CONTENTS ENVELOPE 740 DOCKETS 21/67
1452/64

TENEMENT: S.M.L. 77

TENEMENT HOLDER: C.R.A. Exploration Pty/ Ltd,

REPORT:

CARRUTHERS, D.S. MacKENZIE, D.H., 1962
The Ediacara Mineral Field, South Australia.
With Appendices:
1. diamond drill logs and assays.
2. surface assays
3. assays of samples from shafts. (pgs. 4-27)

Plans:

Plan No. X27/1723 Locality plan, Ediacara Mineral Field. (pg. 28)

Plan NO. X27/1720 Geological plan, Ediacara Mineral Field. Scale 1: 6 000. (740-16)

Plan No. x27/1721 Drill hole cross-section along section No. 1-4 (inclusive). Scale 1:120C (740-20)

Plan No. X27/1722 Drill hole cross-section along sections Nos. 5-7 (inclusive) Scale 1: 1200. (740-18)

REPORT:

McQUEEN, A.F. 1967
Notes on results of drilling of the Ediacara structure South Australia.
With Appendices:
1. Bore co-ordinates and relative levels
2. Analytical results for bore holes E 41/65, E 46/64 and E 47/65.
3. Geological summary logs of bore-holes E 40/65 to E 50/65 (Inclusive) (pgs.29-39)

ADDITIONAL PLANS:

Plan No. SA 29 Geological Cross- Section A-A', Looking 308° (740(1)-1)
" " " 30 " " " B-B' " 324° (740(1)-2)

CONTENTS ENVELOPE 740 Cont:

ADDITIONAL PLANS: Cont.

Plan No.	SA	31	Geological	Cross-section		C-C'	Looking	325°	(740-(1)-3)
"	"	32	"	"	"	D-D'	"	317°	(740(1)-4)
"	"	33	"	"	"	E-E'	"	048°	(740(1)-5)
"	"	34	"	"	"	F-F'	"	055°	(740(1)-6)
"	"	35	"	"	"	G-G'	"	072°	(740(1)-7)
"	"	36	"	"	"	H-H'	"	005°	(740(1)08)
"	"	37	"	"	"	I-I'	"	000°	(740(1)-9)
"	"	38	"	"	"	J-J'	"	277°	(740(1)-10)
"	"	39	"	"	"	K-K'	"	278°	(740(1)-11)
"	"	40	"	"	"	L-L'	"	297°	(740(1)-12)
"	"	41	"	"	"	M-M'	"	338°	(740(1)-13)
"	"	42	"	"	"	N-N'	"	305°	(740(1)-14)
"	"	43	"	"	"	O-O'	"	337°	(740(1)-15)
"	"	44	Contours on top of the pound Quartzite (plan)						(740(1)-19)
"	"	46	Plan showing mineralisation in rock units.						(740(1)-17)

Drill Hole Logs

D D H E 40/65		(740(2)-1) to (740(2)-7)
D D H E 41/65		(740(2)-8) to (740(2)-17) (740(2)-53)
D D H E 41/65	Summary Sheet	(740(2)-18)
D D H E 42/65		to (740(2)-24)
D D H E 43/65		(740(2)-25) to (740(2)-32)

Drill Hole Logs Cont:

D D H E 44/65		(740(2)-33) to (740(2)-35)
D D H E 45/65		(740(2)-36) to (740(2)-40)
D D H E 46/65		(740(2)-41) to (740(2)-45)
D D H E 47/65		(740(2)-46) to (740(2)-49)
D D H E 48/65	(740(2)-50) to 740(2)-52) (740(1)-31 to 740(1)-36))	
D D H E 49/65 E 50/65	740(1)-22 to 740(1)-30)	

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C.R.A.

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THE EDIACARA MINERAL FIELD, SOUTH AUSTRALIA.

by

D. S. Carruthers

and

D. H. Mackenzie

CONTENTS PAGE NO.

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CONTENTS PAGE NO.

PLANS

NO.	TITLE	SCALE
X27/1723	Locality Plan, Ediacara Mineral Field.	32 mls. = 1 inch.
X27/1720	Geological Plan, Ediacara Mineral Field.	500' = 1 inch.
X27/1721	Section No. 1 Ediacara	100' = 1 inch.
	" " 2 "	" "
	" " 3 "	" "
	" " 4 "	" "
X27/1722	" " 5 "	" "
	" " 6 "	" "
	" " 7 "	" "

1. INTRODUCTION

The Ediacara lead and copper mineralisation occurs between Lake Torrens and the Flinders Ranges, 115 miles north of Port Augusta. Beltana Siding on the Commonwealth Pt. Augusta - Alice Springs railway is 12 miles to the east.

The South Australian Department of Mines has been investigating the mineralised area by means of geological mapping and diamond drilling, which work is still continuing. The results of this work up to the middle of October, 1962 were perused by the authors, who also spent two days inspecting the area at Ediacara under the guidance of L.G. Nixon of the Department of Mines.

Results of 25 drill holes completed in the current programme and 3 drilled in 1946 were made available by the Department of Mines. Results of further holes should become available at intervals over the next few months.

2. SUMMARY - CONCLUSIONS

1. Widespread low grade lead and copper mineralsiation has been proved in beds near the base of the Cambrian at Ediacara. The occurrence is closely comparable to the Mississippi Valley type deposits.

2. The structure is a relatively shallow basin 16,000 feet long by a maximum 7,000 feet wide.

3. Practically all the known significant lead mineralisation occurs in a stratigraphic thickness of 100 feet of dolomite. This includes mineralisation in Greenwood's Workings, Southern Workings and in holes drilled in the northern part of the Ediacara structure.

4. The northern area, (which includes Greenwood's Workings) has been more thoroughly drilled than any other. Here it is possible to select from the drilling results an area containing an inferred 16 million tons averaging 0.9% lead over an average thickness of 85 feet, or 8 million tons averaging 1.0% lead over an average thickness of 40 to 50 feet. This zone outcrops along its northern edge, but is at a depth of 300 to 400feet in D.D.E. 33A.

5. High grade carbonate lead ore was worked in the southern workings and sampling has shown sporadic lead occurrence around the southern rim of the basin. This area has been tested by only one hole (D.D. 3-6, 1946) in which no mineralisation was recorded.

6. Sporadic carbonate copper mineralisation is known at Black Eagle Workings (where it was mined), around D.D.E. 3 (northern area) and in the south-eastern and south-western "gossan" areas. So far no economic copper bodies have been indicated, although copper mineralisation at Black Eagle and D.D.E. 3 may be more extensive than is known at present.

7. Silver to lead ratio for primary mineralisation averaging better than 1% lead on existing results is about 1 oz. silver to 2½% lead. Highest silver values have been recorded in copper carbonate mineralisation but they are erratic.

8. Mapping and preliminary testing of the south-eastern and south-western gossans indicates that they are thin, conformable, iron and manganese stained siliceous breccias and contain insignificant mineralisation.

9. Patches of fairly massive psilomelane have been opened up by pits and shafts in the gossan areas, but they appear to be small and largely surficial.

10. The chances of economically exploitable mineralisation being established at Ediacara cannot be considered good. However, we should collect the results of the rest of the testing by the Department of Mines as they become available.

11. Sporadic copper and lead mineralisation occurs in the lower Cambrian equivalents of the Ediacara mineralised beds over a wide area of the Flinders Ranges. These stratigraphic equivalents warrant further study.

3. RECOMMENDATIONS

(i) That we continue to collect the results of testing being carried out by the Department of Mines as they become available. The mapping being carried out by Nixon is of a high standard, and it is considered that nothing could be gained by our mapping the area.

(2) That we study the stratigraphic equivalents of the Ediacara mineralised beds where these show signs of mineralisation in other parts of the Flinders Ranges.

4. HISTORY

From 1888 onwards rich pockets of lead-silver ore were worked at Greenwood's and Southern Workings amounting to several thousand tons of ore from each. Greenwood's was reported to average 31.5% Pb and 8.7 oz. Ag/ton. Much smaller tonnages of secondary copper carbonates, hand picked to 20% Cu, were won at Black Eagle and a little lead and barytes came from Morish's Adit.

After 1913 no further interest was taken until Zinc Corporation Ltd. carried out extensive sampling in 1938. Gustafson's report indicated a small tonnage of good grade ore still available in the old workings but a large low-grade orebody was considered highly unlikely.

In 1941 Rayner and Nye regarded Ediacara as not worthy of geophysical survey.

Interest revived in 1946-47 when the South Australian Mines Department and B.M.R. mapped the field, carried out some geophysical work and diamond drilling. E. Broadhurst designed the exploration on the assumption that faults controlled the mineralisation. Zinc Corporation again showed an interest but this did not progress beyond a cost estimate for mining the small reserves at Greenwood's at a rate of 50 tons per week.

Radioactivity above background was observed by H. F. King at Ediacara in 1952 and some radiometric tests were carried out in 1953.

South Australian Mines Department gave renewed attention to the field in 1961 after Nixon and Parkin recognised mineralisation in a sedimentary breccia similar to the Mississippi Valley type lead deposits. Subsequently extensive drilling with geological and geophysical work has been almost continuously in progress.

5. GEOLOGICAL SETTING

At Ediacara a shallow basin, elongate north-south, consists of sediments of the Upper Precambrian and Lower Cambrian. The basin is expressed topographically by a low ridge flanked by gibber plains to north, east and south and sand dunes on the west. This ridge is isolated on the Lake Torrens plain to the west of the main backbone of the Flinders Ranges.

The Upper Precambrian Marinoan Series comprises dolomites overlain by purplish shales and succeeded by 500-1000 feet of Pound Sandstone. As elsewhere in the Flinders the Pound is overlain by the basal Cambrian worm burrow bed. This is succeeded by transition shales then several hundred feet of dolomite. The highest bed exposed in the Ediacara basin contains Archaeocyatha.

The succession correlates well with the Cambrian elsewhere in the Northern Flinders but is thinner and contains more shallow water sediments than further to the east.

Structurally the gently flexed Ediacara basin is seen as transitional between the strongly folded Northern Flinders and the subhorizontal dolomites and sandstones, assumed to be Cambrian, which cover a wide area west of Lake Torrens. The thinning to the west may indicate nearness to a shoreline or a shallow shelf area.

The Ediacara basin is cut by some marked NE-trending faults and a parallel lineament which may pass into a fault in depth. Minor faults trend E.W. These trends are complementary to the Nor'-West Fault which defines the main trend of the Willouran Ranges from Copley to Marree.

6. STRATIGRAPHIC SUCCESSION

Information from diamond drilling and mapping by L.G. Nixon indicates the following stratigraphic succession over large parts of the basin:-

1. Pound sandstone, 500 to 1000 feet thick; marks the top of the Proterozoic; fairly clean quartz sandstone and quartzite.

2. Worm burrow beds, average 10 feet thick; mark the base of the Cambrian; gritty sandstone with clayey and chloritic matrix; chlorite gives the beds a characteristic green colour; fossil worm burrows well developed. This is the best marker horizon in the Ediacara structure.

3. Transition shales, average 50 feet thick; mostly shales, but there are also layers of sandstone and dolomite and the beds can be quite dolomitic in places.

4. Sandy cross bedded dolomite, average 80 feet thick; fairly well bedded and commonly cross bedded dolomite with arenaceous grain size; Layers of breccia up to a few feet thick are developed in places. Manganese is commonly though weakly developed. Primary lead mineralisation occurs.

5. Laminated algal dolomite, average 120 feet thick. Buff and grey coloured dolomite with laminated nature showing up on weathered surfaces. Structures thought to be Collenia occur. Manganese staining occurs commonly but erratically. Breccias up to a few tens of feet thick are common, and one persistent siliceous, manganese and iron stained breccia occurs near the base of the unit. Primary lead mineralisation occurs.

6. Massive dolomite, 300 to 500 feet thick, possibly more. This is the highest unit exposed, and an unknown thickness of it has been eroded. Archaeocyatha fossils have been found near the top of the exposed unit. Breccias occur, manganese is much less abundant than in the lower dolomitic units, and primary lead mineralisation is known only in traces.

Practically all the known lead mineralisation worth consideration occurs in the sandy cross bedded dolomite and the laminated algal dolomite. These units are also characterised by a more consistent manganese content than the other units.

The only known concentrations of copper mineralisation of interesting grade occur as carbonates, and may therefore be the result of secondary migration. They occur principally in the sandy cross bedded and laminated algal dolomites, although the Black Eagle copper occurs in massive dolomite which may be higher in the sequence than the sandy and laminated units.

The dolomitic breccias are of interest. They are conformable members of the sequence, a fact probably first noticed by L.G. Nixon and L.W. Parkin in Greenwood's workings. They occur from a few inches to a few tens of feet in thickness and quantitatively make up an important portion of the dolomitic sequence. Individual breccias may not have great persistence along strike, but at least one seems to occur fairly persistently, though in lenticular fashion, just above the base of the laminated algal dolomite. This breccia, and some others, principally or entirely in the laminated algal dolomite, contain abundant siliceous (cherty) fragments, and manganese and iron staining. They outcrop rather obviously in contrast to the majority of the breccias which consist of angular fragments of dolomite in a fine grained or sandy dolomitic matrix.

Much of the lead mineralisation in the northern area seems to be associated with breccias in the sandy cross bedded dolomite and towards the base of the laminated algal dolomite. However, there are many breccias that occur without associated mineralisation.

Nixon believes the breccias to be of sedimentary origin, and thinks that most of them may be the result of the action of turbidity currents transporting and depositing dolomite and chert fragments in a flocculated dolomitic matrix.

The sequence described above is best developed and has been most closely studied in the northern area. The southern area has not been drilled in the current programme, but surface information indicates the sequence and thicknesses of members may be similar to those in the northern area. On the eastern and western sides of the basin, Nixon is less sure of the interpretation. There is more soil cover, and drilling coverage is not as good as in the northern area. What information is available suggests that the sandy cross bedded dolomite and laminated algal dolomite are much thinner than in the northern and southern areas, and may have lensed out in places. This is important since these units carry the best mineralisation in the northern area. The thinning of these units, and an apparent increase in the occurrence of pyrite in the eastern and western areas have le d Nixon to suggest that the original sedimentary trends (shorelines, etc.) may have been across the present fold trend and the northern and southern parts of the basin may represent shallower water deposition, with depth of water increasing where some of the beds thin out and pyrite becomes more abundant.

7. STRUCTURE

The Ediacara Basin is elongate north south, length as measured on the worm burrow horizon being 16000 feet, and maximum width of the order of 7000 feet. Folding has been gentle, average dips being of the order of 15 to 25°. In the northern and southern areas, dips average 10 to 15°, but along the flanks of the basin, dips of 25 to 35° are common with occasional readings up to 45-50°. At least three gentle synclines occur in the basin, and average trend of these folds is 20° east of north.

Maximum depth of the basin from the top of the exposed Archaeocyatha dolomite to the worm burrow horizon may be of the order of 1000 feet.

On aerial photographs there is a prominent lineament striking approximately accross the middle of the syncline parallel to the fold axes. Towards the northern end of this structure there has been displacement, although this probably does not amount to more than a few feet vertically. In the middle of the basin the highest horizons have not been displaced, while towards the southern end, mapping is not sufficiently advanced to indicate whether there has been any displacement.

Minor faults have been mapped around the periphery of the basin where they displace the worm burrow beds. The horizontal expression of this displacement always seems to be left handed. The actual movement, however, has probably been principally vertical, and of the order of only a few feet.

Three hundred feet from the western edge of outcrop in the structure, D.D.E. 1 drilled to 175 feet in talus. This indicates a steep slope on the bedrock surface, possibly as a result of a Tertiary or Quaternary fault. It detracts from the possibility of extension of the Ediacara beds to the west towards Lake Torrens.

8. MINERALISATION

A. General Before the present Mines Department programme of testing started, mineralisation was known to occur, and had been worked at - Greenwood's and Morish's Workings (northern area, lead); Southern Workings (southern area, lead and a little copper); Black Eagle Workings (western area, copper). On Nixon's interpretation both Greenwood's and Southern Workings occur in the sandy cross bedded dolomite, and Morish's Workings may also, although faulting makes this more difficult to establish. The Black Eagle copper occurs in massive dolomite which may be higher in the sequence.

Most of the drilling carried out so far by the Department of Mines is in the northern area, and this is discussed in more detail below. Briefly, it has confirmed the presence of a preferred layer of lead mineralisation in the sandy cross bedded dolomite, and has indicated another one near the base of the laminated algal dolomite.

Very little significant copper mineralisation is known. Apart from the Black Eagle and scattered copper assays in the south-eastern and south-western gossan areas, only one small occurrence of carbonates at shallow depth around D.D.E. 3 in the north-eastern area has been located.

As exposed in drilling, galena occurs disseminated and as small irregular aggregates in dolomite. In mineralised breccias it is commonly interstitial to the fragments. Grain size is medium to fine. Pyrite and chalcopyrite occur only rarely with the galena. The absence of pyrite probably resulted in the mineralisation at Greenwood's and Southern Workings having comparatively insignificant outcrops. Fresh disseminated galena can be found at surface in many places. Oxidation of lead ore varies. Outcropping high grade ore (such as at Greenwood's) has been almost completely oxidised to cerussite. In D.D.E.6 ore averaging 7% lead occurs at 23 to 38 feet vertical depth although apparently does not outcrop, and is substantially galena, with minor cerussite. However, aggregates of galena in D.D. 33A at a depth of 170 feet are also partly oxidised to cerussite, so it seems as though all but the disseminated mineralisation may have been partly affected by oxidation to this depth.

Silver to lead ratio in primary mineralisation is variable but seldom exceeds 1 oz. silver to 1 percent lead, except where lead values are very low(say less than 0.2% lead). Much core has not been assayed for silver yet, but for mineralisation averaging better than 1 percent lead for which silver assays are available, silver to lead ratio averages about 1 oz. silver to $2\frac{1}{2}$ percent lead.

B. Northern Area

(1) Diamond Drilling. This includes Greenwood's and Morish's Workings, and much of the drilling which has been carried out by the Department of Mines. The results of 18 holes drilled by the Department in the northern area have been made available to us. These indicate that the best of the lead mineralisation occurs in a stratigraphic thickness of about 100 feet, having its base 35 to 50 feet above the top of the transition shales, and its top 30 to 60 feet above the base of the laminated algal dolomite. Within this zone, there is a tendency for a layer up to 35' thick to occur in the sandy dolomite, and another one up to 50' thick to occur just above the base of the laminated dolomite.

Grades of the individual selected intersections representing these preferred layers are mostly 1 to 2½% lead, but in D.D.E. 6, 15 ft. of 7.3% lead and 14 ft. of 4.0% lead were intersected in separate layers. Between, above and below the preferred layers, mineralisation is either absent or present only as a trace. Five holes have drilled through the favourable stratigraphic zone without intersecting significant mineralisation. These are D.D.'s 2, 4, 21, 22, 31.

The best of the mineralisation on present knowledge occurs in an area of some 50 to 60 acres extending from Greenwood's workings to D.D. 33 A. Averaging the nine diamond drill intersections of the mineralised zone in this area gives an average grade of 0.9% lead over an average thickness of 85 feet. At this thickness, tonnage in the selected area would be approximately 16 million. This zone outcrops along its northern edge, but is at a maximum depth of 300 to 400 feet in D.D.E. 33A.

The selected layer just above the base of the laminated dolomite may be more persistent and regular in this area than the layer in the sandy dolomite. It is likely that there is some association between it and the persistent siliceous breccia which occurs just above the base of the laminated dolomite. In the selected area the bottom 40 to 50 feet of the laminated dolomite is estimated to comprise about 8 million tons at an average grade of 1 percent lead.

Results obtained from the Department of Mines to date do not preclude the possibility of the mineralised zone extending south, south-east or south-west. This possibility will be checked by the next traverse of drill holes.

(ii) Greenwoods's Workings

The ore at Greenwood's, which is present largely as cerussite, occurs in a conformable breccia dipping south-east at about 10°. The workings were sampled by C. Boundy and T. Gibson of the Zinc Corporation Ltd. in 1938 and from their results, E. Broadhurst (1946) estimated that the mine produced some 8,800 tons at a grade of 31% lead, 9 oz. silver over an average thickness of 2.4 feet.

Stratigraphically, Greenwood's occurs towards the top of the sandy dolomite, and can probably be correlated with the mineralised layer intersected in the sandy dolomite by drill holes to the south-west.

(iii) Morish's Workings

These are much smaller than Greenwood's. Much of the carbonate ore seems to have been associated with the steeply dipping Gap Creek Fault. L.G. Nixon thinks that stratigraphically the Morish's mineralisation is in the sandy dolomite.

The pattern of lead mineralisation in the northern area seems to be one of high grade pods in two otherwise weakly mineralised layers within an overall stratigraphic thickness of 100 feet. The relatively high grade intersections in D.D.E. 6 fit this idea. Had they outcropped, secondary enrichment would probably have resulted in their being similar occurrences to Greenwood's and Morish's.

(iv) Copper Mineralisation

D.D.E. 3 intersected 6 feet of copper mineralisation as carbonate assaying 12.4% copper at shallow depths. Three holes :E18, E19, E20 were drilled nearby to test the extent of this copper mineralisation. Copper assays in these holes ranged from 0.4% to 2.8%. Average of the intersections in all four holes is 3.3% copper over 10 feet at an average depth of about 15 feet. However, half of this value comes from the high grade intersection in D.D.E. 3. Down dip from these holes the Department of Mines sank a shaft which is reported to have passed through dolomite with malachite stains in fractures from 15 feet to 45 feet. Assays were not available.

While there is no guarantee that the copper occurs as a continuous sheet, this testing has indicated that there may be a potential of perhaps 30,000 tons of copper mineralisation in this locality at shallow depth. The extent of this mineralisation has not been completely defined. It appears to occur in the bottom 40 feet of the laminated dolomite, and so may have something to do with the layer of lead mineralisation which occurs in this stratigraphic position.

C. Southern Area

This area has not yet been investigated as thoroughly as the northern area; in particular, no holes have yet been drilled there in the current Department of Mines programme. L.G. Nixon feels that the environment in this part of the field more closely resembles that in the northern area than does any other part of the field.

Southern Workings

Like Greenwood's Workings, these have mined predominately carbonate lead ore in a flatly dipping bed. Nixon places the horizon at about 100 feet above the worm burrow horizon and hence towards the top of the sandy cross bedded dolomite. The workings are actually in very weathered shaly and dolomitic material. Nixon feels that the shaly material may be weathered impure dolomite. The rocks are fairly well laminated but there is a suggestion of breccia in places. Malachite occurs near surface.

Sampling by Boundy and Gibson in 1938 indicated an average grade of 12 percent lead 1 oz. silver per ton over an average width of 4.7 feet. Dimensions of the workings suggest that production may have been of the order of 15,000 tons.

Pits and other small excavations in the southern area were sampled by Boundy and Gibson. Most of these seem to occur in the sandy dolomite or the lower part of the laminated dolomite. Most of the samples (see Appendix 2) were practically barren, but five gave appreciable assays for lead and for copper over thicknesses of 3 to 5 feet. All of these came from near the contact of the sandy and laminated dolomites, i.e. from that part of the succession which includes the Southern Workings and the mineralisation of the northern area.

One hole (no. 3-6) was drilled to the north of the Southern Workings in a programme which followed Broadhurst's work. No assays were available from this hole, but the logging indicates that the only mineralisation intersected consisted of traces of copper carbonate over 15 feet at the base of the sandy dolomite and the top of the transition shales.

D. Black Eagle Workings

These workings are the only ones which produced an appreciable amount of copper. Stoping took place on a scale similar to that at Greenwood's, but tonnage and grade of production are not known. The copper mineral was predominantly malachite which occurs in a bed 4 to 10 feet thick of weathered limonitic earthy material. This may originally have been pyritic dolomite. Bedding in the underground exposures seems to be very disturbed, with the development of some breccia, but the weathering and leaching have been so extreme as to mask most structural and stratigraphic features.

On the surface the dolomite around the Black Eagle Workings is much pinker than in most of the field, probably due to weathering of pyrite. Manganese is also more abundant in the dolomite in the immediate vicinity of the workings than elsewhere in the massive type dolomite.

The dolomite containing the Black Eagle mineralisation is massive, and Nixon feels (although this is not by any means established) that the stratigraphic position is above the laminated dolomite - i.e. above the level of the lead mineralisation in the northern and southern areas.

One hole (D.D.E. 7) has been drilled 250 feet east of the collar of the Black Eagle underlay shaft to test the eastern (down dip extension) of this mineralisation. The hole intersected 25 feet averaging 1.1% copper as carbonate from 135 to 160 feet, and 29 feet averaging 1.0% lead from 215 to 244 feet. The intersection of 1.1% copper may represent the down dip extension of the Black Eagle mineralisation but this would pre-suppose steepening of dip to over 30°.

E. South -Eastern and South - Western Gossans

As their name implies these occur around the south-eastern and south-western edges of the basin. Broadhurst described them as being up to several hundred feet wide and associated with the occurrence of quartz reef. He concluded that they represent the surface expression of conformable lodes, and warrant testing at depth. Each group of gossans occurs over a length of about 3000 feet.

Nixon's mapping has shown that the wide surface expression of bouldery and rubbly limonite (manganese coated in part), hematite, and psilomelane is largely due to the spread of scree. The quartz reefs mentioned by Broadhurst seem to be similar in all respects to the siliceous breccias which occur in the laminated dolomite in the northern area. The south-western gossans are characterised by one lenticular limonite and manganese stained siliceous breccia horizon about 5 to 10 feet thick, and the south-eastern gossans by a number of similar breccias occurring over a greater thickness of the sequence.

The gossan areas were sampled in 1938. Results (which are detailed in Appendix 2) indicated that copper mineralisation was exposed by pits and adits at a number of points in both areas. At least some of these appear to be associated with dolomite transition shale contact rather than with the siliceous breccias. There is little information by which to evaluate the significance of these showings of copper mineralisation. None of the excavations is extensive, suggesting that the mineralisation is confined to small patches. Four diamond drill holes E12, E11 (1961) 1-12 and 1-11 (1946) have been drilled on the down dip side of the south-eastern gossans. D.D. 1-12 penetrated to the Pound Sandstone, and so must have tested the stratigraphic position of the gossans. In addition D.D.E. 12 and D.D. 2-11 appear to have been drilled deep enough to have tested this position. Apart from a little pyrite in E12, and iron and manganese staining in all holes, no mineralisation was recorded.

Two holes (E9 and E10) have been drilled just down dip from the northern end of the south-western gossans. Both tested the stratigraphic position of the gossans. E10 intersected 79½ feet averaging 0.3% lead 0.1% copper in dolomite just above the transition shales, and 20½ feet averaging 1.5% lead 0.4% copper in the transition shales. No mineralisation was recorded in D.D.E. 9.

Patches of fairly massive psilomelane have been opened up by pits and shafts in the gossan areas, but they appear to be small and largely surficial, and the prospectors have not been sufficiently encouraged to persist. Drilling down dip from the gossans, while not specifically testing the better surface patches of manganese, has not revealed any signs of an extensive manganese rich horizon of economic interest.

Nixon tentatively correlates the siliceous breccias of the gossan areas with the persistent siliceous breccia near the base of the laminated dolomite in the northern area. Since the breccias of the gossan areas almost directly overlie shales which are probably the transition shales, this suggests that the sandy dolomite is either very thin or non-existent in these areas.

F. Similarities to Mississippi Valley Type Deposits

The following features mark the Ediacara lead mineralisation as being closely similar to the important group of Mississippi Valley type deposits of North America:-

1. Occurrence in Cambrian dolomites.
2. Conformable attitude with most of the mineralisation being confined to a stratigraphic thickness of 100 feet.
3. Association in part with sedimentary breccias.
4. Absence of gangue minerals and the type of alteration commonly associated with epigenetic mineralisation.

9. TESTING

The Ediacara field is being mapped on a scale of 200 feet to an inch, on aerial photographs taken especially for this work.

Some 25 diamond drill holes have so far been completed in the current Department of Mines programme. Most of this drilling has been done at BX core size, and is estimated to have cost (exclusive of overheads) £4/10/- per foot early in the programme, and £3/10/- per foot in the last two months. The dolomitic country rock is fractured in places, which has resulted in some cementing of holes and reduction to EX core size. It is estimated that drilling rate (including time for site preparation and moving drills) has averaged 18 to 20 feet per shift. The work is carried out on a one shift per day basis. An adequate water supply for drilling is obtained from two bores within a few miles of the field.

An induced polarisation survey was started by the Department of Mines team on 26th October.

No beneficiation test on Ediacara mineralised material has yet been carried out, but two samples, thought to average 1% lead and 2% lead respectively have been taken from a shaft and supplied to A.M.D.L.

It is of interest to speculate: if the Ediacara prospect were made available to us at this stage, what further testing would be warranted? The following drillholes are suggested:-

	Footage
Southern area (lead mineralisation) 3 holes, average depth 200'	600
Black Eagle (copper) to test for extension of the Black Eagle copper mineralisation - 3 holes, average 250 feet -	750
Northern area copper - to test for extension of copper mineralisation in D.D.'s 3, 18, 19, 20 - 4 holes, average depth 100 feet.	400
	1,750
Contingencies	250
Total footage	2,000
Estimated cost at £4 per foot	£8,000

If these holes gave no encouragement, then on present knowledge no further testing would be warranted on the part of a company.

As it is, the Department of Mines will continue drilling, and we should collect the results of this work when they become available.

10 FACILITIES

The Ediacara area lies entirely within the Lake Torrens reservation from the operation of The Mining Act which embraces several hundred square miles including Lake Torrens and its environs. Further, an area 10 miles by 5 lying immediately north of Randall's Lookout including most of the mining field is a Fossil Reserve under the State Department of Education.

From Greenwood's Workings it is a relatively short distance eastwards over easy country to several facilities at Beltana: 11 miles to Beltana airstrip, 11½ miles to the Pt. Augusta - Leigh Creek high tension power line, 12 miles to the Pt. Pirie-Marree standard gauge railway and 18 miles to the main north road near Beltana Head Station. Rail distance from Beltana to Pt. Pirie is of the order of 200 miles.

In an area of about 6 inch average annual rainfall local water supplies are drawn from shallow bores which would probably be insufficient for a large mining operation. At Aroona Dam 21 miles due N.E. of Ediacara the Electricity Trust of South Australia have dammed Aroona Creek to reserve 1650 million gallons capacity which supplies Leigh Creek coalfield and a settlement of about 1000 persons. It is unlikely that there is another suitable dam site closer to Ediacara than this.

11. REGIONAL SIGNIFICANCE

Stratiform distribution of lead and copper near the base of the Cambrian has been demonstrated at Ediacara. On a fegional scale the Mines Department has shown that anomalously high lead values characterise the beds near the base of the Cambrian in many parts of S. Australia.

Accordingly the published 1 inch geological sheets of the Flinders Ranges were searched to reveal a number of old mines and prospects in or close to the basal Cambrian horizons. These are listed below together with distance and direction from Ediacara:-

Serle Sheet	(a)	Boolooroo	- Cu	36 miles N.E.
Copley Sheet	(a)	Mt. Bayley	- Cu	18 miles N.E.
	(b)	Ajax	- Cu	20 miles N.E.
	(c)	Copper King	- Cu/ochre	20 miles N.E.
Angepena Sheet	(a)	Angepena	- Cu	48 miles N.E.
Cadnia Sheet	(a)	Sliding Rock	- Cu	30 miles E.
Arrowie Sheet	(a)	Mt. Chambers	- Cu	69 miles E.

In addition there are several lead and copper prospects associated with Lower Cambrian carbonate beds near Wirrealpa which is 48 miles S.E. of Ediacara and 20 miles E. of Blinman. These are:-

1. Wirrealpa Mine - Pb/Ag/Cu.
2. Flinders - Pb/Cu.
3. Fountain Head - Pb.
4. Mt. Lyall - gossans.
5. Nevada - goseans.

There is the further possibility of a correlation between all these prospects and the copper/manganese deposits of Pernatty Lagoon which lies to the west of Lake Torrens and is 70 miles S.W. of Ediacara.

Brief visits were paid to five of these Lower Cambrian mineralisations and a short account of each is given below to illustrate their stratigraphic similarities to the Ediacara area.

1. Mt. Bayley Mine

Workings extend for 200 feet along the strike of a white sandstone 60 feet above worm burrow beds and 10 feet below laminated dolomites. Nodules of copper carbonates occur in the sandstone bed.

2. Ajax Mine

Malachite and azurite impregnate a white sandstone which lies about 30 feet below Cambrian dolomite. Nearby pits have been sunk on copper impregnated white sandstone and shale over a strike of 400 feet. The bed lies below dolomites.

3. Copper King

In a thick blanket of limonite mined for ochre there is a pale streaky bed with small nodules of malachite. If continued down dip this bed would pass below Cambrian dolomite exposed to the north.

4. Angepena

Two miles S.W. of Angepena Head Station copper carbonates occur within white sandstone and shale which lies between the Pound Sandstone and Cambrian dolomite. Pits are scattered over 600 feet strike length.

5. Wirrealpa Lead Mine

Galena is disseminated in the more siliceous parts of a coralline limestone over about 200 feet width and 250 feet strike length. The bed dips 45° to the S.W. Mining was concentrated on richer pockets of argentiferous galena in a "conglomerate" (possibly a sedimentary breccia) above the limestone. Disseminated galena was too low grade to interest the early miners but is sufficiently widespread to merit detailed mapping of the prospect.

There is no current mining title held over this prospect. Small Workings on galena in the same limestone bed have been reported by Ridgeway over 2,600 feet strike length centred on Wirrealpa Mine.

From the regional evidence it is clear that within a narrow stratigraphic interval over a wide area,

(a) copper mineralisation is associated with sandstone and shale in the Lower Cambrian transition sequence; and

(b) later, less widely distributed lead mineralisation occurs in an environment of sedimentary breccias, limestones and dolomites, the last having manganese associated.

A detailed study of these mineralisations is considered to be both necessary and promising as low grade mineralisation in one time unit may indicate where richer or larger mineralisation is located.

D. S. Carruthers

and

D. H. Mackenzie.

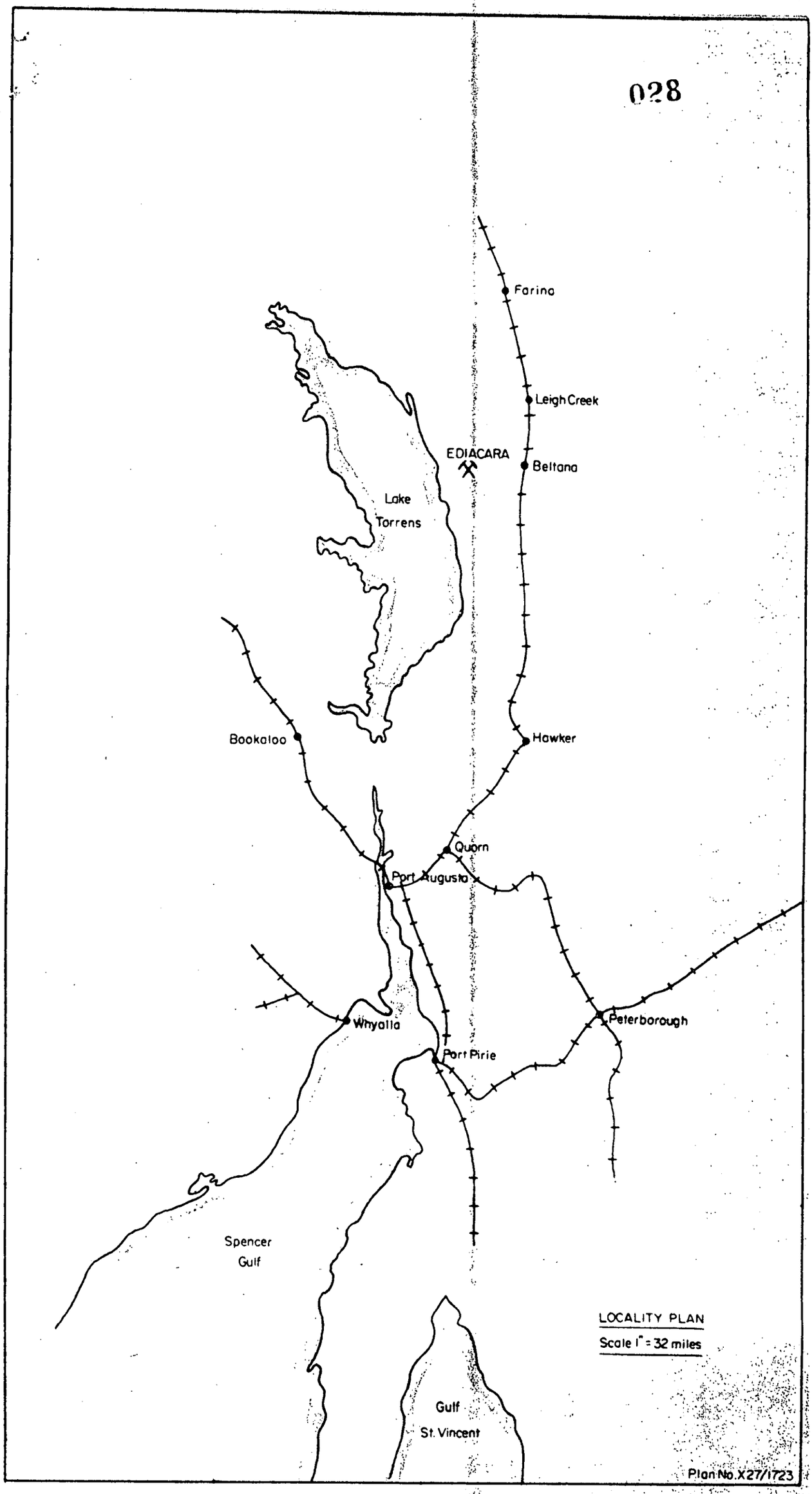
14th November, 1962.
DSC/AJ.

APPENDIX 2.

	Assay	No.	Thickness	Type	% Cu	% Pb.	Oz. Ag.
South East Gossans	1				3.7	0.7	0.1
	2	619		fault breccia	Tr.	0.4	0.1
		620		dump	6.9	1.1	0.2
		621		tunnel	4.1	0.6	0.1
		622		tunnel	0.2	0.5	0.1
	3	623			0.5	0.6	0.1
	4	624		dump	0.5	0.6	0.1
	5	625		costean	0.6	0.4	0.1
	6	626		pit	8.8	2.0	0.1
	7	628		costean	0.2	0.5	0.1
	8	627		dump	Tr.	0.7	0.1
	9				Tr.	0.7	0.1
	10				Tr.	0.9	0.1
	11	629			0.2	0.4	0.1
	12				Tr.	0.7	0.1
		631		tunnel	Tr.	0.7	0.1
		632		tunnel	Tr.	1.3	0.1
		633		W. Face	Tr.	0.6	0.1
		634		dump	Tr.	0.8	0.1
		635		N. end adit	Tr.	0.6	0.1
		636		costean	Tr.	0.5	0.1
	15				2.2	0.5	0.1
		639		adit	0.1	0.5	0.1
		640			0.2	0.5	0.2
	13				Tr.	0.5	0.1
	14				0.1	0.5	0.1
Southern Area		641		dump	1.5	0.4	0.1
		642		lode	1.0	0.6	0.1
	16	643		dump	5.5	0.4	0.1
	17	644			0.6	0.5	0.2
		645		tunnel	Tr.	0.3	0.1
		646	5'		Tr.	0.3	0.1
	18	647 ?		dump	Tr.	0.3	0.1
		648	4'		Tr.	0.4	0.1
	19	649 ?	4'		Tr.	0.5	0.1
		650	4'		Tr.	0.4	0.1
		651	2½'		Tr.	3.1	0.3
		652	4'	band in tunnel	Tr.	0.8	0.1
		653	4'	top	Tr.	1.3	0.1
		654	4'	middle	Tr.	3.2	0.2
		655	4'	Bottom	Tr.	12.6	0.3
	20	656	3½'	creek	Tr.	0.3	0.1

	Assay	No.	Thickness	Type	% Cu.	% Pb.	Oz. Ag.
South West Gossans		657			No assays available.		
	22	658			Tr.	1.8	0.1
		659	3'	E. end	Tr.	1.3	0.2
		660	6'		0.2	3.0	0.2
		661	4'		1.3	4.9	0.1
		662	5½'	W. end	0.9	3.2	0.1
	24	663		Grab N. tunnel	0.4	17.7	0.1
	25	664		dump	0.6	15.8	0.1
	21	665	3'		Tr.	0.6	0.1
	23				0.6	3.2	0.2
	26				Tr.	1.4	0.1
		666			Tr.	2.1	0.1
		667			0.2	0.6	0.1
	27	668			2.1	0.7	0.2
	28	669			Tr.	0.5	0.1
	29	670		dump	4.0	0.5	0.1
	30	671			1.8	3.1	0.1
	31	672			0.2	2.0	0.1
	32	673			2.8	17.7	0.2
	33	674			Tr.	3.5	0.1
	34	675		dump	Tr.	2.5	0.1
	35	676			Tr.	2.1	0.1
	36	677	6'		Tr.	0.3	0.1
	37	678			1.1	1.0	0.1
	38	679			3.9	0.6	0.1
	39	680			10.2	0.7	0.1
	40	681 ?			0.2	0.5	0.1
	41	-			Tr.	0.5	0.1
	42	695	3'	tunnel	Tr.	48.8	2.0

028



Plan No. X27/1723

LEGEND

- A — Massive dolomite
- B — Laminated algal dolomite
- 1 — Sandy cross bedded dolomite
- 2 — Transition shales
- 3 — Worm burrow beds
- 4 — Pound sandstone (Jellyfish bed in red)
- Selected Area
- Fault
- Synclinal fold axis – with pitch
- X17 — Sample location and number

South-Eastern Gossan Area

South-Western Gossan Area

Conzinc Riotinto of Australia Limited

GEOLOGICAL PLAN

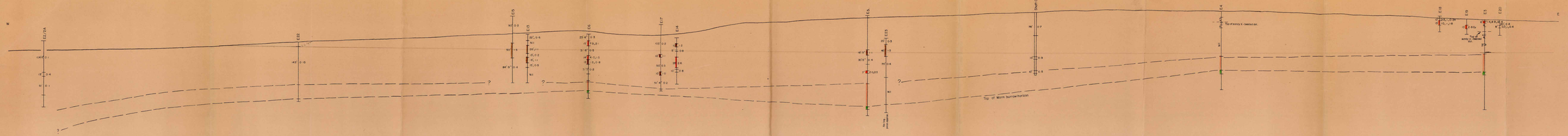
EDIACARA MINERAL FIELD

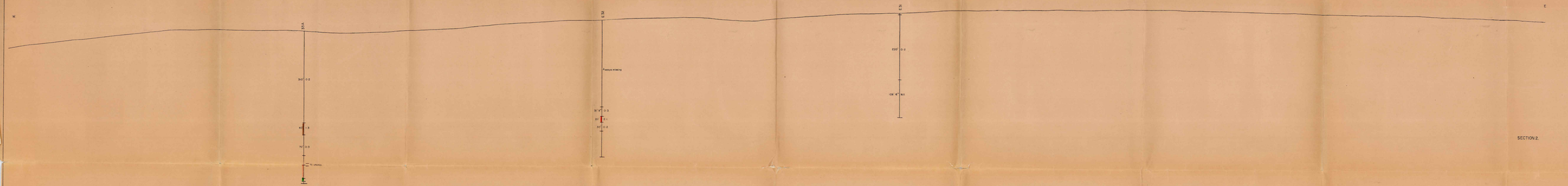
— S.A. —

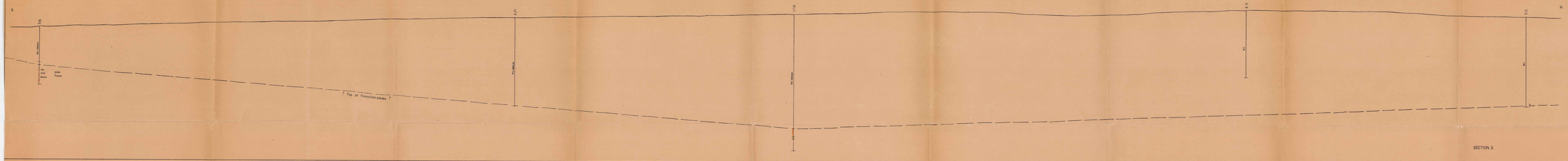
(After S.A. Dept. of Mines)

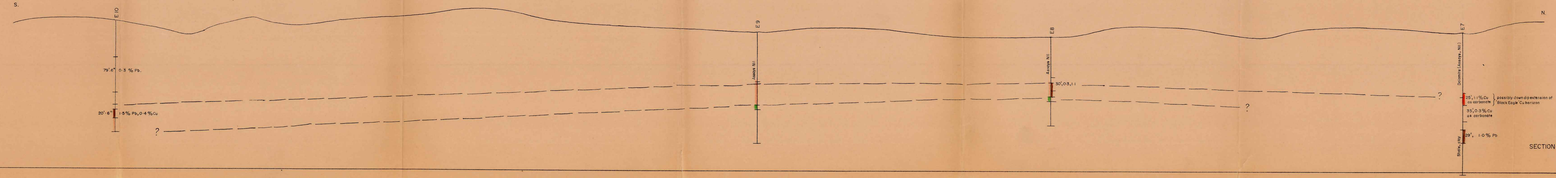
ENV 740(A)-16

Scale	D.S.C.	Plan No.
1" = 500'	Nov. 1962	X27/1720 1









Conzinc Riotinto of Australia Ltd.

SECTIONS 1 - 4

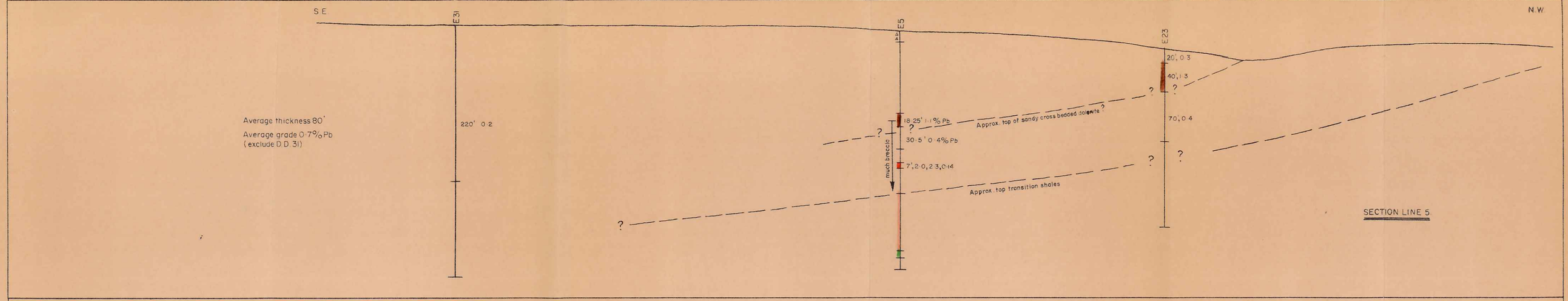
EDIACARA S.A.

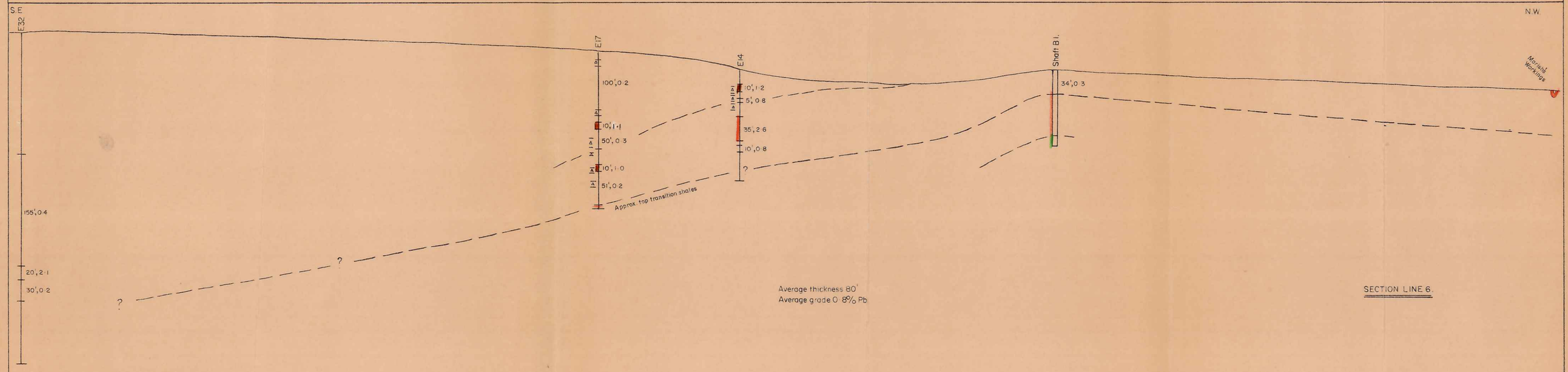
Scale 1" = 100'

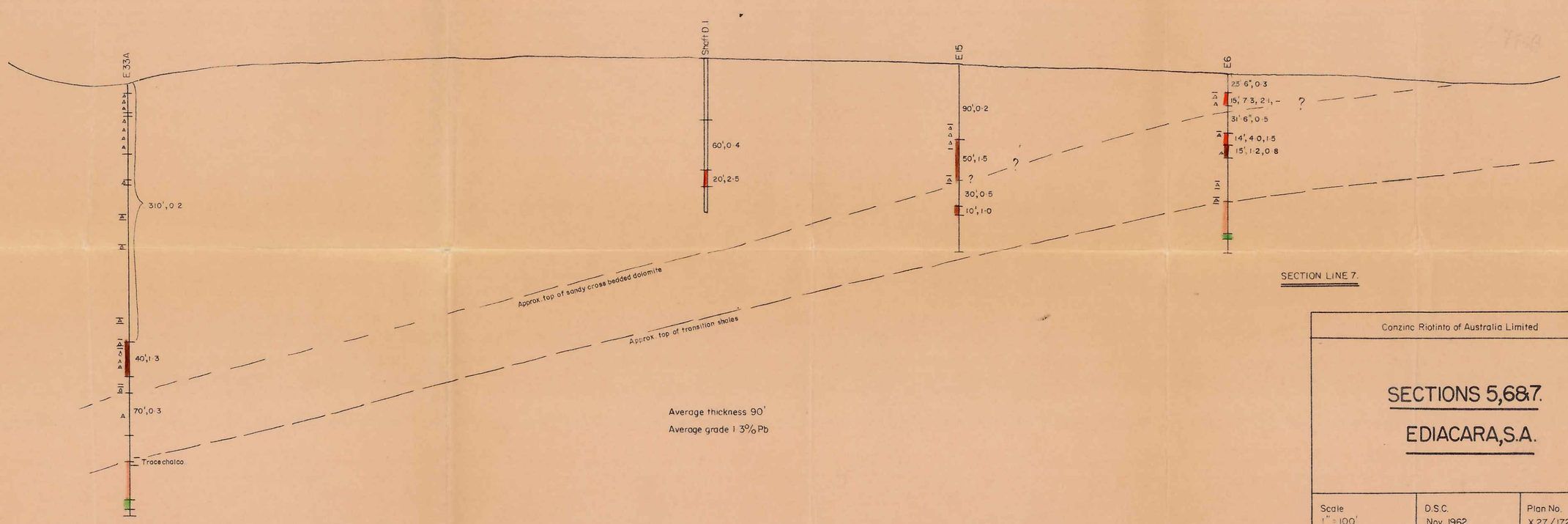
D.S.C. Nov. 1962

Plan No. X27/1721

Env 7401(1)-20







Conzinc Riotinto of Australia Limited

SECTIONS 5,6&7.

EDIACARA, S.A.

Scale	D.S.C.	Plan No.
1" = 100'	Nov. 1962	X 27 / 1722

ENV 740 (1) - 18

1145/64

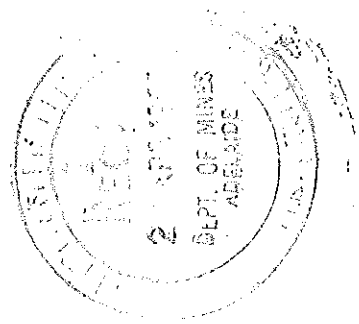
C.R.A. EXPLORATION PTY. LIMITED
(INC. IN N.S.W.)
95 COLLINS STREET, MELBOURNE, C.1

G.P.O. BOX 384D
TELEPHONE 63-0491
TELEGRAMS: "EXPLORECO,"
TELEX 30108 AND 30569

21st April, 1965.

The Director,
Department of Mines,
169 Rundle Street,
ADELAIDE. S.A.

Dear Sir,



Special Mining Lease 77
(Ediacara) - Report on Activities
for 3 months ending 1.4.65

Work on this area during the period was confined to assessment of existing information and laying out a suitable diamond drilling grid for testing the structure.

Yours faithfully,

H. E. Jensen,
Exploration Manager.

DSC:ND

1452/64 *

C.R.A. EXPLORATION PTY. LIMITED
(INC. IN N.S.W.)
95 COLLINS STREET, MELBOURNE, C.1

G.P.O. BOX 384D
TELEPHONE 63-0491
TELEGRAMS: "EXPLORECO,"
TELEX AA 30569 AND 30108

13th. July, 1965.

The Director,
Department of Lands, Surveys and Mines,
Box 38, Rundle Street,
ADELAIDE .. SOUTH AUSTRALIA

Dear Sir,

Ediacara - Special Mining Lease 77

We wish to advise you that our diamond drilling programme on the SML at Ediacara has been held up principally on account of not being able to finalise arrangements with a partner to share the expense of this work.

Mr. F. E. Paholski called at the Department on the 11th. July to make arrangements to carry out preliminary drilling which will involve approximately 7,000 feet in 12 holes.

Would you please accept this letter as being a quarterly report on our activities.

Yours faithfully,

H. E. Jensen
Exploration Manager

HEJ/NVD

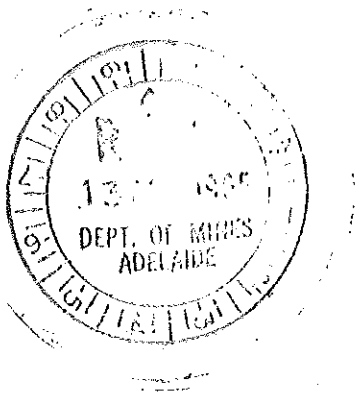
NOTED
Director of Mines

1452/64

C.R.A. EXPLORATION PTY. LIMITED
(INC. IN N.S.W.)
95 COLLINS STREET, MELBOURNE, C.1

G.P.O. BOX 384D
TELEPHONE 63-0491
TELEGRAMS: "EXPLORECO,"
TELEX AA 30569 AND 30108

8th. December, 1965.



The Director,
Department of Mines,
169 Rundle Street,
ADELAIDE .. SOUTH AUSTRALIA

Dear Sir,

Special Mining Lease 77 - Ediacara, S.A.

Report on Activities for Period ended 30th. November, 1965

Diamond drilling commenced on the 2nd. August, and is being carried out on behalf of C.R.A. Exploration by the South Australian Department of Mines.

The table below sets out the drilling completed to the 30th. November, 1965.

Hole No.	Location (Approx.) Co-ordinates	R.L. Feet	From Feet	To Feet	Advance Feet	Remarks
E/40/65	1530N; 160E	1130	0	450	450	To be deepened
E/41/65	810S; 2530W	1080	0	960	960	Completed
E/42/65	00 ; 1280E	1120	0	496'6"	496'6"	In progress

Copies of bore logs to the following depths are enclosed:

Hole No. E/40/65 to a depth of 450 feet
" " E/41/65 " 800 feet
" " E/42/65 " 429 feet

Diamond drill hole No. E41/65 intersected a zone of disseminated mineralisation from 690 to 760 feet; the core from this section was split with one half going to The Zinc Corporation for assays; and the other half being filed in the Mines Department core room in Adelaide.

The table below gives assay values of core samples (in 5 foot sections) for Pb and Ag.

From Feet	To Feet	Values	
		Pb	Ag Dwt./ton
690	695	0.85	3.0
695	700	1.05	3.0
700	705	0.85	3.0
705	710	0.80	3.0
710	715	0.60	2.2
715	720	0.60	2.2
720	725	0.50	2.2
725	730	0.65	3.0
730	735	0.60	3.0
735	740	0.67	3.6
740	745	0.60	2.6
745	750	0.75	3.0
750	755	1.00	4.0
755	760	0.50	2.0
Averages		0.72	2.8

The expenditure for the period from 20th. June to the 6th. November is shown in the table below:

Salaries and Wages	£401
Field Accommodation & Messing	23
Supplies and Freight	51
Travel and Accommodation	194
Diamond Drilling	7,277
Overheads	317
TOTAL	£8,263

Yours faithfully,

H. E. Jensen
Exploration Manager

P.S. Core logs in Hole No. E41/65 have been mislayed being from 155'3" to 309', but as soon as these are received we shall forward them to you.

HEJ/NVD

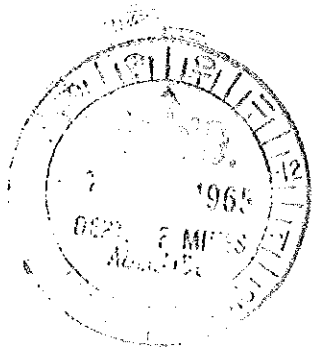
145/64

C.R.A. EXPLORATION PTY. LIMITED
(INC. IN N.S.W.)
95 COLLINS STREET, MELBOURNE, C.1

G.P.O. BOX 384D
TELEPHONE 63-0491
TELEGRAMS: "EXPLORECO,"
TELEX AA 30569 AND 30108

December 10, 1965.

The Director,
Department of Mines,
169 Rundle Street,
ADELAIDE. S. A.



Dear Sir,

Ediacara Mineral Field

It is advised that we have logged bore E41/65 to a total depth of 967 feet and E42/65 to 502 feet 3 inches, and copies of the logs will be forwarded to you when typed.

The only material marked for assay was core from the interval 800 to 804 feet 4 inches in bore E41/65. This interval has been given Sample number Y951, and it would be appreciated if you would forward the sample to the Zinc Corporation Limited, Broken Hill, after splitting the core. The core should be assayed for lead and silver.

Yours faithfully,

H. E. Jensen
Exploration Manager

AFMcQ:GJK

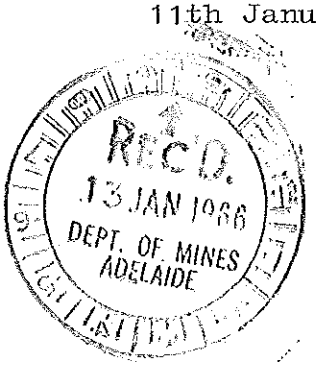
NOTED
Director of ...

C.R.A. EXPLORATION PTY. LIMITED
(INC. IN N.S.W.)
95 COLLINS STREET, MELBOURNE, C.1

G.P.O. BOX 384D
TELEPHONE 63-0491
TELEGRAMS: "EXPLORECO,"
TELEX AA 30569 AND 30108

1452 X
64

11th January, 1966.



The Director,
Department of Mines,
169 Rundle Street,
ADELAIDE S.A.

Dear Sir,

Special Mining Lease 77 - Ediacara
Report on Activities for 3 months ending 31st December, 1965

Diamond drilling continued during the quarter; progress being as follows:

Hole No.	Location	R.L. Feet	From Feet	To Feet	Advance	Remarks
E40/65	1530N.0160E	1130	0	450	450	Suspended. To be deepened
E41/65	0810S.2530W	1080	508	967	459	Completed
E42/65	00 1280E	1120	118	502	384	As at 8th Decembe
E43/65	00 0100W	1090				Rigging up

Copies of bore logs for the following intervals are enclosed.

E41/65 800 feet to 967 feet
E42/65 429 feet to 502 feet 3 inches

Logs of intervals drilled prior to the above have been submitted to the Department.

The reason for the suspension of bore E40/65 is that massive dolomite was apparently interpreted by the driller to represent the Pound Quartzite. This hole will be deepened on completion of hole E42/65. Considerable delay was experienced in drilling bore E42/65 when drill rods became stuck.

Lithologies encountered by drilling have been as expected, but is has been found difficult to pick formation tops, particularly that of the sandy, crossbedded dolomite.

Tentative tops picked to date are as follows:

Bore	E40/65	E41/65	E42/65
Massive dolomite	Surface	Surface	Surface
Laminated dolomite	91'	316'	85'3"
Sandy crossbedded dolomite	Not Picked	682'6"	241'
Transition shales		890'6"	455'6"
Worm Burrow Beds		940'	
Pound Quartzite		951'3"	

These tops are subject to review as additional drilling is effected.

The lithology from 455'6" to 492' in bore E42/65 is similar to the transition shales, but not sufficient section has been penetrated below this interval to confirm this interpretation.

The presence of pyrite and galena has been noted in all bores, but generally as traces only, and usually in the sandy crossbedded dolomite.

On the basis of mineralisation it is probable that the top of this formation occurs at about 230 feet in bore E40/65.

The only intervals selected for assay are 690 to 755 feet and 800 to 804 feet in bore E41/65.

The results for the former interval were reported in our letter of 8th December, 1965, but to comply with the requirements of the lease are repeated hereunder.

From Feet	To Feet	Values Pb	Values Ag Dwt./ton
690	695	0.85	3.0
695	700	1.05	3.0
700	705	0.85	3.0
705	710	0.80	3.0
710	715	0.60	2.2
715	720	0.60	2.2
720	725	0.50	2.2
725	730	0.65	3.0
730	735	0.60	3.0
735	740	0.67	3.6
740	745	0.60	2.6
745	750	0.75	3.0
750	755	1.00	4.0
755	760	0.50	2.0
Averages		0.72%	2.8

NOTED
Director of Mines

Yours faithfully,

H.E. Jensen
Exploration Manager

AFMcQ:ALH

C.R.A. EXPLORATION PTY. LIMITED
(Inc. in N.S.W.)
95 COLLINS STREET, MELBOURNE, C.1

P.O. BOX 384D
TELEPHONE 63-0491
TELEGRAMS: "EXPLORECO"
TELEX AA30108 AND AA30569

9th June, 1966.

The Director,
Department of Mines,
169 Rundle Street,
ADELAIDE. S.A.

Dear Sir,

Special Mining Lease 77 - Ediacara
Report on operations for 3 months ending 31st March, 1966

Diamond drilling continued during the quarter, progress being as follows.

Hole No.	Location	RL.Ft.	From feet	To feet	Advance Ft.	Remarks
E40/65	1530N 0160E	1130	450	571	121	Completed
E42/65	210N 1240E	1120	502	520	18	Completed
E43/65	0180N 0150W	1090	0	495.5	495.5	(Temporarily stopped)
E44/66	2200N 1040E	1120	0	404.5	404.5	Completed
E45/66	5510S 1450W	1080	0	504	504	At 22.3.66
E46/66	6500S 1310W	1070	0	262.75	262.75	At 22.3.66
E47/66	7450S 0600W	1080	0	23	23	Not logged.

Copies of Core Logs for these advances are enclosed.

The Pound Quartzite was intersected in each of the completed holes.

No further core has been split but a low grade intersection in E42 will be assayed.

Yours faithfully,

D.S. Carruthers
Exploration Manager

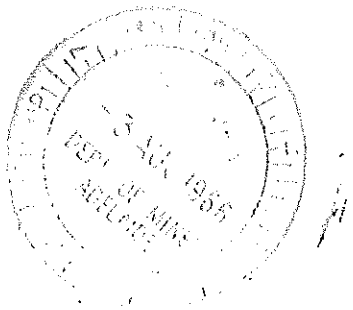
DSC:JP

1455/64

C.R.A. EXPLORATION PTY. LIMITED
(INC. IN N.S.W.)
95 COLLINS STREET, MELBOURNE, C.1

G.P.O. BOX 384D
TELEPHONE 63-0491
TELEGRAMS: "EXPLORECO,"
TELEX 30108 AND 30569

1st. August, 1966



The Director,
Department of Mines,
169 Rundle Street,
ADELAIDE .. S.A.

Dear Sir,

Special Mining Lease 77 - Ediacara
Report on Operations for 3 Months ending 30th. July, 1966

Diamond drilling continued during the quarter, progress being as follows.

Hole No.	Location	R.L. Feet	From Feet	To Feet	Advance Feet	Remarks
E43/65	0180N 150W	1090	495.5	703	207.5	Completed
E45/66	5510S 1450W	1080	504	563	59	Completed
E46/66	6500S 1310W	1070	262.75	456	193.25	Completed
E47/66	7450S 0600W	1080	0	119.5	119.5	Completed
E47a/66	7450S 0600W	1080	0	372	372	Completed
E48/66	3200S 2400W	1110	0	488.5	488.5	In progress
E49/66	1450S 0200E	1060	0	228.75	228.75	In progress

Copies of core logs for these advances are enclosed.

Additional core sections have been assayed to give:-

Hole No.	From Feet	To Feet	Pb%	Ag ozs.
E41/65	760	763.5	0.14	0.22
	763.5	769.33	0.08	0.15
	769.33	773.25	0.10	0.15

B/fwd.

Cont'd.

E41/65	773.25	778.0	0.21	0.19
	778.0	781.75	0.49	0.27
	781.75	786.5	0.27	0.19
	786.5	791.0	0.35	0.19
	791.0	795.5	0.11	0.12
	795.5	800.0	0.47	0.19
	800.0	804.33	0.19	0.12
	804.33	807.58	0.08	0.12
	807.58	811.08	0.11	0.11
	811.08	815.08	0.06	0.12
E46/66	262.75	268.0	0.01	0.11
	268.0	272.75	0.01	0.10
	272.75	276.75	0.02	0.10
	276.75	280.25	0.02	0.10
	280.25	285.75	0.01	0.10
	285.75	289.5	0.01	0.07
	289.5	292.75	0.01	0.10
	292.75	296.25	0.02	0.10
	296.25	302.25	0.02	0.10
	302.25	306.25	0.01	0.10
	306.25	311.0	0.02	0.07
	311.0	316.0	0.03	0.10
	316.0	322.5	0.02	0.10
	322.5	328.25	0.02	0.10
	328.25	331.5	0.01	0.10
	331.5	335.5	0.01	0.10
	335.5	340.25	0.01	0.10
	340.25	345.0	0.01	0.10
	345.0	350.0	0.02	0.10
	350.0	355.0	0.02	0.10
	355.0	359.75	0.01	0.10
	359.75	364.75	0.35	0.30
	364.75	369.75	0.06	1.5
	369.75	374.75	0.11	3.55
	374.75	379.75	0.07	0.57
	379.75	382.75	0.01	1.7
	382.75	387.5	0.02	0.40
	387.5	392.5	0.03	0.19
	392.5	397.5	0.05	0.27

			Cu%
E47a/66	139.92	144.58	0.29
	144.58	149.42	0.47
	149.42	154.0	0.05
	154.0	162.33	0.03
	162.33	167.0	0.02
	167.0	172.75	0.03
	172.75	177.58	0.19
	177.58	181.0	0.17.

Yours faithfully,

R. N. Spratt.

for D. S. Carruthers
Exploration Manager

NOTED

Director of Mines

Encls.
RNS/NVD

C.R.A. EXPLORATION PTY. LIMITED
(INC. IN N.S.W.)
95 COLLINS STREET, MELBOURNE, C.1

G.P.O. BOX 384D
TELEPHONE 63-0491
TELEGRAMS: "EXPLORECO,"
TELEX 30108 AND 30569

2nd. September, 1966

The Director of Mines,
South Australian Mines Department,
Rundle Street,
ADELAIDE .. SOUTH AUSTRALIA

Dear Sir,

Ediacara - S.A.

I enclose details of a stadia survey of diamond drill collars at Ediacara carried out last month.

Yours faithfully,

for D. S. Carruthers
Exploration Manager

Encs.

E D I A C A R A S. A.

Stadia survey of D.D. collars by

R.N. Spratt 16-20/8/66

Coords of E12 accepted as S3000 E500
RL 1115

Bearing E12 —— 1P2 accepted as 270°

H.I. 5' throughout.

C.R.A. EXPLORATION PTY. LIMITED
(INC. IN N.S.W.)
95 COLLINS STREET, MELBOURNE, C.1

G.P.O. BOX 384D
TELEPHONE 63-0491
TELEGRAMS: "EXPLORECO,"
TELEX AA 30569 AND 30103

24th October, 1966

The Director,
Department of Mines,
Box 38,
Rundle Street P.O.,
ADELAIDE
South Australia

Dear Sir,

S.M.L. 77 - EDIACARA

Report for Quarter Ending October 1st, 1966

Diamond Drilling was continued, progress being as follows :

Hole No.	From	TO	Remarks
E 48/66	488'6"	940'	Completed
E 49/66	227'0"	671'	In Progress
E 50/66	Surface	532'	Completed

Copies of core logs available to date are attached. These refer to the following intervals :

Hole No.	From	TO
E 48/66	488'6"	940'
E 49/66	227'0"	568'10"
E 50/66	Surface	254'5"

A trace of galena was reported from bore E 48, but none from bores E 49 and E 50.

Since the end of the period referred to; bore E 49 has been completed at 856 feet in Pound Quartzite, and the drilling programme has been terminated.

Yours faithfully,

for D. S. Carruthers,
Exploration Manager

AFMcQ:RY

NOTED

Director of Mines

C.R.A. EXPLORATION PTY. LIMITED
(Inc. in N.S.W.)
95 COLLINS STREET, MELBOURNE, C.1

P.O. BOX 384D
TELEPHONE 63-0491
TELEGRAMS: "EXPLORECO"
TELEX AA30108 AND AA30569

26th January, 1967.

The Director,
Department of Mines,
Box 38, Rundle Street P.O.,
ADELAIDE, S.A.

Dear Sir,

S.M.L. 77 - Ediacara - South Australia
Report for Quarter Ending January 1, 1967

Drilling of Borehole E.49 was completed in Pound Quartzite at a depth of 856 feet, being an advance of 185 feet during the quarter.

With the completion of this hole, the program of testing the mineralisation of the Ediacara structure was completed. The information obtained from the drilling is currently being reviewed.

Copies of the following core logs are attached:

E.49	568'10"	to 856'
E.50	254'	to 532'

Yours faithfully,

D. S. Carruthers
Exploration Manager

AFMcQ:jm

Attach.

C.R.A. EXPLORATION PTY. LIMITED
(INC. IN N.S.W.)
95 COLLINS STREET, MELBOURNE, C.1

G.P.O. BOX 384D
TELEPHONE 63-0491
TELEGRAMS: "EXPLORECO."
TELEX AA 30108 AND AA 30569

037

11th January, 1966.

The Director,
Department of Mines,
169 Rundle Street,
ADELAIDE S.A.

Dear Sir,

Special Mining Lease 77 - Ediacara
Report on Activities for 3 months ending 31st December, 1965

Diamond drilling continued during the quarter; progress being as follows:

Hole No.	Location	R.L. Feet	From Feet	To Feet	Advance	Remarks
E40/65	1530N.0160E	1130	0	450	450	Suspended. To be deepened
E41/65	0810S.2530W	1080	508	967	459	Completed
E42/65	00 1280E	1120	118	502	384	As at 8th December
E43/65	00 0100W	1090				Rigging up

Copies of bore logs for the following intervals are enclosed.

E41/65 800 feet to 967 feet
E42/65 429 feet to 502 feet 3 inches

Logs of intervals drilled prior to the above have been submitted to the Department.

The reason for the suspension of bore E40/65 is that massive dolomite was apparently interpreted by the driller to represent the Pound Quartzite. This hole will be deepened on completion of hole E42/65. Considerable delay was experienced in drilling bore E42/65 when drill rods became stuck.

Lithologies encountered by drilling have been as expected, but it has been found difficult to pick formation tops, particularly that of the sandy, crossbedded dolomite.

Tentative tops picked to date are as follows:

Bore	E40/65	E41/65	E42/65
Massive dolomite	Surface	Surface	Surface
Laminated dolomite	91'	316'	85'3"
Sandy crossbedded dolomite	Not Picked	682'6"	241'
Transition shales		890'6"	455'6"
Worm Burrow Beds		940'	
Pound Quartzite		951'3"	

These tops are subject to review as additional drilling is effected.

The lithology from 455'6" to 492' in bore E42/65 is similar to the transition shales, but not sufficient section has been penetrated below this interval to confirm this interpretation.

The presence of pyrite and galena has been noted in all bores, but generally as traces only, and usually in the sandy crossbedded dolomite.

On the basis of mineralisation it is probable that the top of this formation occurs at about 230 feet in bore E40/65.

The only intervals selected for assay are 690 to 755 feet and 800 to 804 feet in bore E41/65.

The results for the former interval were reported in our letter of 8th December, 1965, but to comply with the requirements of the lease are repeated hereunder.

From Feet	To Feet	Values	
		Pb	Ag Dwt./ton
690	695	0.85	3.0
695	700	1.05	3.0
700	705	0.85	3.0
705	710	0.80	3.0
710	715	0.60	2.2
715	720	0.60	2.2
720	725	0.50	2.2
725	730	0.65	3.0
730	735	0.60	3.0
735	740	0.67	3.6
740	745	0.60	2.6
745	750	0.75	3.0
750	755	1.00	4.0
755	760	0.50	2.0
Averages		0.72%	2.8

Yours faithfully,

H.E. Jensen

H.E. Jensen
Exploration Manager

AFMcQ:ALH

Enr 740

C.R.A. EXPLORATION PTY. LIMITED

029

NOTES ON RESULTS OF DRILLING OF

THE EDIACARA STRUCTURE

SOUTH AUSTRALIA

by

A. F. McQueen

Melbourne

April 12, 1967.

S.M.L. 77 - EDIACARA, SOUTH AUSTRALIA

In August, 1965, C.R.A. Exploration commenced a program of drilling on S.M.L. 77 to test the possibility that a large low grade lead body remained untested on the Ediacara structure.

Thirty-five holes had been drilled previously, mostly by the Department of Mines, and these revealed two zones relatively richer in base metals. These zones were described by Nixon (1964) as being 50 feet apart and between 100 and 200 feet above the Cambrian-Precambrian contact.

Nixon estimated ore reserves based on this drilling as follows:

> Total tonnage for a grade averaging 2.1% Pb over a thickness of 20 feet is inferred at 620,000 tons. For a grade averaging 1.13% Pb over a thickness of 52 feet, the inferred reserves are estimated at 17,500,000 tons and for a grade of 0.9% Pb, with a thickness of 58 feet, 31,800,000 tons.

The C.R.A. program was for 12 holes on an approximate grid spacing of 1,500 feet. Eleven holes were drilled. The twelfth programmed hole was considered unnecessary as surrounding holes did not contain sulphide mineralisation.

Drilling was carried out by the Department of Mines of South Australia under contract to C.R.A. Exploration. Geological logs of the bores are attached.

The eleven holes drilled were numbered E40 to E50. Bore coordinates and levels are shown in Appendix 1, analytical results in Appendix 2, and formation tops in Appendix 3. The localities are shown in the accompanying plan X27/1720. Only one of these holes, E41, intersected mineralisation of grade greater than 0.5% Pb, and this is on the margin of the mineralised zone outlined by the earlier drilling. Rare specks of galena were recorded in some of the other bores.

The mineralisation in the Cambrian dolomite sequence at Ediacara has been referred to as stratiform, and sulphides have been identified from the Transition Shales, the Sandy Cross Bedded Dolomite and the Laminated Algal Dolomite. The accompanying plan S.A.46 illustrates an interpretation of the distribution of mineralisation in these units based on total drilling to date.

Indicated tonnages of mineralised rock based on this interpretation are:

(a)	Body in Laminated Algal Dolomite	12,000,000 tons 0.84% Pb
(b)	Body in Sandy Cross Bedded Dolomite	17,000,000 tons 1.23% Pb
	with an enriched zone, included in (b), of	1,200,000 tons 2.24% Pb

It is difficult to identify in cores rock units which have been defined from outcrop mapping. This difficulty applies particularly to the cross bedded and laminated dolomites which have similar lithologies in parts.

To what extent facies changes affect identification of stratigraphic units could not be determined without detailed study of the cores. It could be suspected that the allocation of the base of mineralisation in bore 33 to the sandy cross bedded unit is a reflection of a facies change. The unusual thickness of Transition Shales, with accompanying mineralisation, in bore 7, could also represent, in part, a facies variation of the sandy dolomite. However, it does appear that sulphides occur in bores in both the sandy and laminated algal dolomites. Mineralisation occurs in both these units at the surface. An interpretation of formation tops and indications of mineralisation are shown in Appendix 3.

Drilling results indicate that mineralisation in the Ediacara structure is richest, although low grade, on the northwest flank, trending to lower grade, then pinching out, to the south. Surface mapping, however, shows that some mineralisation occurs in outcrops of the Laminated Algal Dolomite in the southern part of the structure.

It is concluded that, although an apparently large area enclosed by bores E24, IP2, E11, E47a, E45 and E48 remains untested, the absence of any significant mineralisation in those bores, and the trend to decreasing mineralisation in the southern part of the structure precludes the likelihood of the existence of an economic deposit in this area.

Density of the drilling, and knowledge of mineralisation in the remainder of the structure indicate that an economic deposit of base metals is unlikely to occur therein.

ACKNOWLEDGEMENT

These notes are adaptions of a summary report prepared by R. N. Spratt, September, 1966.

Cross sections of the Ediacara structure, prepared by Spratt, are submitted herewith.

Melbourne A. F. McQueen

April 12, 1967.

APPENDIX 1

C.R.A. EXPLORATION PTY. LIMITED

EDIACARA MINERAL FIELD

Bore Coordinates and Levels

Bore Numbers	Coordinates		R.L.
	N/S Coord.	E/W Coord.	
IP2	S 3000	W 196	1114
E1	N 150	W 4540	960
2	N 1160	W 3506	968
3	N 3882	E 235	1118
4	N 3612	W 224	1124
5	N 2511	W 925	1111
6	N 2346	W 1957	1047
7	S 1472	W 3902	1053
8	S 2353	W 3977	1025
9	S 2959	W 4024	1034
10	S 3923	W 2992	1057
11	S 3993	E 499	1114
12	S 3000	E 500	1115
13	N 2222	W 2159	1026
14	N 2417	W 1776	1050
15	N 2045	W 2067	1055
17	N 2224	W 1711	1069
18	N 3796	E 129	1120
19	N 3786	E 234	1119
20	N 3771	E 321	1117
21	N 1000	W 3465	970
22	N 1774	W 2752	1011
23	N 2876	W 1139	1088
24	S 1883	W 1737	1066
31	N 2067	W 560	1118
32	N 1430	W 1453	1077
33	N 954	W 2332	1024
34	N 281	W 3064	968
35	N 2646	E 250	1127
39	N 108	W 1617	1054
40	N 1352	E 158	1131
41	S 741	W 2727	1063
42	S 1	E 1169	1124
43	N 2	E 90	1102
44	N 1988	E 1055	1117
45	S 5466	W 1444	1066
46	S 6443	W 1318	1083
47	S 7400	W 316	1081
48	S 3151	W 2280	1114
49	S 1428	W 173	1070
50	S 744	W 5157	923

C.R.A. EXPLORATION PTY. LIMITED

Bore E41

Depth From	Depth To	Values Pb	Ag dwt/ton	Ni	Co	Cu	Zn
690	695	0.85	3.0	16	15	63	39
695	700	1.05	3.0	16	15	78	45
700	705	0.85	3.0	16	17	65	49
705	710	0.80	3.0	15	12	42	43
710	715	0.60	2.2	17	17	89	32
715	720	0.60	2.2	15	16	125	43
720	725	0.50	2.2	15	16	37	42
725	730	0.65	3.0	15	16	53	42
730	735	0.60	3.0	16	16	150	56
735	740	0.67	3.6	15	17	450	68
740	745	0.60	2.6	14	16	300	72
745	750	0.75	3.0	14	14	33	64
750	755	1.00	4.0	16	17	21	61
755	760	0.50	2.0	15	19	110	54
760	763.5	0.14	0.22	14	19	160	146
763.5	769.33	0.08	0.15	15	19	39	43
769.33	773.25	0.10	0.15	14	17	19	42
773.25	778.0	0.21	0.19	14	18	56	38
778.0	781.75	0.49	0.27	14	16	46	156
781.75	786.5	0.27	0.19	14	16	39	49
786.5	791.0	0.35	0.19	13	16	44	49
791.0	795.5	0.11	0.12	14	20	44	51
795.5	800.0	0.47	0.19	15	17	19	46
800.0	804.33	0.19	0.12	15	19	27	47
804.33	807.58	0.08	0.12	15	20	29	38
807.58	811.08	0.11	0.11	15	19	22	54
811.08	815.08	0.06	0.12	17	23	30	45

Bore E46

262.75	268.0	0.01	0.11	13	14	200	49
268.0	272.75	0.01	0.10	15	14	285	68
272.75	276.75	0.02	0.10	14	16	100	40
276.75	280.25	0.02	0.10	15	19	110	56
280.25	285.75	0.01	0.10	12	16	180	42
285.75	289.5	0.01	0.07	14	15	310	58
289.5	292.75	0.01	0.10	14	18	390	35
292.75	296.25	0.02	0.10	12	14	400	126
296.25	302.25	0.02	0.10	15	18	380	80
302.25	306.25	0.01	0.10	14	20	345	96
306.25	311.0	0.02	0.07	13	21	225	51
311.0	316.0	0.03	0.10	17	33	345	82
316.0	322.5	0.02	0.10	20	31	405	43
322.5	328.25	0.02	0.10	15	19	450	47
328.25	331.5	0.01	0.10	16	29	270	37
331.5	335.5	0.01	0.10	17	19	575	43
335.5	340.25	0.01	0.10	15	25	410	42
340.25	345.0	0.01	0.10	17	32	400	52
345.0	350.0	0.02	0.10	17	29	770	146
350.0	355.0	0.02	0.10	14	17	330	136
355.0	359.75	0.01	0.10	12	14	435	129
359.75	364.75	0.35	0.30	13	14	610	126
364.75	369.75	0.06	1.50	15	22	1000	245
369.75	374.75	0.11	3.55	20	33	3400	373
374.75	379.75	0.07	0.57	18	26	910	710
379.75	382.75	0.01	1.70	15	15	820	1150
382.75	387.5	0.02	0.40	24	21	225	2140
387.5	392.5	0.03	0.19	40	94	255	890
392.5	397.5	0.05	0.27	51	265	420	1270

Bore E47(a)

Depth		Value
From	To	Cu %
139.92	144.58	0.29
144.58	149.42	0.47
149.42	154.0	0.05
154.0	162.33	0.03
62.33	167.0	0.02
167.0	172.75	0.03
172.75	177.58	0.19
177.58	181.0	0.17

C.R.A. EXPLORATION PTY. LIMITED

EDIACARÁ MINERAL FIELD

A.A.S. Analysis by The Zinc Corporation Ltd.

Bore Core	B	Cu	Pb	Zn	Co	Ni	Sn	Bi	Ag	Cr	V	Mo	Be	Ge	Mn	Ba	Sr	Li	Rb
	Parts per Million																		
E.41 760 - 815.08'	4	100	2500	30	15	6	8	1	8	10	5	1	<1	1	10,000	3,000	60	70	70
E. 46 268 - 397.5'	7	120	200	70	5	1	1	2	7	5	3	2	2	1	10,000	250	20	70	70

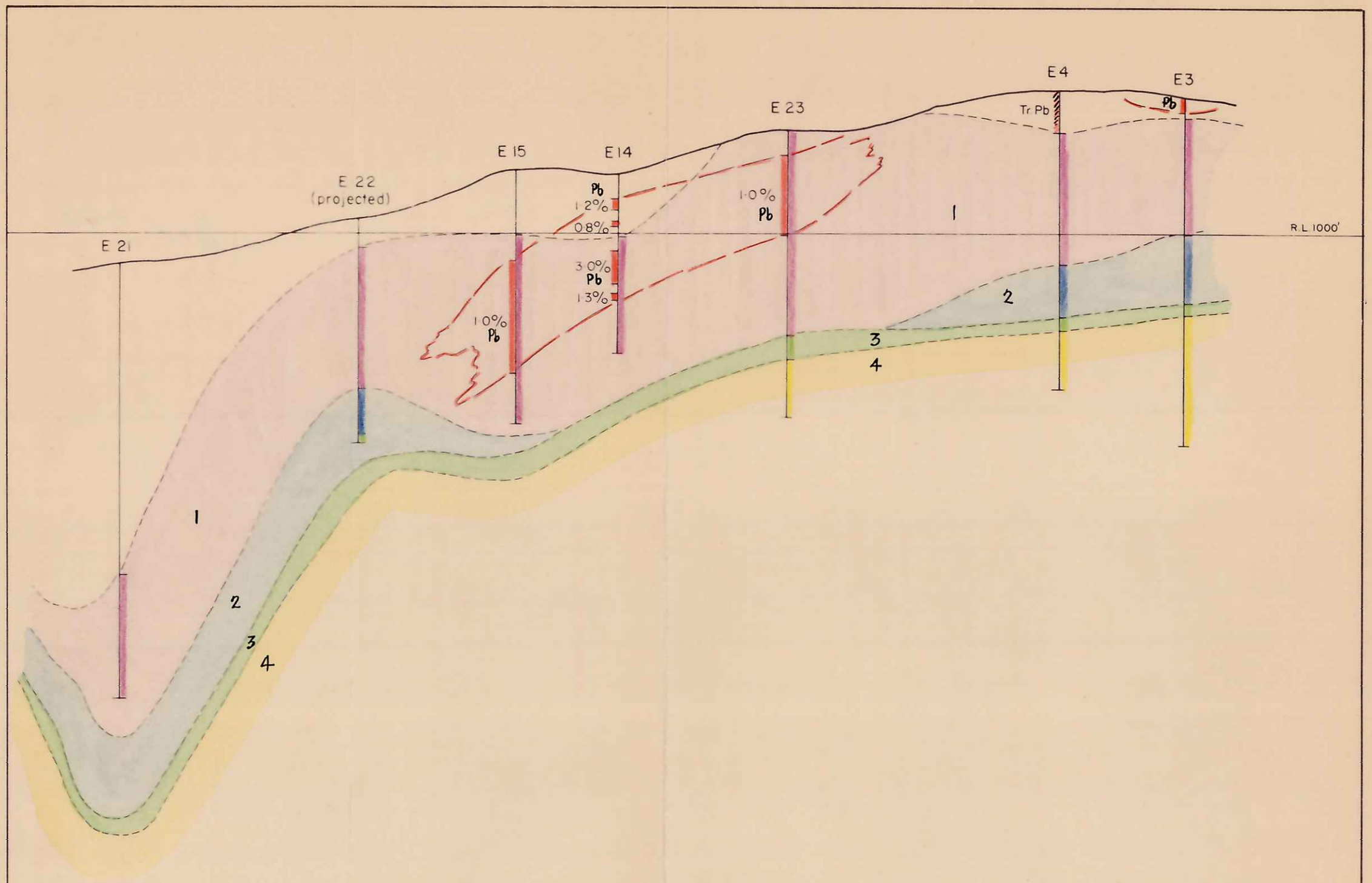
APPENDIX 3

C.R.A. EXPLORATION PTY. LIMITED

EDIACARA MINERAL FIELD

Hole No.	Completed Depth	Date Drilling Commenced	Date Hole Completed	Depths to Formation Tops								Mineralisation
				Sandy Cross bedded Dolomite		Transition Shales		Worm Burrow		Pound Sandstone		
				Depth	R.L.	Depth	R.L.	Depth	R.L.	Depth	R.L.	
E. 40/65	571' 0"	2.8.65	1.2.66	332	799	450	681	476	655	494	637	NIL
E. 41/65	969' 6"	2.8.65	1.12.65	787	276	910	153	945	118	950	113	690' - 755' 65' x 0.7% Pb
E. 42/65	520' 0"	9.9.65	11.12.65	388	736	455	669	502	622	507	617	Tr galena 244' - 304'
E. 43/65	702' 9"	11.12.65	14.6.66	505	597	636	466	677	425	688	414	NIL
E. 44/65	404' 6"	4.2.66	21.2.66	215	902	327	790	372	745	383	734	NIL
E. 45/65	563' 0"	15.2.66	29.3.66			411	655	N.R.		504	562	NIL
E. 46/65	455' 9"	25.2.66	26.4.66			394	689	N.R.		444	639	Tr galena 263' - 393' Nil on assay.
E. 47A/65	372' 1"	25.4.66	2.7.66			240	841	N.R.		351	730	NIL
E. 48/65	940' 0"	3.5.66	18.8.66	745	369	851	263	903	211	909	205	Tr galena 470' - 530'
E. 49/65	856' 0"	20.6.66	15.10.66	271	799	554	516	815	245	822	238	NIL
E. 50/65	532' 0"	13.7.66	18.8.66			526	397			520	403	NIL

036



LEGEND

1	Sandy Dolomite
2	Transition Beds
3	Worm Burrow Beds
4	Pound Sandstone
	+0·5% Pb

C.R.A. EXPLORATION PTY. LTD.

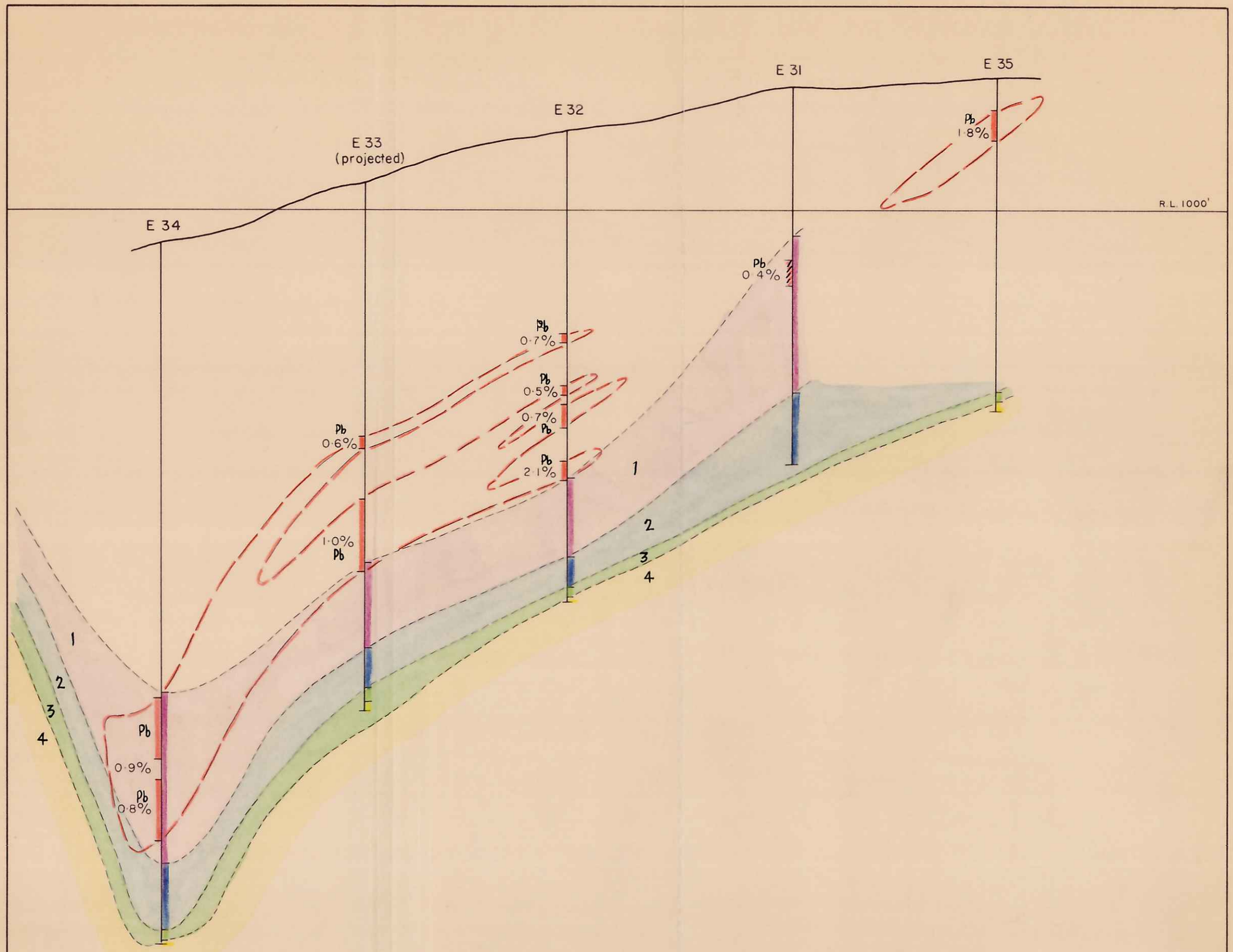
EDIACARA – S.A.

CROSS SECTION A–A', LOOKING 308°

ENV. 740-(1)-1

3

R.N. Spratt, Sept. 1966	SCALE: Hor. 1" = 500', Vert. 1" = 100'	PLAN No. S.A. 29



LEGEND

1	Sandy Dolomite
2	Transition Beds
3	Worm Burrow Beds
4	Pound Sandstone
	+ 0·5% Pb

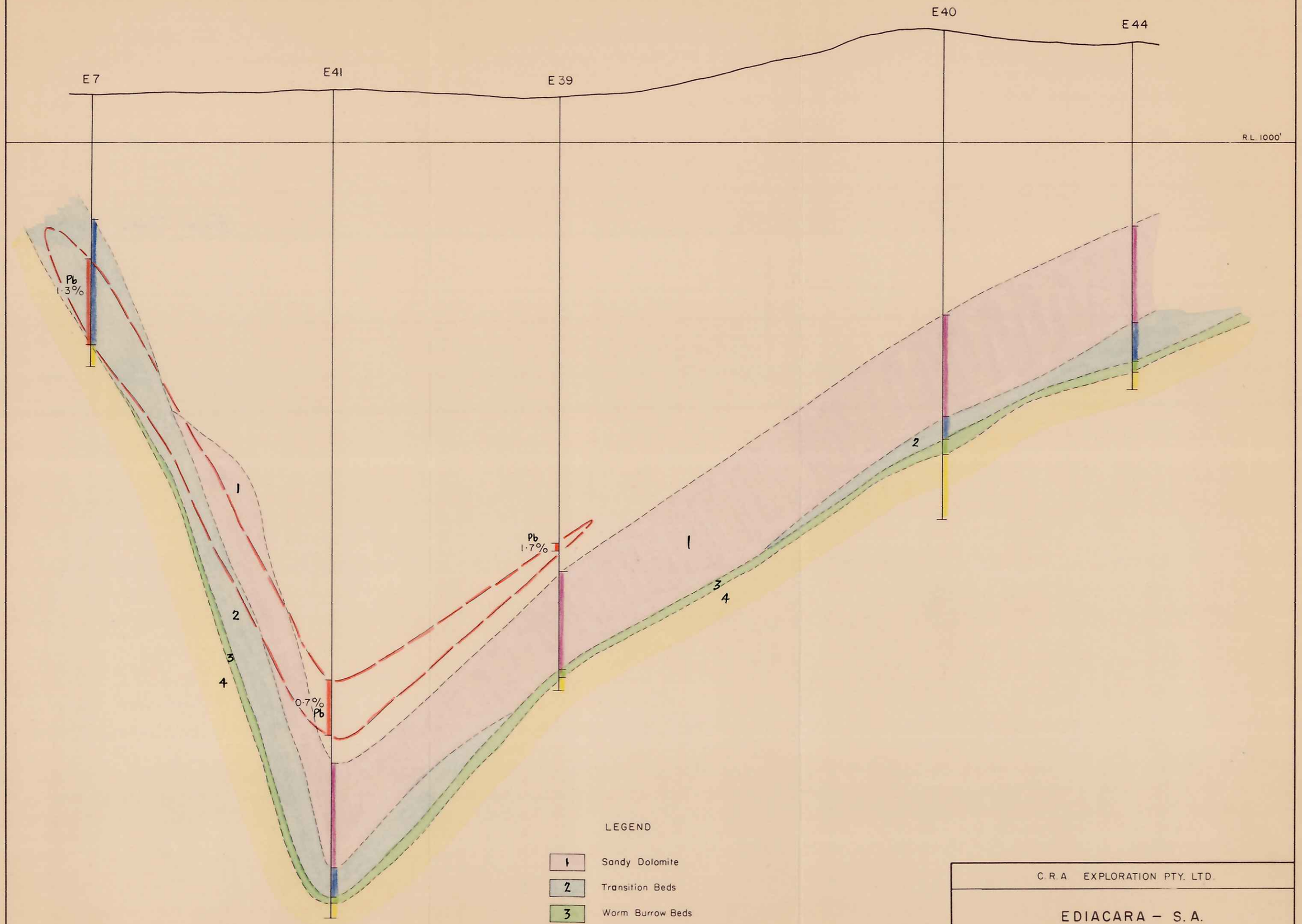
C R A EXPLORATION PTY LTD

EDIACARA - S.A.

CROSS SECTION B - B', LOOKING 324°

ENV 740(t)2 4

R N Spratt, Sept 1966 | SCALE Hor 1" = 500' Vert 1" = 100' | PLAN No S.A 30



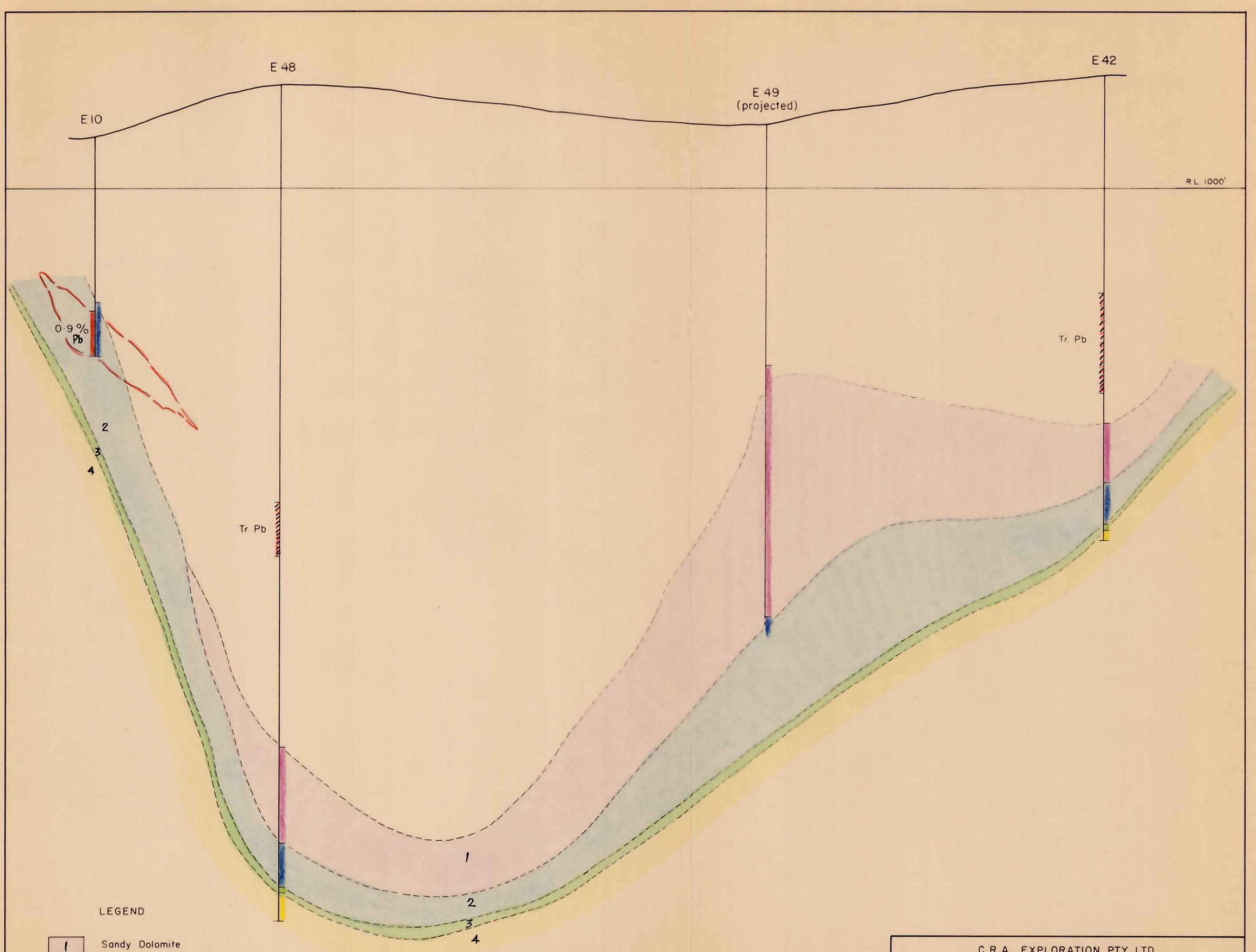
C.R.A. EXPLORATION PTY. LTD.

EDIACARA – S.A.

CROSS SECTION C – C, LOOKING 325°

ENY 740(H)3 5

R.N. Spratt, Sept. 1966	SCALE Hor. 1" = 500' Vert. 1" = 100'	PLAN No. S.A. 31



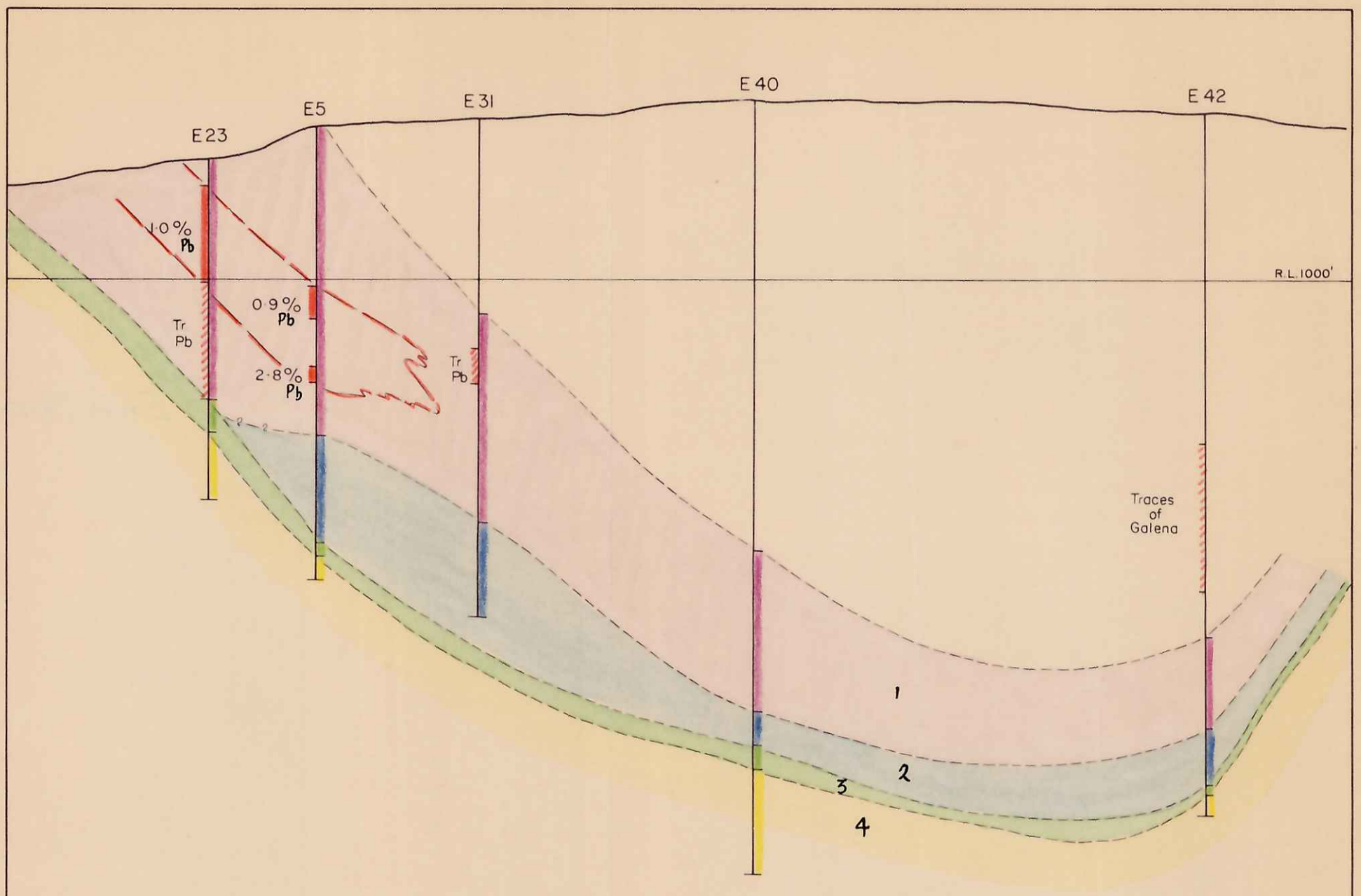
C.R.A. EXPLORATION PTY. LTD.

EDIACARA - S.A.

CROSS SECTION D-D', LOOKING 317°

ENV 740(1)-46

R.N. Spratt, Sept. 1966	SCALE: Hor. 1" = 500' Vert. 1" = 100	PLAN No. S.A. 32



LEGEND

1	Sandy Dolomite
2	Transition Beds
3	Worm Burrow Beds
4	Pound Sandstone
	+ 0·5% Pb

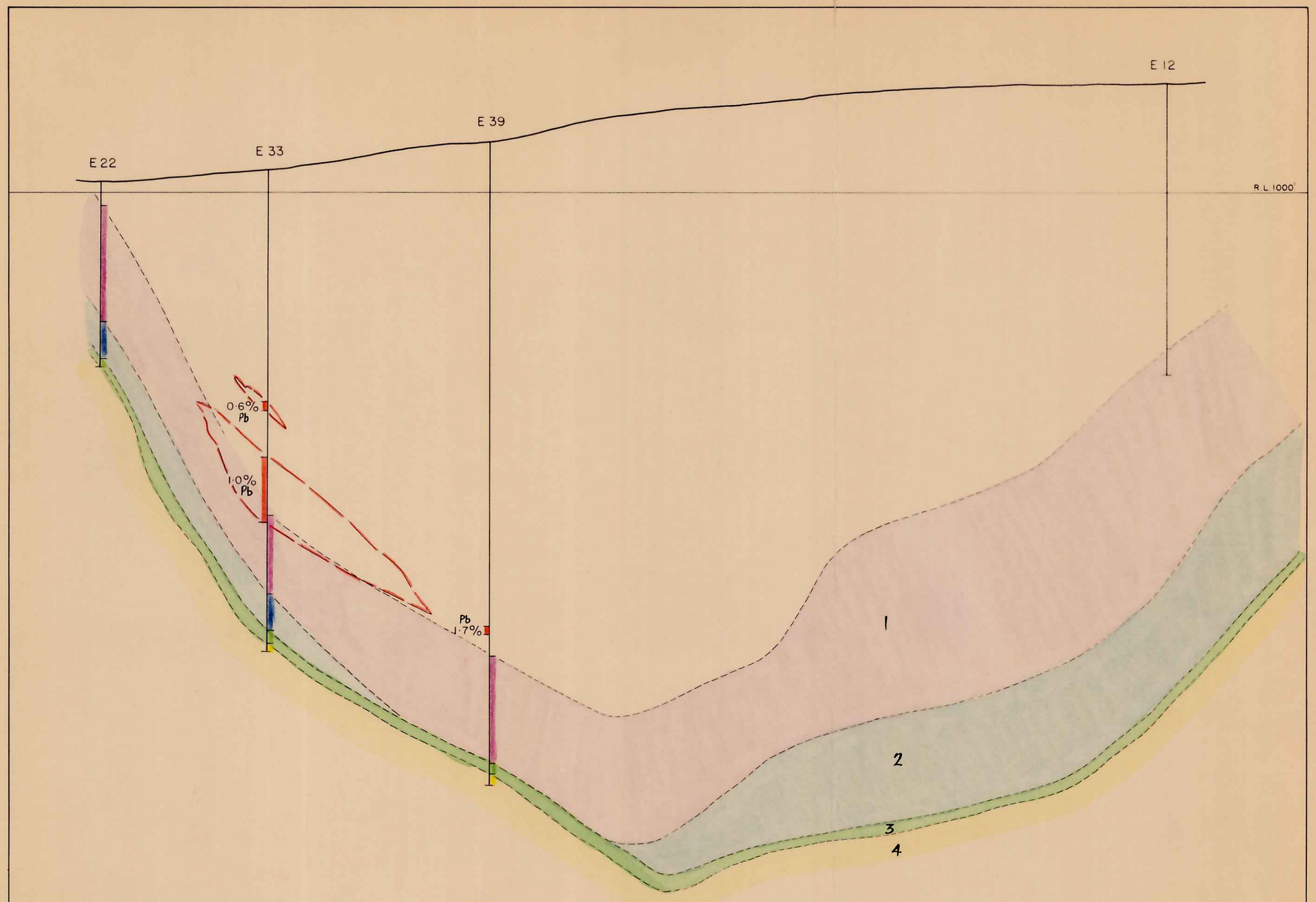
C.R.A EXPLORATION PTY LTD

EDIACARA – S.A.

CROSS SECTION E – E', LOOKING 48°

ENV 740(H)5 7

R.N Spratt, Sept, 1966	SCALE Hor 1" = 500' Vert 1" = 100'	PLAN No S.A 33



LEGEND

1	Sandy Dolomite
2	Transition Beds
3	Worm Burrow Beds
4	Pound Sandstone
	+ 0·5% Pb

C.R.A. EXPLORATION PTY. LTD.

EDIACARA – S.A.

CROSS SECTION F – F', LOOKING 55°

ENV 740(4)68

R. N. Spratt, Sept. 1966	SCALE: Hor. 1" = 500' Vert. 1" = 100'	PLAN No. S.A. 34

E2 E21 E 34 E 41 E 48 E 45 E 46 E 47

R.L. 1000'

Trace Pb

Trace Pb

0·9% Pb

Pb 0·8%

0·7% Pb.

1

2

3

4

LEGEND

1 Sandy Dolomite

2 Transition Beds

3 Worm Burrow Beds

4 Pound Sandstone

+0·5% Pb

C. R. A. EXPLORATION PTY. LTD.

EDIACARA - S.A.

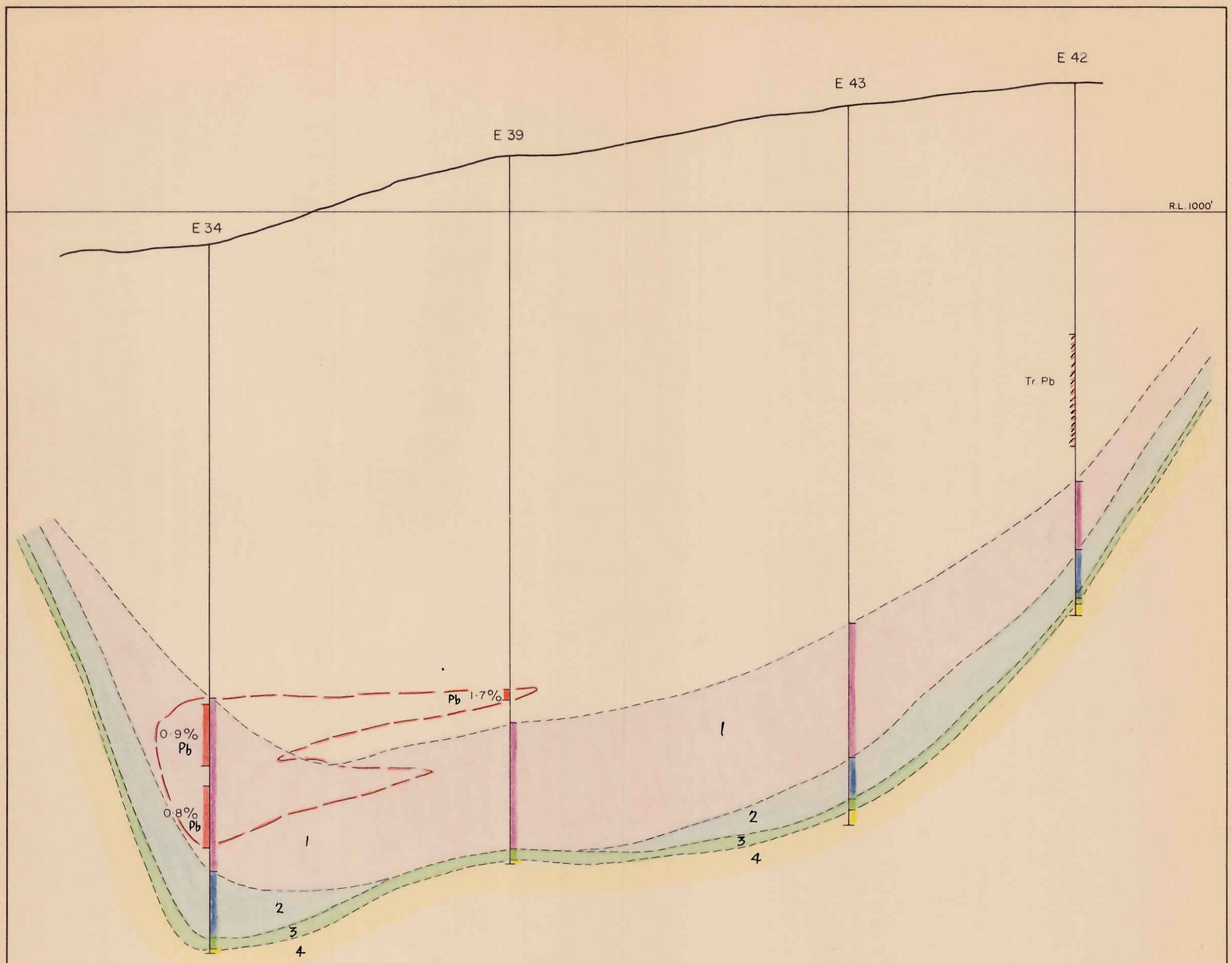
CROSS SECTION G - G', LOOKING 72°

ENV 7407 9

R N Spratt, Sept. 1966

SCALE: Hor 1" = 500', Vert 1" = 100'

PLAN No S.A. 35



LEGEND

1	Sandy Dolomite
2	Transition Beds
3	Worm Burrow Beds
4	Pound Sandstone
	+0·5% Pb

C.R.A. EXPLORATION PTY. LTD.

EDIACARA - S.A.

CROSS SECTION H-H', LOOKING 5°

ENV 7401-8 10

R.N. Spratt, Sept. 1966	SCALE: Hor. 1" = 500' Vert. 1" = 100'	PLAN No. S.A. 36

E 48

IP2

E12

E9

R.L. 1000'

Tr. Pb

1

2

3

4

LEGEND

1	Sandy Dolomite
2	Transition Beds
3	Worm Burrow Beds
4	Pound Sandstone
	+ 0·5% Pb

C.R.A. EXPLORATION PTY. LTD.

EDIACARA – S.A.

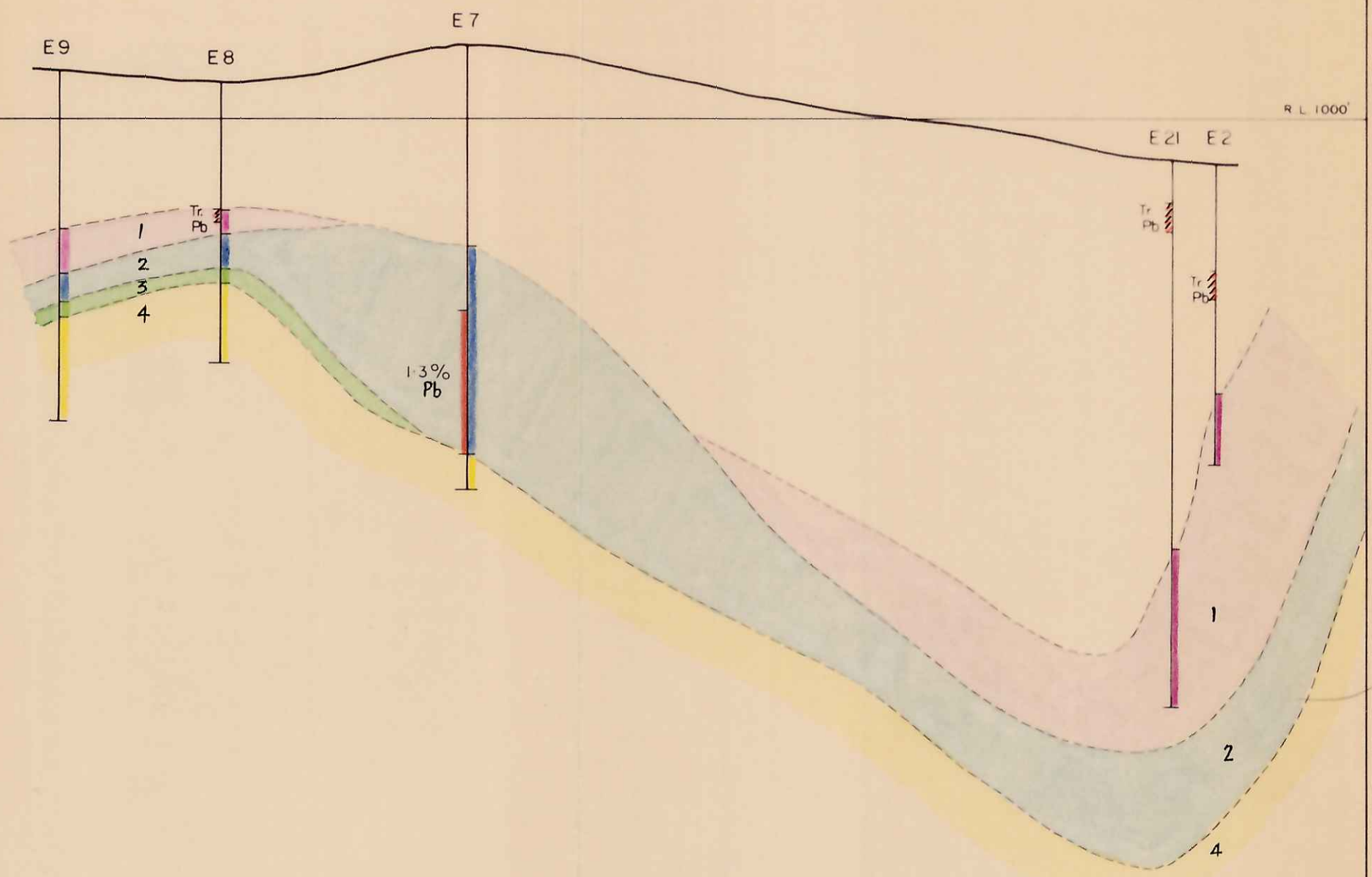
CROSS SECTION 1 - 1', LOOKING 360°

ENV 7409 //

R.N. Spratt, Sept. 1966

SCALE Hor. 1" = 500'
Vert. 1" = 100'

PLAN No S.A. 37



LEGEND

1	Sandy Dolomite
2	Transition Beds
3	Worm Burrow Beds
4	Pound Sandstone
▨	+ 0·5% Pb

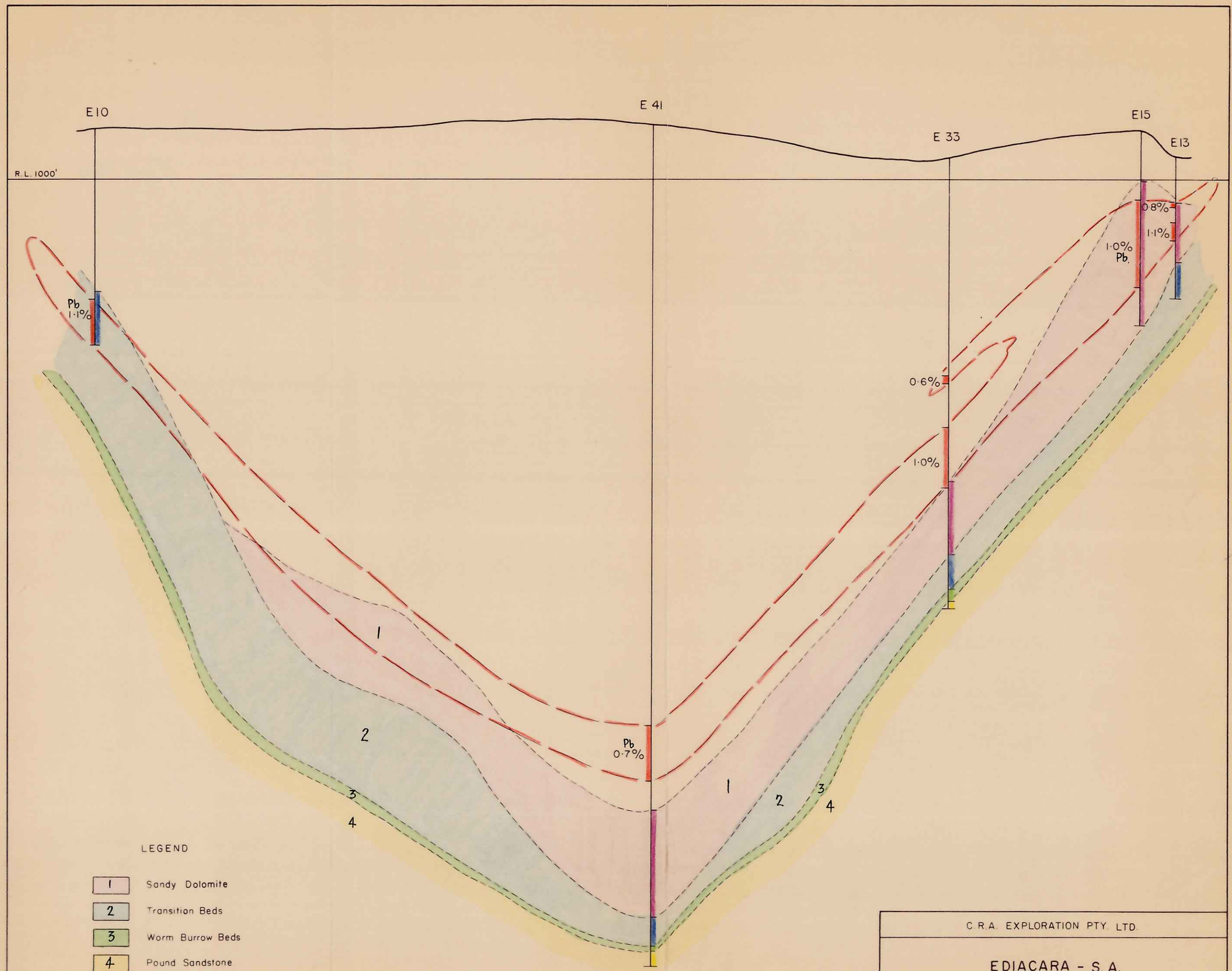
C R A EXPLORATION PTY. LTD.

EDIACARA - S.A.

CROSS SECTION J - J', LOOKING 277°

ENV 740(H)10 12

R.N.Spratt, Sept 1966	SCALE Hor. 1" = 500' Vert 1" = 100'	PLAN No. S.A. 38



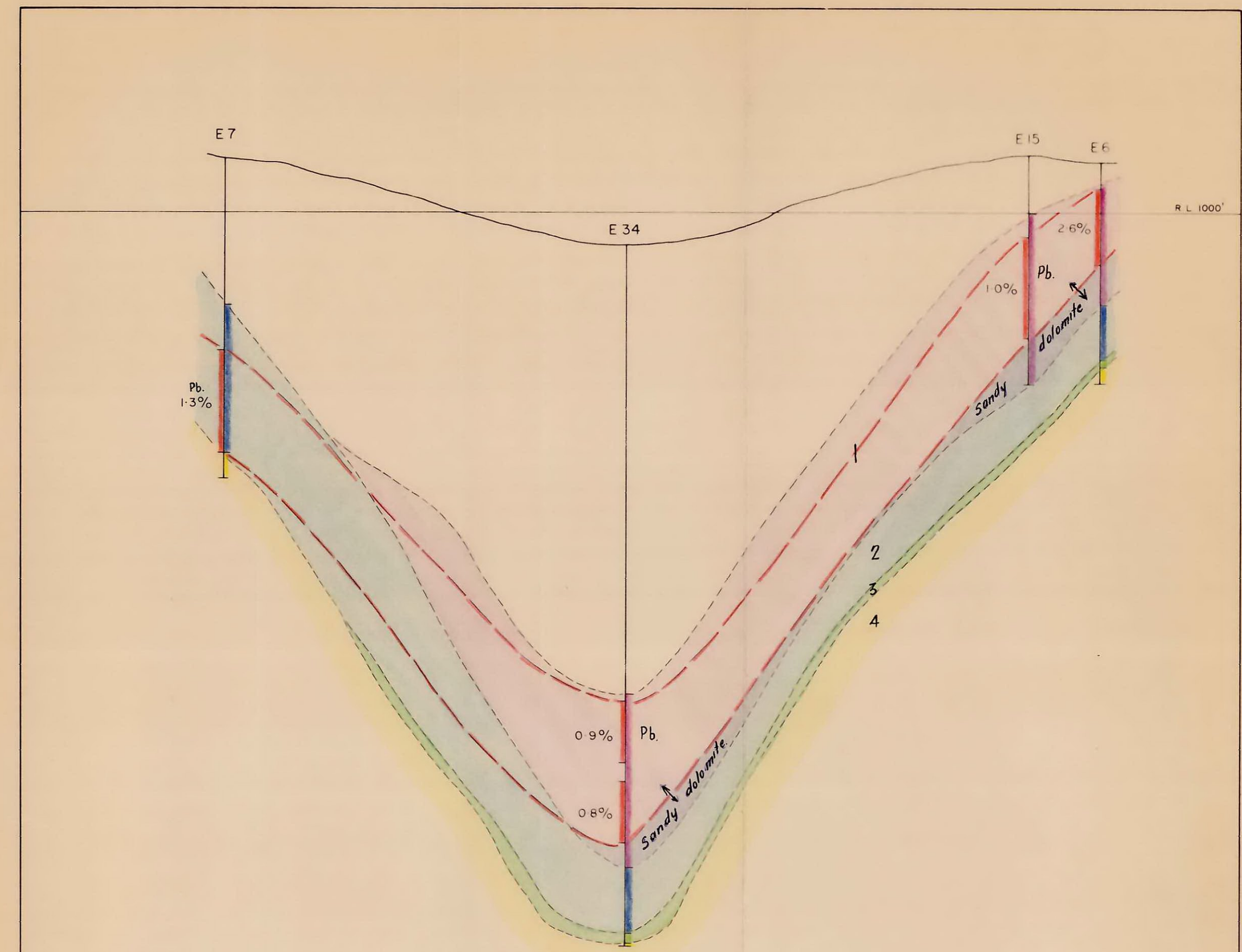
C.R.A. EXPLORATION PTY. LTD.

EDIACARA - S.A.

CROSS SECTION K-K', LOOKING 278°

ENV 740(1)11 13

R.N. Spratt, Sept 1966	SCALE Hor. 1" = 500' Vert 1" = 100'	PLAN No S.A 39



LEGEND

1	Sandy Dolomite
2	Transition Beds
3	Worm Burrow Beds
4	Pound Sandstone
	+ 0·5% Pb

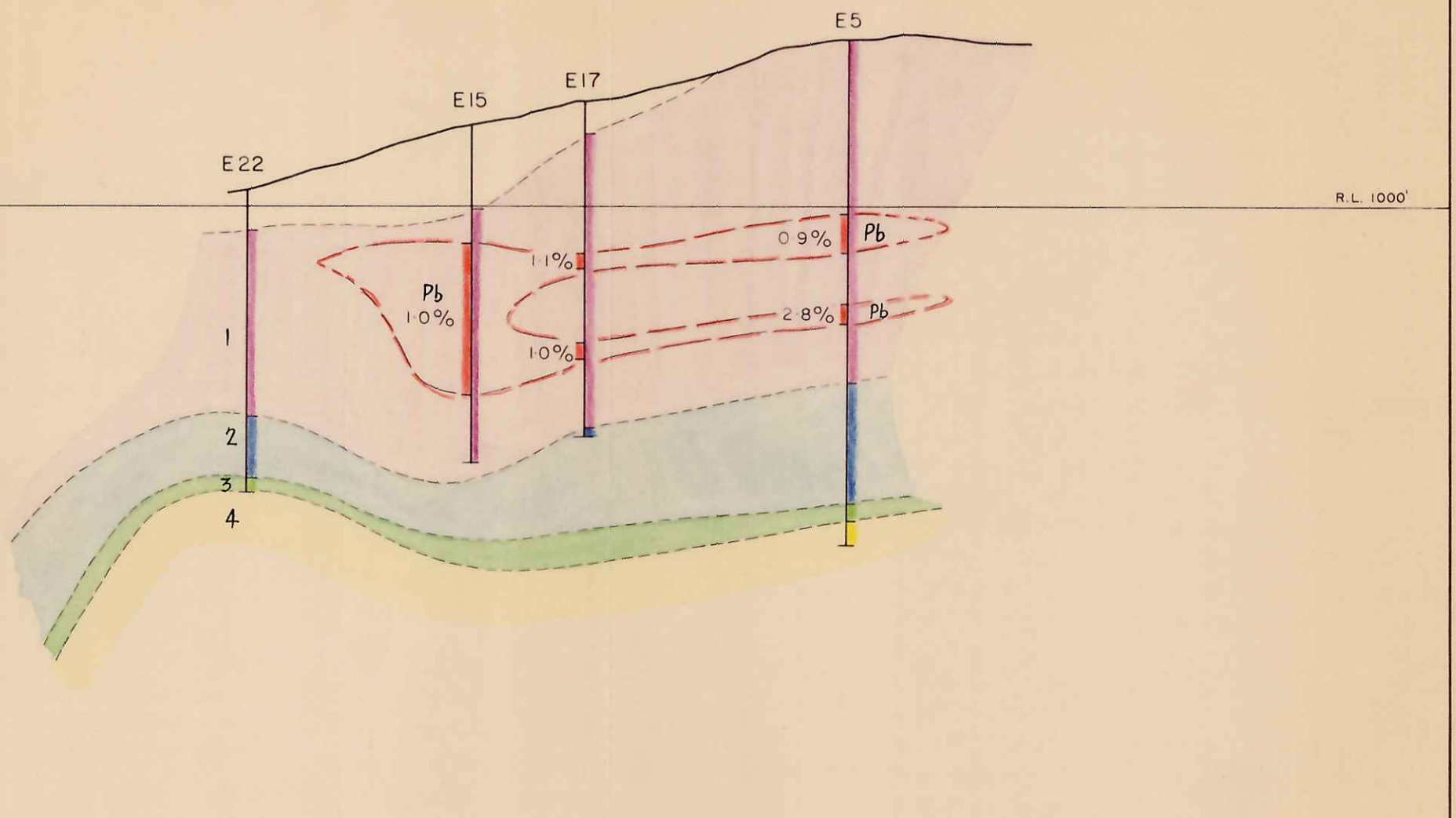
C R A EXPLORATION PTY LTD

EDIACARA – S.A.

CROSS SECTION L – L', LOOKING 297°

ENV 740(H)2 14

R N Spratt, Sept 1966 | SCALE Hor 1" = 500' Vert 1" = 100' | PLAN No S.A. 40



LEGEND

1	Sandy Dolomite
2	Transition Beds
3	Worm Burrow Beds
4	Pound Sandstone
- - -	+ 0·5% Pb

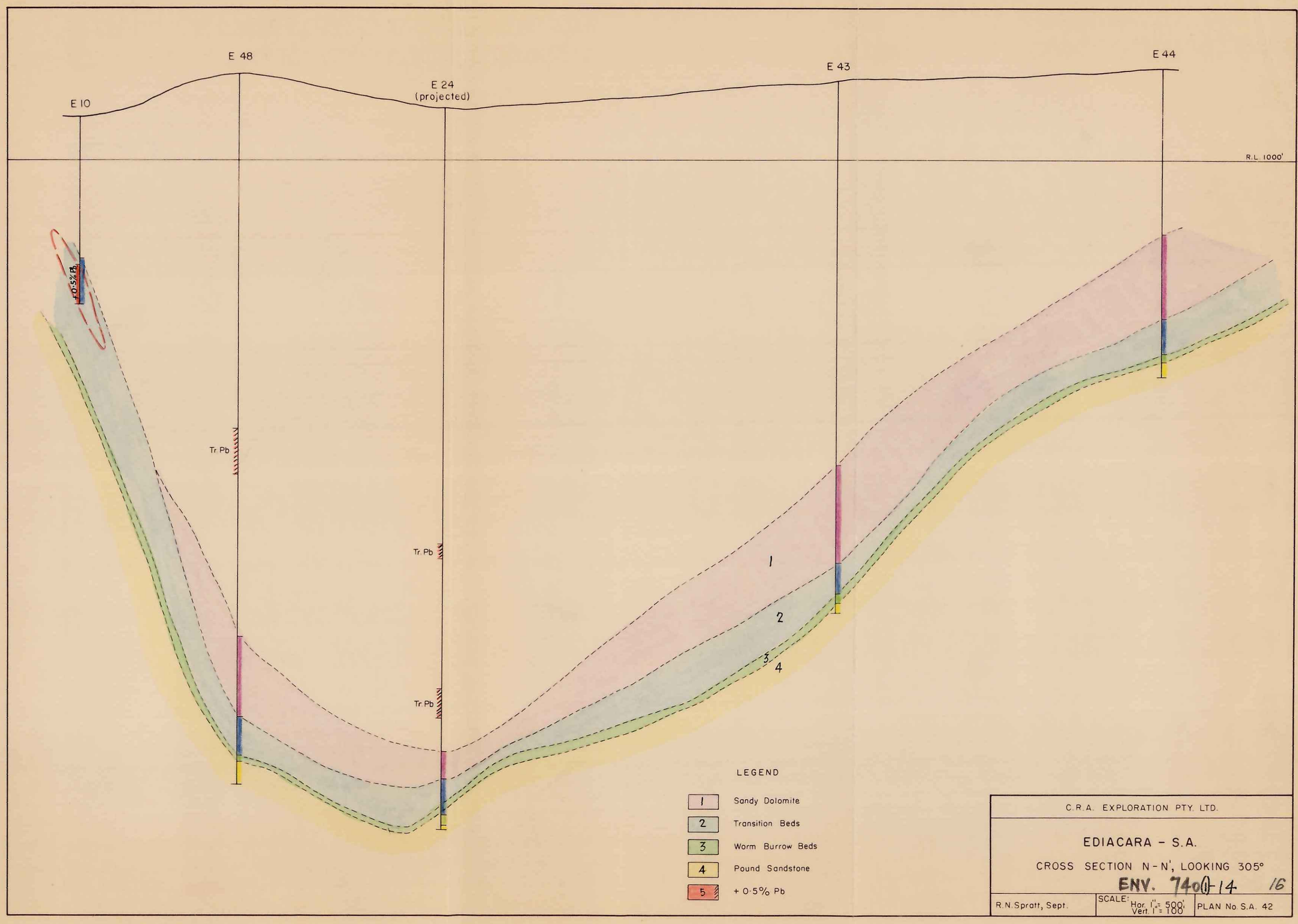
C.R.A. EXPLORATION PTY. LTD.

EDIACARA - S.A.

CROSS SECTION M-M', LOOKING 338°

ENV. 740(A)13 15

R N Spratt, Sept 1966	SCALE Hor 1" = 500' Vert 1" = 100'	PLAN No S.A. 41



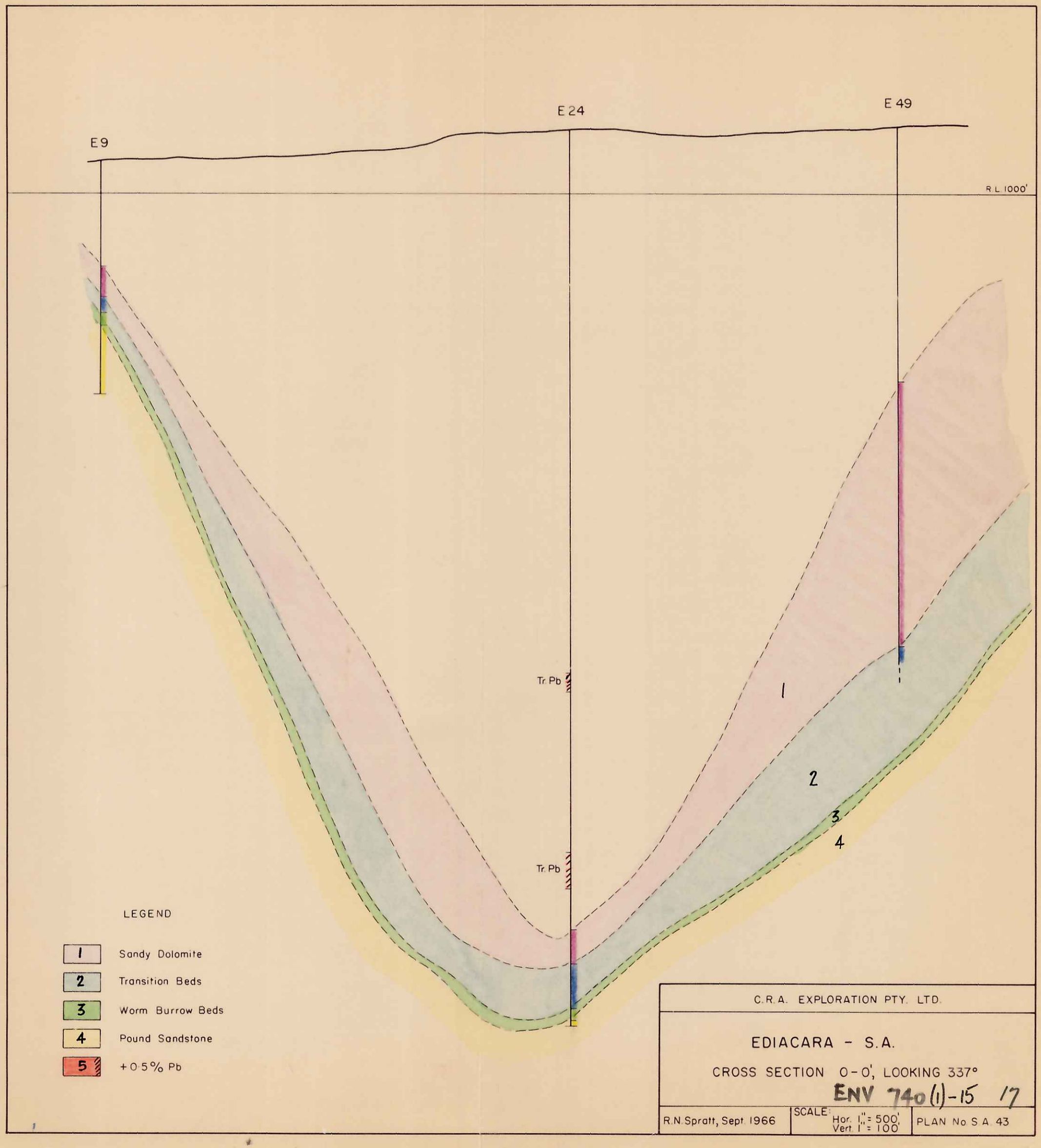
C.R.A. EXPLORATION PTY. LTD.

EDIACARA - S.A.

CROSS SECTION N-N', LOOKING 305°

ENV. 7400-14 16

R.N.Spratt, Sept. | SCALE: Hor. 1"= 500' Vert. 1"= 100 | PLAN No. S.A. 42



C.R.A. EXPLORATION PTY. LTD.

EDIACARA - S.A.

CROSS SECTION O-O', LOOKING 337°

ENV 740(1)-15 17

R.N. Spratt, Sept. 1966	SCALE: Hor. 1" = 500', Vert. 1" = 100'	PLAN No S.A. 43

LEGEND

- A — Massive dolomite
- B — Laminated algal dolomite
- 1 — Sandy cross bedded dolomite
- 2 — Transition shales
- 3 — Worm burrow beds
- 4 — Pound sandstone (Jellyfish bed in red)
- Selected Area
- Fault
- Synclinal fold axis – with pitch
- X17 — Sample location and number

South-Eastern Gossan Area

South-Western Gossan Area

Conzinc Riotinto of Australia Limited

GEOLOGICAL PLAN

EDIACARA MINERAL FIELD

— S.A. —

(After S.A. Dept. of Mines)

ENV 740(A)-16

Scale	D.S.C.	Plan No.
1" = 500'	Nov. 1962	X27/1720 1

+ 0·5% Pb in laminated algal dolomite

+0·5% Pb in sandy cross bedded dolomite

2% - 3% Pb in sandy cross bedded dolomite

+ 0·5% Pb in Transition shales

2% - 3% Pb in Transition shales

E19 Borehole location

GREENWOOD'S WORKINGS

E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E17 E18 E19 E20 E21 E22 E23 E24 E31 E32 E33 E34 E35 E39 E40 E41 E42 E43 E44 E48 E49 IP2

4000N 3000N 2000N 1000N 00 1000S 2000S 3000S

4000W 3000W 2000W 1000W 00 1000E 2000E 5000S

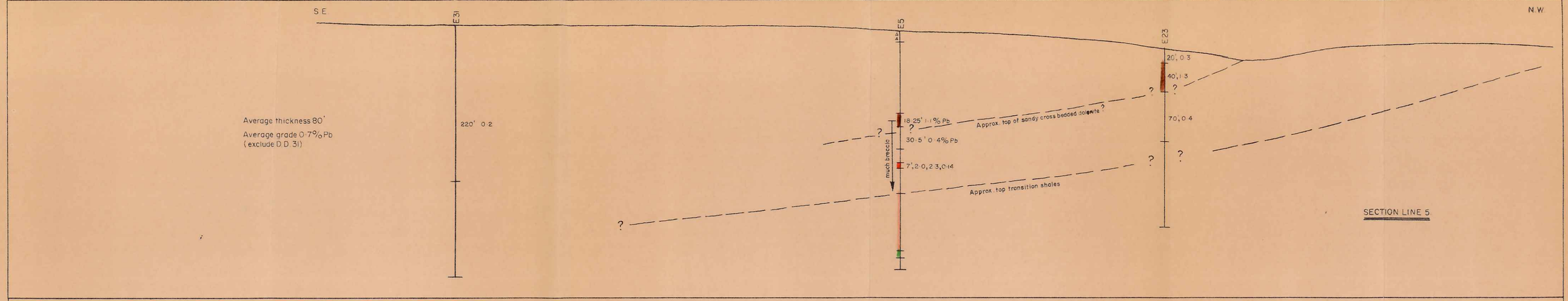
C.R.A. Exploration Pty. Limited.

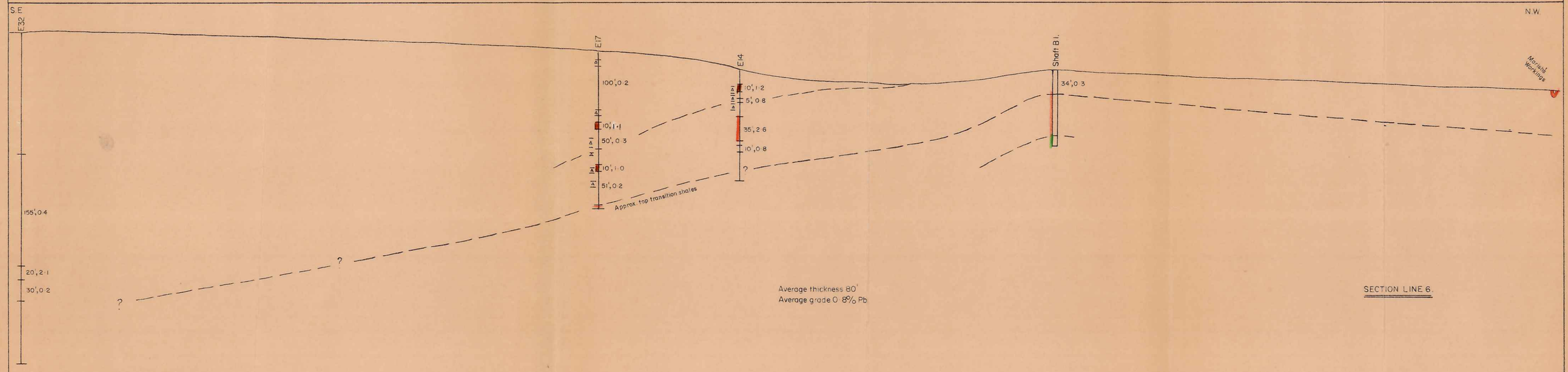
EDIACARA - S.A.

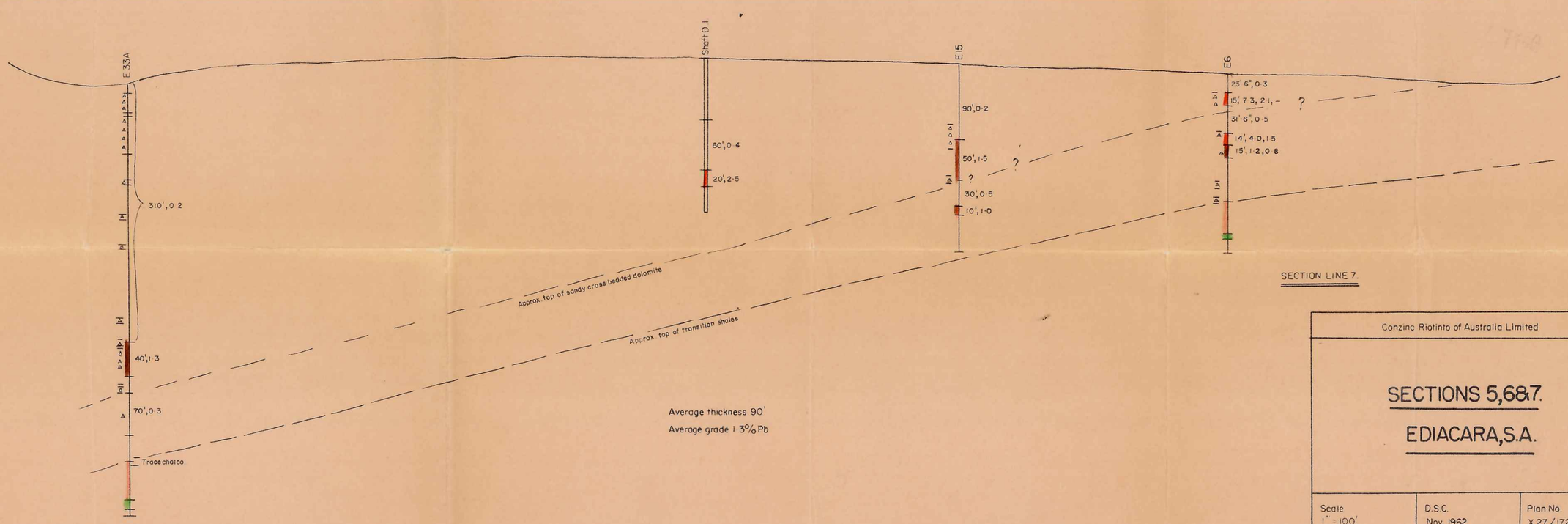
PLAN SHOWING MINERALISATION IN ROCK UNITS.

ENV. 740(1)-17

Scale	A.F. McQ.	Plan No.
1" = 500'	March 1967	S.A. 46 2







Conzinc Riotinto of Australia Limited

SECTIONS 5,6&7.

EDIACARA, S.A.

Scale	D.S.C.	Plan No.
1" = 100'	Nov. 1962	X 27 / 1722

ENV 740 (1) - 18

5000W 4000W 3000W 2000W 1000W 00 1000E 2000E 3000E

6000N 5000N 4000N 3000N 2000N 1000N 00 1000S 2000S 3000S 4000S 5000S 6000S 7000S 8000S 9000S

E1 RL 750

E50 RL 400

E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E17 E18 E19 E20 E21 E22 E23 E24 E31 E32 E33 E34 E35 E39 E40 E41 E42 E43 E44 E45 E46 E47a E48 E49 IP2

A A' B B' C C' D D' E E' F F' G G' H H' J J' K K' L L' M M' N N' O O'

RL 200 RL 300 RL 400 RL 500 RL 600 RL 700 RL 800 RL 1000

C.R.A. EXPLORATION PTY. LTD.

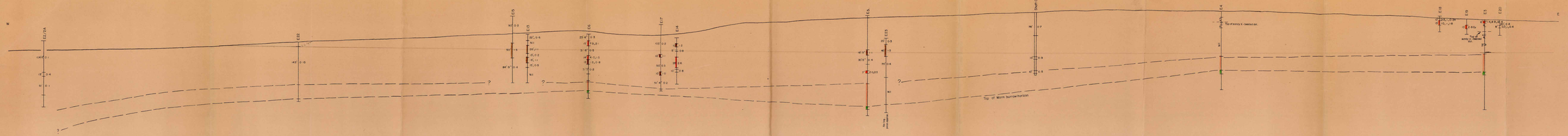
EDIACARA - S.A.

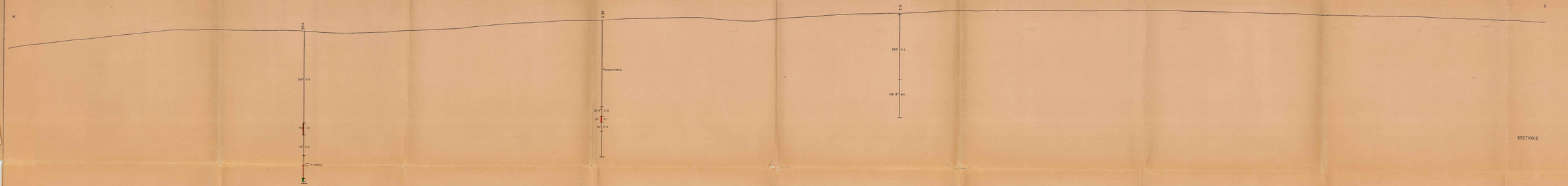
PLAN SHOWING

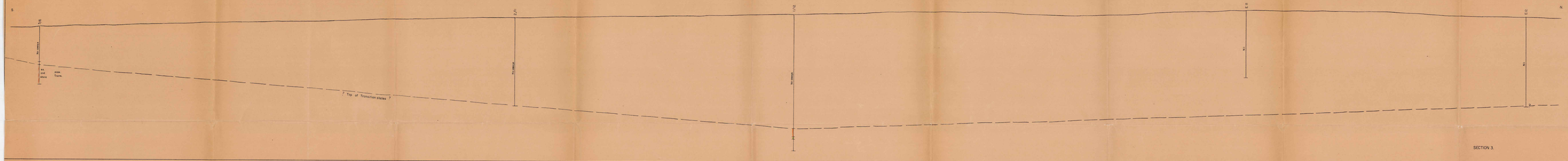
CONTOURS ON TOP OF THE POUND QUARTZITE

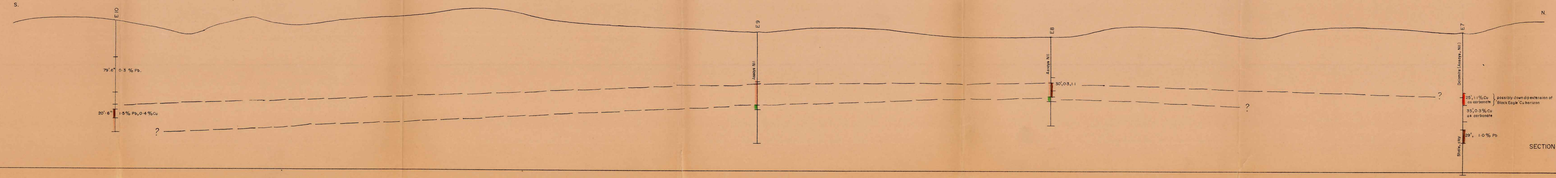
ENV. 740(1)-19

R.N. Spratt, Sept. 1966 | SCALE: 1" = 500' | PLAN No. S.A. 44









Conzinc Riotinto of Australia Ltd.

SECTIONS 1 - 4

EDIACARA S.A.

Scale 1" = 100'

D.S.C. Nov. 1962

Plan No. X27/1721

Env 7401(1)-20

Electric Refills of Australia Limited

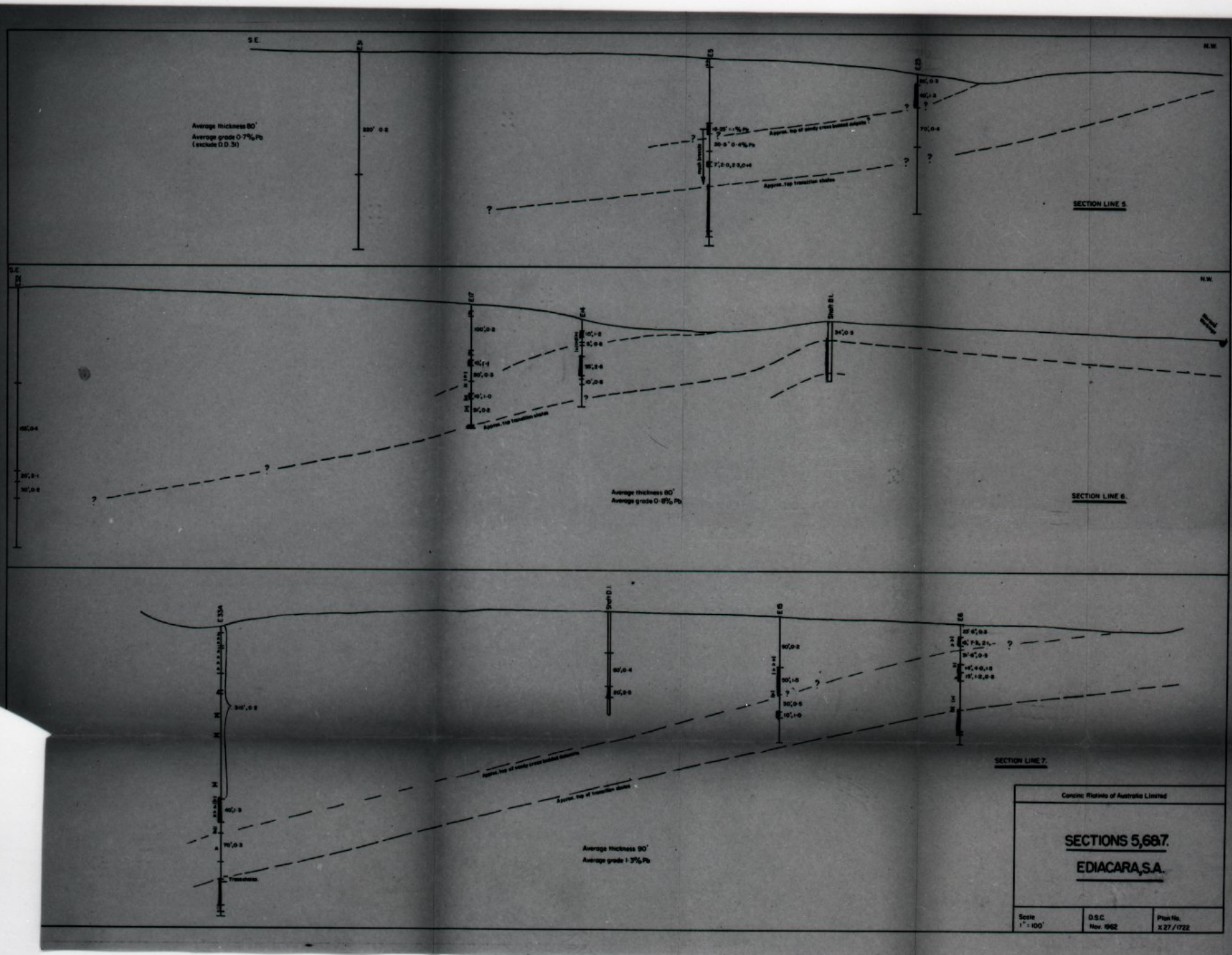
GEOLOGICAL PLAN

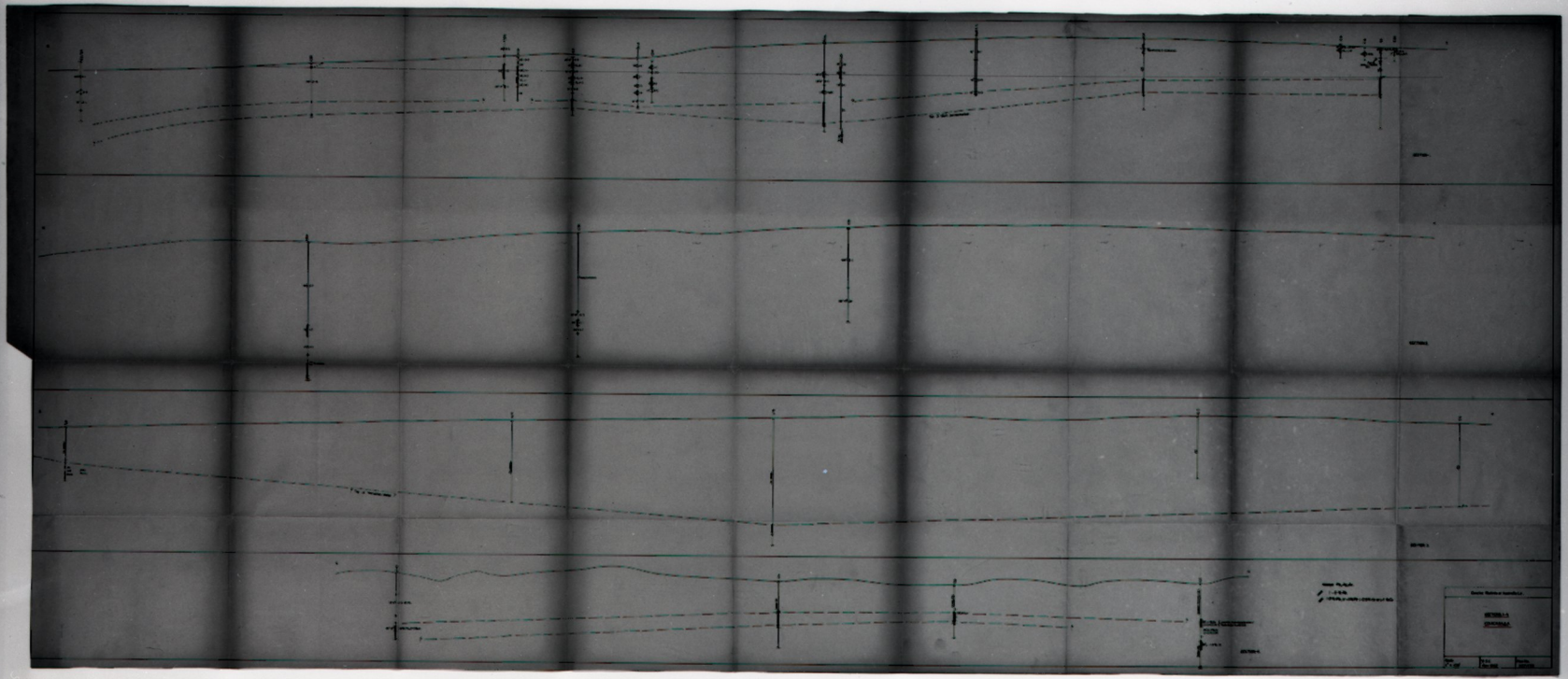
EDIACARA MINERAL FIELD

– S.A. –

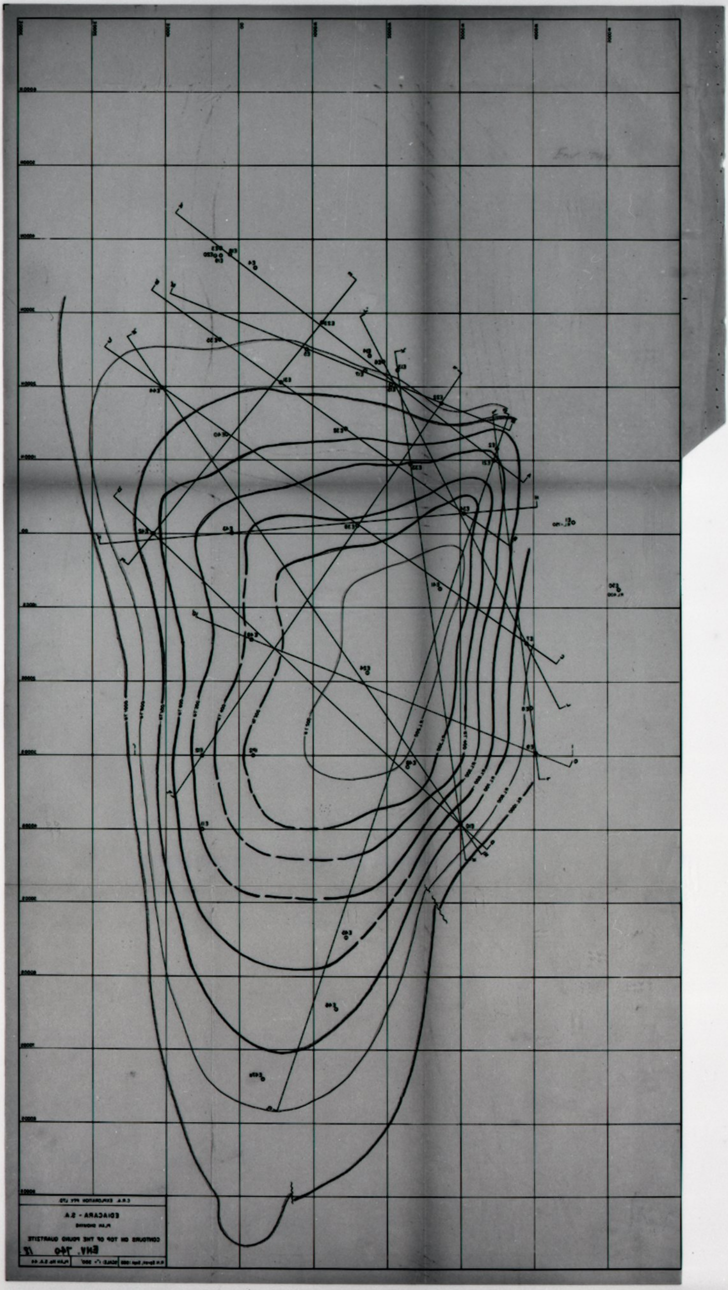
(After S.A. Dept of Mines)

Date	A.C.D. Rec. No.	Plan No.
/ / 1947		


S.E.
N.W.
Average thickness 80'
Average grade 0·7% Pb
(exclude D.D.31)
220' 0·2
Approx. top of sandy cross bedded deposits
Approx. top transition shales
SECTION LINE 5.
Average thickness 80'
Average grade 0·8% Pb
Shaft B1.
SECTION LINE 6.
Shaft D.1.
Average thickness 90'
Average grade 1·3% Pb
Approx. top of sandy cross bedded deposits
Approx. top of transition shales
SECTION LINE 7.
Concinc Riointo of Australia Limited
SECTIONS 5,6&7.
EDIACARA, S.A.
Scale 1" = 100'
D.S.C. Nov. 1962
Plan No. X 27 / 1722



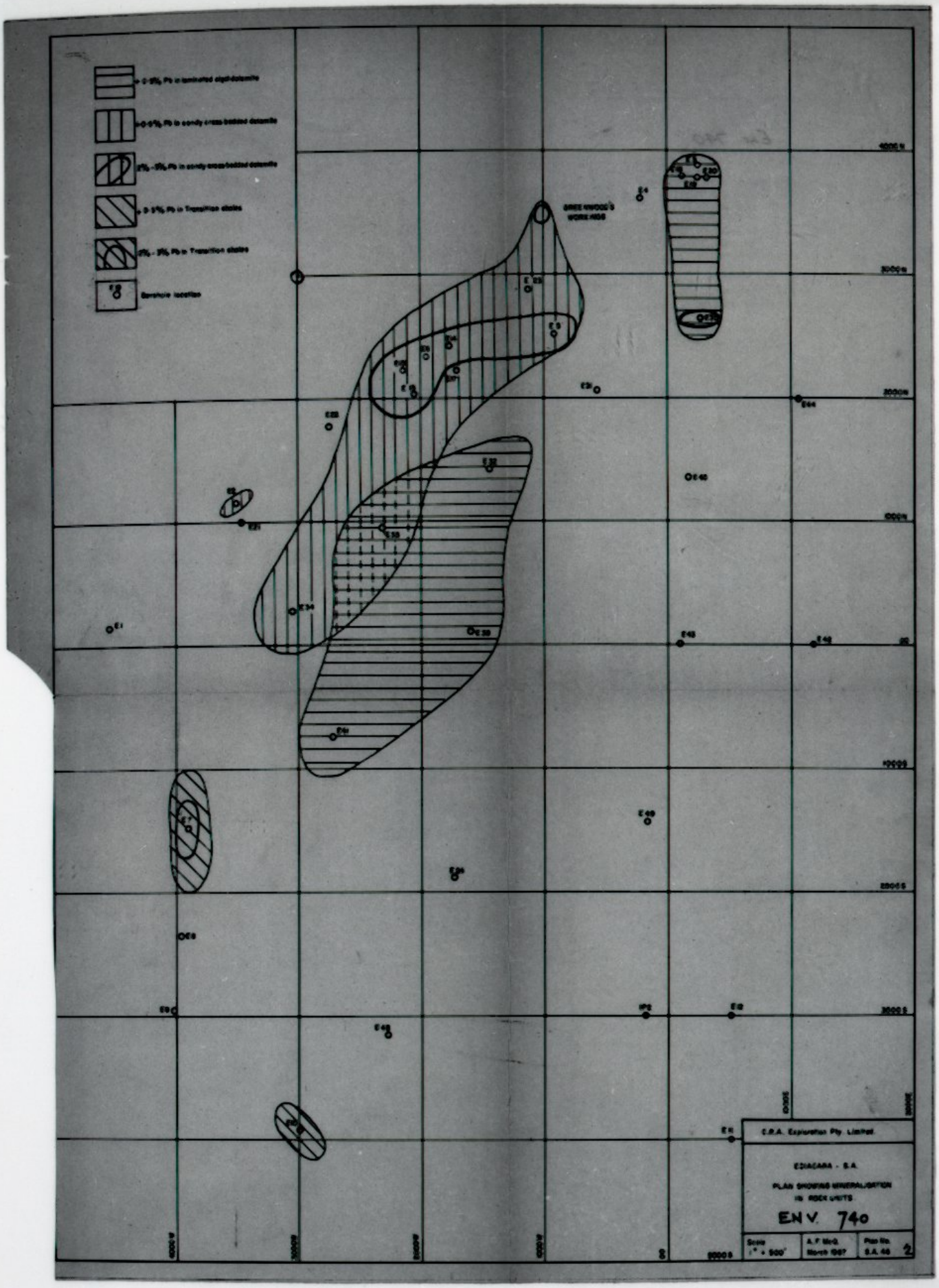

GEOLOGICAL PLAN
EDIACARA MINERAL FIELD
— S.A. —
(After S.A. Dept of Mines)
EMY 740



C.R.A. EXPLORATION PTY LTD
EDIACARA - S.A
PLAN SHOWING
CONTOURS ON TOP OF THE POUND QUARTZITE

EDIACARA


GRID A
GRID B
MAIN GRID
REFERENCE
I.P RESULTS REFERENCE
SCALE
TRANS AUST. EXPL. PTY. LTD.
GEOLOGY OF EDIACARA MINERAL FIELD
BELTANA SOUTH AUSTRALIA
SCALE
1 INCH= 500 FEET
DWG. NO.
S.A.
Base Map after S.A. Dept. of Mines.


C.R.A. Exploration Pty. Limited
ENV. 740

RIO TINTO SOUTHERN PTY. LTD.
RECORD OF DIAMOND DRILLING

Hole No. E40/65
Drilled by Machine s1000
Core Recovery
Logged by
Assays by

AREA OF OPERATION EDIACARA - SML 77
Date Commenced 2/8/65
Date Completed

Reduced Level of Collar 1130 approx.
Co-ords
Bearing 153ON 160E
Vertical Angle

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	0'0	2'0	1'4					Grey siliceous dolomite with hairline Mn filled cracks, signs of leaching and vuggy cavities lined with quartz.
	2'0	4'6	1'6					Pink dolomite, fragmented and altered to caliche.
	4'6	5'7	1'1					Grey dolomite with vugs and alteration to caliche along planes at high angle to core axis.
	5'7	8'0	2'0					Grey dolomite with rusty staining and Mn in small dendrites and filling hairline cracks.
	8'0	10'0	2'0					As above
	10'0	14'9	4'9					Grey dolomite, slightly brecciated in places, with limonite stain along cracks and small cavities lined with calcite.
	14'9	19'7	4'10					Grey dolomite with many hairline cracks filled with Mn, a few calcite filled cracks and occasional thin sandy interbeds.
	19'7	24'5	4'9					Grey dolomite with occasional small vugs, some Mn and limonite stained cracks.
	24'5	29'4	4'10					Grey dolomite with small cavities many Mn filled cracks, brecciated and sandy in places.
	29'4	34'2	4'10					As above
	34'2	39'0	4'10					As above
	39'0	43'10	4'10					As above with limonite stained cracks prominent from 42'0 to 43'0.
	43'10	48'8	4'10					Grey dolomite with small cavities, much Mn in thin cracks, spots and dendrites and many limonite stained cracks.
	48'8	53'6	4'10					As above
	53'6	58'6	4'10					Grey dolomite with Mn spots, leaching shown by many pin hole cavities.
	58'6	61'10	3'4					Grey dolomite with Mn and limonite on cracks and in small cavities.
	61'10	66'11	4'11					Leached vuggy grey dolomite with Mn in spots and cracks, limonite on cracks, vugs lined with calcite and rhodocrosite.
	66'11	72'0	4'11					Vuggy leached grey dolomite with a little Mn and limonite.
	72'0	76'3	3 4'3					Grey vuggy dolomite with Mn cracks and limonite stained cracks.
	76'3	81'2	4'11					Grey dolomite, rusty and brecciated in places, with Mn in thin cracks. Bedded at 45° to long core axis.

740(2) - 1

Hole No. E40/65

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value							Av. Val. and Width	Geological Description
	81'2	86'2	5'0											Grey dolomite, leached in places, with Mn veinlets and limonite stained cracks, irregular pyrolusite veins up to ½" wide from 85' to 85'9.
	86'2	91'0	4'6											Grey dolomite with thin Mn veinlets.
	91'0	95'8	4'7											Slightly leached grey-buff dolomite, with Mn and limonite stain on cracks.
	95'8	100'5	4'9											Buff dolomite with Mn spots and dendrites, limonite stained cracks and small cavities.
	100'5	105'0	4'7											Leached buff dolomite with much limonite stain on cracks and in small cavities and a little Mn.
	105'0	109'8	4'7											Buff dolomite with small cavities, much limonite stain on cracks and a few spots and dendrites.
	109'8	114'4	4'8											As above
	114'4	119'4	5'0											Grey-buff dolomite with Mn dendrites, brecciated in places down to 116'1. Laminated grey-buff dolomite with a few small cavities and some Mn cracks from 116'1 to 119'4. Lamination at 60° from long core axis.
	119'4	124'3	4'10											Laminated grey-buff dolomite with a little Mn. Lamination makes average angle of 70° with long core axis.
	124'3	128'6	4'3											Laminated grey-buff dolomite with a few cavities and some Mn stain and limonite stain on cracks.
	128'6	133'6	5'0											Laminated grey-buff dolomite with Mn in hairline cracks occasional brecciation. A little malachite in thin limonite veins from 132'10 to 133'4, estimated Cu content 0.1 - 0.2%. Limonite spots secondary after ?pyrite.
	133'6	138'4	4'7											Laminated grey-buff dolomite with small Mn spots and nodules in rusty partings brecciated in places, lamination makes 70° with long core axis.
	138'4	143'0	4'8											Laminated grey-buff dolomite, much brecciated, a little Mn in cracks and spots, two specks galena at 138'5.
	143'0	147'10	4'10											Laminated grey-buff dolomite with thin limonite veins, some clusters of limonite spots after pyrite, a few Mn spots and veinlets. Lamination 60° to long core axis. A little galena in limonite vein between 144'11 and 145'6 which makes 20° with long core axis. Grade estimated by eye to be approximately 0.5% Pb over 1'. Two parallel limonite veins between 145'10 and 147'5 are barren.
	147'10	152'9	4'11											Laminated grey-buff dolomite with limonite spots and limonite stained cracks, a little Mn and some brecciation. A quartz vein from 152'5 to 152'9.

Hole No. E40/65

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value							Av. Val. and Width	Geological Description
	152'9	157'4	4'3											Quartz vein from 152'9 to 153'3. Then laminated grey-buff dolomite with limonite stained clay partings and a few Mn spots and dendrites.
	157'4	161'7	4'3											Laminated grey-buff dolomite with a few small cavities, some Mn spots and dendrites.
	161'7	166'1	4'6											Grey dolomited, laminated in places, a little Mn in thin cracks and a thin quartz vein at 166'.
	166'1	169'6	3'5											Quartzose grey dolomite with rare Mn spots.
	169'6	172'2	2'6											Laminated grey-buff dolomite with Mn spots and dendrites.
	172'2	175'10	3'2											Grey-buff dolomite with a little Mn. Ovoid quartz patch at 174'8, quartz vein 175'8 to 175'10.
	175'10	177'10	2'0											Quartzose dolomite from 175'10 to 176'3 then grey-buff dolomite with occasional Mn spots.
	177'10	182'0	4'1											Laminated grey-buff dolomite with a few vugs and a little Mn in dendrites. Lamination makes 75° with long core axis,
	182'0	186'7	4'7											Laminated grey-buff dolomite with a little Mn in spots and some clay partings.
	186'7	190'8	4'1											Laminated grey-buff dolomite with a few small cavities and a few Mn spots and clay partings.
	190'8	195'3	4'5											As above.
	195'3	198'2	2'6											Laminated grey-buff dolomites with a little Mn. Prominent limonite stain from 195'3 to 196'.
	198'2	199'7	1'4											Laminated grey-buff dolomite.
	199'7	202'2	2'3											Laminated grey-buff dolomite with small Mn spots and some rusty partings.
	202'2	204'2	1'11											Buff dolomite with a few Mn dendrites.
	204'2	206'2	1'11											Quartzose laminated grey-buff dolomite with a little Mn.
	206'2	208'2	1'3											Laminated grey-buff dolomite brecciated in places, some Mn spots. Lamination makes 85° with long core axis.
	208'2	212'3	4'1											Grey dolomite, brecciated and quartzose in places with a few thin Mn filled cracks.
	212'3	216'0	3'9											Grey dolomite, brecciated in places, thin jasper vein at 216'.
	216'0	220'6	4'2											Grey dolomite with rusty cavities. A few limonite spots have boxworks after sulphide between 218' and 220'.
	220'6	225'0	4'3											Laminated grey-buff dolomite, much brecciated. Limonite prominent in matrix of breccia and in thin cracks. Lamination makes 50° with long core axis.

740(2) – 3

Hole No. E40/65

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value							Av. Val. and Width	Geological Description
	225'0	229'2	4'1											Slightly brecciated grey-buff dolomite with a few limonite and Mn stained cracks.
	229'2	233'5	4'2											Slightly brecciated grey dolomite.
	233'5	237'10	4'2											Brecciated grey dolomite with some limonite stained cracks and a few limonite spots after sulphides.
	237'10	239'0	1'0											Sandy grey dolomite with pink quartz patches.
	239'0	243'2	3'6											Grey dolomite with Mn stain on fractures.
	243'2	247'4	3'9											As above with small cavities.
	247'4	252'4	5'0											Grey dolomite partially brecciated, limonite stain along cracks.
	252'4	257'4	5'0											Grey dolomite brecciated from 252'4 to 255'4, limonite stains along cracks.
	257'4	262'2	4'10											Brecciated grey dolomite with limonite stained cavities and cracks.
	262'2	266'0	3'8											Laminated grey dolomite with limonite staining on cracks.
	266'0	302'0	36'0											Medium grey dolomite, massive, slightly shattered in parts, generally with appearance of slump breccia and without defined bedding.
	302'0	307'6	4'6											Medium grey dolomite, weathered and broken with joint limonite staining.
	307'6	332'0	24'6											Light to medium grey massive dolomite with irregular texture and breccia at 316' to 319'. Pyrite at 311'. Some cavities.
	332'0	345'6	13'6										T	Light to medium grey even textured massive sandy dolomite with part broken into regular discs at 343' to 344'6.
	345'6	374'6	29' 0											Medium grey massive dolomite, generally without defined bedding. Few cavities, rarely with pyrite in volitic form and with manganese as at 353' Rare thin sandy bands above 265'. Dolomite becomes sandy at 365'-374'.
	374'6	379'0	4'0										—	Medium grey very cavernous dolomite. At this depth there is a change to the underlying sandy oolitic, and generally cross bedded sequence.
														Medium grey, dolomite with fine and coarse grain texture. Section generally sandy but with development thin (3") sandstone bands in parts. Common development of fine grain size oolites, usually dark grey in colour, commonly associated with pyrite. Cross bedding commonand well defined. Some green ? chlorite at 425'6. Limonite staining common in fractures 426' to 429'.
	433'6	450'0	16'6											Medium grey fine textured sandy dolomite with well defined laminated bedding in part. Cross bedded in part and cavernous in part. Sandstone band 446'-447'.
														Note : No sulphides other than pyrite were noted in the material 266' to 450'.

740(2)-4

C.R.A.E. 33

CRA EXPLORATION PTY. LTD.

RECORD OF DIAMOND DRILLING

Hole No. E40/65
Drilled by
Core Recovery
Logged by
Assays by

AREA OF OPERATION EDIACARA S.M.L. 77
Date Commenced 2/8/65
Date Completed 31/1/66

Reduced Level of Collar 1130 approx.
~~Coords~~ Depth 517'0"
~~Bearings~~ Inclination : Vertical
Vertical Angle

Date Logged	From Feet	To Feet	~~Distance~~ Advance	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	450'0	454'9	4'9	4'9				Grey-green shaly sandstone, bedding 80-85° to LCA.
	454'9	459'3	4'6	4'6				As above to 455'6, then grey sandy dolomite.
	459'3	463'9	4'6	4'6				Grey sandy dolomite, slightly pyritic, some worm tubes.
	463'9	468'6	4'9	3'9				As above : also leached oolitic bands
	468'6	473'6	5'0	4'8				As above : also grey grit with pyrite 470'7-470'9.
	473'6	476'3	2'9	2'9				Grey sandy dolomite, green partings, bedding 80° to LCA.
	476'3	481'0	4'9	4'8				Grey laminated sandy shale, few worm tubes.
	481'0	485'6	4'6	4'4				As above
	485'6	490'0	4'6	4'6				Green-pink worm burrow sandstone.
	490'0	494'9	4'9	4'6				As above to 493'8 (base of Cambrian). Then clean white quartzite = Pound quartzite.
	494'9	499'6	4'9	4'7				White quartzite
	499'6	504'0	4'6	4'6				As above
	504'0	510'0	6'0	5'9				As above
	510'0	514'6	4'6	4'1				As above
	514'6	519'0	4'6	4'6				As above : also bedding 80° to LCA.
	519'0	525'6	6'6	6'6				As above
	525'6	534'10	9'4	9'0				White quartzite to 530'10. Then quartzite with dark red bands at 80° to LCA.
	534'10	542'6	7'8	7'6				Brown sandstone with red shaly laminations at 80-85° to LCA.
	542'6	551'2	8'8	8'5				As above
	551'2	556'2	5'0	4'2				As above : but bedding at 90° to LCA.
	556'2	562'6	6'4	5'8				As above
	562'6	571'0	8'6	4'3				As above : bedding at 90° to LCA.
TOTALS			121'0	111'10"				

NOTE :- This hole completed at terminal depth of 571'0".

740(2) - 5

C.R.A.E. 33

Hole No. E40/65
Drilled by Machine E1000
Core Recovery
Logged by D. H. Mackenzie
Assays by

SUMMARY FORM

CRA EXPLORATION PTY. LTD.

RECORD OF DIAMOND DRILLING

AREA OF OPERATION EDIACARA, S.M.L.77
Date Commenced 2/9/65
Date Completed

Reduced Level of Collar 1130 approx.
Co-ords
Bearing 15 30 N 160 E
Vertical Angle

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	0'0	116'1						Massive grey dolomite with many small cavities. Mn in spots, dendrites and thin crack fillings, a few limonite stained cracks and occasional signs of leaching. Colour grades down to buff below 91'0 to 116'1.
	116'1	208'2						Laminated grey-buff dolomite with many thin intercolations of sedimentary dolomite breccia. Many limonite stained cracks and a few thin limonite veins, a few limonite spots after ? pyrite. Mn dendrites and crack fillings common. A little malachite in limonite veins between 132'10 and 133'4. Two specks galena at 138'5. A little galena in thin limonite vein between 144'11 and 145'6. Some small cavities. Lamination makes 70°-85° with long core axis.
	208'2	266'0						Grey dolomite, occasionally brecciated, rarely sandy. Limonite stain on cracks and in a few small cavities. Limonite spots with box-works after sulphides between 218'0 and 220'0. A little Mn in hair-cracks.

740(2)-6

SUMMARY FORM

Hole No. Ediacara SML 77 Hole E40/65 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value							Av. Val. and Width	Geological [Description
	450'0"	485'6	35'6											Transition Beds : grey sandy dolomites, sandy shales and shaly sandstones, with occasional pyrite and some worm tubes.
	485'6	493'8	8'2											Worm burrow sandstone; base of Cambrian.
	493'8	571'0	77'4											Precambrian Pound Quartzite : white quartzites and brown shaly sandstones.

740(2) -7.

Hole No. E41/65
Drilled by Machine E2000
Core Recovery
Logged by D. H. Mackenzie
Assays by

SUMMARY FORM

RIO TINTO SOUTHERN PTY. LTD.
RECORD OF DIAMOND DRILLING

AREA OF OPERATION EDIACARA, S.M.L. 77
Date Commenced 2/8/65
Date Completed

Reduced Level of Collar 1080
Co-ords
Bearing 810S 2530W
Vertical Angle

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	0'0	50'9						Massive grey dolomite with many cavities. Occasional thin sandy interbeds and thin sedimentary breccia bands. Quartz patches common. Limonite stain on cracks prominent.
	50'9	155'3						Grey sandy dolomite with many bands sedimentary dolomite breccia. Sandy beds make 60°-65° with long core axis. A few small cavities. Limonite stain on cracks and a few limonite spots after ?pyrite. A little Mn in dendrites.
	153'3	164'0						Medium grey dolomite, massive with few cavities.
	164'0	180'0						Pale grey dolomite with common cavities, minor limonite staining. Small copper carbonate stain at 179'6".
	180'0	190'0						Pale grey massive dolomite, no cavities.
	190'0	193'0						As above, medium grey colour.
	193'0	200'0						Medium grey massive dolomite shattered. Minor limonite staining on fracture surfaces.
	200'0	205'0						As above, but not shattered.
	205'0	248'0						Medium grey massive and shattered dolomite with only minor limonite staining on fracture surfaces. Core size change to BXM at 231'10.
	248'0	258'0						As above, some cavities developed.
	258'0	279'0						Medium grey massive dolomite, mostly shattered into small pieces. Generally free of cavities. Fine pyrite at 266'.
	279'0	299'0						As above, but with cavities developed. Generally free of limonite staining.
	299'0	329'0						Medium grey massive dolomite, shattered in part, generally free of cavities. Pyrite at 304' to 306'.

RIO TINTO SOUTHERN PTY. LTD.
RECORD OF DIAMOND DRILLING

Hole No. E41/65
Drilled by Machine E2000
Core Recovery
Logged by D. H. Mackenzie
Assays by

AREA OF OPERATION EDIACARA, S.M.L. 77
Date Commenced 2/8/65
Date Completed

Reduced Level of Collar 1080
Co-ords 810S 2530W
Bearing
Vertical Angle

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	0'0	2'0	1'0					Massive grey dolomite
	2'0	6'6	1'7					Massive grey dolomite with a little limonite staining along cracks
	6'6	10'0	0'10					As above
	10'0	11'0	1'0					As above
	11'0	15'0	4'0					Grey dolomite with narrow sandy interbeds at right angles to long core axis. Limonite staining along cracks.
	15'0	19'8	4'2					Grey dolomite with limonite staining on cracks intensely developed at 17'6 to 18'6. A little quartz.
	19'8	22'8	2'8					Grey dolomite with quartzy patches, small cavities, thin sandy interbeds and limonite staining on cracks.
	22'8	24'0	1'4					Grey dolomite with cavities up to ½ inch across, some limonite staining on cracks.
	24'0	27'0	2'9					Grey dolomite with limonite staining on cracks, sandy interbeds up to ½ inch thick, some small cavities.
	27'0	31'8	4'0					Grey dolomite with cavities and limonite stain on cracks, slightly brecciated
	31'8	36'0	1'1					Brecciated grey dolomite with limonite stain on cracks and a few small cavities.
	36'0	41'8	1'7					As above
	41'8	46'0	2'3					Grey dolomite, slightly brecciated with thin sandy interbeds and some small cavities.
	46'0	50'0	3'9					Grey dolomite, brecciated with small cavities, limonite stain on cracks, some cracks lined with calcite.
	50'0	50'9	0'8					Grey dolomite.
	50'9	55'3	3'5					Grey dolomite with quartz patches, slightly sandy, limonite stain on cracks.
	55'3	57'6	2'0					Slightly sandy grey dolomite with quartz patches and limonite stain on cracks.
	57'6	62'2	4'4					As above but brecciated

740(2) - 8

Hole No. E41/65

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value							Av. Val. and Width	Geological Description
	62'2	66'6	4'4											Grey sandy dolomite brecciated in places, bedding makes 65° with long core axis, limonite stain on cracks.
	66'6	69'10	2'10											Grey dolomite with sandy interbeds, quartz patches, slightly brecciated, limonite stain on cracks.
	69'10	75'0	5'2											Brecciated grey sandy dolomite with small quartz patches and limonite stain on cracks.
	75'0	79'8	4'5											As above with a few Mn dendrites
	79'8	82'2	2'6											As above with a few small cavities
	82'2	84'1	1'11											Slightly brecciated sandy dolomite with few small cavities.
	84'1	88'5	4'4											Brecciated grey dolomite, sandy in places, some small cavities, quartz patches and a few limonite spots after pyrite, bedding makes 60° with core axis.
	88'5	93'2	4'9											Brecciated grey dolomite with small cavities lined with calcite, limonite stain on cracks, a little Mn in dendrites.
	93'2	97'10	4'4											As above
	97'10	100'8	2'9											As above
	100'8	101'10	1'2											Brecciated grey sandy dolomite with a few small cavities.
	101'10	106'0	4'2											As above with limonite in cracks and some Mn dendrites.
	106'0	110'8	4'8											Brecciated grey sandy dolomite, limonite stain on cracks.
	110'8	115'4	4'4											Brecciated grey sandy dolomite with small cavities, much limonite stain on cracks.
	115'4	118'9	3'0											As above, with some cavities lined with calcite.
	118'9	120'0	1'1											Grey sandy dolomite with limonite stain on cracks.
	120'0	124'8	4'5											Brecciated grey dolomite sandy in places with limonite stain on cracks, small cavities occur.
	124'8	129'4	4'6											As above
	129'4	134'0	4'6											As above
	134'0	136'4	2'2											As above
	136'4	138'8	2'4											Brecciated grey dolomite, sandy in places, limonite stain on cracks, a few Mn dendrites.
	138'8	143'4	4'1											As above with a few small cavities
	143'4	148'0	4'0											Brecciated grey dolomite, sandy in places, limonite stain on cracks, a few Mn dendrites, a few small cavities.
	148'0	152'0	4'0											Grey dolomite, sandy and slightly brecciated in places, a few small cavities limonite stain on cracks.

Hole No. E/41/65

C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	152'0	155'3	3'3					Brecciated grey dolomite, sandy in places, a few Mn dendrites limonite stain on cracks.
	155'3	164'0						Medium grey dolomite, massive with few cavities.
	164'0	180'0						Pale grey dolomite with common cavities minor limonite staining. Small copper carbonate stain at 179'6".
	180'0	190'0						Pale grey massive dolomite, no cavities.
	190'0	193'0						As above, medium grey colour
	193'0	200'0						Medium grey massive dolomite shattered. Minor limonite staining on fracture surfaces.
	200'0	205'0						As above, but not shattered
	205'0	248'0						Medium grey massive and shattered dolomite with only minor limonite staining on fracture surfaces. Core size change to HXM at 231'10".
	248'0	258'0						As above, some cavities developed.
	258'0	279'0						Medium grey massive dolomite mostly shattered into small pieces. Generally free of cavities. Fine pyrite at 266'.
	279'0	299'0						As above but with cavities developed. Generally free of limonite staining.
	299'0	309'0						Medium grey massive dolomite, shattered in part, generally free of cavities. Pyrite at 304' and 306'.

740(2) - 10

Hole No. E41/65 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
								Deflection at 309'0":-
	309'0	311'0	1'3	2'0				Grey dolomite
	311'0	316'3	4'9	5'3				Grey dolomite, slightly sandy in places, occasional irregular small cavities.
	316'3	320'9	3'0	4'6				Grey dolomite with closely spaced partings.
	320'9	324'3	2'6	3'6				As above
	324'3	328'9	3'1	4'6				Friable grey dolomite, sandy places, angle bedding to long core axis = 80°
	328'9	330'7	1'8	1'10				Grey dolomite with occasional quartz spots.
	330'7	333'6	2'8	2'11				Grey dolomite with irregular partings and occasional quartz and calcite spots.
	333'6	338'3	4'0	4'9				As above
	338'3	343'0	3'8	4'9				Grey dolomite
	343'0	344'6	5"	1'6				As above
	344'6	349'3	2'11	4'9				Grey dolomite, laminated and sandy in places, friable, small Mn spots.
	349'3	353'5	3'0	4'2				Grey sandy dolomite with small irregular cavities.
	353'5	358'3	3'3	4'10				Grey-buff dolomite, sandy in places, with small Mn spots.
	358'3	361'6	2'6	3'3				Grey-buff dolomite with closely spaced partings and small Mn spots.
	361'6	364'9	2'1	3'3				As above
	364'9	367'7	2'2	2'10				Buff dolomite, sandy in places, with small cavities and irregular partings.
	367'7	371'6	3'0	3'11				Buff dolomite, fractured, some small cavities
	371'6	376'3	2'9	4'9				As above with small Mn spots
	376'3	382'0	3'6	5'9				As above, friable and leached.
	382'0	386'9	4'5	4'9				Buff sandy dolomite with small cavities. Prominent rusty partings at 383'0 in leached zone.
	386'9	387'0	3"	3"				Buff sandy dolomite.
	387'0	391'9	4'3	4'9				Buff sandy dolomite with irregular partings, small cavities and occasional Mn spots.
	391'9	395'9	2'9	4'0				As above
	395'9	400'0	2'0	4'3				As above
	400'0	404'6	3'4	4'6				Leached buff dolomite with small cavities and irregular partings.
	404'6	407'3	1'9	2'9				Buff dolomite.

740 (2) -11

Hole No. E4/65 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	407'3	410'3	2'0	3'0				Buff-pink sandy dolomite, small Mn spots and some rusty partings.
	410'3	414'6	3'0	4'3				As above
	414'6	417'9	2'2	3'3				As above
	417'9	422'0	2'0	4'3				Fractured grey dolomite
	422'0	425'6	2'6	3'6				Grey dolomite with pink patches. Clayey buff dolomite with rusty partings from 424' - 424'6
	425'6	427'3	1'7	1'9				Grey dolomite with some rusty partings
	427'3	431'0	3'2	3'9				As above
	431'0	434'0	2'8	3'0				Grey dolomite
	434'0	438'0	3'0	4'0				Grey dolomite with occasional clay partings
	438'0	441'3	2'10	3'3				Grey dolomite with a few small cavities
	441'3	444'6	2'10	3'3				Grey dolomite, sandy in places
	444'6	447'9	2'11	3'3				Fractured grey dolomite
	447'9	452'0	11"	4'3				Grey dolomite
	452'0	456'6	4'3	4'6				Grey dolomite, brecciated at 454'0".
	456'6	461'0	3'6	4'6				Grey dolomite, sandy and brecciated in places
	461'0	463'3	2'0	2'3				Grey sandy dolomite with clay partings.
	463'3	466'6	2'9	3'3				As above
	466'6	470'0	2'11	3'6				Grey dolomite, brecciated and sandy in places.
	470'0	472'10	2'6	2'10				Grey sandy dolomite, bedding at 90° to L.C.A.
	472'10	473'3	5"	5"				Grey dolomite
	473'3	476'3	2'2	3'0				Grey-buff dolomite with thin sandy interbeds
	476'3	479'6	2'6	3'3				Grey-buff dolomite
	479'6	482'1	2'7	2'7				As above
	482'1	485'9	3'2	3'8				Grey-buff dolomite sandy in places
	485'9	489'0	3'0	3'3				As above
	489'0	492'9	3'6	3'9				"
	492'9	495'11	2'11	3'2				"
	495'11	496'5	6"	6"				"
	496'5	500'0	2'7	3'7				"
	500'0	504'0	3'2	4'0				"
	504'0	508'6	3'3	4'6				"
	508'6	513'2	4'0	4'8				"
	513'2	517'11	4'3	4'9				Buff sandy dolomite with small cavities and rusty partings. a few ? worm tubes.

740(2) - 12

Hole No. E41/65 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	517'11	520'7	2'6	2'8				Buff sandy dolomite
	520'7	521'11	1'3	1'4				Buff dolomite with small cavities
	521'11	525'9	2'6	3'10				As above
	525'9	529'0	2'6	3'3				Buff-pink sandy dolomite
	529'0	533'3	4'0	4'3				Buff dolomite with small cavities and Mn spots
	533'3	538'0	4'2	4'9				As above
	538'0	541'10	3'7	3'10				Buff dolomite sandy in places
	541'10	545'7	3'3	3'9				As above
	545'7	550'0	3'10	4'5				"
	550'0	554'6	4'5	4'6				Buff dolomite with small Mn spots
	554'6	559'0	3'2	4'6				Buff dolomite, sandy in places, irregular Mn veins and cavity fillings at 554'6, 555'0 and 559'0.
	559'0	562'6	2'5	3'6				Buff dolomite, brecciated and sandy in places. Irregular Mn veining from 562'0 to 562'6.
	562'6	565'9	2'3	3'3				Buff sandy dolomite with thin Mn veining.
	565'9	569'0	2'3	3'3				Buff sandy dolomite
	569'0	573'6	1'6	4'6				Buff sandy dolomite
	573'6	577'6	3'10	4'0				Buff sandy and laminated dolomite, bedding makes 75° with long core axis.
	577'6	582'0	3'6	4'6				Buff laminated dolomite, bedding 80° to L.C.A.
	582'0	586'0	3'3	4'0				Grey laminated dolomite, bedding 60-65° to L.C.A.
	586'0	590'6	3'6	4'6				As above
	590'6	594'0	2'1	3'6				Grey laminated dolomite
	594'0	597'9	2'0	3'9				Grey laminated dolomite breccia with Mn veinlets
	597'9	601'6	1'9	3'9				As above
	601'6	603'6	1'10	2'0				As above, with a little galena in small crystals in the thin Mn veinlets, not worth assay.
	603'6	607'0	1'9	3'6				Grey dolomite
	607'0	609'7	1'10	2'7				As above
	609'7	612'4	2'8	2'9				"
	612'4	614'0	1'7	1'8				Grey laminated dolomite
	614'0	616'6	2'6	2'6				As above
	616'6	619'6	2'4	3'0				Grey sandy dolomite
	619'6	622'6	2'10	3'0				Grey laminated dolomite : minute galena specks in thin Mn parting at 620'0.

740(2) – 13

Hole No. E41/65 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	622'6	625'6	2'3	3'0				Grey laminated dolomite
	625'6	628'6	2'8	3'0				Grey laminated dolomite : thin pyrite and galena coatings on partings at 626'10, not worth assaying
	628'6	631'3	2'2	2'9				Grey laminated dolomite
	631'3	635'5	10"	4'2				Grey dolomite
	635'5	639'5	10"	4'0				Grey dolomite with band friable dolomite sandy clay
	639'5	643'6	9"	4'1				Grey laminated dolomite
	643'6	648'0	2'0	4'6				Fractured grey dolomite with clay partings
	648'0	652'6	2"	4'6				Grey friable dolomitic sandy clay
	652'6	658'0	7"	5'6				Grey laminated dolomite, much fractured
	658'0	661'3	1'0	3'3				As above
	661'3	665'9	8"	4'6				"
	665'9	668'9	10"	3'0				Grey dolomite
	668'9	671'3	2'0	2'6				"
	671'3	674'0	2'3	2'9				"
	674'0	678'6	3'0	4'6				"
	678'6	682'6	2'8	4'0				"
	682'6	685'11	2'9	3'5				Grey dolomite, siliceous breccia from 685'10-685'11
	685'11	689'6	2'1	3'7				Grey dolomite with thin siliceous breccia bands.
	689'6	691'6	1'6	2'0				Grey dolomite. A little disseminated pyrite, also thin films pyrite and galena on fractures.
	691'6	694'6	2'7	3'0				Grey dolomite breccia with pyritic matrix and some disseminated galena, also vein coatings. Estimated assay 0.2-0.4%Pb.
	694'6	699'2	4'0	4'8				Grey dolomite, brecciated in places; pyrite and galena, latter conspicuous from 696'-697'. Estimated assay 2-3% Pb.
	699'2	702'5	3'2	3'3				Grey dolomite breccia with pyrite and galena in thin veinlets and as matrix.
	702'5	704'9	2'3	2'4				Grey dolomite breccia with films pyrite and galena.
	704'9	709'3	4'0	4'6				Grey dolomite, brecciated in places, conspicuous pyrite, a little galena; estimated assay 0.1% Pb.
	709'3	712'8	3'2	3'5				Grey dolomite breccia; pyrite and galena in thin veinlets and cavity linings.
	712'8	716'2	3'4	3'6				As above, less pyrite and galena, estimated assay about 0.1% Pb.

	From	To	% Pb	oz/ton Ag
	690	695	0.85	3.0
	695	700	1.05	3.0
	700	705	0.85	3.0
	705	710	0.80	3.0
	710	715	0.60	2.2
	715	720	0.60	2.2
	720	725	0.50	2.2
	725	730	0.65	3.0
	730	735	0.60	3.0
	735	740	0.67	3.6
	740	745	0.60	2.6
	745	750	0.75	3.0
	750	755	1.00	4.0
	755	760	0.80	2.0
		Avge.	0.72	2.8

740(2) - 14

Hole No. F41/65 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value							Av. Val. and Width	Geological Description
	716'2	719'11	3'4	3'9										As above, a little galena throughout
	719'11	722'9	2'9	2'10										As above
	722'9	726'6	3'8	3'9										Grey dolomite breccia. A little galena throughout, pyrite conspicuous in matrix.
	726'6	729'6	2'8	3'0										Grey dolomite breccia. A little pyrite and galena as spots and vein films.
	729'6	734'0	4'3	4'6										As above
	734'0	738'6	4'3	4'6										As above. Afew specks chalcopyrite 737'.
	738'6	743'2	4'8	4'8										As above : estimated assay 0.1% Pb.
	743'2	747'3	3'6	4'1										As above
	747'3	751'9	4'3	4'6										"
	751'9	755'9	2'3	4'0										"
	755'9	759'3	3'6	3'6		From (Feet)	To		%Pb.	ozs Ag				As above. Coarse galena in quartose patch at 758'9.
	759'3	763'6	3'10	4'3		760.00	763.50		0.14	0.22				As above
	763'6	764'10	1'4	1'4		763.50	769.33		0.08	0.15				Grey dolomite breccia
	764'10	769'4	4'6	4'6										Grey dolomite, brecciated in places, minute amount pyrite and galena present. Not worth assaying.
	769'4	773'3	3'0	3'11		769.33	773.25	3.92	0.10	0.15				As above
	773'3	778'0	4'8	4'9		773.25	778.00	4.75	0.21	0.19				"
	778'0	781'9	3'4	3'9		778.00	781.75	3.75	0.49	0.27				"
	781'9	786'6	4'9	4'9		781.75	786.5	4.75	0.27	0.19				As above, specks chalcopyrite at 785'9.
	786'6	791'0	4'4	4'6		786.5	791.0	4.5	0.35	0.19				Grey dolomite, brecciated and sandy in places, a little pyrite and galena present. Coarse galena in two quartzose patches at 787' and 788'4.
	791'0	795'6	4'6	4'6		791.0	795.5		0.11	0.12				Grey sandy dolomite breccia, little pyrite and galena
	795'6	800'0	4'6	4'6		795.5	800.0		0.47	0.19				As above : not worth assaying.

Core recovery from 309' to 800' = 370'7.

740(2)-15

Hole No. E 41/65

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value From feet	Assay Value To feet	Assay Value	Assay Value % Pb	Assay Value ozs Ag.	Av. Val. and Width	Geological Description
	800'	804'4"	4'4"	4'4"	~~951~~	800.0	804.33	4.33	0.19	0.12		Grey dolomite breccia with pyrite and galena in part
	804'4"	807'7"	3'3"	4'		804.33	807.58	3.25	0.08	0.12		" " " trace galena
	807'7"	811'1"	3'4"	3'		807.58	811.08	3.50	0.11	0.11		" " " "
	811'1"	815'1"	4'	1'		811.08	815.08		0.06	0.12		" " trace pyrite
	815'	817'7"	2'6"	2'6"								" breccia, trace pyrite
	817'7"	821'7"	4'	2'								" "
	821'7"	823'7"	2'	6"								" "
	823'7"	824'8"	1'1"	9"								" "
	824'8"	826'4"	1'8"	1'8"								" " " "
	826'4"	827'11"	1'7"	1'7"								" " " "
	827'11"	829'5"	1'6"	6"								" " "
	829'5"	831'6"	2'1"	1'								Light grey dolomite, brecciated in part. Steep dipping cleavage
	831'6"	835'6"	4'	3'								" " " " "
	835'6"	837'4"	1'10"	1'								Light grey friable fine grained sand
	837'4"	842'	4'8"	2'6"								Medium grey dolomite - massive
	842'	846'9"	4'9"	1'								" " trace pyrite and galena
	846'9"	850'9"	4'	6"								Grey - buff dolomite
	850'9"	852'5"	1'8"	1'								" " "
	852'5"	853'11"	1'6"	1'								Grey dolomite
	853'11"	856'3"	2'4"	6"								" "
	856'3"	860'6"	4'3"	3'								" " breccia cavernous
	860'6"	864'6"	4'	3'								Light to medium grey, sandy dolomite, generally massive
	864'6"	868'5"	3'11"	2'								As above with thin band dark grey to brown
	868'5"	871'2"	2'9"	2'6"								Medium grey massive dolomite with calcite veining
	871'2"	873'5"	2'3"	1'6"								" " dolomite breccia
	873'5"	877'11"	4'6"	3'								Grey laminated dolomite and dolomite breccia, some calcite veining
	877'11"	880'11"	3'	3'								As above
	880'11"	885'5"	4'6"	3'								Light to dark grey dolomite, laminated and brecciated
	885'5"	890'6"	5'1"	1'								Dark grey dolomite, trace galena, brown sandy dolomite at base
	890'6"	895'8"	5'2"	6"								Brown ? dolomite fault pug and fragments dolomite
	895'8"	900'5"	4'9"	NIL								? Sample missing from fault pug and zone
	900'5"	905'6"	5'1"	6"								Gritty grey-brown dolomite

740(2) - 16

Hole No. E41/65 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value							Av. Val. and Width	Geological Description
	905'6"	910'6"	5'	6"										Grey dolomite
	910'6"	915'6"	5'	1'										Grey to brown shale,
	915'6"	920'5"	4'11"	1'8"										Light grey to brown shale, thin dolomite bed
	920'5"	925'6"	5'1"	1'3"										" " " "
	925'6"	930'6"	5'	3"										Brown sandy dolomite
	930'6"	935'6"	5'	6"										" "
	935'6"	940'3"	4'9"	3'										White to brown shale. 3" at bottom grey green grey and brown sandy shale
	940'3"	945'3"	5'	3'										Interbedded sandy shale, as above, and shale
	945'3"	949'3"	4'	3'6"										Grey saady dolomite with red & green patches
	949'3"	951'3"	2'	2'										As above
	951'3"	955'9"	4'6"	4'6"										Top 3" as above. Remainder massive sandstone, slightly calcareous at top.
	955'9"	960'3"	4'6"	3'6"										White quartzite
	960'3"	965'	4'9"	4'										" "
	965'	967'	2'	2'										White quartzite, ?vertical bedding in part.

740(2) - 17.

RIO TINTO SOUTHERN PTY. LTD.
RECORD OF DIAMOND DRILLING

Hole No. 242/65
Drilled by
Core Recovery
Logged by D. MacKenzie
Assays by

AREA OF OPERATION MIACARA, S. A. S.M.L. 77
Date Commenced
Date Completed

Reduced Level of Collar
Co-ords 00, 1280E
Bearing
Vertical Angle

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	Surface	5' 0"	5' 0"	7"				Grey dolomite with Mn stain
	5' 0"	8' 3"	3' 3"	2'9"				Grey dolomite with Mn and limonite stain, quartzose patches
	8' 3"	12' 0"	3' 9"	3' 9"				As above
	12' 0"	17' 0"	5' 0"	4' 9"				As above
	17' 0"	22' 0"	5' 0"	5' 0"				As above
	22' 0"	32' 0"	10' 0"	9"				As above
	32' 0"	35' 0"	3' 0"	3' 0"				Grey buff dolomite, brecciated in places, much Mn stain and dendrites, and a little limonite stain
	35' 0"	40' 0"	5' 0"	1' 0"				As above
	40' 0"	44' 0"	4' 0"	4' 0"				As above
	44' 0"	49' 0"	5' 0"	2' 8"				As above
	49' 0"	53' 0"	4' 0"	2' 1"				Buff dolomite with Mn veins, dendrites, stain and a little limonite stain
	53' 0"	56' 0"	3' 0"	1' 10"				As above but dark red stain 55' 4" - 56' 0"
	56' 0"	60' 9"	4' 9"	3' 5"				Buff dolomite with much Mn stain and Fe stain
	60' 9"	64' 3"	3' 6"	3' 6"				As above
	64' 3"	67' 6"	3' 3"	3' 3"				As above
	67' 6"	70' 0"	2' 6"	2' 6"				As above
	70' 0"	74' 6"	4' 6"	4' 1"				Buff dolomite with Mn dendrites
	74' 6"	79' 6"	5' 0"	5' 0"				As above, brecciated and rusty at 75' 4", brecciated at 77' 6"
	79' 6"	82' 6"	3' 0"	3' 0"				Buff dolomite with Mn dendrites
	82' 6"	85' 3"	2' 9"	2' 6"				As above
	85' 3"	88' 6"	3' 3"	3' 0"				Buff pink laminated dolomite with Mn veinlets, bedding makes 45°-60° with L.C.A.
	88' 6"	91' 9"	3' 3"	3' 3"				As above, bedding makes 30° with L.C.A.
	91' 9"	94' 6"	2' 9"	2' 7"				Brecciated buff pink laminated dolomite
	94' 6"	99' 6"	5' 0"	4' 8"				Buff laminated dolomite, brecciated in places, Mn dendrites, rusty partings, bedding makes 55° with L.C.A.

740(2) - 18

Hole No. E42/65

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value							Av. Val. and Width	Geological Description
	99' 6"	102' 9"	3' 3"	3' 3"										Brecciated buff-grey laminated dolomite with Mn dendrites
	102' 9"	106' 6"	3' 9"	3' 0"										As above
	106' 6"	110' 6"	4' 0"	3' 8"										Grey laminated dolomite, brecciated in places, Mn dendrites, rusty partings
	110' 6"	115' 3"	4' 9"	4' 9"										As above, bedding makes 50° with L.C.A.
	115' 3"	118' 3"	3' 0"	2' 5"										As above
	118' 3"	123' 3"	5' 0"	4' 8"										As above, dark red stain at 123' 0", bedding makes 50° with L.C.A.
	123' 3"	128' 3"	5' 0"	4' 10"										Grey - buff laminated dolomite with Mn dendrites, brecciated in places
	128' 3"	133' 3"	5' 0"	4' 6"										As above
	133' 3"	136' 6"	3' 3"	2' 10"										As above
	136' 6"	141' 6"	5' 0"	4' 3"										As above
	141' 6"	146' 8"	5' 2"	4' 2"										As above
	146' 8"	151' 8"	5' 0"	3' 9"										As above
	151' 8"	157' 0"	5' 4"	4' 9"										As above
	157' 0"	162' 0"	5' 0"	4' 9"										Buff laminated dolomite, brecciated in places, Mn veinlets, bedding makes 75° with L.C.A.
	162' 0"	167' 0"	5' 0"	4' 9"										As above
	167' 0"	172' 0"	5' 0"	4' 4"										As above, bedding at 60° to L.C.A.
	172' 0"	177' 0"	5' 0"	4' 8"										As above, bedding at 80° to L.C.A.
	177' 0"	182' 0"	5' 0"	5' 0"										Buff laminated dolomite with rusty partings and small cavities, bedding at 85° to L.C.A.
	182' 0"	187' 0"	5' 0"	4' 5"										Grey - buff laminated dolomite with Mn dendrites
	187' 0"	192' 0"	5' 0"	5' 0"										As above, bedding at 85° to L.C.A.
	192' 0"	197' 0"	5' 0"	4' 10"										As above, dolomite slightly clayey
	197' 0"	201' 6"	4' 6"	4' 0"										As above, red clayey band at 201' 0"
	201' 6"	206' 6"	5' 0"	4' 8"										As above, bedding at 55° - 90° to L.C.A.

740(2) - 19

C.R.A.E. 33

CRA EXPLORATION PTY. LTD.

RECORD OF DIAMOND DRILLING

Hole No. E42/65
Drilled by
Core Recovery
Logged by
Assays by

AREA OF OPERATION EDIACARA, S.A., S.M.L.??
Date Commenced
Date Completed

Reduced Level of Collar
Co-ords
Bearing
Vertical Angle

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	206'6"	211'0"	4'6"	3'6"				Buff-grey laminated clayey dolomite with Mn veinlets, brecciated in
	211'0"	216'0"	5'0"	4'5"				As above.
	216'0"	222'0"	4'4"	6'0"				Grey-buff laminated dolomite, clayey, with Mn veinlets and dendrites
	222'0"	227'0"	5'0"	4'6"				As above
	227'0"	232'0"	5'0"	4'7"				As above
	232'0"	237'0"	5'0"	3'6"				As above
	237'0"	242'0"	5'0"	3'6"				As above to 241'0"
								From 241'0" grey brecciated dolomite
	242'0"	247'0"	5'0"	4'5"				Grey brecciated dolomite with thin galena film at 244'3"; not with
	247'0"	252'0"	5'0"	3'3"				Grey-buff dolomite breccia with rusty clay partings.
	252'0"	257'0"	5'0"	3'5"				Grey-buff dolomite breccia
	257'0"	262'0"	5'0"	4'6"				As above, with rusty partings
	262'0"	265'0"	3'0"	2'4"				As above
	265'0"	270'0"	5'0"	2'0"				Grey dolomite breccia
	270'0"	275'0"	5'0"	2'3"				As above
	275'0"	280'0"	5'0"	1'2"				As above
	280'0"	284'3"	4'3"	2'9"				Grey dolomite breccia, clayey in places
	284'3"	287'6"	3'3"	2'3"				As above
	287'6"	292'0"	4'6"	3'0"				Grey dolomite breccia
	292'0"	297'0"	5'0"	3'0"				Grey dolomite breccia with many small cavities
	297'0"	300'6"	3'6"	1'4"				As above
	300'6"	304'3"	3'9"	3'0"				As above
	304'3"	307'3"	3'0"	-10"				As above
	307'3"	312'3"	5'0"	1'11"				As above
	312'3"	315'0"	2'9"	1'6"				Grey oolitic dolomite with many small cavities
	315'0"	320'0"	5'0"	2'5"				Grey laminated dolomited to 319'0"
								From 319'0" grey oolitic dolomite with small cavities

740(2) - 20

C.R.A.E. 33

CRA EXPLORATION PTY. LTD.

RECORD OF DIAMOND DRILLING

Hole No. E42/65
Drilled by
Core Recovery
Logged by
Assays by

AREA OF OPERATION EDIACARA, S.A. S.M.L.77
Date Commenced
Date Completed

Reduced Level of Collar
Co-ords
Bearing
Vertical Angle

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	320'0"	325'0"	5'0"	2'0"				Grey oolitic dolomite with small cavities
	325'0"	329'3"	4'3"	-2"				Grey dolomite breccia
	329'3"	331'3"	2'0"	1'9"				Grey dolomite with cavities and clay partings
	331'3"	333'9"	2'6"	-6"				Grey dolomite with cavities
	333'9"	336'9"	3'0"	1'2"				Grey dolomite and dolomite breccia. Thin galena film on fracture at 335'3".
	336'9"	339'6"	2'9"	1'7"				Grey dolomite breccia with clay partings
	339'6"	342'0"	2'6"	1'4"				Grey dolomite with clay partings
	342'0"	345'0"	3'0"	1'3"				Grey dolomite breccia with clay partings
	345'0"	347'3"	2'3"	1'5"				As above
	347'3"	351'0"	3'9"	3'4"				As above
	351'0"	355'3"	4'3"	2'11"				Grey laminated dolomite, brecciated in places. A speck galena at 353'9".
	355'3"	360'0"	4'9"	1'4"				Grey dolomite with clay partings
	360'0"	363'0"	3'0"	2'9"				Grey dolomite
	363'0"	367'0"	4'0"	2'10"				Grey dolomite breccia with clay partings
	367'0"	369'9"	2'9"	2'4"				Grey dolomite with breccia bands.
	369'9"	374'9"	5'0"	4'9"				Grey dolomite breccia
	374'9"	379'9"	5'0"	4'7"				Grey dolomite breccia, a little pyrite lining cavities
	379'9"	384'9"	5'0"	4'1"				Grey dolomite breccia.
	384'9"	388'0"	3'3"	2'2"				Grey dolomite
	388'0"	393'0"	5'0"	1'8"				Grey sandy dolomite
	393'0"	398'0"	5'0"	3'0"				As above
	398'0"	401'6"	3'6"	3'1"				Grey sandy dolomite breccia
	401'6"	405'0"	3'6"	3'3"				Grey oolitic dolomite to 404'0" . From 404'0" grey dolomite breccia.
	405'0"	410'0"	5'0"	5'0"				Grey dolomite breccia, oolitic and laminated in places, bedding makes 70° with L.C.A.
	410'0"	413'0"	3'0"	1'10"				Grey dolomite breccia

740(2) - 21

Hole No. E 42/65 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value							Av. Val. and Width	Geological Description
	413'0"	417'0"	4'0"	2'6"										Red-brown siliceous dolomite 413'0"-414'6". Grey dolomite breccia 414'6"-417'0".
	417'0"	420'5"	3'5"	2'3"										Grey dolomite breccia
	420'5"	424'9"	4'4"	-5"										As above
	424'9"	429'0"	4'3"	3'10"										Grey-buff laminated dolomite, bedding makes 60° with L.C.A.
														Core Recovery Surface - 429'0" = 312'11"

740(2)-22

Hole No. ~~B42/65~~ C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
8/12/65	429'	432'	3'	9"				Grey-buff dolomite breecia.
	432'	434'4	2'4"	1' 3"				Medium grey, coarse textured laminated oolitic in part dolomite.
	434'4"	438'9"	4'5"	3' 6"				Grey-buff dolomite breccia.
	~~438'6"~~	~~442'6"~~	3'9".	3'				Grey to red-brown cavernous dolomite breccia
	442'6"	448'	5'6"	3' 6"				As above
	448'	455'6	7'6"	2' 5"				Grey to brown sandy cross bedded dolomite, oolitic in part, minor cavities.
	455'6"	462'	6'6"	10"			1	Brown soft micaceous siltstone-mudstone at top of 10" ~~seemsay~~ recovery, light grey dolomite at base.
	462'	467'3"	5'3"	6"				Brownish red, soft micaceous siltstone.
	467'3"	474'6"	7'3"	3'				Top 4" red soft siltstone, 15" light grey massive dolomite.
								17" white to pink soft siltsone
	474'6"	475'	6"	NIL				Light grey to pink soft siltstone, some minor brown dolomite ↓ ↓ ↓ ↓
	475'	480'	5'	1'6"				Interbedded brown mudstone and grey dolomite
	480'	484'8"	4'8"	2'				" light grey " " " "
	484'8"	487'4"	2'8"	1'6"				White to light grey, partly cross bedded calcareous mudstone and siltstone
	487'4"	491'6"	4'2"	2'6"				6" brown mudstone, remainder massive dolomite, oolitic in part.
	491'6"	496'6"	5'	3'				Light grey to brown fine to coarse textured dolomite
	496'6"	499'10"	3'4"	3'4"				As above
	499'10"	502'3"	2'5"	2'5"				

740(2) - 23

RIO TINTO SOUTHERN PTY. LTD.
RECORD OF DIAMOND DRILLING

Hole No. E42/65
Drilled by
Core Recovery
Logged by
Assays by David Mackenzie

AREA OF OPERATION EDIACARA - S.M.L. 77
Date Commenced 9/9/65
Date Completed 11/12/65

Reduced Level of Collar 1125 approx.
~~Co-ords~~ Depth 520'0"
Bearing Vertical
Vertical Angle

Date Logged	From Feet	To Feet	~~Distance Feet~~ Advance	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	502'3	507'3	5'0	4'8				Brown-green poorly bedded sandstone, weak worm tube development = Worm burrow sandstone.
	507'3	513'4	6'1	6'1				Well bedded brown and white quartzite, bedding 70° to L.C.A. = Pound quartzite
	513'4	520'0	6'8	6'2				As above
		totals	17'9"	16'11"				
								note : Hole completed at terminal depth 520'0".

SUMMARY LOG

	494'6"	507'3	12'9
	507'3	520'0	12'9

Worm burrow sandstone - base of Cambrian

Precambrian Pound Quartzite

740(2) - 23

RIO TINTO SOUTHERN PTY. LTD.
RECORD OF DIAMOND DRILLING

Hole No. E/43/65
Drilled by
Core Recovery
Logged by David Mackenzie
Assays by

AREA OF OPERATION EDIACARA S.M.L. 77
Date Commenced 11/12/65
Date Completed In Progress

Reduced Level of Collar {1090 ! / 1110 approx.}
Co-ords ~~180N 150E~~ 0 710 N / 150 W } according to DM 14.12/66 1.8.66.
Bearing Vertical
Vertical Angle

Date Logged	From Feet	To Feet	Advance	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	Surface	5'0	5'0	1'8				Grey dolomite with Mn dendrites
	5'0	11'6	6'6	1'10				As above
	11'6	15'9	4'3	1'6				As above
	15'9	20'0	4'3	2'3				As above
	20'0	25'0	5'0	4'7				Grey dolomite with Mn spots, rusty partings, small cavities
	25'0	29'9	4'9	4'1				Brecciated rusty grey dolomite, Mn stain, leached.
	29'9	34'3	4'6	3'8				As above
	34'3	38'9	4'6	3'6				As above
	38'9	42'9	4'0	2'8				As above
	42'9	47'9	5'0	5'0				As above : also small cavities
	47'9	52'3	4'6	4'6				Grey dolomite, rusty partings, Mn spots.
	52'3	57'0	4'9	4'9				As above
	57'0	60'0	3'0	3'0				As above
	60'0	64'6	4'6	4'6				As above
	64'6	66'6	2'0	2'0				As above
	66'6	71'6	5'0	3'2				Brecciated grey dolomite, rusty sandy partings, cavities.
	71'6	76'6	5'0	3'6				As above
	76'6	81'6	5'0	0'10"				As above
	81'6	86'0	4'6	4'2				As above : also Mn partings
	86'0	87'0	1'0	0'8"				Mn stained dolomite
	87'0	87'6	0'6"	0'6"				As above
	87'6	92'3	4'9	4'9				Grey dolomite, Mn spots, rusty sandy partings.
	92'3	97'0	4'9	4'9				Brecciated grey dolomite with rusty and Mn stain.
	97'0	101'3	4'3	3'0				As above
	101'3	106'6	5'3	2'9				As above : with heavy Mn stain from 106'
	106'6	111'6	5'0"	2'9				As above : with heavy Mn stain to 107'6.
	111'6	116'6	5'0	3'10				As above
	116'6	125'0	8'6	7'9				As above : with heavy Mn stain to 119'0.
	125'0	135'0	10'0	9'0				As above
	135'0	145'0	10'0	6'9				Grey dolomite, leached rusty and Mn partings.

740(2) - 25

Hole No. E/43/65 EDIACARA SML 77 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	145'0	155'6	10'6	8'5				Grey dolomite, rusty partings. Dark red and heavily leached 148'0 - 151'0.
	155'6	165'0	9'6	8'2				Grey dolomite, rusty partings.
	TOTALS TO DATE		165'0	124'3				
	Surface	165'0						SUMMARY LOG Grey dolomite, leached and brecciated in places, with rusty sandy partings and Mn spots and stain.

740(2) -26

C.R.A.E. 33

Hole No. E 43
Drilled by
Core Recovery
Logged by
Assays by D. H. Mackenzie

CRA EXPLORATION PTY. LTD.

RECORD OF DIAMOND DRILLING

AREA OF OPERATION EDIACARA SML 77
Date Commenced 11/12/65
Date Completed

Reduced Level of Collar 1110' approx.
Co-ords 180N 150E
Bearing Vertical
Vertical Angle

Date Logged	From Feet	To Feet	~~Distance~~ Feet Advance	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	165'0	175'0	10'0	1'0				Grey dolomite
	175'0	179'0	4'0	1'3				Grey dolomite with Mn stain
	179'0	189'0	10'0	3'6				Grey dolomite
	189'0	198'6	9'6	5'0				Fractured grey dolomite
	198'6	201'6	3'0	2'6				As above
	201'6	206'6	5'0	4'2				Grey dolomite; breccia in places
	206'6	211'6	5'0	5'0				As above
	211'6	217'0	5'6	3'9				Fractured grey sandy dolomite
	217'0	225'3	8'3	8'0				Grey dolomite breccia
	225'3	228'0	2'9	2'9				As above
	228'0	231'0	3'0	2'7				"
	231'0	235'6	4'6	3'6				"
	235'6	245'0	9'6	9'1				"
	245'0	245'9	9"	7"				Grey dolomite
	245'9	252'3	6'6	4'11				Grey dolomite breccia
	252'3	253'9	1'6	1'3				As above
	253'9	259'1	5'4	4'3				Leached buff sandy dolomite
	259'1	263'4	4'3	2'9				As above
	263'4	269'4	6'0	3'7				Pink laminated dolomite; bedding at 60° to L.C.A.
	269'4	274'0	4'8	3'7				Grey laminated d olomite; bedding 75° to L.C.A.
	274'0	278'4	4'4	3'9				Grey laminated dolomite
	278'4	282'0	3'8	3'3				As above
	282'0	284'9	2'9	2'0				"
	284'9	289'6	4'9	4'6				"
	289'6	294'3	4'9	2'0				"
	294'3	297'6	3'3	2'1				"
	297'6	300'3	2'9	1'0				"
	300'3	307'3	7'0	2'0				"
	307'3	308'3	-	-				No core
	308'3	312'3	4'0	3'6				Grey laminated dolomite
	312'3	316'3	4'0	2'9				Grey laminated dolomite

740(2) -27

Hole No. E43 C.R.A.E. 34

Date Logged	From Feet	To Feet	~~Distance~~ Feet Advance	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	316'3	322'3	6'0	5'3				Grey laminated dolomite, bedding at 75° to L.C.A.
	322'3	326'3	4'0	3'10				As above
	326'3	330'3	4'0	3'6				"
	330'3	338'0	7'9	7'3				" , sandy in places
	338'0	339'6	1'6	1'0				As above
	339'6	341'9	2'3	2'3				"
	341'9	344'9	3'0	3"				"
	344'9	347'9	3'0	5"				"
	347'9	351'9	4'0	1'9				"
								SUMMARY FORM
	165'0	217'0	52'0					Grey dolomite
	217'0	253'9	36'9					Grey dolomite breccia
	253'9	263'4	9'7					Buff sandy dolomite
	263'4	351'9						Grey laminated dolomite

740(2) - 28

C.R.A.E. 33

CRA EXPLORATION PTY. LTD.

RECORD OF DIAMOND DRILLING

Hole No. E43/66
Drilled by
Core Recovery
Logged by A. F. McQueen
Assays by

AREA OF OPERATION EDIACARA
Date Commenced
Date Completed

Reduced Level of Collar
Co-ords 180N 150E
Bearing
Vertical Angle

Date Logged	From Feet	To Feet	Recovery ~~Distance~~ Feet CORE	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	351'9	356'6	4'		Box 16			Pale grey fine grained sandy laminated dolomite
	356'6	358'9	2'					Pale grey laminated dolomite
	358'9	361'9	3'					Medium grey compact dolomite sandy in part
	361'9	366'6	3'					As above
	366'6	372'3	6"					Medium grey compact dolomite some small vughs
	372'3	374'8	8"					Pale grey fine textured sandy dolomite
	374'8	376'2	1'					As above
	376'2	378'3	2'					As above
	378'3	379'6	3"					Medium grey compact, slightly vuggy dolomite
	379'6	380'9	8"					As above
	380'9	383'	2'6					Pale to medium grey fine textured slightly sandy compact dolomite
	383'0	385'6	1'3					Medium grey compact dolomite
	385'6	387'7	1'					Pale brown laminated argillaceous dolomite with some inclusions black ? bituminous material
	387'7	391'11	2'					Medium grey dolomite slightly laminated in part and brecciated in part
	391'11	396'3	1'6		Box 17			Medium grey compact dolomite laminated in part
	396'3	397'3	6"					Pale grey dolomite to pale brown argillaceous dolomite
	397'3	399'9	1'6					As above
	399'9	401'	6"					Pale grey dolomite
	401'	402'9	6"					As above
	402'9	403'9	5"					As above
	403'9	404'9	1'					Medium grey dolomite
	404'9	406'9	1'					Pale grey slightly vuggy dolomite
	406'9	407'8	3"					As above, trace pyrite
	407'8	408'6	6"					Medium grey dolomite to pale grey calcareous fine grained sand
	408'6	410'9	6"					Medium grey compact dolomite
	410'9	411'9	2"					Pale grey dolomite and fine sand
	411'9	412'9	8"					As above
	412'9	414'1	1'					As above, sand unconsolidated
	414'1	415'3	1'2					As above

740(2) - 29

Hole No. E43/66 C.R.A.E. 34

Date Logged	From Feet	To Feet	Recovery ~~Distance~~ Feet CORE	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	415'3	416'9	18"					Pale grey laminated dolomite some medium brown argillaceous material
	416'9	419'9	6"					Pale to medium grey dolomite
	419'9	421'	6"					Medium grey dolomite to pale grey fine sandy dolomite.
	421'	422'8	1'3					Medium grey dolomite
	422'8	423'10	6"					As above
	423'10	425'8	1'					As above slight indication of lamination
	425'8	430'2	2"					Grey fine grained unconsolidated sand, little grey vuggy dolomite
	430'2	431'9	18"					Dark grey vuggy dolomite
	431'9	436'3	1'					Some grey unconsolidated fine grained sand some dark grey vuggy dolomite.
	436'3	438'9	2'6					Dark grey vuggy dolomite
	438'9	442'9	1'9	Box 18				Medium to dark grey vuggy dolomite
	442'9	444'3	6"					As above
	444'3	445'9	5"					As above
	445'9	447'10	2'1					Medium grey compact dolomite
	447'10	449'9	1'0					Medium to dark grey vuggy dolomite
	449'9	452'3	3'					As above
	452'3	453'11	1"					As above
	453'11	463'7	1'					As above, some brown ferruginous staining
	463'7	464'2	1'					Medium grey compact, slightly laminated dolomite
	464'2	465'7	4"					As above
	465'7	467'10	6"					As above, some fine grained unconsolidated sand
	467'10	470'3	2'					Dark grey vuggy dolomite
	470'3	475'	5'					As above
	475'	478'6	6"					Dark grey porous partly oolitic dolomite
	478'6	479'11	1'6					Very dark grey compact dolomite, some fine grained unconsolidated sand, some argillaceous dolomite
	479'11	482'9	1'6					Dark grey partly compact partly porous and oolitic dolomite
	482'9	485'6	1'6					Dark grey porous oolitic dolomite
	485'6	488'4	8"					Light grey compact, and partly porous dolomite
	488'4	491'9	6"					Medium grey dolomite
	491'9	495'6	2'6					Medium grey compact dolomite slight indications of lamination.

-- DRILL UNDER REPAIR --

740(2)-30

Hole No. B43/66 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value							Av. Val. and Width	Geological Description
	495'6	500'0	4'6	9"										OOlitic dolomite
	500'0	505'0	5'0	1'0										White clay
	505'0	510'0	5'0	8"										Leached sandy dolomite
	510'0	515'6	5'6	1'0										Grey massive dolomite with clay bands
	515'6	520'9	5'3	3'6										Massive grey dolomite with small shale bands
	520'9	525'3	4'6	3'10										" " " becoming sandy
	525'3	535'0	9'9	3'0										Grey dolomitic sandstone
	535'0	540'9	5'9	2'6										Sandy massive grey dolomite
	540'9	545'0	4'3	9"										Massive grey slightly oolitic dolomite with sandy lenses
	545'0	550'9	5'9	2'6										Red and grey sandstone - few voids
	550'9	557'3	6'6	4'0										Sandstone and dolomite, breccia zone in middle
	557'3	561'9	4'6	4'6										Massive grey dolomite with small sandy patches and minor limonite
	561'9	566'9	5'0	1'0										9" grey sandstone, 3" leached brecciated dolomite
	566'9	570'9	4'0	3'0										Core more solid. Grey and pink sandstone, slightly crossbedded, trace manganese. $\theta = 85^{\circ}$ (LCA)
	570'9	575'9	5'0	3'0										Brecciated dolomite
	575'9	585'0	9'3	6'0										Alternate grey dolomite and pink to grey sandstone, brecciated about 578', hematitic and slightly manganiferous at end.
	585'0	585'9	9"	9"										Pink sandstone and grey dolomite. Tr?? malachite
	585'9	595'9	10'	8'5										Slightly crossbedded sandstone and dolomite, weathered 586'. Brecciated 590'-595'. Numerous voids at end
	595'9	605'9	10'0	5'6										Grey sandstone and dolomite, weathered in part with minor manganese
	605'9	612'3	6'6	3'9										Grey dolomitic sandstone, minor pyrite
	612'3	618'9	6'6	2'9										Slightly weathered sandstone and shale, minor manganese
	618'9	627'6	8'9	4'0										Grey sandstone and shale
	627'6	630'9	3'3	2'9										Fine and coarse sandstone, slightly dolomitic.
	630'9	635'9	5'0	4'6										Fine grained sandstone, trace? malachite.
	635'9	639'0	3'3	2"										Grey shale
	639'0	643'9	4'9	2'6										"
	643'9	645'9	2'0	6"										Sandy shale, few voids.
	645'5	647'7	2'2	8"										Dolomitic shale
	647'7	652'0	4'5	9"										Grey shale and sandstone
	652'0	653'9	1'9	1'3										Grey shale
	653'9	654'3	6"	3"										"
	654'3	659'10	5'7	3'6										Grey shale, some darker bands $\theta = 85^{\circ}$

740(2)-31

Hole No. E43/66 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	659'10	665'8	5'10	5'3				Grey shale, becoming cherty at end
	665'8	666'8	1'0	9"				Grey shale
	666'8	668'5	1'9	8"				"
	668'5	678'2	9'9	2"				Green sandstone. Drillers report rods dropped 5ft. at 671'9".
								i.e. cavity.
	678'2	683'2	5'	6"				Green shale and green-grey sandstone
	683'2	687'9	4'7	6"				2" green shale, then sandstone
	687'9	694'9	7'0	6'0				Varicoloured sandstone - pound quartzite
	694'9	702'9	8'0	6'6				"
								END OF HOLE

740(2) - 32

C.R.A.E. 33

CRA EXPLORATION PTY. LTD.

RECORD OF DIAMOND DRILLING

Hole No. D44
Drilled by
Core Recovery
Logged by D. H. Mackenzie
Assays by "

AREA OF OPERATION EDIACARA SML 77
Date Commenced 4/2/66
Date Completed 24/2/66

Reduced Level of Collar 1120' approx.
Co-ords 2200N 1040E
Bearing Vertical
~~Vertical~~ Angle / Depth 404'6

Date Logged	From Feet	To Feet	~~Distance~~ Feet Advance	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	Surface	5'0	5'0	1'1				Grey dolomite
	5'0	10'0	5'0	4'6				Grey dolomite with Mn stain
	10'0	14'9	4'9	4'9				As above
	14'9	19'6	4'9	4'9				"
	19'6	24'3	4'9	4'9				"
	24'3	29'0	4'9	4'9				"
	29'0	33'9	4'9	4'9				Grey laminated dolomite, Mn stain, bedding 75° to LCA
	33'9	38'6	4'9	4'8				As above, bedding 80° to LCA
	38'6	43'3	4'9	4'6				Grey dolomite with Mn stain
	43'3	48'0	4'9	4'9				Grey laminated dolomite
	48'0	52'9	4'9	4'8				As above, bedding 65° to LCA
	52'9	57'6	4'9	4'9				Grey laminated dolomite with Mn stain
	57'6	62'0	4'6	4'6				As above
	62'0	66'9	4'9	4'9				As above, bedding at 80° to LCA
	66'9	71'6	4'9	4'6				As above
	71'6	76'3	4'9	3'0				Leached grey laminated dolomite with Mn stain
	76'3	81'0	4'9	4'7				Leached grey dolomite with Fe and Mn stain
	81'0	85'6	4'6	4'6				Grey laminated dolomite; bedding 90° to LCA
	85'6	90'0	4'6	4'6				Grey dolomite, some thin quartz veins
	90'0	94'9	4'9	4'9				Grey dolomite breccia with Mn stain
	94'9	99'3	4'6	4'3				Laminated dolomite and dolomite breccia; bedding 80° to LCA
	99'3	103'9	4'6	4'6				Grey dolomite breccia with Mn stain
	103'9	108'6	4'9	4'9				"
	108'6	113'6	5'0	4'6				Grey dolomite breccia
	113'6	118'6	5'0	4'10				"
	118'6	123'6	5'0	4'8				"
	123'6	128'6	5'0	4'11				"
	128'6	133'0	4'6	4'6				"
	133'0	138'0	5'0	4'9				"
	138'0	143'0	5'0	4'6				"

740(2) - 33

Hole No. E44 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet Advance	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	143'0	148'0	5'0	4'8				Grey dolomite breccia; oolitic in places, siliceous patches
	148'0	152'9	4'9	4'9				Grey dolomite breccia
	152'9	157'6	4'9	4'9				"
	157'6	162'3	4'9	4'9				"
	162'3	167'0	4'9	4'9				"
	167'0	172'0	5'0	4'9				"
	172'0	176'9	4'9	4'8				As above; sandy and laminated in places
	176'9	177'0	3"	3"				"
	177'0	181'9	4'9	4'9				"
	181'9	186'6	4'9	4'6				"
	186'6	191'0	4'6	4'6				Grey dolomite breccia and oolitic dolomite
	191'0	195'9	4'9	4'9				As above : bedding 60° to LCA
	195'9	200'6	4'9	4'9				Grey dolomite breccia
	200'6	205'3	4'9	4'8				"
	205'3	210'0	4'9	4'9				"
	210'0	214'9	4'9	4'9				"
	214'9	219'6	4'9	4'7				Grey laminated and sandy dolomite
	219'6	224'3	4'9	4'8				Grey laminated dolomite; bedding 90° to LCA
	224'3	234'0	9'9	9'3				Grey dolomite
	234'0	244'0	10'0	9'8				Grey dolomite, in parts sandy, brecciated, bedding 50° to LCA
	244'0	252'0	8'0	7'4				Grey sandy dolomite
	252'0	259'0	7'0	6'0				Grey dolomite
	259'0	265'0	6'0	3'9				"
	265'0	269'0	4'0	3'4				Grey sandy dolomite
	269'0	274'6	5'6	4'9				"
	274'6	281'2	6'8	6'3				"
	281'2	287'8	6'6	5'9				As above; bedding at 90° to LCA
	287'8	296'0	8'4	7' 11				Grey laminated sandy dolomite; bedding 70° to LCA
	296'0	301'0	5'0	4'7				Grey sandy dolomite
	301'0	306'0	5'0	2'0				"
	306'0	310'0	4'0	2'10				Grey sandy dolomite
	310'0	314'0	4'0	2'10				Leached grey sandy dolomite
	314'0	317'6	3'6	3'2				Grey sandy cross bedded dolomite
	317'6	327'6	10'0	4'6				"
	327'6	332'0	4'6	3'7				Dolomitic sandstone and shale; bedding 55° to LCA

740(2) -34

Hole No. E44 C.R.A.E. 34

Date Logged	From Feet	To Feet	~~Distance~~ Feet Advance	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	332'0	336'0	4'0	1'9				As above ; bedding 45° to LCA
	336'0	339'6	3'6	3'3				Grey dolomitic sandstone
	339'6	341'0	1'6	9"				"
	341'0	346'0	5'0	2'8				Interbedded grey sandstone and shale; bedding 90° to LCA
	346'0	351'0	5'0	2'4				Interbedded grey green sandstone and shale
	351'0	355'6	4'6	1'8				Grey sandy shales; bedding 80° to LCA
	355'6	360'0	4'6	1'8				Interbedded grey sandstone and mudstone
	360'0	365'0	5'0	3'6				Interbedded grey green sandstone and shale
	365'0	370'0	5'0	4'7				"
	370'0	374'6	4'6	3'7				As above to 372'6 then green worm tube sandstone
	374'6	379'6	5'0	4'4				Green worm burrow sandstone
	379'6	384'6	5'0	4'9				Worm burrow sandstone to 382'9, then white quartzite
	384'6	394'6	10'0	9'11				Cream cross bedded quartzite
	394'6	404'6	10'0	9'9				"
								NOTE : Hole completed at 404'6 total depth in Pound Quartzite

SUMMARY FORM

surface	29'0	29'0
29'0	99'3	70'3
99'3	214'9	115'6
214'9	327'6	112'9
327'6	372'6	45'0
372'6	382'9	10'3
382'9	404'6	

Grey dolomites

Grey laminated dolomites

Grey dolomite breccia

Grey sandy and laminated dolomites

Transition Beds - sandstones and shales

Worm burrow sandstone - base of Cambrian

Precambrian Pound Quartzite

740(2) -35

C.R.A.E. 33

Hole No. E/45
Drilled by
Core Recovery D. H. MACKENZIE
Logged by "
Assays by "

CRA EXPLORATION PTY. LTD.

RECORD OF DIAMOND DRILLING

AREA OF OPERATION EDIACARA S.A.
Date Commenced 15/2/66
Date Completed

Reduced Level of Collar 1080' approx.
Co-ords 5510S 1450W
Bearing Vertical
Vertical Angle

Date Logged	From Feet	To Feet	~~Distance~~ Feet Advance	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	Surface	10'0	10'0	1'4				Grey dolomite
	10'0	13'9	3'9	3'3				"
	13'9	20'4	6'7	6'0				Sandy grey dolomite
	20'4	26'1	5'9	5'6				Buff dolomite with calcrete veins
	26'1"	34'11	8'10	8'10				Buff dolomite, bedding 70° to LCA
	34'11	35'7	8"	8"				Buff dolomite
	35'7	42'8	7'1	6'6				Buff dolomite with calcrete veins
	42'8	47'10	5'2	5'0				Grey dolomite with Mn stain
	47'10	48'7	9"	9"				Grey dolomite, bedding 90° to LCA
	48'7	52'9	4'2	3'7				Grey dolomite
	52'9	61'4	8'7	7'10				"
	61'4	62'5	1'1	1'1				"
	62'5	67'1	4'8	4'8				"
	67'1	74'1	7'0	6'9				Buff dolomite brecciated and recemented
	74'1	76'0	1'11	1'11				"
	76'0	85'9	9'9	9'4				"
	85'9	86'10	1'1	1'1				"
	86'10	95'7	8'9	8'7				"
	95'7	100'5	4'10	3'7				"
	100'5	102'11	2'6	1'5				"
	102'11	106'0	3'1	2'5				Buff dolomite
	106'0	107'0	1'0	1'0				"
	107'0	114'2	7'2	6'10				Leached buff dolomite with some Mn & Fe stain
	114'2	123'3	9'1	8'2				"
	123'3	124'7	1'4	1'2				"
	124'7	133'5	8'10	7'4				As above; bedding at 70° to LCA
	133'5	138'10	5'5	4'2				Pink dolomite with Mn stain
	138'10	142'5	3'7	2'2				Leached buff dolomite
	142'5	145'9	3'4	2'5				"
	145'9	154'1	8'4	6'0				"

740(2) - 36

Hole No. E45 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet Advance	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	154'1	155'7	1'6	1'5				Fractured buff dolomite
	155'7	163'1	7'6	4'9				Leached fractured buff dolomite
	163'1	166'9	3'8	2'2				As above, with Mn stain
	166'9	167'7	10"	8"				Fractured buff dolomite
	167'7	172'3	4'8	2'8				"
	172'3	177'11	5'8	4'2				"
	177'11	182'9	4'10	1'7				"
	182'9	188'10	6'1	2'5				Grey laminated dolomite; bedding 80° to L.C.A.
	188'10	191'6	2'8	2'0				As above; bedding at 70° to L.C.A.
	191'6	193'11	2'5	1'3				Pink laminated dolomite
	193'11	199'0	5'1	4'6				Grey laminated dolomite; bedding 75° to L.C.A.
	199'0	204'0	5'0	3'11				Grey laminated dolomite
	204'0	209'4	5'4	4'3				"
	209'4	210'1	9"	9"				As above; bedding at 60° to L.C.A.
								IN PROGRESS
	Surface	182'9	182'9					
	182'9	210'1						

SUMMARY DESCRIPTION

Buff and grey dolomites; fractured, leached, brecciated in places.

Grey laminated dolomite

740(2) - 37

Hole No. E45/66 C.R.A.E. 34

Date Logged	From Feet	To Feet	Recovery ~~Distance~~ Feet Core	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	210'1	214'3	5'		Box 14			Medium grey to pink laminated dolomite, with indications of fracturing
	214'3	218'8	2'6					As above
	218'8	222'4	4'					As above
	222'4	226'10	4'					As above
	226'10	230'11	4'		Box 15			Pink to grey very broken compact dolomite
	230'11	235'11	5'					Medium grey compact slightly laminated dolomite, pink towards base
	235'11	241'2	6'					Medium grey to pink compact dolomite, indications of lamination very fractured.
	241'2	245'	4'					Pink to grey laminated compact dolomite.
	245'	245'7	7"		Box 17			As above
	245'7	254'2	8'5					Light grey compact laminated dolomite fractured in part
	254'2	260'8	6'6					Grey fractured, compact dolomite
	260'8	264'6	3'6	Box 17 at 262'				Light grey laminated dolomite fractured in part
	264'6	268'2	4'6					As above, pink in part
	268'2	274'8	6'6					As above fractured in part
	274'8	278'7	3'11	Box 18				Light grey to pink laminated dolomite fractured.
	278'7	284'6	6'					Medium grey, very fractured and broken up, dolomite.
	284'6	292'4		Box 19 at 288'4				Light grey to pink to medium grey, very fractured in part laminated dolomite
	292'4	298'1	3'					Medium grey very fractured, compact dolomite, pink in part
	298'1	300'	2'					As above
	300'	304'2	4'					As above
	304'2	313'10	3'3					As above (Reduce to HX)
	313'10	318'1	3'		Box 20			Light to medium grey fractured laminated dolomite
	318'1	321'8	1'6					Grey fractured dolomite
	321'8	326'6	1'6					Grey brecciated dolomite
	326'6	332'	1'6					Grey to pink fractured dolomite
	332'	337'9	1'6					As above
	337'9	342'7	3'					As above
	342'7	345'5	2'					Grey dolomite very broken up due to fracturing
	345'5	350'	1'					Grey to pink fractured dolomite
	350'	352'7	2'					Dark grey fractured dolomite

740(2) - 38

Hole No. E45/66 C.R.A.E. 34

Date Logged	From Feet	To Feet	Recovery Distance Feet Core	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	352'7	356'8	3'6					Dark grey fractured dolomite
	356'8	361'8	3'					Light grey to medium grey to pink very broken up dolomite
	361'8	365'8	1"					Medium grey fractured dolomite
	365'8	369'1	2'					Grey to pink fractured laminated dolomite
	369'1	374'3	3'					Grey to pink fractured dolomite
	374'3	375'8	2'		Box 21			As above
	375'8	380'4	3'					Grey fractured dolomite, slightly vuggy in part
	380'4	389'	3'					Grey fractured dolomite
	389'	403'11	1'					As above
	403'11	410'8	1'					As above
	410'8							Change of formation
	410'8	415'8	5'					Soft white and brown to dark grey silt
	415'8	420'8	3'					Dark grey to brown to soft red shale with some grey sand, some grit
	420'8	430'8	3'6					Brown gritty siltstone, some light grey to brown siltstone - non calcareous
	430'8	450'8	3'					Brown silt and sand, red in part
	450'8	459'5	2'					Brown silt with hematite in part with red colouring and manganese oxide in part
	459'5	461'4	2'3		Box 22			Pale yellow, red to black laminated in part, sandstone ? manganese at 461' light grey to red laminated siltstone in part, ? Secondary silicification in sandstone.
	461'4	482'4	5'					Red and brown siltstone and shale some brown and black sandstone, as above.
	482'4	495'2	3"					Pale grey to brown shale, brown sandstone light grey to brown siltstone
	495'2	503'10	2"					Pale grey to brown siltstone, some dark brown sandy shale, pale grey sandstone

DRILLING IN PROGRESS

740(2) - 39

Hole No. 45/65 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
19. 5.66	503'10"	504' 0"	2"	2"				Pale brown siltstone
	504' 0"	513' 9"	9' 9"	3' 3"				Medium grained grey sandstone, (Pound formation), bedding sub-horizontal
	513' 9"	519'10"	6' 1"	3' 0"				as above
	519'10"	533' 8"	13'10"	9' 6"				" "
	533' 8"	536' 7"	2'11"	2'11"				" "
	536' 7"	543' 8"	7' 1"	4' 3"				" "
	543' 8"	552' 7"	8'11"	6' 0"				" "
	552' 7"	563' 0"	10'5"	3' 2"				" "

740(2) - 40

Area of Operation - Ediacara, S.A.
Date Commenced - 25/2/66

Hole No. E/46/66

Reduced Level of Collar 1070' approx.
Co-ords 6500S 1310W
Bearing
Vertical Angle

C.R.A.E. 34

Date Logged	From Feet	To Feet	~~Distance~~ Feet Advance	Core Recovery Feet	Sample No.	Assay Value							Av. Val. and Width	Geological [Description
														CORE DESCRIPTION
	0'	5'0	5'0	3'9										Leached buff dolomite
	5'0	9'9	4'9	4'5										As above
	9'9	14'6	4'9	4'7										"
	14'6	19'3	4'9	4'9										Buff dolomite with Mn stain
	19'3	24'0	4'9	4'1										As above
	24'0	27'6	3'6	3'5										"
	27'6	32'3	4'9	4'4										"
	32'3	36'9	4'6	4'0										Fractured buff dolomite with Mn and Fe stain
	36'9	41'9	5'0	4'9										Fractured buff dolomite with purplish Fe stain
	41'9	46'3	4'6	4'6										Fractured buff dolomite with Mn stain
	46'3	51'0	4'9	4'9										Fractured leached dark red dolomite
	51'0	55'9	4'9	4'3										As above
	55'9	60'6	4'9	4'3										As above
	60'6	64'9	4'3	4'3										As above
	64'9	69'3	4'6	4'6										As above : bedding at 80° to L.C.A.
	69'3	73'0	3'9	3'9										As above
	73'0	74'6	1'6	1'6										As above
	74'6	78'6	4'0	3'4										As above
	78'6	82'0	3'6	2'0										Fractured buff dolomite
	82'0	86'6	4'6	3'9										Fractured dark red dolomite; bedding 75° to L.C.A.
	86'6	89'0	2'6	2'1										Buff laminated dolomite; bedding 65° to L.C.A.
	89'0	91'6	2'6	2'1										As above

740(2) - 41

Hole No. E46/66 C.R.A.E. 34

Date Logged	From Feet	To Feet	~~Distance~~ Recovery Feet CORE	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	91'6	96'	3'		Box 7			Grey brown and red fractured dolomite
	96'	100'	4'					As above
	100'	102'6	2'9					Grey and brown fractured dolomite
	102'6	104'6	2'					As above
	104'6	107'6	2'					"
	107'6	110'	Nil					
	110'	113'	2'9					"
	113'	117'	3'	Box 8 at 115'				"
	117'	119'	2'					"
	119'	121'6	2'6					" "
	121'6	125'	3'9					"
	125'	129'	4'					" quartz crystals in vug
	129'	133'6	4'6		Box 9			" laminated in part
	133'6	136'	2'6					Grey brown to pink laminated dolomite
	136'	139'	3'					Top 2' fractured grey dolomite, bottom 1' pink and grey laminated
	139'	142'6	3'6	Box 10 at 142'				Grey brown and pink slightly fractured laminated dolomite
	142'6	147'	4'6					As above
	147'	151'9	4'9					Grey and brown fractured laminated dolomite, dendrite mottling
	151'9	156'6	4'9	Box 11 at 152'6				As above dendrite mottling
	156'6	161'6	5'					As above dendrite mottling
	161'6	166'6						Grey to brown trace pink fractured laminated dolomite
	166'6	171'3	4'9	Box 12 at 167'				Grey to brown fractured laminated dolomite some dendrite mottling
	171'3	174'9	3'6					As above
	174'9	178'9	4'					Brown, grey and pink fractured dolomite
	178'9	183'	3'	Box 13 at 179'6				Grey and brown fractured dolomite dendritic marking on fracture planes
	183'	187'3	4'					As above
	187'3	191'9	4'6					Grey and brown fractured laminated dolomite, pink in part
	191'9	196'	4'3	Box 14 at 195'				As above
	196'	200'6	4'6					As above
	200'6	204'6	4'					As above
	204'6	205'6	1'					Grey fractured laminated dolomite
	205'6	206'6	1'					As above

740(2) - 42

Hole No. E46/66 C.R.A.E. 34

Date Logged	From Feet	To Feet	Recovery ~~Distance~~ Feet CORE	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological [Description
	206'6	210'0	3'6	Box 15 at 207'				Grey dolomite breccia (? change formation) laminated in part.
	210'	214'9	4'9					Medium grey dolomite breccia
	214'9	219'6	4'9					Medium grey dolomite breccia some brown limonitic staining in part.
	219'6	224'3	4'9		Box 16			Medium grey dolomite breccia and laminated dolomite
	224'3	228'9	4'6	Box 17 at 232'				As above
	228'9	233'3	4'6					Medium grey fractured dolomite breccia, and laminated dolomite
	233'3	237'6	4'3					Medium grey dolomite breccia some laminated dolomite
	237'6	245'6	8'					Medium grey, fractured dolomite and dolomite breccia
	245'6	254'9	9'3		Box 18			Grey dolomite with brown ferruginous staining. Some grey laminated dolomite and some dolomite breccia
	254'9	262'9	8'	Box 19 at 258'				Medium grey fractured dolomite breccia, laminated dolomite in part. trace pyrite in vugs

740(2)-43

C.R.A.E. 33

CRA EXPLORATION PTY. LTD.

RECORD OF DIAMOND DRILLING

Hole No. E 46
Drilled by
Core Recovery
Logged by F.E. Hughes, J. Barry.
Assays by

AREA OF OPERATION EDIACARA
Date Commenced
Date Completed

Reduced Level of Collar
Co-ords
Bearing
Vertical Angle

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value (Use As) Au 500m	Au %	Cu %	Pb %	Zn %	Av. Val. and Width	Geological Description
19.5.66	262' 9"	268' 0"	5' 3"	5' 3"		262.75	268.0	0.01	5.25	0.11		Dense grey dolomite with very finely disseminated pyrite
	268'	270'	2'	1'10"		268.0	272.75	0.01	4.25	0.10		chalcopyrite and galena. (weakly dispersed)
	270'	272' 9"	2' 9"	2' 5"								Interbeded brecoia bands up to 12" thick
	272' 9"	276' 9"	4'	2' 3"		272.75	276.75	0.02	4.00	0.10		
	276' 9"	280'3"	3' 6"	1' 6"		276.75	280.25	0.02	3.50	0.10		
	280' 3"	281'3"	1' 0"	1'		280.25	285.75	0.01	5.50	0.10		
	281' 3"	282'3"	1'	10"								
	282' 3"	284'	1' 9"	1'								
	284'	284' 9"	9"	9"								
	284' 9"	285' 9"	1' 0"	1' 0"								
	285' 9"	289' 6"	3' 9"	3' 4"		285.75	289.5	0.01	3.75	0.07		
	289' 6"	292' 9"	3' 3"	2' 8"		289.5	292.75	0.01	3.25	0.10		
	292' 9"	296' 3"	3' 6"	3' 6"		292.75	296.25	0.02	3.50	0.10		
	296' 3"	298' 3"	2' 0"	1' 6"		296.25	302.25	0.02	6.00	0.10		
	298' 3"	299' 3"	1' 0"	1' 0"								
	299' 3"	302' 3"	3' 0"	2' 7"								
	302' 3"	306' 3"	4' 0"	2' 6"		302.25	306.25	0.01	4.00	0.10		
	306' 3"	311'	5'	4' 6"		306.25	311.0	0.02	4.75	0.07		
	311'	314' 9"	3' 9"	3' 4"		311.0	316.0	0.03	5	0.10		
	314' 9"	316'	1' 3"	1' 0"								
	316'	319'	3'0"	2' 6"		316.0	322.5	0.02	6.50	0.10		
	319'	322' 6"	3' 6"	3' 2"								
	322' 6"	328' 3"	5' 9"	3' 9"		322.5	328.25	0.02	5	0.10		
	328' 3"	331' 6"	3' 3"	3' 0"		328.25	331.5	0.01	3.25	0.10		
	331'6"	335' 6"	4' 0"	3'6"		331.5	335.5	0.01	4.00	0.10		
	335' 6"	340' 3"	4' 9"	4' 9"		335.5	340.25	0.01	4.75	0.10		
	340' 3"	345'	4' 9"	4' 9"		340.25	345.0	0.01	4.75	0.10		
	345'	350'	5' 0"	4' 3"		345.0	350.0	0.02	5.00	0.10		
	350'	355'	5' 0"	4'11"		350.0	355.0	0.02		0.10		

740(2) - 44

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	(feet) From	(feet) To	Assay Value %	Assay Value oz/t	Av. Val. and Width	Geological Description
19.5.66	355'	359' 9"	4' 9"	4' 6"		355.0	359.75	0.01	0.10		
	359' 9"	364' 9"	5' 0"	4' 9"		359.75	364.75	0.35	0.30		
	364' 9"	369' 9"	5' 0"	4' 8"		364.75	769.75	0.06	1.5		
	369' 9"	374' 9"	8' 0"	4' 6"		369.75	374.75	0.11	3.55		
	374' 9"	379' 9"	5' 0"	2'11"		374.75	379.75	0.07	0.57		
	379' 9"	382' 9"	3' 0"	2' 6"		379.75	382.75	0.01	1.7		
	382'9"	387' 6"	4' 9"	4' 1"		382.75	387.5	0.02	0.40		
	387' 6"	392' 6"	5' 0"	3' 0"		387.5	392.5	0.03	0.19		Grey dolomite with weak mineralisation extends to 393' 6"
	392' 6"	397' 6"	5' 0"	3' 1"		392.5	397.5	0.05	0.27		
	397' 6"	402' 6"	5' 0"	4' 10"							
	402' 6"	407' 6"	5' 0"	1' 4"							From 393' 6" Grey and grey brown shales dipping at 60°-80° to core axis (Transition shales?) with interbeded sandy members. Grading to siltstone at 434 feet.
	407' 6"	412' 6"	5' 0"	1' 7"							
	412' 6"	417' 6"	5' 0"	11"							
	417' 6"	422' 6"	5' 0"	2' 1"							
	422' 6"	427' 6"	5' 0"	3' 0"							434' to 440' grey and yellowish grey siltstone with sandy and shaley intercalations. Bedded 80° to core axis
	427' 6"	435' 9"	8' 0"	2' 0"							
	435' 9"	440' 9"	5' 0"	3' 1"							
	440' 9"	445' 9"	5' 0"	2' 7"							440' to end of hole grey sandstone (Pound sandstone)
	445' 9"	450' 9"	5' 0"	5' 0"							
	450' 9"	455' 9"	5' 0"	5' 0"							
		END OF HOLE									

740(2)-45

C.R.A.E. 33

CRA EXPLORATION PTY. LTD.

RECORD OF DIAMOND DRILLING

Hole No. E47/66
Drilled by
Core Recovery
Logged by F.E.Hughes and J.Barry
Assays by

AREA OF OPERATION EDIACARA
Date Commenced 19.5.66
Date Completed

Reduced Level of Collar 1080
Co-ords ~~300N~~ 7450S ✓ 7450S } according to
Bearing 0600 W } DM. 1452/64
Vertical Angle 1.2.66.

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
19/5/66	0	8' 6"	8'6"	2'				Weathered massive and brecciated pink and yellow-brown dolomite
	8' 6"	13'9 "	5'3"	4'11"				gypsum in fillings and manganese dendrites.
	13'9"	15' 2"	1'5"	1'5"				
	15'2"	22' 7"	5"	4'0"				
	22'7"	25' 6"	2'11"	3'0"				
	25'6"	30' 3"	4' 9"	4'				
	30'3"	33' 5"	3' 2"	1'6"				
	33'5"	36' 5"	3' 0"	1'5"				
	36'5"	39' 9"	3' 4"	2'5"				" Some pale brown shales 37' - 38' at 70' to core axis (i.e. dip 20°)
	39'9"	41' 1"		1'2"				
	41'1"	44'10"		1'4"				" sub-horizontal gypsum shales at 44'6" (concentration of Mn (minerals at 44'10" (base of severe oxidation (and weathering)
	44'10"	51' 3"	6'5"	6'5"				Massive grey-brown & pink weakly
	51' 3"	56' 1"	6'5"	4'10"				brecciated dolomite. Manganese dendrites in cracks and joins (slickensides evident)
	56' 1"	60' 9"	4'8"	4' 8"				Dip of bedding at 60° to core axis. At 65 feet.
	60' 9"	69' 7"	8'10"	8'10"				
	69' 7"	72'10"	3' 3"	3' 3"				
	72'10"	77' 3"	4' 5"	4' 5"				
	77' 3"	81' 4"	4' 1"	4' 1"				77'6" bedding 80° to core axis
	81' 4"	85'10"	4' 6"	4' 6"				
	85'10"	91' 1"	5' 3"	4' 6"				
	91' 1"	95' 5"	4' 4"	4' 4"				95' 6" - 91'10" core broken.
	95' 5"	97' 5"	2' 0"	2' 0"				
	97' 5"	100' 1"	3' 8"	2' 6"				
	100' 1"	109' 0"	8'11"	5' 2"				
	109'	114'	5' 0"	4' 6"				
	114'	119' 6"	5' 6"	3' 6"				bedding at 116' 65° to core axis.
								Hole abandoned at 119ft.6in.

740(2) - 46

C.R.A.E. 33

(1)

CRA EXPLORATION PTY. LTD.

RECORD OF DIAMOND DRILLING

Hole No. E 47A/66
Drilled by
Core Recovery
Logged by J. Barry
Assays by

AREA OF OPERATION EDIACARA
Date Commenced 19/5/66
Date Completed

Reduced Level of Collar 1080
Co-ords 300W 7450S 7450 S } in docket
Bearing 0600 W } dgn. 1412/66
Vertical Angle
1.8.66

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
19.5.66	0	5' 3"						No core
	5' 3"	8' 0"	2' 9"	2' 8"				Weathered & brecciated pink/brown dolomite occassional manganese dendrites in joints and bedding planes. Seams and veins of gypsum common.
	8' 0"	12' 3"	4' 3"	4' 3"				
	12' 3"	15' 5"	3' 2"	3' 2"				
	15' 5"	18' 4"	2'11"	2'11"				
	10' 4"	21' 9"	3' 5"	2' 3"				
	21' 9"	24' 5"	2' 8"	2' 8"				
	24' 5"	28' 1"	3' 8"	3' 3"				
	28' 1"	30' 7"	2' 8"	2' 0"				28' dip of bedding 65° to core axis
	30' 7"	34' 5"	3'10"	3'10"				
	34' 5"	39' 5"	5' 0"	1' 3"				
	39' 5"	42' 5"	3' 0"	2' 5"				
	42' 5"	46' 2"	3' 9"	3' 0"				46' - 46' 6" conc. of manganese (base of zone of oxidation)
	46' 2"	50'11"	4' 9"	3' 5"				
	50'11"	53'11"	3' 0"	3' 0"				Grey-brown-pink massive dolomite(brecciated) 52-52'6" and at 55'6" conc. of manganese adjacent to irregular vertical joints. 54' - 59' vugs with dolomite infilling common. Manganese dendrites dispersed in irregular joints.
	53'11"	55' 6"	1' 7"	1' 7"				
	55' 6"	58' 6"	3' 0"	3' 0"				
	58' 6"	63' 4"	4'10"	4' 6"				
	63' 4"	67'11"	4' 7"	4' 7"				
	67'11"	72' 5"	4' 6"	4'6"				
	72' 5"	75' 5"	3' 0"	3' 0"				73' bedding 55° to core axis,
	75' 5"	78' 6"	3' 1"	3' 0"				
	78' 6"	81' 5"	2'11"	2'11"				
	81' 5"	85' 9"	4' 4"	4' 4"				77' - 89' core broken.
	85' 9"	89' 1"	3' 4"	3' 4"				
	89' 1"	93'9"	4' 3"	4' 8"				103' dip 65°-70° to core axis
	93' 9"	98'5"	4' 8"	4'10"				
	98' 5"	103'1"	4' 8"	4'8"				
	103'1"	107'9"	4' 8"	4'6"				106' - 108' dolomite - lined vugs and joints.

740(2) - 47

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value							Av. Val. and Width	Geological Description
19.5.66	107' 9"	117' 3"	9' 6"	9' 6"										113' - 117' bedding 80° to core axis
	117' 3"	121'11"	4' 8"	4' 6"										in shaley and laminated sections.
	121'11"	125'6"	3' 7"	2' 7"										
	125' 6"	128'8"	3' 2"	3' 2"										
	128'8 "	132'1"	3' 5"	3' 2"										
	132' 1"	137'4"	4' 5"	4' 5"										
	137' 4"	139'10"	2' 6"	2' 6"		From	Feet To	% Pb	% Zn	% Cu				Dolomitic shale at 135' 141' 9" -142'6" dolomitic shale
	139'10"	144' 7"	4' 9"	4' 9"		139.92	144.18	2.66		0.29				dip 65° to core axis.
	144' 7"	149' 5"	4'10"	4' 7"		144.58	149.42	4.34		0.47				142' 3" disseminated malachite in vugs and joints up to
	149' 5"	154' 0"	4' 7"	4' 2"		149.42	154.0	4.58		0.05				146' 6".
	154'	162' 4"	8' 4"	8' 4"		154.0	162.33	[illegible]		0.03				162' bedding 70° to core axis.
	162' 4"	167'	5' 4"	4' 8"		162.33	167.0	4.67		0.02				Dolomite becomes grey-pale brown below 149'
	167'	172' 9"	5' 9"	4' 9"		167.0	172.75	5.75		0.03				170' - 181 disseminated malachite in scattered vugs and joints.
	172' 9"	177' 7"	4'10"	4'10"		172.75	177.58	4.83		0.19				(End of Box 14)
	177' 7"	181' 0"	3' 5"	3' 5"		177.58	181.0	3.42		0.17				
	181'	182' 6"	1' 6"	1' 6"										

740(2) - 48

Hole No. 47a/66 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	182'6	185'5	2'11	2'0				Grey massive dolomite, broken core, trace malachite on joints
	185'5	189'0	3'7	3'0				"
	189'0	191'5	2'5	2'9				"
	191'5	194'0	2'7	2'7				Dolomitic shale with Mn staining
	194'0	197'6	3'6	3'6				Leached and brecciated dolomitic shale becoming sandy. Minor limonite and Mn.
	197'6	198'9	1'3	9"				As above
	198'9	202'7	3'10	3'10				Stylolitic grey dolomite, minor limonite and Mn.
	202'7	207'5	4'10	4'10				As above to 205', then brecciated dolomite
	207'5	208'10	1'5	1'5				Brecciated grey dolomite
	208'10	211'6	2'8	2'8				Broken laminated grey dolomite, minor Mn.
	211'6	214'6	3'0	2'10				Brecciated grey dolomite with veins of massive Mn and pyrite
	214'6	217'1	2'7	2'7				"
	217'1	221'5	4'4	4'4				"
	221'5	222'6	1'1	1"				Grey dolomite
	222'6	225'5	2'11	8"				Soft grey dolomite
	225'5	230'4	4'11	10"				Soft grey dolomite - brecciated
	230'4	234'9	4'5	1'8				"
	234'9	236'10	2'1	1'6				"
	236'10	241'11	5'1	2'11				Soft grey brecciated dolomite passing to grey shale 0 = 75°
	241'11	250'2	8'3	8"				Brecciated grey shale with veins of pyrite at end
from beds.	250'2	255'6	5'4	6"				Brecciated grey shale and clay
	255'6	260'3	4'9	10"				Grey quartz, minor manganese staining
	260'3	350'5	90'2	2'3				Grey clay. This section represents the base of the transition beds and the worm burrow beds
	350'5	355'4	4'11	1'0				Porous grey sandstone with occasional very faint copper stains.
	355'4	362'8	7'4	7'1				"
	362'8	367'5	4'9	1'6				Grey quartzite
	367'5	372'1	4'8	4'4				" END OF HOLE

740(2)-49

Hole No. B48/66

C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value							Av. Val. and Width	Geological Description
	692'9	697'9	5'0	4'6										Brecciated grey stylolitic dolomite, minor pyrite. Quartz vein
	697'9	700'0	2'3	1'3										" massive pyrite vein
	700'0	705'0	5'0	4'0										"
	705'0	707'6	2'6	2'6										"
	707'6	710'2	2'8	1'5										"
	710'2	715'2	5'0	6"										"
	715'2	717'8	2'6	4"										"
	717'8	719'2	1'6	Nil										"

740(2) – 50

Hole No. E48 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	719'2	720'8		10"				
	720'8	722'0		1'4				Grey massive dolomite, minor limonite and a few voids. Very broken
	722'0	723'6		1'3				
	723'6	727'6		Nil				
	727'6	729'0		6"				
	729'0	731'0		Nil				
	731'0	732'0		2"				
	732'0	736'6		9"				Grey brecciated dolomite, quartz vein at 781' slightly sandy
	736'6	740'6		2'0				towards end
	740'6	744'6		2'0'				
	744'6	745'6		2"				
	745'6	755'6		Nil				
	755'6	760'6		1'2				Buff weathered dolomite
	760'6	761'6		6"				Grey brecciated dolomite, traces of pyrite. Slightly sandy
	761'6	765'0		2'9				
	765'0	769'9		2'3				
	769'9	774'9		6"				As above. Last 1" brecciated with Mn
	774'9	780'6		4"				
	780'6	790'0		5'0				Buff clay and sand. Mn and limonite at end
	790'0	792'4		2'4				
	792'4	800'6		2'9				Weathered brecciated dolomite with limonite and Mn
	800'6	806'6		1'6				Buff clay
	806'6	815'0		4"				Grey dolomite and light coloured sandstone
	815'0	823'0		1"				Brecciated dolomite
	823'0	831'0		5"				Light coloured sandstone and limonitic chert
	831'0	841'0		9"				Dolomitic breccia, then light grey sandstone
	841'0	851'0		1'6				
	851'0	861'0		1'0				Light coloured porous sandstone, then brecciated dolomite, pinkish clay and sandstone
	861'0	871'0		2'3				Pink clay and grey sandstone
	871'0	881'0		1'6				Light pink sandstone and clay, becoming buff
	881'0	887'0		2'3				Sandy clay
	887'0	893'0		2'6				Clay and shale $0=10^{o}$
	893'0	898'6		2'6				Buff clay and sandy clay
	898'6	903'6		2'6				

740(2) - 51

Hole No. B48 C.R.A.E. 34

Date Logged	From Feet	To Feet	Distance Feet	Core Recovery Feet	Sample No.	Assay Value	Av. Val. and Width	Geological Description
	903'6	908'6		3'6				Shale with sandy phases. Some green and pink sandstone at bottom.
	908'6	915'0		4'6				Worm burrows. White sandstone and some clay
	915'0	920'0		4'6				White sandstone becoming pink. Pound quartzite
	920'0	930'0		8'0				
	930'0	940'0		8'0				
								END OF HOLE

740(2) - 52