

CRA EXPLORATION PTY. LIMITED

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FINAL REPORT ON EXPLORATION COMPLETED
WITHIN TEMPORARY RESERVES 8470H-8475H YANDI
AJANA, WESTERN AUSTRALIA

MICROFILMED

Author : R. Nelson

Date : May 1982

Report No : 11469

Submitted To : M. Tuite

Accepted by :

Copy To : Department of Mines,
Western Australia.

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LIST OF PLANS

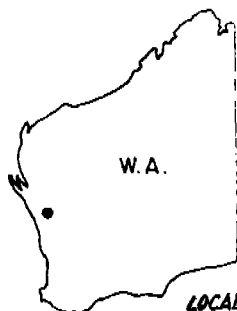
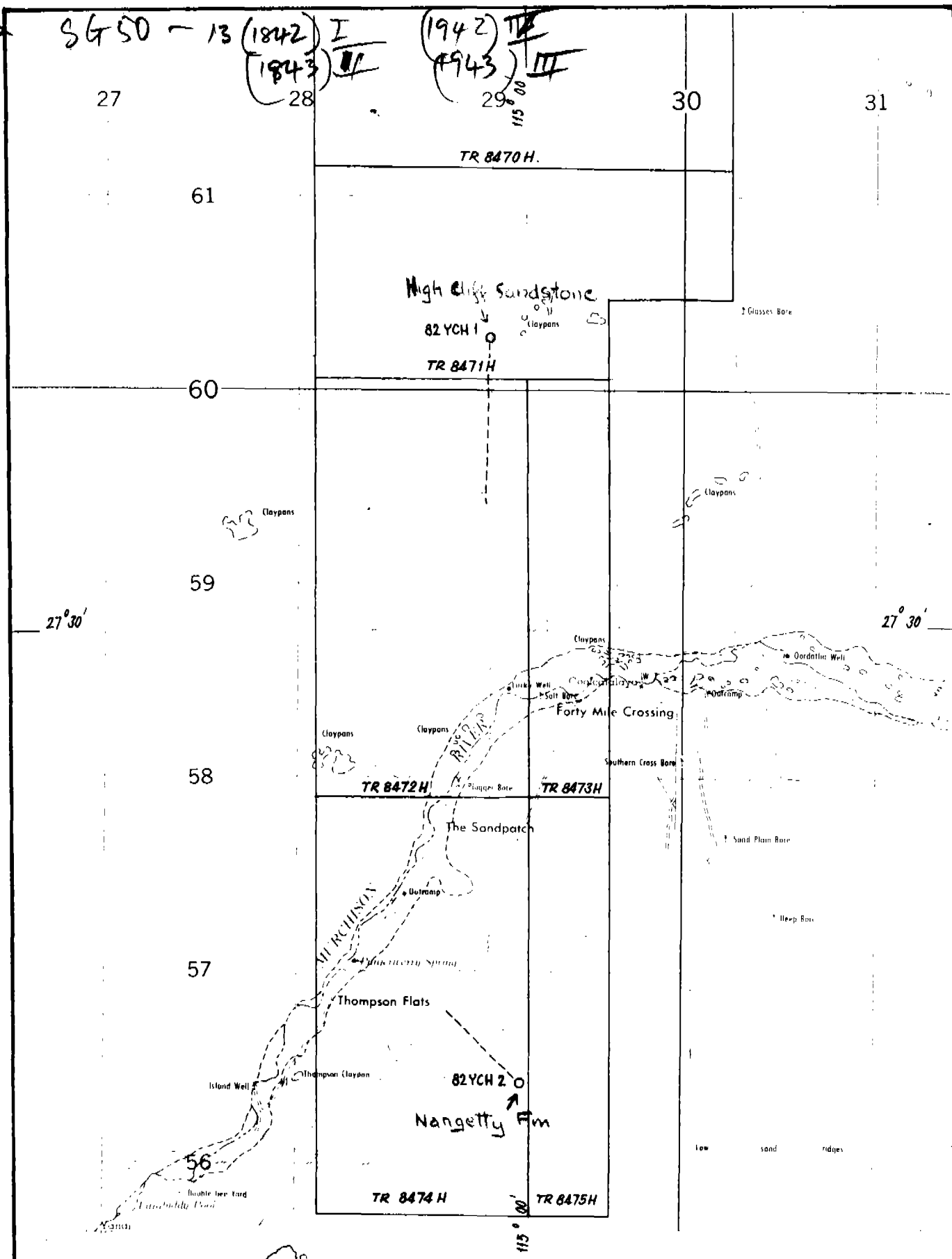
<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
WA 10951p	Tenement and Drill Hole Locality Plan	1:250,000
WA 10953p	Structural Sketch Map	"
WA 10952p	Stratigraphy Drill Holes YCH 1 and YCH 2	1:125,000
WA 11439p	Interpretation of Aeromagnetic Data	1:250,000

Yandi

SG 50 - 13 (1842) I

(1843) II

(1942) III
(1943) IV



LOCALITY DIAGRAM.

5 0 5 10 Km.

C R A EXPLORATION PTY. LIMITED

MURCHISON COAL PROJECT.

YANDI TRs 8470H - 8475H.

Tenement & Drill Hole Locality

ATJANA WA. SG50-13

Geologist, R.W.N.

Scale, 1:250 000.

Report No. 11469

Drawn, E.P.

Date, JUNE '82

Drg No. WA10951p

1. SUMMARY

Two areas in the Yandi region were recommended as possible targets for the Irwin River Coal Measures following an interpretation of the aeromagnetic data of the northern Perth Basin.

One stratigraphic diamond drill hole was drilled in each area.

Neither hole intersected the Irwin River Coal Measures. Both holes were terminated in units that are stratigraphically below the Irwin River Coal Measures.

It is recommended that the Temporary Reserves be relinquished.

2. INTRODUCTION

2.1 Terms of Reference

This report discusses the results of the exploration drilling programme in the Temporary Reserves 8470H-8475H which lie in the Coolcalalaya Sub-basin. This project was designed to test the lower Permian Irwin River Coal Measures for economic resources of black coal.

2.2 Tenements

CRA Exploration Pty. Limited acquired six Temporary Reserves totalling 934 km in area, covering two areas of interest as delineated by geophysical interpretation. These Reserves were gazetted on 16th October 1981.

2.3 Geographical Setting and Access

The block of six Reserves extend north and south of the Murchison River between Yandi and Coolcalalaya Stations. The nearest town is Northampton, located 60 km south on the Northwest Coastal Highway.

There are two physiographic units within the Reserves:

1. The Murchison River flats consisting of sandy alluvium, on which various species of eucalypts and medium sized scrub grow.
2. Sand plain to the north and south of the river flats, where the vegetation is dense, small to medium sized scrub with occasional eucalypts.

Access to the two drill sites is achieved via the shire road from Galena to Coolcalalaya Station, station tracks along fence lines and finally along fourteen kilometres of bulldozed tracks put in by CRAE.

3. CONCLUSIONS

Drill hole 82 YCH 1 intersected the Lower Permian (Artinskian) High Cliff Sandstone and the Lower Permian (Sakmarian) Nangetty Formation.

Drill hole 82 YRC 2 intersected the Lower Permian (Sakmarian) Nangetty Formation.

Both these sequences occur stratigraphically below the Lower Permian (Artinskian) Irwin River Coal Measures. The Irwin River Coal Measures were not intersected in the holes and it is now concluded that the Reserves are not prospective for coal within the Irwin River Coal Measures and the Reserves have been relinquished.

4. REGIONAL GEOLOGY AND STRATIGRAPHY

The only outcrops in the area are exposed between the two drill holes in the Murchison River. The rest of the Reserves is covered by superficial Quaternary sand and residual soils.

The outcrops in the river bed consist of superficial Quaternary deposits, the Miocene (Pindilya Formation) Victoria Plateau Sandstone, the Lower Permian (Sakmarian) Holmwood Shale and Nangetty Formation, and the Silurian(?) Tumblagooda Sandstone.

The Silurian(?) Tumblagooda Sandstone is the basal unit of the Coolcalalya Sub-basin which lies between the Darling Fault in the east and the Hardabut and Yandi Faults in the west.

Aeromagnetic data suggests that several localised areas have thicker sedimentary deposits and may represent small basins within the Coolcalalaya Sub-basin.

CRA acquired six Temporary Reserves to cover two such areas, and drilled one hole in each.

The regional stratigraphy is summarised in Table I.

TABLE I

Age	Group Formation or map unit	Contact with unit below	Lithology
Recent		Unconformable	Aeolian and residual sand.
Tertiary	Victoria Plateau Sandstone (Pindilya Formation)	"	Poorly sorted sandstone and minor conglomerate.
Lower Permian (Artinskian)	Carynginia Formation	Conformable	Black to grey micaceous clay siltstone with interbedded sandstone and minor conglomerate.
Lower Permian (Artinskian)	Irwin River Coal Measures	"	Interbedded very coarse to very fine grained qtz sandstone, pebble and granule conglomerate, siltstone and carbonaceous claystone with intercalated beds and lenses of sub-bituminous coal.
		"	White, yellow and dark grey, very fine to very coarse grained qtz sandstone with thin beds of siltstone and granule, and pebble conglomerate.
Lower Permian (Sakmarian)	Holmwood Shale	"	Dark grey to greenish grey shale and siltstone with beds of limestone. Glacial erratics occur sporadically and cannonball limestone concretions are common in some areas.
	Nangetty Formation		Tillite (boulder clay) shale (including varves) and poorly sorted tillitic sandstone and conglomerate.

5. GEOPHYSICS

An interpretation of the regional aeromagnetic and gravity data covering the northern portion of the Perth basin between latitudes approximately 27°00'S and 29°00'S and longitudes 114°30'E and 115°00'E indicated that the areas most prospective for Permian Coal Measures were those covered areas of relatively deeper basement adjacent to areas of outcropping Holmwood Shale or Nangetty Formation (Plan No. WA 11439p).

Two areas were outlined within the Yandi block. Area E is well defined in terms of reliability of depth estimates but Area D is based on questionable depth estimates. Extensions of Areas D and E to the east is possible

The regional gravity data does not negate the interpretation and gives tenuous support for a localised basin or graben in Area E and extending to the north.

A two hole diamond drilling programme was proposed to test each anomaly.

6. DIAMOND DRILLING

The Longyear Contract Drilling Division, using a truck mounted Longyear 44 rig were contracted to drill two holes on the Reserves.

YCH 1 was drilled to test Area E. The hole was terminated at 299 m in Holmwood Shale. The precollar was drilled using a non-coring rotary bit, and with

open-hole circulation to a depth of 48.5 m. The remainder of the hole was cored with an NQ sized drill string. Total core recovery was 92%. Water was hauled 18 kilometres from a water bore. Between 5000lt and 7000lt of water was required per day because of poor circulation. On completion the hole was cased with PVC and left as a water bore for the station owner.

Hole 82 YCH 1

Summary Log

Age	Depth (m)	Unit Name	Lithology
Recent	0-12		Aeolian and residual qtz sands.
Tertiary	12-48	Victoria Plateau Sandstone (Pindilya Formation).	Whitish fine to coarse grained poorly sorted soft sandstone.
Lower Permian (Artinskian)	48-228	High Cliff Sandstone.	Grey to brown fine to medium grained sandstone with minor siltstone.
Lower Permian (Sakmarian)	228-299	Holmwood Shale	Brown and green-grey shales with medium grained sandstone.

82YCH 2 was drilled to test Area D. It was terminated at 242 m in Nangetty Formation. It took one day to complete. The hole was precollared and cased as above to 69 m and cored to 242 m with an NQ sized drill string. Total core recovery was 86%. Water was hauled 25 kilometres from the Murchison River and used at between 5000lt and 7000lt per day because of poor circulation. The hole was left open on completion at the station owner's request.

Hole 82 YCH 2 Summary Log

Age	Depth (m)	Unit Name	Lithology
Recent	0-15		Aeolian and residual qtz sands.
Tertiary	15-69	Victoria Plateau Sandstone (Pindilya Formation).	White fine to coarse grained poorly sorted, soft sandstone.
Lower Permian (Sakmarian)	69-242	Nangetty Formation	Fine to coarse grained, poorly sorted sandstone and conglomerates - tillitic.

7. SUMMARY OF EXPLORATION STATISTICS

Hole No.	Precollar (m)	Core (m)	Size
82 YCH 1	0-48.5	48.5-299	NQ
82 YCH 2	0-69	69-242	NQ
Total Access cut - 14 kilometres			
Total Water used - 126,000 litres			

KEYWORDS

Coal-brown, Coal Measures, Sandstone, Shale, Tillite,
Palaeozoic-Permian, Drill-diamond, Geophysics-Mag.

LOCALITY

Ajana 1:250,000 Sheet SG 50-13

REFERENCES

- GSWA 1:250,000 Ajana Explanation notes
Sheet SG 50-13
GSWA The Geology of Western Australia, Memoir 2.

EXPENDITURE

APPENDIX I

DRILL LOGS

Drilled by LONGYEAR 44
 Logged by R. Nelson
 Wireline logged by -
 Date Completed 15/3/82
 Abandonment Procedure Converted to water bore

CRA EXPLORATION PTY LTD
COAL DRILL CORE LOG

PROJECT : YANDI COAL
 DRILLHOLE NO. YCH 1

Location 27° 22' 8" S 114° 59' 5" E
 R.L. Collar 1005.6 69.897M
 Total Depth 299m
 Inclination 90°
 Core Interval 3m
 Core Size NQ (48.50 - 299m)

PROJECT : YANDI COAL

DRILLHOLE No. , YCH 1

Interval (m)			Contact	Core Recovery %	S. C. R.	R. G. Q.	LITHOLOGY	MINERALS	Bedding			Sedimentary Structures	Fractures & Joints			STRATIGRAPHY	SAMPLE No.	COMMENTS
Top m	Bottom m	Thick m							Dip	Spore	Desc.		Dip	Spore	Desc.			
0	12	12		x	U	O	Red to brown (grading down hole) oxidised fine to coarse grained subangular to angular, poorly sorted quartz sands											
10	24	12		x	U	O	Whitish f-c grained, subangular to angular, poorly sorted quartz sands with a white clay matrix - probably soft sandstone.											
24	48.50	24.50		x	U	O	No sample return.											
48.50	59.85	11.35		100			Brownish yellow to grey (colour changing down hole) medium to coarse grained subangular to round poorly sorted quartz sandstone. Occasional clast and thin bands of yellow clay near top (decreasing in number down hole).											
59.85	61.50	1.65		91			Grey mudstone grading into quartz sandstone.											
61.50	68.65	7.15		97			Greyish moderate sorted quartz sandstone SA-R											
68.65	70.40	1.75		100			A poorly sorted conglomerate of rounded medium gravel (< 1 cm) mainly quartz.											
70.40	73.00	2.60		97			Greyish med. to coarse grained quartz sandstone.											
73.00	80.00	7.00		98			C/grained quartz sandstone with occasional quartz pebble (20.5m) with bands of red staining (Fe)											
80.00	82.80	2.82		100			Greyish medium coarse grained sandstone											
82.80	83.50	0.70		64			Fine grained grey mudstone grading into sandstone.											
83.50	96.50	15		96			Greyish fine to medium grained SA-R moderately sorted quartz sandstone.											
96.50	112.90	16.4		95			Grey and brown shales, grey and brown boundaries indistinct i.e. mould into each other, they are also contorted 97.50-98 Zone of bioturbation? in shales then grading into a fine to medium grained quartz sandstone.											
112.90	159.05	46.15		97			Grey brown to grey fine to coarse grained subangular to round moderately cemented quartz sandstone with thin bands of shale and sandy shale - occasional rounded quartz pebble (1cm) in sandstone.											

Interval (m)			Contact	Core Recovery %	S. L R	R Q A	LITHOLOGY	MINERALS	Bedding			Sedimentary Structures	Fractures & Joints			Mudcracks Block Dragage	STRATIGRAPHY	SAMPLE No.	COMMENTS
Top m	Bottom m	Thick m							Dip	Spec	Test.		Dip	Spec	Test.				
							125.35-125.60m Small clasts of grey mudstone included in quartz sandstone												
							151 - 157 Coarse grained quartz sandstone with thin (0.5cm) grey to black sandy shale bands - possibly carbonaceous (chip of lignite at 155.25m)												
159.05	164.76	5.71		98			Grey very fine grained sandy mudstone which grades into a med. grained grey quartz sandstone		25										
164.76	170.50	5.74		96			Fine grained "muddy" grey quartz sandstone, grading into a coarse grained quartz sandstone	specks of mica	30										
170.50	182.80	12.30		99			Grey fine grained sandy grey mudstone with thin brown shale bands and fine grained grey quartz sandstone												
182.80	190.50	7.70		96			Very fine grained sandy, grey mudstone with units of brown sandy, thin shales and fine grained grey sandstone												
190.50	199.00	8.50		97			Very fine grained, sandy grey mudstone with units of brown sandy mudstone at 101.70 - 195.40m and 195.70 - 196m												
199.00	222.50	23.5		99			Whitish brown med-coarse grained subangular to round, moderately sorted massive quartz sandstone											199-299m The brownish white sandstone has a white matrix which leaches out when the core is dry (non calcareous).	
222.50	228.00	5.5		98			Grey sandy "shales" and brown shales (brown shales more shaley) boundaries diffuse - poorly bedded												
228.00	251.00	23		98			Brownish white med-coarse grained subangular to round quartz sandstone with thin bands of grey and brown shales		20										
251.00	270.00	19		99			Predominantly brown shale and brownish white quartz sandstone with minor grey shale units in no particular order. Major brown shale unit at 255.40 - 258.50m (basal boundary distorted).												
270.00	272.00	2		100			Brown and grey-green shales "slumped" together grading into grey medium grained quartz sandstone				Slumping								
272.00	276.60	4.60		96			Brownish-white medium coarse grained subangular to round moderately sorted quartz sandstone												

CRA EXPLORATION PTY. LIMITED
COAL DRILL CORE LOG

PROJECT , YANDI COAL
DRILLHOLE No. , YCH 1

[illegible]

Abandonment Procedure Hole left open

CRA EXPLORATION PTY LTD
COAL DRILL CORE LOG

Core Size NQ (69 - 242m)

DRILLHOLE No. : YCH 2

[illegible]

CRA EXPLORATION PTY. LIMITED
COAL DRILL CORE LOG

PROJECT , YANDI COAL
DRILLHOLE No. , YCH 2

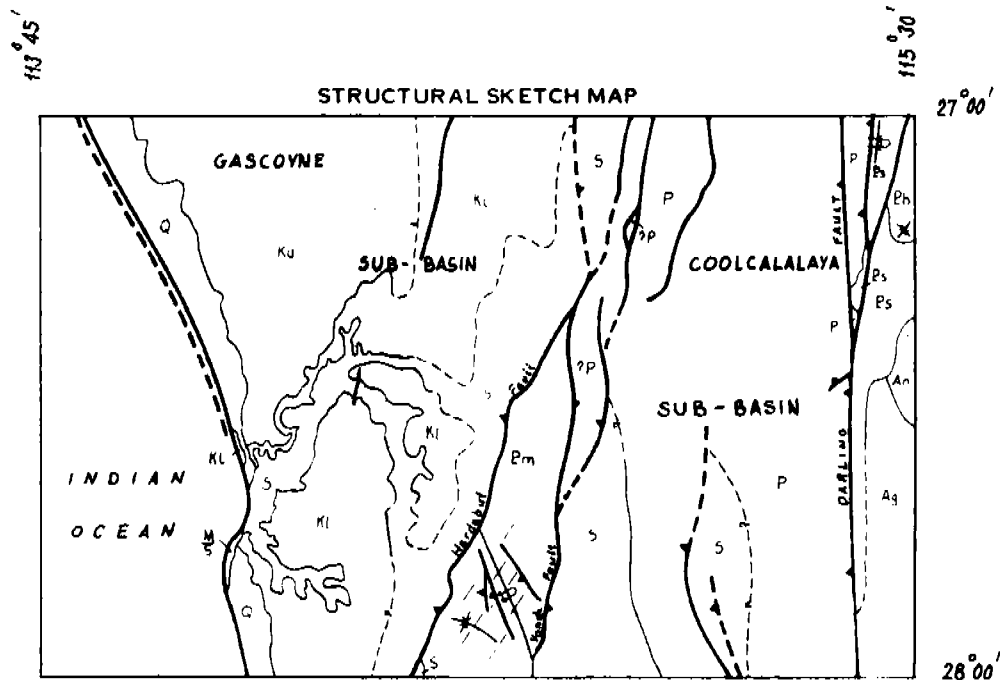
SHEET OF

Interval (m)			Contact	Core Recovery %	S C R	R Q L	LITHOLOGY	MINERALS	Bedding			Sedimentary Structures	Fractures & Joints			Mudstone Bedding	STRATIGRAPHY	SAMPLE No.	COMMENTS
Top m	Bottom m	Thick m							Dip	Spec	Desc.		Dip	Spec	Desc.				
116.60	118.44	1.84		75			Greyish brown med. grained quartz sandstone					Crossbedding							
118.44	118.45	0.01		100			Grey shale band												
118.45	119.00	0.45		100			Grey banded and slumped shale unit		20			Slumping							
119.00	125.00	6		78			Light greyish brown to grey coarse grained subangular to round quartz sandstone		30										
125.00	128.25	3.25		100			Light grey fine grained sandy siltstone grading into coarse grained quartz sandstone		33										
128.25	142.57	13.32		99			Light grey fine grained sandy siltstone grading into a conglomerate at base consisting of clasts of grey mudstone, red and brown sandstone basaltic and quartz pebbles (≤ 3 cms and all well rounded)		43										
142.57	153.00	10.43		98			Light grey very coarse grained quartz sandstone (and grain sized rounded claystone grains) grading into a conglomerate consisting of basaltic, granitic clasts of grey claystone, red and brown sandstone, pebbles all ≤ 5 cm, rounded. - specks of calcareous material throughout - one pebble of limestone at 152.90m												
153.00	160.50	7.50		82			Same as above sequence but conglomerate unit rocks ≤ 7 cm												
160.50	161.60	1.40		85			Light grey fine grained quartz sandstone to conglomerate consisting of basaltic, granitic red and brown sandstone mudstone and one only ultramafic pebbles all ≤ 5 cm, one only round limestone pebble at 160.80 m (all pebbles well rounded)		60										
161.60	161.80	0.20		100			Light grey fine grained very hard limestone band (or section of large boulder)												
161.80	162.20	0.40		85			Light grey calcareous conglomerate, granitic basaltic and quartz pebbles												
162.20	162.35	0.15		100			Light grey fine grained, very hard limestone band or large boulder	Specks of pyrite											
162.35	164.10	1.75		90			Grey sandy conglomerate of quartz siltstone and basalt ≤ 5 cm and well rounded plus specks of a calcareous material												
164.10	164.24	0.14		100			Thin bed of fine grained, light grey, very hard limestone		53										
164.24	165.10	0.86		100			Grey sandy conglomerate, pieces of limestone, subangular siltstone, rounded granite and basalts		55										

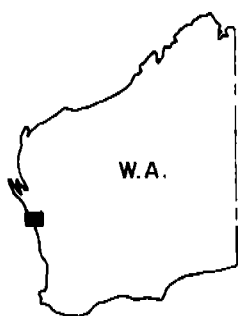
CRA EXPLORATION PTY. LIMITED
COAL DRILL CORE LOG

PROJECT : YANDI COAL
DRILLHOLE No. : YCH 2

Interval (m)			Contact	Core Recev X	S L R	R Q L	LITHOLOGY	MINERALS	Bedding			Sedimentary Structures	Fractures & Joints			STRATIGRAPHY	SAMPLE No.	COMMENTS
Top m	Bottom m	Thick m							Dip	Spec	Desc.		Dip	Spec	Desc.			
165.10	170.10	5		83			Grey fine grained siltstone grading through coarse grained sandstone to a conglomerate consisting of limestone granitic, basaltic and hard sandstone, all rounded and ≤ 5 cm.											
170.10	170.35	0.25		100			Very light grey fine grained limestone, bed dips top and bottom 10°		10									
170.35	170.60	0.25		25			Light grey poorly consolidated conglomerate consisting of limestone, basaltic and quartz pebbles ≤ 3 cm and one nodule of pyrite (marcasite) ≤ 1 cm	pyrite										
170.60	173.15	2.55		83			Light grey mg-cg slightly calcareous quartz sandstone											
173.15	176.00	2.85		100			Light grey very fine grained siltstone grading into a moderately grained quartz sandstone											
176.00	180.00	4.00		100			Light grey sandy shale with several darker grey wavy bands grading into a moderately grained quartz sandstone											
180.00	189.50	9.5		100			Light grey sandy shale grading into a light grey coarse grained quartz sandstone											
189.50	223.90	34.50		100			Above coarse grained sandstone grades into a fine grained light grey siltstone which grades into a light grey moderately grained quartz sandstone (downhole)											
223.90	225.37	1.45		100			Distorted bands of dark grey shale and siltstone. 224.34 - 224.37m 3 light and dark grey shale bands faulted, displaced 4 cm - normal fault		10			Slumping fault	45					
225.37	227.80	2.43					Fine grained grey siltstone grading into a dark moderately grained sandstone		15									
227.80	230.00	2.20		100			Grey fine grained siltstone grading into a grey moderately grained sandstone											
230.00	232.90	2.90		100			Disturbed grey fine grained siltstone and shale grading into moderately grained quartz sandstone		22			Slumping						
232.90	235.85	2.95		98			Disturbed grey shales to moderately grained grey quartz sandstone		15			Slumping						
235.85	240.00	4.15		98			Disturbed grey shales grading into grey coarse grained quartz sandstone containing elongated clasts of shale 236.28 - 237.48m fine grained siltstone and shale with cross bedding					Crossbedding						



ARCHAEO PROTEROZOIC	Q	Quaternary	TAMALA LIMESTONE	—	Fault, established or probable
	Ku	Upper Cretaceous		- - -	Fault, possible and inferred
	Kl	Lower Cretaceous		⌋	Axis of anticline overturned
	M/S	Cretaceous, Triassic and Silurian		+	Axis of syncline, normal
	P	Permian		⌋	Axis of syncline overturned
	S	Silurian		---	Inferred boundary
	Bh	Bulgeradda Group		---	Approximate boundary
	Ps	Metamorphosed sediments (includes NILLING FORMATION)		---	Direction of diorite dyke swarm
	Bm	Granulite and gneiss			
	An	Gneiss			
	Ag	Medium grained granite			



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MURCHISON COAL PROJECT

Structural Sketch Map. (after GSWA)

ATANA W.A. SG50-13

Geologist, R.W.N.

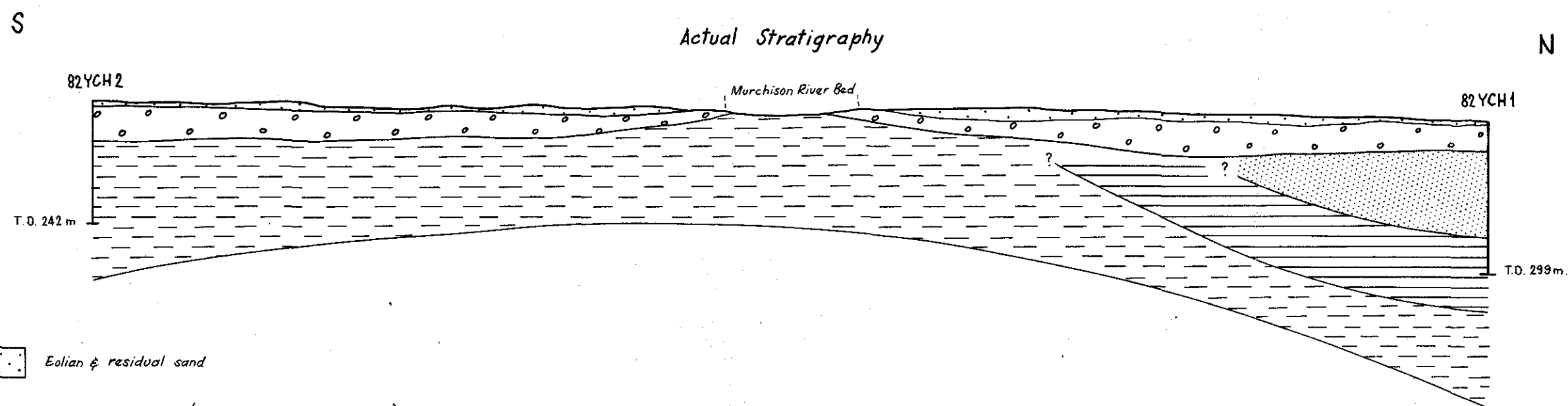
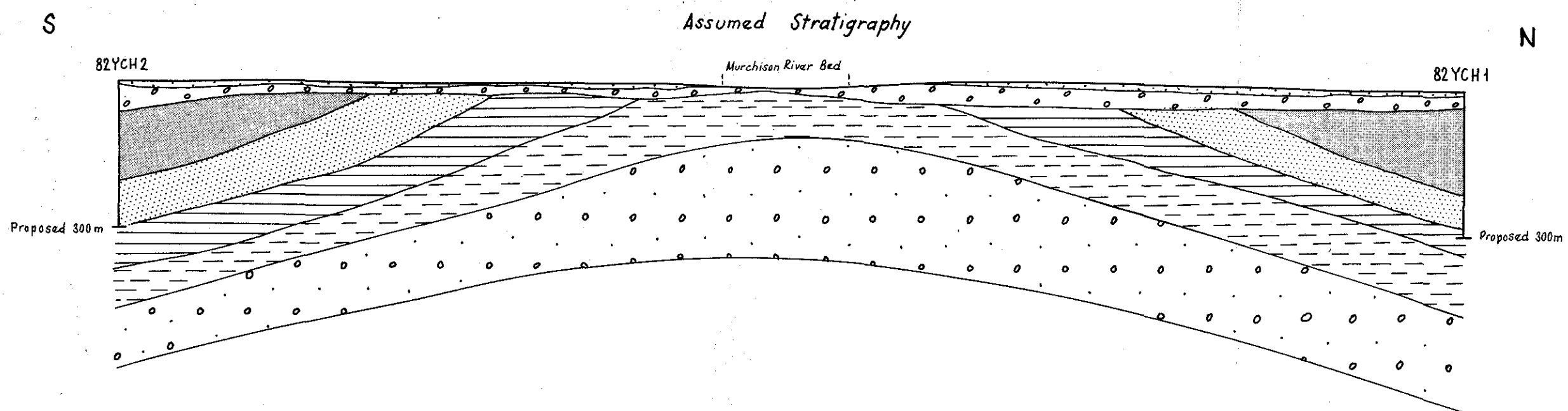
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Report No. 11469

Drawn, E.P.

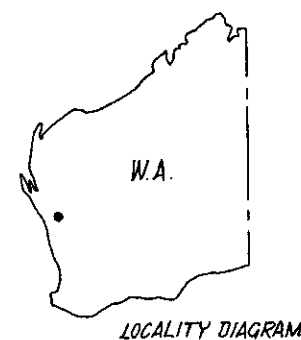
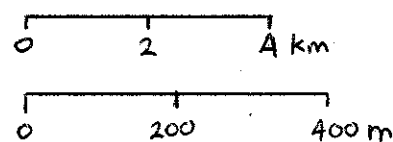
Date, JUNE '82

Drg. No. WA 10953p



- QUATERNARY** *Eolian & residual sand*
- TERTIARY** *PINDILYA FORMATION (VICTORIA PLATEAU SANDSTONE)
Poorly sorted sandstone, conglomerate. ?fluvatile. Includes minor authigenic silcrete.*
- PERMIAN** { *IRWIN RIVER COAL MEASURES.
Sandstone, conglomerate, carbonaceous shale & siltstone, minor coal seams.*
HIGH CLIFF SANDSTONE. White quartz sandstone.
HOLMWOOD SHALE. Grey-green shale & siltstone with thin beds of limestone.
NANGETTY FORMATION. Shale, tillite, tillitic sandstone, conglomerate & minor varves.
- ? SILURIAN** *TUMBLAGOODA SANDSTONE. Red & yellow feldspathic sandstone & conglomerate.*

HORIZONTAL SCALE 1:125000
VERTICAL SCALE 1:10000.



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C R A EXPLORATION PTY. LIMITED

MURCHISON COAL PROJECT.

STRATIGRAPHY

Drill Holes 82YCH1 & 82YCH2

22

AJANA W.A. SG 50-13

Geologist: R.W.N.

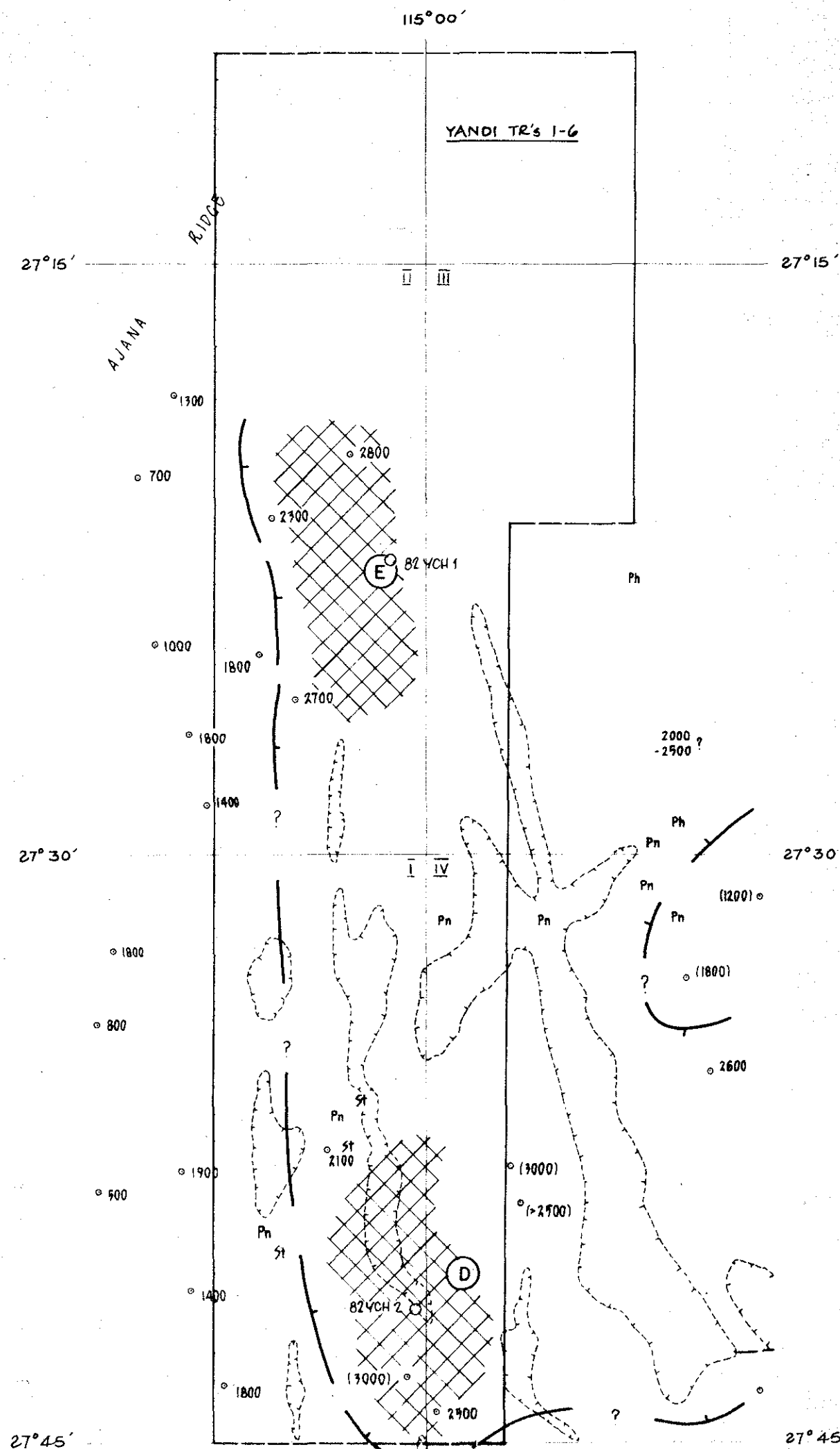
Scale: Vert. 1:10000
Horiz. 1:125000

Report No: 11469

Drawn: E.P.

Date: JUNE '82

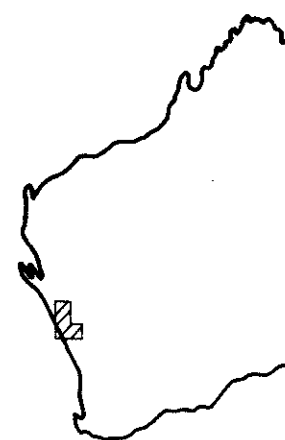
Plan No: WA 10952p



LEGEND

- 900 ESTIMATED DEPTH TO MAGNETIC BASEMENT (m)
- NEAR SURFACE (<~ 100m) OR OUTCROPPING MAGNETIC ROCKS - BASEMENT
- NEAR SURFACE (<~ 100m) OR OUTCROPPING MAGNETIC ROCKS - POSSIBLE BASEMENT
- ZONES CONTAINING SHALLOW (< 300m) MAGNETIC SOURCES
- FAULTS INFERRED FROM MAGNETIC DATA
- POSSIBLE AREAS OF PERMIAN COAL MEASURES (INFERRED FROM MAGNETIC INTERPRETATION)
- AREAS WHERE BASEMENT IS AT > 2000m DEPTH
- OUTCROPPING BASEMENT ROCKS
- MAPPED FAULTS

- Pc GARYNGINIA FORMATION
 - Pq HIGH CLIFF SANDSTONE
 - Ph HOLMWOOD SHALE
 - Pn NANGELTY FORMATION
 - St OUTCROPPING SILURIAN ROCKS
 - ⊕ DRILL HOLES
- OUTCROPPING PERMIAN ROCKS



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C.R.A. EXPLORATION PTY. LIMITED

TEMPORARY RESERVES, 8470-75, YANDI

INTERPRETATION OF YUNA
AEROMAGNETIC DATA

23

GERALDTON 58 50-1 - AJANA 56 50-13

Geol. J. Ashley	Report No.
Drawn.	Date. Feb. 1981
	Plan No. WA 11439p

0 5 10 15 20 km
SCALE 1: 250 000

Interval (m)			Contact	Core Recovery %	S C R	R Q A	LITHOLOGY	MINERALS	Bedding			Sedimentary Structures	Structures & Joints			Weathering Index Strength	STRATIGRAPHY	SAMPLE No.	COMMENTS
Top m	Bottom m	Thick m							Dip	Specs	Desc.		Dip	Specs	Desc.				
0	4.0	4.0		X	U	O	Light brown fine to medium grained qtz sands, probably aeolian.											0-4 m Quaternary and recent sediments.	
4.0	54.0	50.0		X	U	O	White, fine to medium grained, subangular to rounded qtz sands (sst).											4-212 m Permian Sakmarian Nargetty Formation	
54.0	63.0	9.0		98			White fine to medium grained, subangular to rounded qtz sandstone grading into.		100		@ 60.9 m	800						Total Core recovery 94%	
63.0	68.5	5.5		92			Red brown sandy mudstone grading into												
68.5	73.1	4.6		96			Whitish brown fine to medium grained, subangular to rounded qtz sandstone.												
73.1	74.75	1.65		98			Red brown fine grained sandy mudstone.												
74.75	98.52	23.77		100			Whitish brown fine to medium grained qtz sandstone	apparent	100		@ 79.8 m	750							
98.52	98.54	0.02		100			Very fine grained greyish micaceous siltstone.												
98.54	101.4	2.86		100			Whitish brown fine grained grading into very coarse grained qtz at base.		80										
101.4	104.75	3.35		100			As above (to boundary indistinct).												
104.75	122.64	17.89		100			Whitish brown fine to medium grained, subangular to rounded qtz sandstone.												
							110.8-112.5 m whitish brown medium grained sandstone with a zone of jointing.						joints 750-800						
122.64	122.66	0.02		100			Grey fine grained micaceous siltstone		50										
122.66	131.0	8.34		100			Whitish brown fine to coarse grained (grading downhole) qtz sandstone. Zones of vesicles at 125.7-126.1 - smooth sized holes - weathered out clasts of fine grained sandstone.												
							Zone of irregularly spaced joints between 125-128 m						joints 750-800						
131.0	131.18	0.18		100			Whitish fine grained qtz sandstone		50										
131.18	133.2	2.02		98			Whitish brown fine to medium qtz sandstone and contorted veins of silica.		50				veining						
133.2	133.22	0.02		100			Grey, fine grained mudstone.		50										
133.22	134.5	1.28		98			Whitish brown fine grained qtz sandstone												
134.5	134.8	0.3		98			Light brown fine grained qtz sandstone with contacted veining of silica.						veining						
134.8	138.38	3.58		93			Whitish grey fine grained siltstone.												
138.38	138.48	0.1		100			Greyish white conglomerate with a siltstone matrix, consisting of subangular to rounded qtz pebbles 1 cm.												
138.48	140.3	1.82		71			Grey siltstone to red brown sandy mudstone with small grains of rounded qtz.												
140.3	143.15	2.85		88			Greyish fine grained siltstone grading into grey mudstone.												
143.15	143.2	0.05		100			Small bed of grey v. coarse grained qtz sandstone subangular to rounded grains of 2 mm.												
143.2	148.5	5.3		100			Whitish brown, v. coarse grained qtz sandstone.		80										
148.5	150.77	2.17		95			Top boundary dip=80 while bottom boundary grades into Brownish white fine grained to medium grained mod. sorted subangular to rounded qtz sandstone.												
150.77	150.8	0.08		100			Brownish v. coarse grained qtz sandstone grading into												
150.85	151.1	0.25		100			Brownish white, fine grained qtz sandstone bottom boundary distinct.		30										
151.1	152.0	0.9		90			Brownish white and greyish v. coarse grained, subangular to rounded qtz & grey feldspar sandstone (grains 0.5cm)												

Location LAT. 28° 15' 26", LONG. 114° 59' 42".
R.L. Collar
Total Depth 212 m
inclination VERTICAL
Core Interval 3 m
Core Size NQ (54-212 m)

PROJECT : Yuma Coal
DRILLHOLE No. : Yuch 1

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