C.R.A. EXPLORATION PTY. LIMITED

ANNUAL REPORT

GOODPARLA E.L. 1092

PINE CREEK BASIN, N.T.

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Date: March 1980

submitted to : W.H. Johnston

copy: N.T. Dept. of Mines & Energy

CONTENTS

1. SUMMARY

A programme of geological mapping, scintillometer survey, auger and diamond drilling was carried out within Goodparla E.L. 1092 during the 1979 field season.

2. INTRODUCTION

Title to Goodparla E.L. 1092 was granted to C.R.A. Exploration Pty Limited on the 22nd December, 1976 by the N.T. Administration. Location of E.L. 1092 is shown on plan NTd (1317).

Exploration carried out by CRAE within the Goodparla E.L. during the first year of tenure has been described by Wills, 1978 (CRAE Report No.9158) and during the second year of tenure by Ikstrums 1979, (CRAE Report No.9526). This report describes exploration activities carried out during the third year of tenure.

3. CONCLUSIONS

Geological mapping, scintillometer survey and auger drilling aided in further delineating drill targets at the Namoona Prospect. The best two situations were tested by diamond drilling. Neither hole intersected economic basemetal mineralisation.

4. 1979 FIELD WORK AND RESULTS

Work during the 1979 field season concentrated on upgrading anomaly 4.16 (Namoona Prospect). This work consisted of geological mapping, scintillometer survey, auger and diamond drilling.

4.1. Geological mapping

Geological mapping was carried out over the 10.4 zone and the Cockatoo ridge area within the Namoona Prospect. The boundaries of the two areas mapped are shown on plan numbers NTd1320 and NTd1321 whilst the surface geology of the two areas mapped in detail is shown on plans NTd 316 and NTd 1311 respectively. Additional lithological and structual information was required prior to the selection of diamond drill sites.

Results Geological mapping at 1:5000 scale was carried out in the 10.4 zone to further delineate the potassic rhyolite unit and its associated lead zinc silver mineralisation.

Mapping revealed three thin rhyolite units interbedded in a predominantly dolomitic graphitic shale unit. The three rhyolite units are subparallel to each other, have a discontinous strike length of 600 metres and disappear under alluvial cover south of grid line 10,000N. Lead zinc silver mineralisation is only associated with the middle rhyolite unit. The predominantly sedimentary sequence dips steeply to the east in the 10.4 zone.

Detailed mapping (1:1000 scale) in the Cockatoo ridge area has shown that the lithologies intersected in diamond drill hole DD78N8 do in fact correlate with the surface geology.

However, hole DD78N8 did not intersect either gossan horizon despite drilling under the outcropping gossans. Possible explanations for this are:-

(1) The gossan horizons rapidly pinch out at depth.

(2) The gossan horizons may have a shallow plunge to the north and hole DD78N8 was drilled beneath them.

4.2. Scintillometer survey

A ground scintillometer survey was carried out over the 10.4 zone to further delineate the potassic rhyolite unit and its associated lead zinc silver mineralisation prior to diamond drilling.

The surveyed area is shown on plan number NTd1320 and the profiles are located in Appendix I.

A BGS-ISL scintillometer was used to help map the radiometrically anomalous potassic rhyolite units. Readings were taken at 2 to 5 metre intervals on grid lines 200 metres apart.

Results Anomalous radiometric readings were obtained in areas of outcropping rhyolites. Three subparallel rhyolite units were delineated on lines 10400N and 10200N. However, from line 10,000N to line 9200N only one prominant anomaly was defined. This anomaly corresponds with an outcropping ridge of rhyolite.

Possible explanations why the other two rhyolite units were not delineated are:-

(1) the rhyolites may have pinched out along strike.

(2) the allivual cover is too deep in the southern area.

4.3. Auger drilling

Infill auger drilling was carried out in the southern part of the Namoona Prospect between lines 8400N to 10700N. The area drilled is shown on plan number NTd1320 and the location of auger holes with assay results is shown on plan number NTd 1321.

A total of 101 auger holes were drilled to obtain "C" horizon samples. These samples were sieved to -80 mesh and assayed for lead, zinc, silver, copper and manganese, by Tetcham Laboratories, Cairns, under DPO 20903. Logs of auger holes with assay results are given in Appendix II.

Results No outstanding assay results or new anomalous zones were delineated from this auger drilling programme. Assays results ranged from 28 to 1450ppm lead whilst zinc values ranged from 38 to 6800ppm. This "C" horizon auger drilling programme has effected closure of the 10.4 zone along strike to the south.

4.4. Diamond drilling

Two diamond drill holes were drilled into the Namoona Prospect during the 1979 field season. Drill hole DD79N23 was sited 400 metres along strike from drill hole DD79N19 which had intersected sub-economic lead zinc silver mineralisation. Drill hole DD79N2 was sited on the 10.4 zone and it was planned to intersect the mineralisation obtained in DD78N1 at R.L. 200 metres.

The 1979 drill hole information is summarised in Table 1 and location of the holes is shown on plan number NTd 1320. Complete drill logs with assays are given in Appendix III and drill cross section plans on plan numbers NTd 1081 and NTd 1082.

Results Discouraging results were obtained from the drilling programme.

Diamond drill hole DD79N23 was abandoned at 122.4 metres. The drill hole did not reach the target zone due to encountered drilling difficulties which were brought on by unforseen structural complexities. Highest assay values returned were 136Pb, 3200Zn and 160Cu(ppm). A summary log of hole DD79N23 is described below:-

From	To	Lithologies
0.0 -	16.0 m	Weathered clays and brown shales
16.0 -	92.6 m	Black dolomitic graphitic shales minor carbonate and quartz veining, minor pyrite.
96.2 -	97.0 m	Trangressive acid volcanic
97.0 -	116.6 m	Black dolomitic graphitic shales with minor pyrite and carbonate quartz veining
116.6 -	122.4 m	Brecciated quartz veined highly graphitic shale

END OF HOLE.

After two unsuccessful precollaring attempts, diamond drill hole DD79N25 was completed at a depth of 223.0 metres.

The target zone, a multiple potassic rhyolite zone, was intersected at on R.L. 175 metres. No economic base-metal mineralisation was encountered in this position. Highest assay values returned 250Pb, 1540Zn and 1760Cu (ppm). A summary log of hole DD79N25 is given below.

From		To	Lithologies
	(m)		
0	-	30	Weathered purple brown shales.
30	-	56.6	Black dolomitic graphic shale.
56.6	-	57.0	Dolomitic sandstone with pyrite.
57.0	-	172.1	Black dolomitic graphitic shale. minor carbonate quartz veining, minor pyrite. Fault zones up to 3m wide common with pyrite and trace sphalerite.
172.1	-	172.6	Rhyolite tuff 2% pyrite.
172.6	-	196.72	Black dolomitic graphitic shale.
196.72	-	198.32	Rhyolite tuff 7% pyrite.
198.32	-	223.0	Dolomitic graphitic shale.

J.P. IKSTRUMS

G.H. STEEMSON

REFERENCES

Ikstrums, J.P.	1979	Annual Report for year ending 22/12/1978. Goodparla E.L. 1092. Pine Creek Basin, N.T. Report No. 9526.
Needham, R.S. Crick, I.H. Stuart-Smith, P.G.	1979	Regional Geology of the Pine Creek Geosynclinic. International Uranium Symposium on the Pine Creek Geosyncline, N.T. Australia.
Walpole, B.P. Crohn, P.W. Dunn, P.R. Malone, M.A.	1968	Geology of the Katherine Darwin Region, N.T. Bull., Bureau of Mineral Resources 82.
Wills, K.J.	1978	Annual Report Goodparla E.L. 1092. Pine Creek Basin, N.T. Report No.9158.

KEYWORDS

Lead, zinc, copper, silver, carbonaceous pyritic shale, potassic rhyolitic tuff, assays-drill, assays geochem, drill auger, drill diamond, drill logs, geological-mapping.

LOCATION

Mt. Evelyn SD53-5 1:250,000 geological map sheet

LIST OF PLANS

Plan No.	Title	Scale
NTd 1317	Locality map Goodparla E.L. 1092. George Creek E.L.1094. Minglo lease M.L. 105A. Pine Creek Basin, N.T.	1:250,000
NTd 1320	Areas of exploration activities during 1979.	1:5000
NTd 1321	Area of exploration activity during 1979	1:5000
NTd 1316	Geological map Namoona 10.4 zone.	1:5000

Plan No.	Title	Scale
NTd 1311	Geology of the Cockatoo Ridge over the DD78N8 area. Namoona Prospect. Pine Creek Basin.	1:1000
NTd 792	Namoona Prospect - 80 mesh auger hole location and assays.	1:5000
NTd 1081	Namoona Prospect, N.T. Drill section 8600N. Hole DD79N23.	1:200
NTd 1082	Namoona Prospect, N.T. Drill section 10300N. Holes DD79N22, 24, 25.	1:500

LIST OF TABLES

LIST OF APPENDICES

TABLE 1
1979 DRILL HOLE INFORMATION

HOLE NUMBER	ZONE NAME	COLLAR COORDS		DIP	AZIMUTH	DATE DRILLED	PERN. TO (m)	DIAMD. TO (m)
		NORTH	EAST					
DD79N23	Goodparia Creek South	8600	3144	60°	215°	14-7-79 28-7-79	49.0	122.4
DD79N22	10.4	10300	2474	70°	045°	26-7-79 27-7-79	105	
DD79N24	10.4	10300	2469	65°	045°	28-7-79 2-8-79	55	76.0
DD79N25	10.4	10300	2524	75°	045°	11-8-79 23-8-79	52	223

MR473

George Creek
17·24 Sq miles

MR563

LEGEND

AREA OF EXPLORATION LICENCES TO BE RELINQUISHED

AREA UNDER APPLICATION FOR RENEWAL

13° 13' 00"

131° 56' 00"

EL1094

132° 00' 00"

MT. HARRIS

13° 15' 50"

13° 16' 00"

Goodparla
38·26 Sq miles

13°16' 40"
132° 03' 00"

Mary

MR 275

131° 59' 30"

132° 05' 00"

13° 18' 00"
132° 01' 40"

13° 19' 00"

GOODPARLA

EL1092

13° 20' 00"

ML105A

132° 08' 00"

13° 21' 00"

13° 21' 50"

132° 03' 00"

13° 23' 00"

132° 07' 40"

MOUNT WELLS

POLICY RESERVE

MR564

MR563

5 0 5 10 15 20 Km

SCALE 1:250,000

13° 46' 20"
132° 42' 20"

EL Sherana

River

MOLINE

PINE CREEK

C R A EXPLORATION PTY LIMITED

LOCALITY MAP
ML105A, EL1092 & EL1094
PINE CK. BASIN
N.T.

Reference SD 52-8 SD 53-5		
Geologist J.I.	Scale 1 250,000	
Drawn WSP	Date March, 1980	Plan No NTa1317

1979 INFILL AUGER DRILLING PROGRAMME

1979 AREA COVERED BY DETAILED GROUND RADIOMETRICS

1979 GEOLOGICAL GRID MAPPING

C.R.A. EXPLORATION PTY. LTD.		
NAMOONA PROSPECT **AREAS OF EXPLORATION ACTIVITY DURING 1979**		
Reference SD 53/5		Sheet 1 of 4
Geologist K.W., J.I., I.M.	Scale 1:5000	Drawn P.J.W.
Report No. 9529	Date June 1978	Plan No. NTD 1320

Plan 25

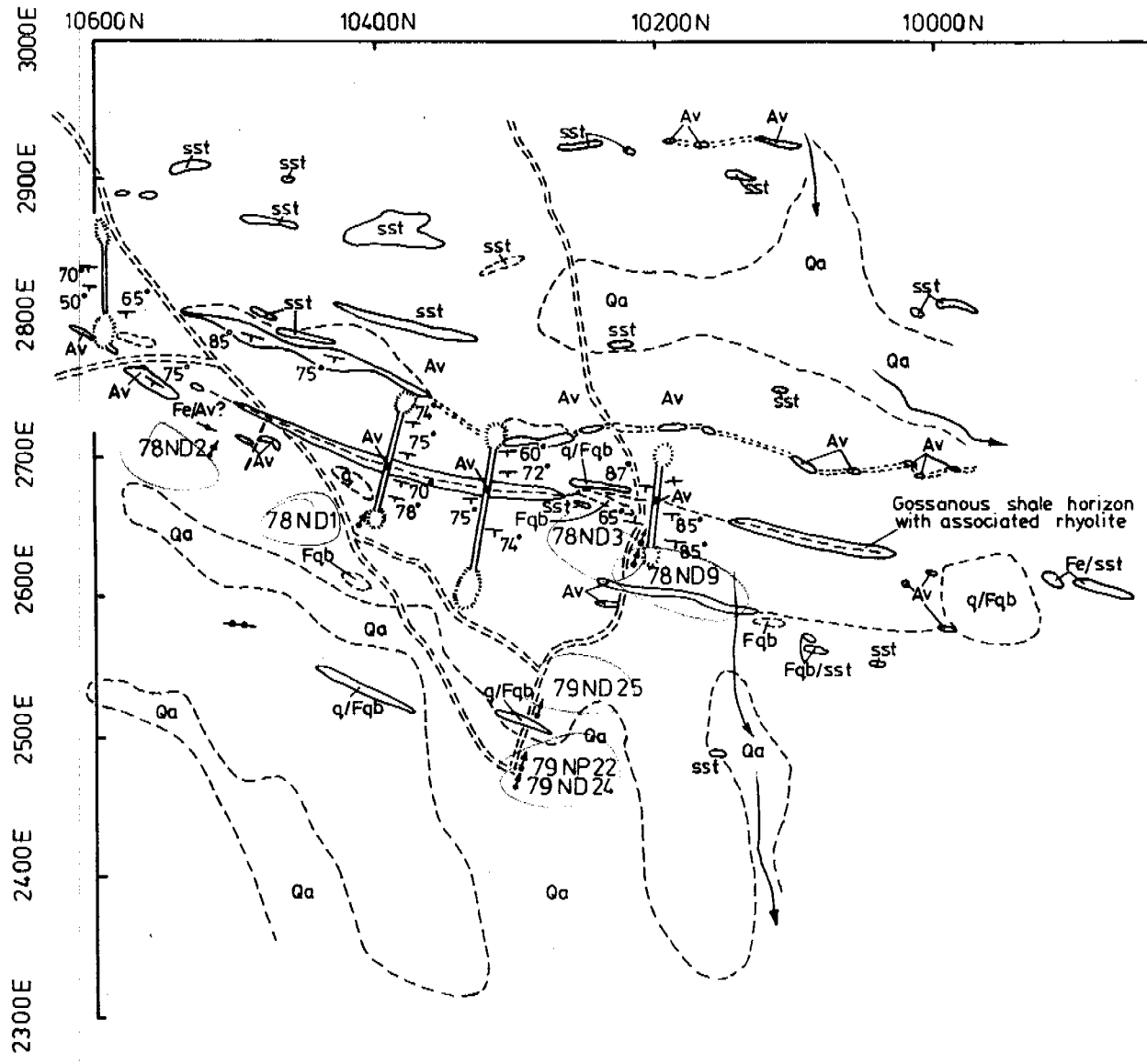
C.R.A EXPLORATION PTY LTD

NAMOONA PROSPECT

AREAS OF EXPLORATION ACTIVITY DURING 1979

Reference SD 53 – 5		Sheet 4 of 4
Geologist K.W., J.I., I.M.	Scale 1:5000	Drawn P.J.W.
Report No 9529	Date June 1978	PLAN No. NTD.1321

Plan 28.



LEGEND

- Track
- Drill hole
- Costean
- Geological boundary
- Strike & dip
- Quartz out crop

GEOLOGICAL REF.

sh	Dolomitic, graphitic, pyritic shale.
Av	Potassic, rhyolitic tuff.
Fqsst	Dolomitic quartz sandstone.
Fqb	Quartz iron breccia.
q	Quartz reef, blows, veins.
Qa	Alluvial.

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GEOLOGICAL MAP
NAMOONA PROSPECT
10·4 ZONE
PINE CK. BASIN N.T.

Reference Mt. Evelyn 1:250,000 SD 53-5		
Geologist J. I.	Scale 1:5,000	Report No.
Drawn W.S.P.	Date March, 1980	Plan No. NTd.1316

21500 N
21400 N
21300 N
21200 N
21100 N
3400 E
3300 E
3200 E
3100 E
B 31, 799, 88
B 186, 1140, 63
B 26, 188, 70
red shale 47, 75, 50
ferr shale 41, 64, 63
ferr shale 48, 66, 52
ferr shale 400, 123, 64
v ferr shale 1410, 511, 162
ferr shale & qtz 50, 129, 97
S(gossanous)
G float
COLLUVIAL FERRUGINOUS SHALE
78 ND 8
COSTEAN
B(float)
WLS
FLAT GROUND ON OUTCROP
shale 119, 134, 44
shale 212 435, 51
shale 138, 178, 58
ferr shale 30% gossan frags 1800, 451, 91
gossanous qtz
ferr shale 78, 38, 25
B 161, 369, 56
v ferr tuff shale 219, 209, 47
FACIES CHANGE FROM BRECCIA TO RED TUFF SHALE
FACIES CHANGE FROM BRECCIA INTO RED FERR TUFF SHALE
tuff & ferr banded shales 44, 44, 30
v ferr Py tuff shale 1160, 62, 318
ferr shale 123, 446, 87
FQB + Fe Stn
MOTTLED PURPLE SHALE & SOME CHARACTERISTICS OF THE BRECCIA - POSSIBLE FACIES CHANGE
qtz vein
SOME CHARACTERISTICS OF BRECCIA - POSSIBLE FACIES CHANGE
COLLUVIAL FERRUGINOUS SHALE
1000
500
N

LEGEND

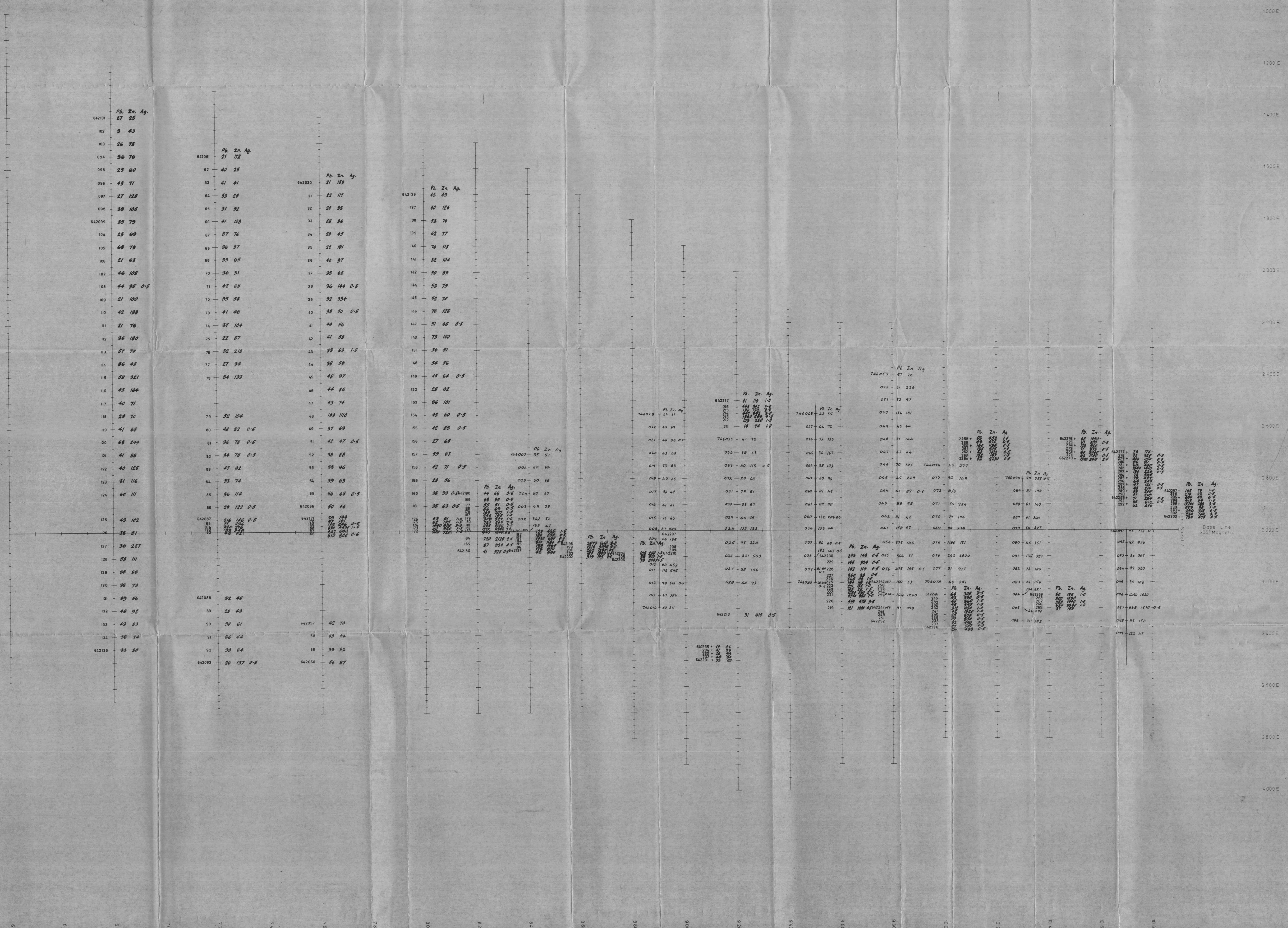
- outcrop
- trace of subcrop
- inferred boundary
- strike direction (dips unobtainable)
- dip and strike
- shale 78, 141, 28 — auger hole to weathered bedrock with lithology and Pb, Zn, Cu assays (see Auger Geochemistry plan for No's and previous auger work.
- gossan outcrop
- gossan trend as inferred from subcrop
- gossan trend as inferred from float
- S — weathered shales - usually red - purple, tuffaceous, highly ferruginised
- WLS — white, bleached shales on gossan margins
- breccia - argillaceous drawn out fragments possibly turbidite. Variable texture
- – 80 mesh, soil surface Pb contours

Solow prosp

C.R.A. EXPLORATION PTY LIMITED

GEOLOGY OF THE COCKATOO RIDGE OVER THE 78 ND 8 AREA NAMOONA PROSPECT PINE CREEK BASIN

Reference SD 53 - 5		
Geologist C.G.S.	Scale 1:1000	Report No
Drawn S.P.S.	Date FEB 1980	Plan No NTd 1311



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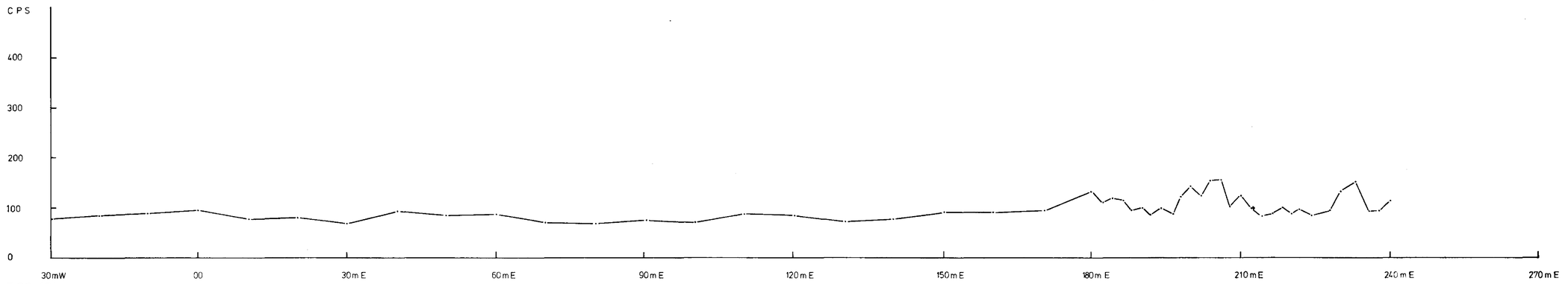
NAMOONA PROSPECT
-80 MESH AUGER ASSAYS
LEAD, ZINC & SILVER
SHEET I.

Reference SD 53-5		
Geologist K.W.	Scale 1:5000	Drawn P.J.W.
Report No. 9529	Date JUNE 1978	PLAN No. NTD 792

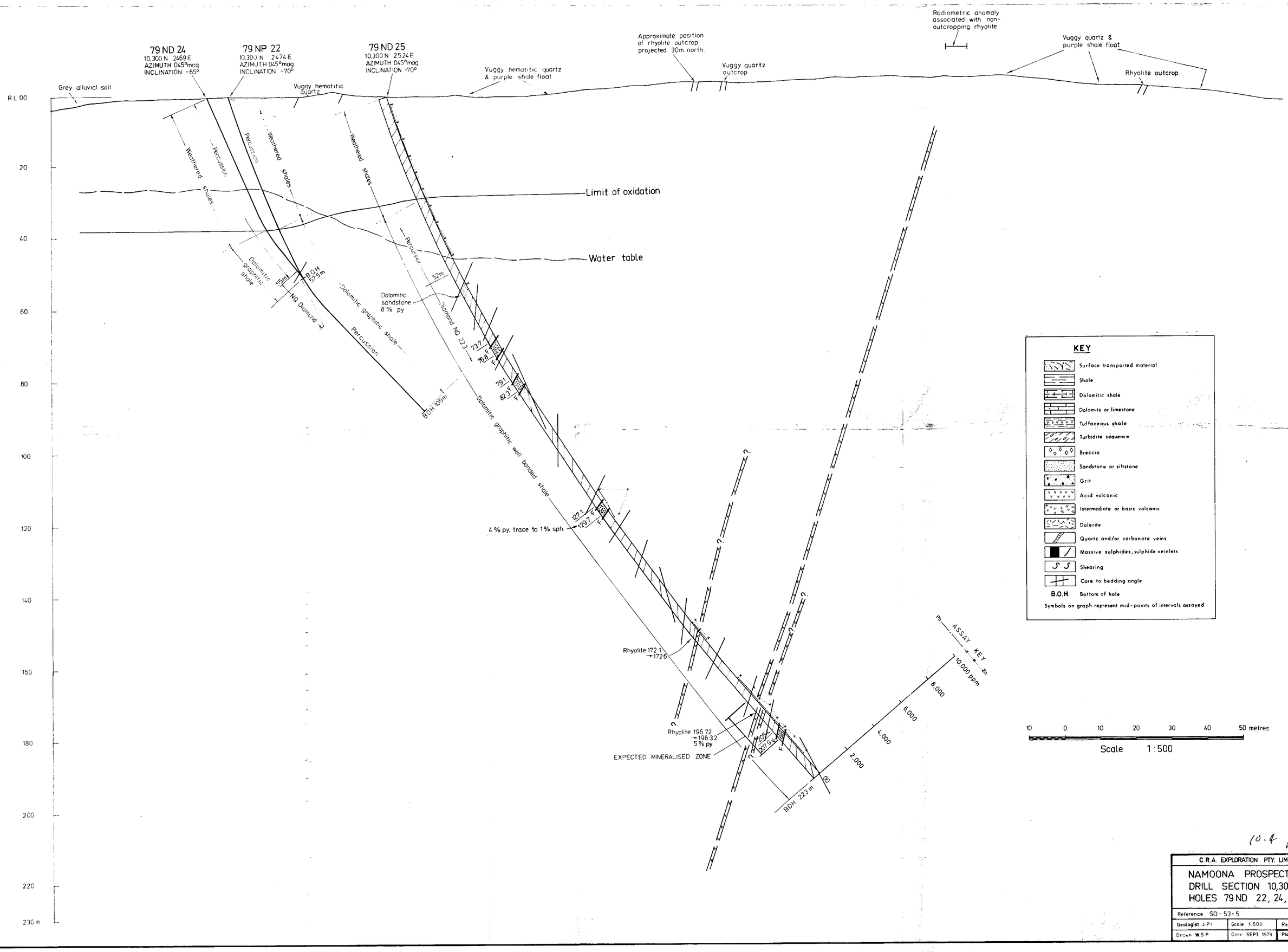
Plan 33.

SURFACE RADIOMETRICS



BGS-1SL

DRILL SECTION 10.300 N (Looking north)



10.4 prosp

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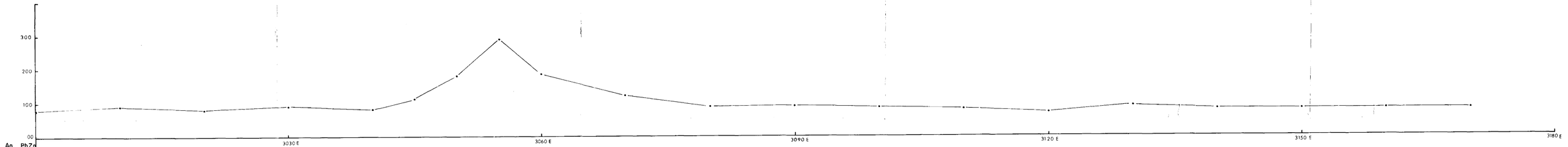
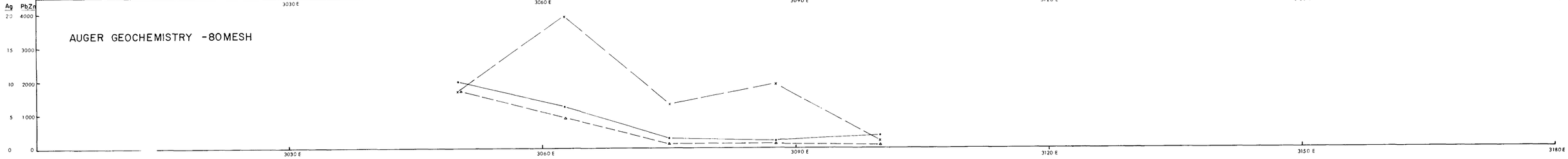
NAMOONA PROSPECT N.T.
DRILL SECTION 10,300 N
HOLES 79 ND 22, 24, 25

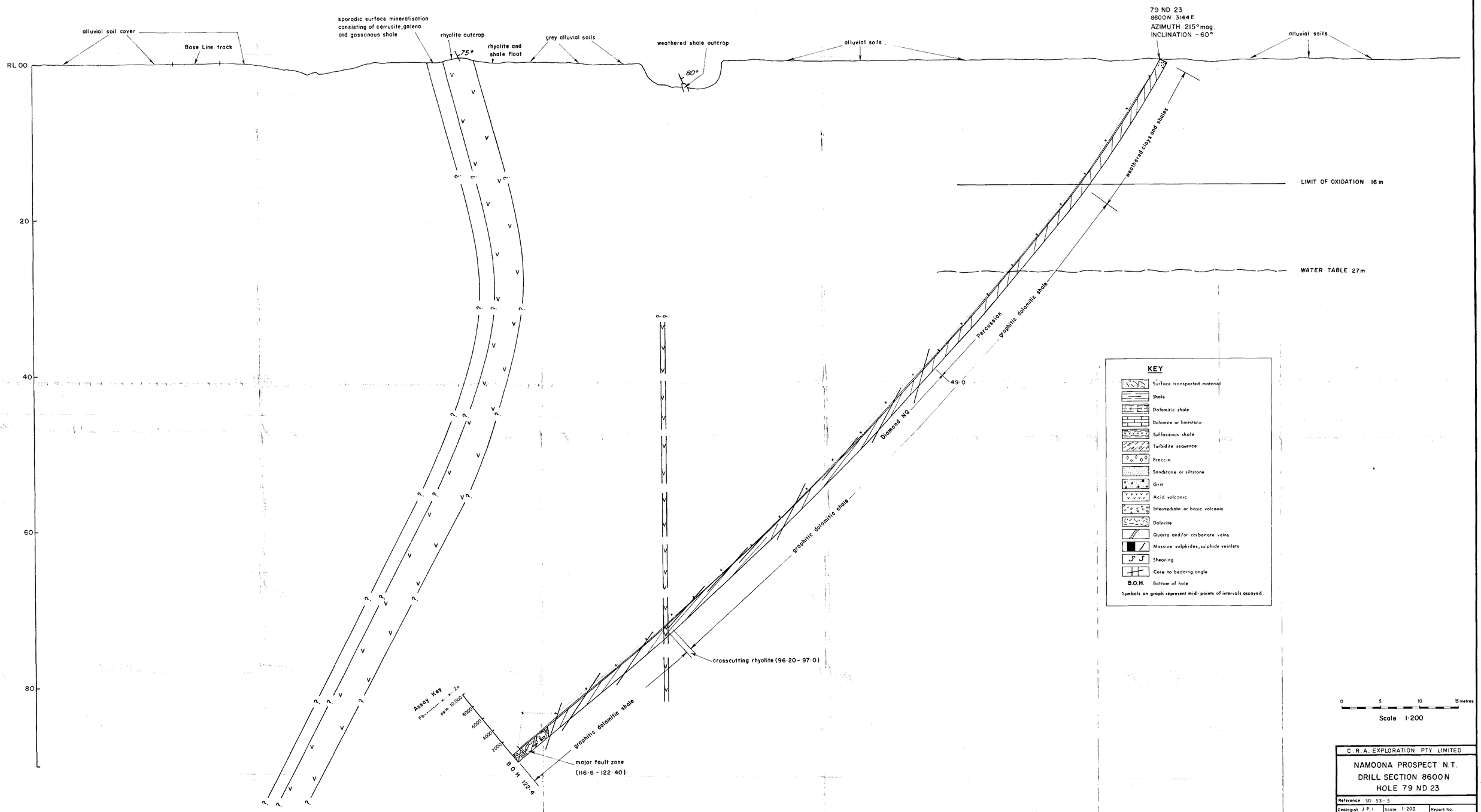
Reference SD-53-5		
Geologist J.P.I	Scale 1:500	Report No
Drawn W.S.P	Date SEPT. 1979	Plan No. N.T.d 1081

SURFACE RADIOMETRICS (BGS - ISL) DRILL SECTION 8600 N (Looking North)



AUGER GEOCHEMISTRY -80MESH





KEY

- Surface transported material
- Shale
- Dolomitic shale
- Dolomite or limestone
- Tuffaceous shale
- Turbidite sequence
- Breccia
- Sandstone or siltstone
- Grit
- Acid volcanic
- Intermediate or basic volcanic
- Dolerite
- Quartz and/or carbonate veins
- Massive sulphides, sulphide veinlets
- Shearing
- Core to bedding angle
- B.O.H. Bottom of hole

Symbols on graph represent mid-points of intervals assayed

0 5 10 15 metres

Scale 1:200

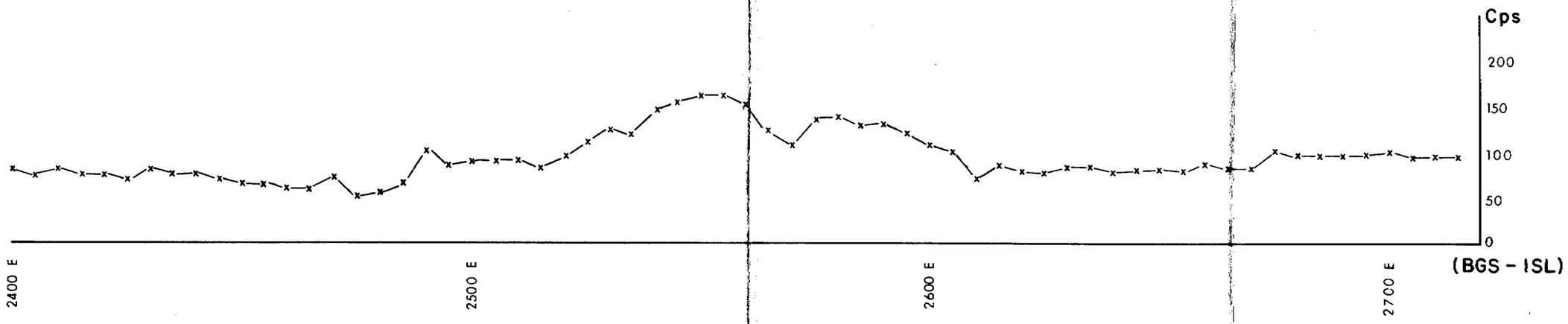
C. R. A. EXPLORATION PTY LIMITED

NAMOONA PROSPECT N.T.
DRILL SECTION 8600N
HOLE 79 ND 23

Reference SD 53-5		
Geologist J.P.I.	Scale 1:200	Report No.
Drawn W.S.P.& S.P.S.	Date SEPT 1979	Plan No NTd 1082

APPENDIX 1

BGS-ISL scintillometer profiles
Namoona Prospect.



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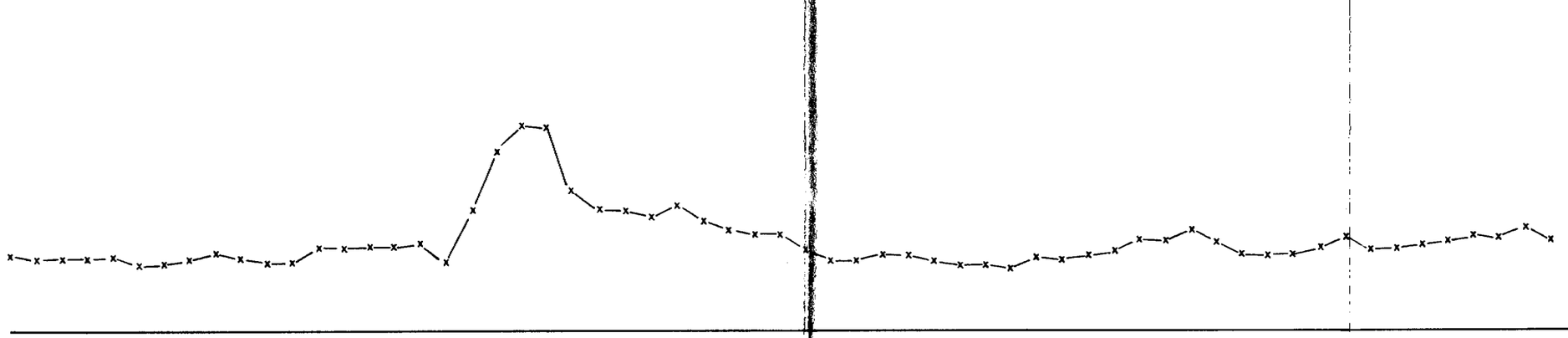
NAMOONA PROSPECT N.T.
GRID RADIOMETRICS
LINE 9200 N

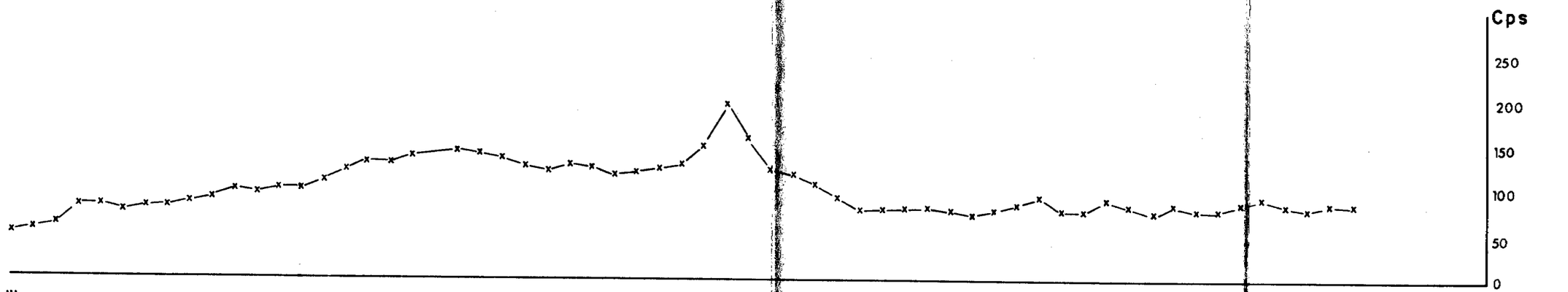
Reference: SD 53-5		
Geologist: J.P.I	Scale: 1:1000	
Drawn: S.P.S	Date: March 1980	Plan No: NTd 1322



C. R.A. EXPLORATION PTY LIMITED

NAMOONA PROSPECT N.T.
GRID RADIOMETRICS
LINE 9400N

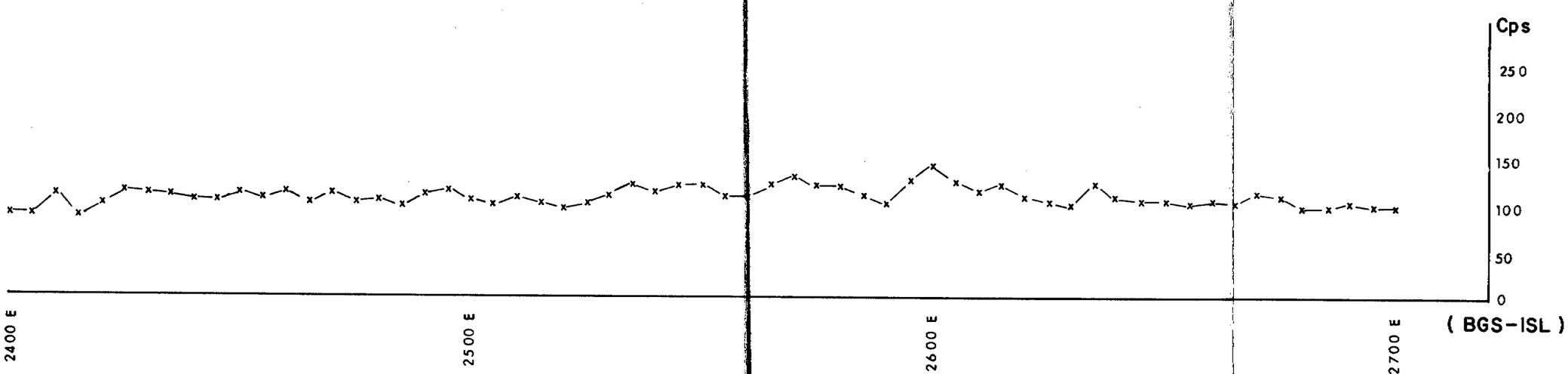
Reference SD 53-5		
Geologist J.P.I.	Scale 1:1000	Report No.
Drawn S.P.S	Date March 1980	Plan No. NTd 1323



C.R.A. EXPLORATION PTY LIMITED

NAMOONA PROSPECT N.T.
GRID RADIOMETRICS
LINE 9600N

Reference SD 53-5		
Geologist J.P.I.	Scale 1:1000	Report No.
Drawn S.P.S.	Date March 1980	Plan No. NTd 1324



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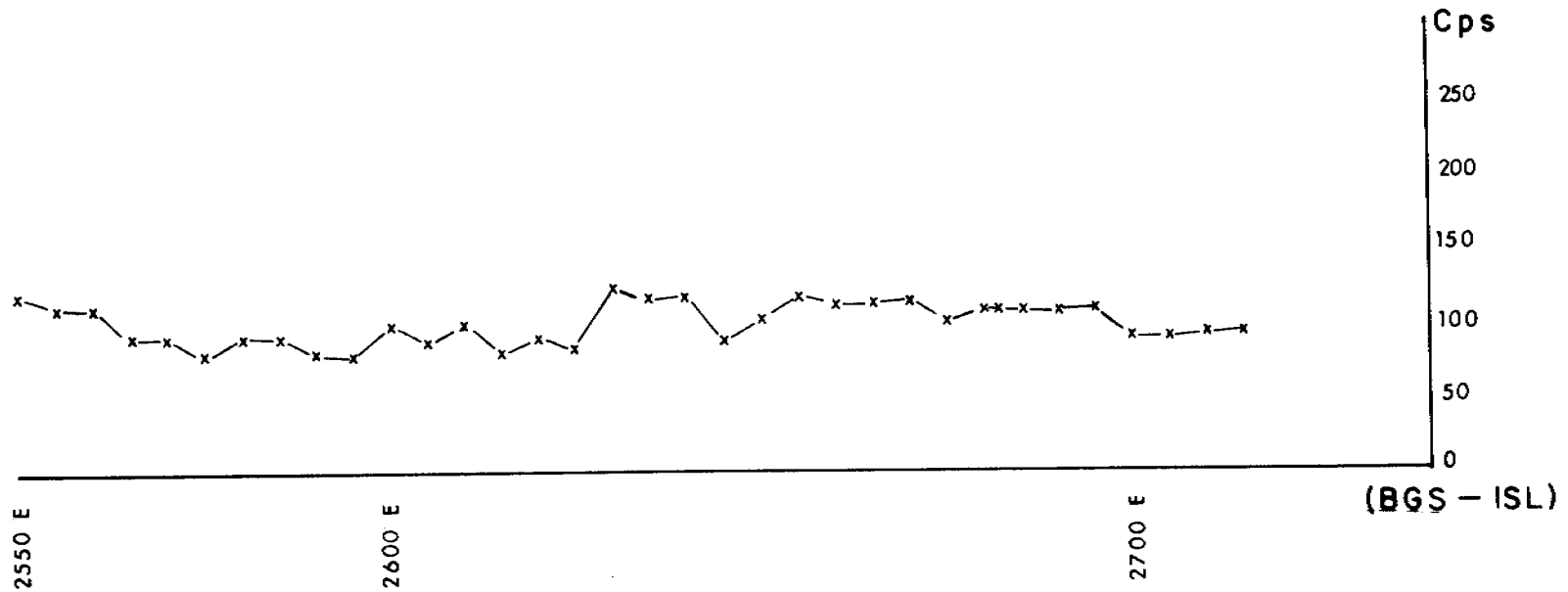
NAMOONA PROSPECT N.T.
GRID RADIOMETRICS
LINE 9800 N

Reference SD 53-5		
Geologist J.P.I.	Scale 1:1000	Ref. No.
Drawn S.P.S	Date March 1980	File No. NTd 1325



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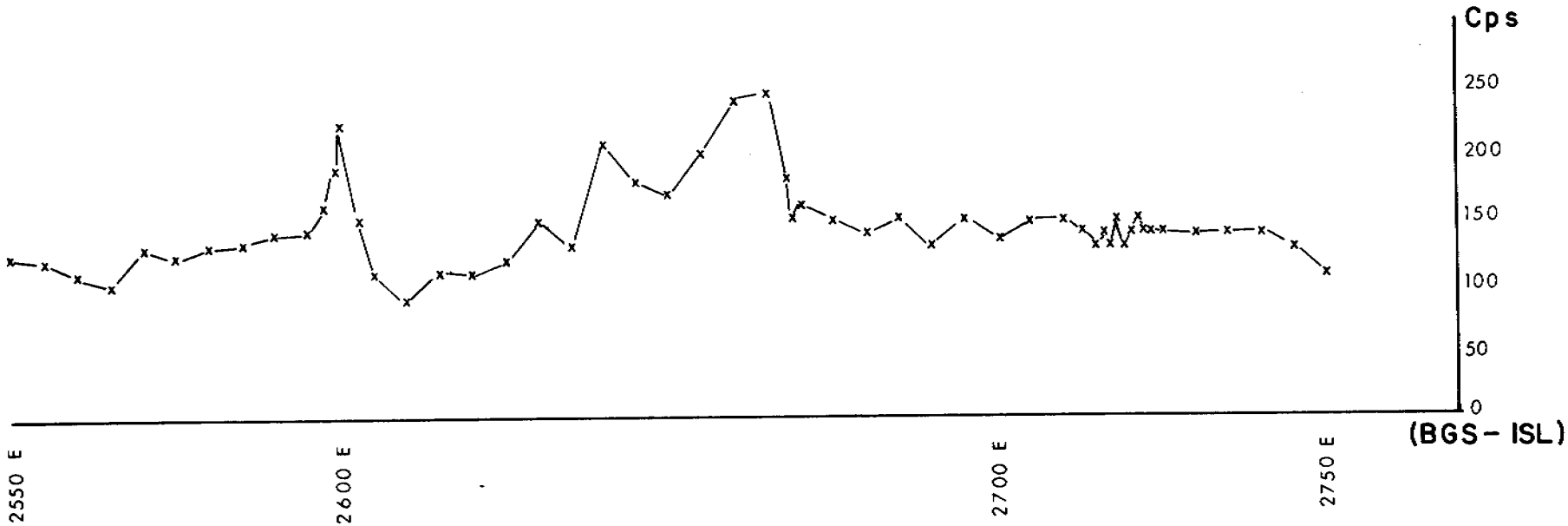
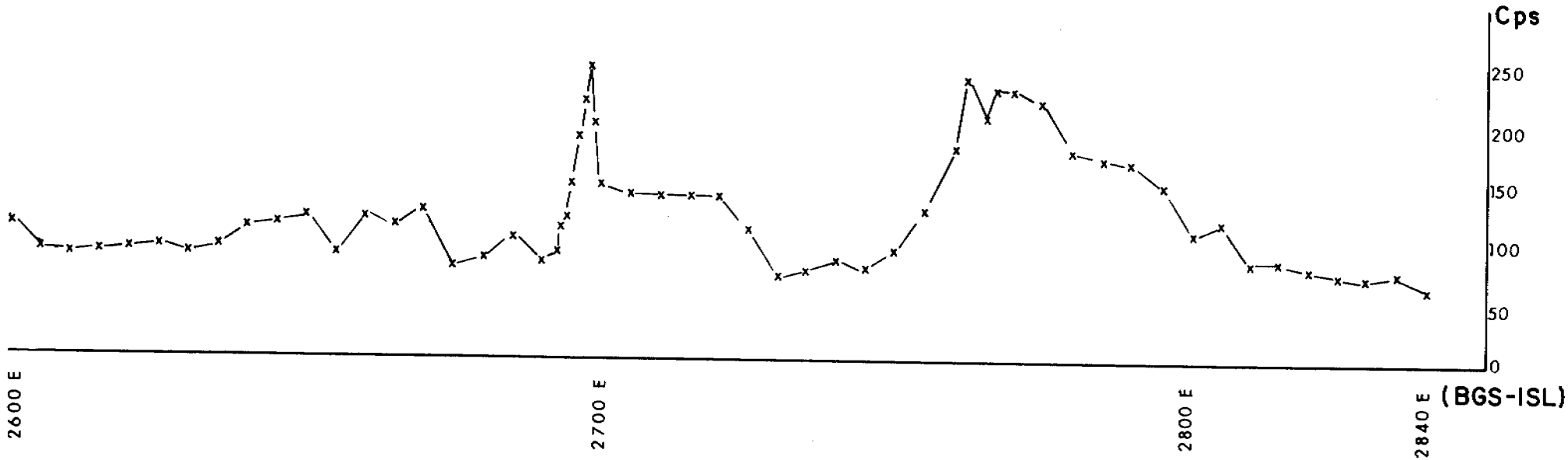
NAMOONA PROSPECT N.T.
GRID RADIOMETRICS
LINE 10000N

Reference SD 53-5		
Drawn J.P.I	Scale 1:1000	Plan No.
Traced S.P.S	Date March 1980	Figure No. NTd 1326



NAMOONA PROSPECT N.T.
GRID RADIOMETRICS
LINE 10200N

SD 53-5		
J.P.I.	1:1000	
S.P.S	March 1980	NTd 1327



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NAMOONA PROSPECT N.T.
GRID RADIOMETRICS
LINE 10400N

Reference SD 53 - 5		
Geologist J.P.I.	Scale 1:1000	Report No.
Drawn S.P.S.	Date March 1980	Plan No NTd 1328

APPENDIX 2

Auger logs and assay results

Namoona Prospect.

C.R.A. EXPLORATION PTY. LIMITED

GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 20903

DATE 21/5/79

AREA NAMOONA

SAMPLE Nos. 746001 - 007.

COLLECTED BY CS, MB.

MAP OR PHOTO REFERENCE Auger Samples To Wea. Bedrock.

ANALYSED BY Fetchen.

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p. p. m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As			Geological observations
8400N 3000E	746001			0	0	0		1	4	0				133	471	74				1020	<0.5					Pink brown clays ± 20% clayey mottled wea shale frags. Sudden change to pink frier at wea rock.
8400N 2950E	746002			0	0	0		2	0	0				342	52	93				43						Red brown clayey colluvium to yellowish clayey wea shale frags at bdrock interface.
8400N 2900E	746003			0	0	0		2	4	0				49	38	50				83						Bdrock is yellow mottled clay. Some frags of banded cream/purple ferr. shale. Minor QTZ on surface
8400N 2850E	746004			0	0	0		1	6	0				50	67	38				223						From yellow-brown mottled cohesive clays to purple highly ferr. clays at 160cm. No chips - all shale.
8400N 2800E	746005			0	0	0		2	4	0				50	68	34				396						As above but bedrock not so uniformly purple. More mottled - all clays, no chips.
8400N 2750E	746006			0	0	0		1	3	0				50	62	46				132						Yellow brown cohesive clays to 140cm. Then sharp change to red + dark purple clays + ferr. shale.
8400N 2700E	746007			0	0	0		1	2	0				35	51	34				133						Orange brown clays, transitioning into khaki clays. Wea shale.

FORM No. 134

C.R.A.E. PLAN No. M828

C.R.A. EXPLORATION PTY. LIMITED

GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 26303

DATE 22/5/79

AREA NAMOONA.

SAMPLE Nos. 746013 - 018

COLLECTED BY CS/MB

MAP OR PHOTO REFERENCE Auger Samples to Wea Bedrock.

ANALYSED BY Tetchem.

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p. p. m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As			Geological observations
8900N	746013			0	0	0		1	0	0																Soft red clay ± khaki coloured wea shale chips.
3250E				1	0	0		1	5	0																As above.
				1	5	0		2	0	0																Clayey grey shale grading into purple coated frags.
				2	0	0		3	0	0				67	384	72				148	<0·5					Wea. bedrock. Soft grey wea shale.
8900N	746014			0	0	0		1	0	0																Reddish + khaki clays ± fine wea shale chips
3300E.				1	0	0		1	4	0																As above coarser chips.
				1	4	0		2	4	0																As above.
				2	4	0		3	0	0				60	211	38				112						Wea. bedrock. Purple clay coated grey wea shale.
8900N	746015			0	0	0		1	0	0																Reddish clay ± khaki + yellow wea shale chips.
2950E				1	0	0		1	5	0																As above coarser chips.
				1	5	0		2	0	0																Wea bedrock – green clay
				2	0	0		2	6	0				75	63	45				152						Forr. QTZ ± some white frags – prn. A.V. or leached qtzy. shale.
8900N	746016			0	0	0		1	0	0																Soft reddish clay ± khaki-yellow wea shale chips
2900E				1	0	0		2	0	0																As above, chips coarser.
				2	0	0		2	7	0																As above, minor QTZ.
				2	7	0		3	0	0				41	51	36				314						Some QTZ, purple tuffaceous shale, + green shale.
8900N	746017			0	0	0		1	0	0																Reddish yellow clays.
2850E				1	0	0		2	0	0																Yellow-grey clays ± white 5'Stn frags
																										+ mottled shale chips.
				2	0	0		3	0	0				36	47	34				104						Reddish brown gritty clay – wea shale.
8900N	746018			0	0	0		1	0	0																Reddish yellow clays.
2800E				1	0	0		2	0	0																Yellow brown clay ± pale + frag. wea shale.
				2	0	0		3	0	0																As above.
				3	0	0		4	0	0																light red-brown clay ± shale chips.
				4	0	0		4	8	0				40	65	21				149						Yellow grey clay ± wea shale chips

FORM No. 134

C.R.A. EXPLORATION PTY. LIMITED

GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 20903

DATE 22/5/79

AREA Namoona

SAMPLE Nos. 746019-21; 746008-10

COLLECTED BY CS/MB/LC

MAP OR PHOTO REFERENCE Auger samples to wea. Bedrock.

ANALYSED BY Tetchem.

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p. p. m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As			Geological observations
8900N	746019			0	0	0		1	0	0																Yellow Brown sandy clay
2750E.				1	0	0		2	0	0																Yellow brown alluvium, minor QTZ.
				2	0	0		3	0	0																As above.
				3	0	0		3	5	0																Grey-khaki wea shale + clay.
				3	5	0		4	5	0																Wea shale bedrock - some dark purple
				4	5	0		4	8	0				53	83	48				1270	<0.5					highly fer. shales + QTZ.
8900N	746020			0	0	0		1	0	0																Yellow brown sandy clay
2700E				1	0	0		2	0	0																Reddish brown sandy clay
				2	0	0		2	5	0																Reddish brown sandy clay ± purple fer. shale clasts
				2	5	0		3	0	0				41	45	32				388	<0.5					Wea bedrock of purple wea shale.
8900N	746021			0	0	0		1	0	0																Grey to brown sandy clay
2650E				1	0	0		1	2	0																Kahki-grey wea shale clays
				1	2	0		1	8	0																Yellow brown clays.
				1	8	0		2	0	0																Red brown clays ± some Fe stained QTZ.
				2	0	0		3	0	0																Red-purple clayey wea shale
				3	0	0		3	1	5				45	58	40				294	0.5					As above - wea bedrock.
8900N	746008			0	0	0		2	4	0				81	200	60				324	<0.5					Pink clays grading through to
3000E																										wea purple clayey shale.
8900N	746009			0	0	0		2	2	0				65	155	96				426	<0.5					As above.
3050E																										
8900N	746010			0	0	0		1	0	0																Kahki-red clays
3100E				1	0	0		1	2	0																" " "
				1	2	0		1	4	0																" " "
				1	4	0		2	0	0.				64	452	73				1460	<0.5					Soft grey clayey wea shale.

C.R.A. EXPLORATION PTY. LIMITED

GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 20903

DATE 22/5/79

AREA Namoona.

SAMPLE Nos. 746011, 012, 022–027

COLLECTED BY CS, MB, LC.

MAP OR PHOTO REFERENCE Auger Samples to Wea. Bedrock.

ANALYSED BY Tetchem.

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p. p. m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As			Geological observations
8900N	746011			0	0	0		2	0	0				116	595	101				1980	<0.5					Pink clays through to light pink wea, partly ferr. shale.
3150E																										
8900N	746012			0	0	0		1	0	0																Reddish shale colluvium ± minor QTZ
3200E				1	0	0		1	2	0																As above
				1	2	0		1	4	0																As above but ± pale shale frags.
				1	4	0		2	0	0																As above.
				2	0	0		3	0	0.				98	515	77				204	0.5					Wea shale bedrock - soft clayey grey frags.
8900N	746022			0	0	0		1	0	0																Red-yellow clay
2600E				1	0	0		2	0	0																Yellow brown clay ± wea shale chips + ferr. QTZ.
				2	0	0		3	0	0																Red-brown + purple wea shale, minor QTZ.
				3	0	0		3	4	0				65	69	48				408	<0.5					As above - wea. bedrock.
8900N	746023			0	0	0		2	0	0																Reddish yellow clay
2550E				2	0	0		2	4	0																Red brown + purple clayey wea shale.
				2	4	0		2	7	5				44	61	46				236	<0.5					Red ferr., pale to white wea. clayey shale, minor QTZ
9200N	746024			0	0	0		1	8	0				135	122	51				42	<0.5					Sandy clay grading into wea shale bedrock.
3000E																										
9200N	746025			0	0	0		1	8	0				95	224	54				275	<0.5					As above
3050E																										
9200N	746026			0	0	0		2	0	0				221	503	70				609	<0.5					As above.
3100E.																										
9200N	746027			0	0	0		2	0	0																Light brown sandy clay ± wea ferr. shale chips
3150E				1	0	0		3	0	0																Brown to purple finer, ferr shale chips
				3	0	0		3	4	0				38	156	68				445	<0.5					Purple wea shale bedrock

FORM No. 134

C.R.A. EXPLORATION PTY. LTD.

C.R.A. EXPLORATION PTY. LIMITED

GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 20903

DATE 22/5/79

AREA Namoona — SAMPLE Nos. 746028 - 034. — COLLECTED BY CS, MB, EC.

MAP OR PHOTO REFERENCE Auger Samples to wea. Bedrock. — ANALYSED BY Tetchem.

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p. p. m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As			Geological observations
9200N	746028			0	0	0		1	0	0																Rd brn colluvial shales ± QTZ.
3200E				1	0	6		8	5	0				40	93	44				594	40·5					Red clays grading to light brn clays at 850 ± increasing wea shale chips
				8	50			8	6	0																wea bedrock - fer shales ± fer. QTZ.
9200N	746029			0	0	0		2	0	0																Red - yellow clay
2950E				2	0	0		2	4	0				46	78	59				861	40·5					Wea. Bedrock; yellow grey clay; grey clayey shale.
9200N	746030			0	0	0		1	0	0																Red - yellow clay.
2900E				1	0	0		2	0	0																Yellow - grey clay, wea shale chips
				2	0	0		2	6	0.				33	83	69				516	40·5					Yellw - kahki fines, wea pla pale shale
9200N	746031			0	0	0		1	0	0																Red - yellow clay, QTZ frags.
2850E				1	0	0		2	0	0																Red - brown clay, " "
				2	0	0		2	2	0.																Yellow - kahki fines.
				2	2	0		2	6	0.				79	89	102				497	40·5					Pink fines - pink. purple wea shale
9200N	746032			0	0	0		1	0	0																Red yellow clay, shale + fer QTZ frags.
2800E				1	0	0		5	0	0																Kahki clay ± hard frags shale.
				5	0	0		5	7	0				28	68	56				845	40·5					As above - wea bedrock.
9200N	746033			0	0	0		2	7	0																Red clay
2750E				2	7	0		3	0	0																Reddish yellow clay
				3	0	0		4	0	0																Yellow - brown to purple clay.
				4	0	0		4	9	0																Light brown - yellow clay ± wea shale frags.
				4	9	0		5	0	0				40	115	42				801	0·5					Wea. bedrock. Dark purple fer. shales
9200N	746034			0	0	0		3	0	0																Yellow brown through to Reddish Kahki clay.
2700E				3	0	0		5	0	0																Purple clays ± frags purple fer. shale.
				5	0	0		6	0	0				38	63	39				445	40·5					Kahki - brown clay ± frags brown fer shale

FORM No. 134

C.R.A.E. PLAN No. M828

C.R.A. EXPLORATION PTY. LIMITED
GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 20903
DATE 23-5-79

AREA NAMOONA
SAMPLE Nos. 746035-042
COLLECTED BY CS, MB, LC
MAP OR PHOTO REFERENCE Auger Drilling to Wea. Bedrock
ANALYSED BY Tetchem.

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p.p.m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As	Geological observations
9200N	746035			0	0	0		1	0	0														Red-yellow clay.
2650E				1	0	0		2	0	0														Yellow clay
				2	0	0		3	0	0				41	73	86				459	<0.5			Kahki clay - soft wea kahki shales
9500N	746036			0	0	0		0	8	0														Grey clay
3000E				0	8	0		1	0	0														Reddish clay
				1	0	0		2	0	0														Reddish clay c̄ frags grey clayey shale.
				2	0	0		3	0	0				103	64	74				80	<0.5			As above — bedrock - grey wea shale
9500N	746037			0	0	0		1	0	0														Red-yellow clays.
3050E				1	0	0		1	8	0				86	69	76				29	0.5			As above c̄ wea shale frags.
9500N	746038			0	0	0		1	0	0														Red brown clay, some quartz
3100E				1	0	0		2	0	0														As above c̄ grey clayey wea shale frags.
				2	0	0		3	0	0				152	145	6[illegible]				47	0.5			Purple clays — purple fer. wea shale.
9500N	746039			0	0	0		1	0	0														Red brown clayey colluvium some QTZ.
3150E				1	0	0		2	2	0				81	89	6[illegible]				37	0.5			Red clay c̄ frags grey clayey shale
9500N	746040			0	0	0		1	0	0														Red brown clays.
3200E				1	0	0		2	0	0														Red clay c̄ frags grey clayey shale.
				2	0	0		4	8	0														Purple clays c̄ frags purple fer. shale.
				4	8	0		7	4	0				48	442	68				55	0.5			Kahki clays c̄ frags kahki-brown shale
9800N	746041			0	0	0		0	8	0														Yellow-grey shale colluvium, some fer. QTZ
3000E				0	8	0		1	6	0														Red-brown fines, clayey frags wea grey shale.
				1	6	0		2	0	0				158	67	5[illegible]				27	<0.5			Purple & yellow clays. wea shale
9800N	746042			0	0	0		1	0	0														Red brown alluvial shales. some QTZ
2950E				1	0	0		1	3	0				81	42	45				22	<0.5			Reddish-brown clays and grey clayey shale.

FORM No. 134

C.R.A.E. PLAN No. M828

C.R.A. EXPLORATION PTY. LIMITED
GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 20903
DATE 24/5/79

AREA NAMOONA
SAMPLE Nos. 746043 - 048
COLLECTED BY CS, LC, MB
MAP OR PHOTO REFERENCE Auger Drilling to Wea. Bedrock.
ANALYSED BY TETCHEM

Grid Co-ordinate	Sample No.	Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Depth (inches)	Colour (Munsell) Chart No.	pH	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As			Geological observations
9800N	746043			3	0	0		1	0	0				88	98	103				17	<0.5					Yellow clays transitioning into reddish
2900E																										yellow clay + wea. clayey shale at 1.00m.
9800N	746044			0	0	0		0	4	0																Brown sandy loam.
2850E				0	4	0		3	0	0																Red clays c QTZ chips
				3	0	0		4	5	0																Kahki clays.
				4	5	0		8	4	0				41	87	110				930	0.5					Gradual change to pink clays, wea. shale
																										+ quartz chips
9800N	746045			0	0	0		1	0	0																Red clayey fines
2800E				1	0	0		3	0	0																Pink-brown fines - pale clayey shale
				2	0	0		3	0	0																Kahki coloured clay. pale shales.
				8	0	0		9	0	0				45	229	36				620	<0.5					Kahki grey fines. Shale purple-grey fragments
9800N	746046			0	0	0		0	6	0																Orange brown colluvial clays
2750E				0	6	0		1	2	0																Kahki fine clays. 20% ferr. shale.
				1	2	0		1	6	0																Coarse QTZ + Ferr shale frags. Purple-kahki
				1	6	0		2	4	0																Pink purple fines - clayey wea. shale.
				2	4	0		3	0	0				70	105	49				330	<0.5					Kahki fines - clayey few shale frags
																										some ferr. clays c goethite.
9800N	746047			0	0	0		1	0	0																Pink brown, coarse clayey wea. shale
2700E				1	0	0		1	8	0																Ferr. clays - kahki to pink
				1	8	0		2	0	0				42	64	54				360	<0.5					Yellow-kahki fines. 30% purple siltstone
9800N	746048			0	0	0		1	0	0																Orange-brown colluvial clays
2650E				1	0	0		1	2	0																Kahki clay, some shale.
				1	2	0		2	0	0																Pink-purple fines some coarse shale frags
				2	0	0		2	5	0																Kahki fines, 30% purple shale
				2	5	0		3	0	0				31	144	70				391	<0.5					Kahki fines c [illegible] shale.

FORM No. 134

C.R.A.E. PLAN No.

C.R.A. EXPLORATION PTY. LIMITED
GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 28363

DATE 24/5/70

AREA Namoona

SAMPLE Nos. 746049 - 054

COLLECTED BY S., L.C., M.B.

MAP OR PHOTO REFERENCE Auger Drilling to bedrock

ANALYSED BY Tetchem

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p. p. m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As			Geological observations
9800N	746049			0	0	0		1	0	0																Orange brown colluvial clay.
2600E				1	0	0		1	2	0																Soft grey-white clay lumps coated c̄
																										orange clay
				1	2	0		2	0	0				45	64	4[illegible]				24	<0.5					Red to khaki clays c̄ grey/red shale frags.
9800N	746050			0	0	0		1	0	0																Light brown + orange colluvial clay
2550E				1	0	0		1	8	0																As above c̄ chips of QTZ + shale
				1	8	0		2	5	0																Soft grey-white clay lumps coated c̄ orange clay.
				2	5	0		2	6	5				134	181	67				107	<0.5					Red brown clays c̄ grey/red shale frags.
9800N	746051			0	0	0		1	5	0																Red brown clays c̄ quartz fragments.
2500E				1	5	0		2	0	0																Soft grey white clay c̄ shale frags
				2	0	0		2	4	0				52	97	42				347	<0.5					Red grey clays c̄ grey/red shale frags
9800N	746052			0	0	0		1	5	0																Mustard coloured soft clay shale c̄ qtz frags.
2450E				1	5	0		2	0	0																As above
				2	0	0		3	5	0																Soft white-grey clays.
				3	5	0		4	0	0				51	236	98				473	<0.5					Grey/Red mottled shale frags c̄ yellow clay stain.
9800N	746053			0	0	0		1	5	0																Red-brown clay c̄ coarse frags soft red/grey shale.
2400E				1	5	0		3	0	0																Soft grey-red clay.
				3	0	0		3	2	0				57	72	38				47	<0.5					Soft grey/red shale frags.
9800N	746054			0	0	0		0	8	0																White-grey clay containing ferr. QTZ.
2350E				0	8	0		1	8	0																Soft brown clay c̄ red brown ferr shale frags + QTZ
				1	8	0		2	4	0																Soft grey white clay.
				2	4	0		2	6	0				375	146	56				38	<0.5					Pink clays c̄ frags red, grey + brown shale

FORM No. 134

C.R.A. EXPLORATION PTY. LIMITED
GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. [illegible]

DATE [illegible]

AREA Nammana

SAMPLE Nos. 746055 – 061

COLLECTED BY ES, C, MB.

MAP OR PHOTO REFERENCE Auger Drilling to Wea. Bedrock

ANALYSED BY Tetchem

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p. p. m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As			Geological observations
9800N	746055			0	0	0		1	0	0																White grey clay coating ferruginous QTZ
3100E				1	0	0		2	0	0																Light brown clay c̄ red brown ferr QTZ + shale.
				2	0	0		3	5	0																Orange brown clay " " " " "
				3	5	0		4	0	0				504	37	31				10	<0.5					Red brown + grey frags shale + light brown clay
9800N	746056			0	0	0		1	3	0																Light brown clay c̄ red brown shale + QTZ fr
3150E				1	8	0		2	3	0																Orange " " " " " " "
				2	8	0		3	0	0																Light brown clay c̄ fine QTZ chips.
				3	0	0		4	0	0																Yellow clay " " " "
				4	0	0		4	6	0				475	165	46				19	0.5					" " c̄ yellow-brown shale frags.
9800N	746057			0	0	0		1	0	0																Light brown clay c̄ ferr. QTZ frags
3200E				1	0	0		2	5	0																Pink clays " " "
				2	5	0		3	5	0																Light brown clay c̄ frags grey/yellow shale.
				3	5	0		4	0	0				160	53	18				8	<0.5					white grey clay c̄ red shale frags
9800N	746058																									
3250E				0	0	0		1	0	0																Brown clay c̄ red brown ferr-shale (sub outcrop,
				1	0	0		1	2	0				144	1260	18				171	<0.5					light grey clay c̄ grey shale frags.
9800N	746059			0	0	0		1	0	0																Dark brown surface float (shale) from outcrop.
3300E				1	0	0		1	8	0																Mustard coloured clay c̄ red/yellow wea. shale frag
				1	8	0		2	0	0				91	898	65				414	<0.5					Purple clay c̄ purple shale frags.
9500N	746060			0	0	0		1	0	0					-											Red-brown clay
2950E.				1	0	0		1	2	0																Purple clay c̄ soft red yellow shale frags.
				1	2	0		1	3	5				132	206	57				97	0.5					Light brown clay c̄ red/grey wea. shale frags.
9500N	746061			0	0	0		0	5	0																Light brown colluvial shale + QTZ
2900E				0	5	0		1	2	0																Brown clay c̄ red-grey shale frags
				1	2	0		1	6	0																Light brown clay c̄ brown grey shale frags
				1	6	0		2	0	0				82	90	55				66	<0.5					[illegible]

C.R.A. EXPLORATION PTY. LIMITED
GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 28903
DATE 24-5-79

AREA NAMOONA
SAMPLE Nos. 746062 – 066
COLLECTED BY CS, LC, MR.

MAP OR PHOTO REFERENCE Auger Drilling to Wea. Bedrock.
ANALYSED BY TECHCHEM

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell Chart No.)	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p.p.m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As			Geological observations
9500N	746062			0	0	0		0	8	0																Light brown colluvial shale + qtz.
2850E				0	8	0		1	0	0																Light brown clay c̄ ferr. qtz chips + shale.
				1	0	0		1	6	0																Brown clay c̄ soft red/grey shale frags
				1	6	0		2	0	0				81	45	39				35	<0.5					Red clay c̄ red + grey siltstone.
9500N	746063			0	0	0		1	8	0																Dark red colluvial shale + qtz
2800E				1	8	0		2	8	0																Light red clay c̄ yellow-grey clayey shale frags.
				2	8	0		3	0	0				50	94	46				96	<0.5					Purple clay c̄ purple ferr. wea. shale chips.
9500N	746064			0	0	0		1	0	0																Light brown colluvial shale + qtz.
2750E				1	0	0		2	0	0																Light red clay c̄ soft yellow/grey wea. shale.
				2	0	0		2	5	0																Purple brown clay c̄ brown purple wea. shale frags.
				2	5	0		3	0	0				38	103	45				323	<0.5					Light brown clay c̄ soft yellow grey shale frags.
9500N	746065																									
2700E				0	0	0		1	0	0																Yellow clay c̄ red, yellow, grey shale frags.
				1	0	0		2	0	0																Light brown clay c̄ " " " "
				2	0	0		3	0	0																Mustard coloured clay " " " "
				3	0	0		3	2	0				36	167	134				557	<0.5					Light brown clay c̄ grey + brown shale frags
9500N	746066			0	0	0		1	5	0																Red clay, grey + white shale frags
2650E				1	5	0		1	8	0																Brown clay c̄ " " "
				1	8	0		2	0	0																Purple clay c̄ purple shale ferr. frags.
				2	0	0		2	4	0				72	125	44				416	<0.5					Lighter purple c̄ light purple ferr shale frags

C.R.A. EXPLORATION PTY. LIMITED

GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 20928

DATE 24-5-79

AREA Namoona

SAMPLE Nos. 746067 - 071

COLLECTED BY CS, LS, TB.

MAP OR PHOTO REFERENCE Auger Drilling to Wea. Bedrock.

ANALYSED BY Tel. CHEM

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p. p. m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As			Geological observations
9500N	746067			0	0	0		0	3	0																Red clay topsoil
2600E.				0	3	0		0	4	0																Yellow brown clay
				0	4	0		1	0	0																Red brown clay c grey + red ferr. shale frags
				1	0	0		2	5	0																Brown clay c yellow + brown soft clayey shale frags.
				2	5	0		3	0	0				44	72	48				1710	20·5					Brown clay with hard dark + light grey shale and dark grey quartzite(?) c white QTZ chips
9500N	746068			0	0	0		1	6	0																Light brown clay c brown + purple ferr shale chips
2550E				1	6	0		2	2	0																As above c some QTZ.
				2	2	0		3	0	0				42	55	23				301	20·5					Purple clay c ferr. purple shale chips
10,000 N	746069			0	0	0		1	0	0																Light brown clay with red hematic lumps
3,000 E				1	0	0		1	5	0																Light brown clay with soft grey brown siltstone lu
				1	5	0		1	8	0																Light brown clay with hard grey brown siltstone lu
				1	8	0		2	4	0				90	234	73				14	20·5					Purple cuttings with hard purple chips.
10,000 N	746070			0	0	0		1	0	0																Light brown clay with orange to red chips
2,950 E				1	0	0		2	0	0																Red brown clay with grey brown chips. coars
				2	0	0		2	8	0																Red brown clay with grey brown chips Fine.
				2	8	0		3	0	0				79	196	50				93	20·5					Lighter brown clay with grey brown siltston lumps
10,000N	746071			0	0	0		1	0	0																Light brown clay with dark red hematitic nodules coarse
2,900 E				1	0	0		1	4	0																Brown clay with small grey brown chips.
				1	4	0		2	0	0																Light brown clay with soft grey brown lumps siltston
				2	0	0		2	5	0																Light brown clay with hard grey brown lumps siltstone coarse
				2	5	0		2	8	0																Light brown clay with hard grey brown lumps siltstone fine
				2	8	0		3	0	0				50	954	110				91	20·5					Light brown clay with hard grey brown lumps siltstone coarse

FORM No. 134

C.R.A.E. PLAN No. M828

C.R.A. EXPLORATION PTY. LIMITED
GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 20903
DATE 24-5-79

AREA NAMOONA
SAMPLE Nos. 746072 - 078
COLLECTED BY C.S , L.C., M.B.
MAP OR PHOTO REFERENCE AUGER DRILLING TO WEATHERED BEDROCK
ANALYSED BY TETCHEM

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p.p.m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As	Geological observations
10,000 N	746072			0	0	0		1	0	0														Orange Red clays c̄ red hematitic chips course
2,850 E				1	0	0		1	8	0														Orange Red clays c̄ red hematitic chips course
				1	8	0		2	6	0														Red Brown clay c̄ soft red grey siltstone lumps
				2	6	0		3	0	0														Purple clay c̄ purple siltstone lumps (cuttings)
10,000 N	746073			0	0	0		1	0	0														Red yellow clay c̄ course red yellow lumps
2,800 E				1	0	0		2	0	0				90	149	71				45	<0.5			Purple clay c̄ grey white lumps soft siltstone
10,000 N	746074			0	0	0		1	0	0														Red yellow clay c̄ course red yellow lumps hard.
2,750 E				1	0	0		1	8	0														Red yellow clay c̄ course red yellow lumps soft.
				1	8	0		2	7	0														Red clay with soft grey siltstone & some Qtz chips.
				2	7	0		3	5	0														Yellow clay c̄ hard yellow lumps containing soft grey clay.
				3	5	0		4	0	0														Yellow clay c̄ hard yellow lumps containing Qtz lumps
				4	0	0		4	8	0				43	277	86				956	<0.5			Yellow clay c̄ hard yellow brown nodules.
10,000 N	746076																							Near gossonous Qtz outcrop.
3,100 E				0	0	0		1	0	0														Dark brown gossonous colluvium c̄ Fe-rich brown clayey shale.
				1	0	0		1	3	0				242	6800	46				6700	<0.5			Change to dark brown fines c̄ ferrugianous brown clayey shale.
10,000 N	746075			0	0	0		1	0	0														Red pink colluvium on ridge top. Much ferr. Qtz.
3,050 E				1	0	0		2	0	0				1180	151	96				56	<0.5			Gradual chang to pink brown colour. Much Qtz. Clayey
																								ferr. shales. Some clayey frags. very ferr.
10,000 N	746077																							Gossonous Colluvial cover.
3,150 E				0	0	0		0	9	0														Pink brown & Qtz colluvium
				0	9	0		1	4	0														Change to brown fine ferr. clay c̄
				1	4	0		1	6	0				31	917	40				722	<0.5			yellow brown ferr. weathered shale.
10,000 N	746078			0	0	0		1	0	0														Red brown clay.
3,200 E				1	0	0		2	0	0				45	281	84				303	<0.5			Yellow brown ferr. weathered shale.

FORM No. 134

C.R.A. EXPLORATION PTY. LIMITED

GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 20903

DATE 25-5-79

AREA NAMOONA SAMPLE Nos. 746079 – 085 COLLECTED BY C.S., G.C., M.B.,

MAP OR PHOTO REFERENCE AUGER DRILLING TO WEATHERED BEDROCK. ANALYSED BY TETCHEM

Grid Co-ordinate	Sample No.	Soil composition					Soil horizon	Sample			Bedrock			Metal content, p. p. m.										Geological observations
		Rock %	Laterite %	Sand %	Silt %	Clay %		Depth (inches)	Colour (Munsell) Chart No.	pH	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As	
10,300 N	746079			0	0	0		0	8	0														Red brown angular shale colluvium.
3000 E				0	8	0		1	2	0				54	207	82				511	40·5			Change to purple at 080 E ab 120 to purple & Fe rich brown clayey shale pugs.
10, 00 N	746080			0	0	0		0	8	0														Brown colluvial & shales & SS. Shales very ferr.
3,050 E				0	8	0		1	0	0														Brown colluvial & shales & SS. Shales very ferr.
				1	0	0		1	2	5				46	351	27				191	40·5			Pink ferr. sandstone & horizon.
10,000 N	746081			0	0	0		0	7	0														Red brown colluvium - shale
3,100 E				0	7	0		0	8	0														Qtz zone
				0	8	0		0	9	0														Pink zone of Qtz & clayey ferr. shale
				0	9	0		1	2	0														Brown clays - ferr. shales
				1	2	0		1	6	0														Red brown ferr. clays, weathered shales
				1	6	0		2	0	0				135	329	34				679	40·5			Purple change to orange brown. 20% med ferr. brown shale. Soft clayey fragments.
10,300 N	746082			0	0	0		1	3	0														Red clays & ferr. fragments.
3,150 E				1	3	0		2	0	0				72	180	29				73	40·5			Sharp change to yellow brown clayey weathered shale
10,300 N	746083			0	0	0		0	9	0														Brown clays.
3200 E				0	9	0		1	2	5				61	158	97				138	40·5			Orange fines, cream to orange ferr. soft shale.
10,300 N	746084			0	0	0		0	6	0														Yellow brown fines - clays.
3250 E				0	6	0		1	0	0														Lighter coloured fines - weathered shale traces
				1	0	0		1	2	0				104	621	60				156	40·5			Yellow brown fines. 30% slightly weathered shales ferr.
10,300 N	746085			0	0	0		2	0	0														Brown ferr clays & clayey frags of coll. ferr. shale weathered
3300 E				2	0	0		2	3	0														White clays (mottled) grey to white clayey shale
				2	3	0		2	5	0				46	290	69				1141	40·5			Yellow brown fines. ferr. shales

C.R.A. EXPLORATION PTY. LIMITED

GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 22907

DATE 25/5/79

AREA NAMOONA

SAMPLE Nos. 746086 - 093

COLLECTED BY C.S., A.E., M.B.

MAP OR PHOTO REFERENCE AUGER DRILLING TO WEATHERED BEDROCK

ANALYSED BY TETCHEM.

Grid Co-ordinate	Sample No.	Soil composition					Soil horizon	Sample			Bedrock			Metal content, p. p. m.										Geological observations
		Rock %	Laterite %	Sand %	Silt %	Clay %		Depth (inches)	Colour (Munsell) Chart No.	pH	Outcrop	Concealed	Est. Depth to	Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As	
10,300 N	746086			0	0	0		0	8	0														Yellow brown clays.
3350 E				0	8	0		1	8	0														Pink-Red clays & clayey siltstone.
				1	8	0		2	3	0														White brown clays & minor Qtz.
				2	3	0		2	4	0				31	182	60				1030	<0.5			Greenish brown clays & clayey pale siltstone & minor Qtz
10,300 N	746087			0	0	0		1	7	0														Orange Colluvium
2450 E				1	7	0		2	3	0				61	304	44				49	<0.5			Sudden change to purple lines & angular frags. purp shales & white banding.
10,300 N	746088			0	0	0		0	9	0														Red brown colluvial clays.
2900 E				0	9	0		1	1	0														Pink brown lines & weath. siltstone
				1	1	0		1	3	0				81	143	56				92	<0.5			Purple lines & clayey purple weath. shales.
10,300 N	746089			0	0	0		2	8	0														Red brown clays & much Qtz.
2850 E				2	8	0		3	0	0				81	198	38				42	<0.5			Sudden change to purple lines & frag. purple shale & white banding.
10,300 N	746090			0	0	0		1	2	0														Brown lines & clay & shale/Qtz colluvium.
2800 E				1	2	0		1	7	0														Red brown lines & clay & ferr. Qtz.
				1	7	0		1	9	0				50	355	84				72	0.5			Yellow brown - soft to clayey brown shale.
10,700 N	746091			0	0	0		3	0	0														Red clayey colluvial Qtz at 170. white clayey sha at 250
3000 E				3	0	0		3	1	0				93	172	37				57	0.5			Sharp change to purple finely banded shale.
10,700 N	746092			0	0	0		2	8	0														Pink then dark red clayey colluvium & weath. sha some sandstone Qtz band @ = 110 & at 190.
3050 E				2	8	0		3	0	0				92	836	25				196	<0.5			Yellow brown sub-angular frags. yellow weath. sh
10,700	746093			0	0	0		3	5	0														Brown clayey soil & clayey shale & ss frags. lighter col at 250-30
3108				3	5	0		4	0	0				26	300	14				63	<0.5			Yellow brown - to light brown ferr. soft sha

C.R.A. EXPLORATION PTY. LIMITED
GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 20903
DATE 25/5/79

AREA Nameona — SAMPLE Nos. 746094 – 099 — COLLECTED BY C.S., L.G., M.B.

MAP OR PHOTO REFERENCE Auger Drilling to weathered bedrock — ANALYSED BY Tetchem.

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p. p. m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As		Geological observations
10,700 N	746094			0	0	0		2	5	0															Orange brown clay - some Qtz.
3150 E				2	5	0		2	7	0															Purple fines. - soft clayey weathered Perr. shale some Qtz.
				2	7	0		3	0	0				89	340	72				803	<0.5				Yellow to brown shale some Perr. Frags. gossan. Qtz
10,700 N	746095			0	0			0	0	5															Pink fines – Perr. Qtz.
3200 E				0	0	5		2	0	0															Brown Red clay: all weath. Perr. shale.
				2	0	0		2	1	5				30	188	39				794	<0.5				Yellow brown to light brown weathered clayey shale some Perr.
10,700 N	746096			0	0	0		2	0	0															Pink Red clayey fines - clayey shales to weath. Red brown shale. at 110.
3250 E				2	0	0		2	6	0				1450	1620	148				1050	<0.5				From light brown to red brown very Perr. shale.
10700 N	746097			0	0	0		0	5	0															Pale brown clays.
3300 E				0	5	0		4	2	0															Red Brown clays. - mottled Perr. shale frags.
				4	2	0		4	4	0															Dark Brown fines clays.
				4	4	0		4	6	0				868	1570	55				7200	0.5				Slow yellow brown – Perr clayey shales. (Fe th
10,700 N	746098			0	0	0		0	9	0															Orange brown clays ē minor Qtz.
3350 E				0	9	0		1	8	0															Red brown clays.
				1	8	0		1	9	0															Pink clays ē white clayey shales.
				1	9	0		2	5	0															Gradual change yellow brown ē Perr. clayey shales
				2	5	0		2	6	0				85	158	94				156	<0.5				Yellow brown 'ē' - Fines brown ē Perr. clayey shale
10700 N	746099			0	0	0		0	8	0															Brown Clays.
3400 E				0	8	0		1	9	0															Red brown clays - weath clayey Perr. shale
				1	9	0		2	0	0				122	147	96				376	<0.5				Yellow brown clayey Perr. shales.

C.R.A. EXPLORATION PTY. LIMITED
GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 26903
DATE 28/5/79

AREA Cockatoo Ridge Namoona
SAMPLE Nos. 746100 – 104
COLLECTED BY CS
MAP OR PHOTO REFERENCE Auger Samples – To Wea. Bedrock
ANALYSED BY Tetchem

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p.p.m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As		Geological observations
21200N	746100			0	6	0	→	2	6	0				123	446	87				225	<0.5				Red brown colluvium, purple mottled
3150E																									shales c̄ gossanous Fe'stn.
				2	6	0		3	0	0															Purple-pink – transitional change to
																									purple ferruginous shale at bedrock interface
21200N	746101			0	0	0		0	7	5				1160	62	38				52	<0.5				Dark purple fines
3175E																									
				0	7	5		0	9	5															Lighter purple. Bedrock is lighter ferr.
																									??-py. shale next to Fe'stn ck
21200N	746102			0	0	0		1	1	0				44	44	30				36	<0.5				Red brown coarse colluvium of colour banded
3200E																									brown ferr. tuffaceous shales
				1	1	0		2	0	0															Dark purple fines. Bedrock sample at 2.0m
																									of banded purple shale.
21200N	946103			0	0	0		2	9	0															Coarse red-brown colluvium of dark purple
3225E																									tuff shale c̄ minor gossanous frags.
				2	9	0		3	0	0				219	209	47				37	<0.5				Sudden change to pink-purple vari-coloured
																									partially ferr. shale
21200N	746104			0	0	0		2	6	0															Fine colluvium of ferr. tuffaceous shale.
3250E																									Several gossan fragments.
				2	6	0		3	0	0															Transitional change from purple to white
																									clays. Rock is bleached, mottled clayey tuff shale.
				3	0	0		4	0	0				161	369	56				61	<0.5				Sample at 3.00m. As above
				4	0	0		4	2	0															Kaki yellow tuff shales – these have
																									clayey clasts. This is the breccia on
																									the contact edge of the gossan.

FORM No. 134

C.R.A.E. PLAN No. M828

C.R.A. EXPLORATION PTY. LIMITED
GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 20903
DATE 28/5/79

AREA Cockatoo Ridge (Wamorna)
SAMPLE Nos. 746105 — 110
COLLECTED BY CS.
MAP OR PHOTO REFERENCE Auger Samples to Wea. Bedrock.
ANALYSED BY Tetchem.

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p.p.m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As	Geological observations
21200N	746105			0	0	0		0	9	5														Red coarse colluvium of red shale.
3275E				0	9	5		1	0	0				78	38	25				29	<0.5			Pink - white fines - pale, partially ferr.
																								shales. Sample at 1.00m.
				1	0	0		1	7	5														Change to pink fines. Hard pale to
																								ferr shales.
21200N	746106			0	0	0		1	4	0														Pink fines. Highly ferr- shale.
3300E				14	0			4	3	0				1800	451	92				215	0.5			Dark pink. Very ferr. shale, some frags
																								of Fe'stn: One gossanous fragment.
																								AT 430 encountered 80% gossanous fragment
																								c̄ very ferr. buff shales.
21200N	746107			0	0	0		2	4	0				138	178	58				51	<0.5			Pink purple colluvium - very ferr. brown
3325E.																								ferr shales. Bedrock sample at 240.
				0	0	0		3	6	0														As above - uniform brown ferr. shales.
21200N	746108			0	0	0		2	5	0														Red colluvial shales c̄ much QTZ.
3350E				2	5	0		2	8	0				212	435	61				67	<0.5			Pink fines, all ferr shales. Sample 280.
				2	8	0		4	8	0														Uniform clayey wea. shale.
21200N	746109			0	0	0		2	4	7														Red brown colluvium - QTZ c̄ very
3375E.																								ferr. shales.
				2	4	7		3	2	0				119	134	44				23	<0.5			Green clay - wea clayey shale.
																								Some similarities to breccia - turbidite
																								At 320 - change to yellow-khaki wea
																								shale.
21500N	746110			0	0	0		1	6	0														
3400E				1	6	0		2	5	4				186	1140	63				48	0.5			Red colluvium - few shale frags.
																								Change to purple-pink fines. Green to
				2	5	4		4	0	0														purple shale. Sample 254.
																								Little change but clasts => Probable
																								Breccia / Turbidite rock

FORM No. 134

C.R.A. EXPLORATION PTY. LIMITED

GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 20903/64

DATE 28/5/77

AREA NAMOONA - COCKATOO RIDGE. SAMPLE Nos. 746111 – 116. COLLECTED BY CS.

MAP OR PHOTO REFERENCE Auger Samples to Wea. Bedrock ANALYSED BY TRETCHFM.

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p. p. m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As			Geological observations
21500N	746111			0	0	0		2	6	0																Pink-red colluvium. Purple-green
3375N																										breccia/turbidite rock.
				2	6	0		2	8	0				186	1140	63				6470	0·5					Rapid change to dark green frags at
																										270 - green breccia.
21500N	746112			0	0	0		2	2	0																Red brown clayey colluvium.
3350E																										
				2	2	0		2	4	0				26	188	70				1250	<0·5					Khaki-green frags of breccia/turbidite
																										rock - sample at 240.
				2	4	0		4	8	0																Mottled green - as above.
21500N	746113																									
3300E				0	0	0		1	2	0																Red brown shale colluvium.
				1	2	0		1	7	5				41	64	63				202	<0·5					Change to pink fines. Purple and varicolored
																										shale.
21500N	746114			0	0	0		2	0	0																Light brown clay + dark red + grey frags
3325E																										of colluvial shale.
				2	0	0		3	0	0				47	75	50				89	<0·5					Dark red clay of wea. shale.
21500N	746115			0	0	0		1	0	0																Light brown clay, dark red + grey
3275E																										colluvial shale frags.
				1	0	0		2	2	0				48	66	52				24	<0·5					Salmon colored fines. Yellow-grey and
																										purple shale frags.
21500N	746116			0	0	0		0	6	0																Mustard colored clay & fine colluvial
3250E																										red fer. shale frags.
				0	6	0		1	0	0																Darker clays.
				1	0	0		2	0	0				400	123	64				380	0·5					Dark pink fines. Grey, red + purple
																										wea. shale frags.

FORM No. 134 C.R.A.E. PLAN No. M828

C.R.A. EXPLORATION PTY. LIMITED

GEOCHEMICAL SOIL SAMPLING LEDGER

D.P.O. No. 20903/4

DATE 23/5/79

AREA Cockatoo Ridge - Namoona.

SAMPLE Nos. 746117 - 118

COLLECTED BY CS

MAP OR PHOTO REFERENCE Auger Samples to Wea Bedrock

ANALYSED BY Tetchem.

Grid Co-ordinate	Sample No.	Soil composition: Rock %	Laterite %	Sand %	Silt %	Clay %	Soil horizon	Sample: Depth (inches)	Colour (Munsell) Chart No.	pH	Bedrock: Outcrop	Concealed	Est. Depth to	Metal content, p. p. m.: Pb	Zn	Cu	Ni	Co	Cr	Mn	Ag	Mo	As			Geological observations
21500N	746117			0	0	0		1	0	0																light brown to red clay & red+grey colluvial shale frags.
3225E																										
				1	0	0		1	8	0				1410	511	162				691	0·5					Dark brown to red clay & red purple shale frags.
21500N	746118			0	0	0		1	0	0																light brown clay & dark red + light grey chips + frags of colluvial shale.
3200E																										
				1	0	0		2	6	0				50	129	97				24	20·5					Salmon coloured clay & red+grey frags of wea shale & some QTZ frags.

APPENDIX 3

1979 Diamond drill logs and assays.

C.R.A. EXPLORATION PTY. LIMITED

79ND23 DRILL CORE LOG

PROJECT NAMOONA – GOODPARLA CREEK SOUTH

CO-ORDINATES 8600N, 3144E | AZIMUTH 215° Magn. | DRILLERS DRILLMAC | COMMENCED 14/7/79 | DEPTH 122.40m | HOLE No. 79ND23

RL COLLAR SURFACE | INCLINATION −60° | DRILL TYPE SCHRAMM 985 HA. | COMPLETED 28/7/79 | CASING LEFT | DPO No(s) 20832

DEPTH FROM(M)	DEPTH TO(M)	CORE REC. (M)	PERN CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	BGS REC (M)	ASSAY VALUES (ppm) Pb	Zn	Cu	Ag
0					0-1. Minor grey superficial soil.	Slightly dolomitic.								
					1-5. Orange brown clay and fines, ≈5% angular buckeye milky qtz.									
	5				90% orange yellow brown clays. ≈2% qtz. frags.	" "	766100	0	5	68	40	68	35	<1
	10				70% weathered light brown shales. 10% weathered black graphitic shales. 5% milky qtz. 15% nebuly brown fines.		766101	5	10	72	136	440	55	<1
	15				90% black graphitic dolomitic shale. Minor qtz + CO_3 veins.	Oxidation limit 16m.	766102	10	15	70	27	430	50	<1
	20				95% black graphitic dolomitic shale. Minor qtz + CO_3 veins.		766103	15	20	72	23	320	74	<1
	25				90% black graphitic dolomitic shale with minor qtz + CO_3 veins. ≈5% upper hole contamination.	Tr → 1% py in veinlets and as thin smears. Water table at 27m.	766104	20	25	74	52	390	71	<1
	30				80% black graphitic dolomitic shale with minor qtz + CO_3 veinlets.	Tr–2% very fine disseminated py in graphitic black shale.	766105	25	30	70	28	170	38	<1
	35				As above, ≈10% contamination.		766106	30	35	72	87	200	77	<1
	40				80% black graphitic dolomitic shale. 5% milky white qtz. 15% contamination.	Tr. py.	766107	35	40	72	110	260	41	<1
	45				30% black graphitic dolomitic shale, 3% milky white qtz, ≈60% contamination.		766108	40	45	84	102	230	54	<1
	49	NQ			Grey fine grained dolomitic shale, minor carbonaceous material.		766109	45	49	78	51	190	64	<1

CRAE 147
PLAN No M 496

SUMMARY AND SPECIAL COMMENTS 0-15, Orange brown clays and weathered brown shale. 15-49, Black graphitic dolomitic shale, Tr py.

LOGGED BY J. Portmore DATE 14-28/7/79

C.R.A. EXPLORATION PTY. LIMITED

PROJECT NAMOONA — GOODPARLA CREEK SOUTH.

79ND23

DRILL CORE LOG

CO-ORDINATES 8600N, 3144E — AZIMUTH 215° Magn. — DRILLERS DRILLMAC — COMMENCED 14/7/79 — DEPTH 122.4 m — HOLE No. 79ND23

RL COLLAR SURFACE — INCLINATION −60° — DRILL TYPE LONGYEAR 44 — COMPLETED 28/7/79 — CASING LEFT — DPO No(s) 20832

	DEPTH FROM (M)	DEPTH TO (M)	CORE REC. (M)	NQ CORE SIZE	CORE DESCRIPTION	SPECIAL FEATURES (WEATH., ALTERATION, FRACTURING, VEINING, MINERALIZATION)	SAMPLE No.	FROM (M)	TO (M)	BGS (M) ISL	Pb	Zn	Cu	Ag
		50		.40	Black fine grained dolomitic graphitic shale. Shale	Minor thin dolomite veinlets.				68				
BOX 1				.55	appears very massive, bedding difficult to see.	Thin smears of py on joints and								
				.80		slickensided surfaces.								
				1.00		Bedding ∠ at 53.5 = 2° parallel	766701	49	54		56	400	130	<1
		55		1.00		to bedding in other places.				68				
55.2				1.00	Black fine grained massive dolomitic									
				1.00	graphitic shale. Minor very fine lighter coloured									
				1.00	bands.									
BOX 2				.90		Minor py on bedding planes	766702	54	59		18	640	94	<1
		60		1.00						70				
				1.00										
61.5				.60										
				1.00	As above, slight increase in large whitish									
BOX 3				.70	coloured bands.	Very broken core in this								
		65		.40		section.	766703	59	64	70	29	450	100	<1
				.80										
66.4				1.00										
				.70	As above, less graphite content. The									
BOX 4				1.00	graphitic and the not so graphitic sections are both	Minor py on joints and	766704	64	69		13	430	87	<1
		70		1.00	dolomitic.	in thin veins.				68				
				.80										
72.13				.80										
				.80	Very uniform massive fine grained black	Minor very thin CO_3 veinlets.								
				1.00	dolomitic graphitic shale.	Very hard to discern any	766705	69	74		71	380	79	<1
		75		1.00		bedding in massive shale.				72				
BOX 5				1.00										
				1.00										
				1.00										
78.14				1.00	As above. Prominent bedding visible at	Bedding ∠ at 78.80 = 5°.	766706	74	79		18	270	180	<1
		80		.80	78.80.	Minor py on slickensides.				68				
BOX 6				1.00										
				.90		Minor concentration of thin								
				.90		CO_3 veins.								
83.6				1.00			766707	79	84		39	250	160	<1
		85		1.00						68				
				.80										
BOX 7				.70	Less graphitic shale band occurs from 86.2–90.7.	Bedding ∠ at 86.2 = 5°. Thin CO_3								
				.90		veining present. Broken core								
				.70		between 87.0 – 87.2.	766708	84	89		58	570	110	<1
89.5		90		1.00		Minor conc. of qtz/CO_3 veins and				76				
				1.00	90.70–96.20. Massive black dolomitic graphitic shale. Minor	pugh material at 87.70.								
BOX 8				1.00	thin less graphitic bands also present. Shale effervesces	Minor py xtals on joint faces.								
				.95	vigourously with 20% HCl soln.	Minor slumping at 93.20								
				.85	Bedding ∠ just before shale/AV contact is	Bedding ∠ at 93.60 = 5–8°.	766709	89	94		23	420	110	<1
		95		1.00	10–15°. Top AV contact = 45°. Very sharp clear contact. Bottom					76				
95.90				1.00	AV contact = 60°. Also very sharp contact.	Bedding ∠ at 95.20 = 10°	766710	94.00	96.20		50	540	100	<1
				1.00	96.20–97.00 Crosscutting rhyolitic tuff. 3 directions of CO_3 veining in rhyolite.		766711	96.20	97.00	80-82	18	440	120	<1
BOX 9				.90	97.00–102.00. Massive black dolomitic graphitic shale.	Bedding ∠ at 97.5 = 8°								
				1.00	Minor thin less graphitic bands.	" " " 98.6 = 10°.								
		100		1.00	Numerous thin and minor wider CO_3 veins	Py xtals and smears on joint faces.				76				

CRAE NT PLAN No M414

SUMMARY AND SPECIAL COMMENTS: 49.0–96.20. Black dolomitic graphitic shale, qtz/CO_3 veining, minor py. 96.20 – 97.00. Cross-cutting rhyolitic tuff. 97.00 – 116.6. Black dolomitic graphitic shale.

LOGGED BY J. [illegible] — DATE 14-28/7/79

SHEET 2 OF 3

79ND23 DRILL CORE LOG

PROJECT NAMOONA – GOODPARLA CREEK SOUTH

CO-ORDINATES 8600N, 3144E. AZIMUTH 215° Magn. DRILLERS DRILL MAC COMMENCED 14/7/79 DEPTH 122·40 HOLE No. 79ND23

RL COLLAR SURFACE INCLINATION −60° DRILL TYPE LONGYEAR 44 COMPLETED 28/7/79 CASING LEFT DPO No(s) 20832

DEPTH FROM(M)	DEPTH TO(M)	CORE REC. (M)	NQ CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	SAMPLE No.	FROM (M)	TO (M)	BGS-REC (M)	ASSAY VALUES (ppm) Pb	Zn	Cu	Ag
	100		1·00			Bedding ∠ at 101·6 = 8°.								
			·70		Grey/dk blue dolomitic graphitic shale (less graphite content. More thin and wide less graphitic bands present. Abundant thin and wide cementing CO_3 veinlets.	Minor slumping in bedding at 104·0m.	766712	97·00	102·00	80	69	390	85	4
102·4			·80											
BOX 10			1·00			Bedding ∠ at 106·0 = 22°								
	105		1·00			" " " 106·9 = 18°				78				
			·80			" " " 107·8 = 15°								
			·80				766713	102·00	107·00		97	300	45	4
			1·00											
108·3			1·00		As above, locally shale becoming more graphitic. Broken core 112·4 – 113·5 (CO_3/qtz) veining plus slickensiding.	Thin and wide CO_3 veining.								
	110		1·00			Bedding ∠ at 109·10 = 10°				70				
BOX 11			1·00			" " " 111·2 = 15°								
			1·00			" " " 113·7 = 2°	766714	107·00	112·00		79	430	65	4
			·70		Shale becoming less graphitic towards fault zone. Dominant less dolomitic bands, increase in CO_3/qtz veining towards fault zone.									
114·1			·80											
	115		1·00							72				
			·90											
			·60		116·6 – 117·2 Broken graphitic slickensided fault rough material.	Major fault zone from 116·6 – 122·4	766715	112·00	116·6		120	490	51	4
BOX 12			·50											
			·60		117·2 – 122·4 Brecciated contorted slickensided graphitic CO_3/qtz veined fault zone. Abundant sedimentary structures, folding, slumping, micro faulting. The whole fault zone intensively pervaded by CO_3/qtz veining.	Bedding ∠ at 115·8 = 40°								
	120		·60			" " " 116·2 = 85°	766716	116·6	120·6	68	97	3200	98	4
120·8			·70			Minor py in qtz/CO_3 veinlets and as smears on slickensides.								
BOX 13			·60				766717	120·6	122·4		97	390	63	4
122·4			·20											
	125				END OF HOLE 122·40m.									

SURVEYS:−

m	degrees.
0	60°
53	47°
71	46°
118	39

CRAE 117
PLAN No M 414

SUMMARY AND SPECIAL COMMENTS 116·6 – 122·40 Major fault zone. (much brecciation, slickensiding, qtz/CO_3 veining). End of hole 122·40m.

LOGGED BY J. Matthews DATE 14-28/7/79

SHEET 3 OF 3

C.R.A. EXPLORATION PTY. LIMITED

PROJECT: NAMOONA, 10 4 ZONE

79ND25 DRILL CORE LOG

CO-ORDINATES: 10300N, 2524E | AZIMUTH: 045° Magn. | DRILLERS: DRILL MAC. | COMMENCED: 11/8/79 | DEPTH: 223.0m. | HOLE No. 79ND25.

RL COLLAR: SURFACE | INCLINATION: -70° | DRILL TYPE: SCHRAMM 985HA | COMPLETED: 23/8/79 | CASING LEFT: 52.0m. | DPO No(s): 20832.

DEPTH FROM (M)	DEPTH TO (M)	CORE REC. (M)	PERN. SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES (WEATH., ALTERATION, FRACTURING, VEINING, MINERALIZATION)	SAMPLE No.	FROM (M)	TO (M)	BGS REC (%)	Pb	Zn	Cu	Ag
0					0-1. Grey colluvial soil, minor shale qtz. frags.									
					1-5. 70% large purple shale frags. 10% orange shale frags. 20% purple fines.									
							766131	0	5	76	75	180	121	<1
	5				80% purple brown shale. 10% orange shale. 10% purple fines.									
							766132	5	10	92	18	130	89	<1
	10				70% orange fines. 20% purple shales. 10% orange shales.									
	15				70% purple browny shales. 10% orange shale. 20% purple fines.	Shale effervesces with 20% HCl soln.	766133	10	15	96	<1	140	74	<1
	20				80% purple brown shale. 10% purple fines.		766134	15	20	94	7	98	65	<1
	25				90% weathered black dolomitic graphitic shale. Minor fines, minor brown purple shale.	Vigorous effervescence with 20% HCl soln.	766135	20	25	86	23	80	83	<1
	30				100% fresh black dolomitic graphitic shale.	Oxidation limit 30m. Trace fine py on bedding planes.	766136	25	30	92	4	56	57	<1
	35				As above.		766137	30	35	90	21	76	140	<1
	40				As above, minor qtz/CO3 veinlets.	Trace fine py on slickensides.	766138	35	40	90	25	74	72	<1
	45				As above, ≈5% qtz/CO3 veining.	Minor hematitic veining - minor py. Water table 48.0m.	766139	40	45	90	21	68	140	<1
	50						766140	45	50	82	21	60	98	<1

SUMMARY AND SPECIAL COMMENTS: 0-30 Weathered purple brown shales. Oxidation limit 30.0m. 30-56.6 Fresh black dolomitic graphitic shale, minor qtz/CO3 veining, minor py. Water table 48.0m. 56.6-57.0 Dolomitic sandstone,

LOGGED BY: J. [signature] DATE: 11/8/79

SHEET 1 OF 5

CRAE 117 PLAN No M494

CRA-[illegible] EXPLORATION PTY. LIMITED

PROJECT NAMOONA, 10·4 ZONE.

79ND25 DRILL CORE LOG

CO-ORDINATES 10300N, 2524E. AZIMUTH 045° Magn. DRILLERS DRILLMAC COMMENCED 11/8/79 DEPTH 123·0m HOLE No. 79ND25.

RL COLLAR SURFACE INCLINATION −70° DRILL TYPE LONGYEAR 44 COMPLETED 23/8/79 CASING LEFT 52·0m DPO No(s) 20832.

DEPTH FROM(M)	DEPTH TO(M)	PERN CORE REC. (M)	PERN CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	Δ	SAMPLE No.	FROM (M)	TO (M)	BGS REC (M)	ASSAY VALUES (ppm) Pb	Zn	Cu	Ag
50·0			NQ		Black dolomitic graphitic shale, ≈10% qtz/CO3 veining present.										
52·0		·50			Irregular black well banded dol. graphitic shale.	Broken ground. Numerous thin CO3 veins & qtz veins. Minor py	65°				68				
BOX 1	55	·50			Occasional white bands up to 1cm wide. Both black and white bands effervesce with 20% HCl soln.	1/11 to bedding on joint faces and within CO3/qtz veining.	50°								
		1·00									72				
		·90					60°								
57·56		1·00	qtz veins		Med. grained dol. sst. Irregular contact with shale. Several qtz veins. Solid qtz vein (57·8–58·03)	≈8% coarse py blebs within sst.		766718	56·6	57·0		6	46	64	41
		1·00					40°								
BOX 2		1·00			Black dol. graphitic shale with alternating thin and wide white bands CO3/qtz veins present.	Minor py occurs 1/11 to bedding and in CO3/qtz veins. Minor faulting and slumping present. Minor brecciation.	15°								
	60	1·00	CO3 veins				35°				70				
		1·00													
		·80					40°								
62·10		·90													
BOX 3		·80	CO3		As above but a decrease in white coloured bands. Some broader white coloured bands still present.	Numerous thin CO3/qtz veins. Minor thin veinlets py bands 1/11 to bedding	35°								
	65	·70									76				
		1·00													
		·90					45°								
67·75		1·00													
BOX 4		1·80			As above, predominantly thin white bands, occasional wider white bands. Some qtz shale brecciation around 70·30. Shale effervesces vigorously with 20% HCl soln. An increase in qtz veining at 72·50.	Tr fine py 1/11 to bedding Abundant qtz/CO3 veining. Much minor faulting Abundant thickening/bedding present.	50°								
	70	1·00									80				
		·80													
		1·00					75°								
73·40		·80	qtz												
		·70			Decrease in alternating banding, increase in qtz+CO3 veining + abundant thickening/bedding.	Fine bands of bedded py at 74·40. Δ=60° Probable fault zone between 73·70–76·80 Much minor faulting, thickening, abundance of qtz/CO3 veining.	60°				60				
BOX 5	75	·60			10° sharp contact between probable fault zone and unbroken black graphitic dolomitic shale.										
		·50					60°								
		·50													
78·17		·80	qtz/CO3		Unbrecciated black graphitic shale with numerous qtz/CO3 veins. Minor white bands.		48°								
BOX 6	80	·80			Major fault zone from 79·1–82·30 Black graphitic shale containing abundant qtz/CO3 veins (some massive), much brecciated material, much thickening and very broken core.	Minor py in qtz/CO3 veins and also in dark bands 1/11 to bedding. Sharp contact zone between fault zone and shale Δ=76°					70				
		·60													
		·80	qtz veins				10°								
82·80		1·00													
BOX 7		1·00			Light grey/black dol. graphitic shale. Shale effervesces with 5% HCl soln. Many thin veinlet bands within predominantly black shale.	Numerous qtz/CO3 veins. Much minor faulting, minor slumping. Minor py blebs in qtz vein sections 1/11 to bedding									
	85	1·00					8°				84				
		1·00													
		1·00					2°								
88·90		1·00													
BOX 8	90	1·00			Dark grey/black dol. graphitic shale. Very minor white bands. Black shale very uniform throughout.	Minor thin CO3/qtz veins.					80				
		1·00													
		1·00					2°								
		1·00													
		1·00					10°								
95·20	95	1·00									76				
		1·00													
BOX 9		1·00			Black uniform dol. graphitic shale. As noted above qtz/CO3 veining.	Lack of CO3/qtz veining. Minor py blebs associated with qtz/CO3 patches.									
		·90					5°								
		1·00													
	100	1·00									78				

SUMMARY AND SPECIAL COMMENTS ≈8% coarse pyrite 57·0–73·70 Black dolomitic graphitic shale. 73·70–76·80 Fault zone. 76·80–79·10 Black dolomitic graphitic shale. 79·10–82·3 Fault zone. 82·3–127·10 Black dolomitic graphitic

CRAE 117
PLAN No M414

LOGGED BY J. Hartmann DATE 11-23/8/79

SHEET 2 OF 5

C.R.A. EXPLORATION PTY. LTD.

79ND25 DRILL CORE LOG

PROJECT KAMOONA, 104 ZONE.

CO-ORDINATES 10300N, 2524E. AZIMUTH 045° Magn. DRILLERS DRILLMAC COMMENCED 4/8/79 DEPTH 223.0 HOLE No. 79ND25.

RL COLLAR SURFACE INCLINATION -70° DRILL TYPE LONGYEAR 44 COMPLETED 23/8/79 CASING LEFT 52.0m. DPO No(s) 20832.

DEPTH FROM(M)	DEPTH TO(M)	CORE REC. (M)	NQ CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	Δ	SAMPLE No.	FROM (M)	TO (M)	REC (M)	ASSAY VALUES (ppm) Pb	Zn	Cu	Ag
100		1.00													
		1.00			Greyish black dol. graphitic shale. Appearance of lighter coloured bands. Lighter coloured bands may be very thin or up to 1cm wide. Prominent absence of CO_3/qtz veining. Shale appears to be far more less graphitic.	Minor very thin qtz/CO_3 veins. Minor faulting and granulation. Minor thin bands of py ill to bedding predominantly in lighter coloured bands.	35°							
		1.00					58°				72				
	105	1.00													
		1.00					60°								
		1.00													
		1.00	qtz/car		Locally shale appears less graphitic.	Concentration of qtz/CO_3 veins	68°								
	110	1.00			prominent greyish white bands present.	from 109.50 - No. 3	85°				74				
		1.00				Increase in qtz/CO_3 veins from	55°								
		1.00				113.4 - 119.3.									
		1.00				Minor faulting and slumping present.	2°								
		1.00													
	115	1.00			Greyish black dol. graphitic shale.	Abundant qtz/CO_3					76				
		1.00			Intense faulting and folding in this section.	veining, folding, faulting,	65°								
		1.00			Some bands are quite sandy - coarser sands towards	disturbing. Minor py in	70°								
		1.00			the bottom, eg at 119.70m (α=70°)	sandy sections.									
	120	1.00													
		1.00									78				
		1.00			As above, prominent wide whitish	Numerous CO_3/qtz veins.									
		1.00			sandier bands present. (coarser material towards bottom)	Minor minor folding and		766719	122.1	127.10		250	270	59	<1
		1.00	qtz/car		Numerous irregular CO_3/qtz veins.	faulting.									
		1.00				Minor py blebs	60°								
	125	1.00				restricted to the more					80				
		1.00				sandier patches.									
		1.00			Increase in CO_3/qtz veins and slickensiding meaning fault		40°								
		1.00			zone										
		1.00			Major fault zone between 127.10 - 129.70. Abundant	~4% coarse py, Tr-1% sph.		766720	127.10	129.7		130	1540	71	<1
		1.00			qtz/CO_3 veining, brecciated clumping, slickensiding, micro	(reddish brown) within									
	130	1.00			faulting and folding.	fault zone material.					68				
		1.00					43°	766721	129.7	134.7		35	390	97	<1
		1.00													
		1.00			Greyish black well banded dol. graphitic	Minor qtz/CO_3 veining.									
		90			shale. The lighter coloured bands are quite sandy and	Minor micro faulting.									
		1.00			graded. Lighter coloured bands can be 2-3cms. wide.		75°								
	135	1.00					70°				74				
		1.00			As above, shale becoming less graphitic,	Minor CO_3/qtz veining. Numerous									
		1.00			numerous large sandy bands.	thin py bands ill to bedding									
		1.00				eg 134.8m α = 70°									
		1.00					40°								
	140	1.00			Shale becoming more graphitic, decrease in	Minor CO_3 veins, minor					78				
		1.00			fine white sandy bands.	thin py bands ill to bedding.	45°								
		1.00													
		1.00			As above, some thin sandy bands still	Large CO_3 vein present.									
		1.00			present.	Micro faulting and clumping.									
	145	1.00				Minor blebs of py	55°				78				
		1.00	CO_3			restricted to the more									
		1.00				sandier rich sections.									
		1.00					5°								
	150	1.00									76				

CRAE H7
PLAN No M 404

SUMMARY AND SPECIAL COMMENTS shale, minor CO_3/qtz veining, minor pyrite. 127.10 - 129.70 Fault zone, 4% pyrite, Tr-1% sph. 129.7 - 172.1 black dolomitic graphitic shale. 172.1 - 172.6 Rhyolite dyke. 172.6 - 196.72 Black dolomite.

LOGGED BY J. Hartmann DATE 11-23/8/79

C.R.A. EXPLORATION PTY. LIMITED

PROJECT NAMOONA 10-4 ZONE

79ND25 DRILL CORE LOG

CO-ORDINATES 10300N 2524E. AZIMUTH 045° Magn. DRILLERS DRILLMAC COMMENCED 11/8/79 DEPTH 223.0m HOLE No. 79ND25

RL COLLAR SURFACE INCLINATION −70° DRILL TYPE LONGYEAR 44 COMPLETED 23/8/79 CASING LEFT 52.0m DPO No(s) 20832

DEPTH FROM(M)	DEPTH TO(M)	CORE REC. (M)	NQ CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	Δ	SAMPLE No.	FROM (M)	TO (M)	BGS REC (M)	ASSAY VALUES (ppm) Pb	Zn	Cu	Ag
150		1.00													
		1.00			Greyish black dol. graphitic shale. Minor	Thin CO_3 veinlets present. Core									
		1.00			large whitish coloured silty bands present. Shale	dCA/α veins at 156.80	8°								
		1.00			effervesces vigorously with 20% HCl soln.	Micro faulting, folding and									
	155	1.00		py	Minor very thin CO_3 veinlets	minor slumping.	18°				76				
		1.00				Thin py bands $\perp$'ll to bedding. Py also occ. in									
		1.00				α rich bands	35°								
		1.00													
		1.00			As above, shale appears to be more										
	160	1.00			graphitic. A marked decrease in CO_3/α veins.	Minor thin py	25°				74				
		1.00				bands $\perp$'ll to bedding.									
		1.00				Tr. sph. in CO_3 vein at 159.40	25°								
		1.00													
		1.00			As above. Sandy bands have coarser										
	165	1.00			grainsize towards bottom of the band.	Minor py in CO_3 veins									
		1.00				and in wallr.	43°				68				
		1.00				Micro faulting and									
		1.00				minor slumping. Local		766722	167.1	172.1		30	230	45	$\perp$1
		1.00				concentration of CO_3/α	55°								
		1.00				veins.									
	170	1.00					65°				78				
		1.00			Increase in CO_3/α veining before rhyolite contact										
		1.00			Sharp conformable contact between rhyolite/shale at 172.1m.										
		1.00	172.1 172.6		Yellow massive rhyolite. Pronounced banding within rhyolite	≈2% embedded py. Numerous CO_3	45°	766723	172.1	172.6		16	26	1760	$\perp$1
		1.00			α/CO_3 veining, folding, faulting and minor slumping around	veins within rhyolite.		766724	172.6	177.6		74	160	29	$\perp$1
	175	1.00			173.8m. Black dol. graphitic shale. Minor		45°				70				
		1.00			whitish sandy bands.	Minor CO_3/α veins.									
		1.00													
		1.00			As above, less whitish sandy bands and	Minor py in α/CO_3 veins									
	180	1.00			fewer less CO_3/α veining.	and in irregular sandy	65°				80				
		1.00				patches.									
		1.00													
		1.00				Very fine thin CO_3 veins,									
		1.00			Greyish black dol. graphitic shale. Locally	some wider veins. Minor									
	185	1.00			some very minor sandy bands.	py in bands $\perp$'ll to bedding.	55°				72				
		1.00				Minor py in CO_3/α patches		766725	186.72	191.72		68	270	53	$\perp$1
		1.00				and in CO_3/α veins									
		1.00													
		1.00													
	190	1.00				Very minor α/CO_3 veining	50°				78				
		1.00			As above, prominent whitish coloured	Minor py in bands $\perp$'ll									
		1.00			sandier bands (coarser material towards bottom)	to bedding and in α/CO_3		766726	191.72	196.72		45	390	51	$\perp$1
		1.00				veins.	70°								
		1.00					60°								
	195	1.00			Prominent whitish sandia bands present.		50°				80				
		1.00													
		1.00	196.72		Very sharp contact between shale and rhyolite at 196.72.		90°	766727	196.72	198.32	80→	67	130	35	$\perp$1
		1.00			Massive (locally bedded) greenish coloured rhyolite.	Rhyolite contains 5-3% scheelite	70° 50°				96				
		1.00	198.32		Small wedge of rhyolite at 198.90m.	py. Local banding and	75°	766728	198.32	203.32		41	410	64	$\perp$1
		1.00			Massive black dol. graphitic shale.	CO_3 veins in rhyolite.					70				
	200	1.00													

CRAE 117
PLAN No M414

SUMMARY AND SPECIAL COMMENTS graphitic shale. 196.72 – 198.32. Rhyolitic tuff. 198.32 – 205.4 Dolomitic graphitic shale. 205.4 – 207.9 Vault zone 207.9 – 223.0. Dolomitic graphitic shale.

LOGGED BY J. Hostetmann DATE 11-23/8/79

SHEET 4 OF 5

C.R.A. EXPLORATION PTY. LIMITED

79ND25 DRILL CORE LOG

PROJECT NAMOONA, 104 ZONE.

CO-ORDINATES 10300N, 2524E. AZIMUTH 045° Magn. DRILLERS DRILL MAC COMMENCED 11/8/79 DEPTH 223.0m HOLE No. 79ND25

RL COLLAR SURFACE INCLINATION −70° DRILL TYPE LONGYEAR 44 COMPLETED 23/8/79 CASING LEFT 52.0m. DPO No(s) 20832.

DEPTH FROM(M)	DEPTH TO(M)	CORE REC. (M)	NQ CORE SIZE	GRAPHIC LOG	CORE DESCRIPTION	SPECIAL FEATURES WEATH., ALTERATION, FRACTURING VEINING, MINERALIZATION	Δ	SAMPLE No.	FROM (M)	TO (M)	BGS REC (M)	ASSAY VALUES (ppm) Pb	Zn	Cu	Ag
200		1.00			Black graphitic dol. shale. Minor thin lens graphitic sandier bands also present.	Minor thin CO_3/qtz veins.	53°								
		1.00													
		.60					85°								
		.50				Minor py in qtz/CO_3 rich patches.		766729	203.32	205.4		19	220	120	.1
		.40									64				
		.40	205.4	F	Major fault zone between 205.4 – 207.9	Major fault zone.									
		.50			(this fault zone is very close to the expected position of the ore	Concentrated qtz/CO_3 veining,		766730	205.4	207.9		120	190	35	.1
207.4		.80	207.9	F	zone).	much disturbance, shearing	40°								
		1.00			Black graphitic dol. shale. Minor wide and thin lens graphitic bands also present. Numerous thin CO_3 veins.	and brecciation. Minor conc. of py at 207.40 Very graphitic and clay rich fault gouge contact between fault zone and shale at 207.9m. (Δ = 40°)		766731	207.9	212.9		15	250	56	.1
		1.00					40°				58				
		1.00													
		1.00													
		1.00					25°	766732	212.9	217.9		14	260	350	.1
213.5		1.00													
		1.00			As above, some minor longer lens graphitic bands, slight decrease in CO_3 veining.						56				
		1.00													
		1.00					28°								
		1.00													
		1.00					40°								
		.80									58				
220.0		1.00			Black graphitic dol. shale. Decrease in lens graphitic bands and CO_3 veining.	Minor py concentrated in qtz/CO_3 rich patches.									
		1.00					12°								
		1.00													
223.0															
					BOTTOM OF HOLE 223.0m.										

SURVEYS:

m	degrees
30	67°
50	62°
100	57°
150	53°
200	49°

(m = 70°)

CRAE 117
PLAN No M 414

SUMMARY AND SPECIAL COMMENTS

LOGGED BY J. Hartmann DATE 23/8/79.

SHEET 5 OF 5