	X	X	80	10	X	X	131	147	
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	5	5	5	5	2	100	5	5	10	
24	DIGESTION										
25	METHOD	SCAN	SCAN	SCAN	SCAN	SCAN	SCAN	SCAN	SCAN	SCAN	

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

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125

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ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

		15.2 08 2482				31.5.84		30177		2 OF 5	
TUBE No.	SAMPLE No.	Zr	Tb	Sm	Sc	Dy	Hf	Y	Eu	La	
1	1197001	X	X	X	1	X	X	2	X	X	
2	1197002	X	X	X	X	X	X	1	X	5	
3	1197003	X	X	X	1	X	X	2	X	X	
4	1197004	X	X	X	1	X	X	2	X	X	
5	1197005	X	X	X	1	X	X	2	X	X	
6	1197006	X	X	X	1	X	X	2	X	X	
7	1197007	X	X	X	X	X	X	3	X	X	
8	1197008	40	X	X	8	X	X	4	X	12	
9	1197009	X	X	X	1	X	X	2	X	X	
10	1197010	X	X	X	1	X	X	2	X	X	
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23	DETECTION	5	5	2	1	2	5	1	1	5	
24	DIGESTION										
25	METHOD	SCAN	SCAN	SCAN	SCAN	SCAN	SCAN	SCAN	SCAN	SCAN	

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

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126

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ANALYTICAL DATA

SAMPLE PREFIX
REPORT NUMBER
REPORT DATE
CLIENT ORDER No.
PAGE

15.2 00 2482
31.5.84
30177
3 OF 5

TUBE No.	SAMPLE No.	Th	Sr	Zn	Nd	Re	Ba	Cr	Be	Yb
1	1197001	X	489	247	X	X	43	200	X	X
2	1197002	X	270	178	X	X	54	184	X	X
3	1197003	X	597	939	15	X	2100	227	X	X
4	1197004	X	624	801	10	X	666	189	X	X
5	1197005	X	588	504	8	X	296	229	X	X
6	1197006	X	435	1120	X	X	562	214	X	X
7	1197007	X	450	764	9	X	165	185	X	X
8	1197008	X	445	595	x	X	578	1020	X	X
9	1197009	X	573	671	15	X	333	169	X	X
10	1197010	X	868	701	13	X	400	132	X	X
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	5	1	5	5	2	5	10	1	1
24	DIGESTION									
25	METHOD	SCAN								

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

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ANALYTICAL DATA

SAMPLE PREFIX REPORT NUMBER REPORT DATE CLIENT ORDER No. PAGE

		15.2 08 2482				31.5.84	30177		4 OF 5	
TUBE No.	SAMPLE No.	Li	Er	Bi	CAO%	TIO2%	SI02%	MNO%	FE203%	AL203%
1	1197001	20	X	X	23.6	0.04	2.39	5.33	0.51	0.60
2	1197002	31	X	X	19.7	0.04	2.11	4.04	0.51	0.54
3	1197003	14	X	X	32.0	0.10	6.63	6.01	0.81	1.01
4	1197004	24	X	X	24.7	0.12	8.15	4.25	0.88	0.92
5	1197005	16	X	2	23.7	0.06	5.65	5.58	0.65	0.77
6	1197006	15	X	3	21.4	0.08	4.64	5.36	0.84	0.96
7	1197007	31	X	X	17.8	0.05	8.17	5.15	0.44	0.49
8	1197008	22	X	X	4.39	0.38	39.1	0.74	22.2	5.89
9	1197009	21	X	X	22.2	0.06	5.59	5.30	0.58	0.71
10	1197010	14	X	5	23.3	0.04	4.59	3.47	0.38	0.56
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION	2	1	2						
24	DIGESTION									
25	METHOD	SCAN	SCAN	SCAN	SCAN	SCAN	SCAN	SCAN	SCAN	SCAN

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

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ANALYTICAL DATA

SAMPLE PREFIX

REPORT NUMBER

REPORT DATE

CLIENT ORDER No.

PAGE

15.2 08 2482

31.5.84

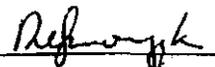
30177

5 OF 5

LINE No.	SAMPLE No.	MG0%	K20%	NA20%	P205%					
1	1197001	5.21	23.7	0.52	3.99					
2	1197002	4.69	30.9	0.41	4.65					
3	1197003	7.59	11.5	1.73	5.22					
4	1197004	5.09	19.4	3.34	5.33					
5	1197005	6.01	16.9	4.99	4.63					
6	1197006	15.5	14.3	1.30	6.21					
7	1197007	8.02	21.1	2.75	5.75					
8	1197008	1.82	13.4	0.65	0.37					
9	1197009	6.02	17.8	3.74	4.81					
10	1197010	8.03	20.0	2.02	5.82					
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23	DETECTION									
24	DIGESTION									
25	METHOD	SCAN	SCAN	SCAN	SCAN					

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

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50

5 cm

346130

E.L. 43/70

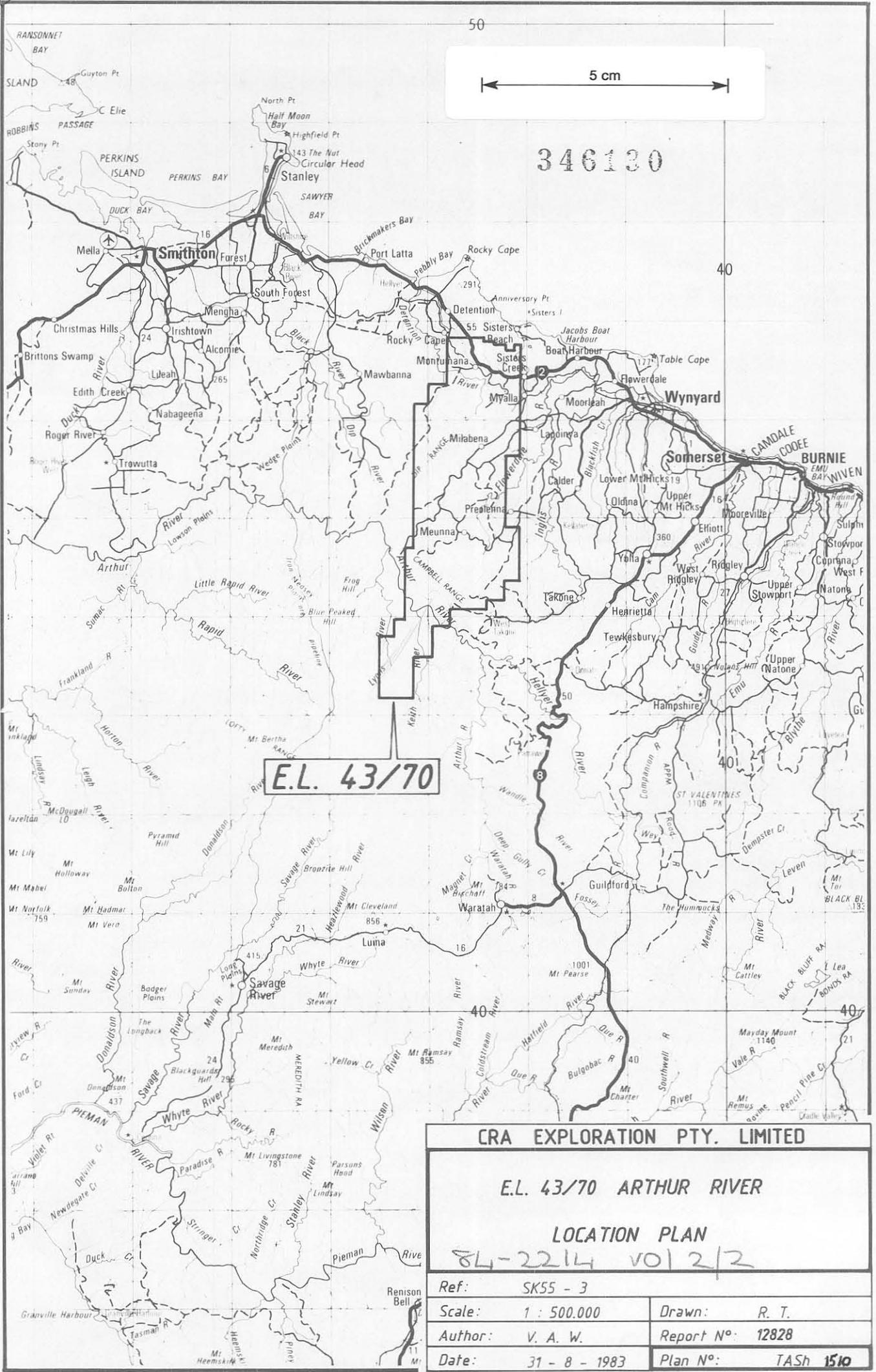
CRA EXPLORATION PTY. LIMITED

E.L. 43/70 ARTHUR RIVER

LOCATION PLAN

84-2214 VOL 2/2

Ref:	SK55 - 3	Drawn:	R. T.
Scale:	1 : 500,000	Report N°:	12828
Author:	V. A. W.	Plan N°:	TASH 1510
Date:	31 - 8 - 1983		



5 442 000 m N

5 440 000

54 32 000

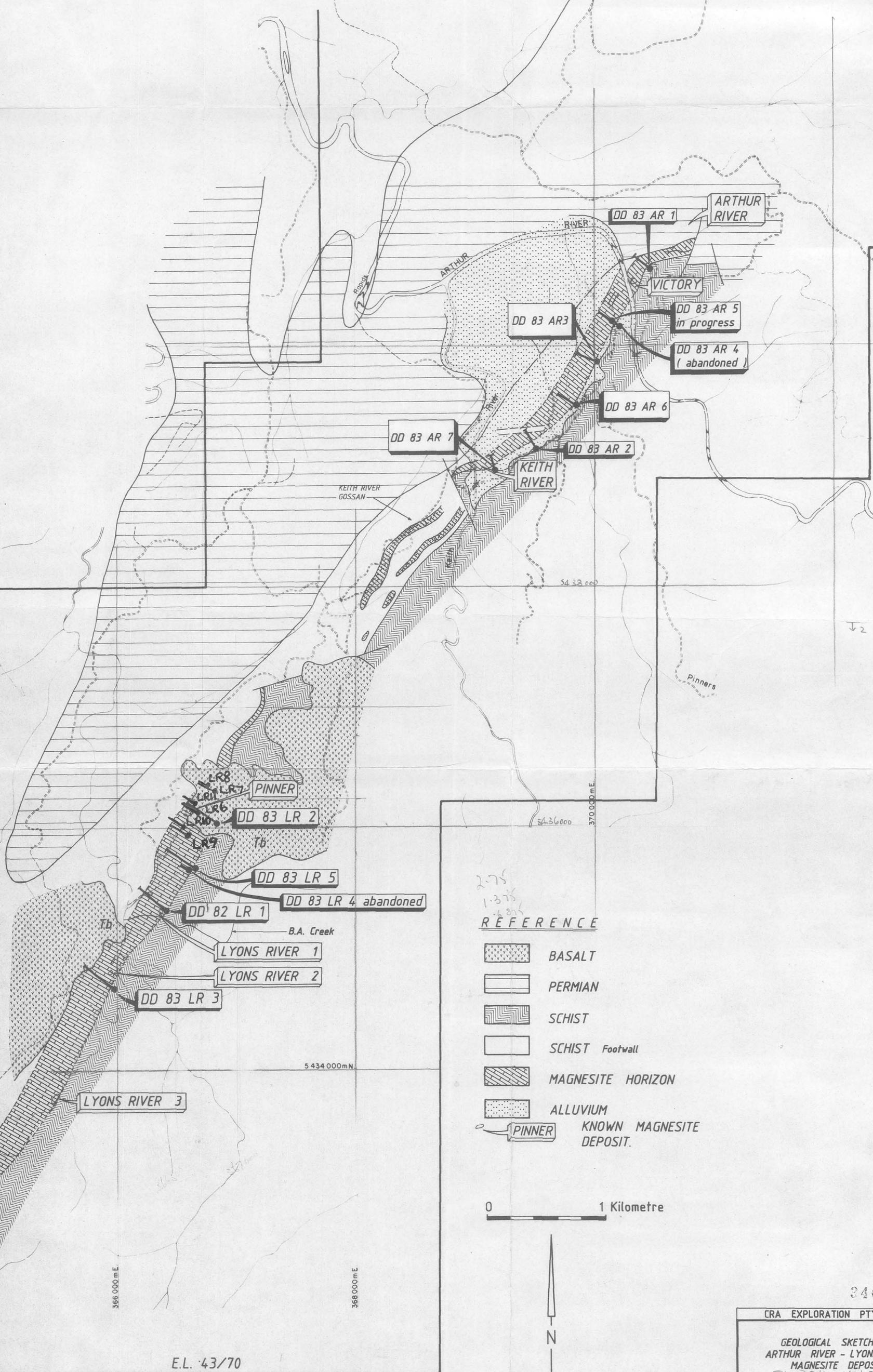
54 36 000

5 434 000 m N

566 000 m E

568 000 m E

E.L. 43/70



REFERENCE

-  BASALT
-  PERMIAN
-  SCHIST
-  SCHIST Footwall
-  MAGNESITE HORIZON
-  ALLUVIUM
-  PINNER KNOWN MAGNESITE DEPOSIT.

0 1 Kilometre



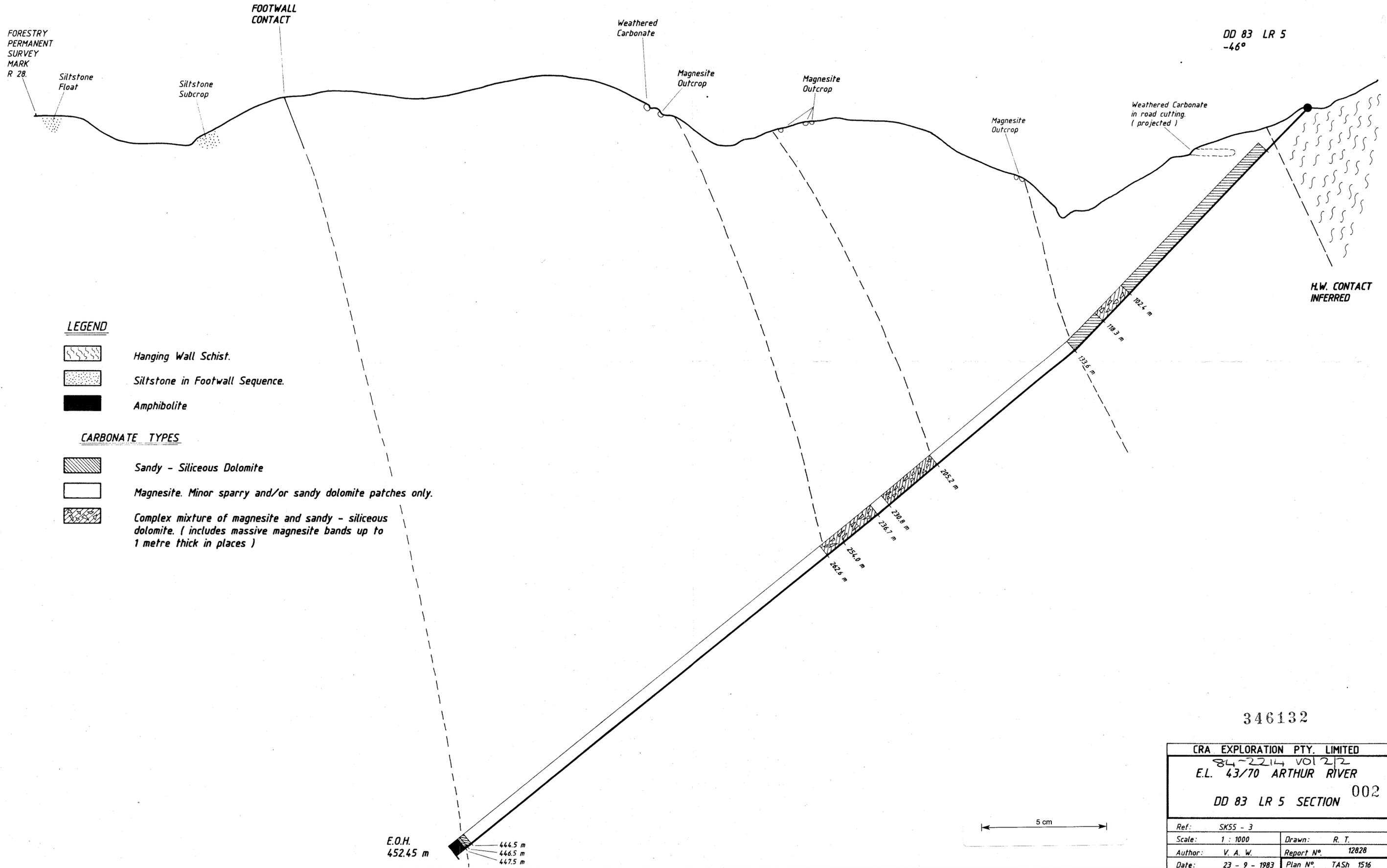
5 cm

346131

CRA EXPLORATION PTY. LIMITED	
001	
GEOLOGICAL SKETCH MAP ARTHUR RIVER - LYONS RIVER MAGNESITE DEPOSITS 84-2214 VOL 2/2	
Ref: SK55 - 3	Drawn: R. T.
Scale: 1 : 20 000	Report N° 12828
Author: T. W. D.	Plan N°, TASH 1435
Date: 30 - 6 - 1983	

300° AMG

120° AMG



DD 83 LR 5
-46°

LEGEND

-  Hanging Wall Schist.
-  Siltstone in Footwall Sequence.
-  Amphibolite

CARBONATE TYPES

-  Sandy - Siliceous Dolomite
-  Magnesite. Minor sparry and/or sandy dolomite patches only.
-  Complex mixture of magnesite and sandy - siliceous dolomite. (includes massive magnesite bands up to 1 metre thick in places)

346132

CRA EXPLORATION PTY. LIMITED	
84-2214 VOL 2/2	
E.L. 43/70 ARTHUR RIVER	
DD 83 LR 5 SECTION 002	
Ref:	SK55 - 3
Scale:	1 : 1000
Author:	V. A. W.
Date:	23 - 9 - 1983
Drawn:	R. T.
Report No:	12828
Plan No:	TASH 1516

5 cm

E.O.H.
452.45 m

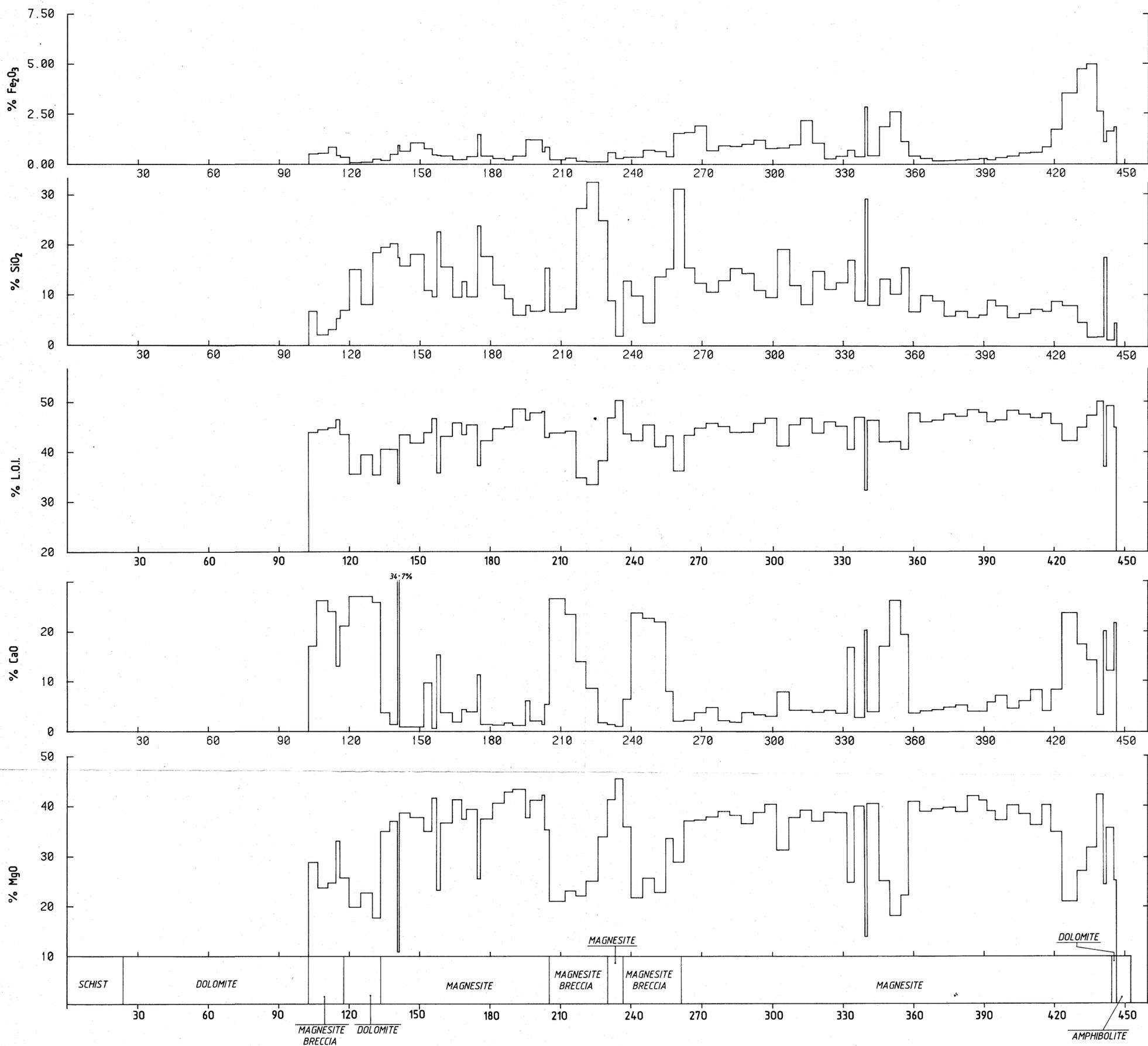
444.5 m
446.5 m
447.5 m

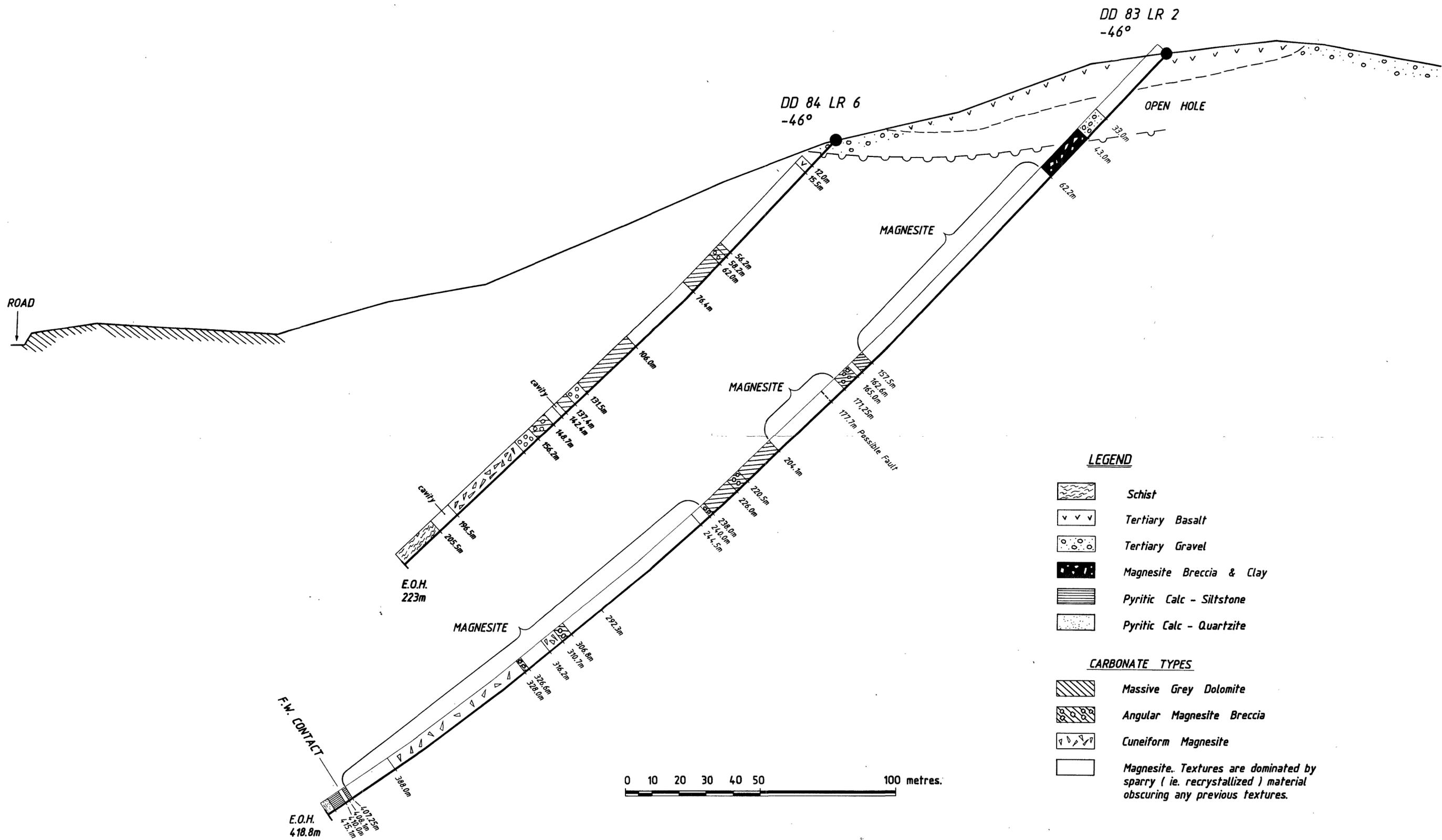
346133

CRA EXPLORATION PTY. LIMITED
84-22-14 401 2/2
E.L. 43710 ARTHUR RIVER 003
DD 83 LR 5
GRAPHIC LOG AND ASSAYS

Ref:	SK 55 - 3	Drawn:	R. T.
Scale:	1 : 1000	Report No:	12828
Author:	T. W. D.	Date:	7 - 11 - 1983
		Plan No:	7450 - 1526

5 cm





LEGEND

- Schist
- Tertiary Basalt
- Tertiary Gravel
- Magnesite Breccia & Clay
- Pyritic Calc - Siltstone
- Pyritic Calc - Quartzite

CARBONATE TYPES

- Massive Grey Dolomite
- Angular Magnesite Breccia
- Cuneiform Magnesite
- Magnesite. Textures are dominated by sparry (ie. recrystallized) material obscuring any previous textures.

346134

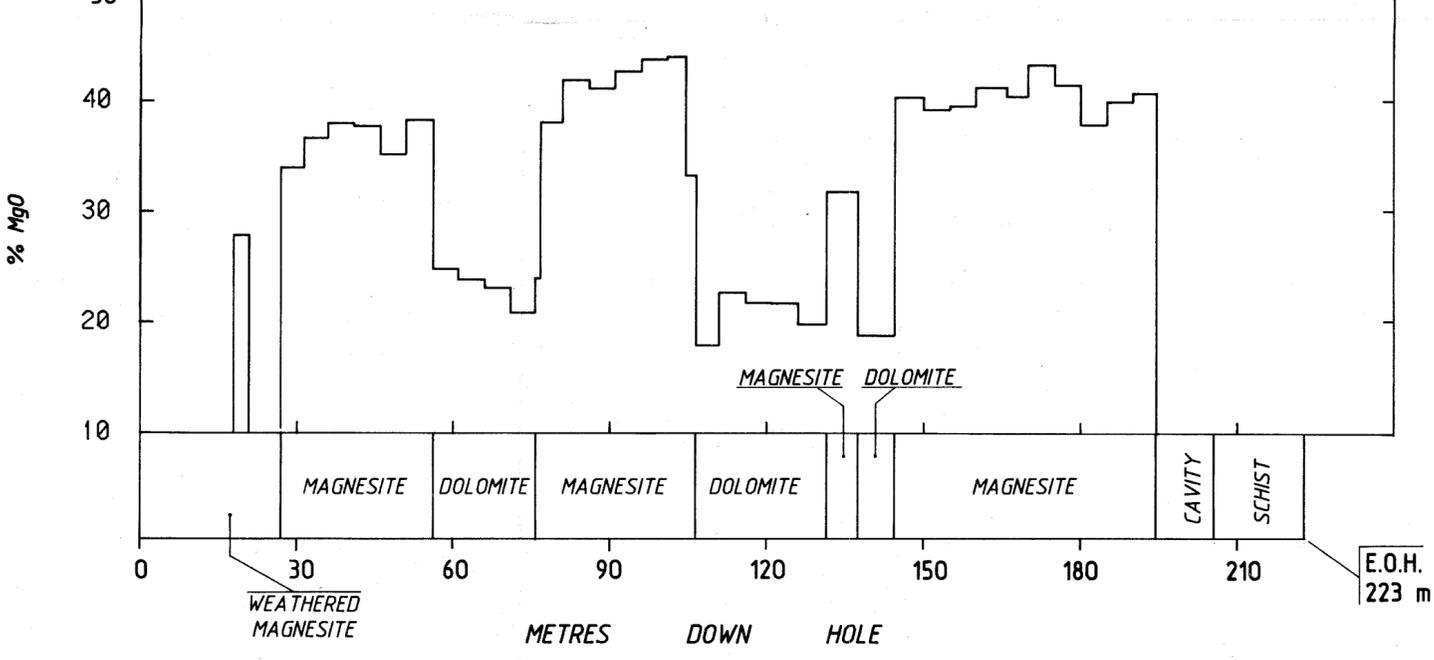
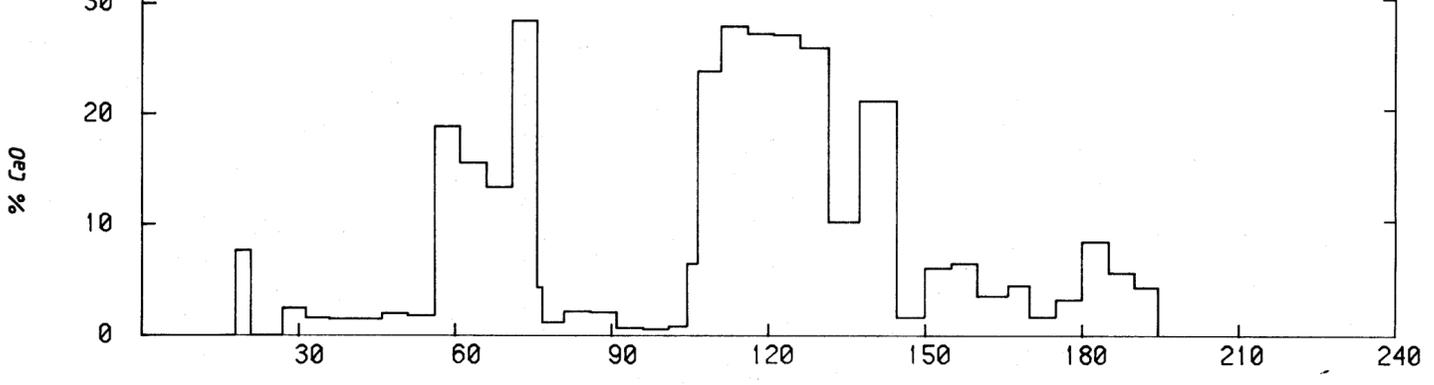
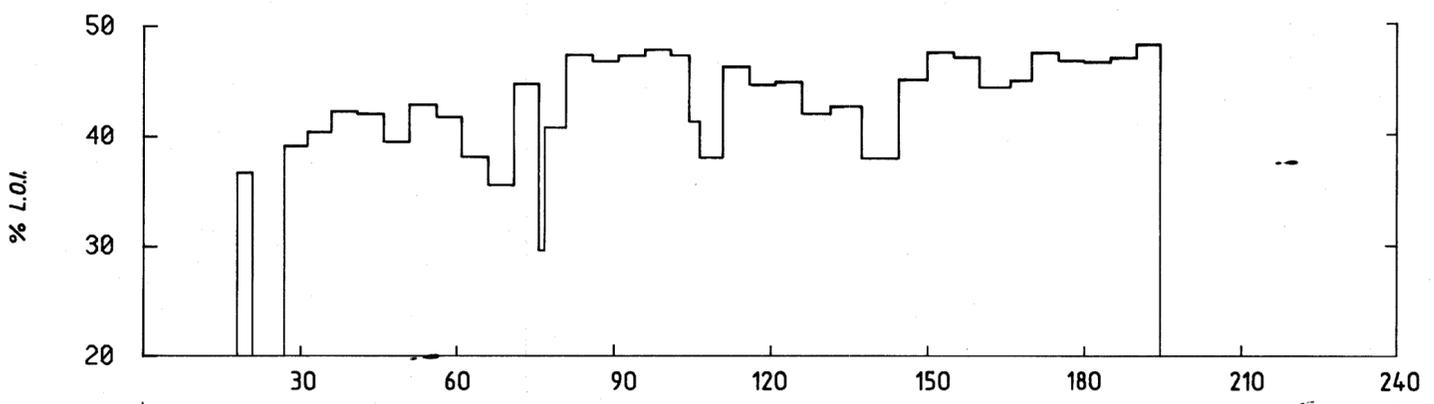
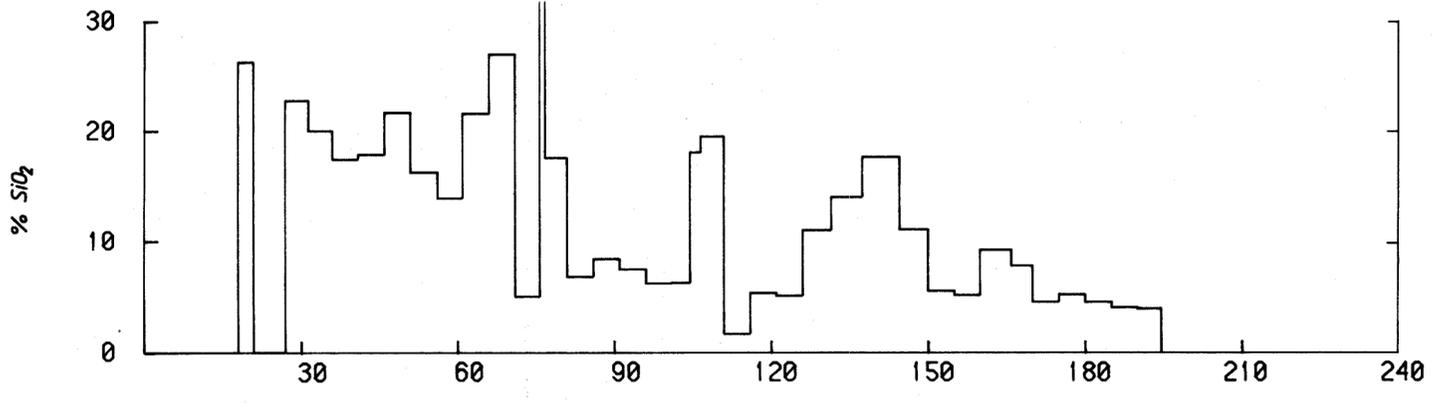
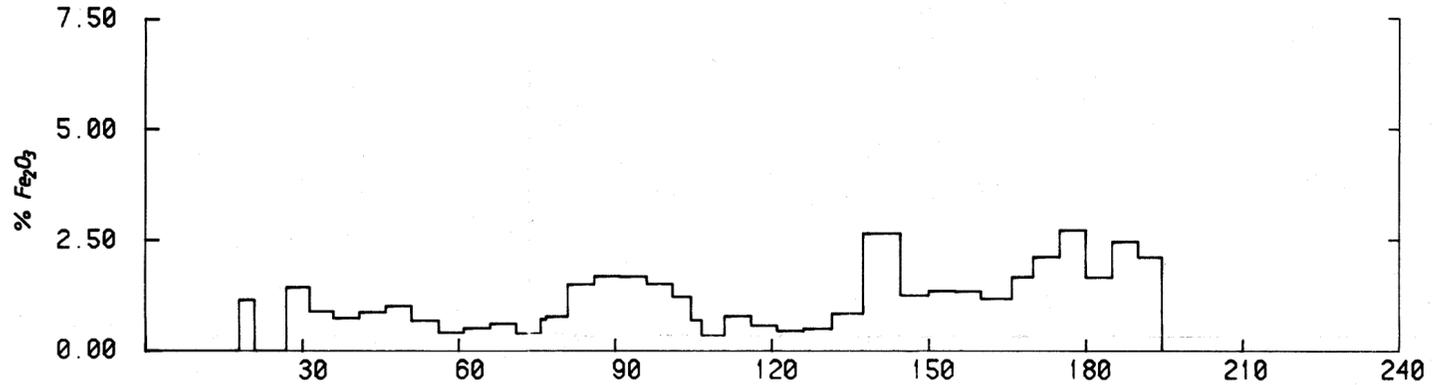
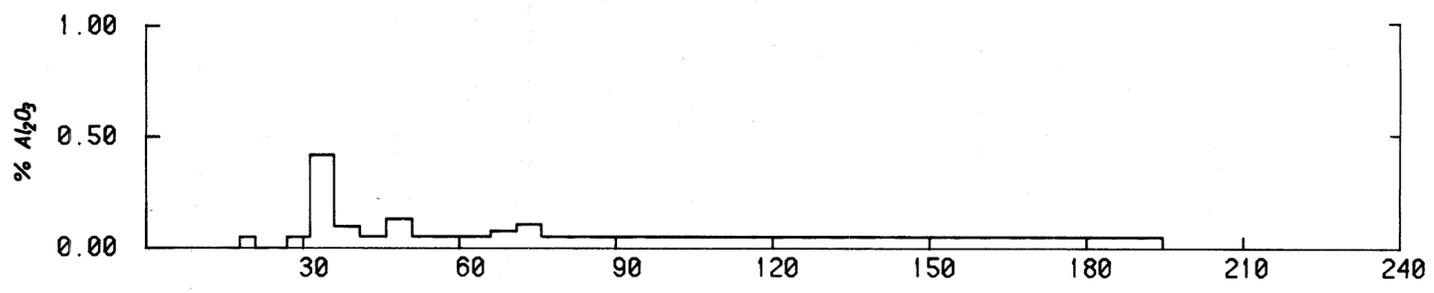
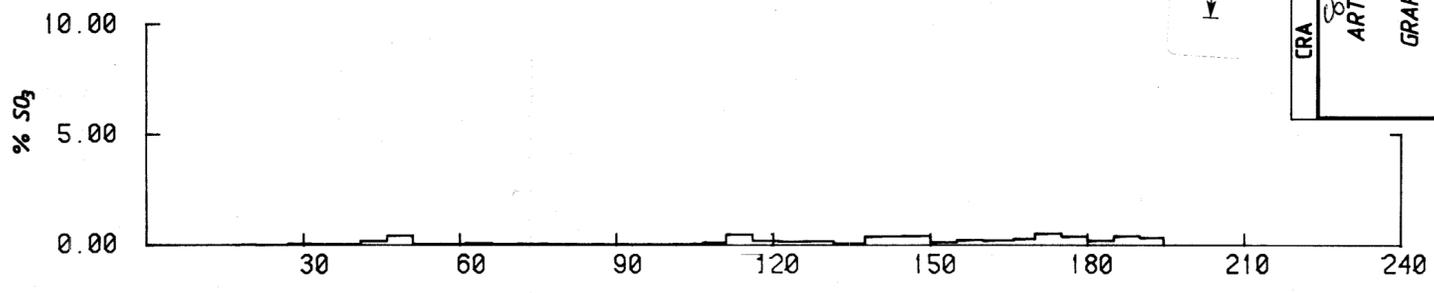
5 cm

CRA EXPLORATION PTY. LIMITED	
84-2214 vol 2/2	
E.L. 43/70 ARTHUR RIVER	
DD 83 LR 2 & DD 84 LR 6	
SECTIONS 004	
Ref:	SK55 - 3
Scale:	1 : 1000
Author:	V. W.
Date:	23 - 3 - 1983
Drawn:	R. T.
Report N°:	12828
Plan N°:	TASH 1779

346125

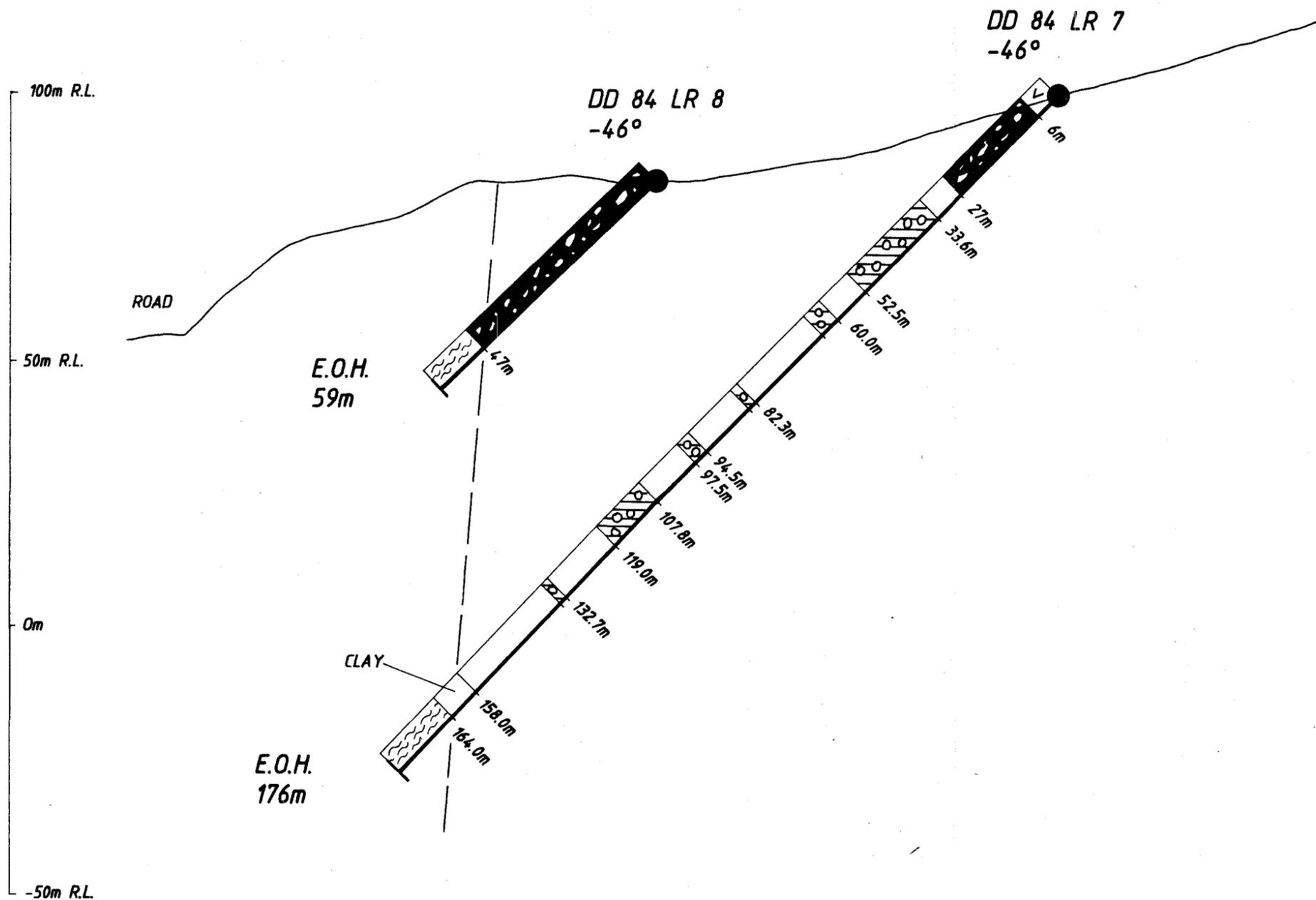
5 cm

CRA EXPLORATION PTY. LIMITED	
54-2214 V01212	
ARTHUR RIVER E.L. 43/70005	
DD 84 LR 6	
GRAPHIC LOG AND ASSAYS	
Ref.	SK55 - 3
Scale.	1 : 1000
Author.	T.W.D.
Date.	12 - 6 - 1984
Drawn.	R.T.
Report No.	12828
Plan No.	TASh 1775

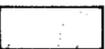


E.O.H. 223 m

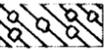
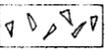
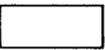
Section
290° Mag.



LEGEND

-  Schist
-  Tertiary Basalt
-  Tertiary Gravel
-  Magnesite Breccia & Clay
-  Pyritic Calc - Siltstone
-  Pyritic Calc - Quartzite

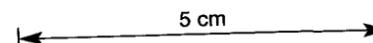
CARBONATE TYPES

-  Massive Grey Dolomite
-  Angular Magnesite Breccia
-  Cuneiform Magnesite
-  Magnesite. Textures are dominated by sparry (ie. recrystallized) material obscuring any previous textures.

346136

CRA EXPLORATION PTY. LIMITED		
84-2214 VOL 2/2		
E.L. 43/70 ARTHUR RIVER		
DD 84 LR 7 & DD 84 LR 8		
SECTIONS		006

REF.	SK55 - 3	
SCALE	1 : 1000	DRAWN R.T.
AUTHOR	P. McK.	REPORT No. 12828
DATE	22 - 6 - 1984	PLAN No. TASH 1777

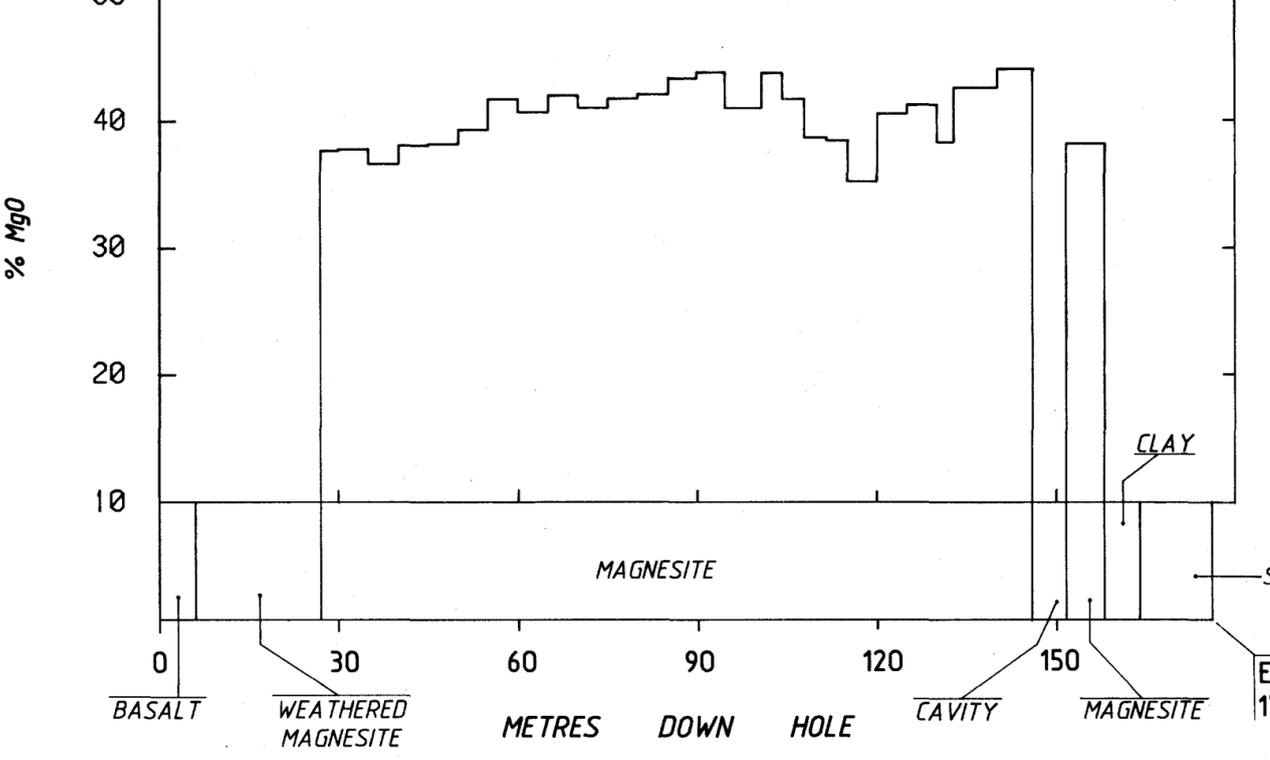
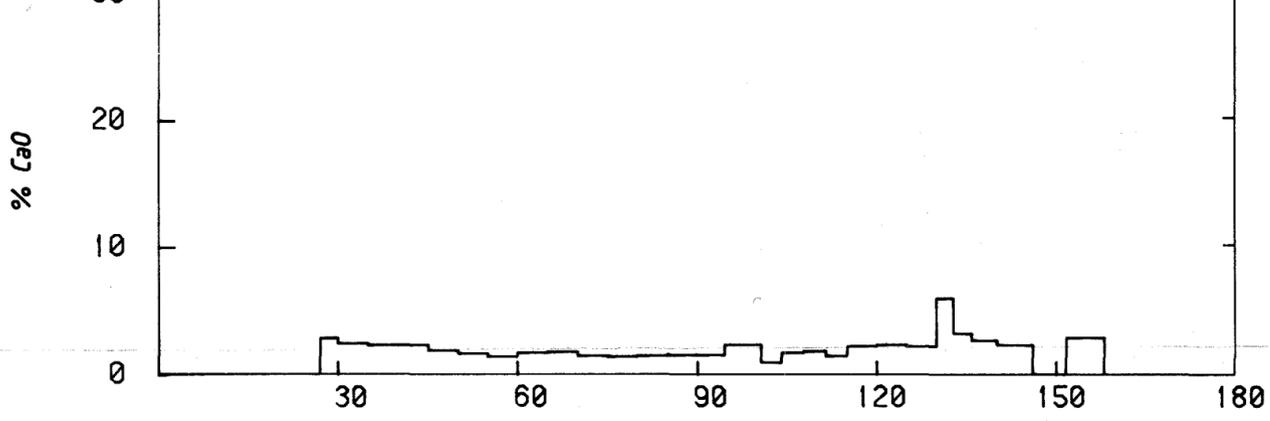
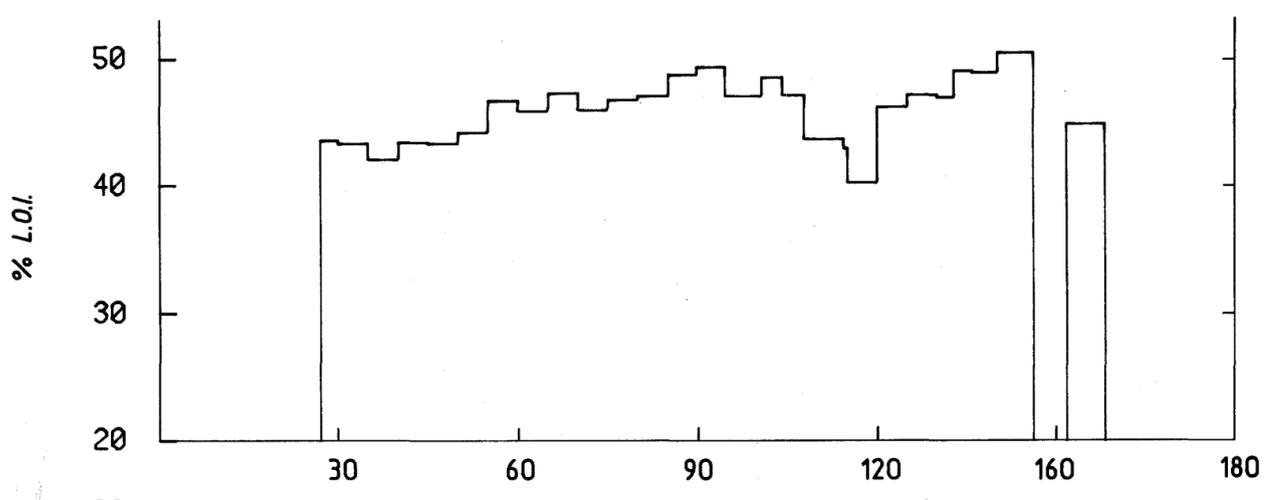
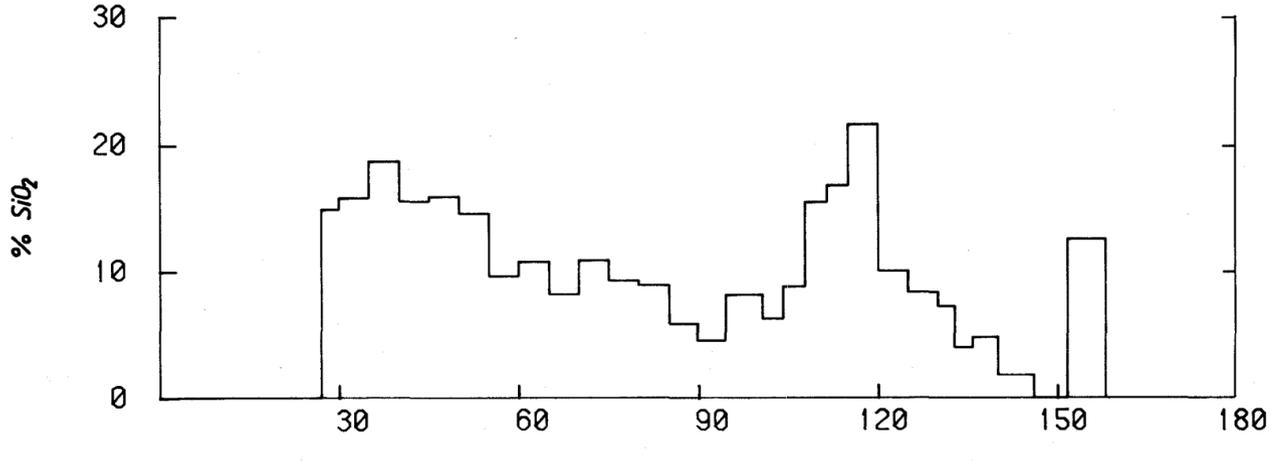
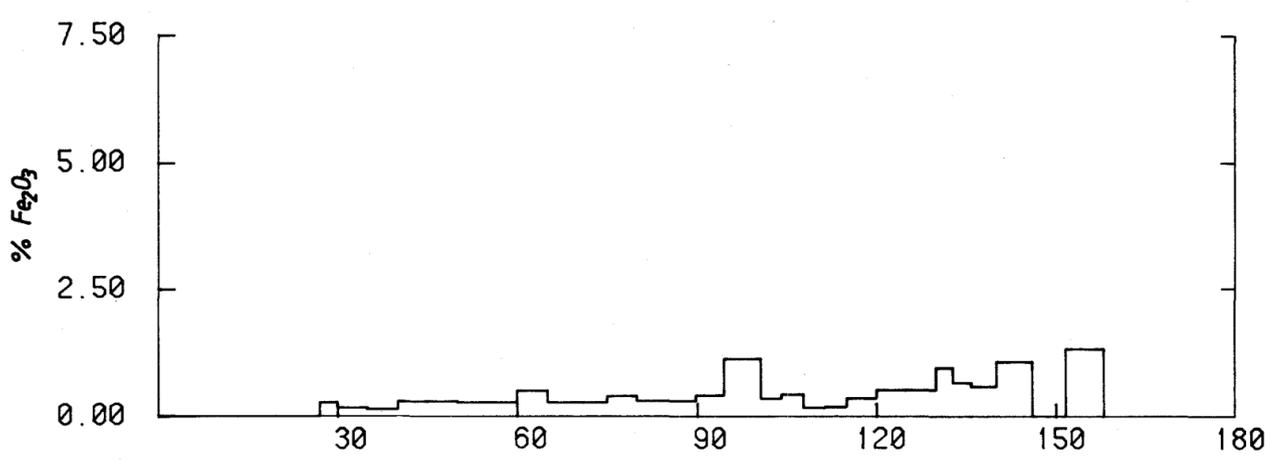
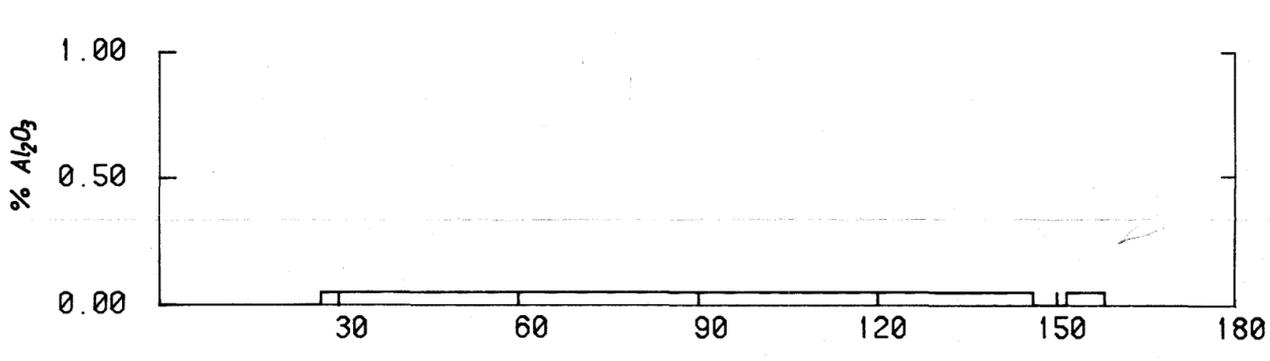
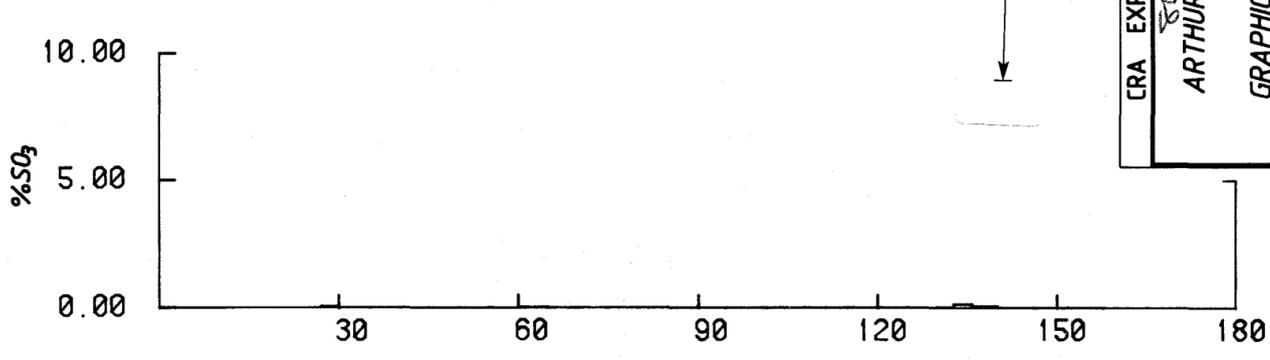


CRA EXPLORATION PTY. LIMITED
 84-2714 VOL 2/2
 ARTHUR RIVER E.L. 43/70
 DD 84 LR 7
 GRAPHIC LOG AND ASSAYS

Ref. SK55 - 3	Drawn. R.T.
Scale. 1 : 1000	Report No. 12828
Author. T.W.D.	Plan No. TASH 1776
Date. 13 - 6 - 1984	

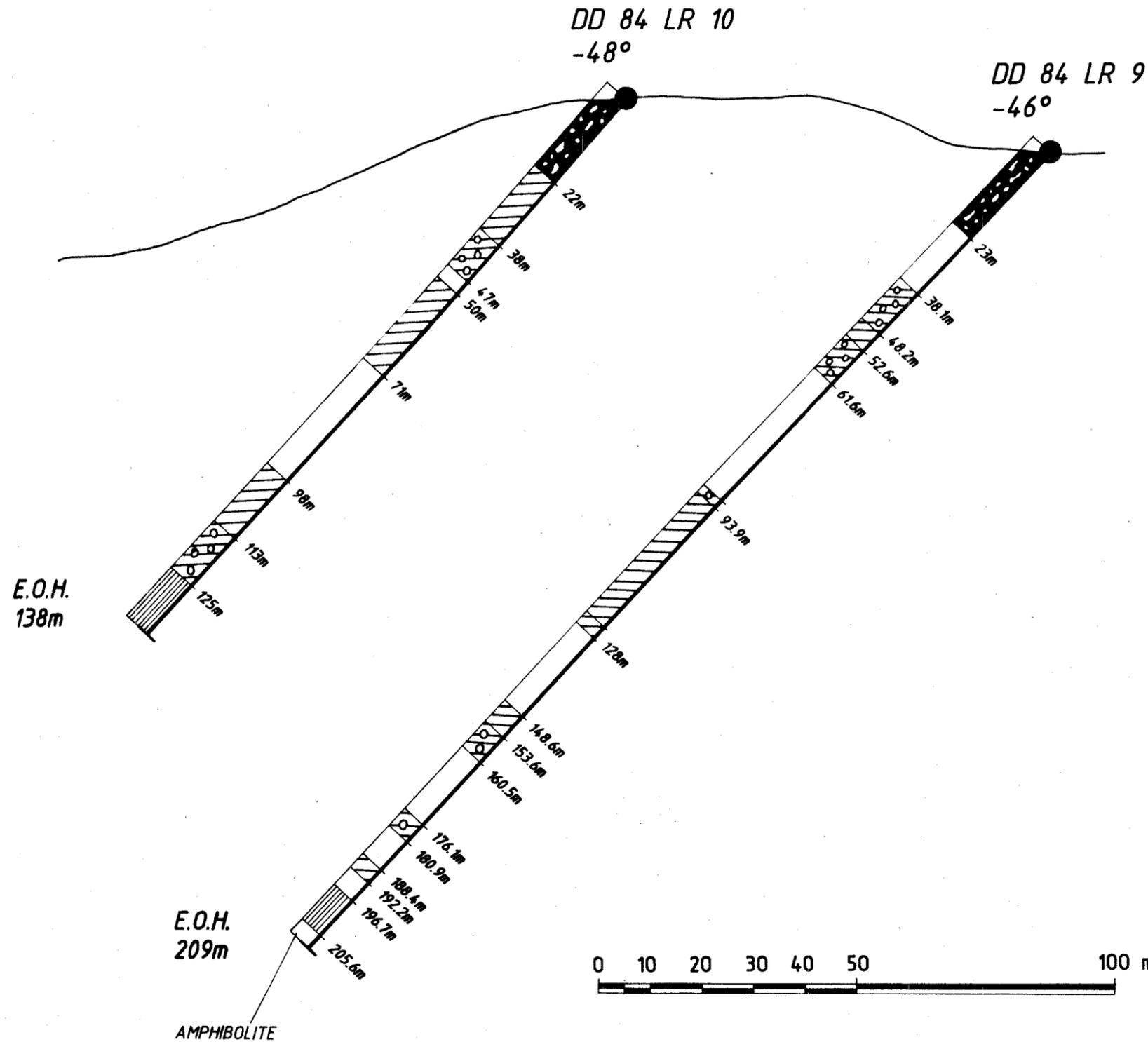
346137
 5 cm

007

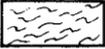
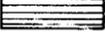
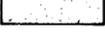


0 30 60 90 120 150 176m.
 BASALT WEATHERED MAGNESITE MAGNESITE CAVITY CLAY MAGNESITE SCHIST
 METRES DOWN HOLE E.O.H. 176m.

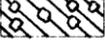
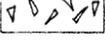
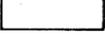
Section
290° AMG



LEGEND

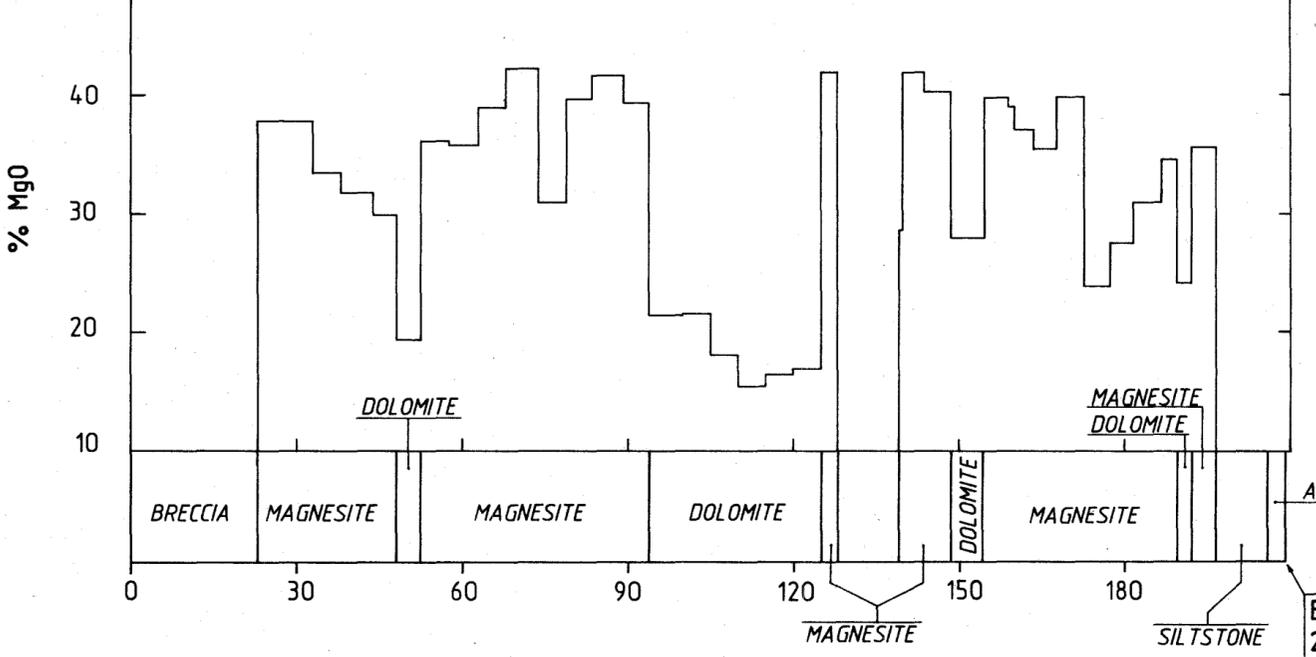
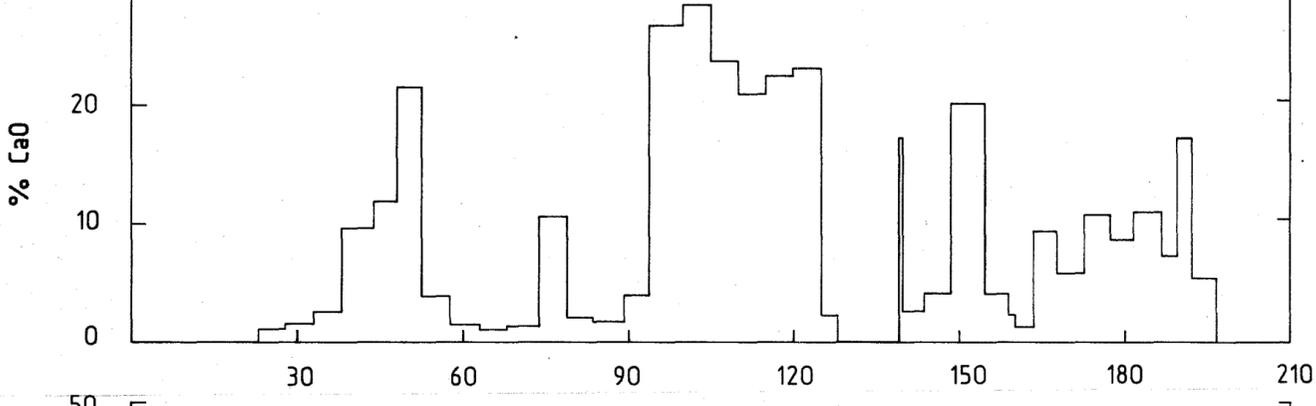
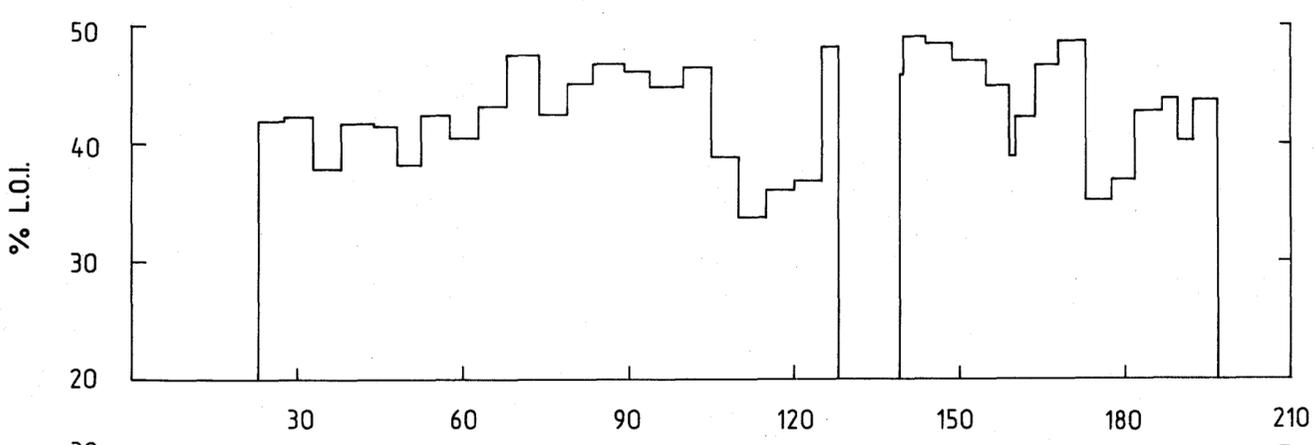
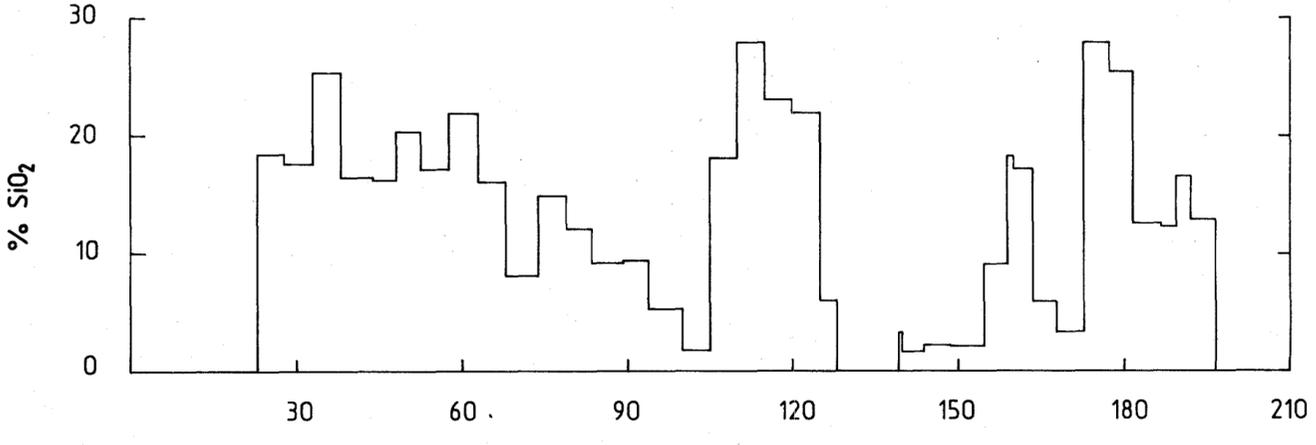
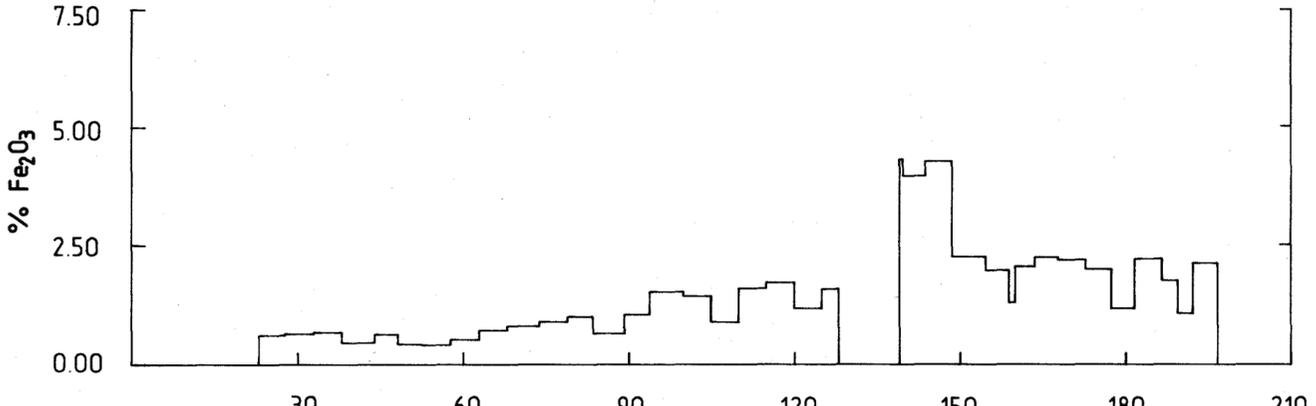
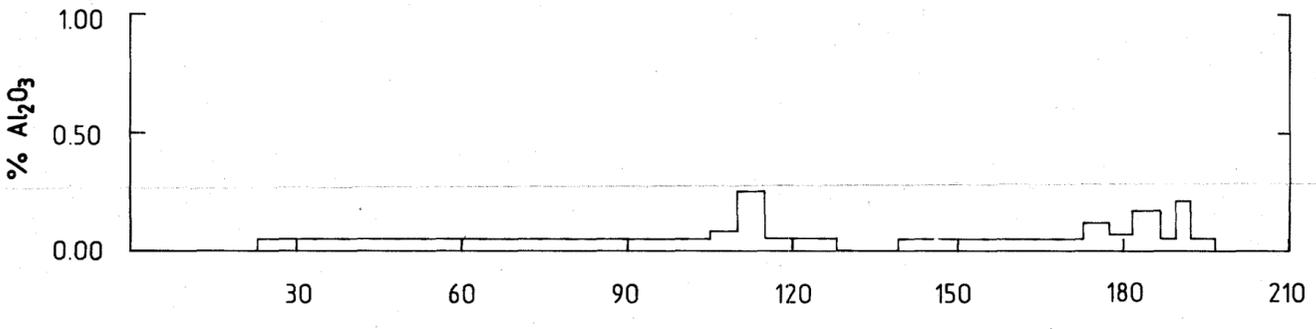
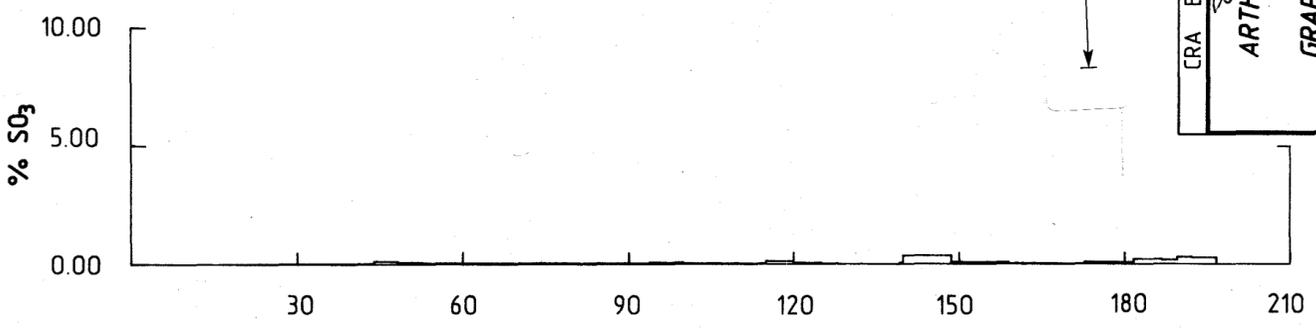
-  Schist
-  Tertiary Basalt
-  Tertiary Gravel
-  Magnesite Breccia & Clay
-  Pyritic Calc - Siltstone
-  Pyritic Calc - Quartzite

CARBONATE TYPES

-  Massive Grey Dolomite
-  Angular Magnesite Breccia
-  Cuneiform Magnesite
-  Magnesite. Textures are dominated by sparry (ie. recrystallized) material obscuring any previous textures.

346138

CRA EXPLORATION PTY. LIMITED	
84-2214 VOL 2/2	
E.L. 43/70 ARTHUR RIVER	
DD 84 LR 9 & DD 84 LR 10	
SECTIONS 008	
REF.	SK55 - 3
SCALE	1 : 1000
DRAWN	R.T.
AUTHOR	P. McK
REPORT No.	12828
DATE	22 - 6 - 1984
PLAN No.	TASh 1778

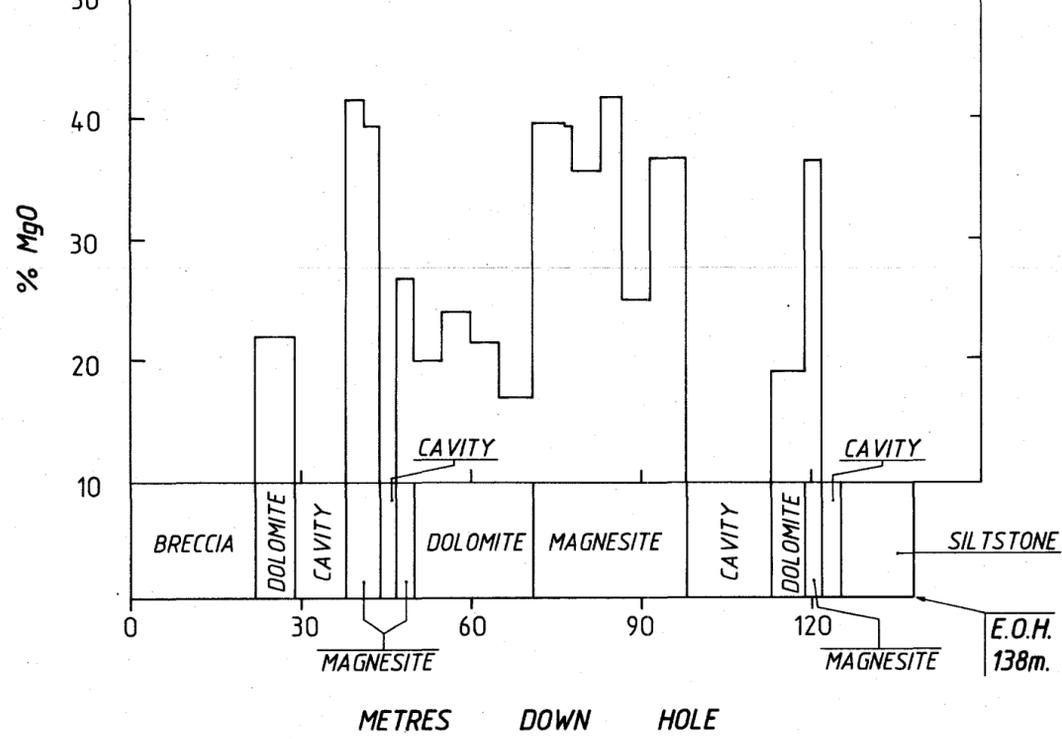
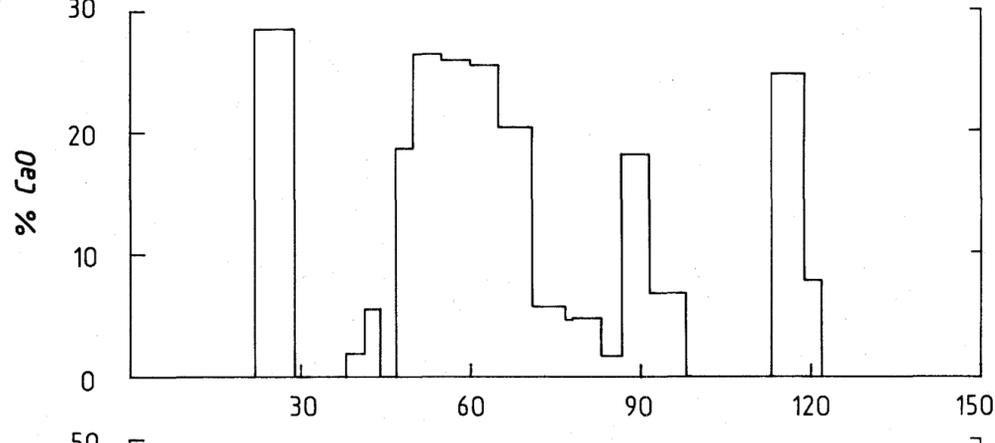
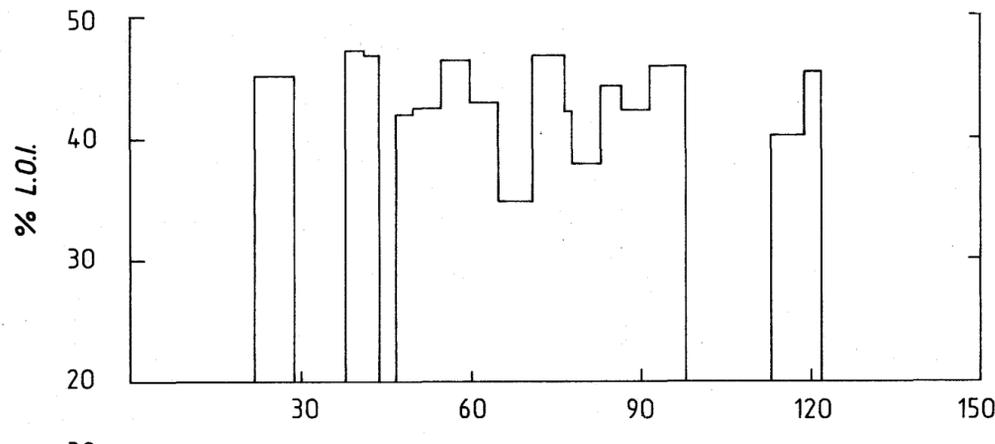
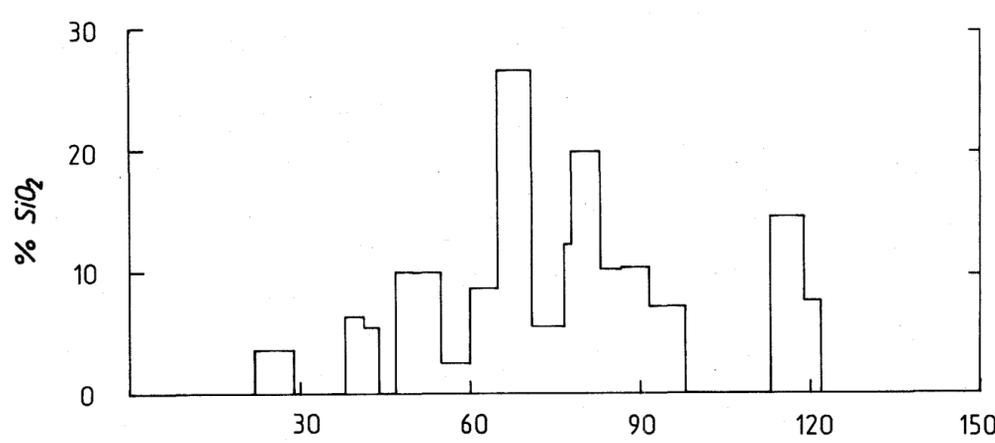
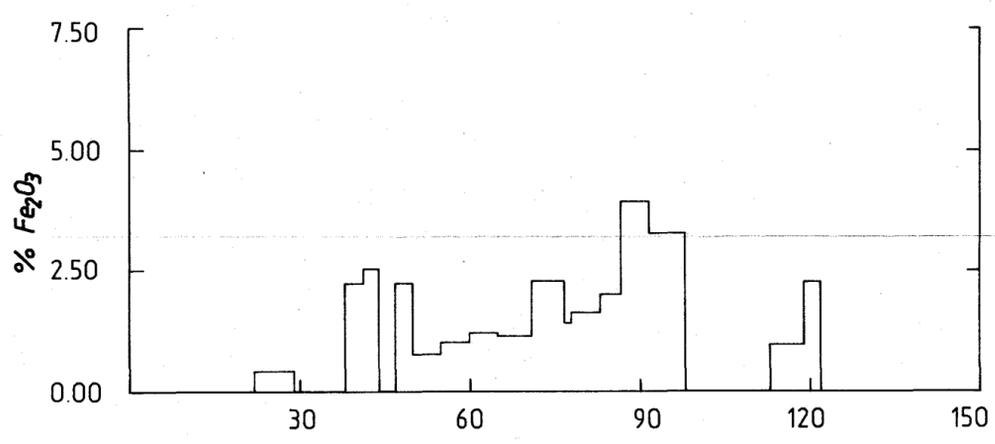
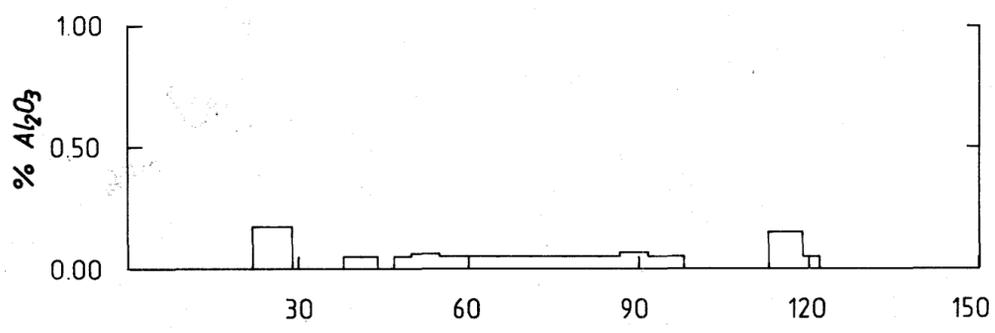
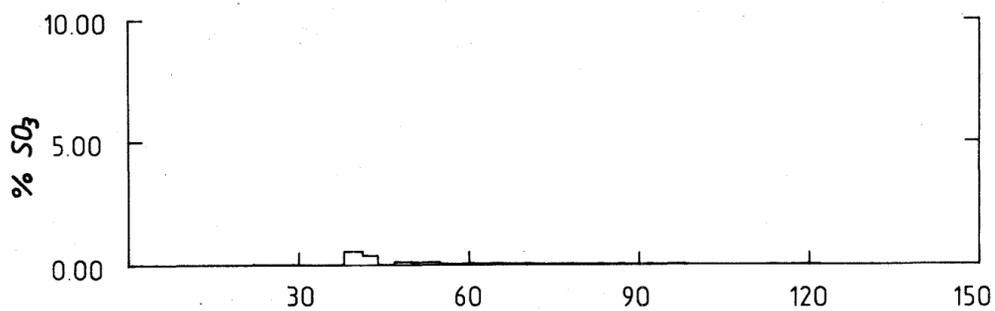


BRECCIA MAGNESITE DOLOMITE MAGNESITE DOLOMITE MAGNESITE DOLOMITE MAGNESITE DOLOMITE AMPHIBOLITE
 MAGNESITE SILTSTONE E.O.H. 209m.

METRES DOWN HOLE

346139

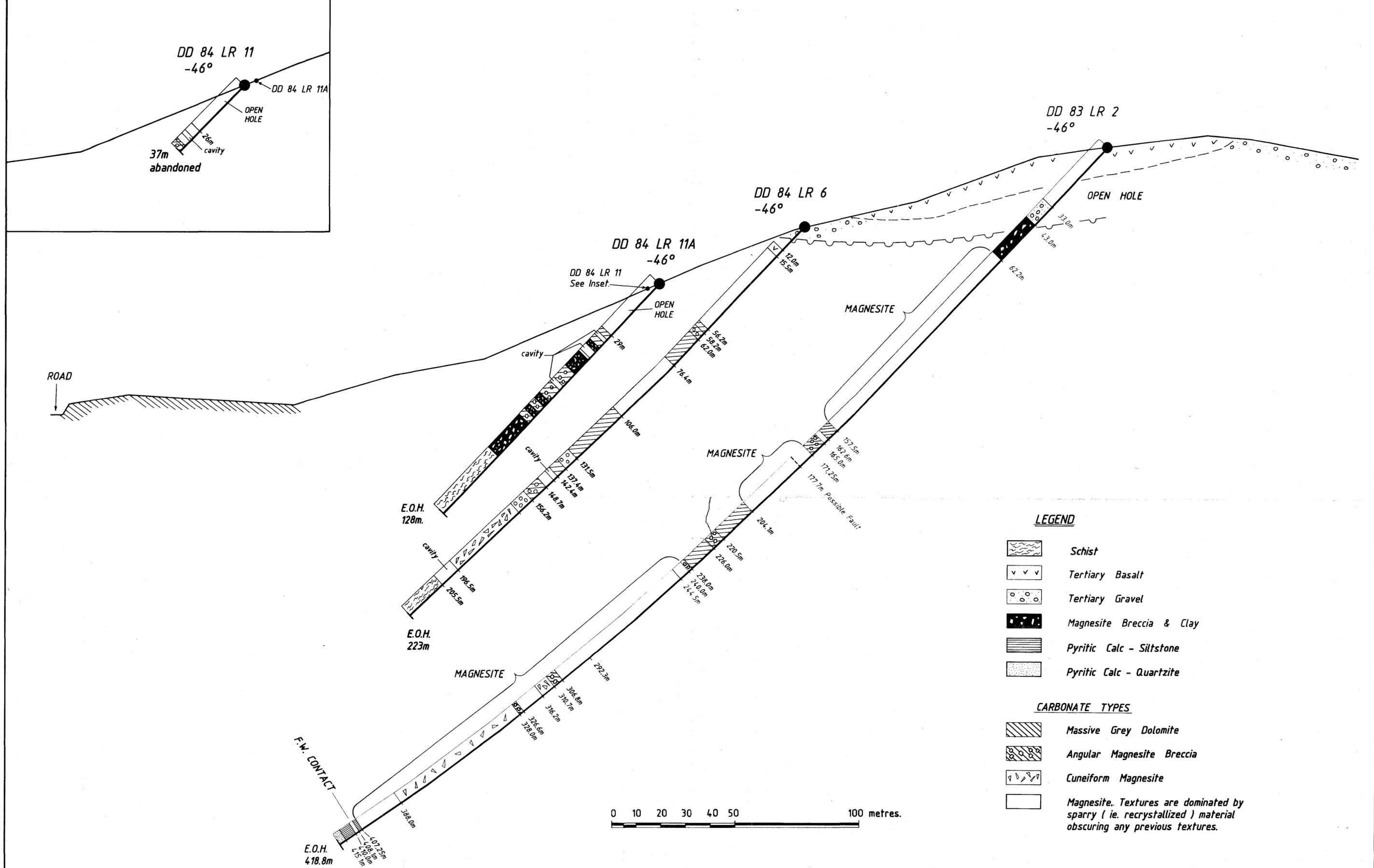
5 cm



CRA EXPLORATION PTY. LIMITED
 84-2214 VOL 2/2
 ARTHUR RIVER E.L. 43/70
 DD 84 LR 10
 GRAPHIC LOG AND ASSAYS

Ref:	SK55 - 3
Scale:	1 : 1000
Author:	T.W.D.
Date:	6 - 7 - 1984
Drawn:	R.T.
Report No.	12828
Plan No.	TASh 1781

346140
 5 cm
 010



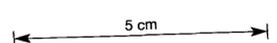
LEGEND

- Schist
- Tertiary Basalt
- Tertiary Gravel
- Magnesite Breccia & Clay
- Pyritic Calc - Siltstone
- Pyritic Calc - Quartzite

CARBONATE TYPES

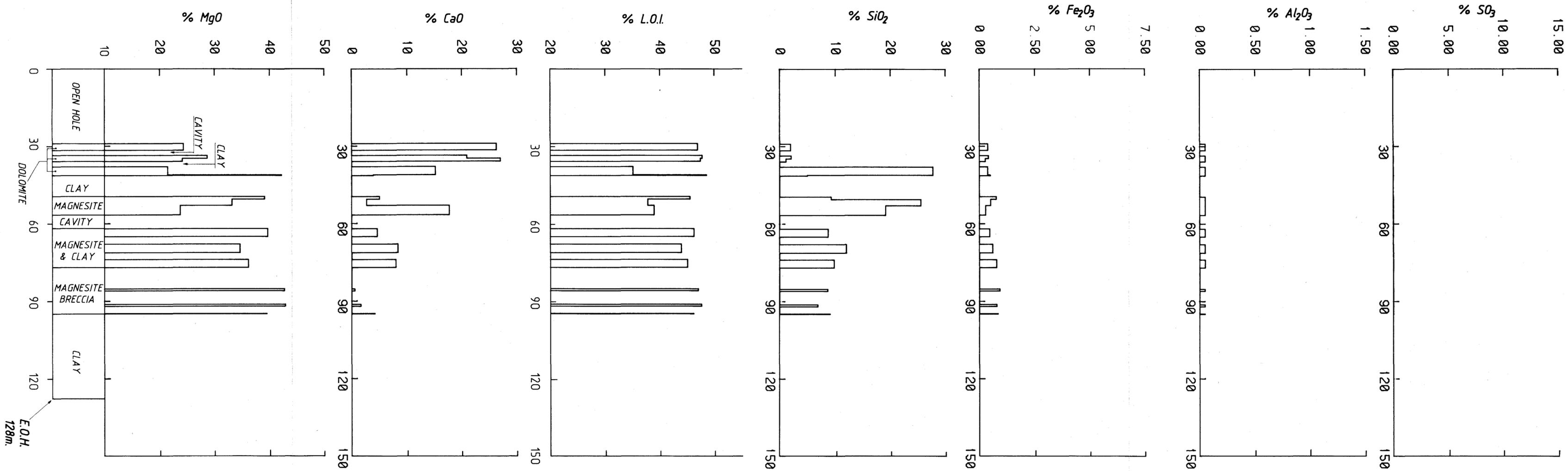
- Massive Grey Dolomite
- Angular Magnesite Breccia
- Cuneiform Magnesite
- Magnesite. Textures are dominated by sparry (ie. recrystallized) material obscuring any previous textures.

346141



CRA EXPLORATION PTY. LIMITED	
84-2214 Vol 2/2	
E.L. 43/70 ARTHUR RIVER	
DD 83 LR 2, DD 84 LR 6, 11 & 11A	
SECTIONS 011	
Ref:	SK55 - 3
Scale:	1 : 1000
Author:	V. W. & P.M.k
Date:	27 - 7 - 1984
Drawn:	R. T.
Report N°:	12828
Plan N°:	TASh 1913

METRES DOWN HOLE



5 cm

012

346142

CRA EXPLORATION PTY. LIMITED	
84-2214 vol 2/2 ARTHUR RIVER E.L. 43/70 DD 84 LR 11A GRAPHIC LOG AND ASSAYS	
Ref: SK55 - 3	
Scale: 1 : 1000	Drawn: R.T.
Author: P. McK.	Report No. 12828
Date: 10 - 9 - 1984	Plan No. TASH 1991

9650 mE

9700 mE

9750 mE

9800 mE

9850 mE

9900 mE

9950 mE

10 000 mE

10 050 mE

10 100 mE

10 150 mE

301.5° AMG

121.5° AMG

DD 83 AR 3
- 46°

200m R.L.

Inferred Sinkhole

FOOTWALL CONTACT

LEGEND



QUATERNARY - TERTIARY (?) ALLUVIUM



YELLOW SAND. PROBABLY WEATHERED MAGNESITE KARST - FILL



HANGING WALL QUARTZ SCHIST



HEAVILY RECRYSTALLIZED VARIABLY WEATHERED MAGNESITE - DOLOMITE.



ANGULAR MAGNESITE BRECCIA



SANDY DOLOMITE



QUARTZ SANDSTONE

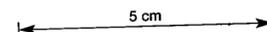


PYRITIC CALC SILSTONE



AMPHIBOLITE

346143



E.O.H.
408.0 m

392.2 m
386.7 m
403.8 m

Pyritic

Pyritic

Pyritic

Pyritic shale in carbonate

242.6 - 243.0 m
249.1 m
251.3 m

261.0 m
271.0 m

330.0 m
338.5 m

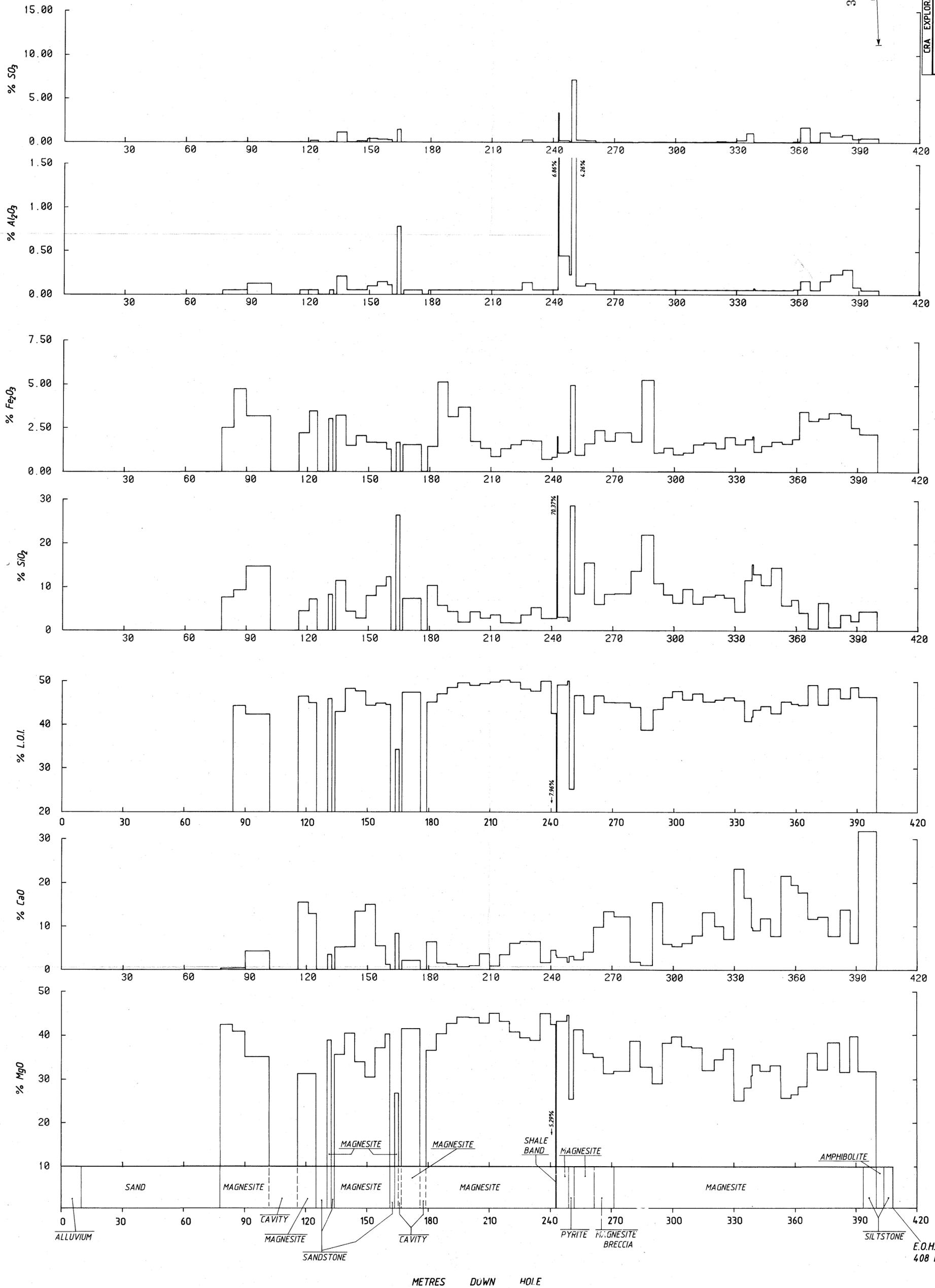
28.8 m
78.0 m

125.0 m
130.4 m
136.0 m
132.5 m

161.2 m
163.1 m

CRA EXPLORATION PTY. LIMITED	
84-2214 VOL 2/2	
ARTHUR RIVER E.L. 43/70	
KEITH - ARTHUR RIVER PROSPECT	
DD 83 AR 3 SECTION 013	
Ref: SK55- 3	
Scale: 1 : 1000	Drawn: R. T.
Author: V. A. W.	Report No. 12828
Date: 23 - 11 - 1983	Plan No. TASH 1559

346144
5 cm



METRES DOWN HOLE

E.O.H.
408 m.

300° AMG

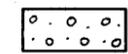
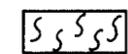
120° AMG

ARBITRARY LEVEL 200m.

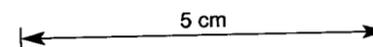
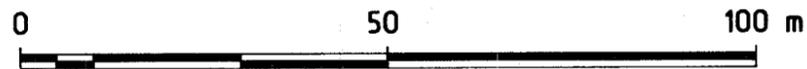
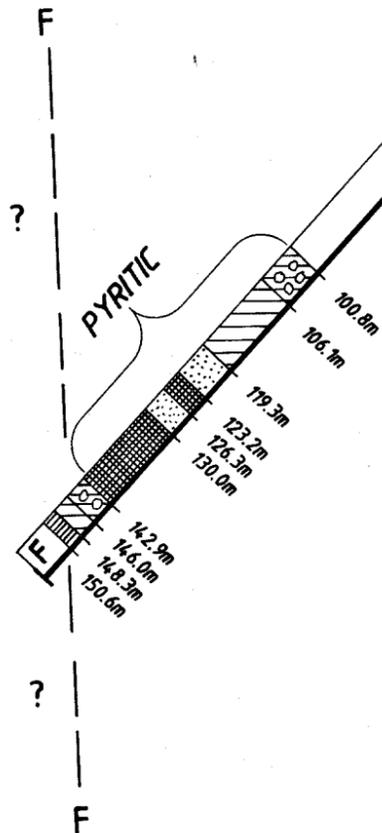
DD 83 AR 5
- 46°

10 000 mE

LEGEND

-  Quaternary - Tertiary (?) Alluvium
-  Hanging Wall Quartz Schist
-  Magnesite. Variably Recrystallised
-  Angular Magnesite Breccia
-  Sandy Dolomite
-  Strongly Recrystallised Magnesite - Dolomite
-  Pale Green Slate
-  Pyritic Calc Siltstone
-  Fault Gouge

E.O.H.
156.2 m.



346145

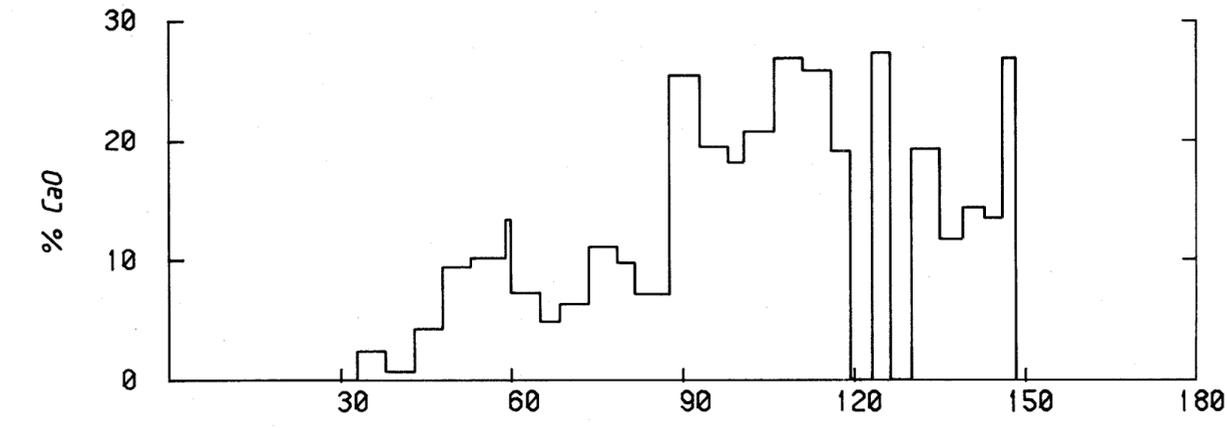
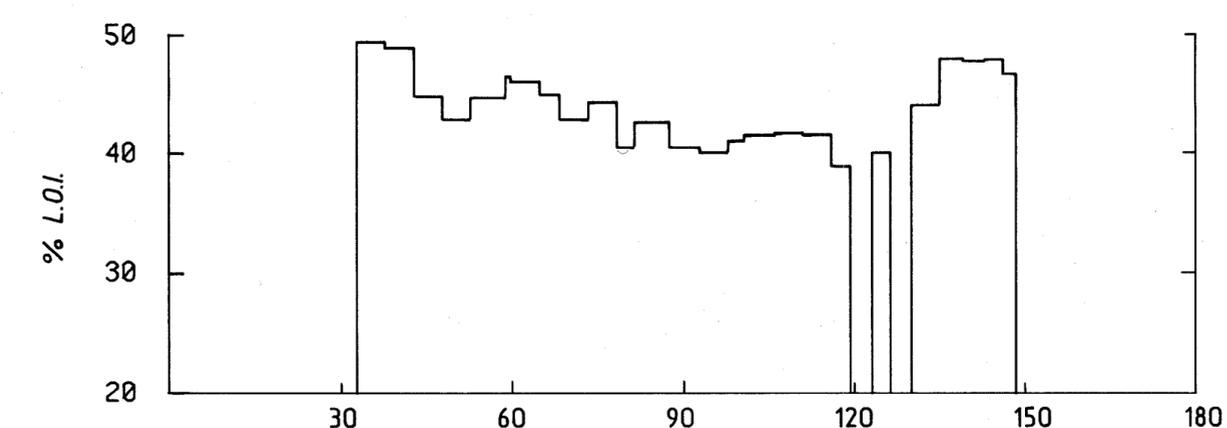
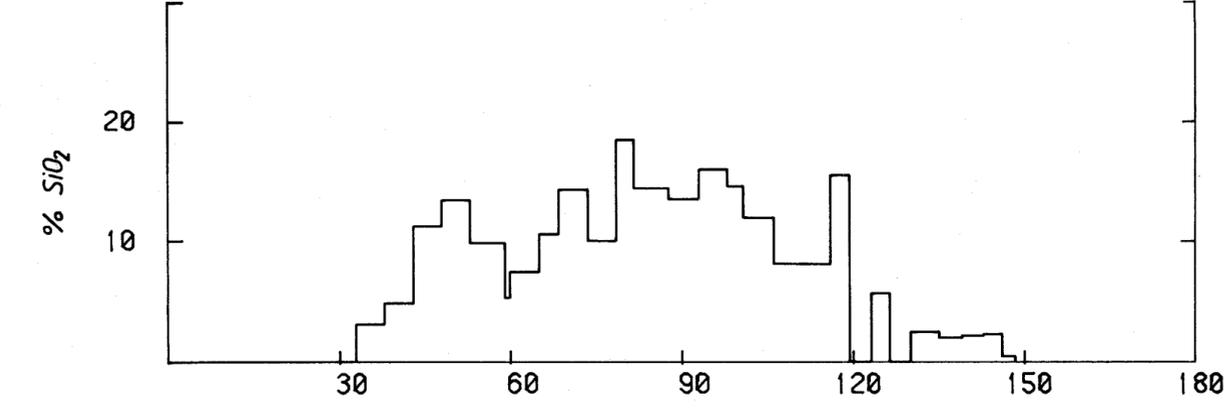
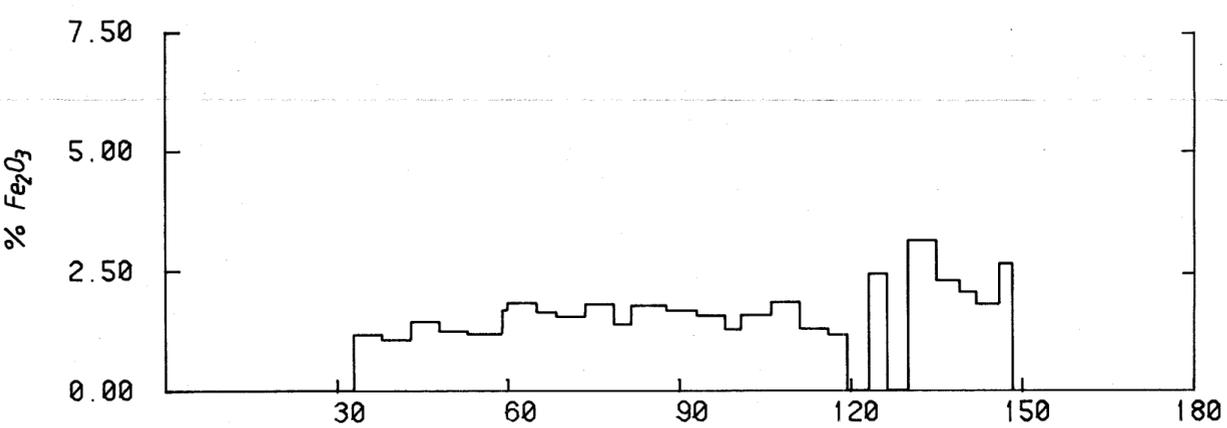
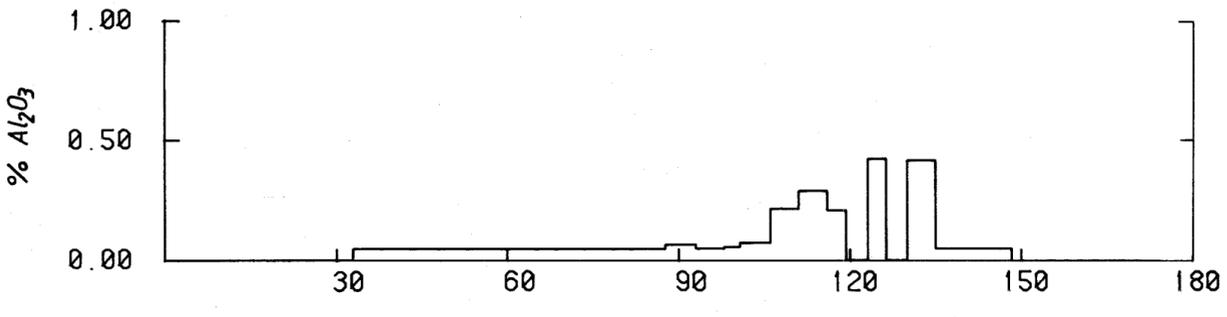
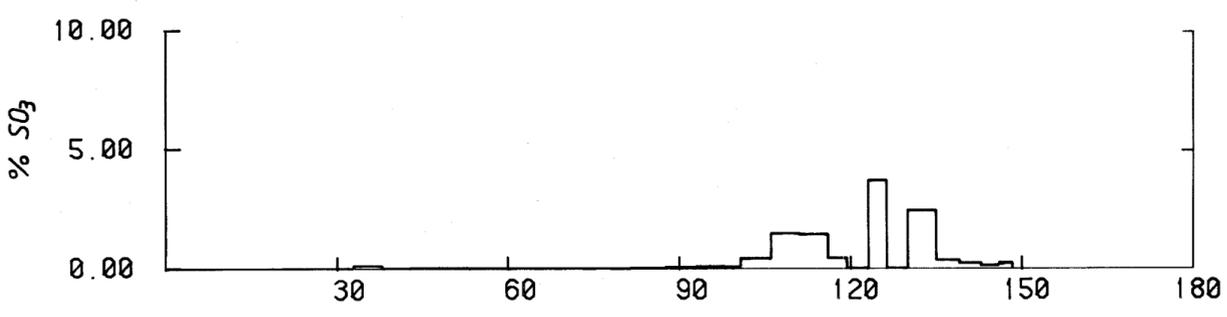
CRA EXPLORATION PTY. LIMITED
 84-2214 VOL 2/2
 E.L. 43/70 ARTHUR RIVER
 KEITH - ARTHUR RIVER PROSPECT
 DD 83 AR 5 SECTION 015

REF.	SK55 - 3	DRAWN	R.T.
SCALE	1 : 1000	REPORT No.	12828
AUTHOR	V. A. W.	PLAN No.	TASh 1563
DATE	6 - 12 - 1983		

346146

CRA EXPLORATION PTY. LIMITED
 Sta 22-14 Vol 2/2
 ARTHUR RIVER E.L. 43/70
 DD 83 AR 5
 GRAPHIC LOG AND ASSAYS

REF.	SK 55 - 3	DRAWN	R. T.
SCALE	1 : 1000	REPORT No.	12828
AUTHOR	T. W. D.	PLAN No.	TASH 7564
DATE	6 - 12 - 1983		

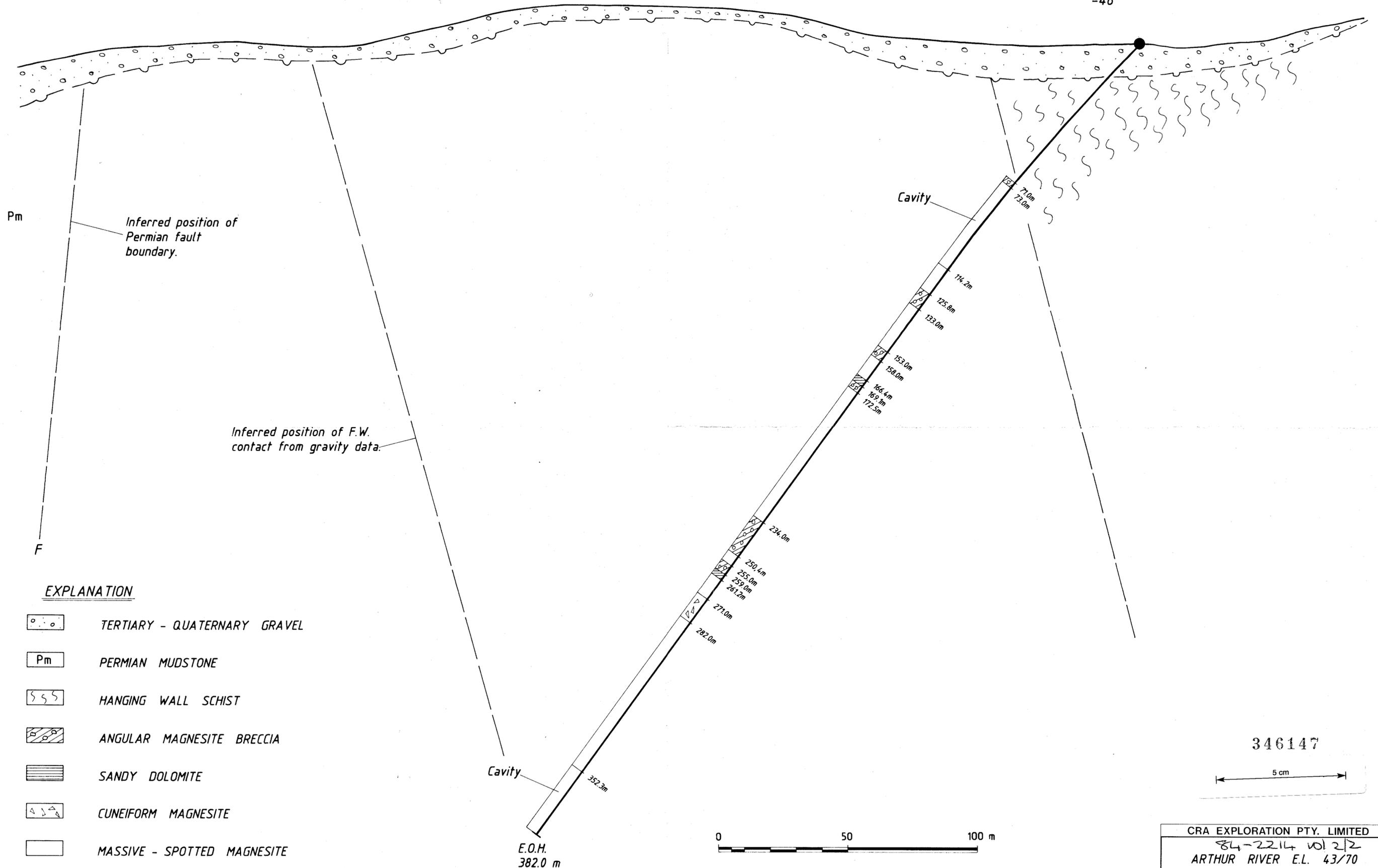


5 cm

310° AMG

DD 83 AR 6
-46°

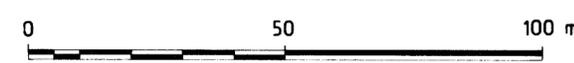
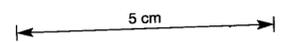
130° AMG



EXPLANATION

-  TERTIARY - QUATERNARY GRAVEL
-  PERMIAN MUDSTONE
-  HANGING WALL SCHIST
-  ANGULAR MAGNESITE BRECCIA
-  SANDY DOLOMITE
-  CUNEIFORM MAGNESITE
-  MASSIVE - SPOTTED MAGNESITE

346147



CRA EXPLORATION PTY. LIMITED	
84-2214 VOL 2/2	
ARTHUR RIVER E.L. 43/70	
DD 83 AR 6	
SECTION 017	
REF.	SK55 - 3
SCALE	1 : 1000
AUTHOR	V. A. W.
DATE	14 - 12 - 1983
DRAWN	R.T.
REPORT No.	12828
PLAN No.	TASh 1565

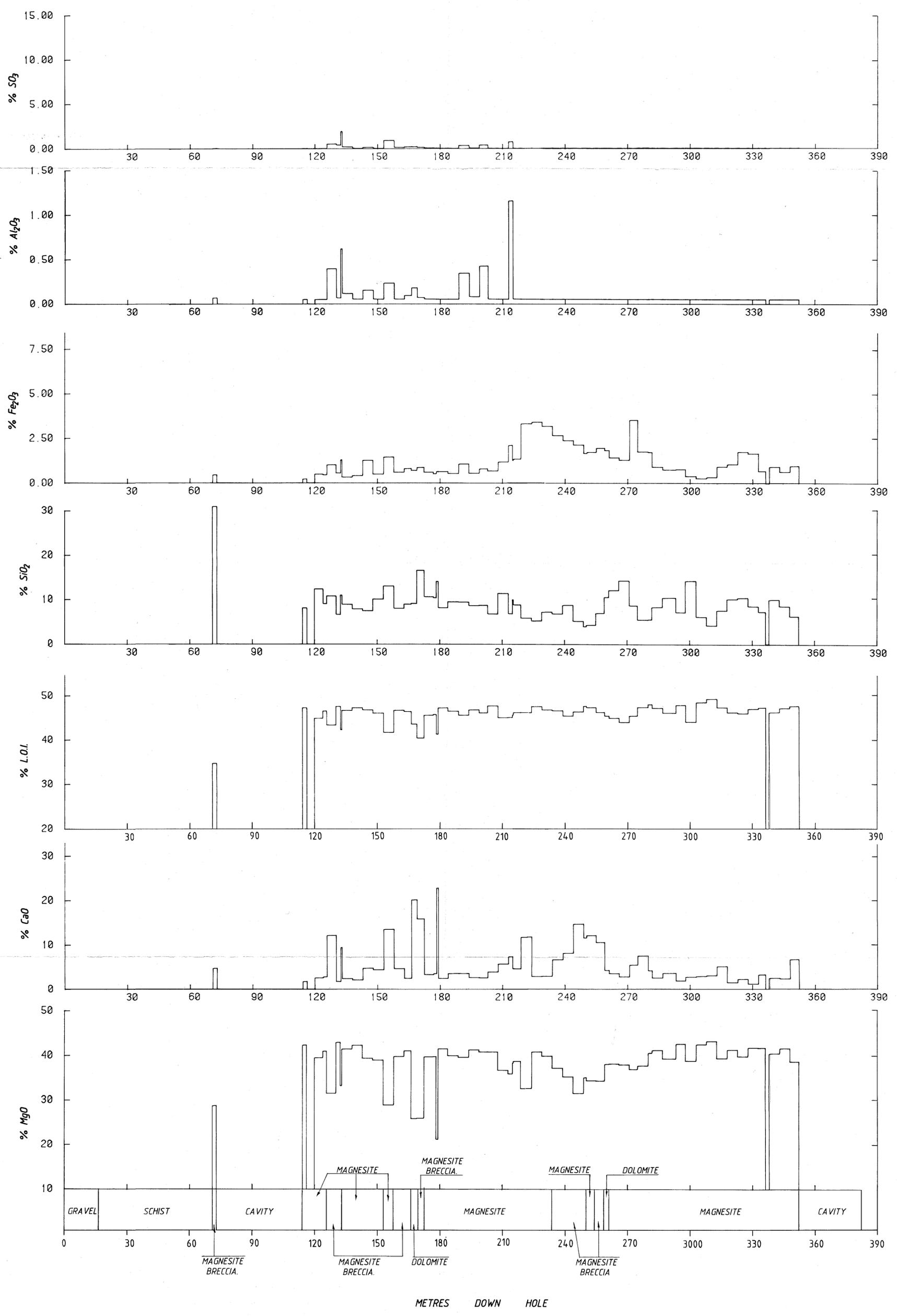
346148

5 cm

CRA EXPLORATION PTY. LIMITED
 84-22-111 VOL 2/2
 E.L. 43770 ARTHUR RIVER
 DD 83 AR 6
 GRAPHIC LOG AND ASSAYS

REF.	SK55 - 3
SCALE	1 : 1000
AUTHOR	M. F. F.
DATE	13 - 2 - 1984
DRAWN	M. A. C.
REPORT No.	12828
PLAN No.	TASH 1638

018

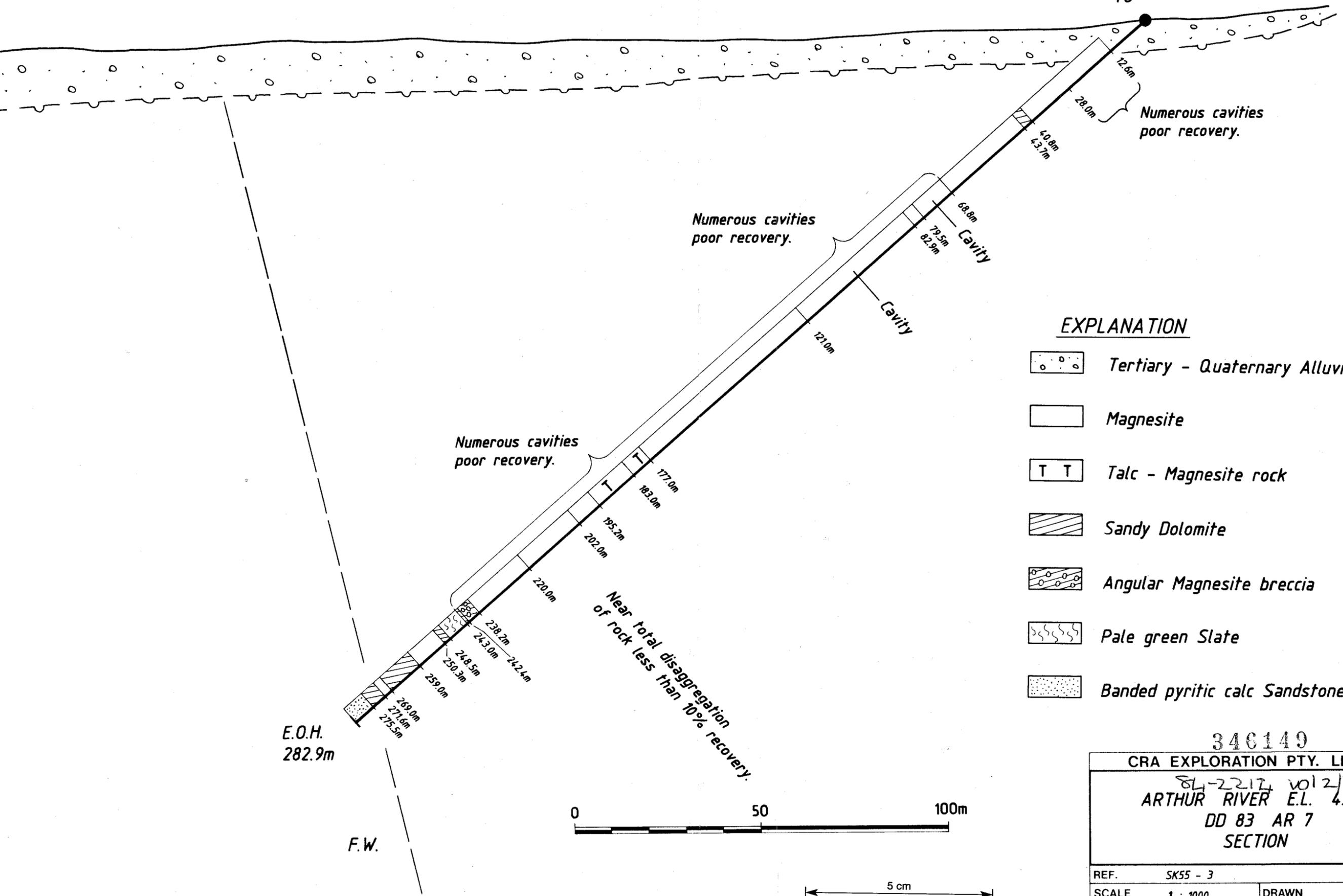


METRES DOWN HOLE

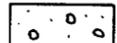
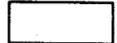
330° AMG

150° AMG

DD 83 AR 7
-46°



EXPLANATION

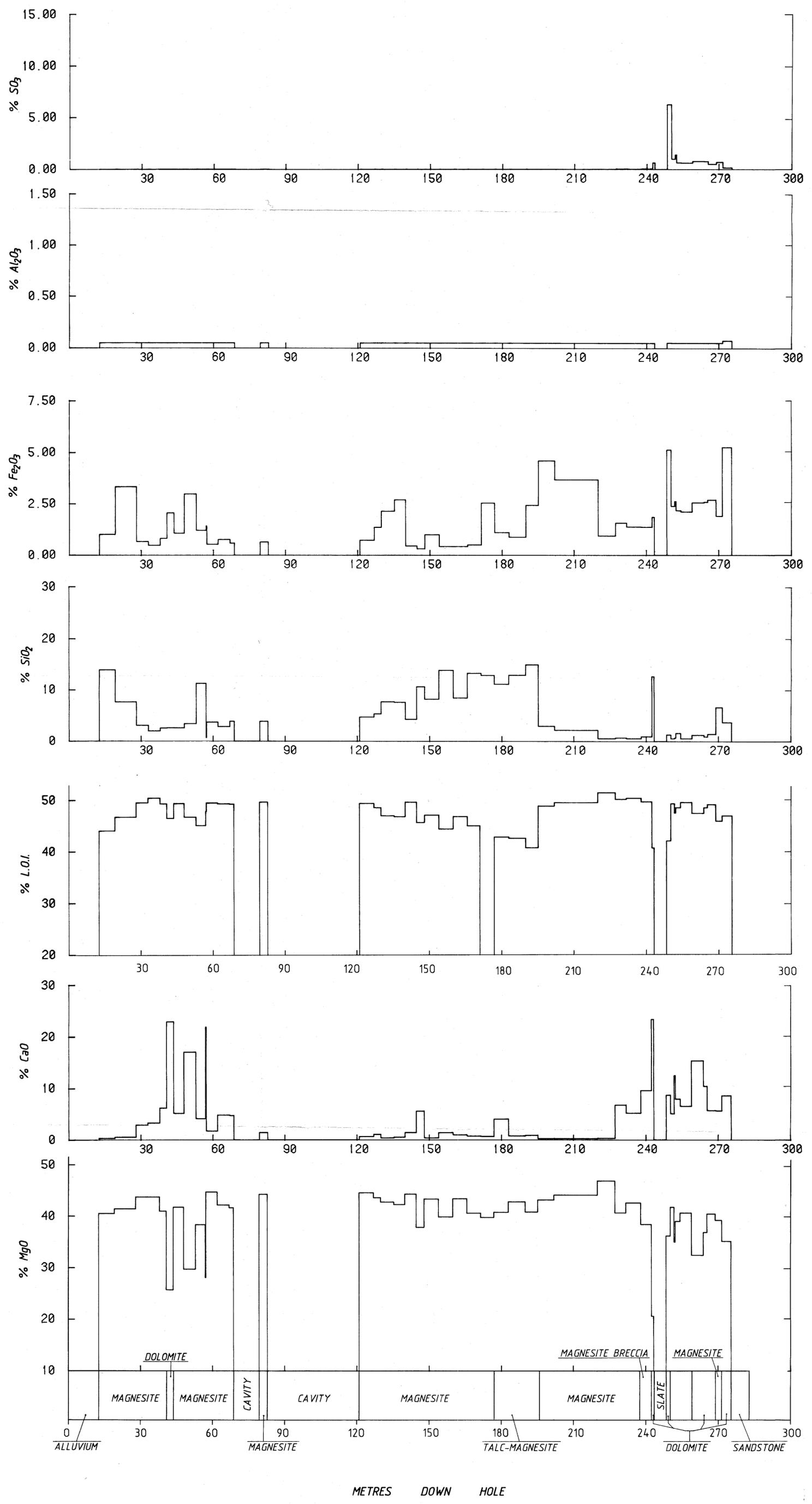
-  Tertiary - Quaternary Alluvium
-  Magnesite
-  Talc - Magnesite rock
-  Sandy Dolomite
-  Angular Magnesite breccia
-  Pale green Slate
-  Banded pyritic calc Sandstone

346149

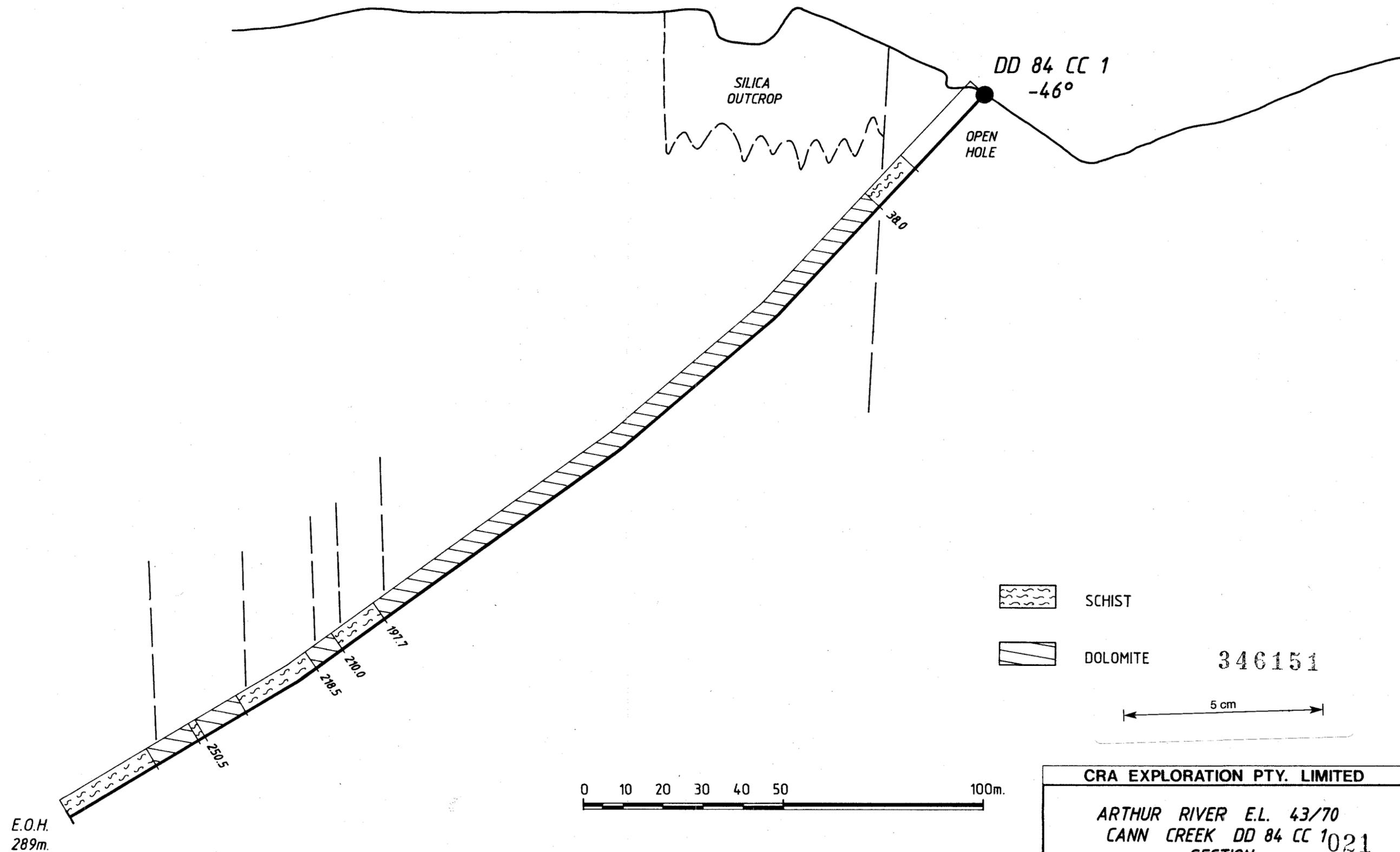
CRA EXPLORATION PTY. LIMITED	
84-2217 vol 2/2 ARTHUR RIVER E.L. 43/70 DD 83 AR 7 SECTION 019	

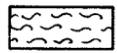
REF.	SK55 - 3	DRAWN	R. T.
SCALE	1 : 1000	REPORT No.	12828
AUTHOR	V. A. W.	PLAN No.	TASh 1566
DATE	15 - 12 - 1983		

346150
 5 cm



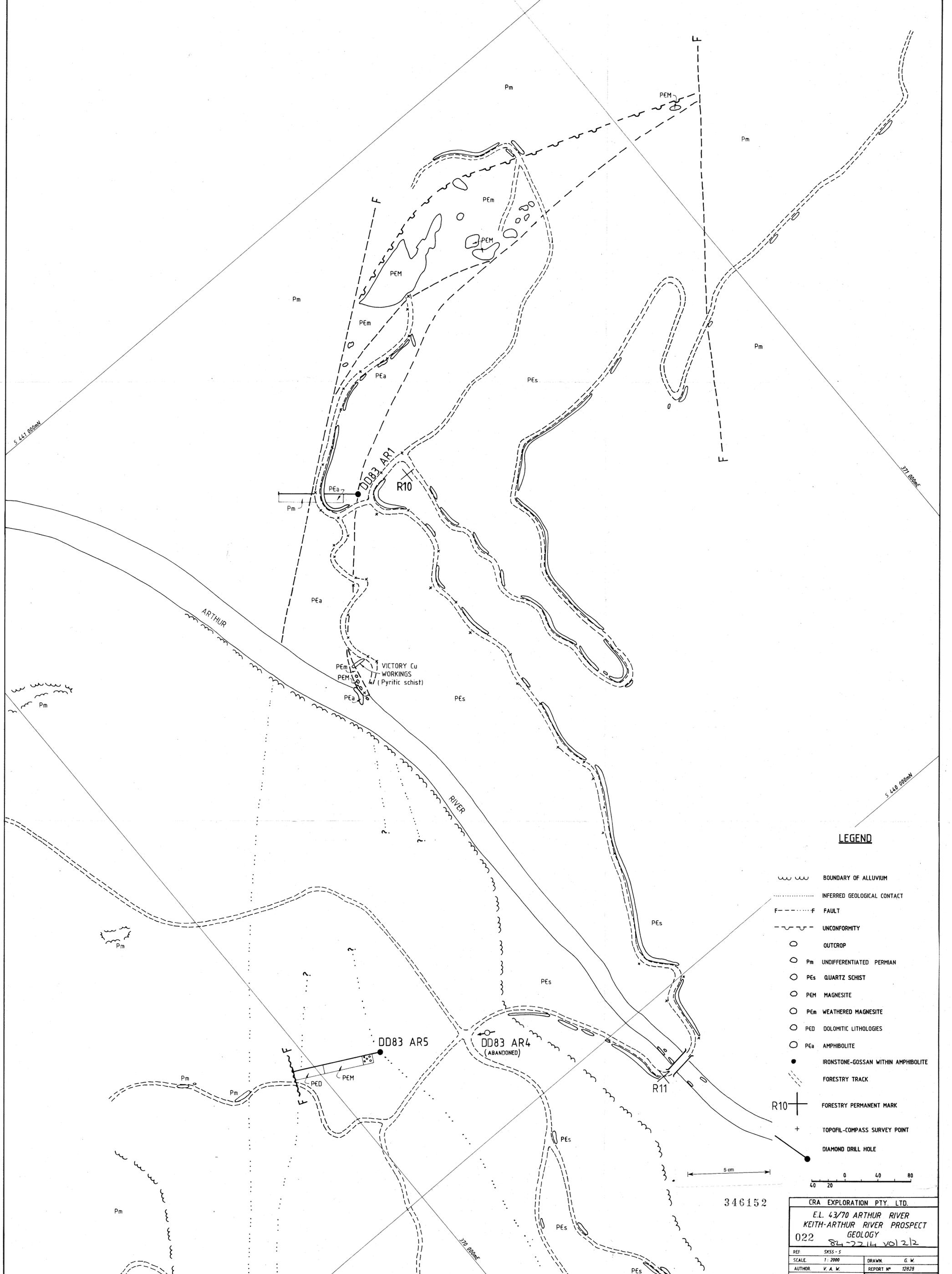
METRES DOWN HOLE



 SCHIST
 DOLOMITE

346151

CRA EXPLORATION PTY. LIMITED			
ARTHUR RIVER E.L. 43/70 CANN CREEK DD 84 CC 1021 SECTION 84-2214 VOL 2/2			
REF.	SK55 -3		
SCALE	1 : 1,000	DRAWN	R.T.
AUTHOR	P. M ^c K.	REPORT No.	12828
DATE	26 - 7 - '84	PLAN No.	TASh 1912

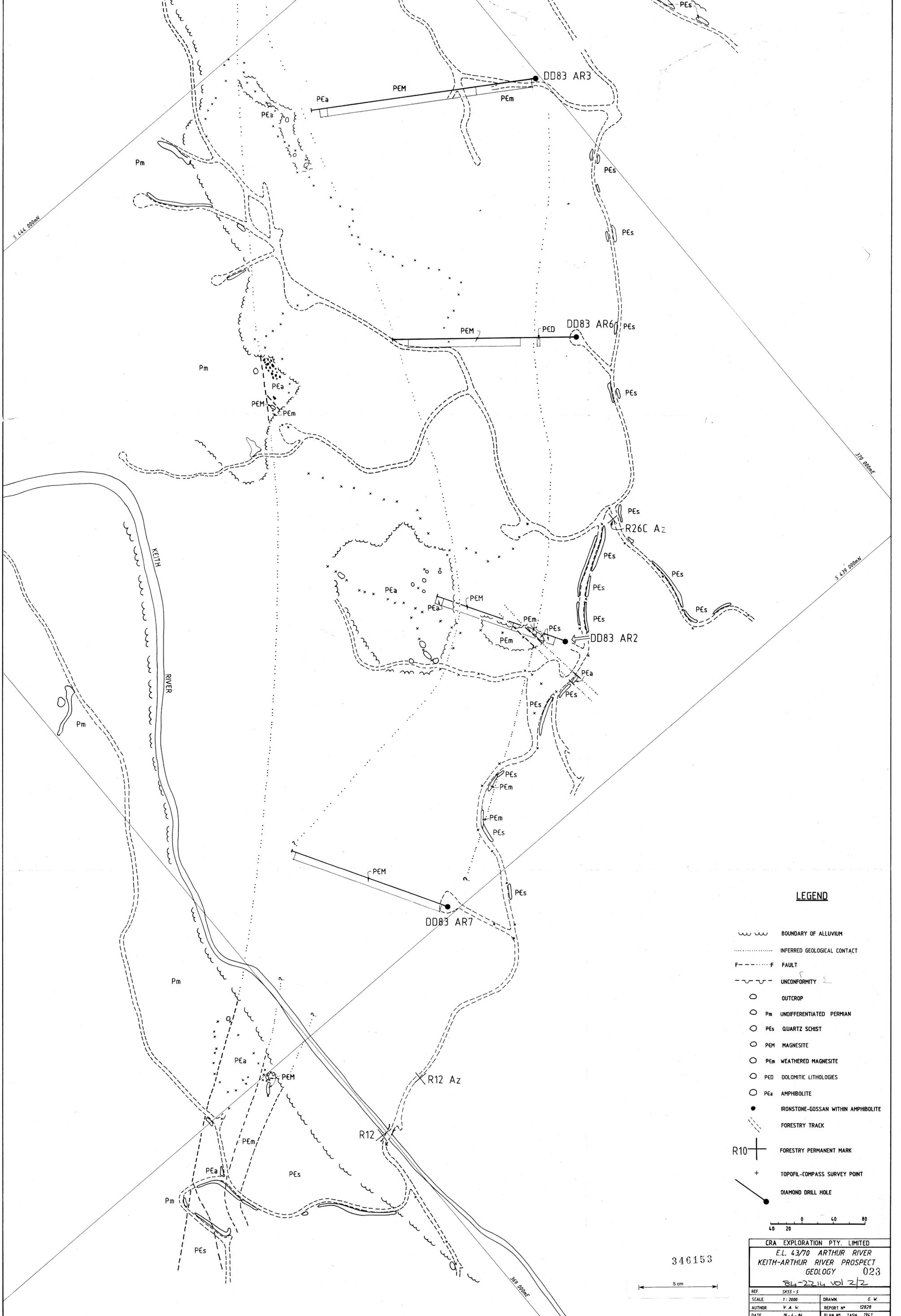


LEGEND

- BOUNDARY OF ALLUVIUM
- INFERRED GEOLOGICAL CONTACT
- FAULT
- UNCONFORMITY
- OUTCROP
- Pm UNDIFFERENTIATED PERMIAN
- PEs QUARTZ SCHIST
- PEM MAGNESITE
- PEm WEATHERED MAGNESITE
- PED DOLOMITIC LITHOLOGIES
- PEa AMPHIBOLITE
- IRONSTONE-GOSSAN WITHIN AMPHIBOLITE
- FORESTRY TRACK
- FORESTRY PERMANENT MARK
- TOPOFIL-COMPASS SURVEY POINT
- DIAMOND DRILL HOLE

346152

CRA EXPLORATION PTY. LTD.	
E.L. 43/70 ARTHUR RIVER KEITH-ARTHUR RIVER PROSPECT	
022 84-77-14 VOL 2/2	
REF: SKSS-5	
SCALE: 1:2000	DRAWN: G.W.
AUTHOR: V.A.W.	REPORT NO: 12828
DATE: 19-4-84	PLAN NO: TASH 1940

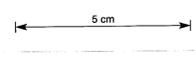


LEGEND

- BOUNDARY OF ALLUVIUM
- INFERRED GEOLOGICAL CONTACT
- FAULT
- UNCONFORMITY
- OUTCROP
- Pm UNDIFFERENTIATED PERMIAN
- PEs QUARTZ SCHIST
- PEM MAGNESITE
- PE_m WEATHERED MAGNESITE
- PED DOLOMITIC LITHOLOGIES
- PE_a AMPHIBOLITE
- IRONSTONE-GOSSAN WITHIN AMPHIBOLITE
- FORESTRY TRACK
- FORESTRY PERMANENT MARK
- TOPOFIL-COMPASS SURVEY POINT
- DIAMOND DRILL HOLE



346153

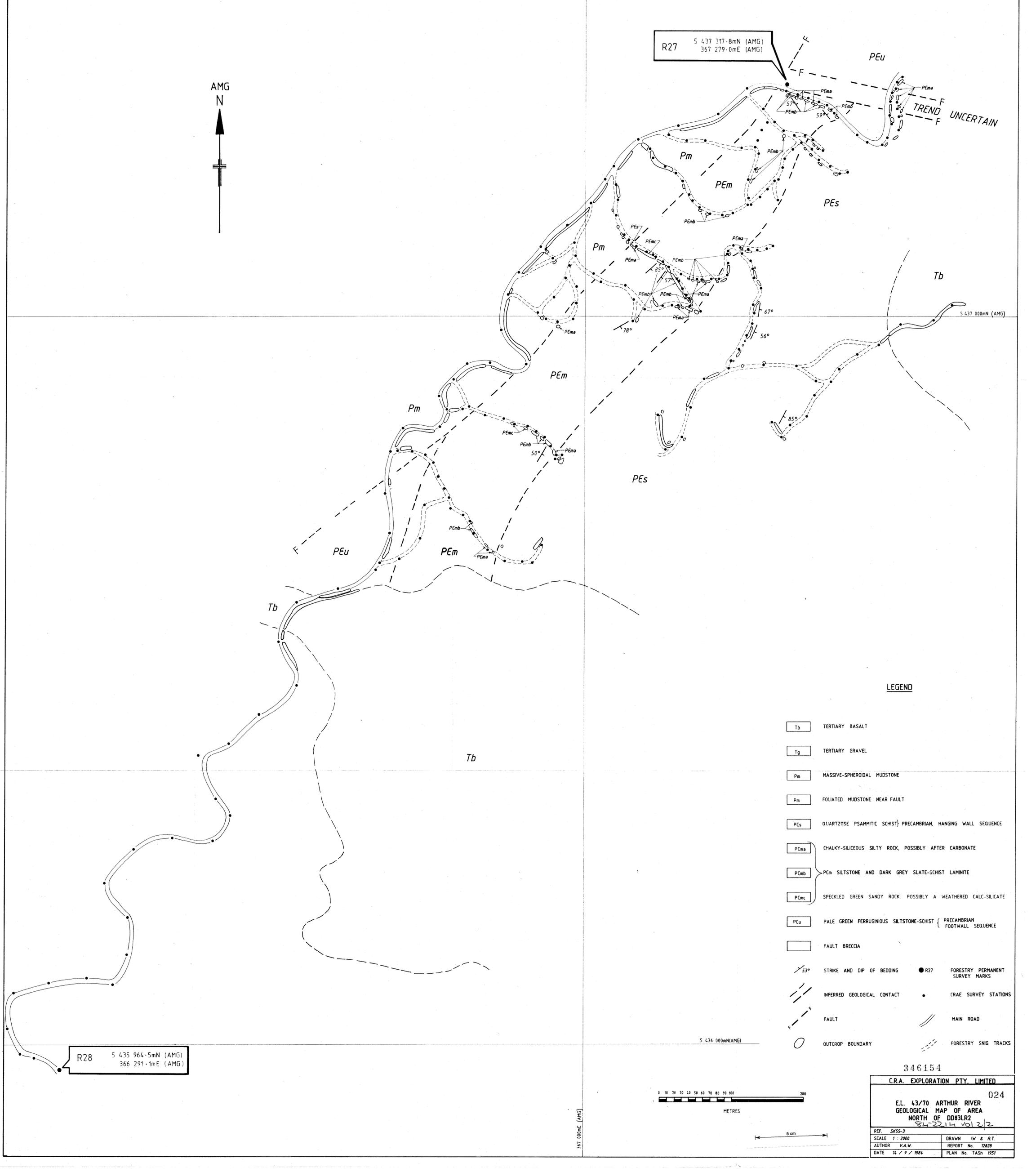


CRA EXPLORATION PTY. LIMITED	
E.L. 43/70 ARTHUR RIVER	
KEITH-ARTHUR RIVER PROSPECT	
GEOLOGY 023	
84-2214 VOL 2/2	
REF. SK55-5	
SCALE 1:2000	DRAWN G.W.
AUTHOR V.A.W.	REPORT NO 12828
DATE 19-4-84	PLAN NO TASH 1947



R27
5 437 317.8mN (AMG)
367 279.0mE (AMG)

PEu
TREND UNCERTAIN

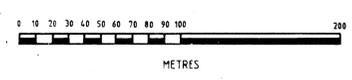


LEGEND

- Tb TERTIARY BASALT
- Tg TERTIARY GRAVEL
- Pm MASSIVE-SPHEROIDAL MUDSTONE
- Pm FOLIATED MUDSTONE NEAR FAULT
- PCs QUARTZOSE PSAMMITIC SCHIST (PRECAMBRIAN, HANGING WALL SEQUENCE
- PCma CHALKY-SILICEOUS SILTY ROCK, POSSIBLY AFTER CARBONATE
- PCmb } PCm SILTSTONE AND DARK GREY SLATE-SCHIST LAMINITE
- PCmc } SPECKLED GREEN SANDY ROCK, POSSIBLY A WEATHERED CALC-SILICATE
- PCu PALE GREEN FERRUGINOUS SILTSTONE-SCHIST (PRECAMBRIAN FOOTWALL SEQUENCE
- FAULT BRECCIA
- 53° STRIKE AND DIP OF BEDDING ● R27 FORESTRY PERMANENT SURVEY MARKS
- INFERRED GEOLOGICAL CONTACT ● CRAE SURVEY STATIONS
- FAULT // MAIN ROAD
- O OUTCROP BOUNDARY // FORESTRY SNIG TRACKS

5 436 000mN(AMG)

R28
5 435 964.5mN (AMG)
366 291.1mE (AMG)



346154

C.R.A. EXPLORATION PTY. LIMITED

E.L. 43/70 ARTHUR RIVER
GEOLOGICAL MAP OF AREA
NORTH OF DD83LR2
84-2214 VOL 2/2

REF. SK55-3	SCALE 1:2000	DRAWN IW & RT.
AUTHOR V.A.W.	REPORT No. 12828	
DATE 16/9/1984	PLAN No. TASH 1951	

024

S 447 000m (N1AMG) S 447 000m (N1AMG)

S 446 000m (N1AMG) S 446 000m (N1AMG)

S 445 000m (N1AMG) S 445 000m (N1AMG)

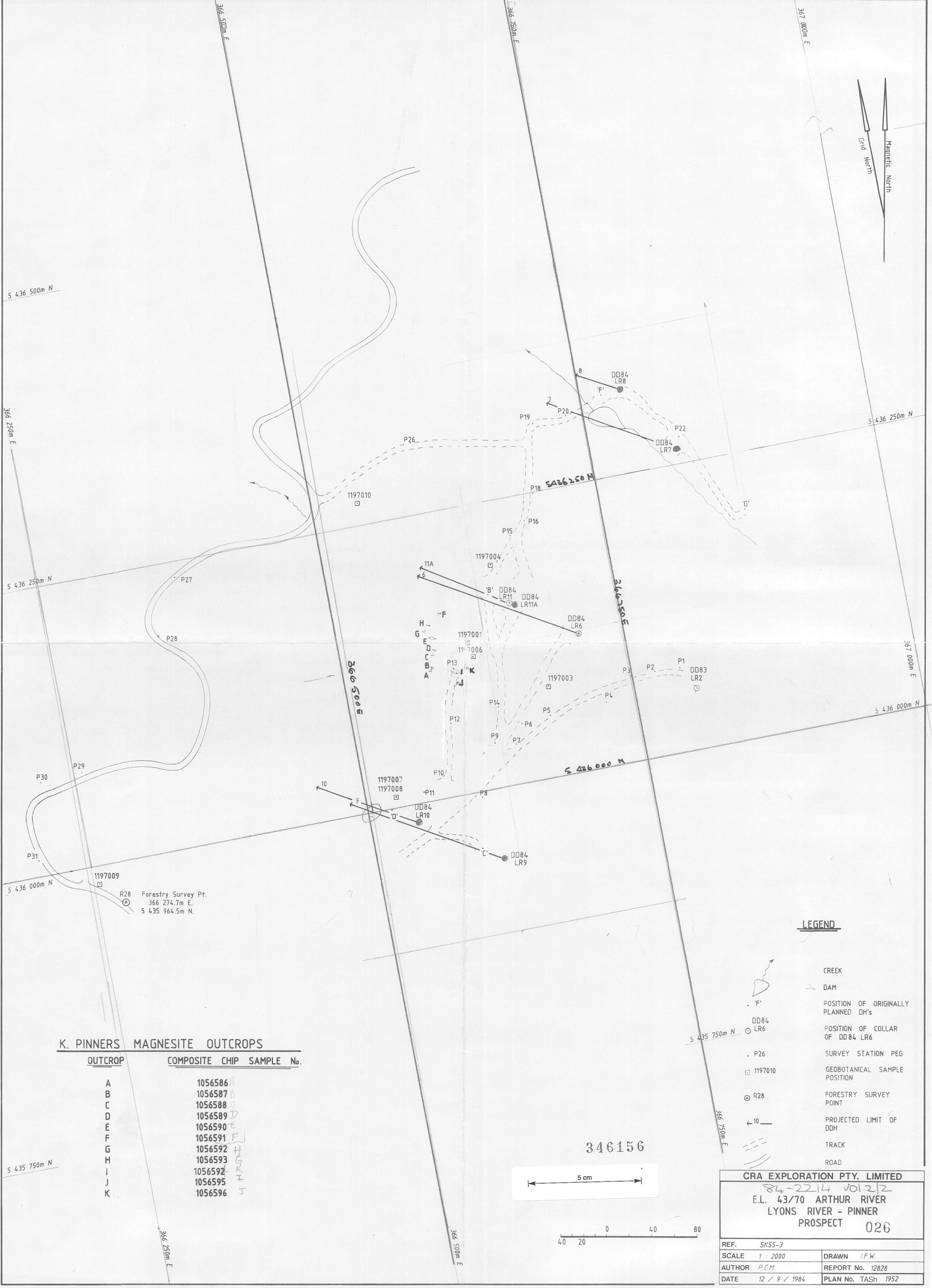
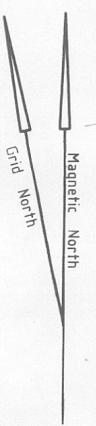


346155

5 cm

CRA EXPLORATION PTY. LIMITED
 EL. 43/70 ARTHUR RIVER
 CANN CREEK MAGNESITE PROSPECT
 GEOLOGY 025

REF: SK35-3	DRAWN: JFW
SCALE: 1:2000	REPORT NO: 2282
AUTHOR: V.A.W.	PLAN NO: TASH 1992
DATE: 17/7/1984	



K. PINNERS MAGNESITE OUTCROPS

OUTCROP	COMPOSITE CHIP SAMPLE No.
A	1056586
B	1056587
C	1056588
D	1056589
E	1056590
F	1056591
G	1056592
H	1056593
I	1056592
J	1056595
K	1056596

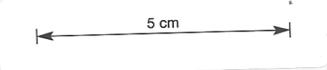
LEGEND

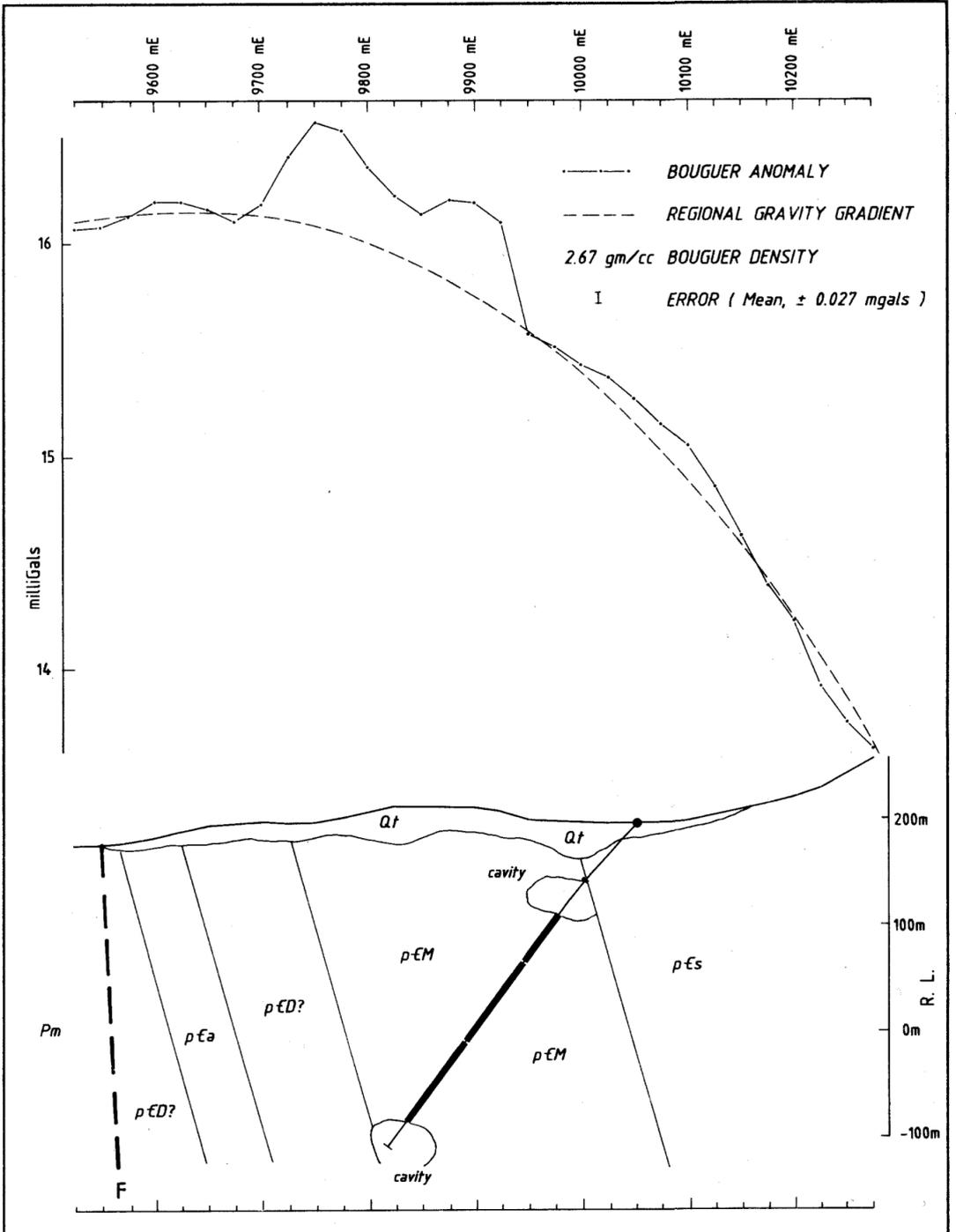
- CREEK
- DAM
- POSITION OF ORIGINALLY PLANNED DH's
- POSITION OF COLLAR OF DD84 LR6
- SURVEY STATION PEG
- GEOBOTANICAL SAMPLE POSITION
- FORESTRY SURVEY POINT
- PROJECTED LIMIT OF DDH
- TRACK
- ROAD

CRA EXPLORATION PTY. LIMITED

84-2214 VOL 2/2
E.L. 43/70 ARTHUR RIVER
LYONS RIVER - PINNER
PROSPECT 026

REF. SK55-3	
SCALE 1 : 2000	DRAWN I.F.W.
AUTHOR P.C.M.	REPORT No. 12028
DATE 12 / 9 / 1984	PLAN No. TASH 1952



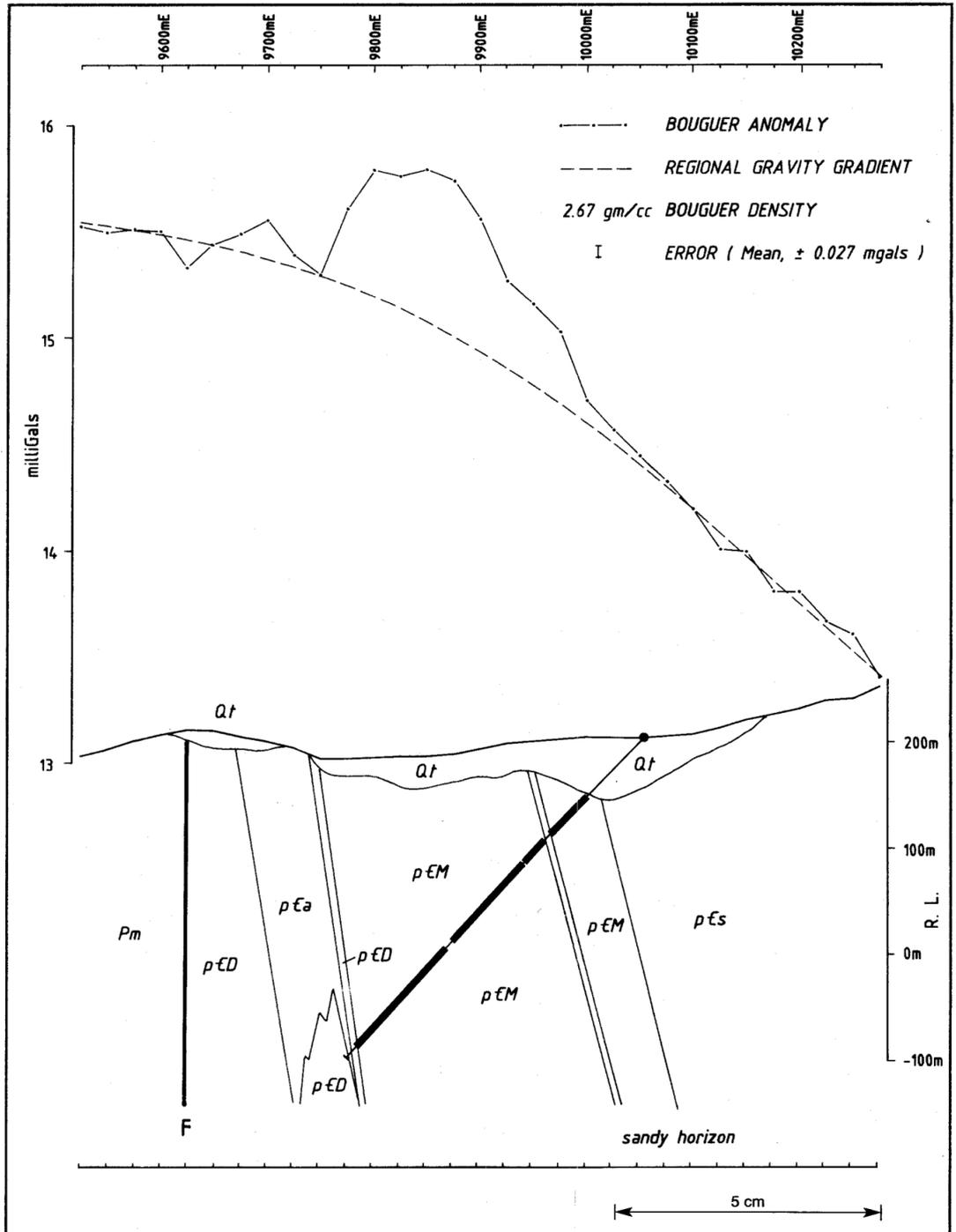


Qt = Alluvium
 Pm = Permian mudstones
 pEs = preCambrian Quartz schist
 pEM = preCambrian Magnesite
 pED = preCambrian Dolomite lithologies
 pEa = preCambrian Amphibolites

CRA EXPLORATION PTY. LIMITED
 84-2214 VOL 2/2
 ARTHUR RIVER E.L. 43/70
 GRAVITY PROFILE
 With DD 83 AR 6 Section & Interpretation
 LINE 19 250 mN 027

REF.	SK55 - 3	
SCALE	1 : 5000	DRAWN R.T.
AUTHOR	M.F.F.	REPORT No. 12828
DATE	27 - 7 - 1984	PLAN No. TASH 1767

INTERPRETATION BASED ON OUTCROP, DRILLED SECTION AND GRAVITY PROFILE.

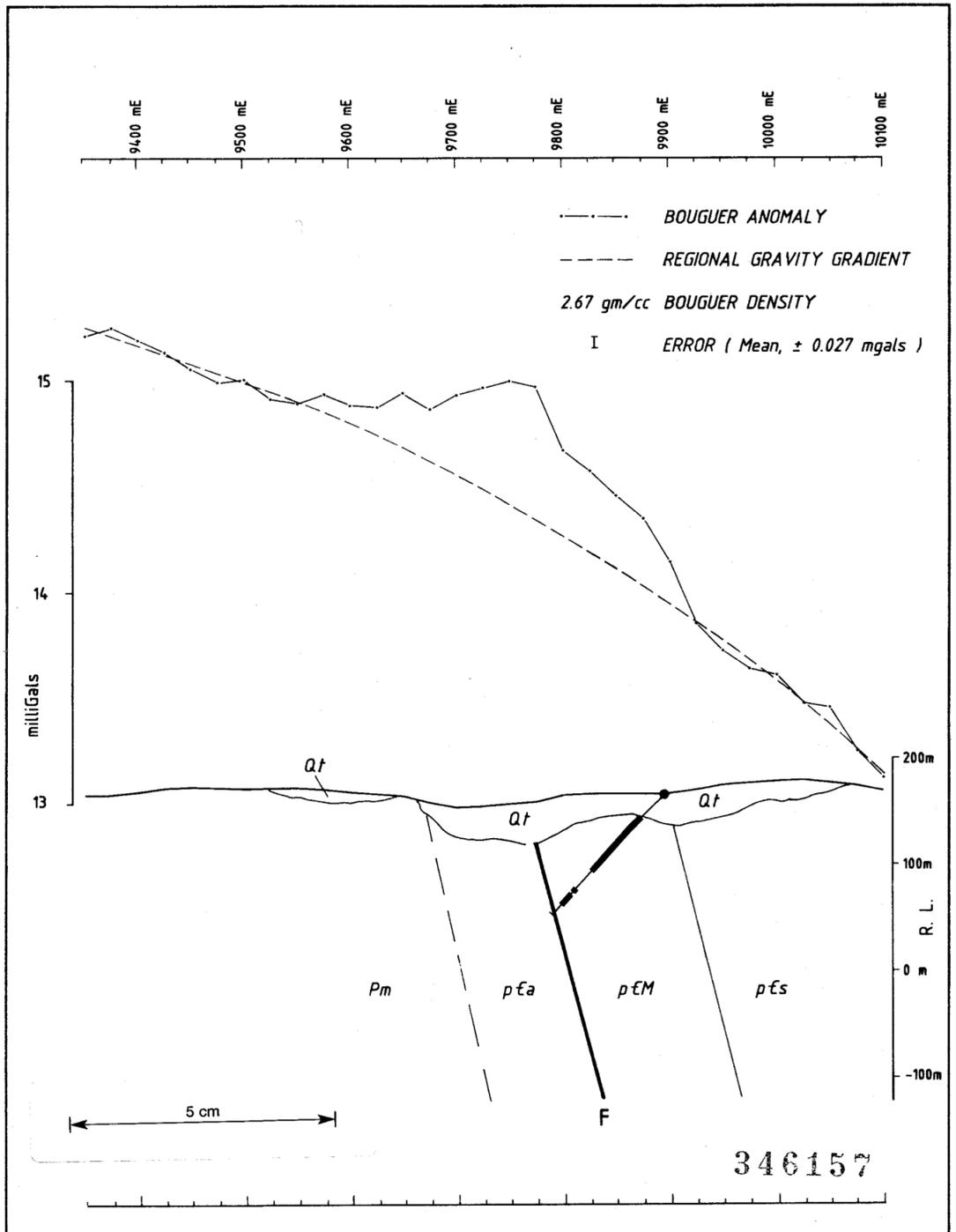


Qt = Alluvium
 Pm = Permian mudstones
 pEs = preCambrian Quartz schist
 pEM = preCambrian Magnesite
 pED = preCambrian Dolomite lithologies
 pEa = preCambrian Amphibolites

CRA EXPLORATION PTY. LIMITED
 84-2214 VOL 2/2
 ARTHUR RIVER E.L. 43/70
 GRAVITY PROFILE
 With DD 83 AR 3 Section & Interpretation
 LINE 19 600 mN

REF.	SK55 - 3	
SCALE	1 : 5000	DRAWN R.T.
AUTHOR	M.F.F.	REPORT No. 12828
DATE	27 - 7 - 1984	PLAN No. TASH 1768

INTERPRETATION BASED ON OUTCROP, DRILLED SECTION AND GRAVITY PROFILE.



Qt = Alluvium
 Pm = Permian mudstones
 pEs = preCambrian Quartz schist
 pEM = preCambrian Magnesite
 pED = preCambrian Dolomite lithologies
 pEa = preCambrian Amphibolites

CRA EXPLORATION PTY. LIMITED
 84-2214 VOL 2/2
 ARTHUR RIVER E.L. 43/70
 GRAVITY PROFILE
 With DD 83 AR 5 Section & Interpretation
 LINE 20 000 mN 027

REF.	SK55 - 3	
SCALE	1 : 5000	DRAWN R.T.
AUTHOR	M.F.F.	REPORT No. 12828
DATE	27 - 7 - 1984	PLAN No. TASH 1769

INTERPRETATION BASED ON OUTCROP, DRILLED SECTION AND GRAVITY PROFILE.

346157



--- GEOLOGICAL BOUNDARIES INTERPRETED FROM OUTCROP AND DRILLING

█ BLOCK INCLUDED IN EXCESS MASS DETERMINATION

5 cm

028

346158

CRA EXPLORATION PTY. LIMITED

61-2214 VOL 3/2

ARTHUR RIVER E.L. 43/70

CONTOURS OF

RESIDUAL BOUGUER ANOMALIES

0.1 milligal Contour Interval

Ref.	SK55 - 3
Scale:	1 : 2000
Author:	M.F.F.
Date:	27 - 7 - 1984
Drawn:	I.F.W.
Report No.	12828
Plan No.	TASH 1770