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DEPARTMENT OF MINES
SOUTH AUSTRALIA

CHEVRON EXPLORATION CORPORATION
PALYNOLOGICAL EXAMINATION OF SELECTED DRILLHOLES, POLDA BASIN, EYRE PENINSULA, E.L. 37

by

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PALAEONTOLOGY SECTION

9th November, 1973

Rept.Bk.No. 778
G.S. No. 5270
D.M. No. E.L. 37
Pal. Rept. No. 13/73

CONTENTS

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ABSTRACT

Palynological analyses of 31 samples from drillholes in the eastern Polda Basin indicate three distinct microfloral units - a. a Late Jurassic assemblage comparable with those from the "Polda Formation" further west, b. a Middle Eocene assemblage comparable with those described from the Poelpena Formation in Polda No. 1 Well, and c. a mid-Tertiary assemblage hitherto unrecorded from the basin which may be correlated with microfloras from the Munno Para Clay of mid-Miocene age.

All of the sediments were deposited under reducing conditions in a non-marine environment.

Whilst difficulties still exist in separating the formations on lithological evidence palynological evidence is definitive.

INTRODUCTION

Palynological examination of sections drilled in the eastern part of the Polda Basin, Eyre Peninsula (E.L. 37), was initiated by Chevron Exploration Corporation because of difficulties in lithostratigraphic interpretation. The difficulty of distinguishing between the Late Jurassic "Polda Formation" and the Middle Eocene Poelpena Formation was emphasised by Harris and Foster (1972) and the problem has now been compounded further by a third and younger carbonaceous unit.

Following a preliminary perusal of logs and cuttings, 31 samples from 9 bores were selected for palynological

examination. Nearly all samples, with the exception of core from LDH21 (samples S2812-S2815), were cuttings. The difficulty of working with cuttings samples was readily apparent. Frequently the yield was diluted and the origin of the microfloral assemblage difficult to determine because of down-hole contamination. This latter effect produced the usual mixing of assemblages characteristic of this type of sample. Eleven samples were barren and thus no palynological evidence as to their age is forthcoming. The location of the bores is plotted on Plan 73-714. The general stratigraphy of the Polda Basin has been discussed by Harris & Foster (1972).

THE ASSEMBLAGES, CORRELATION AND AGE

The appendix summarises the stratigraphic determinations made on the samples and is based on the following discussion. None of the holes penetrated a complete sequence that could be recognised palynologically.

Jurassic assemblages

Microfloras are dominated by *Tsugaepollenites* spp. *Araucariacites australis* and *Inaperturopollenites* spp. with a strong component of bisaccate and trilete species. The assemblages are correlated with those described by Harris and Foster (1972) from the "Polda Formation" and are therefore of Late Jurassic age, i.e. biostratigraphic unit J6 of Evans (1966).

Eocene assemblages

These are characterised by very common *Nothofagidites* species, *N. falcata, N. mataurensis, N. flemingii,* and a

diverse complex of *Proteacidites* species including *P. incurvatus*, *P. kopiensis*, *P. pachypolus* and *P. asperopolus*. This microflora equates with these described from the Poelpena Formation and is of Middle Eocene age - *Proteacidites confragosus* Zone.

Because this analysis is based on cuttings this interpretation must be treated with caution. If there are any younger Eocene units present in this part of the basin it would be most difficult to recognise them without core samples because of problems of downhole contamination with cuttings.

?Mid-Tertiary assemblages

A distinctive assemblage, hitherto not recorded from th Polda Basin, was recovered in six samples. The microflora is not diverse and the lack of good samples does not permit a full evaluation. It is characterised by a low diversity and frequency of *Nothofagidites* species (only *N. mataurensis* has been recorded) and a dominance of *Haloragacidites harrisii* and the alga, *Botryococcus* sp. Other elements include *Podocarpidites* sp., *Lygistepollenites florinii* and *Casuarinidites cainozoicus*.

Without better material it is not possible to correlate this microflora with those from eastern Australia although it does have similarities with mid-Miocene assemblages from the Munno Para clay. It appears to be non-marine and confined to a lithological unit which may be distinct from the Poelpena Formation.

CONCLUSIONS

Three very distinctive palynomorph assemblages can be recognised in this part of the Polda Basin and each is separated by a major hiatus.

As a general rule the lignites or very carbonaceous sediments of the Poelpena Formation tend to be dark brown whereas those of the "Polda Formation" are dark grey. Palynological analysis is the most reliable method of separating the two units at this time.

Reliable separation of the Poelpena Formation and the unit carrying the younger assemblage may be possible on lithological evidence but only after adequate sampling.

All units are non-marine in this area of the basin and where results are positive, reducing conditions have applied since deposition.

9th November, 1973

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REFERENCES

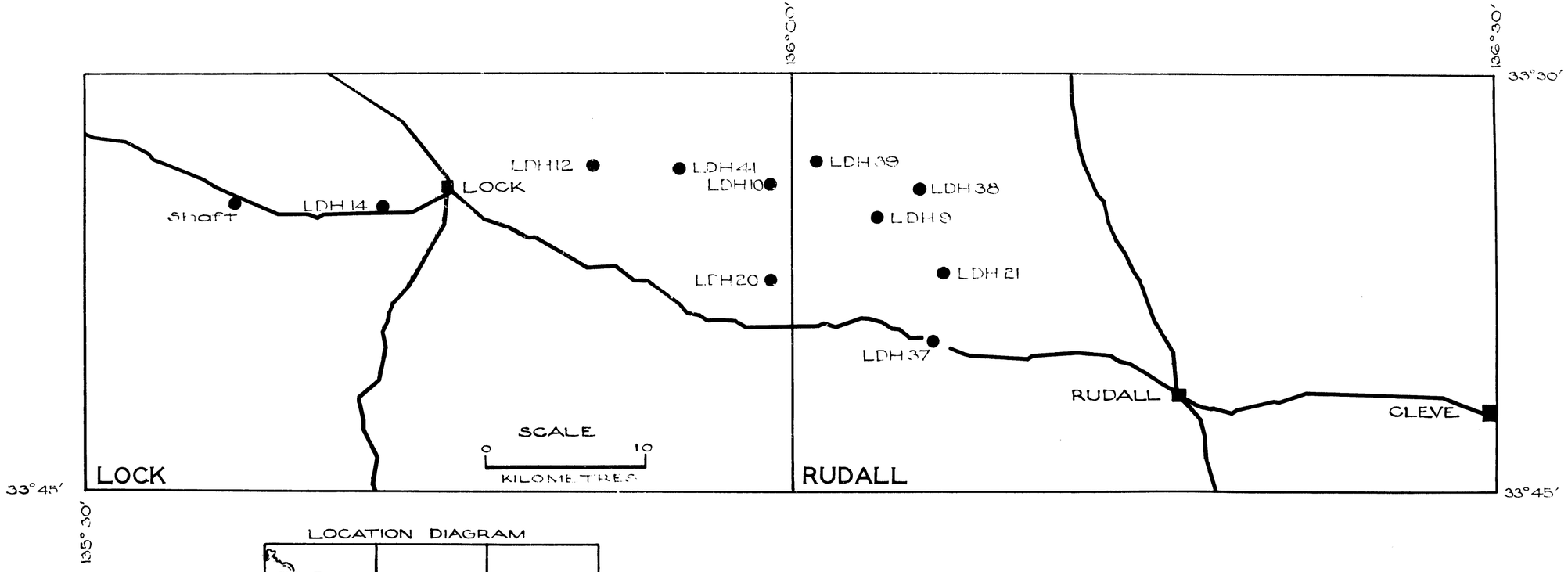
Evans, P.R., 1966. Mesozoic stratigraphic palynology in Australia. *Australas. Oil Gas J.* 12, 58-63.

Harris, W.K. & Foster, C.B., 1972. Stratigraphy and palynology of the Polda Basin. Unpubl. Report, S. Aust. Dept. Mines RB. 72/105.

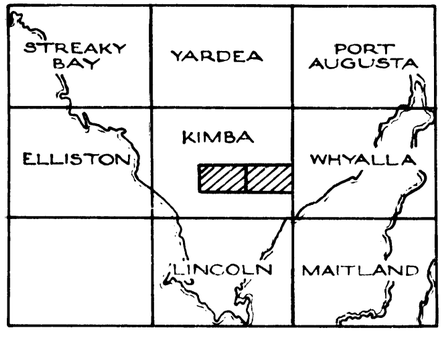
APPENDIX

SAMPLE LIST & STRATIGRAPHIC SUMMARY

Bore No.	Depth in feet (metres in parenthis)		Age	Sample No.
LDH9	300-310	(91.5 - 94.5)	Barren	S2747
LDH9	340-350	(103.7-106.7)	"	S2834
LDH9	390-400	(118.8-122.0)	Mid-Tertiary	S2748
LDH9	440-450	(134.2-137.3)	Middle Eocene	S2749
LDH10	300-310	(91.5 - 94.5)	Barren	S2751
LDH10	440-450	(134.8-137.3)	"	S2750
LDH14	270-280	(82.4 - 85.4)	Late Jurassic	S2830
LDH14	300-310	(91.5 - 94.5)	" "	S2752
LDH14	490-500	(149.5-152.5)	" "	S2754
LDH20	250-260	(76.3 - 79.3)	Mid-Tertiary	S2756
LDH20	350-360	(106.7-109.8)	Middle Eocene	S2755
LDH21	156.9	(47.86)	Late Jurassic	S2812
LDH21	165	(50.33)	Barren	S2813
LDH21	175	(53.38)	Late Jurassic	S2814
LDH21	183	(55.82)	" "	S2815
LDH21	380-390	(115.9-118.9)	" "	S2828
LDH21	450-460	(137.3-140.3)	" "	S2829
LDH37	150-160	(45.8 - 48.8)	Middle Eocene	S2825
LDH37	230-240	(70.2 - 73.2)	" "	S2826
LDH37	410-420	(125.1-128.1)	Barren	S2827
LDH38	410-420	(125.1-128.1)	"	S2831
LDH38	470-480	(143.4-146.4)	Middle Eocene	S2753
LDH39	330-340	(100.7-103.7)	Barren	S2823
LDH39	380-390	(115.9-119.0)	Mid-Tertiary	S2757
LDH39	480-490	(146.4-149.5)	Barren	S2824
LDH41	70- 80	(21.4 - 24.4)	"	S2758
LDH41	110-120	(33.6 - 36.6)	Mid-Tertiary	S2759
LDH41	160-170	(48.8 - 51.9)	Barren	S2820
LDH41	220-230	(67.1 - 70.2)	Mid-Tertiary	S2760
LDH41	230-240	(70.2 - 73.2)	" "	S2821
LDH41	470-480	(143.4-146.4)	Middle Eocene	S2822



LOCATION DIAGRAM



● LDH 10 Borehole Location

PALAEONTOLOGY SECTION	DEPARTMENT OF MINES – SOUTH AUSTRALIA	Scale: 1:250000
Compiled: W.K.H.	EASTERN POLDA BASIN	Date: 25 Oct. 1973
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