

8/7/76

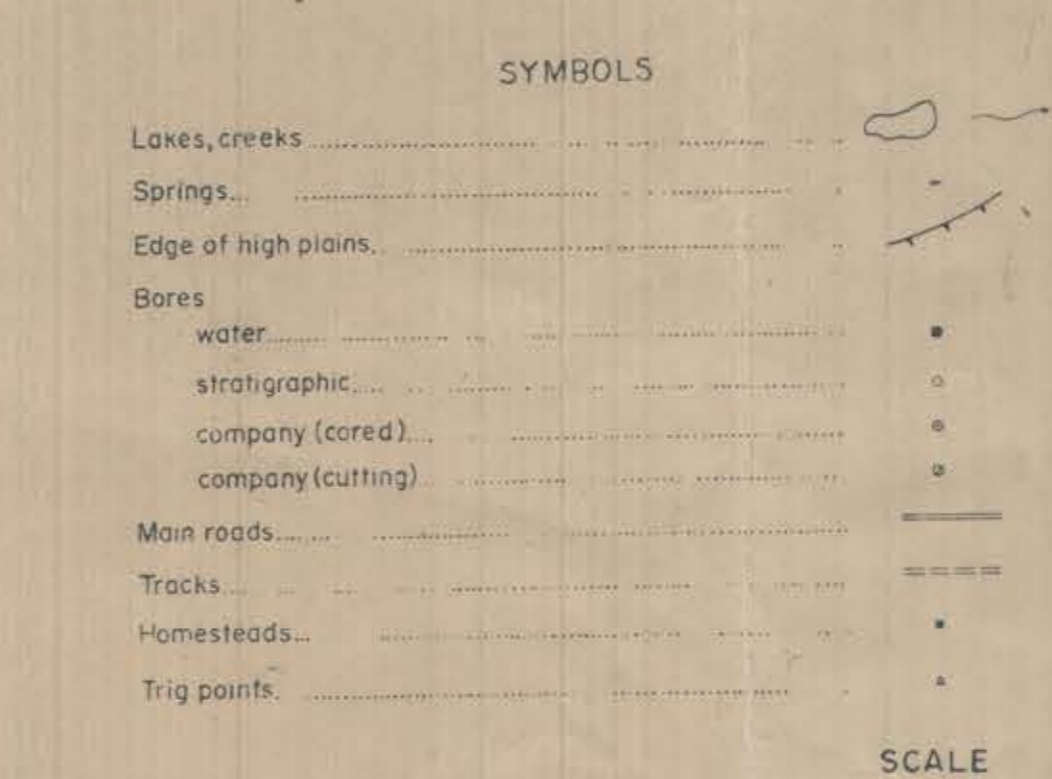
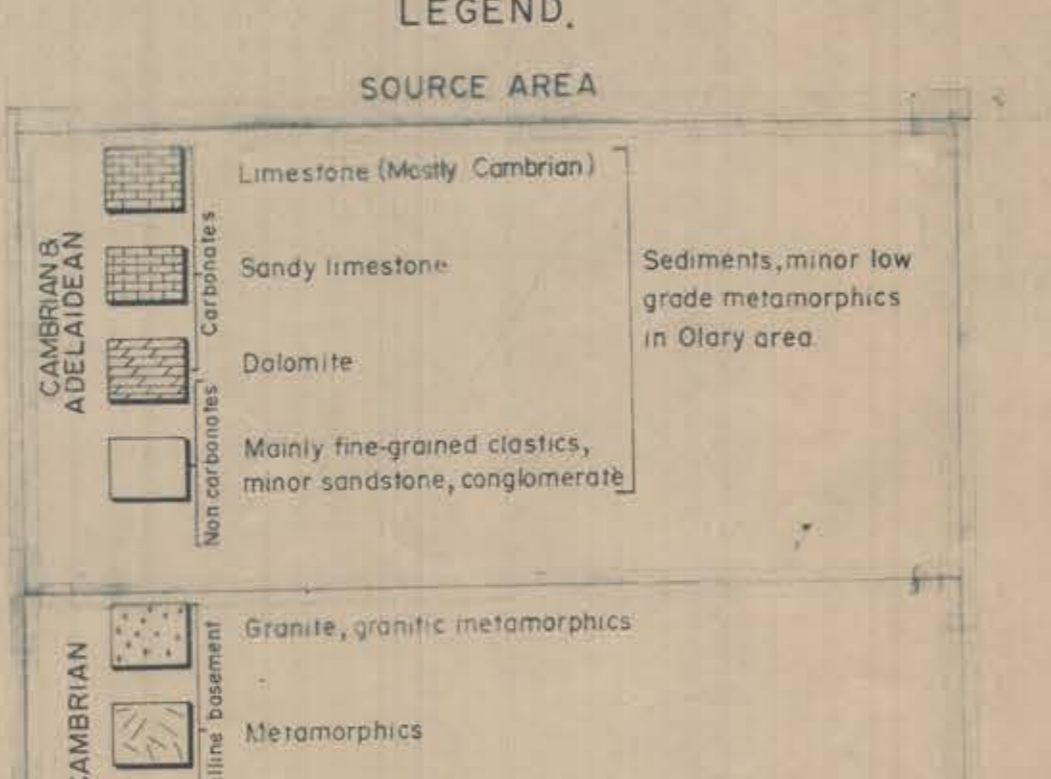
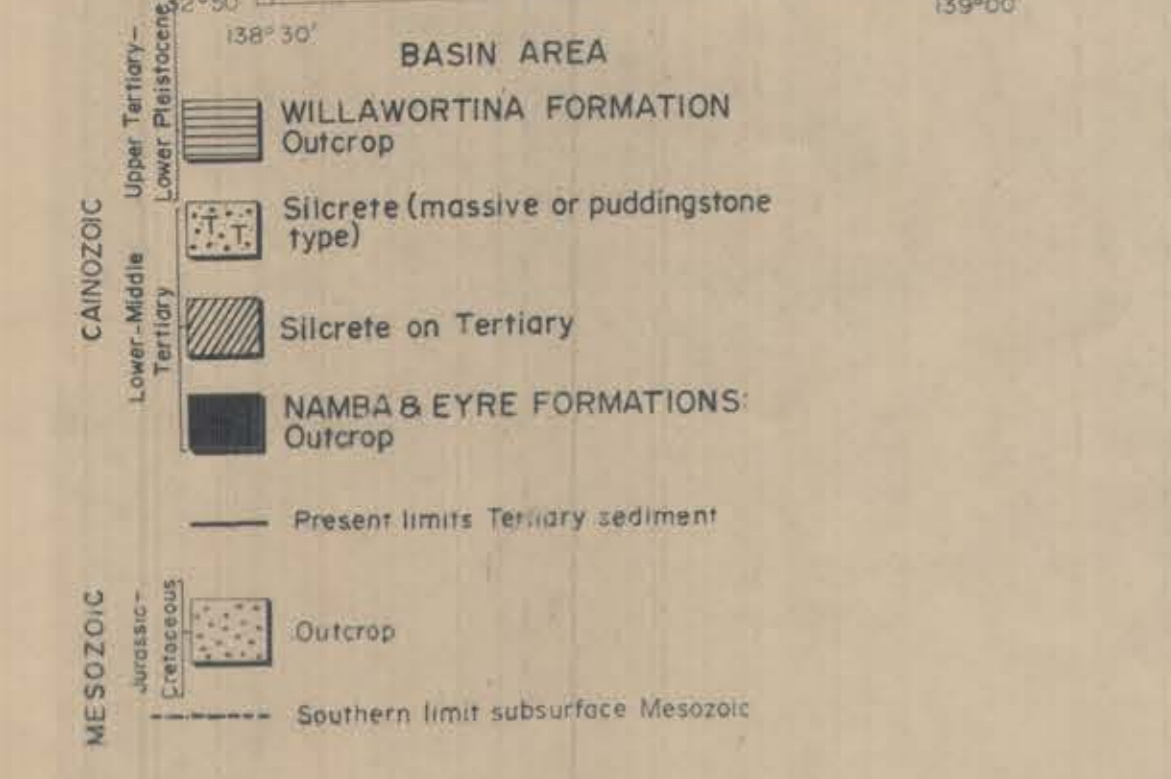
THE STRATIGRAPHY, SEDIMENTOLOGY AND URANIUM DEPOSITS OF TERTIARY  
ROCKS: LAKE FROME AREA, SOUTH AUSTRALIA

by

ROGER ARTHUR CALLEN, B.Sc.(Hons)  
Geological Survey of South Australia

Submitted for the Degree of M.Sc. through the Department of Geology  
and Mineralogy, University of Adelaide, September, 1975





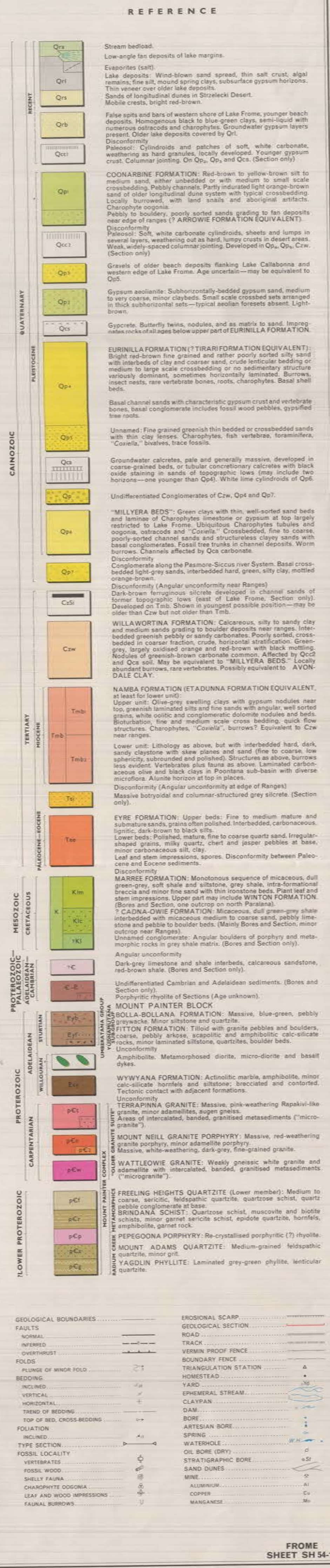
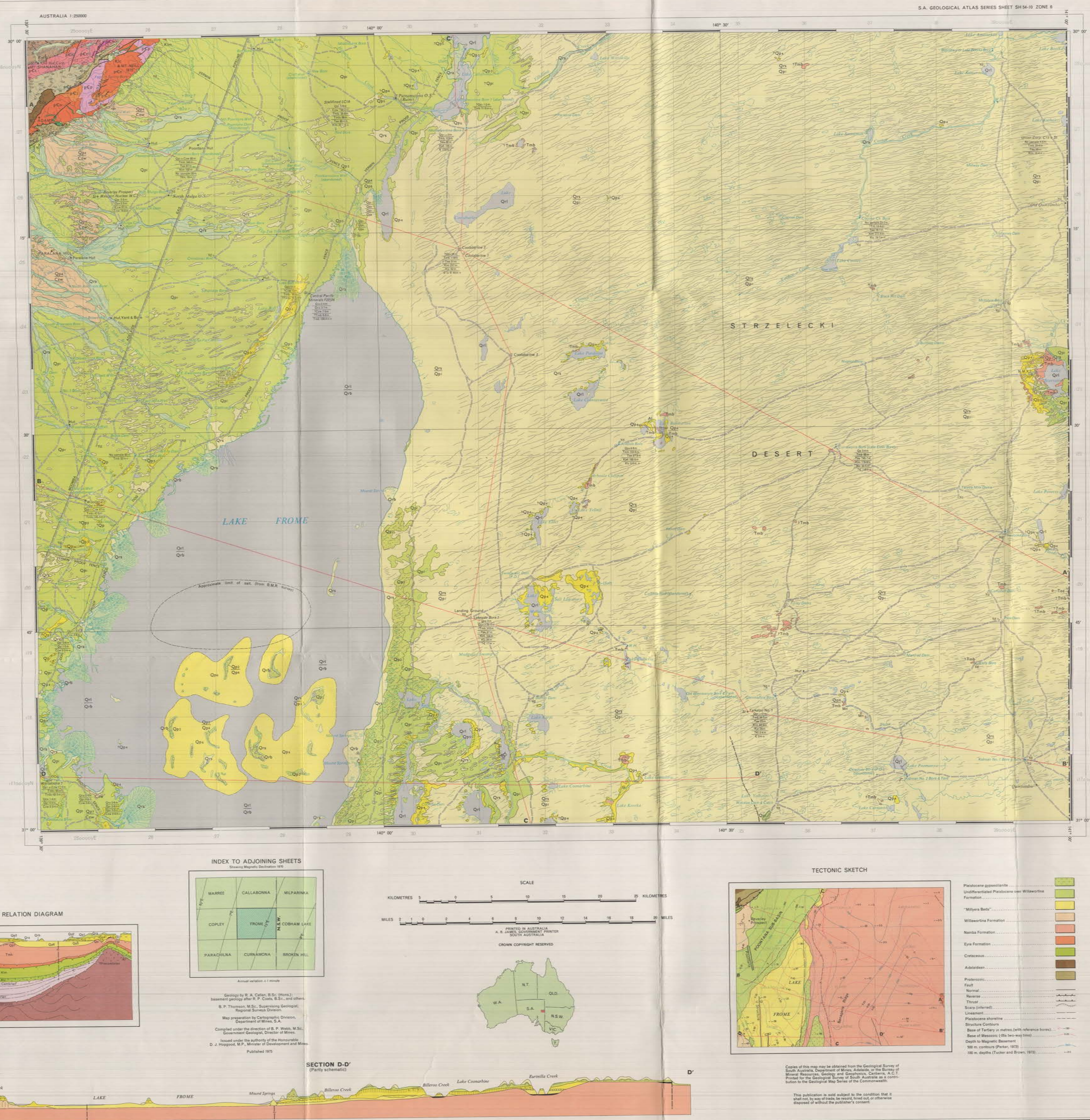
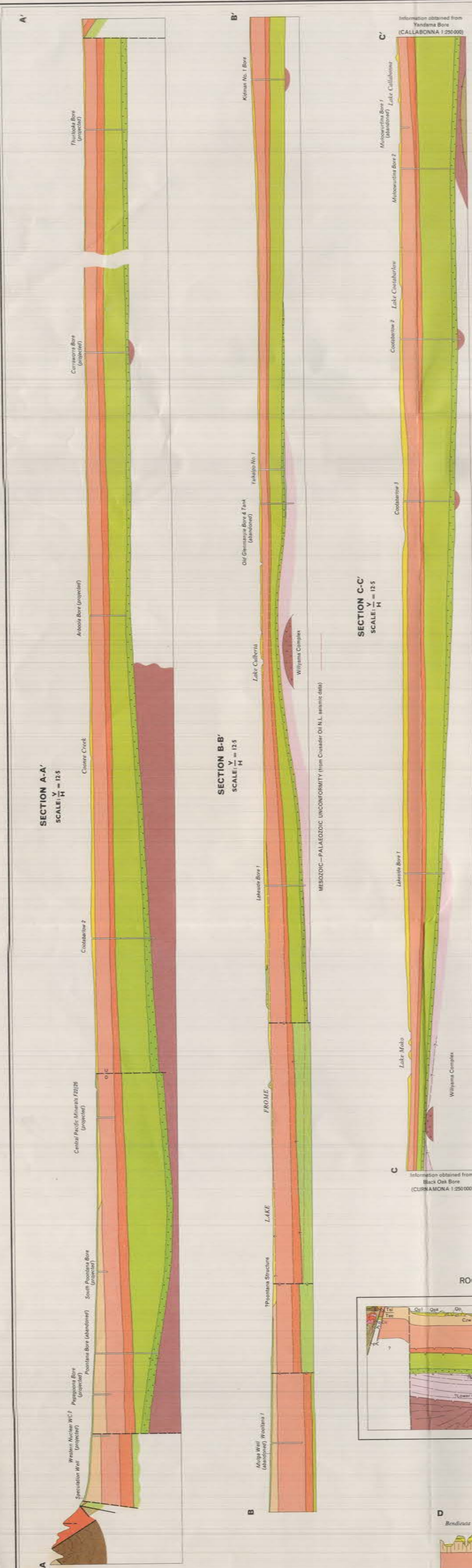
S.A. DEPARTMENT OF MINES

## LAKE FROME AREA

Cainozoic Basin and Source Beds  
Thin section localities

Regional Surveys	R. A. Callen Del: J.A. Appelbee	74-54 21/74 994.2+4
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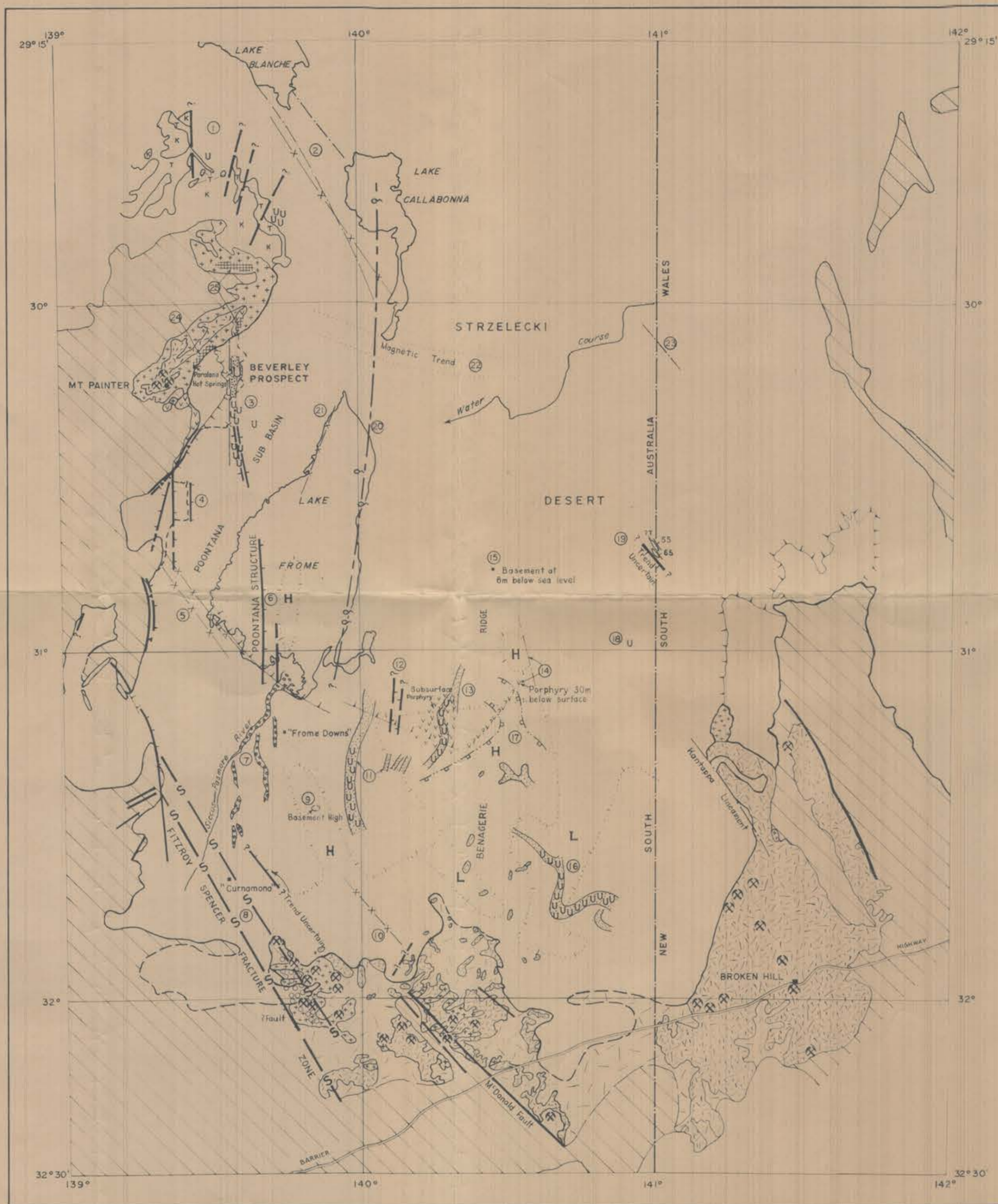




Copies of this map may be obtained from the Geological Survey of South Australia, Department of Mines, Adelaide, or from the State Printing Office, Adelaide. The map is published under the authority of the Hon. Minister of Mines, South Australia.

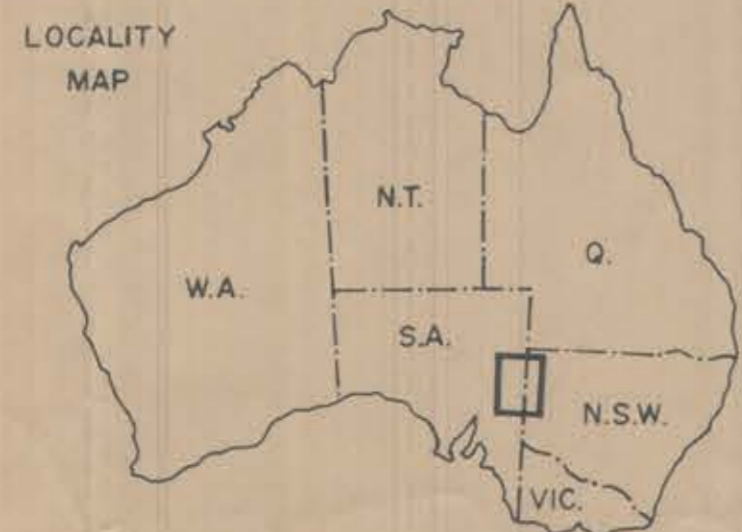
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REFERENCE

- Cainozoic sediments T
- Mesozoic sediments K
- Palaeozoic and Precambrian sediments [diagonal lines]
- Precambrian Crystalline Basement:
  - Granite; Granitic Metamorphics [cross-hatch]
  - Metamorphics; sparse symbol indicates thin Quaternary cover [dots]
  - Volcanics [V-pattern]
- Plio - Pleistocene channel conglomerates [wavy lines]
- Paleo stream channel in Tertiary sediments [dashed lines]
- Present limit of Tertiary sediments [solid line]
- Limit of EYRE FORMATION over basement; squares point towards basement [squares]
- Fault:
  - Observed [solid line with ticks]
  - Inferred [dashed line with ticks]
  - Thrust [solid line with triangles]
- Fracture zone [dashed line with zig-zag]
- Area of seismic activity [wavy lines]
- Mound spring trend; mound spring [dashed line with circles]
- Lineaments:
  - ERTS [dashed line with X]
  - Other [dashed line]
- Breakaway slopes [dashed line with triangles]
- Boundary of high plain [dashed line]
- Selected aeromagnetic features:
  - Regional trend [dotted line]
  - High or low point [H L]
- URANIUM
  - Occurrence in basement [cross-hatch]
  - Anomalous radioactivity in basement [grid]
  - Anomalous sedimentary occurrence [U]
- Data source and explanation in text [circle with 12]



DEPARTMENT OF MINES — SOUTH AUSTRALIA

LAKE FROME AREA  
SEDIMENTARY URANIUM

SIGNIFICANT GEOLOGICAL, STRUCTURAL, GEOGRAPHIC AND AEROMAGNETIC  
FEATURES RELATING TO CAINOZOIC SEDIMENTS

REGIONAL GEOLOGY R.A.Cullen

75-139  
25,26,33,34,41,42,49,50  
Del: J.M.B. 17/2/1975







BORE LOG

PROJECT LAKE FROME CAINOZOIC SECTION  
 LOCATION CURNAMONA 1:63,360, 1:259,000 SE of CURNAMONA HUNDRED

R.L. 96.0  
 T.D. 160.0m

LAT. 31° 26' 15"  
 LONG. 139° 34' 30"

DEPTH (METERS)	WENTWORTH GRAIN SIZE SAND	LITHO LOG	INDUR-ATION	FOSSIL BOILS WEATHERING INDURATION	CARBONATE	% SAND	MUNSELL COLOUR	ROUNDNESS & SPHERICITY OF GRAINE	GRAIN SURFACE FEATURES	MINERALS						SORTING	CLASTS	PORO-SITY	FOSSILS	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES For Analysis	PHOTOS
										Q	M	H	F	C	Other										
40		No CORE																							
42		O = 40m																							
44	Bimodal					57%	10-15% High S		Pitted, rough	aggr - Common quartz 20% Musc. mag Biot Rutile Stau Mag Tourm Ilmenite Biot								Thinly bedded							
46																									
48																									
50																									
52																									
54																									
56																									
58																									
60							N9			95-97% (XRD)				XRD whole rock 2.4-90% rock M.K. M.K. SD K.A. X.L.				Soapy feel						60.70 P529/70 (192-197)	
62																									
64																									
66																									
68																									
70		CORE D 5cm																							
72																									
74							74%																		
76							N75																		
78							N7																		
80										30-40%				XRD whole rock 60% K.D. K.M. M.A.				clay dyke? Soapy feel Swelling clay						79.25 (60) P525/70	

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION

Using method of Selley & C. 1968. J. Sed. Pet. 38:2: pp 263-272

Symbols from Selley & Rowe A.H. 1962 Sedimentology of Fluvial Deposits (Elsevier) Litho log

Induration

Grain size graph with sedimentary structure symbols

NOTES

Sedimentary Structures: Use column for details, place symbol in grain size column

Induration code: Use own code & specify here or on separate sheet

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Powers scale

Sorting: Folk R.L. 1968: Petrology of Sedimentary Rocks (Stratigraphy) pp 103-105

VP = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type whether interconnected pores or not

Q	Quartz
M	Mica
H	Heavy
F	Feldspar
C	Clays
Other	Other minerals

LOGGED BY RAC DATE 1973

TRACED BY AR DRAFTING BRANCH

DEPARTMENT OF MINES SOUTH AUSTRALIA

CHECKED SHEET 1 OF 3



BORE LOG

PROJECT LAKE FROME CAINOZOIC SECTION

SECTION

R.L. 96.0

LAT 31° 26' 15"

LOCATION CURNAMONA 1:63,360, 1:250,000 "SE of Carnamona", HUNDRED

T.D. 160.0m

LONG. 139° 34' 30"

DEPTH (METRES)	WENTWORTH GRAIN SIZE	LITHO LOG	INDURATION	FOSSIL SOILS WEATHERING INDURATION	% CARBONATE	MUNSELL COLOUR	% SAND	ROUNDSNESS & SPHERICITY OF GRAINS	GRAIN SURFACE FEATURES	MINERALS						SORTING	CLASTS	POROSITY	FOSSILS	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES Pet & Analyte	PHOTOS
										Q	M	H	F	C	Other										
80									Mixtura of pitted & smooth sand and SA-SK granules. Broken surfaces or polished.						Q pebbles			Lamination & slumping	Soapy feel.						
82																									
84																									
86																									
88																									
90																									
92																									
94																									
96																									
98																									
100																									
102																									
104																									
106																									
108																									
110																									
112																									
114																									
116																									
118																									
120																									

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION

Using method of Selley & C. 1968 J. Sed. Pet. 38(2) pp 363-372

Symbols from Selley & Baume A.M. 1962 Sedimentology of Flysch Deposits (Elsevier)

Litho log

Induration

Grain size graph with sedimentary structure symbols

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% Sand: State method

Roundness: Use Powers scale

Sorting: Folk R.L. 1968: Petrology of Sedimentary Rocks (Memphis) pp. 103-105

VF = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type whether interconnected pores or not

- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals

LOGGED BY RAC	DATE 1973
TRACED BY AR	DRAFTING BRANCH
DEPARTMENT OF MINES, SOUTH AUSTRALIA	
CHECKED	SHEET 2 OF 3

D.M.G. No. 75-554g







BORE LOG

PROJECT LAKE FROME CAINOZOIC SECTION  
LOCATION SICCU5 1:63,360, FROME 1:250,000 HUNDRED

R.L. 39:00m  
T.D. 152:40m

LAT 31° 13' 42"  
LONG 139° 48' 20"

DEPTH (METRES)	WENTWORTH GRAIN SIZE	LITHO LOG	INDURATION	FOSSIL SOILS WEATHERING INDURATION	CARBONATE	% SAND	MINERALS	SORTING	CLASTS	POROSITY	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES	PHOTOS
0																
2																
4																
6																
8																
10																
12																
14						5-10% silt	VA-R mostly P. Heav. by SA.		2% ? minerals opaques		16-18 cm. Burrows of rodent. Not branched, vertical.	Began coring		BURROWED HORIZON		
16																
18																
20																
22																
24																
26																
28																
30																
32																
34																
36																
38																
40																

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION

Using method of Selley R.C. 1968 J. Sed. Pet. 38(2) pp. 363-372

Symbols from Selley or Baum A.H. 1962 Sedimentology of Flysch Deposits (Elsevier)

DRG. No. 75-556

EAR 6

7/9

NOTES

Sedimentary Structures: Use column for details, place symbol in grain size column

Induration code: Use own code & specify here or on separate sheet

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Power's scale

Sorting: Folk R.L. 1968 Petrology of Sedimentary Rocks (Hemphill) pp. 103-105

VP = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type (whether interconnected pores or not)

- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals

LOGGED BY R. Callen DATE 19-4-73

TRACED BY J.R. DRAFTING BRANCH DEPARTMENT OF MINES SOUTH AUSTRALIA

CHECKED SHEET 1 OF 4



**BORE LOG**

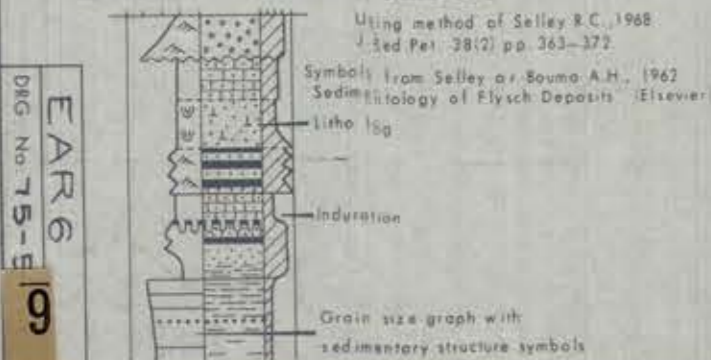
PROJECT LAKE FROME CAINOZOIC SECTION  
 LOCATION SICCU5 1163,360, FROME 125,000 HUNDRED

R.L. 39.00m  
 T.D. 152.40m

LAT. 31° 13' 42"  
 LONG. 139° 48' 20"

DEPTH (METRES)	WENTWORTH GRAIN SIZE (mm)	LITHO LOG	INDURATION (S, C, E)	FOSSIL SOILS WEATHERING INDURATION	CARBONATE (%)	% SAND	MINERALS (G, M, H, F, C, Other)	GRAIN SURFACE FEATURES	SORTING (V, W, M)	CLASTS	PORO-SITY (High, Medium, Low)	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES (Pet, Analyse)	PHOTOS
40-42		[Litho symbol]											Swelling marl sub-sol. Fracture leached appearance	Swelling CLAY		P1153/73 41.50m	
44-46		[Litho symbol]			25% clay	1.2% Mg sand		SR, Frosted D. - stained rough grains k. frosted or clear SR staining. Grains may be certain					Carbonate dissolved in hot HCl and wt. difference determined			P1154/73 44.00	
48-50		[Litho symbol]						ill. var. 1/2 grains are polygonal edges of polyhedral or rough kino. quartz					Scattered col. liths	Alternating SILT and CALICHE			
50-52		[Litho symbol]			5% Fe Mn stain			A-SR Frosted with (1/4)					1/2 cm bk. pellets & stained clay.				
56-58		[Litho symbol]															
60-62		[Litho symbol]			5% silt	SA-SK sand		Frosted to shiny or polished xlt. shapes common									
64-66		[Litho symbol]						Low S. A-SK Some g. shiny & some rougher with sand									
68-70		[Litho symbol]			8% silt			quartz from on grain									
72-74		[Litho symbol]															
76-78		[Litho symbol]															

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION



NOTES:  
 Sedimentary Structures: Use column for details, place symbol in grain-size column.  
 Induration code: Use own code & specify here or on separate sheet  
 Cement, etc.: Use symbol code.  
 % Carbonate: State method  
 % Sand: State method  
 Roundness: Use Powers scale  
 Sorting: Folk R.L., 1968. Percentage of Sedimentary Rocks. Harpenden: pp. 105-106  
 VP = very poor, P = poor, M = moderate, W = well, VW = very well  
 Porosity: State type whether interconnected pores or not

- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals



BORE LOG

PROJECT LAKE FROME CAINOZOIC SECTION R. 39-00m  
LOCATION SICCUS 1:63,360, FROME 1:25,000 HUNDRED T.D. 152-40m

LAT. 31° 13' 42" LONG. 139° 48' 20"

DEPTH (METRES)	WENTWORTH GRAIN SIZE				LITHO LOG	INDURATION	FOSSIL SOILS, WEATHERING INDURATION	% CARBONATE	MUNSELL COLOUR	% SAND	ROUNDNESS & SMOOTHNESS OF GRAINS	GRAIN SURFACE FEATURES	MINERALS						SORTING	CLASTS	POROSITY	FOSSILS	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES No. & Analysis	PHOTOS								
	1/16"	1/8"	1/4"	> 1/4"									Q	M	H	F	C	Other											VP	W	M	VW				
80												Shiny, frosted, 15-25% polished																								
84																							Alternating scapy silt & gn. clay, sub-conch. fracture													
88																																				
90																																				
94																																				
96																																				
100																																				
104																																				
106																																				
108																																				
110																																				
112																																				
114																																				
116																																				
118																																				
120																																				

Alternating CALcareous SILT and SWELLING BLACK CLAY WITH SKEW PLANES

SI "scapy" silt

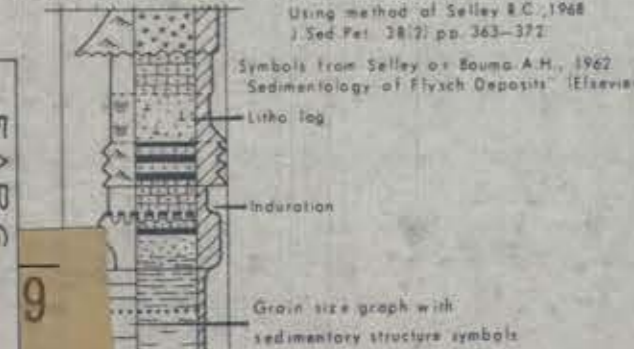
FORMATION

Alternating MICACEOUS SILT AND SAND, MINOR CLAY  
NAMBIA

F6 sand in silt matrix

FORMATION?

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION



- NOTES**
- Sedimentary Structures: Use column for details, place symbol in grain size column
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  - % Carbonate: State method
  - % Sand: State method
  - Roundness: Use Powers scale
  - Sorting: Folk R.L., 1968 Petrology of Sedimentary Rocks (Memph. Ill.) pp. 103-105  
VP = very poor, P = poor, M = moderate, W = well, VW = very well
  - Porosity: State type (whether interconnected pores or not)

- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals

LOGGED BY R. Collen DATE 19-4-73  
TRACED BY A.R. DRAFTING BRANCH  
DEPARTMENT OF MINES, SOUTH AUSTRALIA  
CHECKED SHEET 3 OF 4



BORE LOG

PROJECT LAKE FROME CAINOZOIC SECTION  
 LOCATION SICCUS 1:63,360, FROME 1:250,000 HUNDRED

R.L. 39 00m  
 T.D. 152.40m

LAT. 31° 13' 42"  
 LONG. 139° 48' 20"

DEPTH (METRES)	WENTWORTH GRAIN SIZE	LITHO LOG	INDURATION	FOSSIL SOILS WEATHERING INDURATION	% CARBONATE	% SAND	ROUNDEDNESS & SPHERICITY OF GRAINS	GRAIN SURFACE FEATURES	MINERALS						SORTING	CLASTS	POROSITY	FOSSILS	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES (No. & Analyte)	PHOTOS		
									Q	M	H	F	C	Other												
120		No Core																								
122																										
124																										
126																										
128																										
130																										
132																										
134																										
136																										
138																										
140																										
142																										
144																										
146																										
148																										
150																										
152																										
		END HOLE																								

**REFERENCE FOR GRAIN SIZE, LITHO AND INDURATION**  
 Using method of Selley R.C. 1968  
 J. Sed. Pet. 38(2) pp. 363-372.  
 Symbols from Selley & Baum A.H. 1962  
 Sedimentology of Flysch Deposits (Elsevier)

EAR 6  
 DRG. No. 75-556 c

**NOTES**  
 Sedimentary Structures: Use column for details, place symbol in grain size column  
 Induration code: Use own code & specify here or on separate sheet  
 Cement, etc.: Use symbol code  
 % Carbonate: State method  
 % Sand: State method  
 Roundedness: Use Powers scale  
 Sorting: Folk R.L. 1968 'Petriology of Sedimentary Rocks' Hemphill, pp. 102-105  
 VP = very poor; P = poor; M = moderate; W = well; VW = very well  
 Porosity: State type (whether interconnected pores or not)

Q	Quartz
M	Mica
H	Heavies
F	Feldspar
C	Clays
Other	Other minerals

LOGGED BY R. Colten	DATE 19-4-73
TRACED BY A.P.	DRAFTING BRANCH
DEPARTMENT OF MINES SOUTH AUSTRALIA	
CHECKED	SHEET 4 OF 4



BORE LOG

PROJECT LAKE FROM CENOZOIC  
SADM Stratigraphic drilling project  
LOCATION QUINYAMBIE 1:63,360 FROME 1:250,000  
near L. Yalkalpo

SECTION  
HUNDRED

R.L. 42.5m  
T.D. 219.67

LAT. 30° 51' 47"  
LONG. 140° 31' 58"

DEPTH (METERS)	WENTWORTH GRAIN SIZE	LITHO LOG	INDURATION	FOSSIL SOILS WEATHERING INDURATION	CARBONATE	% SAND	MUNSELL COLOUR	ROUNDNESS OF GRAINS	GRAIN SURFACE FEATURES	MINERALS						SORTING	MAX. GRAIN SIZE (mm)	CLASTS	POROSITY	FOSSILS	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES No. & ANALYSE	PHOTOS
										Q	M	H	F	C	Other											
0																					CUTTINGS (2 bags)	Red bn Sand	COGNACINE FORMATION			
2																										
4																										
6																										
8																										
10																										
12																										
14																										
16																										
18																										
20																										
22																										
24																										
26																										
28																										
30																										
32																										
34																										
36																										
38																										
40																										

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION

Using method of Selley R.C. 1968  
J. Sed. Pet. 38(2) pp. 363-372

Symbols from Selley or Bouma A.H. 1962  
Sedimentology of Flysch Deposits (Elsevier)

Litho log

Induration

Grain size graph with sedimentary structure symbols

NOTES

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% Carbonate: State method

% Sand: State method

Roundness: Use Power's scale

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Q	Quartz
M	Mica
H	Heavies
F	Feldspar
C	Clays
Other	Other minerals

LOGGED BY RAC DATE 1973

TRACED BY AR DRAFTING BRANCH

DEPARTMENT OF MINES, SOUTH AUSTRALIA

CHECKED SHEET 1 OF 6



BORE LOG

PROJECT LAKE FROME CENOZOIC  
 SADM Stratigraphic drilling project  
 LOCATION QUINYAMBIE 1:63,360, FROME 1:250,000  
 near L. Yalkalpo

SECTION HUNDRED

R.L. 42 0m  
 T.D. 218.67

LAT. 30° 51' 47"  
 LONG. 140° 31' 58"

DEPTH (METERS)	WENTWORTH GRAIN SIZE	LITHO LOG	INDURATION	FOSSIL SOILS WEATHERING INDURATION	CARBONATE %	MUSSELS COLOUR	% SAND	GRAIN SURFACE ROUNDNESS & SPHERICITY OF GRAINS	GRAIN SURFACE FEATURES	MINERALS						SORTING	CLASTS	POROSITY	FOSSILS	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES No. & Analyst	PHOTOS
										Q	M	H	F	C	Other										
40																									
42																									
44																									
46																									
48																									
50																									
52																									
54																									
56																									
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66																									
68																									
70																									
72																									
74																									
76																									
78																									
80																									

**REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION**

Using method of Selley R.C. 1968  
 Sed. Pet. 38:21 pp. 363-372

Symbols from Selley or Baum A.H. 1967  
 Sedimentology of Flysch Deposits (Elsevier)

Litho. log

Induration

Grain size graph with sedimentary structure symbols.

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- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals

LOGGED BY RAC	DATE 1973
TRACED BY A.R.	DRAFTING BRANCH
DEPARTMENT OF MINES, SOUTH AUSTRALIA	
CHECKED	SHEET 2 OF 6



BORE LOG

PROJECT LAKE FRONE CENOZOIC  
SADM Stratigraphic drilling project  
LOCATION GUINYAMBJE 1:63,360 FROME 1:250,000  
near Yalkalpo

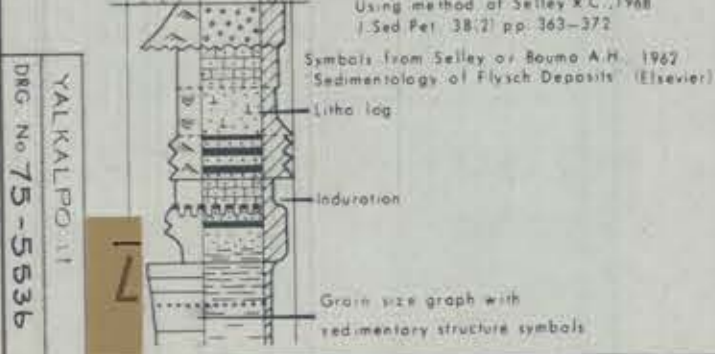
SECTION HUNDRED

R.L. 42.5m  
T.D. 219.67m

LAT. 30° 51' 47"  
LONG. 140° 31' 58"

Table with columns: DEPTH (METRES), WENTWORTH GRAIN SIZE, LITHO LOG, INDURATION, FOSSIL SOILS WEATHERING INDURATION, CARBONATE, % SAND, MUNSSELL COLOUR, GRAIN ROUNDNESS & SPHERICITY OF GRAINS, GRAIN SURFACE FEATURES, MINERALS (Q, M, H, F, C, Other), SORTING, CLASTS, POROSITY, FOSSILS, SEDIMENTARY STRUCTURES, COMMENTS, ROCK NAME, FORMATION, SAMPLES, ANALYSIS, PHOTOS. Includes lithological log and handwritten annotations such as 'Solid sulphate layer', 'Thin section', 'Plant stem impressions', and 'Py-Marc'.

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION



NOTES  
Sedimentary Structures: Use column for details, place symbol in grain size column.  
Induration code: Use own code & specify here or on separate sheet.  
Cement, etc.: Use symbol code  
% Carbonate: State method  
% Sand: State method  
Roundness: Use Power's scale  
Sorting: Folk S.L., 1968 Petrology of Sedimentary Rocks (Hemphill's) pp. 103-105  
VR = very poor, P = poor, M = moderate, W = well, VW = very well  
Porosity: State type (whether interconnected pores or not)

- Q Quartz  
M Mica  
H Heavies  
F Feldspar  
C Clays  
Other Other mineral

LOGGED BY RAC DATE 1973  
TRACED BY AP DRAFTING BRANCH  
DEPARTMENT OF MINES, SOUTH AUSTRALIA  
CHECKED SHEET 2 OF 6



BORE LOG

PROJECT LAKE FROME CENOZOIC  
SADM Stratigraphic drilling project  
LOCATION QUINYAMBIE 1:63,360 FROME 1:250,000 HUNDRED  
near L. Kalkalpo

R.L. 42.5m  
T.D. 219.67

LAT. 30° 51' 47"  
LONG. 140° 31' 58"

DEPTH (METRES)	WENTWORTH GRAIN SIZE		LITHO LOG	INDURATION	FOSSIL SOILS WEATHERING INDURATION	CARBONATE %	MUNSELL COLOUR	% SAND	ROUNDNESS & SPHERICITY OF GRAINS	GRAIN SURFACE FEATURES	MINERALS						SORTING	MAX. GRAN SIZE (mm)	CLASTS	POROSITY	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES Pat & Analyt	PHOTOS
	GRAVEL	SAND									Q	M	H	F	C	Other										
122																										
124																										
126																										
128																										
130																										
132																										
134																										
136																										
138																										
140																										
142																										
144																										
146																										
148																										
150																										
152																										
154																										
156																										
158																										
160																										

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION

Using method of Selley R.C. 1968  
J. Sed. Pet. 38(7) pp. 363-372

Symbols from Selley or Bouma A.H. 1967  
Sedimentology of Flysch Deposits (Elsevier)

Litho log

Induration

Grain size graph with sedimentary structure symbols

NOTES

Sedimentary Structures: Use column for details, place symbol in grain size column

Induration code: Use own code & specify here or on separate sheet

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Power's scale

Sorting: Folk R.L., 1968 'Petrology of Sedimentary Rocks' (Hemphill's) pp. 103-105

VP = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type (whether interconnected pores or not)

Q	Quartz
M	Mica
H	Heavies
F	Feldspar
C	Clays
Other	Other minerals

LOGGED BY RAL DATE 1973

TRACED BY A.R. DRAFTING BRANCH, DEPARTMENT OF MINES, SOUTH AUSTRALIA

CHECKED SHEET 4 OF 6



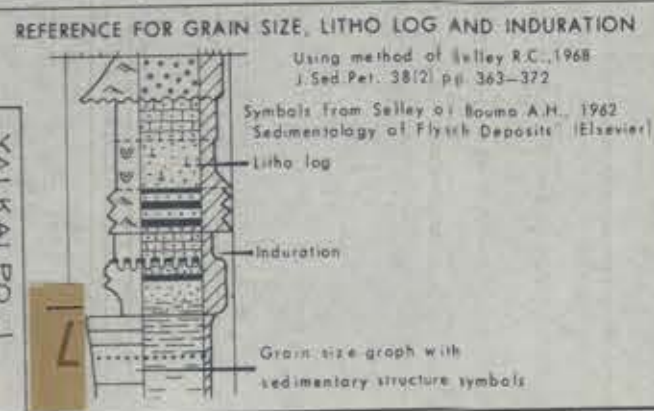
BORE LOG

PROJECT LAKE FROM CAINOZOIC  
 SADM Stratigraphic Drilling project  
 LOCATION QUINYAMBIE 1:63,360 FROM 1:250,000  
 near L. Yalkalpo

R.L. 42.8m  
 T.D. 218.67

LAT. 30° 51' 47"  
 LONG. 140° 31' 58"

DEPTH (METRES)	WENTWORTH GRAIN SIZE	LITHO LOG	INDURATION	FOSSIL SOILS, WEATHERING INDURATION	% CARBONATE	% SAND	MINERALS	GRAIN SURFACE FEATURES	CLASTS	POROSITY	FOSSILS	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES	PHOTOS
160									19x11 chert Gn. shale, dr. gy. porphy. & long shale table broken down large dist.								
162											Buttrons						
164											Prochiropt. brachiopods brachiopods Buttrons						
166											crustacean Foropora frag??						
168									38x20 gn. shale, dr. gy. porphy. & long shale table broken down large dist.							167.49 P1023/73	
170									~55x20 Intraformational Aracaria logs		Buttrons						
172													Coarsely crystalline, with patches of shale			172.20 PALAEO NSW DM (RM)	
174																	
176													Claystone, but becomes spaly on exposure to air				
178																	
180																	
182									Red-tn porphyry chips							180.69 PALAEO NSW DM (RM)	
184									Red porphyry pebbles wh. feldspar								
186									7/8 Flag-KE Rhyolite porphy.							187.15 P1024/73	
188																	
190													Very soft			190.89 PALAEO NSW DM (RM)	
192																	
194																	
196									7/8 Porphyritic rhyolite trachy rhyolite voids c.t. BUR. BARR.							195.48 PALAEO NSW DM (RM)	
198									Shale pebbles at base								
200									Porphyry pebbles.								192.94 P1024-5/73



NOTES

Sedimentary Structures: Use column for details, place symbol in grain size column

Induration code: Use own code & specify here or on separate sheet

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Power's scale

Sorting: Folk R.L., 1968 "Petrology of Sedimentary Rocks" (Hemphill) p. 103-105  
 VP = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type (whether interconnected pores or not)

- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals

LOGGED BY RAL DATE 1973

TRACED BY AR DRAFTING BRANCH  
 DEPARTMENT OF MINES, SOUTH AUSTRALIA

CHECKED SHEET 5 OF 6



### BORE LOG

PROJECT LAKE FROME CENOZOIC  
 5ADM Stratigraphic drilling project  
 LOCATION QUINYAMBIE 1:83,360 FROME 1:250,000  
 near L. Yalkalpo

SECTION  
 HUNDRED

R.L. 42.5m  
 T.D. 219.67m

LAT. 30° 51' 47"  
 LONG. 140° 31' 58"

DEPTH (METERS)	WENTWORTH GRAIN SIZE	LITHO LOG	INDUR-A-TION	FOSSIL SOILS, WEATHERING INDURATION	CARBONATE %	MUNSELL COLOUR	% SAND	ROUNDSNESS & SPHERICITY OF GRAINS	GRAIN SURFACE FEATURES	MINERALS							SORTING	MAX. GRAIN SIZE (mm)	CLASTS	POROSITY	FOSSILS	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	CORRECTION INFORMATION (SAMPLING)	SAMPLING (Pet & Analyte)	PHOTOS								
										Q	M	H	F	C	Other																				
200																																			
202																																			
204																																			
206																																			
208																																			
210																																			
212																																			
214																																			
216																																			
218																																			
220		END HOLE			219.68m																														

**REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION**

Using method of Selley, R.C. 1968 J. Sed. Pet. 38(3) pp 363-372

Symbols from Selley & Bouma A.H. 1962 Sedimentology of Flysch Deposits (Elsevier)

Litho log

Induration

Grain size graph with sedimentary structure symbols

**NOTES**

Sedimentary Structures: Use column for details; place symbol in grain size column.

Induration code: Use own code & specify here or on separate sheet

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Powers scale

Sorting: Folk R.L. 1968 Petrology of Sedimentary Rocks (Hemphill) pp 103-105

VP = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type (whether interconnected pores or not)

- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals

LOGGED BY **RAC** DATE **1973**

TRACED BY **AR** DRAFTING BRANCH, DEPARTMENT OF MINES, SOUTH AUSTRALIA

CHECKED \_\_\_\_\_ SHEET **6** OF **6**



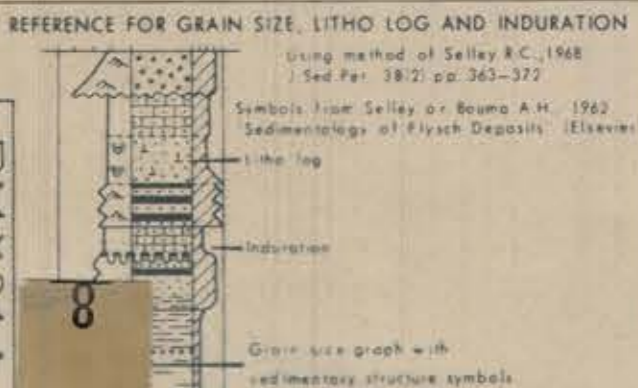
BORE LOG

PROJECT LAKE FROME CAINOZOIC SECTION  
SANDYOGTA 1:63360 HUNDRED  
CURNAMONA 1:250,000

R.L. 71.4 m  
T.D. 125.7 m

LAT 31° 25' 42"  
LONG 139° 57' 14"

Main bore log table with columns for Depth (metres), Wentworth Grain Size, Litho Log, Induration, Fossil Soils, Carbonate, Sand, Roundness, Grain Surface Features, Minerals (Q, M, H, F, C, Other), Sorting, Porosity, Sedimentary Structures, Comments, Rock Name, Formation, Samples, and Photos. The log shows various sedimentary layers with detailed descriptions of grain characteristics and mineral content.



NOTES  
Sedimentary Structures: Use column for details, place symbol in grain size column  
Induration code: Use own code & specify here or on separate sheet  
Cement, etc.: Use symbol code  
% Carbonate: State method  
% Sand: State method  
Roundness: Use Powers scale  
Sorting: Folk R.L. 1968 'Petrology of Sedimentary Rocks' (Hemphill) pp. 103-105  
VF = very poor, P = poor, M = moderate, W = well, VW = very well  
Porosity: State type (whether interconnected pores or not)

Legend for mineral symbols:  
Q Quartz  
M Mica  
H Heavies  
F Feldspar  
C Clays  
Other Other minerals

LOGGED BY R.A. Collins DATE 14-6-73  
TRACED BY A.A. DRAFTING BRANCH  
DEPARTMENT OF MINES, SOUTH AUSTRALIA  
CHECKED SHEET 1 OF 1



# BORE LOG

ADAPTED FROM SELLEY LOG

PROJECT *LAKE FROME - CAINOZOIC*  
LOCATION *YARRAMBA ST. ANDREWS 1:63,360*  
*CURNAMONA 1:259,000*

SECTION  
HUNDRED

R.L. *Approx 110.0m*  
T.D. *125.43*

LAT. *31° 44' 41"*  
LONG. *140° 41' 41"*

DEPTH (METRES)	WENTWORTH GRAIN SIZE		LITHO LOG	INDUR- ATION	CEMENT & FOSSIL SOILS	% CARBONATE		% SAND		MUNSELL COLOUR	ROUNDS- NESS & SURFACES OF GRAINS	GRAIN SURFACE FEATURES	MINERALS						SORTING	CLASTS	PORO- SITY	FOSSILS	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES For Analysis	PHOTOS								
	Coarse	Fine				75	25	75	25				Q	M	H	F	C	Other											VP	W	M	VW	High	Medium	Low	
40																																				
42																																				
44																																				
46																																				
48																																				
50																																				
52																																				
54																																				
56																																				
58			NO CORE (0-76.2m)																																	
60																																				
62																																				
64																																				
66																																				
68																																				
70																																				
72																																				
74																																				
76																																				
78																																				
80																																				

NO  
CORE  
(0-76.2m)

BEGAN CORING  
*Sippyfeel*

NB  
5Y7/3

VA origin - Polished - covered with 2% 2.4%  
shiny steel - thick - feldspar  
pebble faces - coarse - look like  
red granite - quartz (x100)  
all in

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION

Using method of Selley R.C., 1968  
*J. Sed. Pet.* 38(2) pp. 363-372

Symbols from Selley or Bouma A.H., 1967  
*"Sedimentology of Flysch Deposits"* (Elsevier)

Litho log

Induration

Grain size graph with  
sedimentary structure symbols

NOTES

Sedimentary Structures: Use column for details, place symbol in grain size column

Induration code: Use own code & specify here or on separate sheet

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Power's scale

Sorting: Folk R.L., 1968 "Petology of Sedimentary Rocks" (Mamphill's) pp. 103-105  
VP = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type (whether interconnected pores or not)

- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals

See Drg. No 74-605 for  
Explanation of Symbols

**74-9**

LOGGED BY *RA Callen* DATE *28<sup>th</sup> AUG 1946*

TRACED BY *AGK* DRAFTING BRANCH,  
DEPARTMENT OF MINES, SOUTH AUSTRALIA

CHECKED SHEET 1 OF 3



**BORE LOG**  
ADAPTED FROM SELLEY LOG

PROJECT LAKE FROME - CENOZOIC  
LOCATION YARRAMBA AREA ST. ANDREWS 1°63360  
CURNAMONGA 1°250,000 SECTION HUNDRED

R.L. Approx. 110 Om.  
T.D. 125.43

LAT. 31° 44' 41"  
LONG. 140° 41' 41"

DEPTH (METRES)	WENTWORTH GRAIN SIZE SAND	LITHO LOG	INDURATION	CEMENT & FOSSIL SOILS	% CARBONATE	MUNSELL COLOUR	% SAND	ROUNDNESS & SPHERICALITY OF GRAINS	GRAIN SURFACE FEATURES	MINERALS						SORTING	MAX. GRAIN SIZE mm.	CLASTS	POROSITY	FOSSILS	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES Pet. & Analyte	PHOTOS
										Q	M	H	F	C	Other											
80																										
82																										
84		NO CORE																								
86		NO CORE																								
88																										
90																										
92																										
94																										
96																										
98																										
100																										
102																										
104																										
106																										
108																										
110																										
112																										
114																										
116																										
118																										
120																										

**REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION**

Using method of Selley R.C. 1968  
J.Sed.Pet. 38(2) pp. 363-372

Symbols from Selley or Bauma A.H. 1962  
"Sedimentology of Flysch Deposits" (Elsevier)

6

**NOTES**

Sedimentary Structures: Use column for details, place symbol in grain size column

Induration code: Use own code & specify here or on separate sheet

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Powers scale

Sorting: Folk R.L. 1968 "Petrolology of Sedimentary Rocks" (Hemphill's) pp. 103-105

VP = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type (whether interconnected pores or not)

Q Quartz  
M Mica  
H Heavies  
F Feldspar  
C Clays  
Other Other minerals

See Drg. No 74-605 for Explanation of Symbols

**74-803A**  
FL

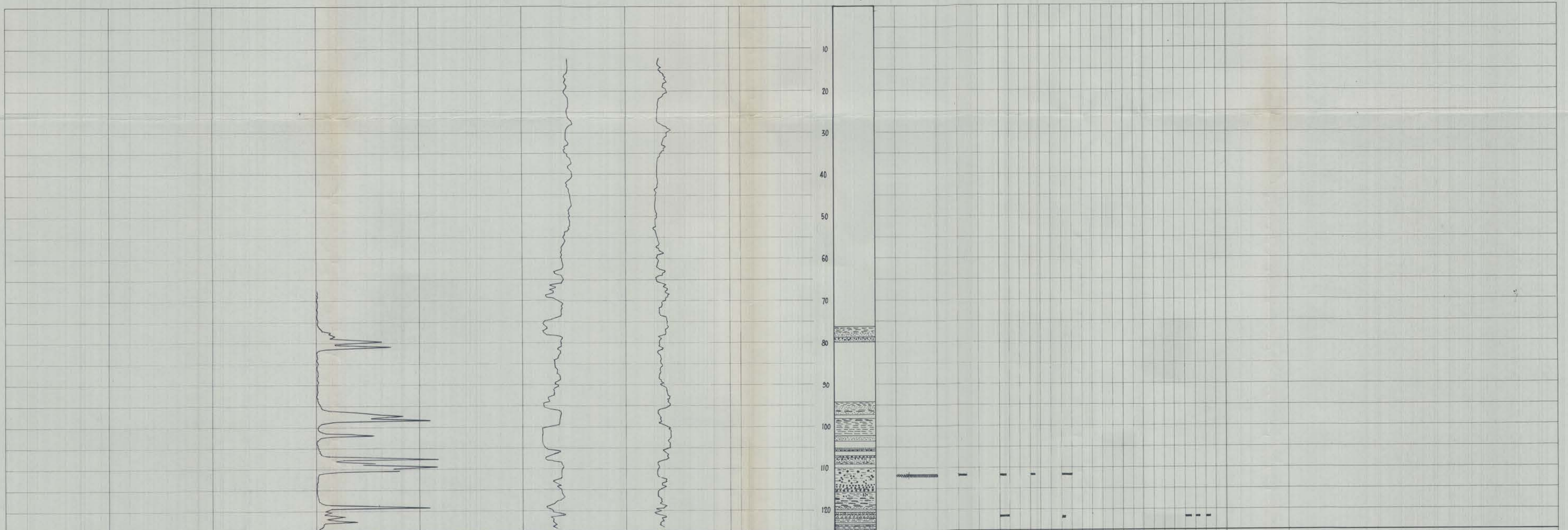
LOGGED BY RACOLLAN DATE 2<sup>nd</sup> Sept 1978  
TRACED BY AGG DRAFTING BRANCH  
DEPARTMENT OF MINES, SOUTH AUSTRALIA  
CHECKED SHEET 2 OF 3



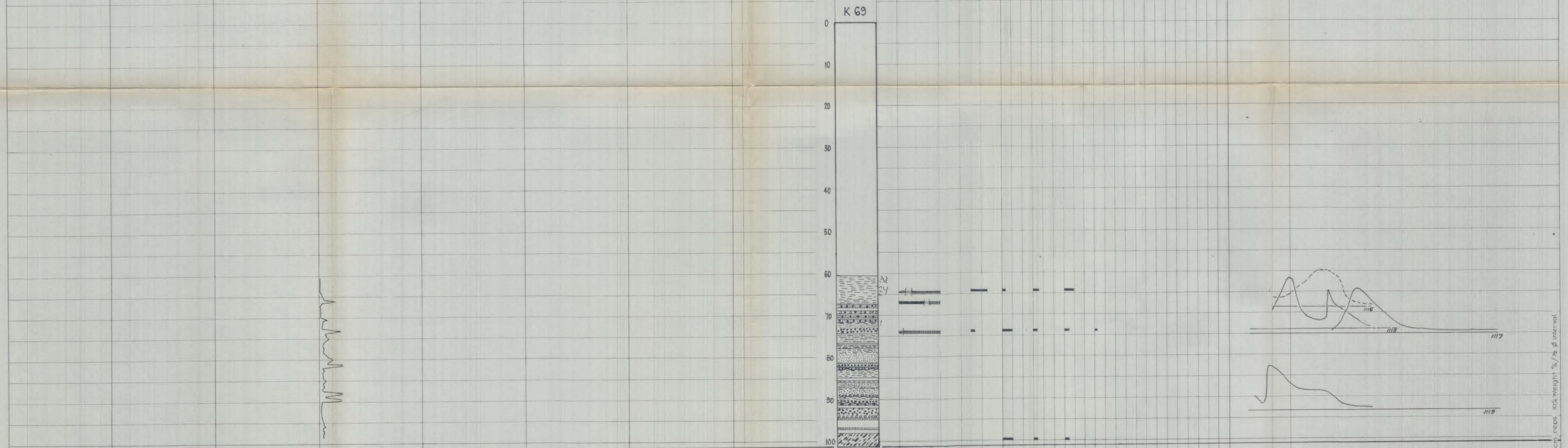




B 240/C3



K 69



6 FT. LATERAL RESISTIV. 16 IN. NORMAL RESISTIV. 64 IN. NORMAL RESISTIV. GAMMA NEUTRON SELF POTENTIAL POINT RESISTIVITY

RELATIVE ABUNDANCE FELDSPATHIC IN THIN SECTION

DEPTH (m) GRAPHIC LOG Refer to Fig. for Symbols.

RELATIVE % CLAY MINERALS

WHOLE ROCK ANALYSIS Q D Ca M S RI K P Chl F An Hrd Al Gy Gt Sid Mn Py Mc SO<sub>4</sub> -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13

GRAIN SIZE IN  $\phi$  UNITS

Numbers on curves refer to Dept. of Mines petrological numbering system 'P' numbers.

X-RAY DIFFRACTION

THIN SECTION DATA

O Orthoclase  
P Plagioclase  
M Microcline  
Tr Trace

Tr 0-5%  
A 5-20%  
CD 20-50%  
D 50-100%  
CD Dominant (Actual percentage depends on no. of calcic clay minerals)

KEY TO SYMBOLS FOR X-RAY DIFFRACTION

S S  
M M  
RI RI  
K K  
P P  
Chl Chl  
Relative abundance less accurate where RI present

Q Quartz  
D Dolomite  
Ca Calcite  
M Mica, Illite  
S Smectite  
RI Randomly interstratified clays  
K Kaolinite  
P Palgorskite  
Chl Chlorite  
F Feldspar

An Anatase (Rutile?)  
Hrd Halite  
Al Alunite  
Gy Gypsum  
Gt Goethite  
Sid Siderite  
Mn Manganese minerals (oxides)  
Py Pyrite  
Mc Marcasite  
SO<sub>4</sub> Iron sulphates

DEPARTMENT OF MINES - SOUTH AUSTRALIA

LAKE FROME AREA

BORE LOG SUMMARY SHEET INCLUDING PETROPHYSICAL LOGS & SIZE FREQUENCY CURVES

B 240/C3, K 69

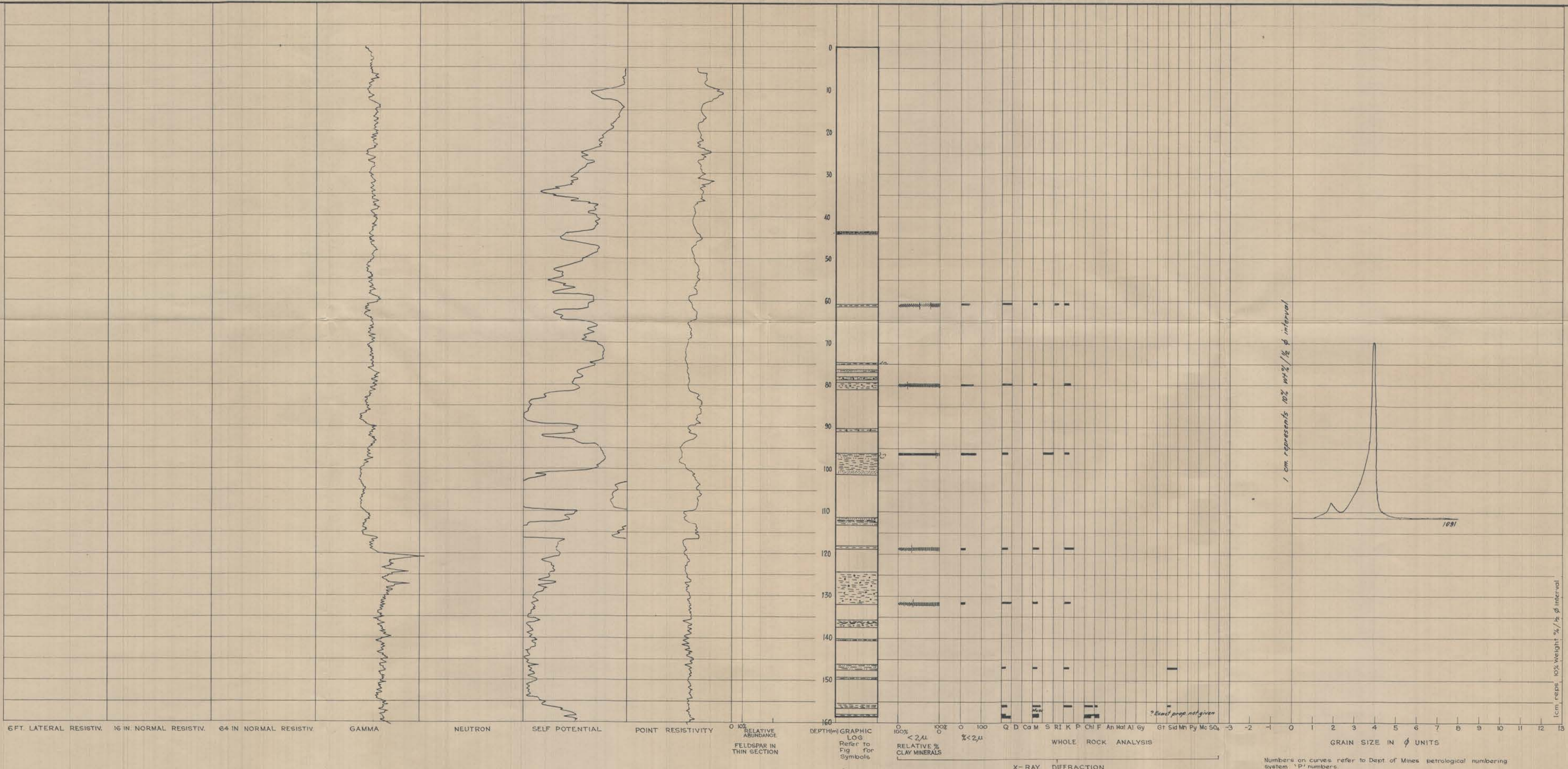
REGIONAL MAPPING SECTION	R. A. Callen GEOLOGIST	Compiled R. A. C.	Scale: 1:500
		Drn. B. S. G.	Date: March 1975
		Ckd.	Drng. No. 75-523

Director of Mines

0905.m  
C151  
v.2  
C3

8/7/76





1 cm. represents 10% wt% / 1/2 φ interval

1 cm. resp. 10% weight % / 1/2 φ interval

Numbers on curves refer to Dept of Mines petrological numbering system 'P' numbers.

**THIN SECTION DATA**

- O Orthoclase
- P Plagioclase
- M Microcline
- Tr Trace

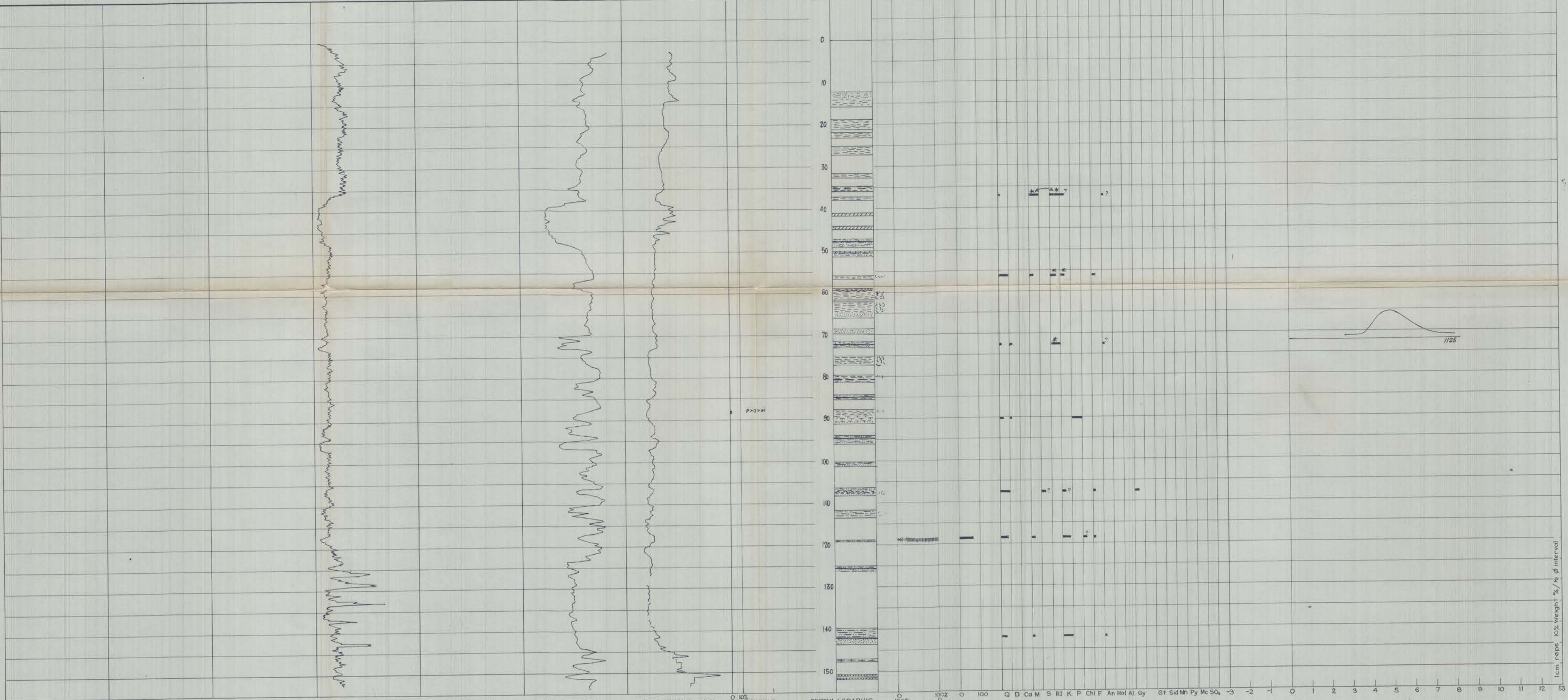
- Tr 0-5%
- A 5-20%
- SD 20-50%
- D 50-100%
- CD Codominant (Actual percentage depends on no. of codominant clay minerals.)

**KEY TO SYMBOLS FOR X-RAY DIFFRACTION**

- S S
- M M
- RI RI
- K K
- P P
- Chl Chl
- Q Quartz
- D Dolomite
- Ca Calcite
- M Mica, illite
- S Smectite
- RI Randomly interstratified clays
- K Kaolinite
- P Palygorskite
- Chl Chlorite
- F Feldspar
- An Anatase (Rutile?)
- Hal Halite
- Al Alunite
- Gy Gypsum
- Gr Goethite
- Sid Siderite
- Mn Manganese minerals (oxides)
- Py Pyrite
- Mc Marcasite
- S<sub>2</sub> Iron sulphates

DEPARTMENT OF MINES - SOUTH AUSTRALIA			
LAKE FROME AREA			
BORE LOG SUMMARY SHEET INCLUDING			
PETROPHYSICAL LOGS & SIZE FREQUENCY CURVES			
EAR 3			
REGIONAL MAPPING SECTION	R. A. Callen GEOLOGIST	Compiled R. A. C.	Scale: 1:500 Date: March 1975
		Drn. B. S. G. Ckd.	Drg. No. 75-538
Director of Mines			





6FT. LATERAL RESISTIV. 16 IN. NORMAL RESISTIV. 64 IN. NORMAL RESISTIV. GAMMA NEUTRON SELF POTENTIAL POINT RESISTIVITY 0 100% RELATIVE ABUNDANCE FELDSPAR IN THIN SECTION DEPTH(m) GRAPHIC LOG Refer to Fig. for Symbols 0 100% RELATIVE % CLAY MINERALS <math> < 2\mu </math> <math> \% < 2\mu </math> WHOLE ROCK ANALYSIS Q D Ca M S RI K P Chi F An Hal Al Gy Gt Sid Mn Py Mc SO<sub>4</sub> -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 10% weight % / % interval

Numbers on curves refer to Dept. of Mines petrological numbering system 'P' numbers.

THIN SECTION DATA

- O Orthoclase
- P Plagioclase
- M Microcline
- Tr Trace

- Tr 0-5%
- A 5-20%
- SD 20-50%
- D 50-100%
- CD Codominant (Actual percentage depends on no. of codominant clay minerals.)

KEY TO SYMBOLS FOR X-RAY DIFFRACTION

- S
  - M
  - RI
  - K
  - P
  - Chi
- Relative abundance less accurate where RI present.

- Q Quartz
- D Dolomite
- Ca Calcite
- M Mica, illite
- S Smectite
- RI Randomly inter-stratified clays
- K Kaolinite
- P Palygorskite
- Chi Chlorite
- F Feldspar

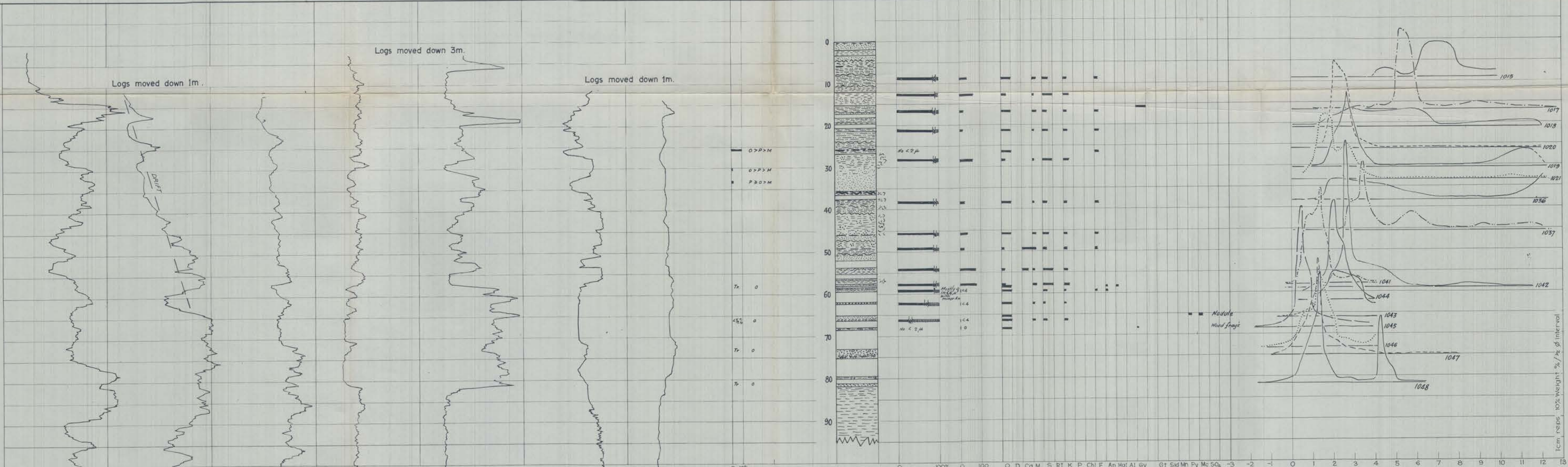
- An Anatase (Rutile?)
- Hal Halite
- Al Alunite
- Gy Gypsum
- Gr Goethite
- Sid Siderite
- Mn Manganese minerals (oxides)
- Py Pyrite
- Mc Marcasite
- SO<sub>4</sub> Iron sulphates

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LAKE FROME AREA  
BORE LOG SUMMARY SHEET INCLUDING  
PETROPHYSICAL LOGS & SIZE FREQUENCY CURVES  
EAR 6

REGIONAL MAPPING SECTION	R.A. Callen GEOLOGIST	Compiled R.A.C.	Scale: 1:500
		Drn. B. S. G. Ckd.	Date: March 1975
Director of Mines			Drg. No.





6FT LATERAL RESISTIV. 16 IN. NORMAL RESISTIV. 64 IN. NORMAL RESISTIV. GAMMA NEUTRON SELF POTENTIAL POINT RESISTIVITY

RELATIVE ABUNDANCE FELDSPAR IN THIN SECTION

DEPTH(m) GRAPHIC LOG Refer to Fig for Symbols

RELATIVE % CLAY MINERALS

WHOLE ROCK ANALYSIS

X-RAY DIFFRACTION

GRAIN SIZE IN φ UNITS

Numbers on curves refer to Dept of Mines petrological numbering system 'P' numbers.

Temperature log available.

THIN SECTION DATA

O Orthoclase  
P Plagioclase  
M Microcline  
Tr Trace

Tr 0-5%  
A 5-20%  
D 20-50%  
D 50-100%  
CD Codominant (Actual percentage depends on no. of codominant clay minerals.)

KEY TO SYMBOLS FOR X-RAY DIFFRACTION

S Smectite  
M Mica, Illite  
RI Randomly inter-stratified clays  
K Kaolinite  
P Palygorskite  
Chl Chlorite  
F Feldspar

Q Quartz  
D Dolomite  
Ca Calcite  
M Mica, Illite  
S Smectite  
RI Randomly inter-stratified clays  
K Kaolinite  
P Palygorskite  
Chl Chlorite  
F Feldspar

An Anafase (Rutile?)  
Hal Halite  
Al Alumite  
Ca Calcite  
Gy Gypsum  
Gt Goethite  
Sid Siderite  
Mn Manganese minerals (oxides)  
Py Pyrite  
Mc Marcasite  
S<sub>2</sub> Iron sulphates

DEPARTMENT OF MINES — SOUTH AUSTRALIA

LAKE FROME AREA  
BORE LOG SUMMARY SHEET INCLUDING  
PETROPHYSICAL LOGS & SIZE FREQUENCY CURVES  
YALKALPO I

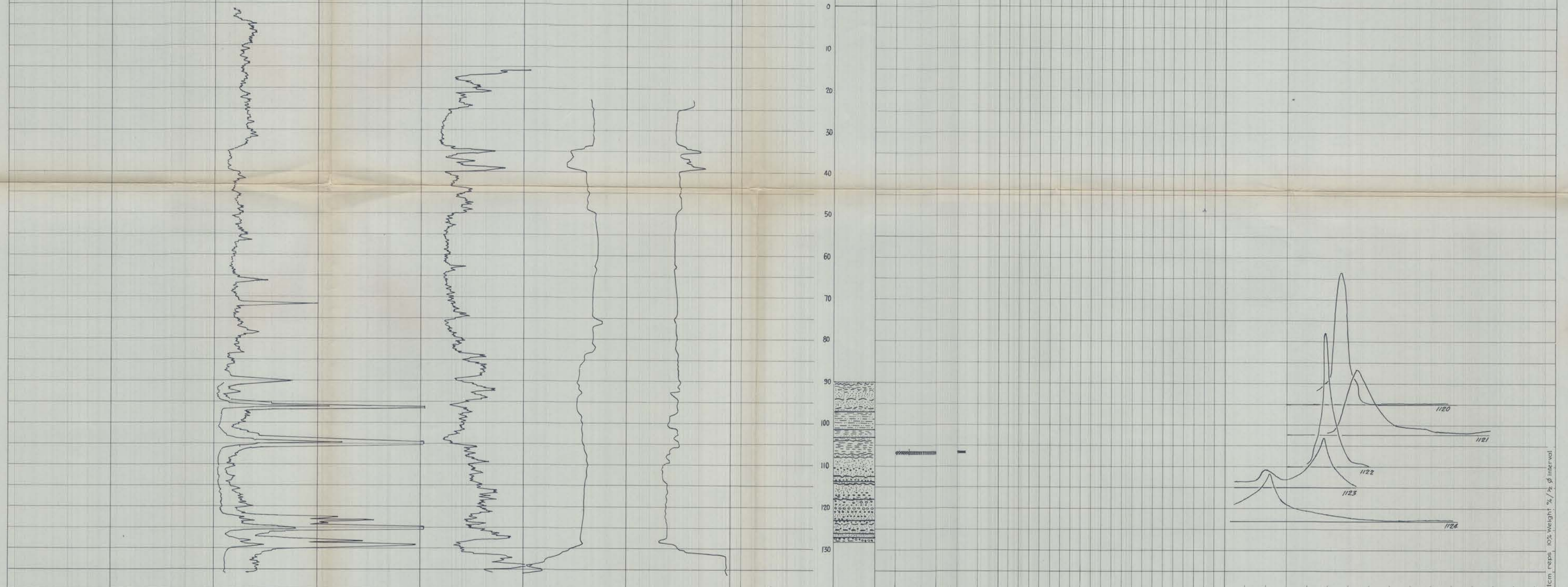
REGIONAL MAPPING SECTION	R. A. Callen GEOLOGIST	Compiled R.A.C.	Scale: 1:500
		Drn. B. & G.	Date: March 1975
		Ckd.	Drng. No. 75-520

Director of Mines

0905.m  
C157  
v2  
c2







6 FT. LATERAL RESISTIV. 16 IN. NORMAL RESISTIV. GAMMA NEUTRON SELF POTENTIAL POINT RESISTIVITY 0 10% RELATIVE ABUNDANCE FELDSPAR IN THIN SECTION DEPTH(m) GRAPHIC LOG Refer to Fig. for Symbols 0 100% < 2μ RELATIVE % CLAY MINERALS 0 100% < 2μ Q D Ca M S RI K P Chi F An Hal Al Gy Gr Sid Mn Py Mc SQ<sub>4</sub> -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 WHOLE ROCK ANALYSIS X-RAY DIFFRACTION GRAIN SIZE IN φ UNITS

Numbers on curves refer to Dept. of Mines petrological numbering system 'P' numbers.

THIN SECTION DATA

- O Orthoclase
- P Plagioclase
- M Microcline
- Tr Trace

- Tr 0-5%
- A 5-20%
- SD 20-50%
- D 50-100%
- CD Codominant (Actual percentage depends on no. of codominant clay minerals.)

KEY TO SYMBOLS FOR X-RAY DIFFRACTION

- S
  - M
  - RI
  - K
  - P
  - CHI
- Relative abundance less accurate where RI present.

- Q Quartz
- D Dolomite
- Ca Calcite
- M Mica, illite
- S Smectite
- RI Randomly interstratified clays
- K Kaolinite
- P Palygorskite
- Chi Chlorite
- F Feldspar

- An Anatase (Rutile?)
- Hal Halite
- Al Alunite
- Gy Gypsum
- Gr Goethite
- Sid Siderite
- Mn Manganese minerals (oxides)
- Py Pyrite
- Mc Marcasite
- SQ<sub>4</sub> Iron sulphates

**DEPARTMENT OF MINES — SOUTH AUSTRALIA**

**LAKE FROME AREA**

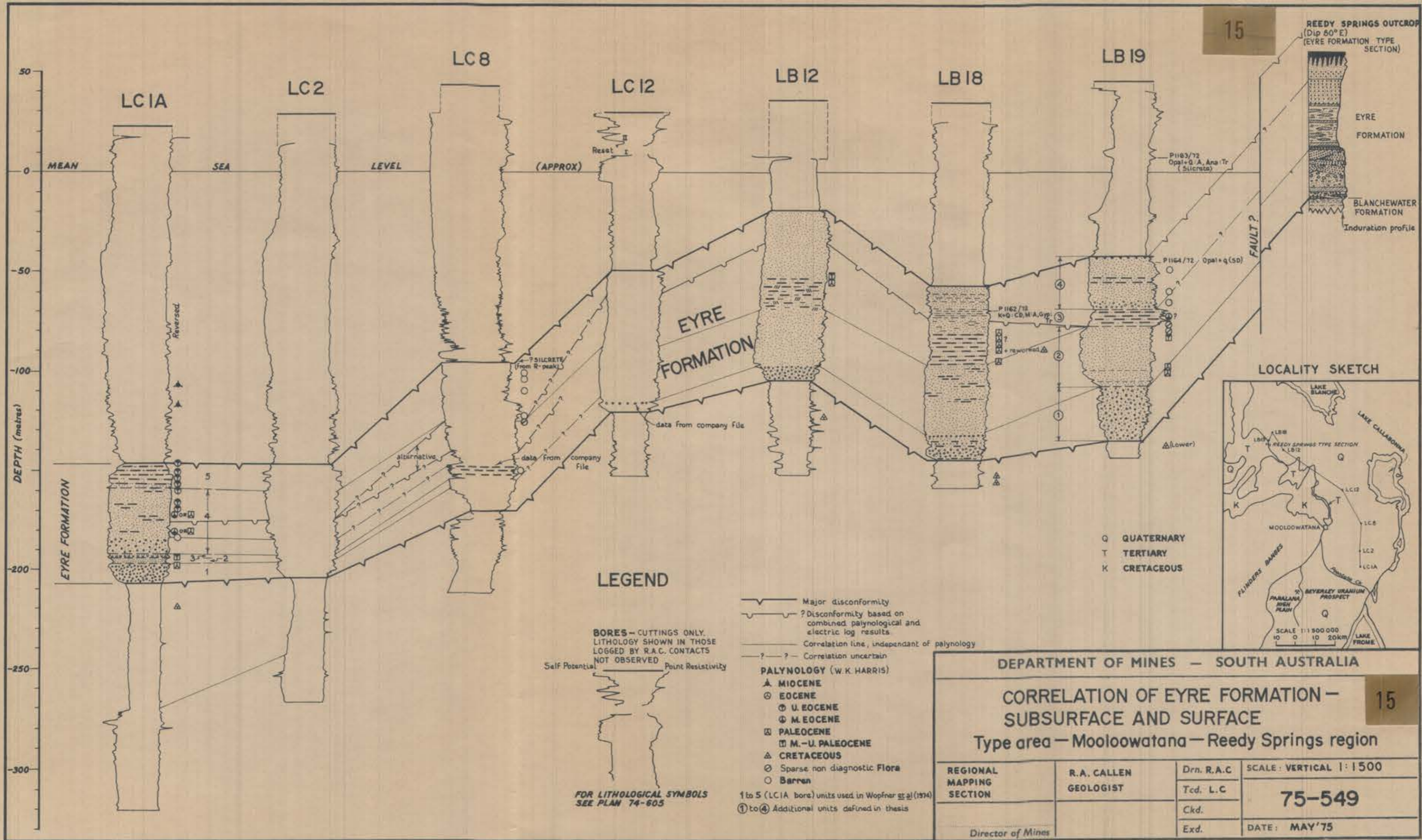
**BORE LOG SUMMARY SHEET INCLUDING**

**PETROPHYSICAL LOGS & SIZE FREQUENCY CURVES**

**PMX 24a**

REGIONAL MAPPING SECTION	R.A. Callen GEOLOGIST	Compiled R.A.C.	Scale: 1:500 Date: March 1975
Director of Mines		Dra. B. S. G. Ckd.	Drg. No.





REEDY SPRINGS OUTCROP  
(Dip 60° E)  
(EYRE FORMATION TYPE SECTION)

EYRE FORMATION

BLANCHEWATER FORMATION

Induration profile

LOCALITY SKETCH



Q QUATERNARY  
T TERTIARY  
K CRETACEOUS

LEGEND

- Major disconformity
- ~ Disconformity based on combined palynological and electric log results
- - - Correlation line, independent of palynology
- ? - ? Correlation uncertain

BORES - CUTTINGS ONLY.  
LITHOLOGY SHOWN IN THOSE  
LOGGED BY R.A.C. CONTACTS  
NOT OBSERVED

- PALYNOLOGY (W.K. HARRIS)
- ▲ MIOCENE
  - ⊙ EOCENE
  - ⊕ U. EOCENE
  - ⊖ M. EOCENE
  - ⊞ PALEOCENE
  - ⊟ M.-U. PALEOCENE
  - ▲ CRETACEOUS
  - ⊙ Sparse non diagnostic Flora
  - Barren

1 to 5 (LC1A bore) units used in Wopner et al (1974)  
① to ④ Additional units defined in thesis

FOR LITHOLOGICAL SYMBOLS  
SEE PLAN 74-605

DEPARTMENT OF MINES - SOUTH AUSTRALIA

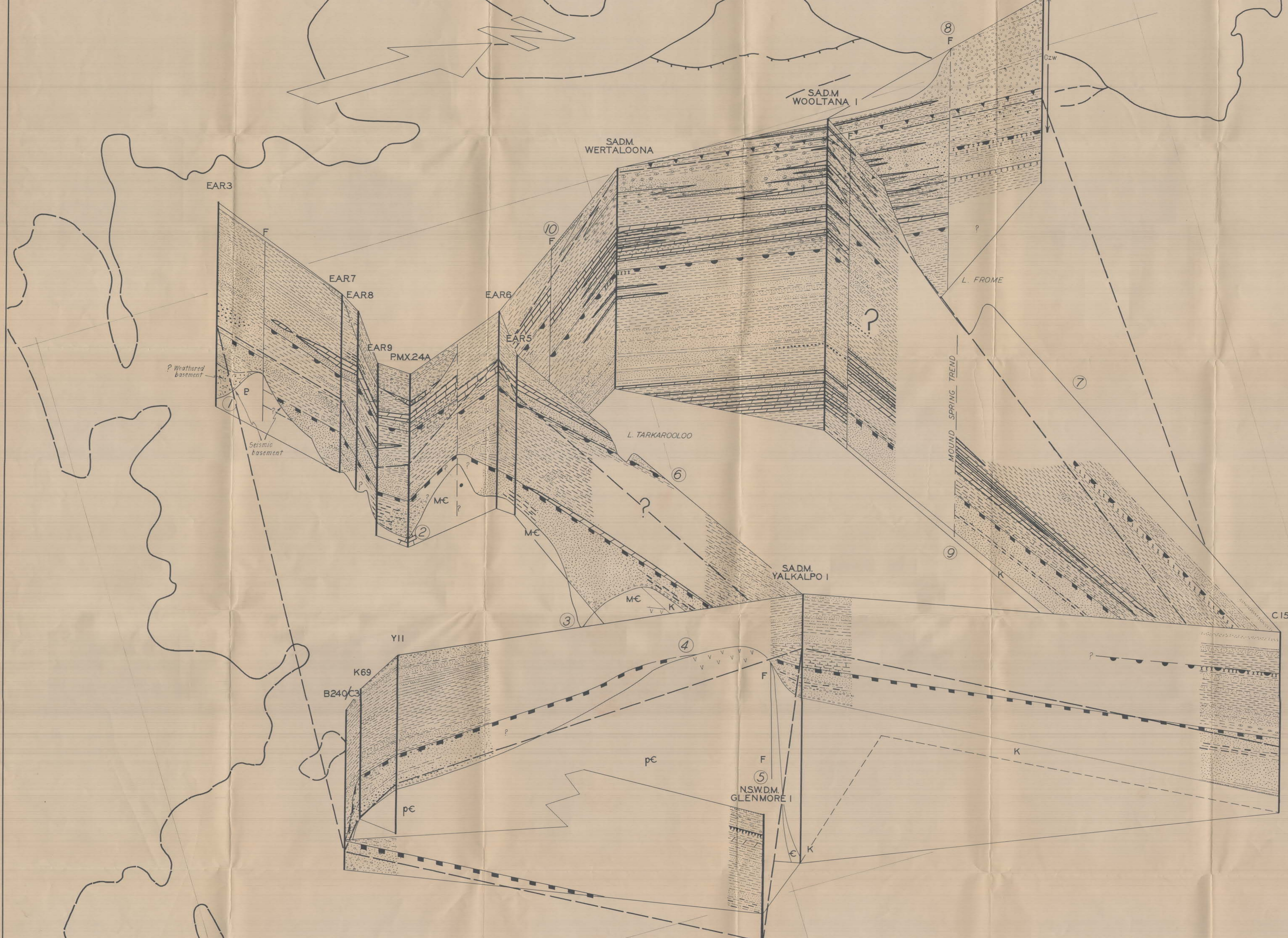
CORRELATION OF EYRE FORMATION -  
SUBSURFACE AND SURFACE

Type area - Mooloowatana - Reedy Springs region

REGIONAL MAPPING SECTION	R.A. CALLEN GEOLOGIST	Drn. R.A.C.	SCALE: VERTICAL 1:1500
		Tcd. L.C.	75-549
		Ckd.	
			Exd.

Director of Mines





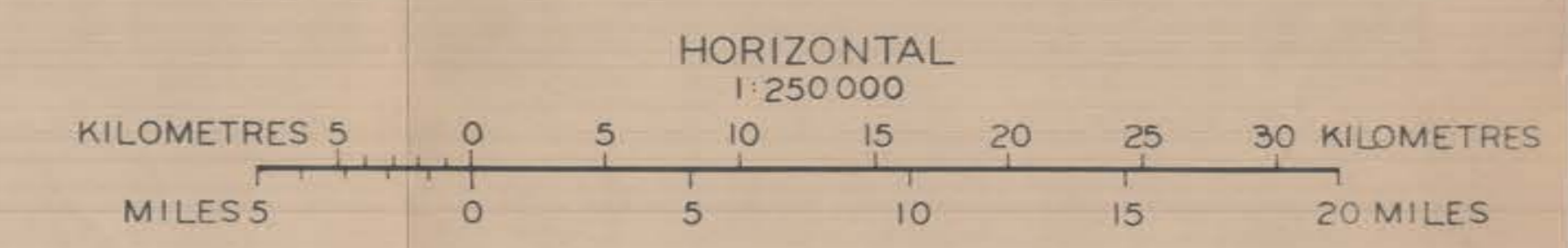
LEGEND

- Czw WILLAWORTINA FORMATION
- DISCONFORMITY
- Tmb<sub>2</sub> NAMBA FM. (UPPER MEMBER 2)
- ? DISCONFORMITY
- Tmb<sub>1</sub> NAMBA FM. (LOWER MEMBER 1)
- DISCONFORMITY
- Tee EYRE FORMATION
- DISCONFORMITY
- K MARREE FORMATION
- ANGULAR UNCONFORMITY
- Mc LAKE FROME GROUP
- ANGULAR UNCONFORMITY
- v v v ACID PORPHYRY
- pC PRECAMBRIAN UNDIFFERENTIATED

NOTE: SYMBOLISM BETWEEN BORES PARTLY DIAGRAMMATIC

ACKNOWLEDGEMENTS

- PROFILE NO. 1 2 3
- 1 BASEMENT PROFILE: NELSON AND GALBRAITH (1973) FOR PACMINEX PTY. LTD.
  - 2 BASEMENT PROFILE FROM GEOLOGICAL MAPPING, WATERBORE RECORDS (R CALLEN) AND TOTAL MAGNETIC INTENSITY SHEET 67-530FI (WHITTEN 1966)
  - 3 LOG OF GLENMORE I FROM FILES OF N.S.W. DEPT. OF MINES
  - 4 DATA FROM SURFACE MAPPING (R CALLEN) AND INTERPRETATION OF WATER BORES, COMPANY BORES OF TRICENTROL(AUST) PTY LTD LOGGED BY R CALLEN.
  - 5 DATA FROM PETROPHYSICAL LOGS RANDELL (1973) UNION CORP (AUST) PTY LTD
  - 6 POONTANA STRUCTURE FROM SEISMIC DATA: UNITED GEOPHYSICAL CORP PTY LTD (1966) FOR CRUSADER OIL NL.





BORE LOG

17/1

PROJECT LAKE FROME CAINOZOIC  
SADM STRATIGRAPHIC DRILLING PROJECT  
LOCATION Flood Creek, Balcanonga  
ARKAROOA 1:63,360 FROME 1:250,000

SECTION  
HUNDRED

R.L. 21.44 m  
T.D. 244.45 m

LAT. 30° 35'  
LONG. 139° 34' 15"

DEPTH (METRES)	WENTWORTH GRAIN SIZE SAND	LITHO LOG	INDURATION	FOSSIL SOILS WEATHERING INDURATION	% CARBONATE	MINERAL COLOUR	% SAND	GRAIN SURFACE FEATURES	MINERALS						SORTING	CLASTS	POROSITY	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES	PHOTOS
									Q	M	H	F	C	Other									
0																							
2																							
4																							
6		Dimoclit?						Some q. xls. Clean some. Pitted. High. Prosted.	Octah. Curved. Hydro. ang. opaque. Irregular.					Rock frags.				Upper conglomerate granules cemented with fine carbonate, followed by unconsolidated coarse, then massive green carbonate upper clay sand. No drift from older beds lower in sequence except for presence of ss.	SAND WITH CARBONATE NODULES	EURINELLA FORMATION			
8		1-6% silt patches						Pitted. Clear.															
10		Raw gyp. Some fossil ss. Fg gyp.						Pitted. High. Prosted.															
12																							
14		Clay cement.																					
16																							
18																							
20																							
22																							
24																							
26																							
28																							
30																							
32																							
34																							
36																							
38																							
40																							

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION

Using method of Skelly R.C., 1968 (Sed. Per. 38(2) pp. 263-272)

Symbols from Skelly & Bouma A.H., 1962 (Sedimentology of Flysch Deposits - Elsevier)

Litho. Log

Induration

Grain size graph with sedimentary structure symbols

NOTES

Sedimentary Structures: Use column for details, place symbol in grain size column.

Induration code: Use own code & specify here or on separate sheet.

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Power's scale

Sorting: Folk R.L., 1968 (Petology of Sedimentary Rocks) (Hemphill) pp. 103-105

VP = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type (whether interconnected pores or not)

Q	Quartz
M	Mica
H	Heavies
F	Feldspar
C	Clays
Other	Other minerals

17



BORE LOG

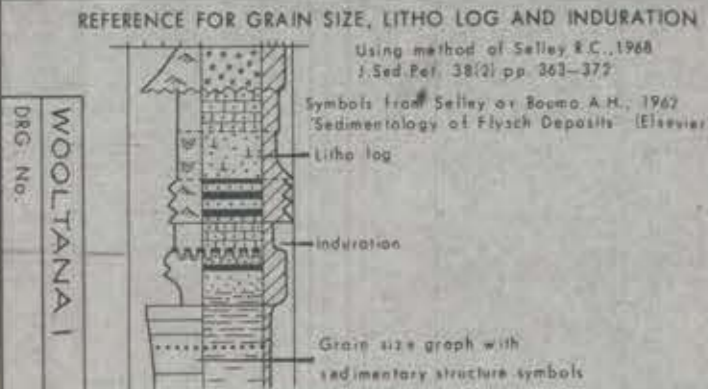
PROJECT LAKE FROME CAINOZOIC  
LOCATION Floods Creek, Balcanoona

SECTION  
HUNDRED

R.L. 21.44 m  
T.D. 244.45 m

LAT. 30° 35'  
LONG. 139° 34' 15"

DEPTH (METRES)	WENTWORTH GRAIN SIZE	LITHO LOG	INDURATION	FOSSIL SOILS WEATHERING INDURATION	CARBONATE	% SAND	ROUNDEDNESS & SPHERICITY OF GRAINS	GRAIN SURFACE FEATURES	MINERALS						SORTING	CLASTS	POROSITY	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES	PHOTOS
									Q	M	H	F	C	Other									
40-42					Carb. isbn.												Secondary carbonate and pods obscures contacts.						
44-46					Mottled (a) 7-8% 90/100					65% Eddy							c1/vps/sym/mk Modes 4.1 & 13.4			VERY POORLY SORTED CLAYEY SAND & SILT WITH CARBONATE BEDS & NODULES	P128/73 44-00		
48-50					wh. spots carbon etc.												Neutron log reflects spots of approx. carbonate Carbonate sometimes complicates interp.			VERY POORLY SORTED CLAYEY SAND & CLAYEY SILT WITH CARBONATE & SAND BEDS	P1078/73 52-22		
52-54					Blocky form cement												Roughly flat. Some approaching 4			VERY POORLY SORTED CLAYEY SAND & CLAYEY SILT WITH CARBONATE	P1059/73 54-00		
56-58					5.7% 2.5% 11.4-R												Sand fraction 2.2-5.3m but appears to be 2.2-5.3m			CLAY, POORLY SORTED SANDY CLAY WITH CARBONATE BEDS AT TOP	P1060/73 58-64		
60-62					10.7% 0-25% (dry) to sandstone 2.5% 1.25% silt												Ground up. PEBs of carbonate & whole containing clay paper & harder than that above & essentially sandstone above is sand			CLAY, POORLY SORTED SANDY CLAY WITH CARBONATE BEDS AT TOP	P1061/73 62-00		
64-66					5.7% 5.7%												Thin bedded to fine lam. 1-2 cm spacing & bn clay. No filling cuts across banding. Soundness of rise of textural change.			CLAY, POORLY SORTED SANDY CLAY WITH CARBONATE BEDS AT TOP	P1254/73 66-70		
68-70					100% silt												68-67 Araldite seal.			VERY POORLY SORTED FELDSPATHIC SAND, MINOR PEBBLE & MICACIOUS SILT BEDS	68-67 Agfa F14 5/BA		
72-74					100% silt												Ca. 8.8% Mg 5.6% Ca 20ppm Similar to P1059/73 but also contains 50% of disappeared 100% (F) VPS/VPS/SPK/LK			VERY POORLY SORTED FELDSPATHIC SAND, MINOR PEBBLE & MICACIOUS SILT BEDS	A957/73 P1062/73 70-24 P1051/73 70-47		
76-78					100% silt												Ca. 15% Mg 8.4% Ba 200ppm Sr 150ppm Sc 150ppm. LT 20ppm			CLAY WITH THIN BEDS, LAMINATED	A939/73 P1061/73 76-36-75		
80					100% silt												MZ/EP/S/FSK/VPK Modes 3.3, 13.0			BURNED CARBONATE	P1062/73 78-00 P20/74		



NOTES

Sedimentary Structures: Use column for details, place symbol in grain size column

Induration code: Use own code & specify here or on separate sheet

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Power's scale

Sorting: Folk R.L., 1968 'Petrolology of Sedimentary Rocks' (Hemphill) pp. 103-105

VP = very poor; P = poor; M = moderate; W = well; VW = very well

Porosity: State type (whether interconnected pores or not)

Q	Quartz
M	Mica
H	Heavy
F	Feldspar
C	Clays
Other	Other minerals

LOGGED BY R. Callen DATE 17-5-73

TRACED BY A.P. DRAFTING BRANCH

DEPARTMENT OF MINES SOUTH AUSTRALIA

CHECKED SHEET 2 OF 7











BORE LOG

PROJECT LAKE FROM CENOZOIC  
LOCATION Floods Creek, Balcarona

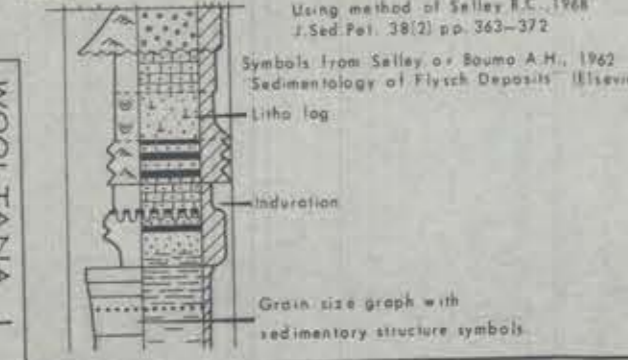
SECTION  
HUNDRED

R.L. 21.44 m  
T.D. 24.4-45 m

LAT. 30°35'  
LONG. 139°34'15"

DEPTH (METRES)	WENTWORTH GRAIN SIZE	LITHO LOG	INDURATION	FOSSIL SOILS, WEATHERING INDURATION	CARBONATE	% SAND	MINERALS	SORTING	CLASTS	PORO-SITY	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLE No. & Analyte	PHOTOS
160																
162																
164																
166																
168																
170																
172																
174																
176																
178																
180																
182																
184																
186																
188																
190																
192																
194																
196																
198																
200																

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION



**NOTES**

Sedimentary Structures: Use column for details, place symbol in grain size column

Induration code: Use own code & specify here or on separate sheet

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Power's scale

Sorting: Folk R.L., 1968 'Petology of Sedimentary Rocks' (Hemphill) pp. 102-105

VP = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type (whether interconnected pores or not)

- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals

LOGGED BY R. Collan DATE 17-5-73

TRACED BY AR DRAFTING BRANCH

DEPARTMENT OF MINES, SOUTH AUSTRALIA

CHECKED SHEET 5 OF 7



BORE LOG

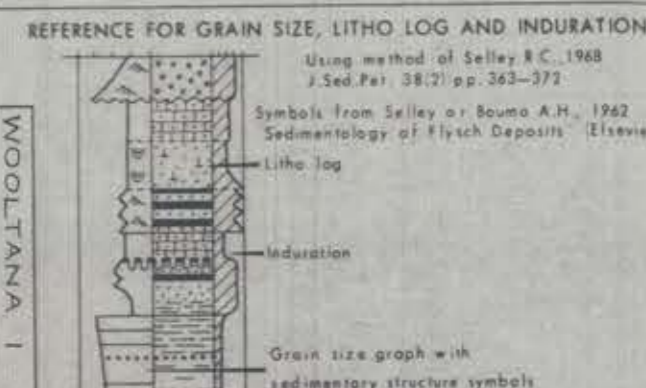
PROJECT LAKE FROM CINOZOIC  
LOCATION Flood creek "Balcanoona"

SECTION  
HUNDRED

R.L. 2144m  
T.D. 244.45m

LAT. 30° 35'  
LONG. 139° 34' 15"

Main bore log table with columns for Depth (meters), Wentworth Grain Size, Litho Log, Induration, Fossil Soils, Carbonate, % Sand, Roundness, Grain Surface Features, Minerals, Sorting, Porosity, Sedimentary Structures, Comments, Rock Name, Formation, Samples, and Photos. Includes detailed lithological descriptions and stratigraphic columns.



NOTES  
Sedimentary Structures: Use column for details; place symbol in grain size column.  
Induration code: Use own code & specify here or on separate sheet.  
Cement, etc.: Use symbol code.  
% Carbonate: State method.  
% Sand: State method.  
Roundness: Use Power's scale.  
Sorting: Folk R.L., 1968, 'Petology of Sedimentary Rocks' (Hemphill's) pp. 103-105.  
VP = very poor, P = poor, M = moderate, W = well, VW = very well.  
Porosity: State type (whether interconnected pores or not).

- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals

LOGGED BY R. Callan DATE 17-5-73  
TRACED BY A.M. DRAFTING BRANCH  
DEPARTMENT OF MINES, SOUTH AUSTRALIA  
CHECKED SHEET 6 OF 7







BORE LOG

LAKE FROME CENOZOIC  
PROJECT SADM STRATIGRAPHIC DRILLING PROJECT  
LOCATION FROME 1:63,360 SHEET  
HUNDRED

SECTION:  
T.D. 174:35m

R.L. 4-3m

LAT. 30° 56' 13"  
LONG. 139° 30' 42"

DEPTH (METERS)	WENTWORTH GRAIN SIZE	LITHO LOG CORE DIAMETER 6.03cms	INDURATION	FOSSIL SOILS WEATHERING INDURATION	CARBONATE	% SAND	MINERALS	GRAIN SURFACE FEATURES	SORTING	CLASTS	POROSITY	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES No. & Analysis	PHOTOS
0																	
2																	
4																	
6																	
8																	
10																	
12																	
14																	
16																	
18																	
20																	
22																	
24																	
26																	
28																	
30																	
32																	
34																	
36																	
38																	
40																	

CORING BEGINS

In this hole visual estimates of the sand & silt content of the bk. clay with silt clasts are too low according to XRD recorder

Disrupted bedding

isolated patches of disrupted fine lamination

Silt examined above and below this contact appeared the same, horizon though slightly coarser and higher to above

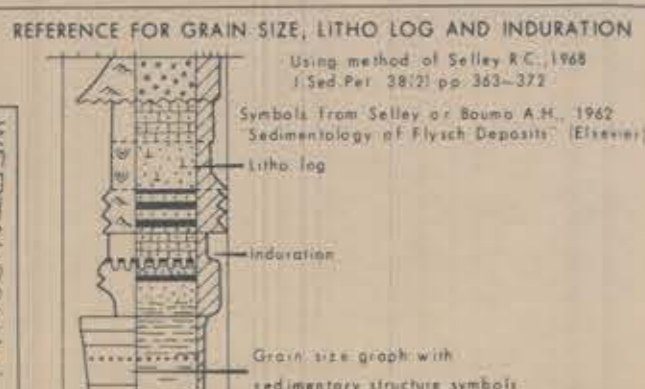
Puggy when wet

Silt disrupted to form silt clasts through clay

Fine silt disrupted and partly incorporated in clay - quick flow clay with thin silt

V. fine lam. obscured by induration

Pipette unsuccessful



NOTES

Sedimentary Structures: Use column for details, place symbol in grain size column

Induration code: Use own code & specify here or on separate sheet

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Power's scale

Sorting: Folk R.L. 1968 Petrology of Sedimentary Rocks (Memphis) pp. 103-105

VP = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type (whether interconnected pores or not)

- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals

LOGGED BY R. CALLEN DATE 12-4-73

TRACED BY A.R. DRAFTING BRANCH

DEPARTMENT OF MINES, SOUTH AUSTRALIA

CHECKED SHEET 1 OF 5







BORE LOG

LAKE FROME CENOZOIC PROJECT 5ADM STRATIGRAPHIC DRILLING PROJECT SECTION LOCATION FROME 1:63,360 & 1:250,000 SHEETS HUNDRED

R.L. 4.3m T.D. 174.35m

LAT. 30° 56' 13" LONG. 139° 30' 42"

Main bore log table with columns for Depth (metres), Wentworth Grain Size, Litho Log, Induration, Fossil Soils, Carbonate, Minerals, Grain Surface Features, Sorting, Porosity, Sedimentary Structures, Comments, Rock Name, Formation, Samples, and Photos. The table contains detailed stratigraphic data from 80m to 120m depth.

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION. Includes diagrams for grain size symbols, litho log symbols, and induration symbols, along with a grain size graph with sedimentary structure symbols.

NOTES: Sedimentary Structures: Use column for details, place symbol in grain size column. Induration code: Use own code & specify here or on separate sheet. Cement, etc.: Use symbol code. % Carbonate: State method. % Sand: State method. Roundness: Use Powers scale. Sorting: Folk R.L., 1968 'Petriology of Sedimentary Rocks' (Hemphill's) pp. 103-105. VP = very poor, P = poor, M = moderate, W = well, VW = very well. Porosity: State type (whether interconnected pores or not).

Legend for mineral abbreviations: Q Quartz, M Mica, H Heavies, F Feldspar, C Clays, Other Other minerals. Includes a table for logging and tracing information: LOGGED BY M. Collins, DATE 12-4-75, TRACED BY AR, DRAFTING BRANCH, DEPARTMENT OF MINES, SOUTH AUSTRALIA, CHECKED, SHEET 3 OF 5.



BORE LOG

LAKE FROM CENOZOIC PROJECT SADM STRATIGRAPHIC DRILLING PROJECT SECTION LOCATION FROM 1:63,360 & 1:250,000 SHEETS. HUNDRED

R.L. 4.3m T.D. 174.35m

LAT. 30° 56' 13" LONG. 139° 30' 42"

Main bore log table with columns for Depth (m), Lithology, Induration, Fossil Soils, Carbonate, % Sand, Roundness, Grain Surface Features, Minerals (Q, M, H, F, C, Other), Sorting, Porosity, Sedimentary Structures, Comments, Rock Name, Formation, Samples, and Photos. Includes detailed lithological descriptions and mineralogical data.

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION. Includes diagrams for grain size classification, lithology symbols, and induration symbols.

NOTES: Sedimentary Structures: Use column for details, place symbol in grain size column. Induration code: Use own code & specify here or on separate sheet. Cement, etc.: Use symbol code. % Carbonate: State method. % Sand: State method. Roundness: Use Power's scale. Sorting: Folk R.L., 1968. Petrology of Sedimentary Rocks (Hemphill) pp.102-105. VP = very poor, P = poor, M = moderate, W = well, VW = very well. Porosity: State type (whether interconnected pores or not).

Legend for mineral abbreviations: Q Quartz, M Mica, H Heavy, F Feldspar, C Clays, Other Other minerals. Includes a table for logging details: LOGGED BY R.A. Colten, DATE 12-4-73, TRACED BY A.R. DRAFTING BRANCH, DEPARTMENT OF MINES, SOUTH AUSTRALIA, CHECKED, SHEET 4 OF 5.



BORE LOG

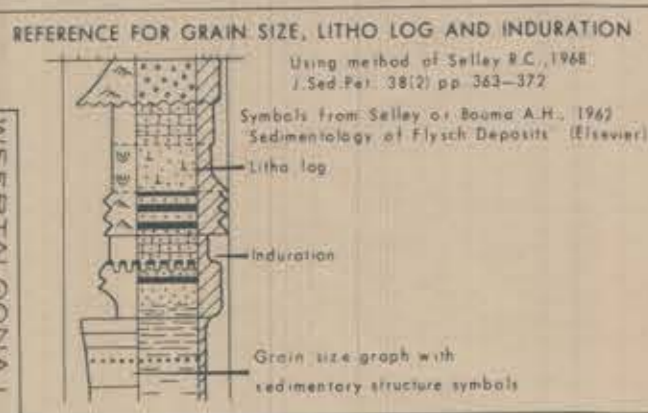
LAKE FROME CENOZOIC PROJECT SADM STRATIGRAPHIC DRILLING PROJECT SECTION LOCATION FROME SHEETS-1:63,360 & 1:250,000 HUNDRED

R.L. 4.3m T.D. 175.35m

LAT. 30° 56' 13" LONG. 139° 30' 42"

Main bore log table with columns for Depth (meters), Wentworth Grain Size, Litho Log, Induration, Fossil Soils, Carbonate, % Sand, Munsell Colour, Grain Surface Features, Minerals (Q, M, H, F, C, Other), Sorting, Porosity, Fossils, Sedimentary Structures, Comments, Rock Name, Formation, Samples, and Photos. Includes detailed lithological descriptions and chemical analysis notes.

END OF HOLE (174.35m)



NOTES: Sedimentary Structures: Use column for details, place symbol in grain size column. Induration code: Use own code & specify here or on separate sheet. Cement, etc.: Use symbol code. % Carbonate: State method. % Sand: State method. Roundness: Use Power's scale. Sorting: Folk R.L., 1968 'Petrolology of Sedimentary Rocks' (Hemphill's) pp. 103-105. VP = very poor, P = poor, M = moderate, W = well, YW = very well. Porosity: State type (whether interconnected pores or not).

- Q Quartz
M Mica
H Heavies
F Feldspar
C Clays
Other Other minerals

LOGGED BY R.A. Collier DATE 12-4-73
TRACED BY A.P. DRAFTING BRANCH
DEPARTMENT OF MINES, SOUTH AUSTRALIA.
CHECKED SHEET 5 OF 5



BORE LOG

PROJECT LAKE FROME CAINOZOIC

SECTION

R.L. 32.9 m

LAT. 31° 13' 13"

LOCATION CURNAMONA 1:250,000  
SICCUS 1:63,360

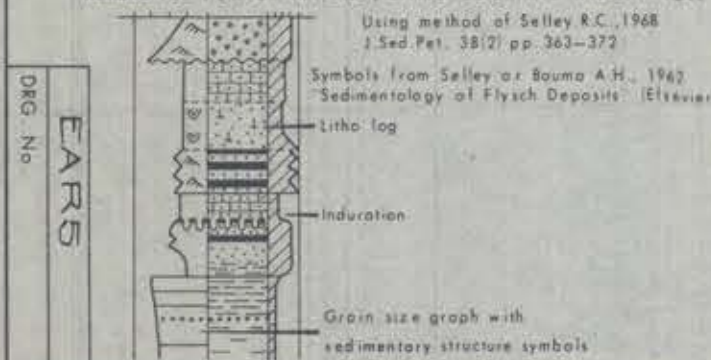
HUNDRED out of Hundreds

T.D. 124.05 m (126.15)

LONG. 139° 51' 32"

DEPTH (METRES)	WENTWORTH GRAIN SIZE		LITHO LOG	INDURATION	FOSSIL SOILS, WEATHERING INDURATION	CARBONATE	MUNSELL COLOUR	% SAND	ROUNDSNESS & SPHERICITY OF GRAINS	GRAIN SURFACE FEATURES	MINERALS						SORTING	CLASTS	POROSITY	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES Pre- & Analytical	PHOTOS
	Coarse	Fine									Q	M	H	F	C	Other									
2	SHEET STARTS AT 2.00m																								
4	NO																								
6	CORE (0-12.19m)																								
8	?																								
10	NOTE - samples labelled in feet. Accurate depth is here given in metres.																								
12	NO																								
14	A-SA																								
16	OLIVE CLAY																								
18	NO																								
20	DOLOMITE																								
22	DOLOMITE																								
24	DOLOMITE																								
26	DOLOMITE																								
28	DOLOMITE																								
30	DOLOMITE																								
32	DOLOMITE																								
34	DOLOMITE																								
36	DOLOMITE																								
38	DOLOMITE																								
40	DOLOMITE																								
42	DOLOMITE																								

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION



NOTES

Sedimentary Structures: Use column for details, place symbol in grain size column

Induration code: Use own code & specify here or on separate sheet

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Power's scale

Sorting: Folk R.L., 1968 'Petrolology of Sedimentary Rocks' (Hemphill's) pp. 103-105

VP = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type (whether interconnected pores or not)

- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals



























BORE LOG

PROJECT LAKE FROME CENOZOIC SECTION  
LOCATION SANDYOOTA 1:63360 CURNAMONA 1:250,000 HUNDRED

R.L. B2:2  
T.D. 124.58 124.66

LAT. 31° 29' 12"  
LONG. 139° 56' 12"

DEPTH (METRES)	WENTWORTH GRAIN SIZE	LITHO LOG	INDURATION	FOSSIL SOILS WEATHERING INDURATION	CARBONATE	% SAND	MUNSELL COLOUR	GRAIN SURFACE FEATURES	MINERALS						SORTING	CLASTS	POROSITY	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES	PHOTOS
									Q	M	H	F	C	Other									
0																							
2																							
4																							
6																							
8																							
10																							
12																							
14																							
16		57/71 57/56 Pink, cap, sandy calcareous	57/71 57/56					VA-A	Q/D (XRD)	1% Micas	XRD F.A. 57/56 XRD whole rock = 20% calc. Q, D, K, M, S, P, 30% F, M, A, clay, K.A.	2-4% 1.5 2.3	Mainly calc. & clay. In sec. calcareous. Wh. F. from xth. minor. F. gran. cover. of. grains. 2% by volume. Some pebbles broken.			MZ/EP5/FSK/MK Modes 3.9φ & 11.5φ core v. broken	RED LOOSE MICACEOUS PEBBLY SAND	EURNILLA FORMATION?	15/62 P1025/73				
18																							
20																							
22		Calcareous 2-3% from (weathering clay)	57/72 57/76 278/516					A	Q/A (XRD)	Rough surfaced (XRD)	XRD F.A. 278/516 XRD whole rock = 20% calc. Dol, D, Q, M, F, K, sil.						25% detrital (carb. dissolved in HCl)	CARBONATE SAND	WILLAWORTINA FORMATION?	21/82 P1026/73			
24																							
26																							
28		Vertical streaks of colour	57/72 57/76 278/516																				
30																							
32																							
34																							
36																							
38																							
40																							

RED LOOSE MICACEOUS PEBBLY SAND  
EURNILLA FORMATION?

CARBONATE SAND  
WILLAWORTINA FORMATION?

CLAY  
NAMBA FORMATION

MZ/EP5/FSK/MK  
Modes 3.9φ & 11.5φ  
core v. broken

25% detrital (carb. dissolved in HCl)

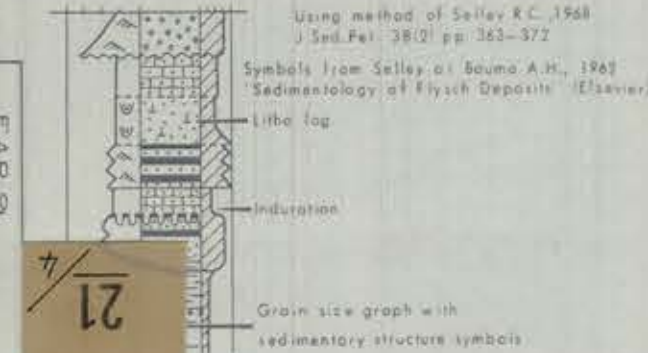
On clay is oxid. & hard & absorbent when dry

Markers wrong - too much care for interval shown

Thin beds, hand shiny swelling clay

(1.2% interstitial clay lumps)

REFERENCE FOR GRAIN SIZE, LITHO LOG AND INDURATION



NOTES

Sedimentary Structures: Use column for details, place symbol in grain size column

Induration code: Use own code & specify here or on separate sheet

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Powers scale

Sorting: Folk R.L., 1968 Petrology of Sedimentary Rocks (Macmillan) pp. 103-105

VP = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type (whether interconnected pores or not)

- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals



























BORE LOG

PROJECT LAKE FROME CAINOZOIC  
LOCATION PARALANA, FROME  
1:63,360 1:250,000

SECTION  
HUNDRED

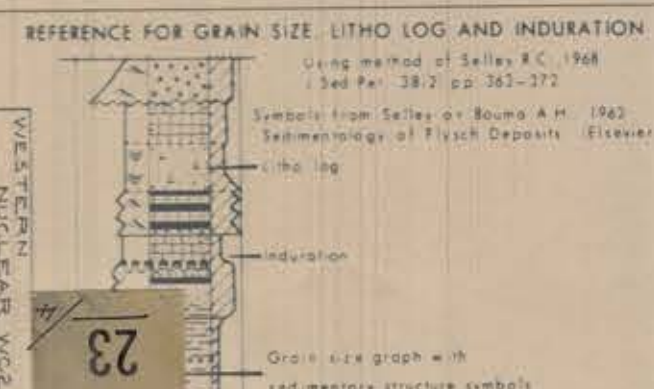
R.L. 79.86m  
T.D. 142.85m

LAT. 30° 11' 30"  
LONG. 139° 35' 49"

DEPTH (METRES)	WENTWORTH GRAIN SIZE	LITHO LOG	INDURATION	FOSSIL SOILS WEATHERING INDURATION	% CARBONATE	% SAND	MINERALS	SORTING	CLASTS	POROSITY	FOSSILS	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES	PHOTOS
0													Bag of fragments of calcareous siltstone, sand and granite, mica, feldspar, quartz, etc. Also of 40-50 microns mica & pebbles to cobbles.		COGNARINE FORMATION		
2					25% Ksp								2.9, 9.7, 1mm		EURINILLA FORMATION		
4													V. dense purple of large siltstone, fine grained, thin bedded, grading to silt in evidence.				
6													COBBLES				
8													60% Abundant				
10													1-2% Mica				
12													VA-SA corroded				
14													5-10% Purple f. of mica & quartz, between 25-50 microns				
16													75-80% Calc. quartz, 15-20% f. of purple, 10-15% coarse f.				
18													VA-A v. rough				
20													Rock types 11-12				
22													VA-A smooth, dull an. SA (CO)				
24													5-10% Mica, f. of mica & quartz, plagioclase				
26													VA-SA well pillared or Dem. shaly, commonly clear crystals of large conchoidal fractures. Minute fragments in sand.				
28													VA-A				
30													Large, thin bedded				
32													Pinkish earthy mica, coarse, granular, coarse f. of mica & quartz, large f. of pebbles.				
34													Small, granular pebbles				
36																	
38																	
40																	

PEBBLY CLAYEY SAND WITH COBBLE BEDS  
WILLAWORTINA FORMATION

COGNARINE FORMATION  
EURINILLA FORMATION



**NOTES**  
Sedimentary Structures: Use column for details, place symbol in grain size column.  
Induration code: Use own code & specify here or on separate sheet.  
Cement, etc.: Use symbol code.  
% Carbonate: State method.  
% Sand: State method.  
Roundness: Use Power's scale.  
Sorting: Folk R.L. 1968 Petrology of Sedimentary Rocks (Hemphill's) pp. 103-105.  
VP = very poor, P = poor, M = moderate, W = well, VW = very well.  
Porosity: State type (whether interconnected pores or not).

- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other: Other minerals



BORE LOG

PROJECT LAKE FROME CENOZOIC

SECTION HUNDRED

R.L. 79.86m

LAT. 30° 11' 30"

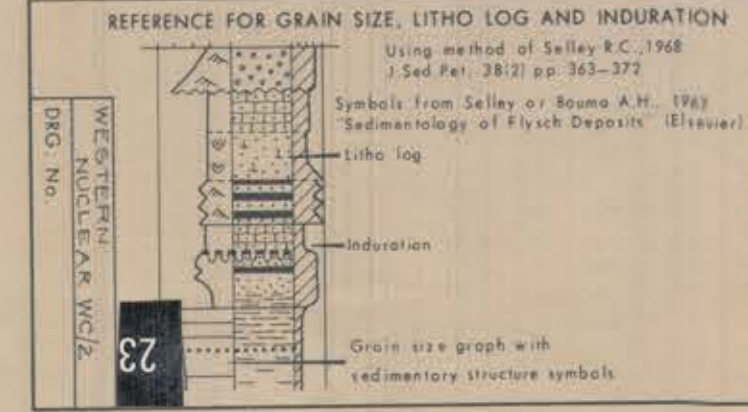
LOCATION PARALANA FROME 1250,000

HUNDRED

T.D. 142.85m

LONG. 138° 35' 49"

DEPTH (METRES)	WENTWORTH GRAIN SIZE		LITHO LOG	INDURATION	FOSSIL SOILS, WEATHERING INDURATION	CARBONATE	% SAND	MINERALS	SORTING	CLASTS	POROSITY	FOSSILS	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES Det & Analyst	PHOTOS
	GRAIN SIZE	SAND																
40								XRD XRD-XRD whole rock FA - 15% to 15-20% S.D. 100										P1142/73 40.25
42														Marker displaced. Modes 0.94, 2.66, 6.54 F5/E P5/E5K/LK				P1142/73 43.49
44																		
46										Granite grains								P1143/72 (151) 46.03m
48																		
50																		
52										f. mica qf								
54										Granite banded pink & red. Eq.								
56										Feldspar (possibly quartz)								
58																		P1143/73 58.00
60																		
62										Purple qf (possibly cased)				Core ground up				
64																		
66																		
68																		
70										q, quartz pebbles								68.76 Agfa EPM 9/19
72																		
74										Portion granite recrystallized to quartz pebb. uphole contamination								
76										Coarsely grained granite				MZ/EPS/SPS/LK Modes 2.79, 1.78				P1143/73 74.70 75.13m P1104/72 (246.0)
78																		



NOTES

Sedimentary Structures: Use column for details, place symbol in grain size column

Induration code: Use own code & specify here or on separate sheet

Cement, etc.: Use symbol code

% Carbonate: State method

% Sand: State method

Roundness: Use Power's scale

Sorting: Folk R.L., 1968 "Petrolology of Sedimentary Rocks" (Hemphill) pp. 103-105

VP = very poor, P = poor, M = moderate, W = well, VW = very well

Porosity: State type (whether interconnected pores or not)

- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals

LOGGED BY P.A. Collier DATE 2-6-73

TRACED BY A.P. DRAFTING BRANCH

DEPARTMENT OF MINES, SOUTH AUSTRALIA

CHECKED SHEET 2 OF 4



BORE LOG

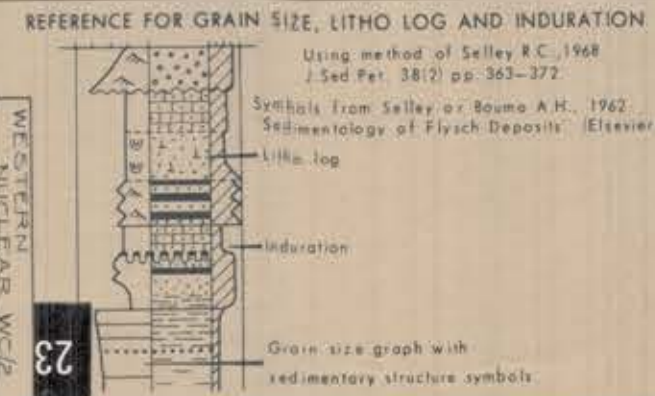
PROJECT LAKE FROME CAINOZOIC  
 LOCATION PARALANA, FROME  
 1:63,360 1:250,000

SECTION  
 HUNDRED

R.L. 79.86m  
 T.D. 142.85m

LAT. 30° 11' 30"  
 LONG. 139° 35' 49"

DEPTH (METRES)	WENTWORTH GRAIN SIZE	LITHO LOG	INDURATION	FOSSIL SOILS, WEATHERING INDURATION	CARBONATE	% SAND	MINERALS	SORTING	CLASTS	POROSITY	FOSSILS	SEDIMENTARY STRUCTURES	COMMENTS	ROCK NAME	FORMATION	SAMPLES	PHOTOS
80																	
82																	
84																	
86																	
88																	
90																	
92																	
94																	
96																	
98																	
100																	
102																	
104																	
106																	
108																	
110																	
112																	
114																	
116																	
118																	
120																	



NOTES  
 Sedimentary Structures: Use column for details, place symbol in grain size column.  
 Induration code: Use own code & specify here or on separate sheet.  
 Cement, etc.: Use symbol code.  
 % Carbonate: State method.  
 % Sand: State method.  
 Roundness: Use Powers scale.  
 Sorting: Folk R.L., 1968 Petrology of Sedimentary Rocks (Memph II) pp. 103-105.  
 VP = very poor, P = poor, M = moderate, W = well, VW = very well.  
 Porosity: State type (whether interconnected pores or not).

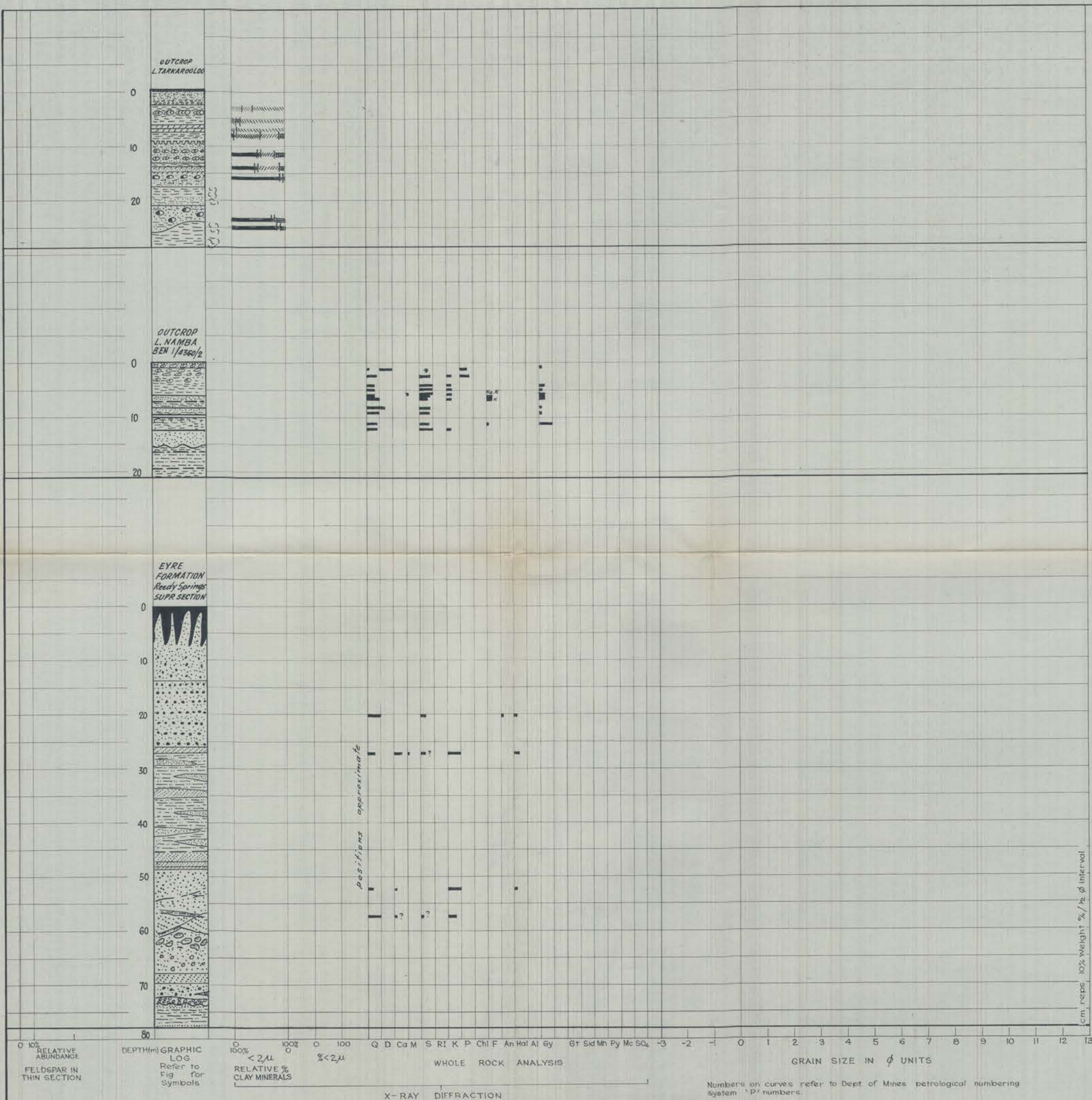
- Q Quartz
- M Mica
- H Heavies
- F Feldspar
- C Clays
- Other Other minerals

LOGGED BY R. A. Collier DATE 2-6-73  
 TRACED BY A. R. DRAFTING BRANCH  
 DEPARTMENT OF MINES, SOUTH AUSTRALIA  
 CHECKED SHEET 3 OF 4







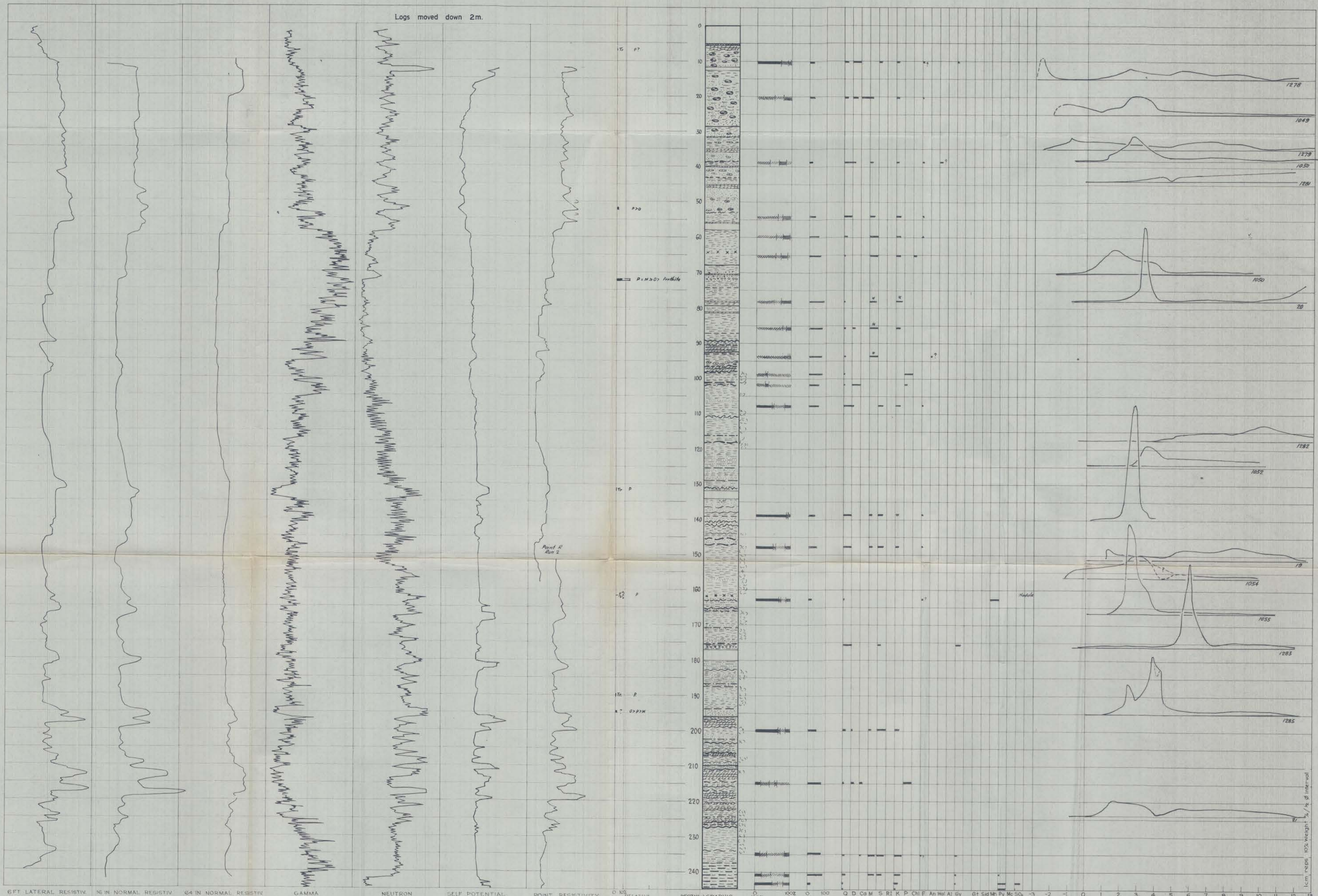


DEPARTMENT OF MINES — SOUTH AUSTRALIA

LAKE FROME AREA  
BORE LOG SUMMARY SHEET INCLUDING  
PETROPHYSICAL LOGS & SIZE FREQUENCY CURVES  
OUTCROPS AT L. TARKAROOLOO, LAKE NAMBA & REEDY SPRINGS

REGIONAL MAPPING SECTION	R. A. Callen GEOLOGIST	Compiled R. A. C.	Scale: 1:500
		Drn. B. S. G. Ckd.	Date: March 1975
Director of Mines		Drg. No. 75-524	





6 FT. LATERAL RESISTIV. 16 IN. NORMAL RESISTIV. 64 IN. NORMAL RESISTIV. GAMMA. NEUTRON. SELF POTENTIAL. POINT RESISTIVITY. DEPTH (m) GRAPHIC LOG. RELATIVE ABUNDANCE. FELDSPAR IN THIN SECTION. WHOLE ROCK ANALYSIS. GRAIN SIZE IN  $\phi$  UNITS.

THIN SECTION DATA

- Q Orthoclase
- P Plagioclase
- M Microcline
- tr trace

- Tr 0-5%
- A 5-20%
- CD 20-50%
- D 50-100%
- CD Co-dominant (Actual percentage depends on no. of co-dominant clay minerals)

KEY TO SYMBOLS FOR X-RAY DIFFRACTION

- S Quartz
- D Dolomite
- Ca Calcite
- M Mica, Illite
- S Smectite
- RI Randomly interstratified clays
- K Kaolinite
- P Polygorskite
- Ch Chlorite
- F Feldspar

- An Anatase (Rutile?)
- Hal Halite
- Al Alunite
- Gy Gypsum
- Gl Goethite
- Sd Siderite
- Mn Manganese minerals (oxides)
- Py Pyrite
- Mc Marcasite
- So Iron sulphates

**DEPARTMENT OF MINES — SOUTH AUSTRALIA**

**LAKE FROME AREA**

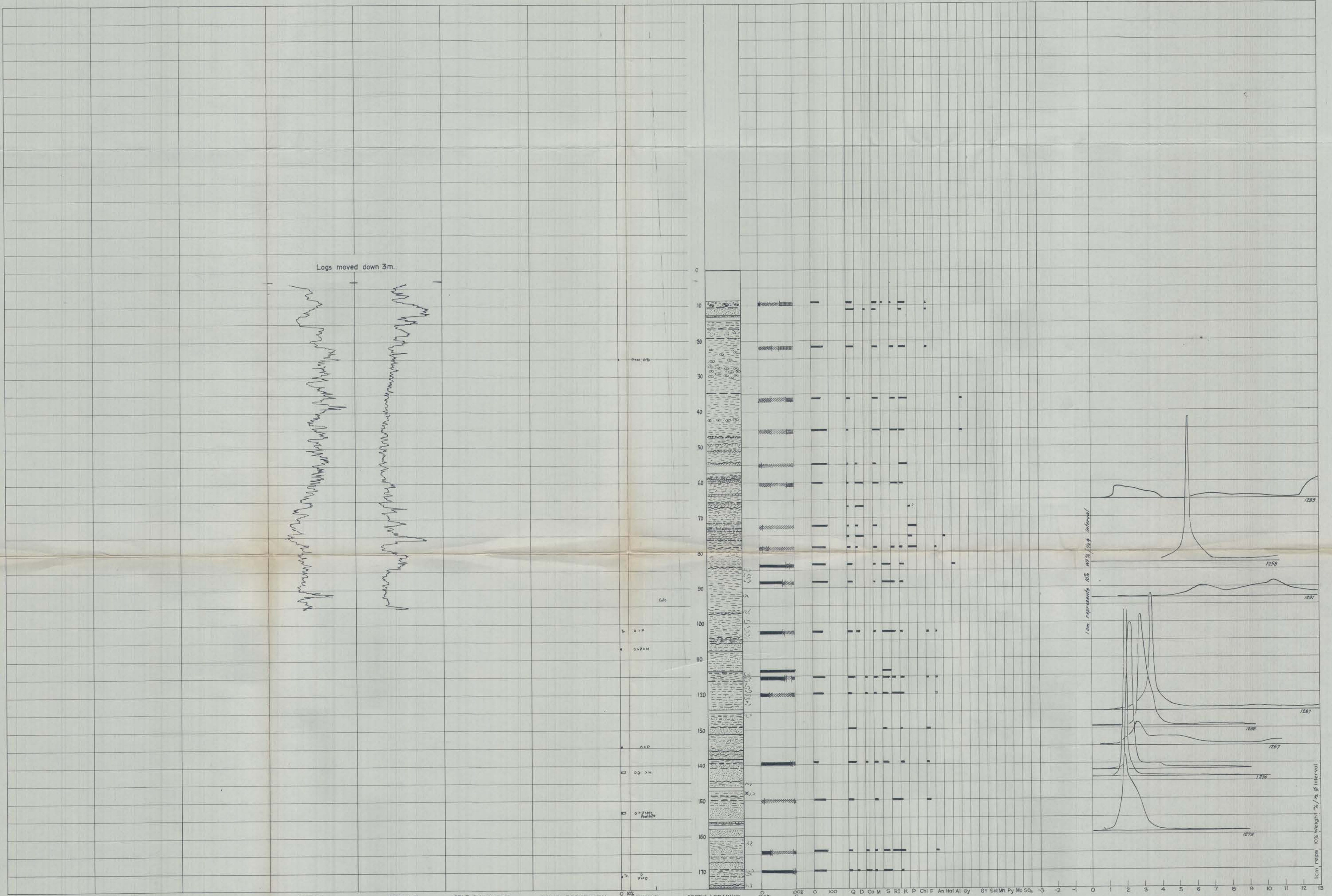
**BORE LOG SUMMARY SHEET INCLUDING**

**PETROPHYSICAL LOGS & SIZE FREQUENCY CURVES**

**WOOLTANA I**

REGIONAL MAPPING SECTION	R. A. Callen GEOLOGIST	Compiled R. A. C.	Scale: 1:500 Date: March 1975
Director of Mines		Drn. Ckd.	Prog. No. 75-522





THIN SECTION DATA

- O Orthoclase
- P Plagioclase
- M Microcline
- Tr Trace

- Tr 0-5%
- A 5-20%
- SD 20-50%
- D 50-100%
- CD Co-dominant (Actual percentage depends on no. of co-dominant clay minerals)

KEY TO SYMBOLS FOR X-RAY DIFFRACTION

- S Quartz
- M Dolomite
- RI Calcite
- K Mica, Illite
- P Smectite
- Chi Randomly interstratified clays
- K Kaolinite
- P Polygonskite
- Chi Chlorite
- F Feldspar
- An Anatase (Rutile?)
- Hol Halite
- Al Alunite
- Gy Gypsum
- St Siderite
- Mn Manganese minerals (oxides)
- Py Pyrite
- Mc Marcasite
- SO Iron sulphates

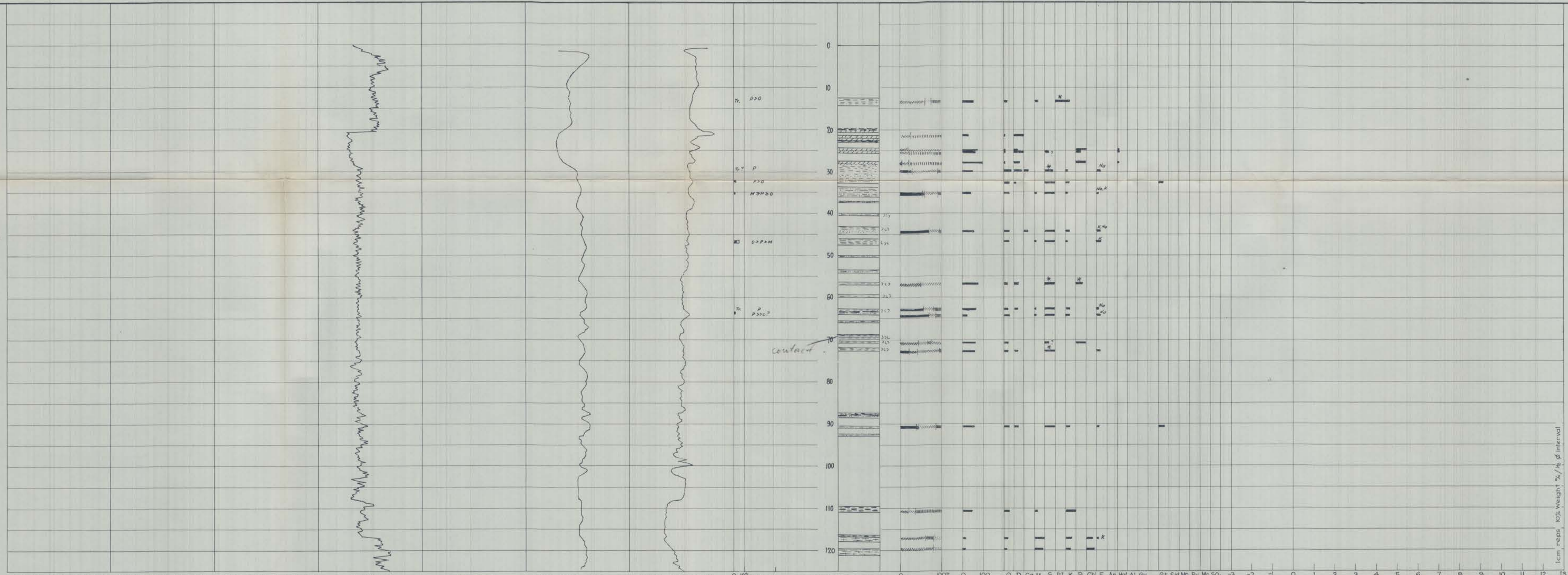
DEPARTMENT OF MINES - SOUTH AUSTRALIA

LAKE FROME AREA  
BORE LOG SUMMARY SHEET INCLUDING  
PETROPHYSICAL LOGS & SIZE FREQUENCY CURVES  
WERTALOOKA 1

REGIONAL MAPPING SECTION	R. A. Callen GEOLOGIST	Compiled R. A. C.	Scale: 1:500 Date: March 1975
Director of Mines		Drn. Ckd.	Drg. No. 75-521

0905.m  
C151  
v2  
8/7/76





6FT. LATERAL RESISTIV. 16 IN. NORMAL RESISTIV. 64 IN. NORMAL RESISTIV. GAMMA NEUTRON SELF POTENTIAL POINT RESISTIVITY 0 100% RELATIVE ABUNDANCE FELDSPAR IN THIN SECTION DEPTH(m) GRAPHIC LOG Refer to Fig for Symbols 0 100% RELATIVE % CLAY MINERALS <math> < 2\mu </math> <math> \% < 2\mu </math> WHOLE ROCK ANALYSIS \* - Degraded X-RAY DIFFRACTION GRAIN SIZE IN  $\phi$  UNITS

Numbers on curves refer to Dept. of Mines petrological numbering system \* P# numbers.

THIN SECTION DATA

- O Orthoclase
- P Plagioclase
- M Microcline
- Tr Trace

- Tr 0-5%
- A 5-20%
- SD 20-50%
- D 50-100%
- CD Codominant (Actual percentage depends on no. of codominant clay minerals.)

KEY TO SYMBOLS FOR X-RAY DIFFRACTION

- S S
- M M
- RI RI
- K K
- P P
- Chi Chi
- D D
- RI Randomly interstratified clays
- K Kaolinite
- P Palygorskite
- Chi Chlorite
- F Feldspar
- Q Quartz
- D Dolomite
- Ca Calcite
- M Mica, Illite
- S Smectite
- RI Randomly interstratified clays
- K Kaolinite
- P Palygorskite
- Chi Chlorite
- F Feldspar

- An Anatase (Rutile?)
- Hal Halite
- Al Alumite
- Gy Gypsum
- Gt Goethite
- Sid Siderite
- Mn Manganese minerals (oxides)
- Py Pyrite
- Mc Marcasite
- SO<sub>4</sub> Iron sulphates

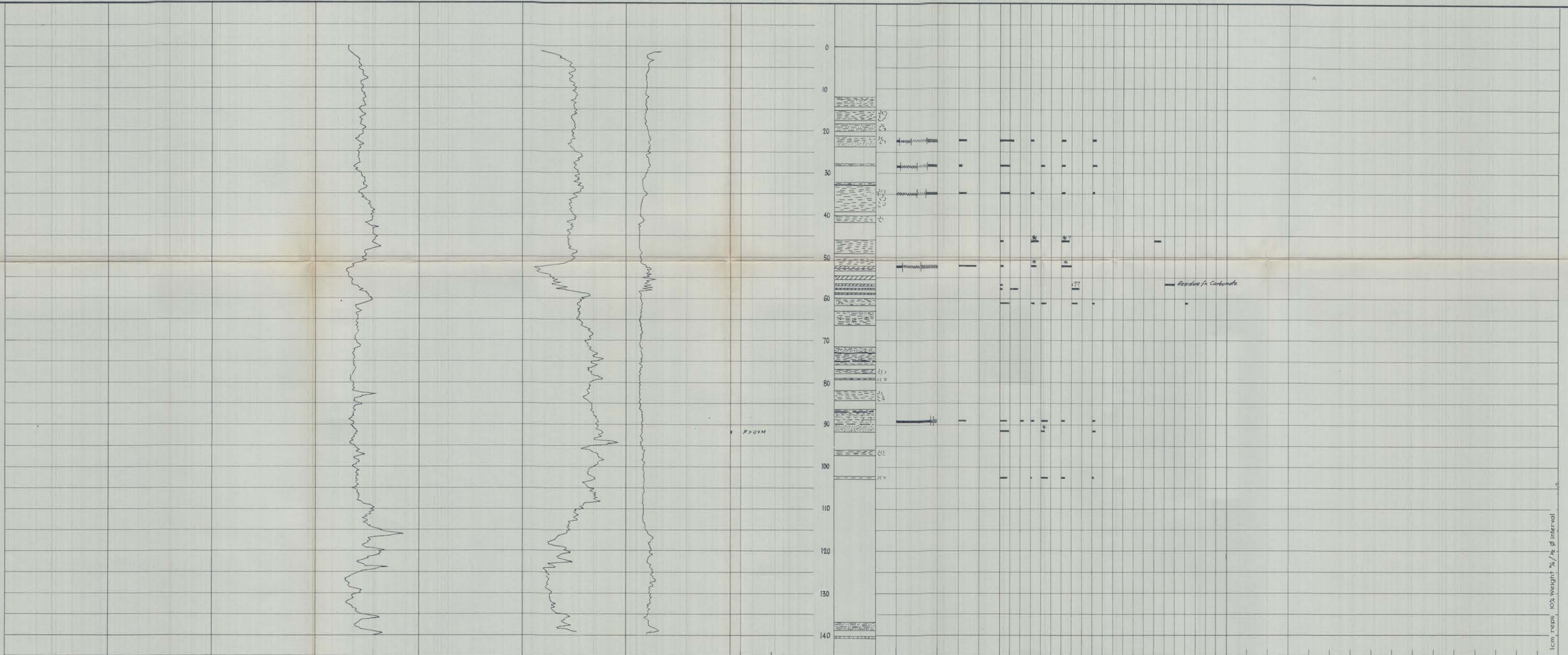
DEPARTMENT OF MINES - SOUTH AUSTRALIA  
LAKE FROME AREA  
BORE LOG SUMMARY SHEET INCLUDING  
PETROPHYSICAL LOGS & SIZE FREQUENCY CURVES  
EAR 5

REGIONAL MAPPING SECTION	R. A. Callen GEOLOGIST	Compiled R.A.C. Dn. B. S. G. Ckd.	Scale: 1:500 Date: March 1975 Drg. No.
--------------------------	---------------------------	---	--

0905.M  
C157  
V2  
C2

8/17/76





6 FT. LATERAL RESISTIV. 16 IN. NORMAL RESISTIV. 64 IN. NORMAL RESISTIV. GAMMA NEUTRON SELF POTENTIAL POINT RESISTIVITY 0 100% RELATIVE ABUNDANCE FELDSPAR IN THIN SECTION DEPTH(m) GRAPHIC LOG Refer to Fig. for Symbols. 0 100% <math>< 2\mu</math> RELATIVE % CLAY MINERALS 0 100% <math>\% < 2\mu</math> WHOLE ROCK ANALYSIS Q D Ca M S RI K P Chl F An Hal Al Gy Gt Sid Mn Py Mc SO<sub>4</sub> -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 GRAIN SIZE IN  $\phi$  UNITS

Numbers on curves refer to Dept. of Mines petrological numbering system 'P' numbers.

THIN SECTION DATA

- O Orthoclase
- P Plagioclase
- M Microcline
- Tr Trace

- Tr 0-5%
- A 5-20%
- SD 20-50%
- D 50-100%
- CD Co dominant (Actual percentage depends on no. of co-dominant clay minerals.)

KEY TO SYMBOLS FOR X-RAY DIFFRACTION

- S S
- M M
- RI RI
- K K
- P P
- Chl Chl
- Q Quartz
- D Dolomite
- Ca Calcite
- M Mica, illite
- S Smectite
- RI Randomly interstratified clays
- K Kaolinite
- P Palygorskite
- Chl Chlorite
- F Feldspar

- An Anatase (Rutile?)
- Hal Halite
- Al Alunite
- Gy Gypsum
- Gt Goethite
- Sid Siderite
- Mn Manganese minerals (oxides)
- Py Pyrite
- Mc Marcasite
- SO<sub>4</sub> Iron sulphates

090-sm  
C157  
v2  
c2

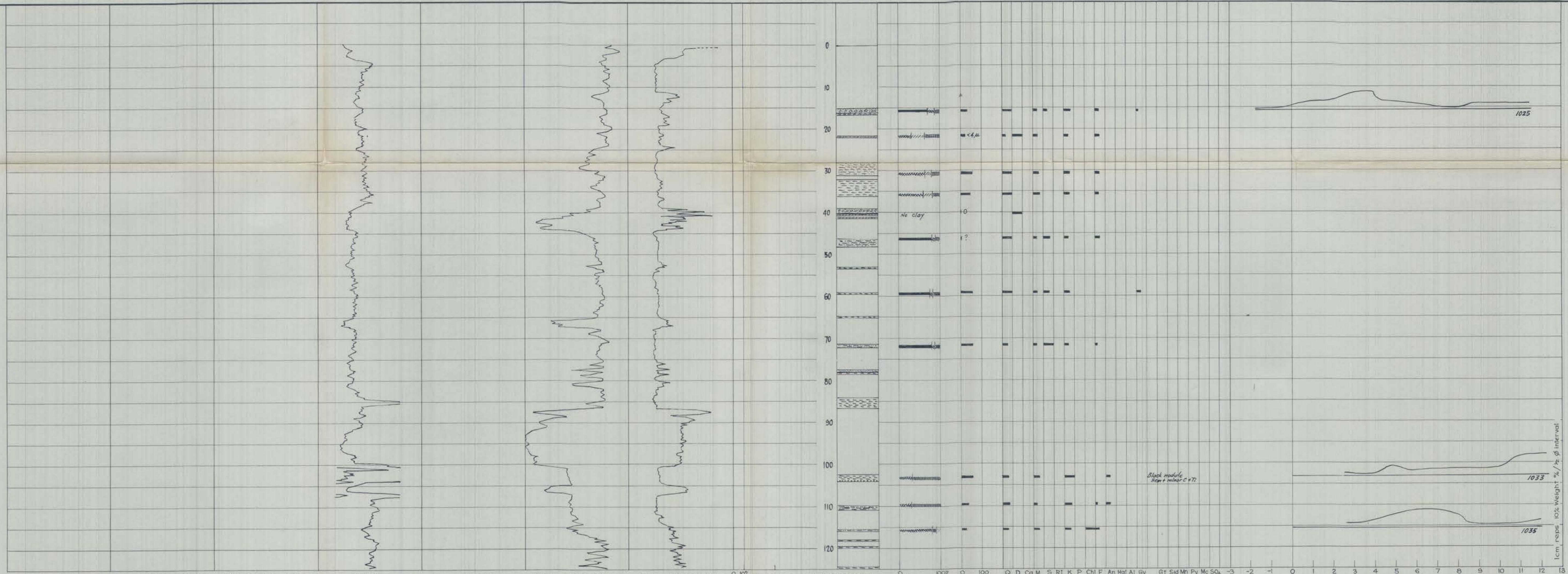


**DEPARTMENT OF MINES — SOUTH AUSTRALIA**  
**LAKE FROME AREA**  
**BORE LOG SUMMARY SHEET INCLUDING**  
**PETROPHYSICAL LOGS & SIZE FREQUENCY CURVES**  
**EAR 7**

REGIONAL MAPPING SECTION	R. A. Callen GEOLOGIST	Compiled R. A. C.	Scale: 1:500 Date: March 1975
		Drg. No. 28	
Director of Mines		Drg. No. 28	



0905M  
C157  
v.2  
c.2



6 FT. LATERAL RESISTIV. 16 IN. NORMAL RESISTIV. 64 IN. NORMAL RESISTIV. GAMMA NEUTRON SELF POTENTIAL POINT RESISTIVITY  
 0 100% RELATIVE ABUNDANCE FELDSPAR IN THIN SECTION  
 DEPTH (m) GRAPHIC LOG Refer to Fig. for Symbols  
 0 100% RELATIVE % CLAY MINERALS  
 Q D Ca M S RI K P Chi F An Hal Al Gy Gt Sid Mn Py Mc SO<sub>4</sub> -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13  
 WHOLE ROCK ANALYSIS GRAIN SIZE IN phi UNITS  
 Numbers on curves refer to Dept. of Mines petrological numbering system 'P' numbers.

THIN SECTION DATA

- O Orthoclase
- P Plagioclase
- M Microcline
- Tr Trace

- Tr 0-5%
- A 5-20%
- SD 20-50%
- D 50-100%
- CD Codominant (Actual percentage depends on no. of codominant clay minerals.)

KEY TO SYMBOLS FOR X-RAY DIFFRACTION

- S S
  - M M
  - RI RI
  - K K
  - P P
  - chi chi
- Relative abundance less accurate where RI present.

- Q Quartz
- D Dolomite
- Ca Calcite
- M Mica, illite
- S Smectite
- RI Randomly interstratified clays
- K Kaolinite
- P Palygorskite
- Chi Chlorite
- F Feldspar

- An Anatase (Rutile?)
- Hal Halite
- Al Alunite
- Gy Gypsum
- Gt Goethite
- Sid Siderite
- Mn Manganese minerals (oxides)
- Py Pyrite
- Mc Marcasite
- SO<sub>4</sub> Iron sulphates

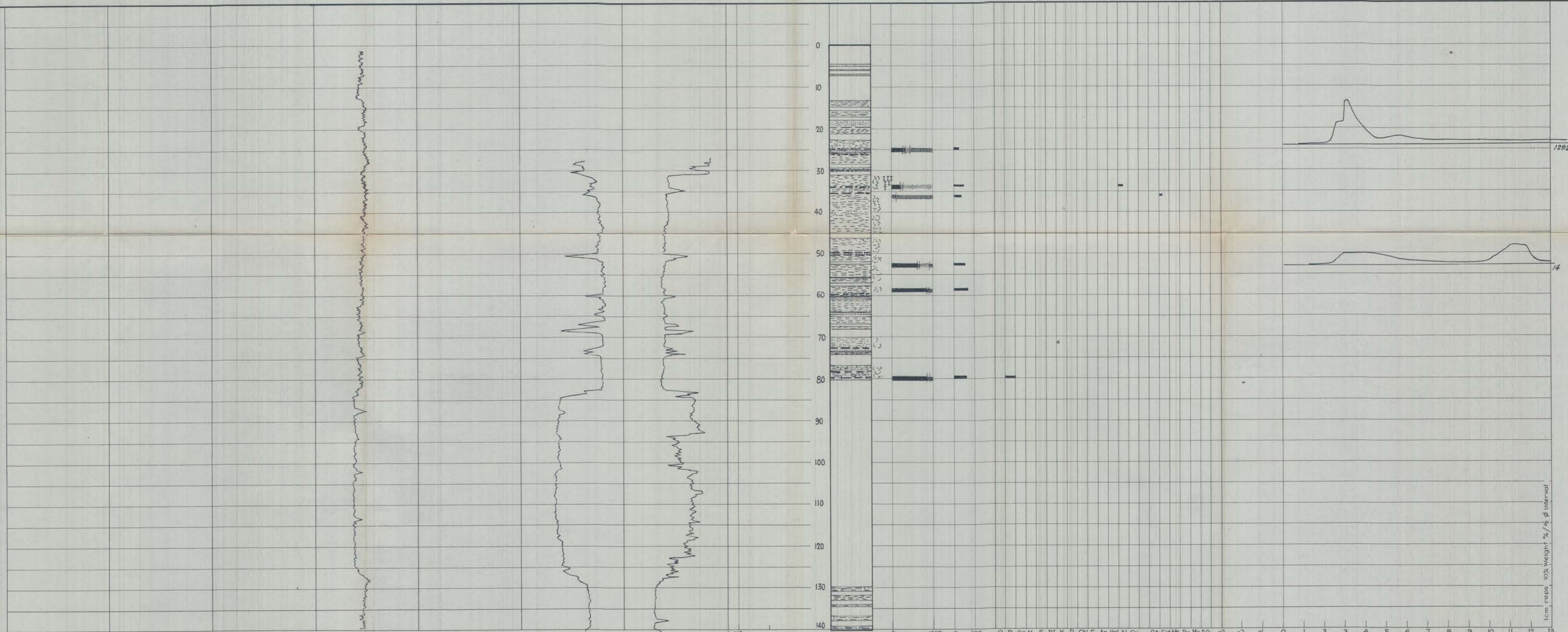
DEPARTMENT OF MINES — SOUTH AUSTRALIA

LAKE FROME AREA  
BORE LOG SUMMARY SHEET INCLUDING  
PETROPHYSICAL LOGS & SIZE FREQUENCY CURVES  
EAR 9

REGIONAL MAPPING SECTION	R.A. Callen GEOLOGIST	Compiled R.A.C.	Scale: 1:500 Date: March 1975
		Drn. B.S.G. Ckd.	Drg. No. 29

Director of Mines





6 FT. LATERAL RESISTIV. 16 IN. NORMAL RESISTIV. 64 IN. NORMAL RESISTIV. GAMMA NEUTRON SELF POTENTIAL POINT RESISTIVITY 0 100% RELATIVE ABUNDANCE FELDSPAR IN THIN SECTION DEPTH(m) GRAPHIC LOG Refer to Fig. for Symbols 0 100% <math> < 2\mu </math> RELATIVE % CLAY MINERALS >math> > 2\mu </math> WHOLE ROCK ANALYSIS Q D Ca M S RI K P Chi F An Hal Al Gy Gt Sid Mn Py Mc So<sub>4</sub> -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 GRAIN SIZE IN  $\phi$  UNITS

Numbers on curves, refer to Dept. of Mines. petrological numbering system. 'P' numbers.

THIN SECTION DATA

- O Orthoclase
- P Plagioclase
- M Microcline
- Tr Trace

- Tr 0-5%
- A 5-20%
- SD 20-50%
- D 50-100%
- CD Codominant (Actual percentage depends on no. of codominant clay minerals.)

KEY TO SYMBOLS FOR X-RAY DIFFRACTION

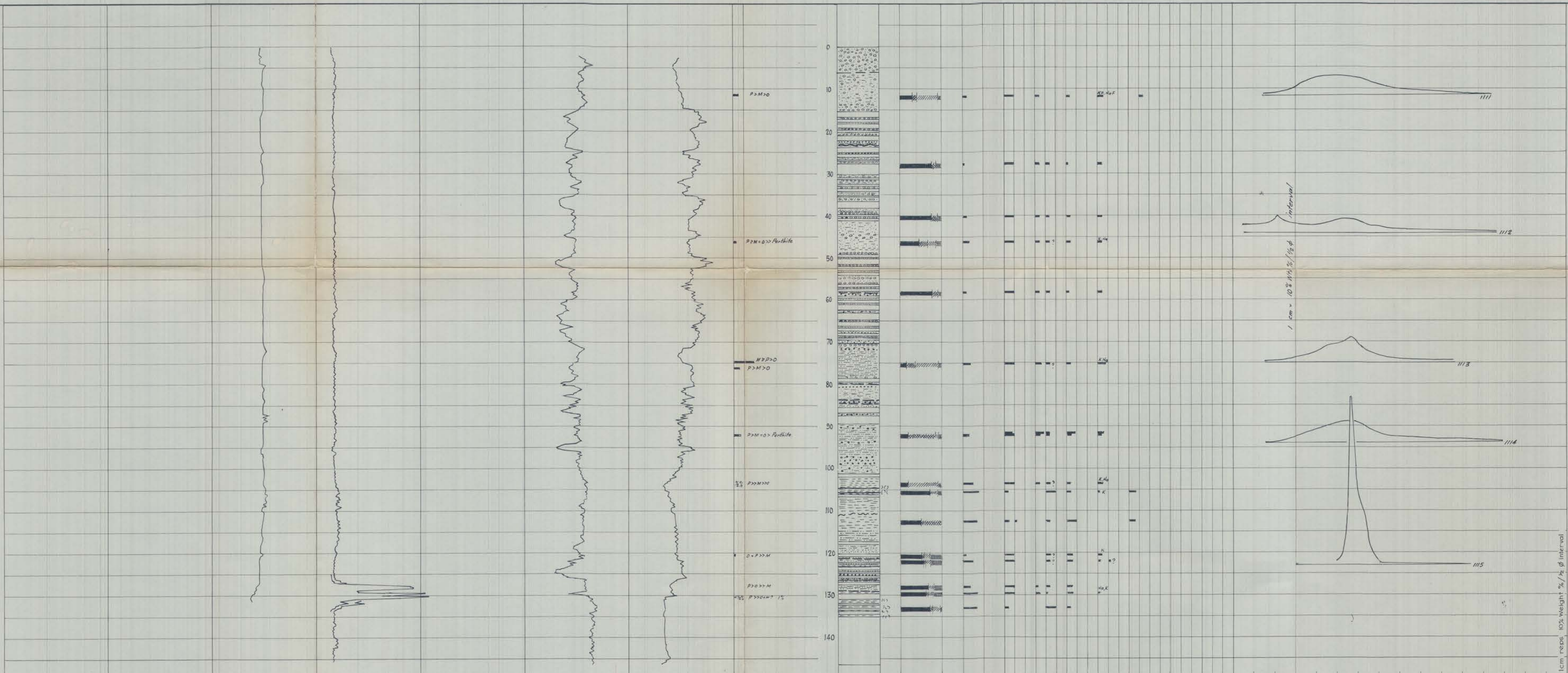
- S S
- M M
- RI RI
- K K
- P P
- Chi Chi
- F F

- Q Quartz
- D Dolomite
- Ca Calcite
- M Mica, illite
- S Smectite
- RI Randomly interstratified clays
- K Kaolinite
- P Palygorskite
- Chi Chlorite
- F Feldspar
- An Anatase (Rutile?)
- Hal Halite
- Al Alunite
- Gy Gypsum
- Gt Goethite
- Sid Siderite
- Mn Manganese minerals (oxides)
- Py Pyrite
- Mc Marcasite
- So<sub>4</sub> Iron sulphates

**DEPARTMENT OF MINES — SOUTH AUSTRALIA**  
**LAKE FROME AREA**  
**BORE LOG SUMMARY SHEET INCLUDING**  
**PETROPHYSICAL LOGS & SIZE FREQUENCY CURVES**  
**C 15**

REGIONAL MAPPING SECTION	R.A. Callen GEOLOGIST	Compiled R.A.C.	Scale: 1:500 Date: March 1976
Director of Mines		Drgn. Ckd.	Drg. No. 75-519 30





6 FT LATERAL RESISTIV. 16 IN. NORMAL RESISTIV. CALIPER GAMMA NEUTRON SELF POTENTIAL POINT RESISTIVITY

RELATIVE ABUNDANCE IN THIN SECTION

DEPTH(m) GRAPHIC LOG Refer to Fig for Symbols

RELATIVE % CLAY MINERALS

WHOLE ROCK ANALYSIS

GRAIN SIZE IN  $\phi$  UNITS

1 cm reps 10% weight % /  $\frac{1}{2}$   $\phi$  interval

Numbers on curves refer to Dept of Mines petrological numbering system 'P' numbers.

THIN SECTION DATA

- O Orthoclase
- P Plagioclase
- M Microcline
- Tr Trace

- Tr 0-5%
- A 5-20%
- OD 20-50%
- D 50-100%
- CD Codominant (Actual percentage depends on no. of codominant clay minerals)

KEY TO SYMBOLS FOR X-RAY DIFFRACTION

- S
  - M
  - RI
  - K
  - P
  - CHI
- Relative abundance less accurate where RI present

- Q Quartz
- D Dolomite
- Ca Calcite
- M Mica, illite
- S Smectite
- RI Randomly interstratified clays
- K Kaolinite
- P Palygorskite
- CHI Chlorite
- F Feldspar
- An Anatase (Rutile?)
- Hal Halite
- Al Alunite
- Gy Gypsum
- Gt Goethite
- Sid Siderite
- Mn Manganese minerals (oxides)
- Py Pyrite
- Mc Marcasite
- SO<sub>4</sub> Iron sulphates

**DEPARTMENT OF MINES - SOUTH AUSTRALIA**

**LAKE FROME AREA**

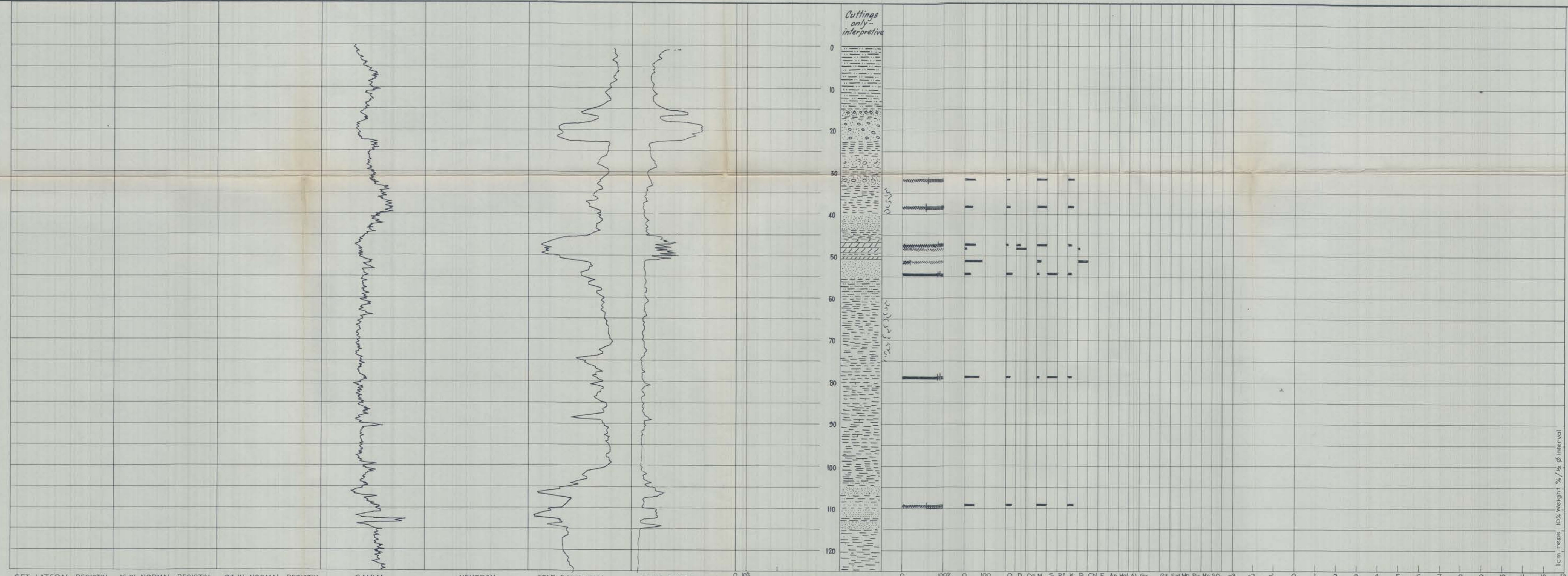
**BORE LOG SUMMARY SHEET INCLUDING**

**PETROPHYSICAL LOGS & SIZE FREQUENCY CURVES**

**WC 2**

REGIONAL MAPPING SECTION	R. A. Callen GEOLOGIST	Compiled R.A.C.	Scale: 1:500 Date: March 1975
		Drn.	Drng. No.
	Director of Mines	Ckd.	





6 FT. LATERAL RESISTIV. 16 IN. NORMAL RESISTIV. 64 IN. NORMAL RESISTIV. GAMMA NEUTRON SELF POTENTIAL POINT RESISTIVITY

RELATIVE ABUNDANCE FELDSPAR IN THIN SECTION

DEPTH (m) GRAPHIC LOG Refer to Fig. for Symbols

RELATIVE % CLAY MINERALS < 2μ % < 2μ

WHOLE ROCK ANALYSIS

X-RAY DIFFRACTION

GRAIN SIZE IN φ UNITS

Numbers on curves refer to Dept. of Mines petrological numbering system 'P' numbers.

THIN SECTION DATA

- O Orthoclase
- P Plagioclase
- M Microcline
- Tr Trace

- Tr 0-5%
- A 5-20%
- SD 20-50%
- D 50-100%
- CD Codominant (Actual percentage depends on no. of codominant clay minerals.)

KEY TO SYMBOLS FOR X-RAY DIFFRACTION

- S
- M
- RI
- K
- P
- Chl

Relative abundance less accurate where RI present

- Q Quartz
- D Dolomite
- Ca Calcite
- M Mica, illite
- S Smectite
- RI Randomly interstratified clays
- K Kaolinite
- P Palygorskite
- Chl Chlorite
- F Feldspar

- An Anatase (Rutile?)
- Hal Halite
- Al Alunite
- Gy Gypsum
- Gt Goethite
- Sid Siderite
- Mn Manganese minerals (oxides)
- Py Pyrite
- Mc Marcasite
- SO<sub>4</sub> Iron sulphates

0905<sub>21</sub>  
C157  
v2  
e-2



**DEPARTMENT OF MINES — SOUTH AUSTRALIA**

**LAKE FROME AREA**  
**BORE LOG SUMMARY SHEET INCLUDING**  
**PETROPHYSICAL LOGS & SIZE FREQUENCY CURVES**  
**EAR 8**

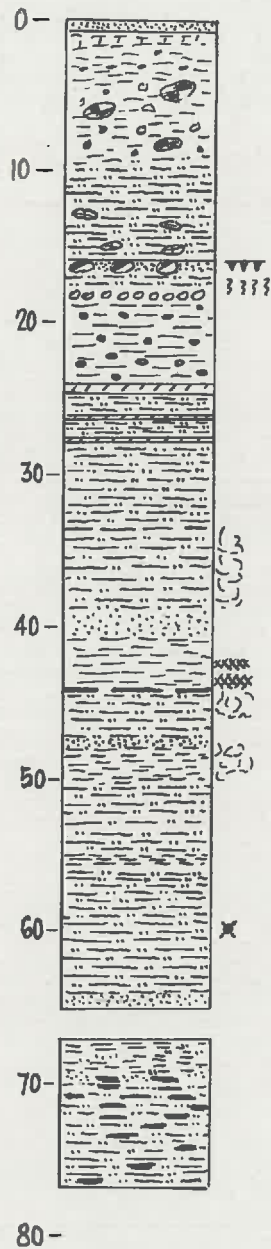
REGIONAL MAPPING SECTION	R. A. Callen GEOLOGIST	Compiled R. A. C.	Scale: 1:500 Date: March 1976
		Drn. B. S. G. Ckd.	Drg. No.

Director of Mines









*Compiled from Bunny 1968, N.S.W D.A.M.  
Contacts not recorded in detail.*

		DEPARTMENT OF MINES — SOUTH AUSTRALIA	Scale : 1 : 500
Compiled	R. A. C.	<b>GEOLOGICAL BORE LOG GLENMORE I</b>	Date : 11. 4. 75.
Drn	B. S. G. Ckd		Drq. No. S11449
			<b>34</b>



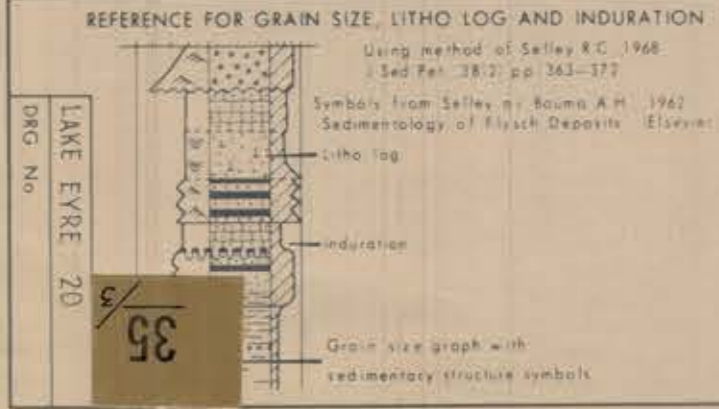
# BORE LOG

PROJECT LAKE EYRE SURVEY SECTION  
 LOCATION MADIGAN'S GULF HUNDRED

RL -12.2 m (approx.)  
 TO 299.62 m

LONG 137° 28' 40"  
 137° 28' 40"

DEPTH (METRES)	WENTWORTH GRAIN SIZE SAND	LITHO LOG	INDUR AT-ON	FOSSIL SOILS WEATHERING INDURATION	CARBONATE	% SAND	MINERALS	SORTING	POROSITY	SEDIMENTARY STRUCTURES	COMMENTS	CSIRO	REMARKS
0													
2											crumbly		
4											crumbly, slightly porous		
6											clay hard, bt. bl. gn. streaks		
8													
10													
12													
14													
16													
18													
20													
22													
24													
26													
28													
30													
32													
34													
36													
38													
40													



NOTES:  
 Sedimentary Structures: Use column for details place symbol in grain size column  
 Induration code: Use own code & specify base or on separate sheet  
 Cement, etc.: Use symbol code  
 % Carbonate: State method  
 % Sand: State method  
 Roundness: Use Powers scale  
 Sorting: Folk X.I. 1968. Petrology of Sedimentary Rocks (Memphis) pp 103-105  
 VP = very poor, P = poor, M = moderate, W = well, VW = very well  
 Porosity: State type (whether interconnected pores or not)

Q Quartz  
 M Mica  
 H Heavies  
 F Feldspar  
 C Clays  
 Other Other minerals

LOGGED BY: KACALLEN DATE: 1974  
 TRACED BY: D.J.M. DRAFTING BRANCH  
 DEPARTMENT OF MINES SOUTH AUSTRALIA  
 CHECKED: SHEET 1 OF 3









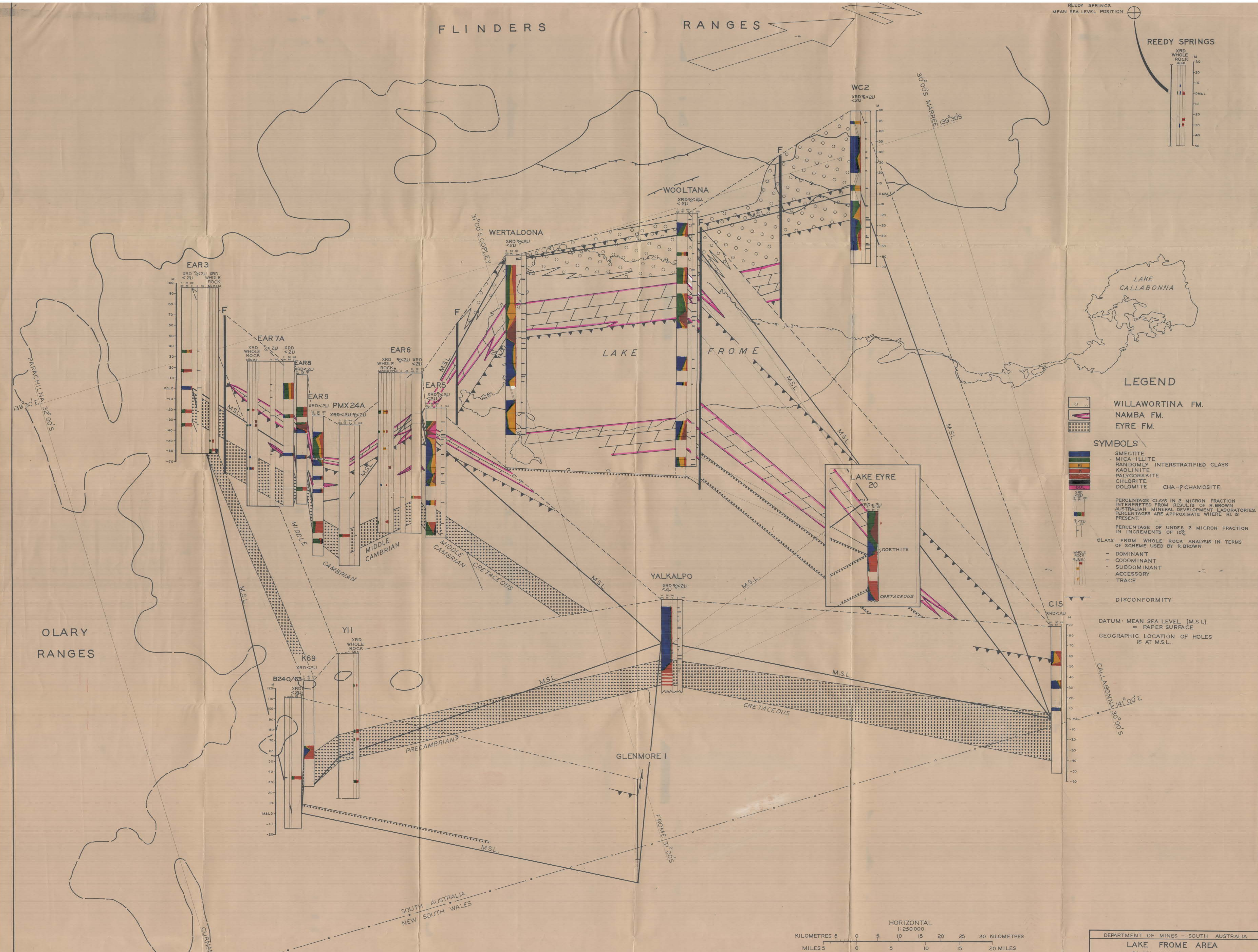
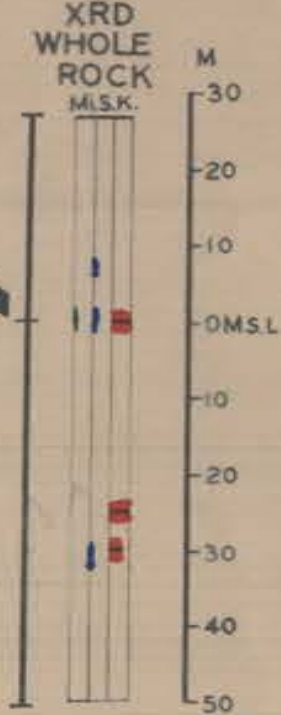


FLINDERS

RANGES

REEDY SPRINGS  
MEAN SEA LEVEL POSITION

REEDY SPRINGS



LEGEND

- WILLAWORTINA FM.
- NAMBA FM.
- EYRE FM.

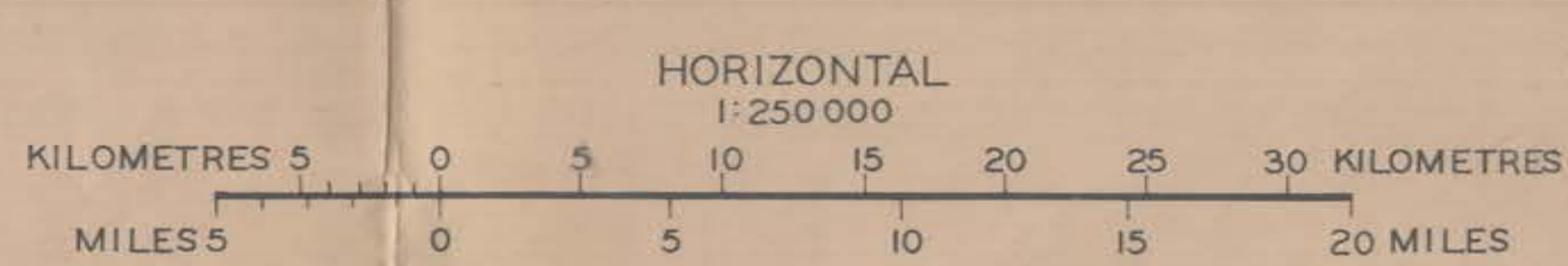
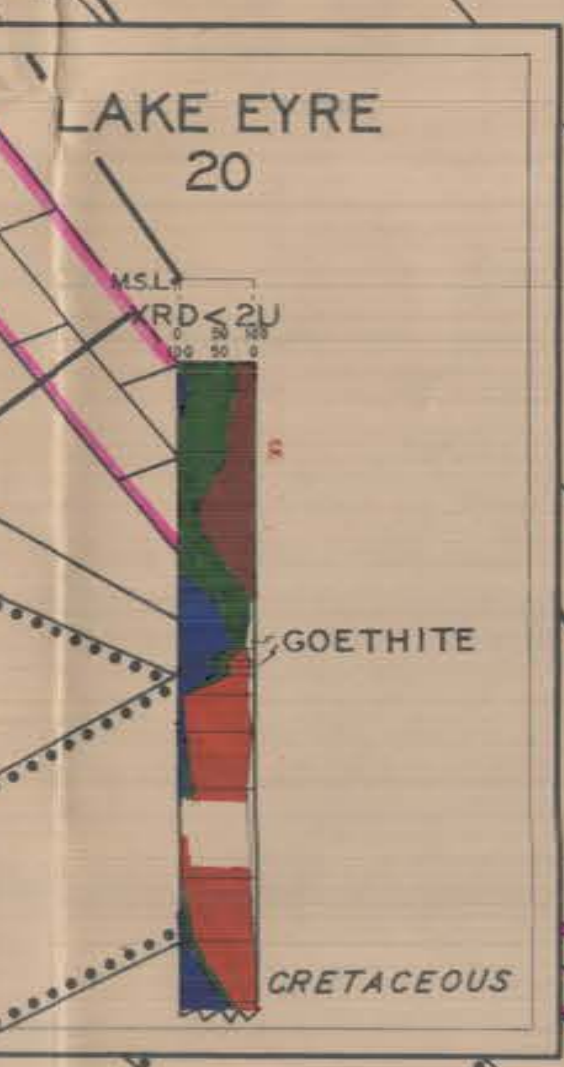
SYMBOLS

- SMECTITE
  - MICA-ILLITE
  - RANDOMLY INTERSTRATIFIED CLAYS
  - KAOLINITE
  - PALYGORSKITE
  - CHLORITE
  - DOLOMITE
  - CHA-? CHAMOSITE
- PERCENTAGE CLAYS IN 2 MICRON FRACTION INTERPRETED FROM RESULTS OF R. BROWN AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES. PERCENTAGES ARE APPROXIMATE WHERE RI IS PRESENT.
- PERCENTAGE OF UNDER 2 MICRON FRACTION IN INCREMENTS OF 10%
- CLAYS FROM WHOLE ROCK ANALYSIS IN TERMS OF SCHEME USED BY R. BROWN
- DOMINANT
  - CODOMINANT
  - SUBDOMINANT
  - ACCESSORY
  - TRACE

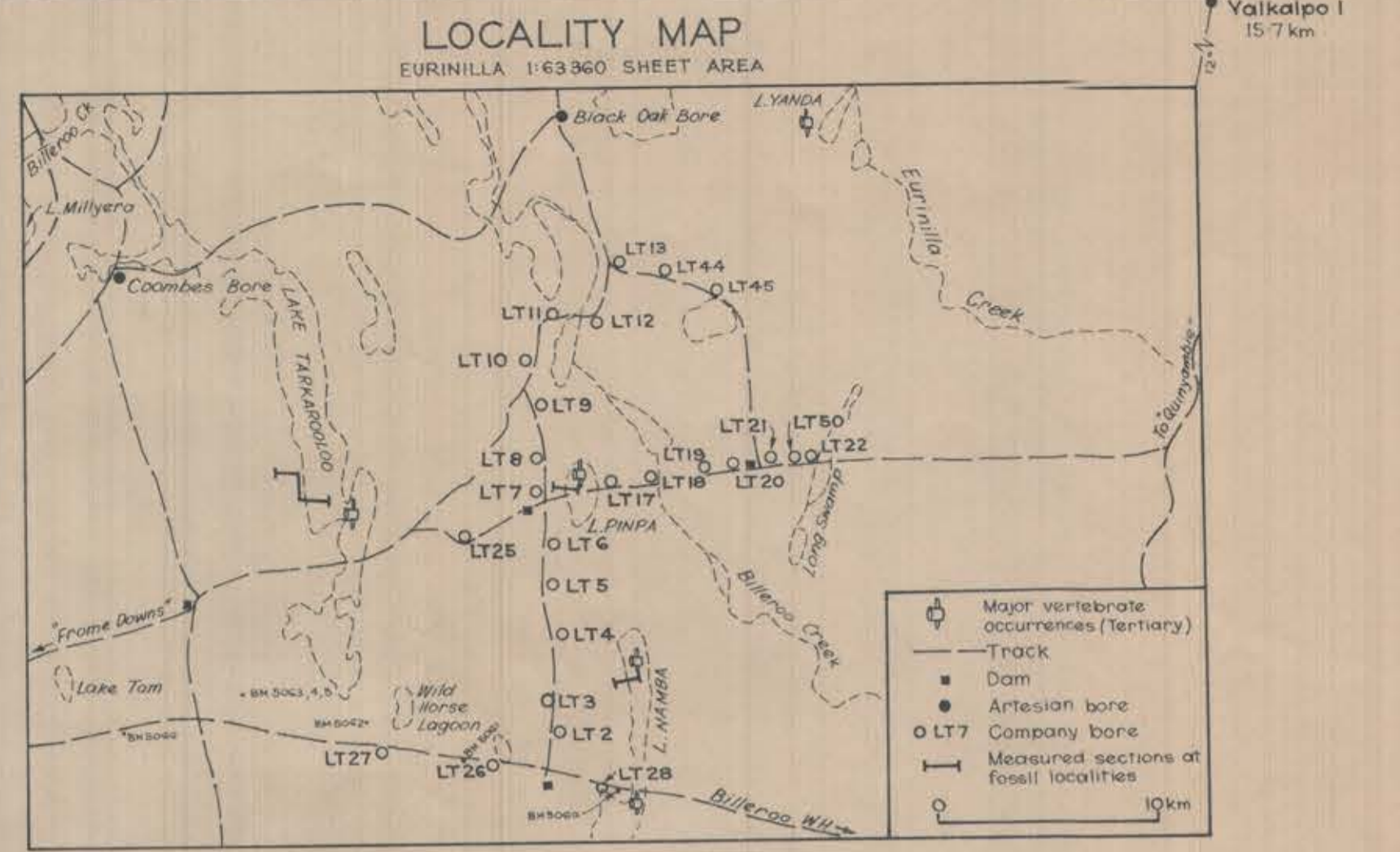
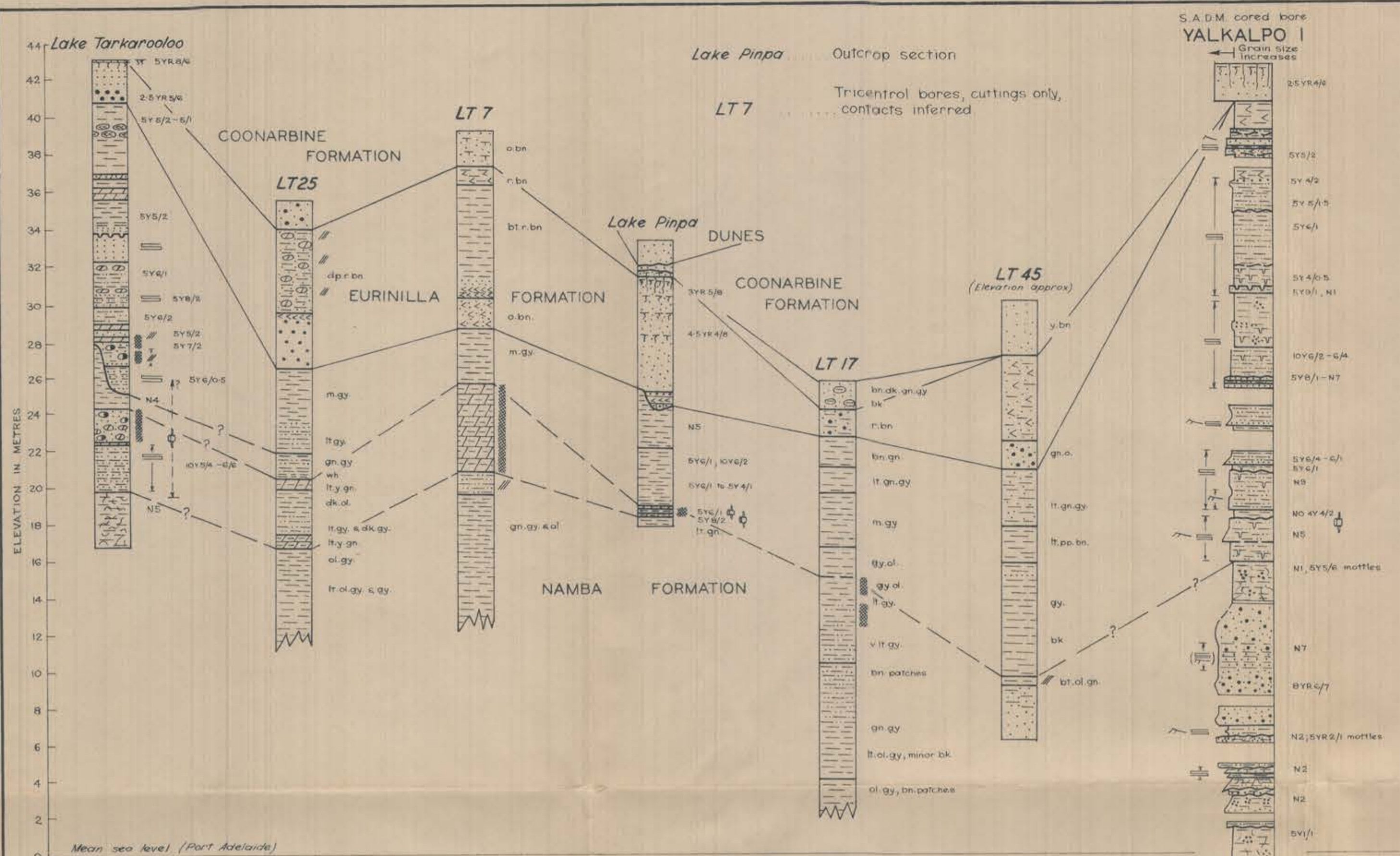
DISCONFORMITY

DATUM: MEAN SEA LEVEL (M.S.L.) = PAPER SURFACE  
GEOGRAPHIC LOCATION OF HOLES IS AT M.S.L.

OLARY RANGES



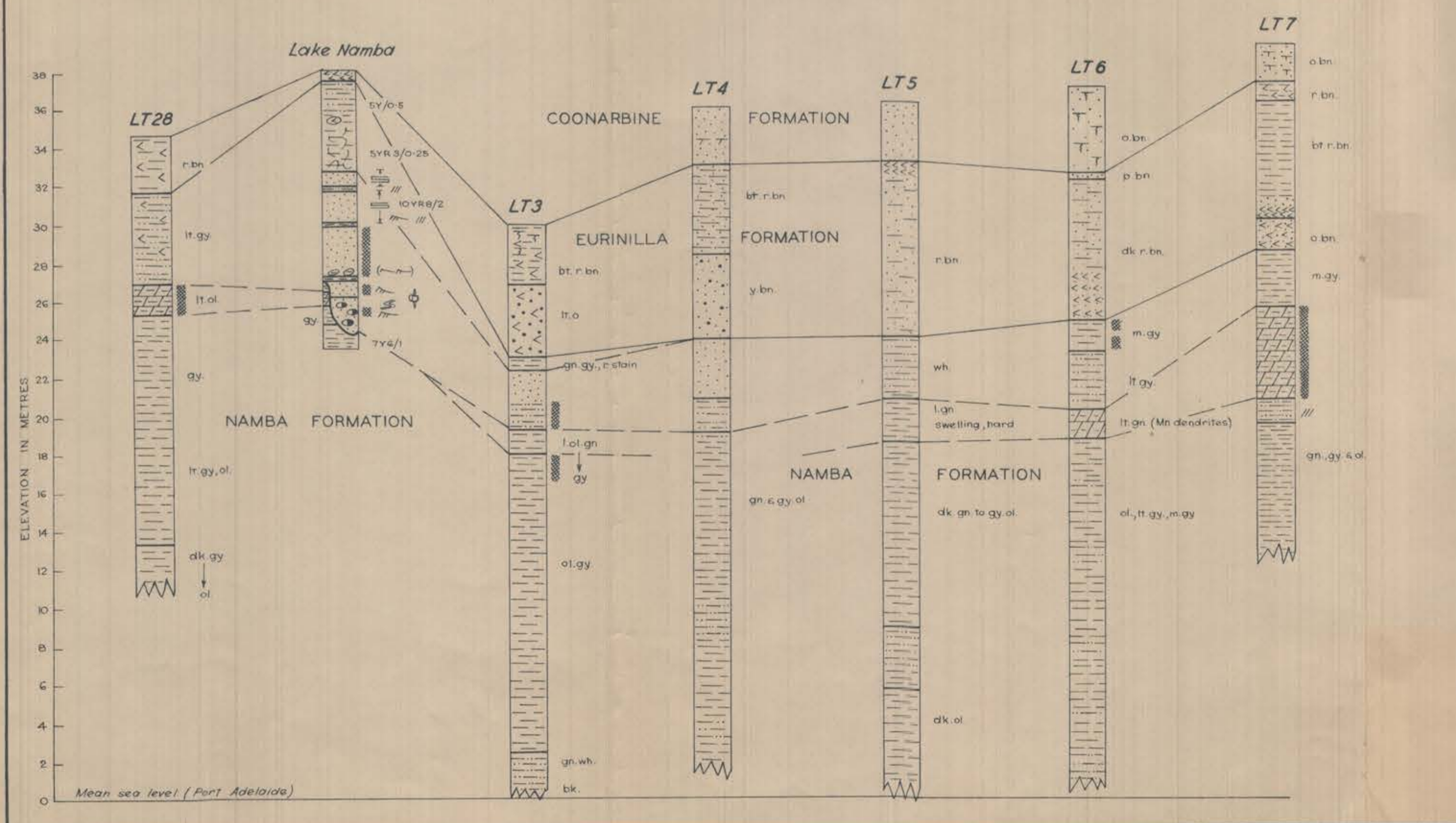
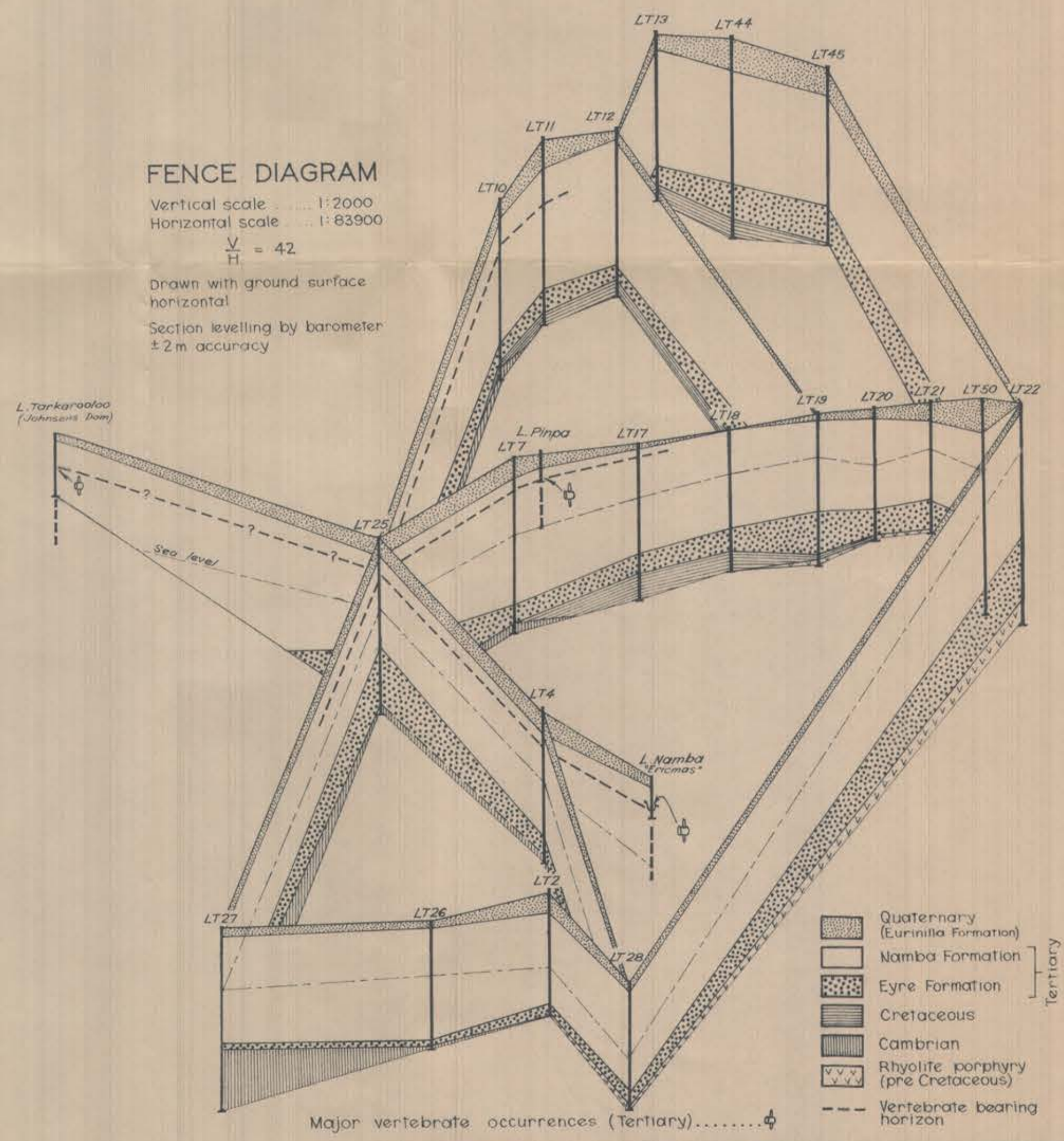




**COLOUR SYMBOLISM**  
10Y5/4 Munsell colour code

r. red	gn. green	pp. purple	lt. light	br. bright
bn. brown	y. yellow	o. orange	m. mid	v. very
gy. grey	ol. olive	p. pink	dk. dark	dp. deep
wh. white	bk. black			

**FENCE DIAGRAM**  
Vertical scale 1:2000  
Horizontal scale 1:83900  
 $V/H = 42$   
Drawn with ground surface horizontal  
Section levelling by barometer  
± 2m accuracy

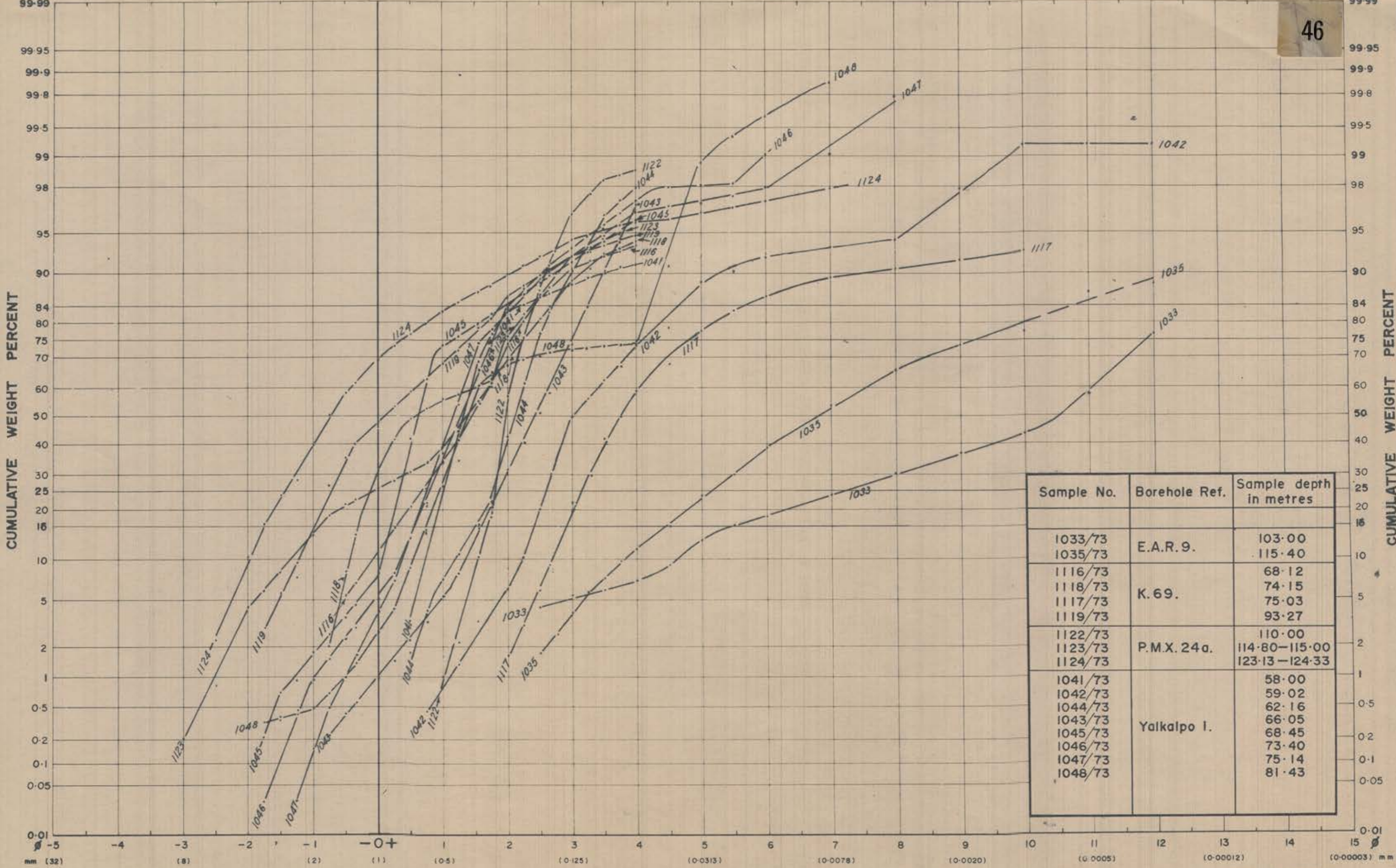


**DEPARTMENT OF MINES - SOUTH AUSTRALIA**  
LAKE FROME AREA: CAINOZOIC  
STRATIGRAPHY OF VERTEBRATE OCCURRENCES  
CORRELATION OF SURFACE AND SUBSURFACE SECTIONS  
EURINILLA 1:63360 SHEET AREA (CURNAMONA)

REGIONAL MAPPING SECTION	R.A. Callen GEOLOGIST	Compiled R.A.C.	Scale: 1:200 Vert Date: May 1975
Director of Mines		Drn. A.F. Ckd.	Drng. No. 75-37

1000-9.73 E407





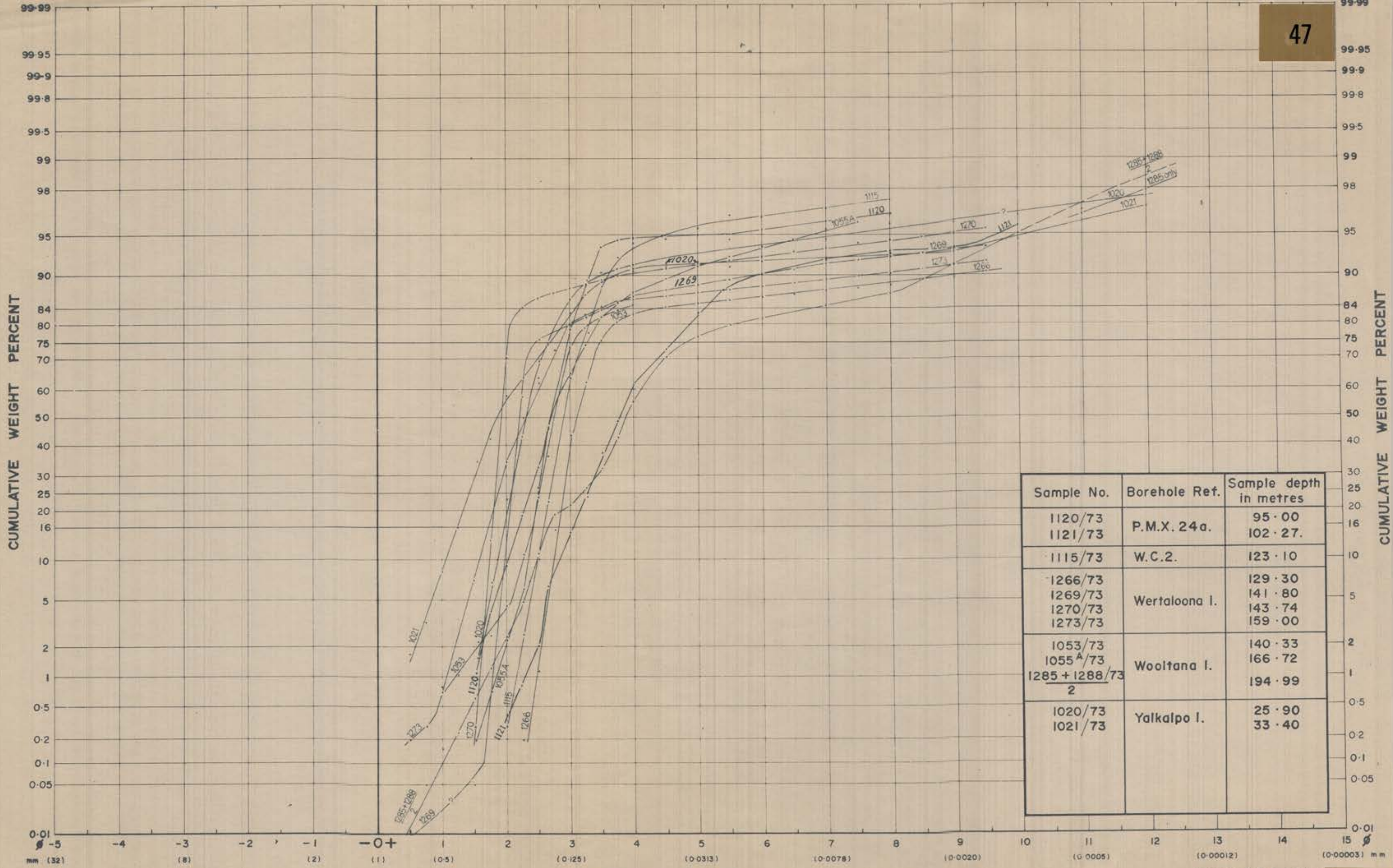
DIAMETER IN PHI UNITS

Compiled: R.A.Collen.

LAKE FROME-TERTIARY - GRAIN SIZE DISTRIBUTION

GROUP I EYRE FORMATION





Sample No.	Borehole Ref.	Sample depth in metres
1120/73 1121/73	P.M.X. 24a.	95.00 102.27.
1115/73	W.C.2.	123.10
1266/73 1269/73 1270/73 1273/73	Wertaloona I.	129.30 141.80 143.74 159.00
1053/73 1055 <sup>A</sup> /73 $\frac{1285 + 1288}{2}$	Wooltana I.	140.33 166.72 194.99
1020/73 1021/73	Yalkalpo I.	25.90 33.40

DIAMETER IN PHI UNITS

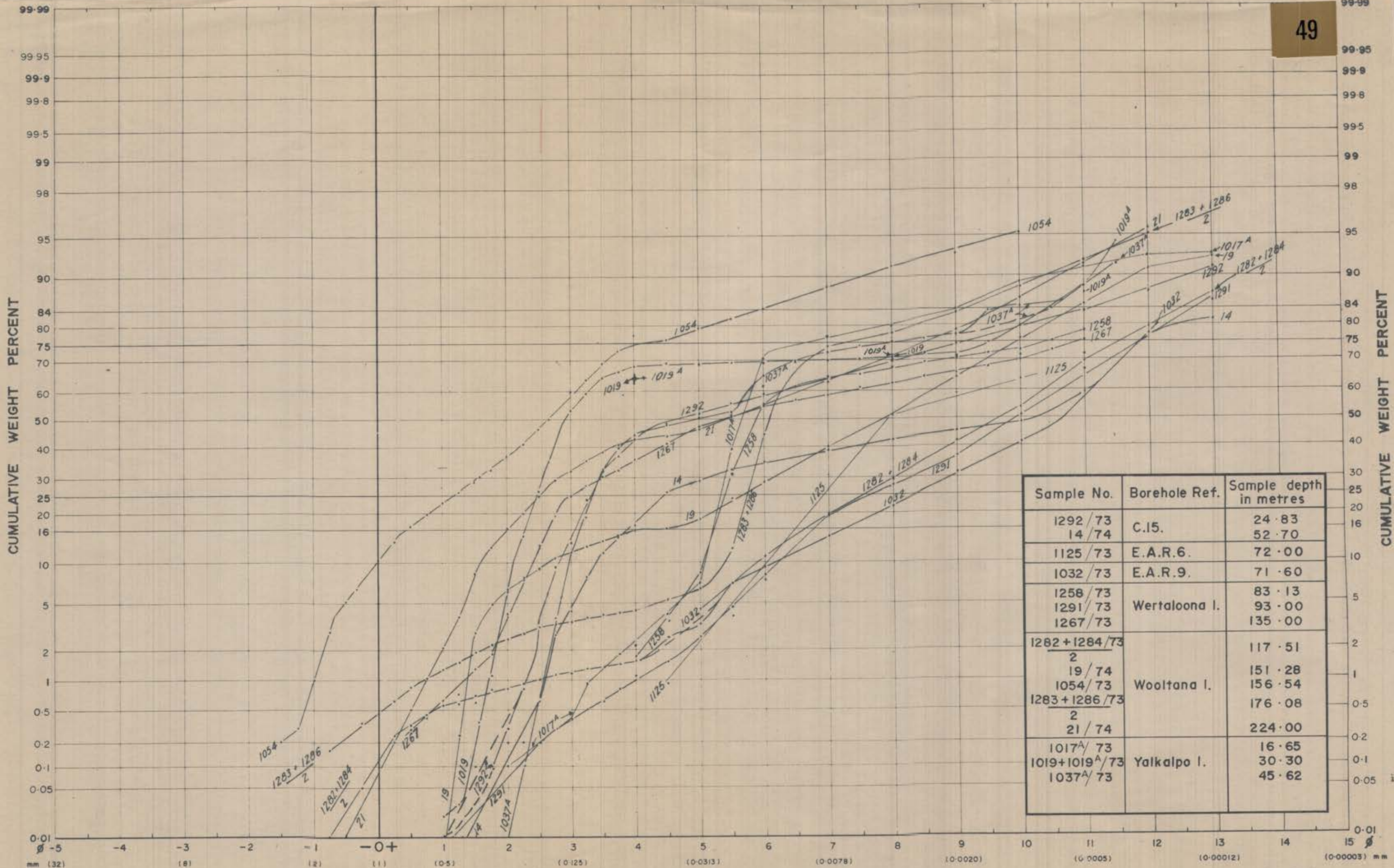
Compiled: R.A. Callen

LAKE FROME - TERTIARY - GRAIN SIZE DISTRIBUTION  
GROUP 2 NAMBA FORMATION SANDS









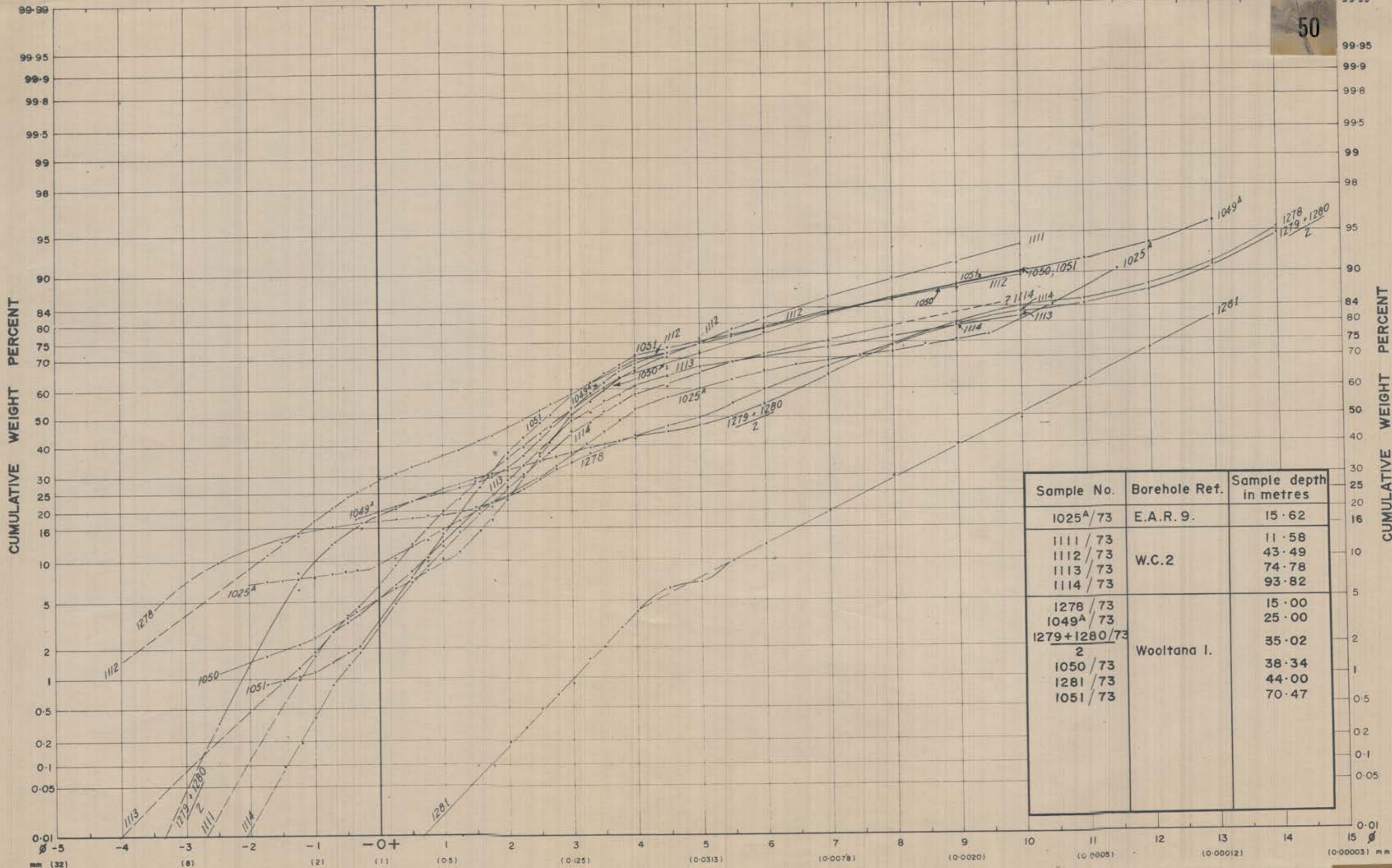
DIAMETER IN PHI UNITS

Compiled: R.A. Callen.

LAKE FROME-TERTIARY — GRAIN SIZE DISTRIBUTION

GROUP 4 NAMBA FORMATION BLACK CLAYS.





DIAMETER IN PHI UNITS

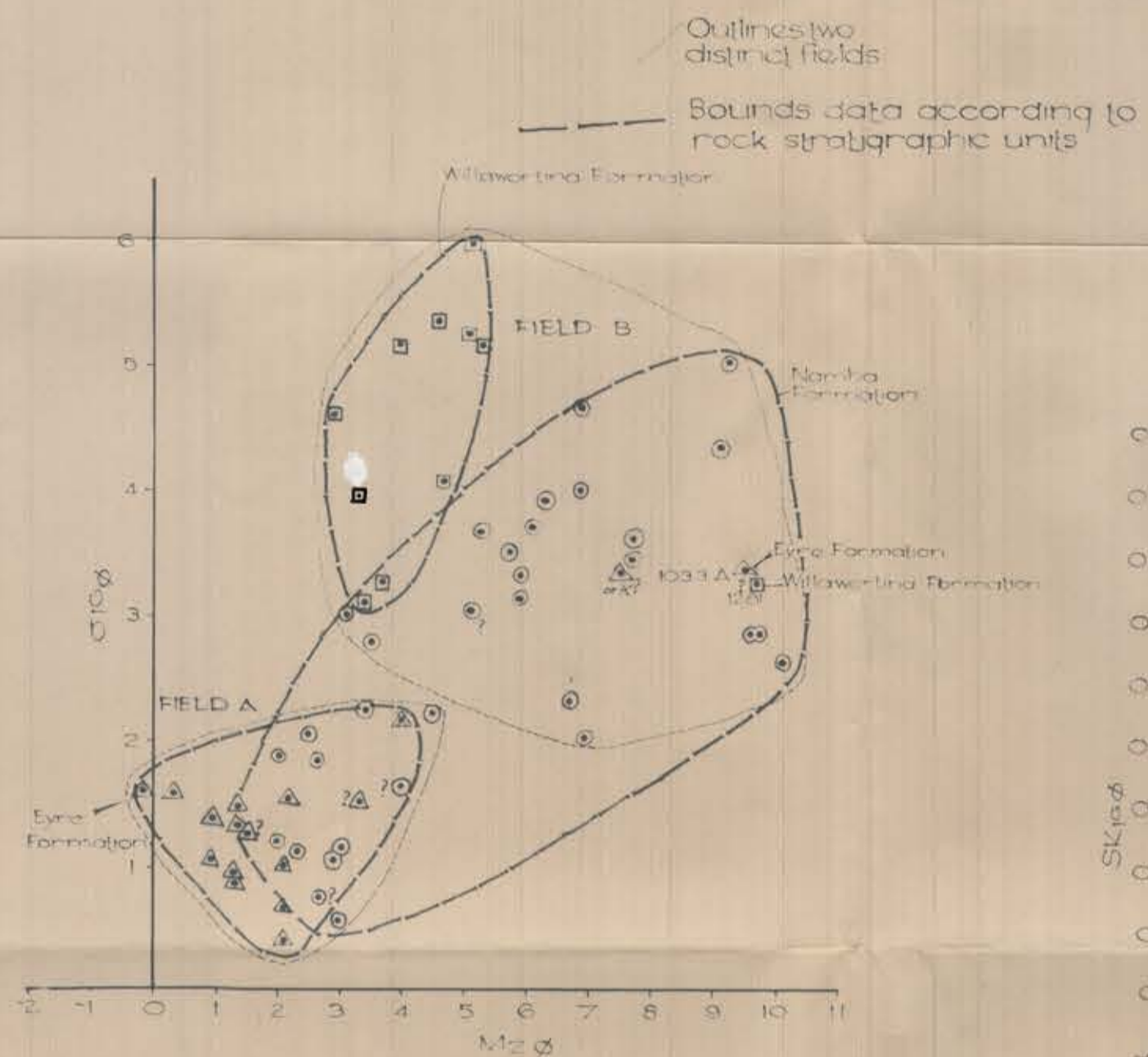
Compiled: R.A. Callen.

LAKE FROME - TERTIARY - GRAIN SIZE DISTRIBUTION

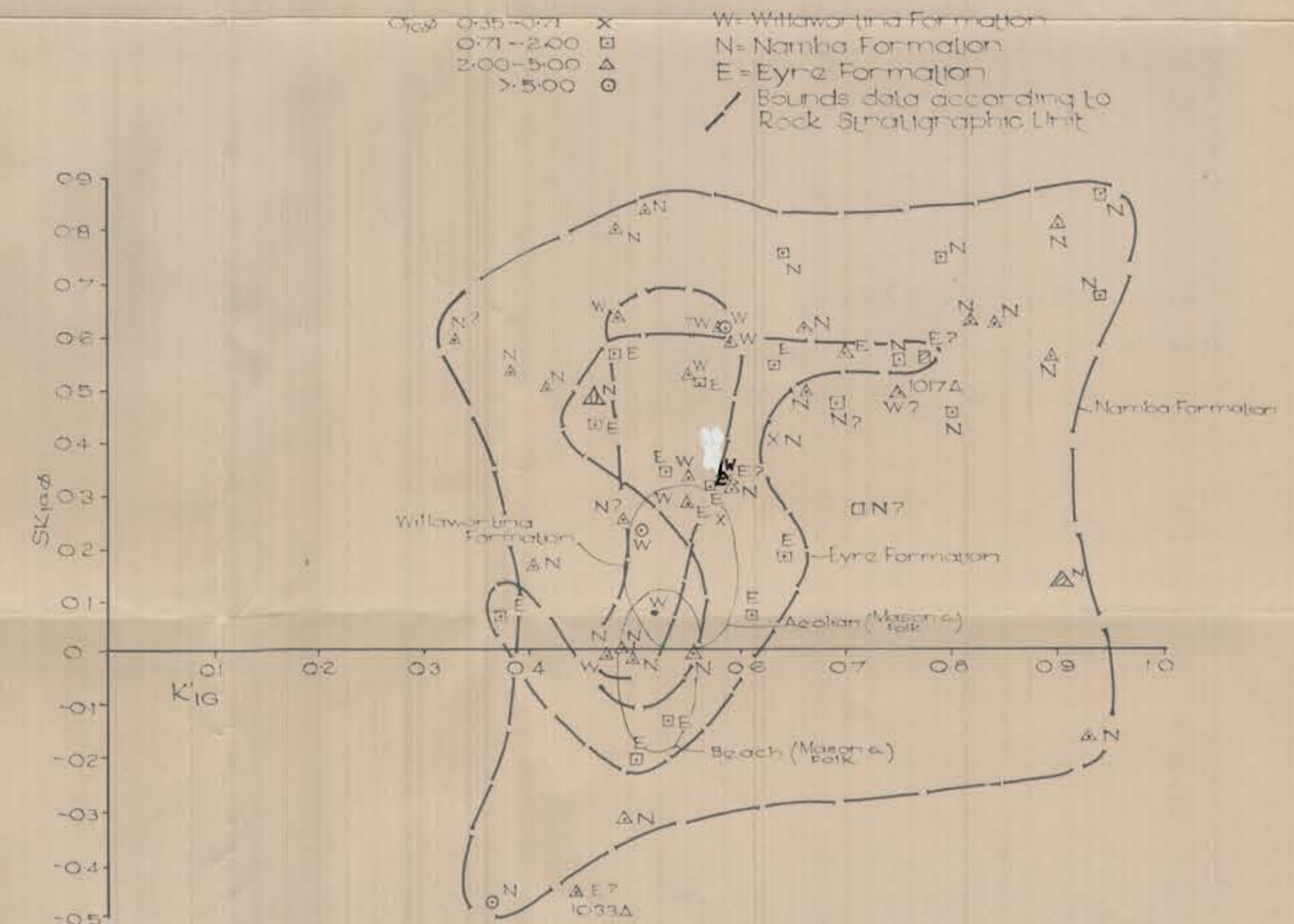
GROUP 5 WILLAWORTINA FORMATION



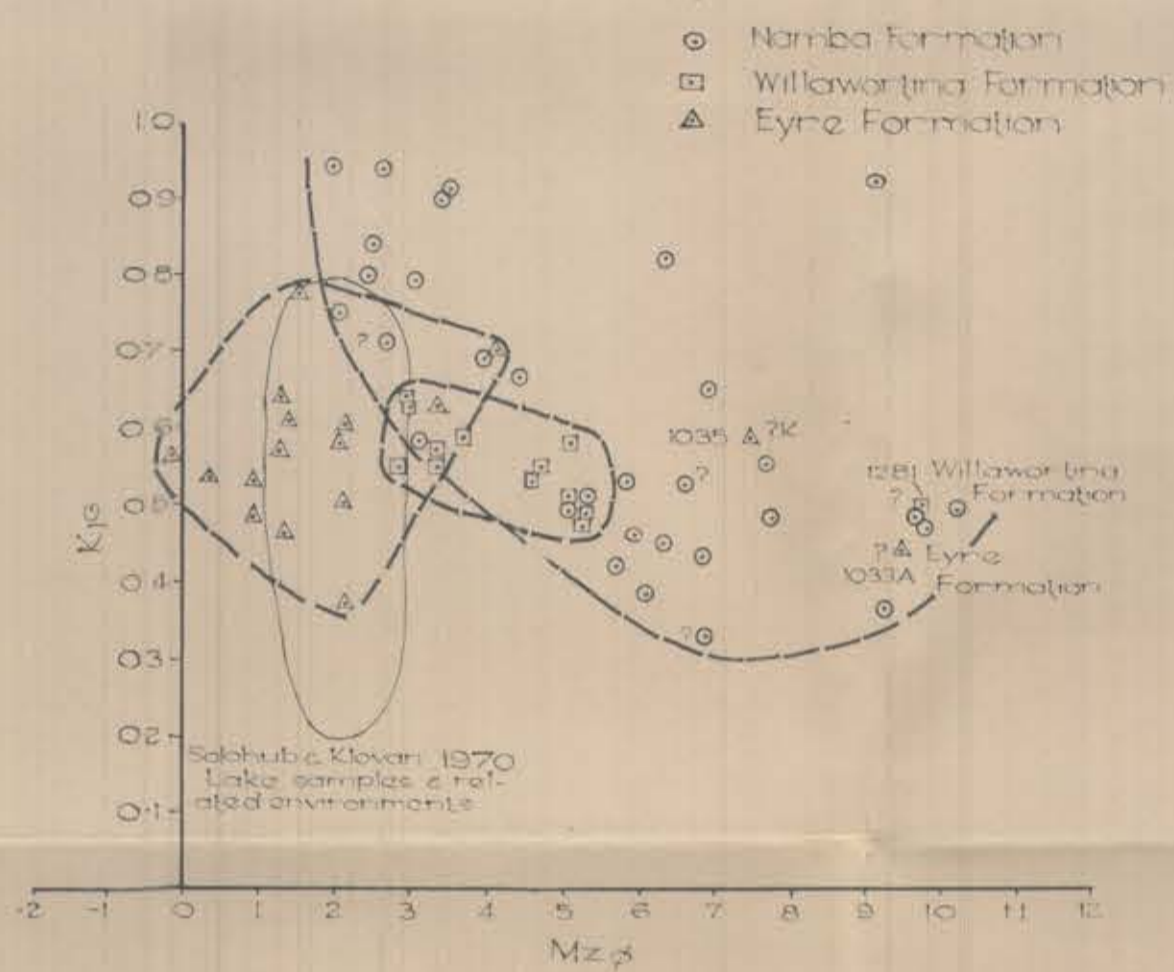
Dispersion (Sorting) vs Mean Size



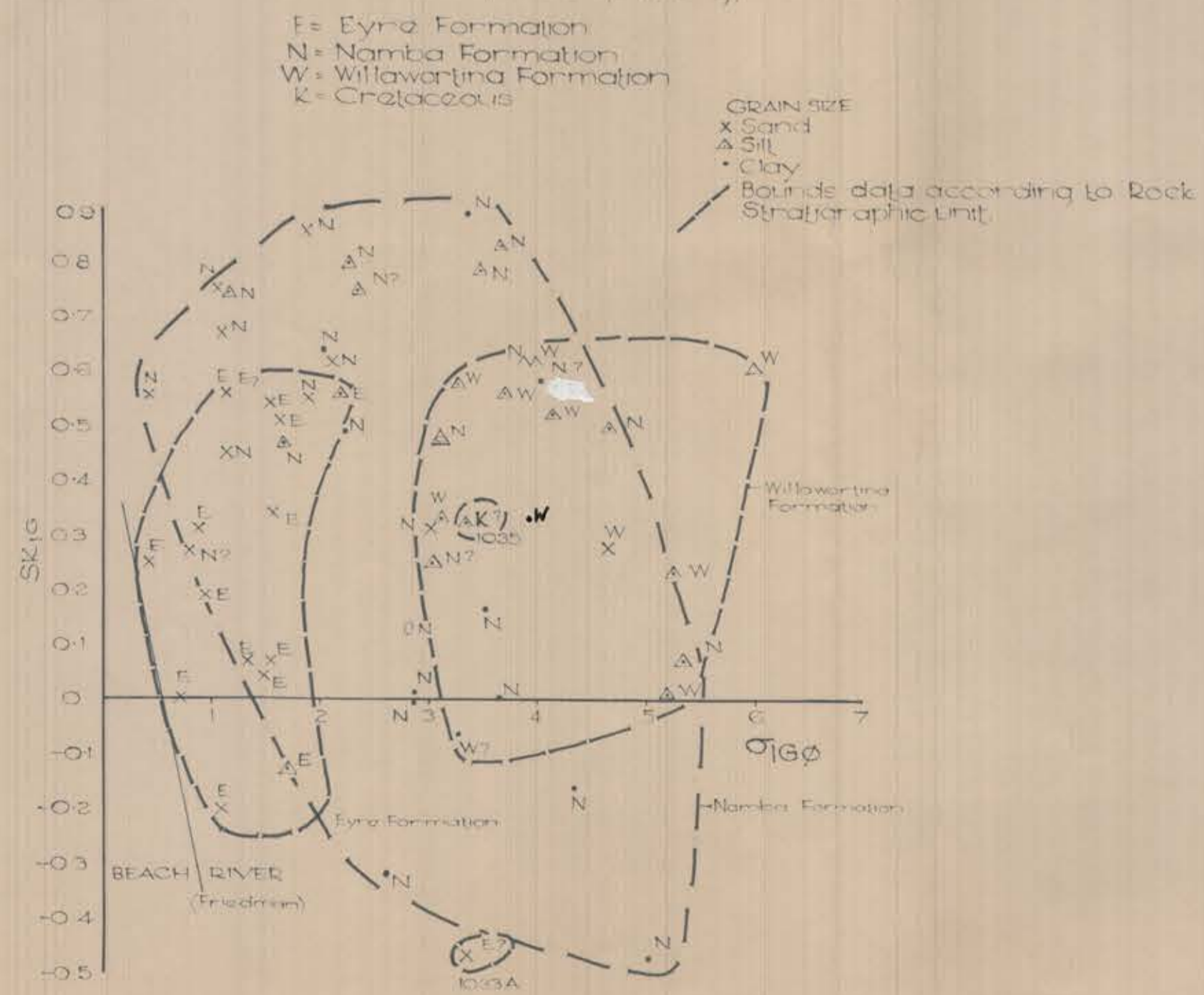
Skewness vs Kurtosis



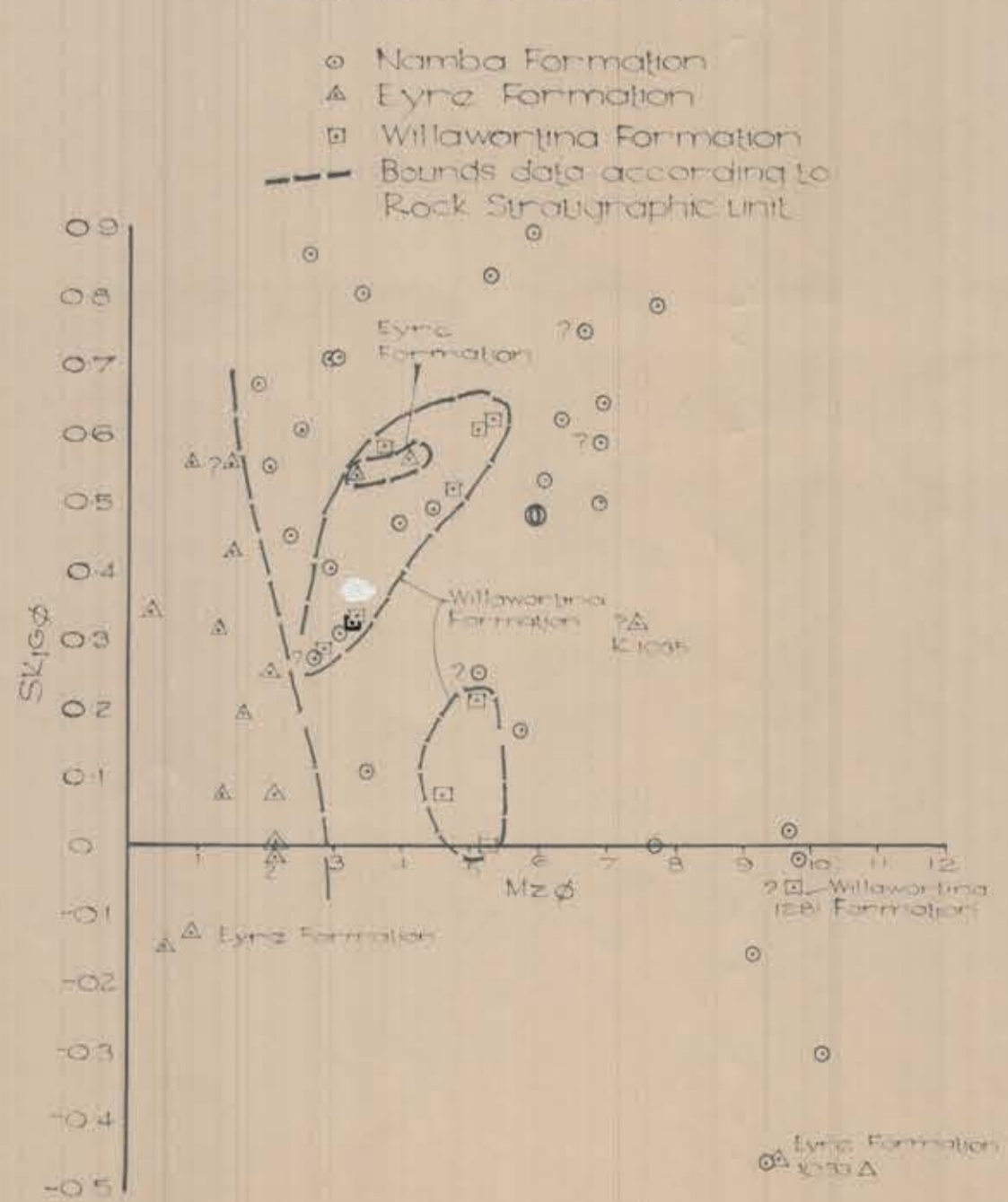
Normalized Kurtosis vs Mean Size



Skewness vs Dispersion (Sorting)



Skewness vs Mean Size



**DEPARTMENT OF MINES — SOUTH AUSTRALIA**

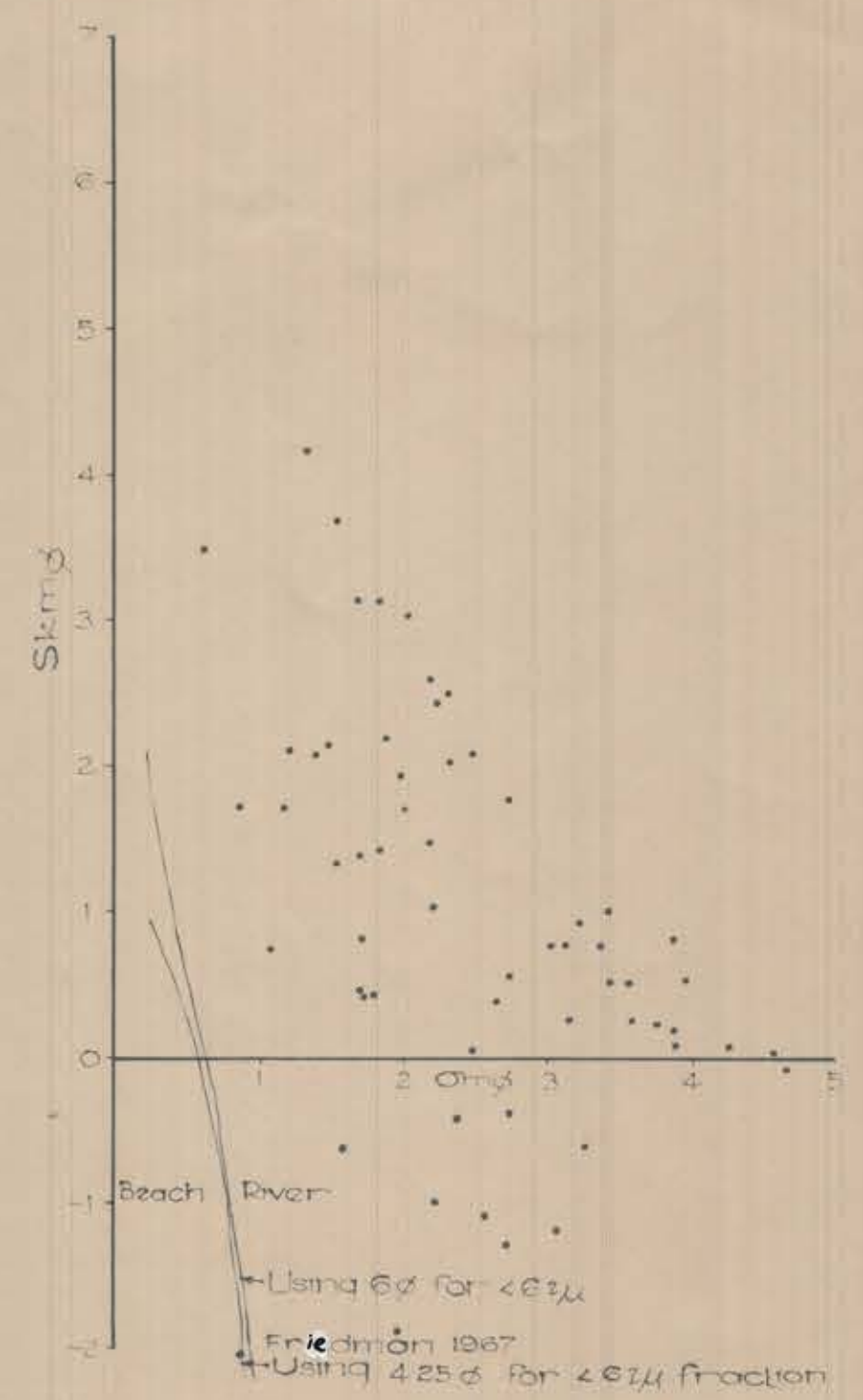
**LAKE FROME-CAINOZOIC**

**GRAIN SIZE PARAMETERS — GRAPHICAL MEASURES**

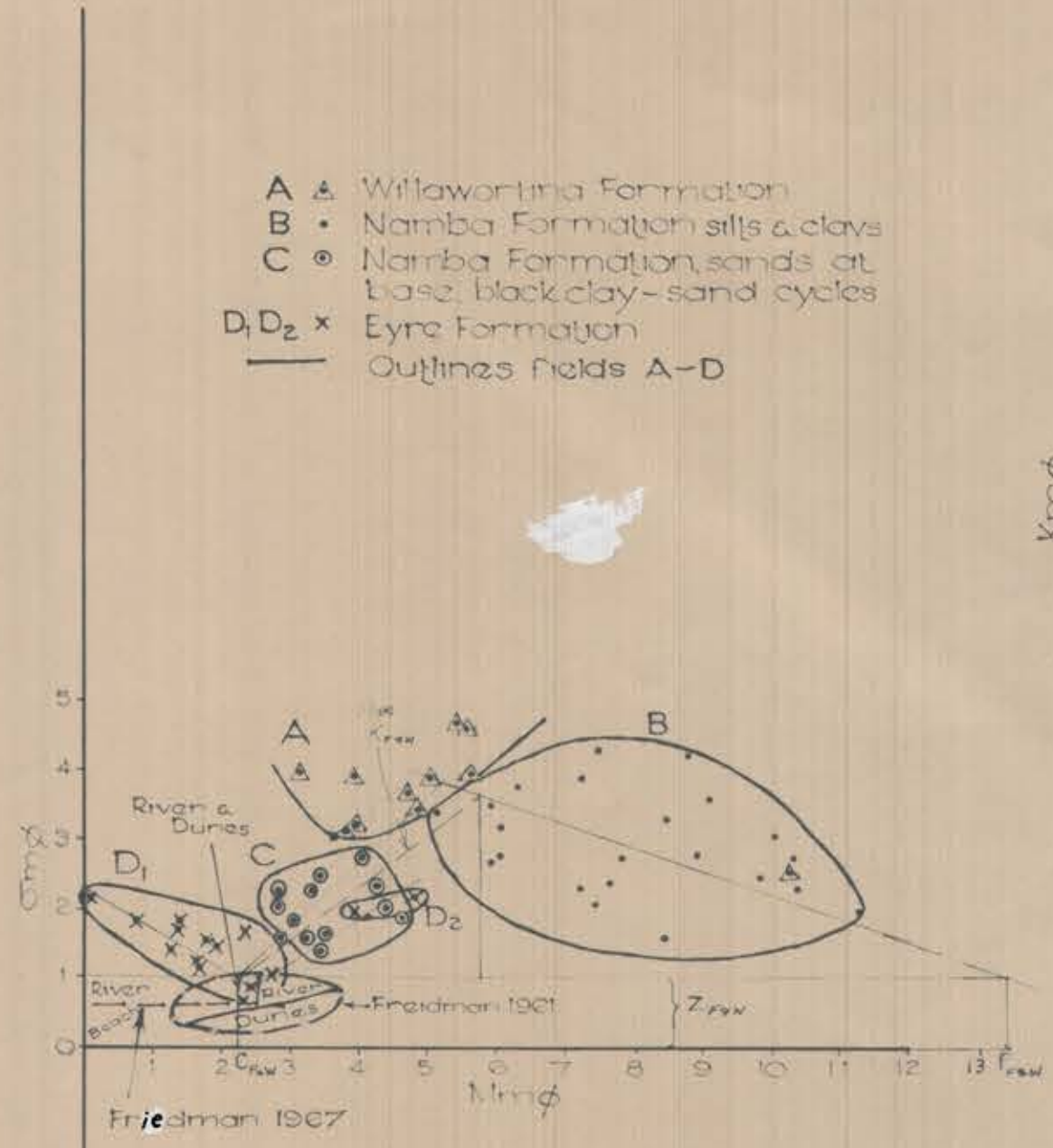
REGIONAL MAPPING SECTION	GEOLOGIST	Dra. R.A.C.	SCALE: No Scale
		Ted. R.B.	<b>74-85</b>
		Ckd. A.F.	
Director of Mines		Exd.	DATE: 3rd Oct 1985



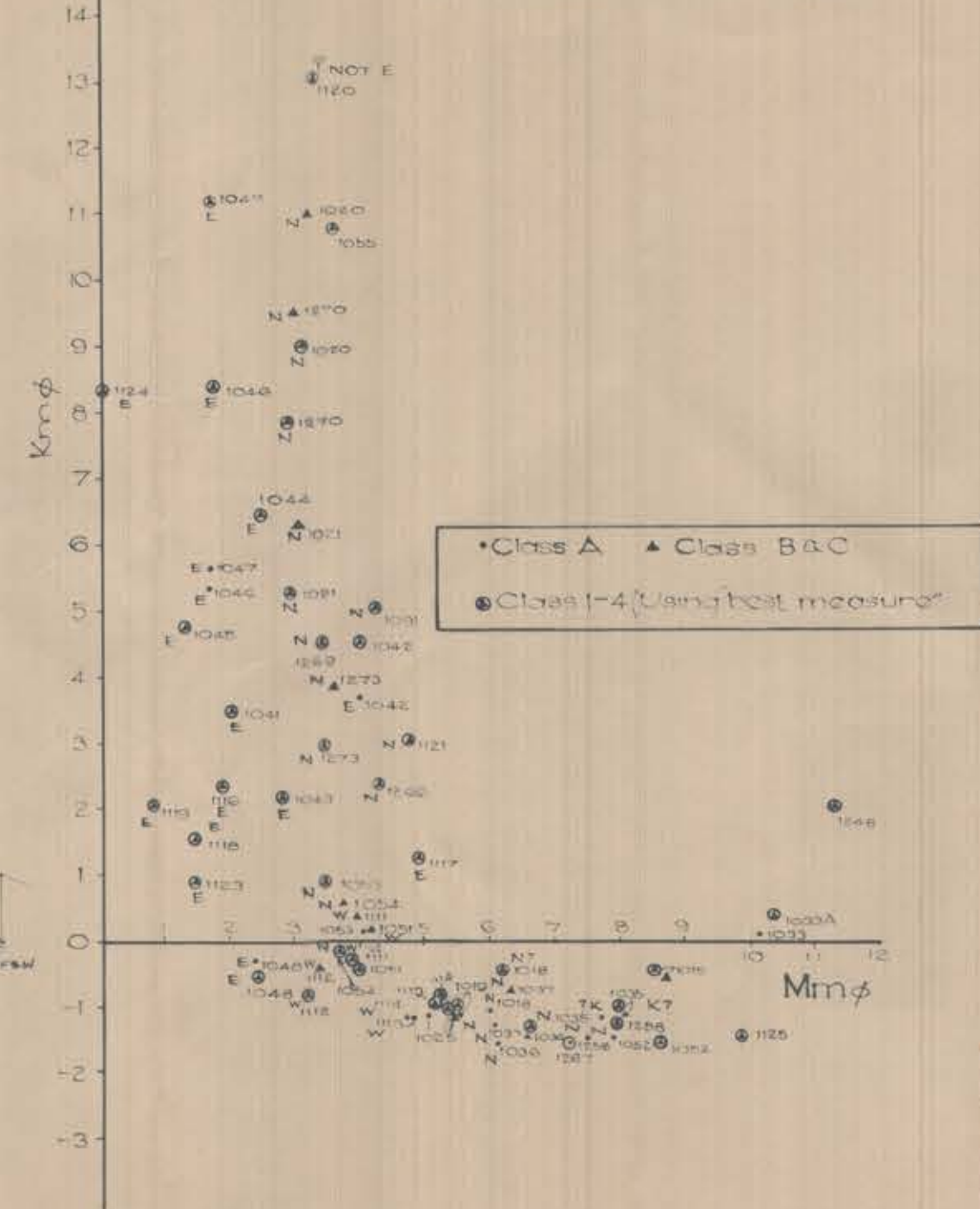
Skewness vs. Sorting (dispersion)  
Class A; B&C used where A is not available



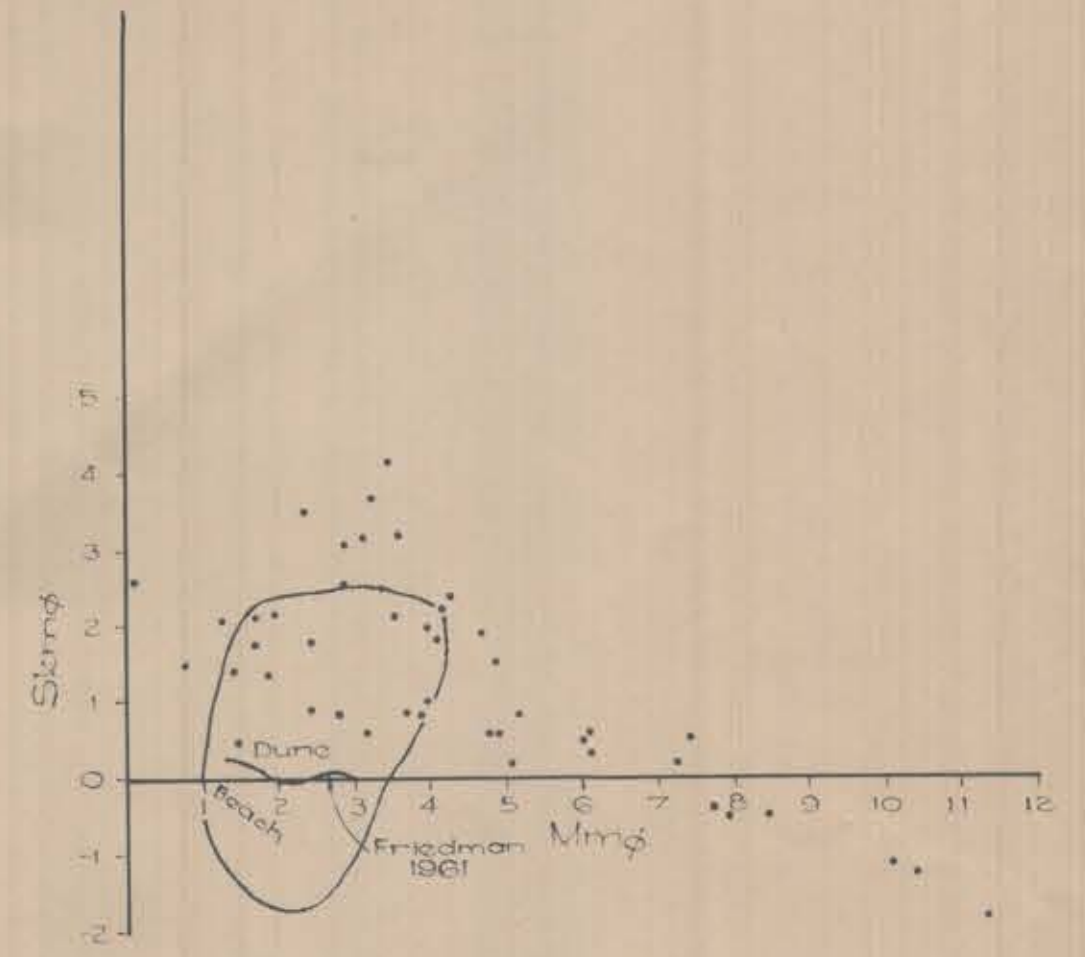
Sorting (dispersion) vs Mean Size  
Class A; B&C used where A is not available



Normalized Kurtosis vs Mean Size  
Using all classes (Size Symbolism)  
E= Eyre Formation  
N= Nambra Formation  
W= Willawortina Formation



Skewness vs Mean size  
Class A; B&C used where A is not available



DEPARTMENT OF MINES — SOUTH AUSTRALIA			
LAKE FROME—CAINOZOIC GRAIN SIZE PARAMETERS MOMENT MEASURES DATA CLASSES A—C, 1—4			
REGIONAL MAPPING SECTION	GEOLOGIST	Drn. R.A.C.	SCALE: No Scale
		Tcd. R.B.	74—83
		Ckd. A.F.	Cd
		Exd.	DATE: 2 <sup>ND</sup> Oct
Director of Mines			52



0905.M  
 C157  
 v-2  
 c-2

33  
 30-9/14 F-32 O

REGIONAL MAPPING SECTION  
 Compiled R.A.C.  
 Dm L.C. Ckd  
 R.A. CALLEN  
 GEOLOGIST

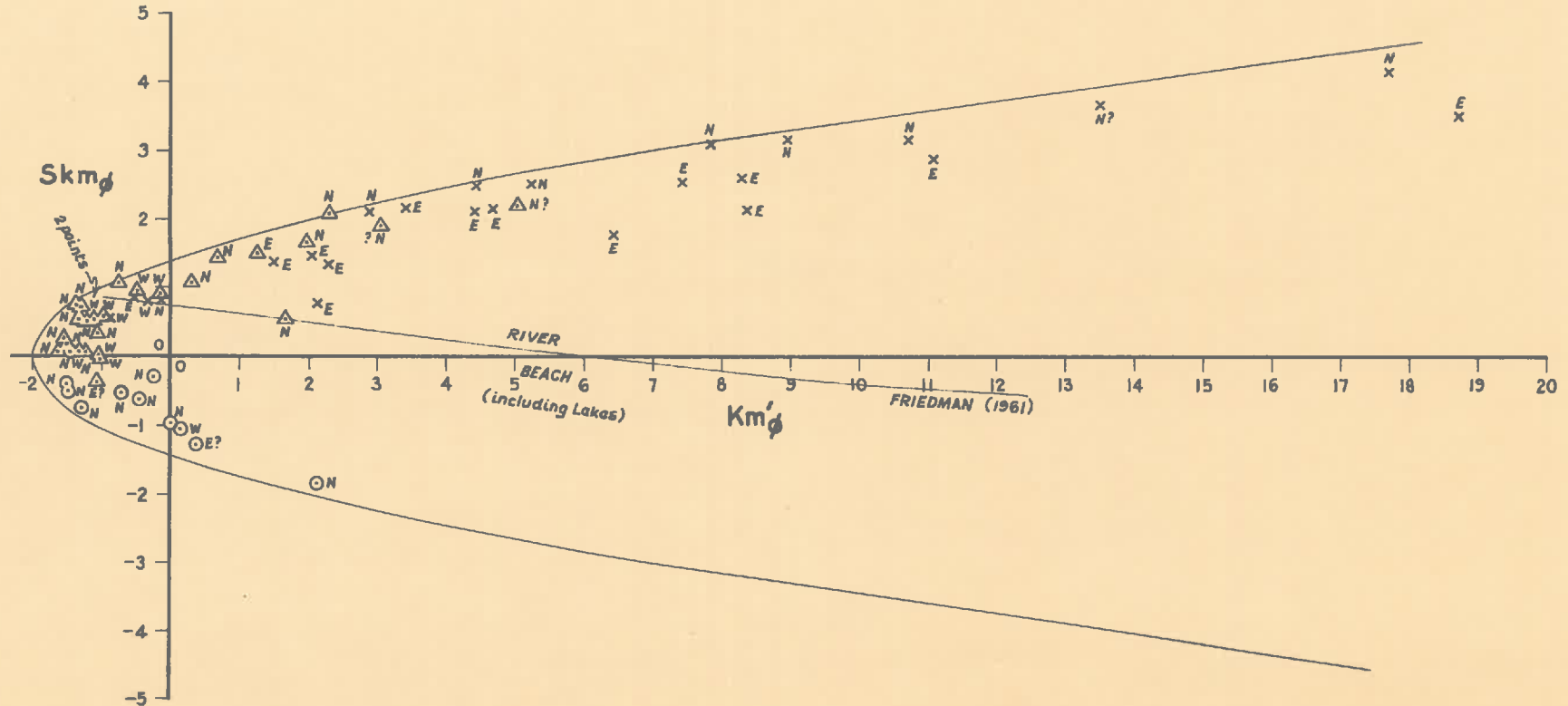
DEPARTMENT OF MINES — SOUTH AUSTRALIA  
 LAKE FROME CAINOZOIC-TERTIARY  
 Grain size parameters; moment measures

Scale: —  
 Date: APRIL '75  
 Drg No. S11456

**MOMENT MEASURES**

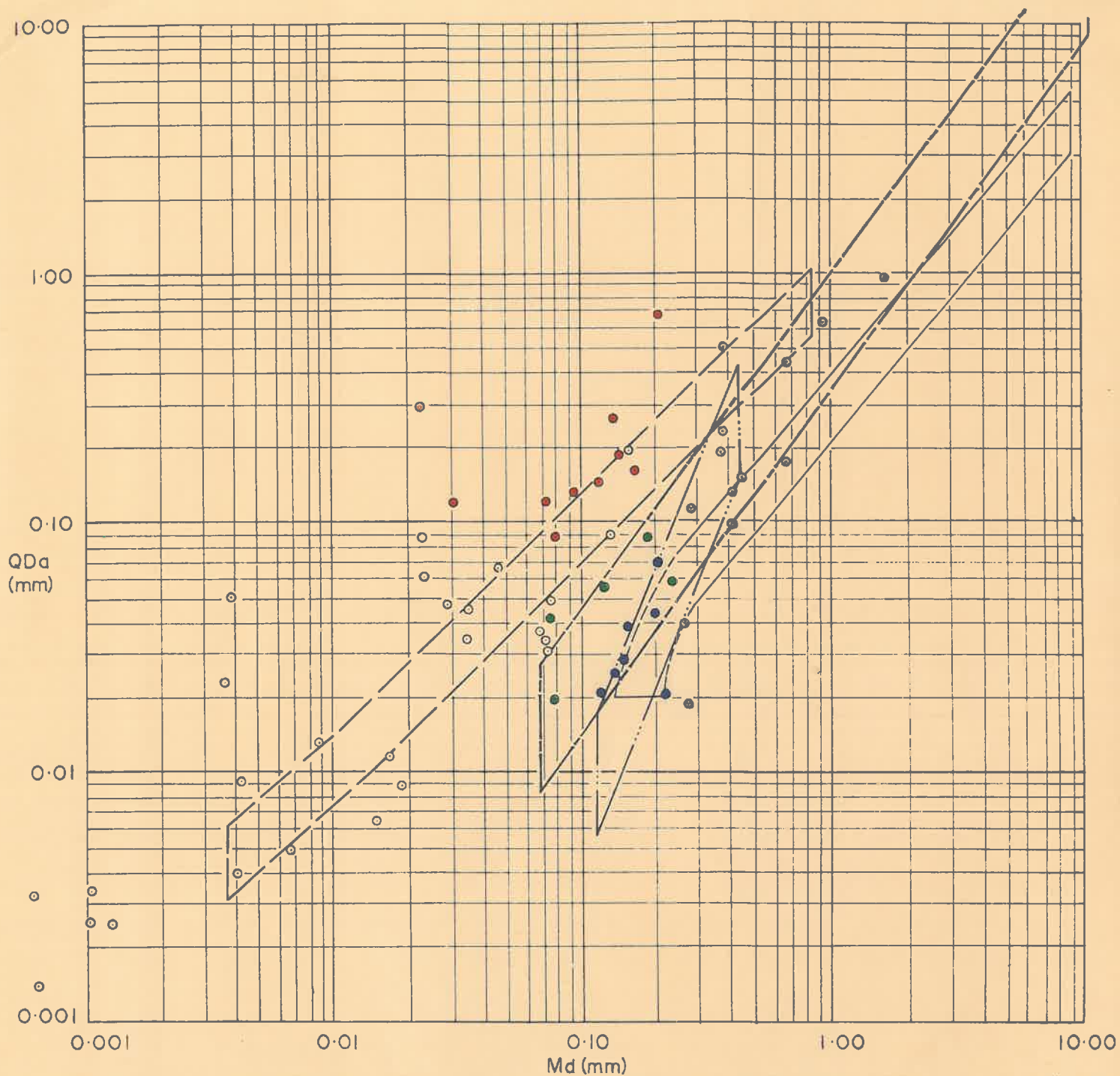
Skewness vs. Kurtosis  
 using 'best fit' data from  
 all classes  
 samples identified for grain  
 size and rock unit.

- x sand
- Δ silt
- clay
- w Willawortina Formation
- N Namba Formation
- E Eyre Formation





LAKE FROME — TERTIARY  
GRAIN SIZE ANALYSIS USING METRIC MEASURES



RESULTS USING 75th & 25th PERCENTILES.....○

EYRE FORMATION.....● NAMBA Fm.(Fine facies).....○

NAMBA Fm.(Sandy facies).....● WILLAWORTINA Fm.....○

THE ENVELOPES REPRESENT THE VARIATION WITHIN EACH ENVIRONMENT AS INDICATED BY ONE STANDARD DEVIATION ON EACH SIDE OF THE MEDIAN TREND LINE. (ACCORDING TO BULLER & McMANUS 1972)

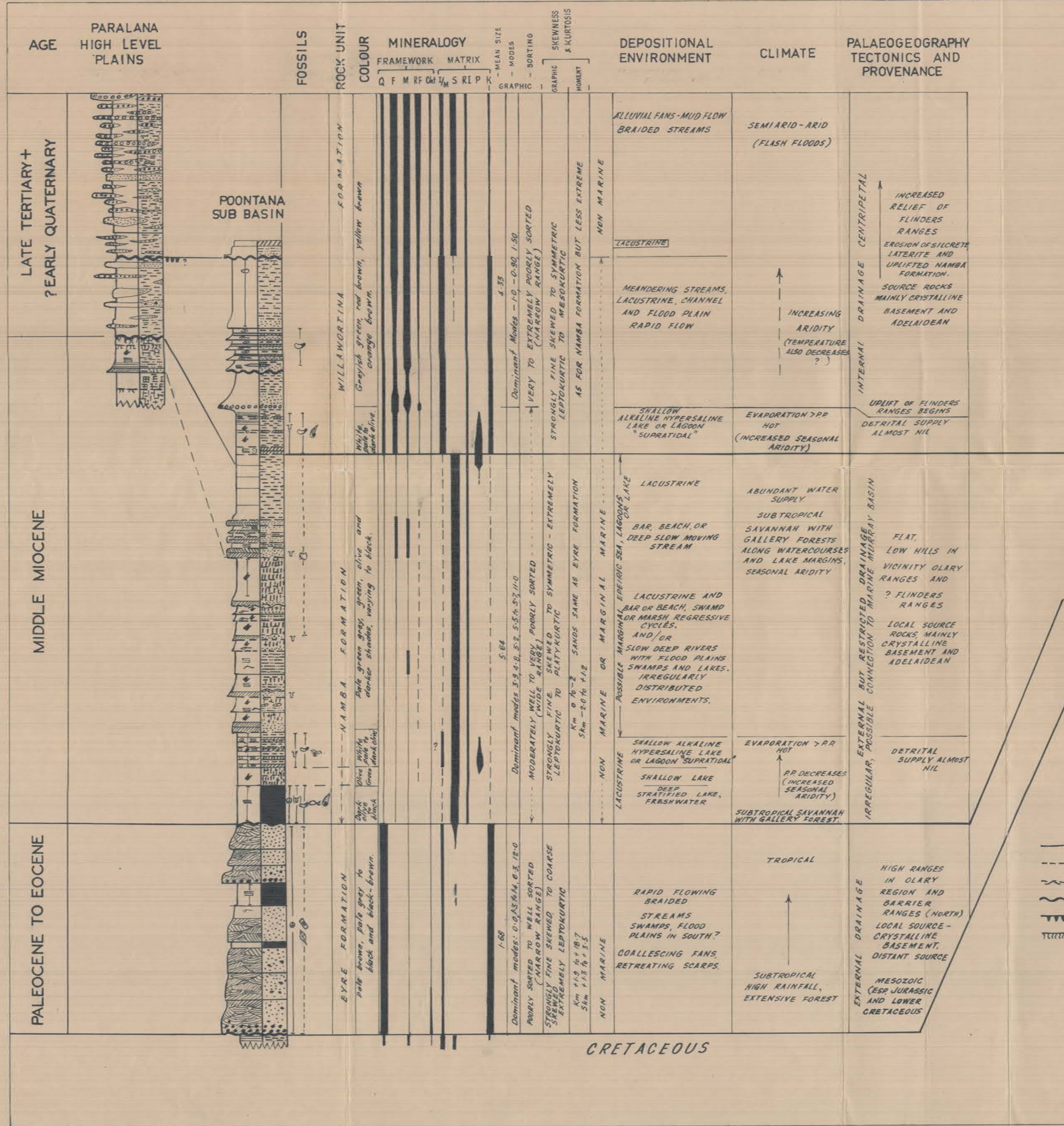
REFERENCE

- AEOLIAN ..... ————
- "QUIET WATER"..... - - - - -
- BEACHES & SAND BANKS..... ————
- FLUVIATILE ..... - - - - -









**MINERALOGY CODE**

Q Quartz  
 F Feldspar  
 M Mica  
 RF Rock Fragments  
 Cht Chert  
 I/M Illite and mica  
 S Smectite  
 RI Randomly interstratified clays  
 P Palygorskite  
 K Kaolinite

Clays < 2 μ fraction

↑ increasing abundance (empirical scale)  
 ↓

**SYMBOLS**

▨ Dolomite  
 ▨ Limestone  
 ▨ Clay  
 ▨ Black sandy clay  
 ▨ Carbonaceous clay or silt  
 ▨ Silt  
 ▨ Sand  
 ○○○○ Granules, small pebbles  
 ○○○○ Pebbles, boulders  
 ○○○○ Secondary carbonate nodules  
 ~~~~~ Lensing bedding  
 ▨ Thin Bedded  
 ▨ Laminated  
 ▨ 1-5 cm Cross laminated  
 ▨ 5-50 cm  
 ▨ > 20 cm

● Intraformational breccia, churned structure.  
 ○ Oolites  
 U Burrows, bioturbation  
 O Ostracodes  
 S Spores & Pollen  
 L Leaves  
 F Fossil wood  
 FR Fish remains  
 OV Other vertebrates  
 G Gastropods  
 AM Algal mats

**CONTACTS**

— Sharp  
 - - - Transitional  
 ~~~~~ Disturbed  
 ~~~~~ Disconformity  
 ▨ With silcrete Unconformities  
 ▨ With alunite

**DEPARTMENT OF MINES - SOUTH AUSTRALIA**

**TERTIARY SEDIMENTS**  
**TARKAROOLOO BASIN, LAKE FROME AREA**  
**SOUTH AUSTRALIA - SUMMARY**

|                           |                            |
|---------------------------|----------------------------|
| Compiled<br>R. A. Collier | Scale: -                   |
| Drn. B. S. G.             | Date: 28 <sup>th</sup> Apr |
| Ckd.                      | Drg. No. 75-56             |

Director of Mines



SYMBOLS

LITHOLOGY

- Cobbles, boulders
- Pebbles
- Very coarse grained sand—granules
- Very fine grained—coarse grained sand
- Silt
- Clay
- Siltstone
- Shale
- Carbonaceous Clay
- Dolomite
- Evaporites (Halite)
- Calcareous
- Limestone
- Sandy Limestone (or Dolomite)
- Carbonate nodules (primary)
- Primary gypsum
- Mica
- Oolites, pisolites
- Siltcrete, Limestone clasts

SECONDARY ALTERATION

- Manganese staining
- Secondary calcareous cement or groundwater calcare
- Ferruginous or manganiferous mottling (marmorisation)
- Calcareous paleosols (length indicates degree of development)
- Carbonate nodules (secondary)
- Manganese or iron nodules
- Secondary gypsum

- Gypsum nodules
- Siltcrete nodules
- Alunite
- Irregular curved fractures often slickensided (Skew planes)
- Layer of sulphide or iron and manganese oxide
- Siltcrete
- Sulphides—disseminated
- Sulphide nodules
- SEDIMENTARY STRUCTURES**  
Sharp
- Present, but not clear, or difficult to see
- Diffuse (poorly defined)
- Horizontally laminated
- Wavy laminated
- Cross Lamination  
Very small scale (sets < 1cm thick)
- Small scale (sets 1cm—5cm thick)
- Medium scale (sets 5cm—0.5m thick)
- Large scale (sets > 0.5m thick)
- Burrows, burrowed contact, trace fossils
- Bioturbation
- Bedding Planes (wavy or flat)  
Sharp
- Diffuse (transitional < 1cm)
- Gradational (transition 1—10cm)
- Transitional (transition > 10cm but < 1m approx)
- Irregular bedding
- Mixed zoned with vertical streaked structure
- Desiccation cracks
- Shrinkage cracks
- Slump
- Lensing bedding or lamination
- Convolute bedding
- Flame structures
- Sedimentary breccia
- FOSSILS**  
Charophytes
- Spores and pollen
- Algal stems
- Vertebrates (other than fish)—aquatic or terrestrial
- Fish bones
- Gastropods
- Land snails
- Ostracods
- Aboriginal artifacts
- Emu egg shell
- Bivalves
- Leaf remains
- Fossil wood
- Root casts

ABBREVIATIONS

COLOUR

- IOY5/4 = MUNSELL COLOUR CODE
- |           |          |           |
|-----------|----------|-----------|
| r red     | bn brown | lt light  |
| o orange  | bk black | m mid     |
| y yellow  | wh white | dk dark   |
| gn green  | gy grey  | bt bright |
| bl blue   | ol olive | v very    |
| pp purple | p pink   | dp deep   |

GRAIN PARAMETERS

1. ROUNDNESS ( Powers )
- |                 |                              |        |
|-----------------|------------------------------|--------|
| VA Very Angular | φ                            | mm     |
| A Angular       | Boulders < -8                | >256   |
| SA Subangular   | Cobbles -6 to -8             | 64     |
| SR Subrounded   | Pebbles -2 to -6             | 4      |
| R Rounded       | Granules -1 to -2            | 2      |
| WR Well Rounded | Very Coarse Sand 0.0 to -1.0 | 1      |
|                 | Coarse Sand 1.0 to 0.0       | 0.5    |
|                 | Medium Sand 2.0 to 1.0       | 0.25   |
|                 | Fine Sand 3.0 to 2.0         | 0.125  |
|                 | Very Fine Sand 4.0 to 3.0    | 0.0625 |
|                 | Silt 8.0 to 4.0              | 0.031  |
|                 | Mud > 8.0                    | 0.015  |
2. WENTWORTH GRAIN SIZE
3. FOLK PARAMETERS ( quoted in comments column ) Order : mean size / sorting / skewness / kurtosis
- |                                           |                                        |                                    |
|-------------------------------------------|----------------------------------------|------------------------------------|
| 3-1 SORTING                               | 3-2 SKEWNESS (Sk)                      | 3-3 KURTOSIS (K)                   |
| VWS Very Well Sorted 0.35 φ               | SFSk Strongly Fine Sk +1 to +0.3       | VPK Very Platy Kurtic < 0.67       |
| WS Well Sorted 0.35 to 0.50 φ             | FSk Fine Sk -0.3 to +0.10              | PK Platy Kurtic 0.67 to 0.90       |
| MWS Moderately well Sorted 0.50 to 0.71 φ | SYM near Symmetrical -0.10 to +0.10    | MK Meso Kurtic 0.90 to 1.11        |
| MS Moderately Sorted 0.71 to 1.0 φ        | CSk Coarse Sk -0.10 to -0.30           | LK Lepto Kurtic 1.11 to 1.50       |
| PS Poorly Sorted 1.0 to 2.0 φ             | SCSk Strongly Coarse Sk -1.00 to -0.30 | VLK Very Lepto Kurtic 1.50 to 3.00 |
| VPS Very Poorly Sorted 2.0 to 4.0 φ       |                                        | ELK Extremely Lepto Kurtic > 3.00  |
| EPS Extremely Poorly Sorted > 4.0 φ       |                                        |                                    |

INDURATION CODE

- |              |                                                                                                  |                             |
|--------------|--------------------------------------------------------------------------------------------------|-----------------------------|
| E Extremely  | Breaks with difficulty under heavy hammer blows                                                  | Siliceous shale, Siltcrete  |
| C Completely | Brittle, breaks with hammer point does not leave a deep impression                               | Sandstone, shale, limestone |
| P Partly     | Can be broken by hand, may be plastic, hammer point leaves clean deep impression                 | Claystone                   |
| S Slightly   | Deforms when struck, can be broken by hand, and be moulded. Hammer point leaves deep impression. | Clay, Clayey sand           |
| N Not        | Behaves like liquid, or disintegrates on lifting (frac running)                                  | Liquid clay or sand         |

CHEMICAL ANALYSES

( in comments column of detailed logs )  
Standard chemical element symbols used

MINERALOGY

- |                       |                                                           |                  |
|-----------------------|-----------------------------------------------------------|------------------|
| Ana Anatase           | KF Potash = Mic (Microcline) Feldspar = Orth (Orthoclase) | S Smectite       |
| And Andalusite        | M Mica, illite { Musc (Muscovite) Biot (Biotite)          | Sill Sillimanite |
| Ca Calcite            | Mag Magnetite                                             | Staur Staurolite |
| Cham Chamosite        | Marc Marcasite                                            | Tourm Tourmaline |
| Carb Carbonate        | Mn Manganese                                              |                  |
| Chi Chlorite          | NaCl or Hal Halite                                        |                  |
| Dol Dolomite          | NaF Sodic = Plag (Plagioclase) Feldspar                   | D Dominant       |
| F Feldspar            | P Polygorskite                                            | SD Subdominant   |
| Goeth Goethite        | Py Pyrite                                                 | A Accessory      |
| gyp gypsum            | Pyrx Pyroxene                                             | Tr Trace         |
| Hb Hornblende         | qz Quartz                                                 | CD Codominant    |
| Ilm Ilmenite          | RI Randomly interstratified clay                          |                  |
| K Kandite (Kaolinite) |                                                           |                  |

ROCKS

- |              |               |                 |
|--------------|---------------|-----------------|
| Qt Quartzite | m metamorphic | calc calcareous |
| COBS Cobbles | sh shale      | ss sandstone    |
| PEBS Pebbles | ls limestone  |                 |

OTHER

- |                                  |                            |                      |
|----------------------------------|----------------------------|----------------------|
| a a as above                     | dioc dioctahedral          | // parallel          |
| anal analysis                    | Dam Dominant               | propn proportion     |
| ang angular                      | Frag Fragment              | h/r perpendicular    |
| Access ( Accessory Accessories ) | fr From                    | prob probable        |
| & and                            | grad gradational           | sl slightly          |
| approx approximate               | g/s grain size             | strat stratification |
| @ at                             | Hex Hexagonal              | thro through         |
| Ave Average                      | Horiz Horizontal           | T/S Thin Section     |
| Δ, Δd breccia brecciated         | interp interpretation      | Vert Vertical        |
| conch conchoidal                 | Intraform Intraformational | wt weight            |
| c.f compare with                 | irreg irregular            | z with               |
| X cross                          | lam laminated              | XRD xray diffraction |
| xtis crystals                    | lamm lamination            |                      |
| D Diameter                       | O/C Out Crop               |                      |
| decomp decomposed                | Oxidn Oxidation            |                      |

FIG.147

DEPARTMENT OF MINES – SOUTH AUSTRALIA

LAKE FROME—CAINOZOIC  
SYMBOLS AND ABBREVIATIONS

|                          |                        |                   |                                         |
|--------------------------|------------------------|-------------------|-----------------------------------------|
| REGIONAL MAPPING SECTION | R. A. CALLEN GEOLOGIST | Compiled R.A.C.   | Scale: NOT APPLICABLE<br>Date: JULY '75 |
| Director of Mines        |                        | Drn. L.C.<br>Ckd. | Drg. No. 75-661                         |



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APPENDICES TO WOPFNER, CALLEN & HARRIS, 1974

APPENDIX I

TYPE SECTION, EYRE FORMATION, 4.8 km EAST OF  
INNAMINCKA HOMESTEAD (HW)

| Unit No. | Thickness in metres | Description                                                                                                                                                                                                                                                                                                       |
|----------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15       | 3.0 m               | This interval is composed of a columnar quartzite silcrete on top and a mottled, broken up and brecciated zone immediately beneath the silcrete.                                                                                                                                                                  |
| 14       | 3.6 m               | Sandstone medium grained to coarse grained, rounded. Near top partly silicified and indurated.                                                                                                                                                                                                                    |
| 13       | 2.7 m               | Sandstone fine grained to medium grained white kaolinitic.                                                                                                                                                                                                                                                        |
| 12       | 3.6 m               | Sandstone white fine to medium grained slightly kaolinitic and slightly micaceous.                                                                                                                                                                                                                                |
| 11       | 1.2 m               | White micaceous clay stone.                                                                                                                                                                                                                                                                                       |
| 10       | 2.4 m               | Sandstone white fine grained silty and micaceous.                                                                                                                                                                                                                                                                 |
| 9        | 7.9 m               | Sandstone coarse grained to granule conglomerate dark brown semi friable and with very little ferruginous cement and in parts slightly silicified, becoming finer grained higher up in the section. There is good grading from the granule size near the base to a coarse to medium grained sandstone at the top. |

The type section is offset approximately 120 metres along the boundary between units 8 and units 9 to the east. There is excellent correlation and projection from locality 1 to locality 2 without any loss of section.

|   |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8 | 7.3 m | This unit consists of a number of wedge shaped or lenticular units which, in ascending order are identified as 8 a, b, c, etc. The individual thicknesses are either average or maximum thicknesses and the actual position may be obtained by referring to the section in Fig. 2. Wedge 8a: 1.5 m pale pink fine grained friable sandstone sub-angular ill sorted mainly quartz, trace of black grains, current bedded to torrentially bedded. Wedge 8b: white siltstone and very fine grained to fine grained sandstone, thinly interbedded 12 mm; some fawn, fine grained sandstone minutely current bedded or festoon bedded. Approximately 10 cm of light grey to buff clay cap this unit. Wedge 8c: sandstone fine to medium grained friable, pale pink subangular |
|---|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



fair sorting. Wedge 8d: 1.2 m of very pale cream, slightly silty clay overlain by 0.5 m of white, thinly bedded siltstone, and very fine grained, silty, kaolinitic sandstone. On top of wedge 8d there is a sequence of pale pink to brick red sandstone medium to fine grained and current bedded. The sand is completely friable. It is subangular and is well sorted with some thin kaolinitic and silty bands. Wedge 8f: 0.3 m siltstone to clay stone, pale yellow very fine grained massive and conchoidal fracturing, slightly gypsiferous and very finely micaceous near top. Above this unit there are 4.1 m of red sandstone friable and current bedded subangular and clay which is interbedded with silt bands in the lower and upper part. There is a lens of clean sand in the centre of this interval.

- |   |       |                                                                                                                                                                                                                                                                                                                       |
|---|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7 | 1.1 m | Sandstone pale pink near base grey and brown in thinly bedded layers 12 mm thick further up. Sand is fine to medium grained subangular and shows fair sorting. It is kaolinitic with silty bands, friable to semi friable and contains some iron staining.                                                            |
| 6 | 0.5 m | Sandstone white very fine grained and silty, slightly micaceous richly kaolinitic and grading near the top into brown and white mottled kaolinitic siltstone.                                                                                                                                                         |
| 5 | 0.3 m | Sandstone as in unit 4 but grey to fawn subangular, well sorted and slightly kaolinitic.                                                                                                                                                                                                                              |
| 4 | 0.6 m | Sandstone, pale pink fine to medium grained friable, angular to subangular well sorted with very little kaolinite matrix. Some clay galls are present.                                                                                                                                                                |
| 3 | 2.1 m | Sandstone, fawn to pale brownish pink, fine to medium grained, slightly micaceous slightly silty with silty micaceous bands, semi-friable; some coarse bands and clay galls with torrential bedding.                                                                                                                  |
| 2 | 2.6 m | Sandstone light grey medium grained to coarse grained, semi-friable subangular well sorted, porous with clay galls and sand crystals near top. Granule conglomerate near base and exhibiting torrential bedding. The sandstone is medium hard and slightly kaolinitic and well sorted. This unit grades up to unit 3. |



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|   |           |                                                                                                                                                                                                                                                                                                                                                                                         |
|---|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | 0.2-0.5 m | Basal conglomerate consisting of well rounded highly polished pebbles with average grain size of 5 to 20 mm and maximum size of 75 mm. The pebbles have a very high polish and are of low to intermediate sphericity, discoidal, well rounded quartz pebbles being the dominant component. Other components are black pebbles of silicified wood, yellow and grey agate and red cherts. |
|---|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|  |        |                  |
|--|--------|------------------|
|  | 33.6 m | Total thickness. |
|--|--------|------------------|



## APPENDIX II

## EYRE FORMATION, REEDY SPRINGS TYPE SECTION (RAC)

| Unit | Thickness<br>Metres | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Petrology                                                                                                                                                                                   |
|------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11   | 7.4                 | <p>Sand, very fine grained-coarse grained, well-rounded polished grains of irregular shape, 50-80 cm bedding.</p> <p>Partly silicified in layers parallel to bedding. Numerous columns and nodules of light grey silcrete oriented perpendicular to bedding. (Best developed at base of bed). Some cobble sized blocks of silcrete consist of smaller nodules with still smaller nodules filling interstices between. Degree of development unaffected by topography.</p> | <p>P290/72 Poorly sorted gravelly sandy silt silicified quartz-arenite. Submature. Minor chert. Some quartz is second cycle since has rounded optically continuous quartz over-growths.</p> |
| 10   | 2.2                 | <p>Sand, very fine grained-coarse grained, well-rounded polished grains of irregular shape, 50-80 cm bedding.</p> <p>Unsilicified at top of creek bank, grading to nodular at creek bed.</p>                                                                                                                                                                                                                                                                              |                                                                                                                                                                                             |
| 9    | 3.4                 | <p>Sandstone, coarse grained to very coarse grained sub-angular, subrounded polished irregularly shaped grains. Wavy bedding. Obscure crossbeds in 40-50 cm sets.</p> <p>Solidly silicified at top of creek bank, grading to nodular at creek bed.</p>                                                                                                                                                                                                                    |                                                                                                                                                                                             |
| 8    | 7.4                 | <p>Sandstone, medium grained polished grains in very fine grained matrix (bimodal?). Obscure cross-bedding. Bedding 2-20 cms thick. Scattered coarse to granule-sized grains and small pebbles. Milky and clear quartz rare red jasper.</p>                                                                                                                                                                                                                               |                                                                                                                                                                                             |



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|   |      |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                |
|---|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |      | Extremely massive, hard and grey silcrete on top of creek banks. Nodular silcrete at base.                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                |
| 7 | 5.2  | <p>Silt, clayey, grading to very fine grained sand at top. Laminated to thin bedded 1-9 cm thick, wavy, distinct.</p> <p>Solid sheet and boxwork silcrete at top of creek bank, grades down to nodular and then botryoidal silcrete, penetrates down bedding varying amounts according to porosity.</p>                                                                                                                                   | P291/72. Laminated well sorted mudstone, calcareous quartz smectite lutite. Framework grains in contact. Sparry calcite patchy.                                                |
| 6 | 1.0  | <p>Sandstone, calcareous, medium-grained, well sorted, angular to rounded unpolished grains. Loosely cemented. Distinct planar tabular cross-bedding in 40 cm sets, sometimes slightly convex.</p> <p>Strongly silicified at top of bank.</p>                                                                                                                                                                                             |                                                                                                                                                                                |
| 5 | 20.0 | <p>Alternating sandstone, sand and claystone. Silty, calcareous 5Y7/1 weathering white. 50% silt to very fine grained sand. Grains not in contact. Laminated 1-2 cm, resulting from variation in sand content. Sand dominates base of unit, and bedding is coarser. Lenses of sandstone are fine grained, white, micaceous and well sorted, in 10-20 cm obscurely cross-laminated beds. Black patches (iron oxide) on bedding planes.</p> | P292/72. Kaolinized and silicified silt. Kaolin secondary. Brecciated - probably represents kaolinised zone associated with silcrete.                                          |
| 4 | 14.0 | <p>Siltstone, sandy calcareous white, alternating with 5Y7/3 sand, calcareous. Siltstone has up to 45% calcite. Arenaceous fraction is fine grained polished well-sorted, sub-angular to subrounded quartz. Beds 5-30 cm, lenticular, sand is</p>                                                                                                                                                                                         | <p>P293/72 - angular silt, well sorted, supported by crystalline kaolin matrix. Secondary calcite. Kaolin diagenetic?</p> <p>P294/72 - well sorted clayey sand: calcareous</p> |

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fine to medium grained, weathering orange, with crossbed sets up to 30 cm, with laminae of alternating clay and sand. Well-sorted, very angular shiny grains. Calcareous siltstone occurs as laminae within small to medium scale crossbed sets, or as beds defining the boundaries of larger scale composite cross beds 120 cms thick. Poor outcrop prevented determination of cross-bedding type.

kaolin quartz arenite. Some grains broken others with crystal faces, many with quartz over-growths. Coarse kaolin with vermicular structures.

Some beds ferruginized, becoming silcreted solid sheets on top creek bank.

---

|   |     |                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                     |
|---|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | 7.0 | Lithology as above, grading sand medium grained, calcareous, with very polished quartz grains, and occasional carbonate grains. Grains angular to subrounded, irregular shapes. Intraformational pebbles of white calcareous siltstone are common at top and bottom. Cross-bedding as above, obscure.                | P295/72. Moderately sorted medium sand: calcareous kaolin quartz arenite. Many flattened oriented grains presumably subparallel to bedding. Some broken grains. Submature. Calcite replaces kaolin. |
| 2 | 1.6 | Sand, white, medium grained with larger scattered grains. Upper bed finely laminated 2mm - 1 cm, wavy. Clayey with rare white clay pebbles. Lower bed is medium scale cross-laminated sharply cut off top and bottom.                                                                                                |                                                                                                                                                                                                     |
| 1 | 3.2 | Sandstone, calcareous, with pebble beds: moderate sorting. Sub-angular to subrounded quartz grains, numerous polished milky and clear granules and pebbles. Basal pebble beds, cemented with calcite, and iron-oxide, lenticular, 30-45 cms thick. The two pebble beds lens along strike and trend into one-another. | P296/72. Moderately sorted coarse sand: ferruginous cherty quartz-arenite. Submature.                                                                                                               |

---



Pebbles are well-rounded well-sorted polished white and clear quartz, grey and black chalcedony and jasper, rare Blanchewater Formation clay flakes. Matrix is FG sand, thus unit is bimodal. Basal contact sharp, undulating, with pebbles in scour structures.

P297/72. Moderately sorted bimodal pebbly and coarse grained sand: ferruginous cherty quartz arenite. Pebbles granite quartz gneissic quartz, chert ?volcanics.

Very ferruginized.

APPENDIX III

EYRE FORMATION TYPE SECTION, MINAD LCIA (RAC)

| Unit | Thickness (in metres) | Description                                                                                                                                                                                                                                                                                        |
|------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5    | 14.75                 | Carbonaceous mudstone grading down to sand. Mudstone: carbonaceous, subconchoidal fracture, silky lustre, black. Grades to: sand, lignitic, medium grained, moderately sorted, with subangular to subrounded grains. Gradation by increasing size and sand proportion.                             |
| 4    | 30.25                 | Sand, fine to coarse grained, (the average is on the fine and medium grained border), clear grains, very angular to subrounded - larger grains polished. Moderate to well sorted. Interbeds of clay, silty to sandy, carbonaceous. Colour brownish grey, pyrite common.                            |
| 3    | 4.0                   | Sand, fine grained moderately sorted, with numerous larger polished grains up to granule size and of irregular shapes. Fine grained fraction more angular and better sorted than coarse-grained fraction. Carbonaceous and pyritic. Maximum grain size 0.8 x 0.4 cms.                              |
| 2    | 3.0                   | Carbonaceous mudstone, silty, pyritic.                                                                                                                                                                                                                                                             |
| 1    | 8.5                   | Pebbly sand. Poorly sorted, varying from fine to pebble size. Larger pebbles highly polished milky, yellowish clear, and grey quartz, black chert. All grains show some polish. Many grains irregular shapes, subrounded. Maximum grain sizes 1.4 x 1 and 1.1 x 0.8 cms. Carbonaceous and pyritic. |



APPENDIX IV  
 EYRE FORMATION  
 MT. ALEXANDER TYPE SECTION (HW)

| Unit | Thickness (in metres) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5    | 3.0+                  | (Top eroded) Sandy silcrete (silicified sandstone) light grey to buff, dense siliceous cement; some pisolitic structures.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 4    | 4.6                   | Gritty quartz sandstone, offwhite to pale buff; very fine to coarse grained; slightly calcareous, pallid-argillaceous matrix, semifriable, massive but for one foot, finely laminated 2.5 m above base. Variable 10-20% granules and very coarse quartz, commonly smoky, subangular to angular, polished. Finer fraction clear to translucent quartz, subangular to subrounded, minor rose quartz, reddish and black opaques. The interval is progressively more silicified upward of 0.6 m from the base with some rough semispheroidal concretions, these in top 1 m vertically aligned. Irregular, sinuous solution channel 6 to 12 mm diam, lined with concentrically layered white silica, and some with clusters of tiny (0.2 mm siliceous "ooliths" or partly cemented brownish red goethite. |
| 3    | 3.4                   | (Poor exposure) Sandstone, pale brown ferruginous medium to fine grained; fair sorting; patchy incipient silicification.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2    | 1.2                   | Siltstone (leached) offwhite to pale buff; moderately hard; argillaceous, micaceous, fine to coarse sandy patches; subrounded shale fragments to small pebble size.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 1    | 1.8                   | Gritty quartz sandstone; (leached) white, very fine to very coarse with granules; argillaceous matrix partially silicified, medium soft and friable; essentially quartz, clear, subrounded to subangular and polished. Some grey and black rounded chert pebbles, and clastic shale fragments near base.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|      | 14+                   | Total thickness.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |



## APPENDIX V

## Data on Palynological Samples (WKH)

| Bore Name                | Type of Sample | Depth in Metres | Sample No. | Biostratigraphic Unit          |
|--------------------------|----------------|-----------------|------------|--------------------------------|
| Seismic shothole YB30    | Cuttings       | 6.1             | S1972      | early Proteacidites pachypolus |
| " " LPC.60               | "              | 29.0            | S2081      | early Proteacidites pachypolus |
| Lake Eyre Bore 20        | Core           | 47.6            | S21        | early Proteacidites pachypolus |
| " " "                    | "              | 48.3            | S2601      | " pachypolus                   |
| " " "                    | "              | 48.8            | S2602      | " " "                          |
| " " "                    | "              | 50              | S20        | " " "                          |
| " " "                    | "              | 51.8            | S2600      | " " "                          |
| " " "                    | "              | 52.7            | S2597      | " " "                          |
| " " "                    | "              | 58.2            | S2603      | " " "                          |
| " " "                    | "              | 59.4            | S2599      | " " "                          |
| " " "                    | "              | 73.2            | S17        | Gambierina edwardsii           |
| " " "                    | "              | 73.5            | S2604      | " "                            |
| Minad LB17               | "              | 185.9-189.0     | S2616      | " "                            |
| Minad LB12               | "              | 88.4- 91.4      | S2573      | " "                            |
| Minad LB18               | "              | 115.8-118.9     | S2593      | " "                            |
|                          | "              | 118.9-121.9     | S2594      | " "                            |
|                          | "              | 121.9-125.0     | S2595      | " "                            |
|                          | "              | 125.0-128.0     | S2596      | " "                            |
|                          | "              | 131.1-134.1     | S2582      | " "                            |
| Minad LB19               | "              | 128.0-131       | S2580      | " "                            |
|                          | "              | 143.3-146.3     | S2572      | " "                            |
|                          | "              | 146.3-149.4     | S2581      | " "                            |
| Cannuwaukaninna Bore     | ?Core          | 33.2            | S715       | " "                            |
|                          | "              | 38.7            | S710       | " "                            |
|                          | "              | 45.7            | S716       | " "                            |
|                          | "              | 48.2            | S717       | " "                            |
| Patchawarra Bore         | Sludge         | 182.9-184.0     | S919       | " "                            |
| " "                      | "              | 216.4-228.6     | S1998      | " "                            |
| Delhi-Santos Moomba 4    | Cuttings       | 253.0-256.0     | S1391      | " "                            |
| "                        |                | 262.1-265.1     | S1392      | " "                            |
| Minad Lake Callabonna 1A | Cuttings       | 170.7-173.7     | S2571      | early Proteacidites pachypolus |



|                               |          |             |       |                                   |
|-------------------------------|----------|-------------|-------|-----------------------------------|
| Minad Lake Callabonna<br>1A   | Cuttings | 176.8-179.8 | S2563 | early Proteacidites<br>pachypolus |
| " " "                         | "        | 182.9-185.9 | S2609 | " " "                             |
| " " "                         | "        | 185.9-189.0 | S2613 | " " "                             |
| " " "                         | "        | 189.0-192.0 | S2614 | " " "                             |
| " " "                         | "        | 192.0-195.0 | S2564 | " " "                             |
| " " "                         | "        | 216.4-219.5 | S2566 | Gambierina edwardsii              |
| Muloowurtinna No. 2           | "        | 126.5-135.6 | S914  | early Proteacidites<br>pachypolus |
| Coonee Creek Bore             | "        | 45.7- 47.6  | S2295 | Gambierina edwardsii              |
| Cootabarlow No. 2             | Core     | 157.0       | S546  | early Proteacidites<br>pachypolus |
| "                             | "        | 163.4       | S5547 | " " "                             |
| "                             | "        | 167.6       | S1084 | Gambierina edwardsii              |
| "                             | "        | 177.1       | S1086 | " "                               |
| Curraworra Bore               | ?Core    | 95.1        | S920  | " "                               |
| Chevron QDH16                 | Cuttings | 108.2-111.3 | S2458 | Proteacidites confragosus         |
| " "18                         | "        | 100.6-103.6 | S2459 | late Proteacidites<br>pachypolus  |
| Yalkalpo No. 1                | Core     | 73.14       | S2579 | Gambierina edwardsii              |
| "                             | "        | 74.18       | S2480 | " "                               |
| E.A. Rudd Bore 5              | Core     | 109.7       | S1987 | " "                               |
| " "                           | "        | 113.1       | S1989 | " "                               |
| " "                           | "        | 116.1       | S1886 | " "                               |
| " "                           | "        | 116.7       | S1990 | " "                               |
| Pacminex 7A                   | "        | 115.8       | S2314 | ?Proteacidites confrag-<br>osus   |
| " 14A                         | "        | 124.4       | S2311 | early Proteacidites<br>pachypolus |
| Sedimentary Uranium<br>B240C3 | "        | 117.0       | S2486 | ?Proteacidites confrag-<br>osus   |
| " " "                         | "        | 118.9       | S2558 | " " "                             |
| Mundi Mundi No. 1             | Cuttings | 88.4- 89.3  | S917  | Gambierina edwardsii              |



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# ECONOMIC GEOLOGY OF AUSTRALIA AND PAPUA NEW GUINEA

## 1. METALS

**LAKE FROME AREA—REGIONAL GEOLOGY, TERTIARY  
STRATIGRAPHY AND URANIUM LOCALIZATION**

*by*

**R. A. CALLEN**



INCORPORATED BY ROYAL CHARTER 1955

**THE AUSTRALASIAN INSTITUTE OF MINING AND METALLURGY**

1976



Callen, R. A. (1976). Lake Frome area - regional geology, tertiary stratigraphy and uranium localization. In C. L. Knight (Ed.), *Economic geology of Australia and Papua New Guinea* (Vol. 1, pp. 803-808). Parkville, Vic: Australasian Institute of Mining and Metallurgy.

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*Vol. 21, Pt 1, pp. 17-52*

**THE LOWER TERTIARY EYRE FORMATION OF THE  
SOUTHWESTERN GREAT ARTESIAN BASIN**

**By H. WOPFNER, R. CALLEN, and W. K. HARRIS**

**SYDNEY**  
**March, 1974**



Wopfner, H., Callen, R., & Harris, W. K. (1974). The lower tertiary Eyre formation of the Southwestern great Artesian basin. *Journal of the Geological Society of Australia*, 21(1), 17-51

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Papers

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Wopfner et al. (1974). The Lower Tertiary Eyre Formation of the Southwestern Great Artesian Basin, plus appendices from S. Aust. Dept. Mines Rep. 73/89.

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Figs. 1-38, 46-55, 147.

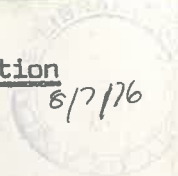
FIGURES

| <u>No.</u> | <u>Description</u>                                                                                       | <u>Location</u> |
|------------|----------------------------------------------------------------------------------------------------------|-----------------|
| 1.         | Geology Lake Frome Area 1:500 000 (with thin section localities).                                        | VOL. II         |
| 2.         | FROME 1:250 000 Geological Map (Sheet SH54.10)                                                           | "               |
| 3.         | Significant geological, structural, geographic and aeromagnetic features relating to Cainozoic sediments | "               |
| 4.         | K69 bore. Detailed Lithology.                                                                            | "               |
| 5.         | EAR3 " " "                                                                                               | "               |
| 6.         | EAR6 " " "                                                                                               | "               |
| 7.         | Yalkalpo 1 bore. Detailed Lithology.                                                                     | "               |
| 8.         | PMX24a bore. Detailed Lithology                                                                          | VOL. II         |
| 9.         | B240C3 " " "                                                                                             | "               |
| 10.        | B240C3 and K69 bores generalized log, grain size frequency curves, petrophysical logs, clay mineralogy.  | "               |
| 11.        | EAR 3. Generalized log, as for Fig. 10                                                                   | "               |
| 12.        | EAR 6. " " " " " "                                                                                       | "               |
| 13.        | Yalkalpo 1 " " " " " "                                                                                   | "               |
| 14.        | PMX24a " " " " " "                                                                                       | "               |
| 15.        | Correlation of Eyre Formation, Subsurface and surface.                                                   | "               |
| 16.        | Fence Diagram of Tertiary.                                                                               | "               |
| 17.        | Wooltana 1 bore. Detailed lithology.                                                                     | "               |
| 18.        | Wertaloona 1 " " "                                                                                       | "               |
| 19.        | EAR 5 " " "                                                                                              | "               |
| 20.        | EAR 7 " " "                                                                                              | "               |



0908.M  
C157  
v2  
c2

FIGURES (contd.)



| No.    | Description                                                                                               | Location |
|--------|-----------------------------------------------------------------------------------------------------------|----------|
| 21.    | EAR 9 " " "                                                                                               | "        |
| 22.    | C15 " " "                                                                                                 | "        |
| 23.    | WC2 " " "                                                                                                 | "        |
| 24.    | Outcrops showing clay mineral analyses.<br>L. Tarkarooloo, L. Namba, Reedy Springs.                       | "        |
| 25.    | Wooltana 1 bore. Generalized log, grain<br>size frequency curves, petrophysical logs,<br>clay mineralogy. | "        |
| 26.    | Wertaloona 1 bore. As for Fig. 25.                                                                        | "        |
| 27.    | EAR 5 " " " " "                                                                                           | "        |
| 28.    | EAR 7 " " " " "                                                                                           | "        |
| 29.    | EAR 9 " " " " "                                                                                           | "        |
| 30.    | C15 " " " " "                                                                                             | "        |
| 31.    | WC2 " " " " "                                                                                             | "        |
| 32.    | EAR 8 " " " " "                                                                                           | "        |
| 33.    | Y11 bore. As for Fig. 25.                                                                                 | VOL. II  |
| 34.    | Glenmore 1 bore. As for Fig. 25                                                                           | "        |
| 35.    | Lake Eyre 20 bore. Detailed litholog.                                                                     | "        |
| 36.    | Clay mineralogy and fence diagram.                                                                        | "        |
| 37.    | Stratigraphy of vertebrate occurrence -<br>correlation of surface and subsurface sections.                | "        |
|        | Eurinilla 1:63 360 sheet area (CURNAMONA)                                                                 | "        |
| 46-50. | Grain size distributions plotted on log-<br>probability paper.                                            | VOL. II  |
|        | Group 1. Eyre Formation                                                                                   | "        |
|        | Groups 2-4. Namba Formation                                                                               | "        |
|        | Group 5. Willawortina Formation                                                                           | "        |
| 51.    | Grain size parameters - graphic measures.<br>(scatter diagrams)                                           | "        |
| 52-53. | Grain size parameters - moment measures.                                                                  | "        |
| 54.    | Metric quartile parameters.                                                                               | "        |
| 55.    | C-M Diagram.                                                                                              | "        |
| 56.    | Summary sheet.                                                                                            | "        |
| 147.   | Symbols and abbreviations.                                                                                | VOL. II  |



DEPARTMENTAL MEMORANDUMDate 19th January, 1976

ECCo/ks200—11.54 1964

From :

R. M. Callen

To :

UNIVERSITY OF ADELAIDER. CALLENHISC THESIS OCT. 1975Subject: CONFIDENTIAL PLANS AND TEXT, REPORT 75/105Docket Reference D.M.291/75

Security File No.

The following plans should be available only to the appropriate leaseholder:

|               |          |                               |
|---------------|----------|-------------------------------|
| <i>Fig 3.</i> | ✓ 75-139 | Portion thereon               |
| <i>Fig 10</i> | ✓ 75-523 | } <i>Not able to identify</i> |
|               | 75-535   |                               |
|               | 75-536   |                               |
|               | 75-537   |                               |
|               | 75-555   |                               |
|               | 75-560   |                               |
|               | 75-570   |                               |
|               | 75-802   |                               |
| <i>Fig. 9</i> | ✓ 74-803 |                               |

The text Chapter 8, and Appendix 6 are available only to leaseholders in amended form, and are otherwise confidential.

Before releasing to a leaseholder, please submit report for checking deletions to Mr. R. Callen.

*Figs 16, 33 (not numbered)*