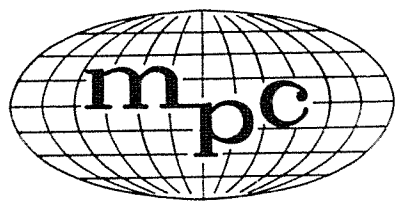


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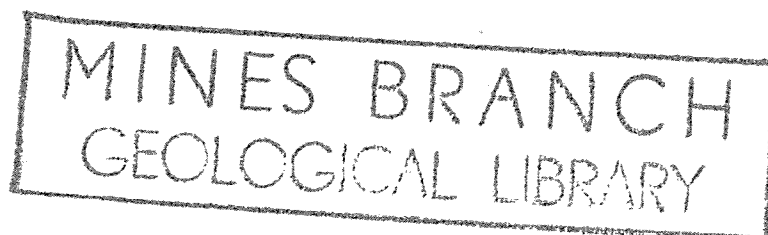
PETROLEUM PROSPECTS

OIL PERMITS 43 & 46

*also including - Tennant Creek -
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EARLY SEQUENCE OF INTERESTING SHELF DEPOSITS, CENTRAL AUSTRALIA

by

C. R. Stelck and Roy M. Hopkins, Jr.

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SUMMARY OF MAJOR FEATURES OF
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by
H. I. Harris

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I N T R O D U C T I O N

At the request of Mr. Benjamin W. Heath, President of Magellan Petroleum Corporation, hereinafter referred to as the "Company", I made a preliminary geologic examination of the Amadeus area in March 1960. Shortly thereafter I recommended the Company should apply for a permit covering what then appeared to be the most promising part of the area. Preliminary exploratory work, which was done under my technical supervision, has now been completed and five drilling prospects have been delineated. Six other prospects have been partly delineated.

This report, prepared at Mr. Heath's request, is an exploratory appraisal of the Amadeus area and its prospects. The main objective of the report is to provide management with technical data for planning future exploratory operations.

Section One of the report deals briefly with stratigraphy and refers the reader to Appendix A of the report for a more complete discussion of the same subject. Section Two deals with the evolution of the Amadeus area and introduces the evidence for an ancient geosynclinal trough situated north of the present location of the Macdonnell Ranges. Section Three deals with petroleum geology and discusses the source potentials of the sediments in some detail. Section Four describes pros-

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pects that have been sufficiently well defined by surface mapping to qualify as drilling prospects. Section Five describes various prospects requiring geophysical work for the delineation of traps and Section Six of the report deals with the demand for petroleum products in Australia.

Appendix A of the report, entitled "Early Sequence of Interesting Shelf Deposits, Central Australia", was written by Dr. Charles R. Stelck and Mr. Roy M. Hopkins, Jr. Appendix B, prepared by Mr. H. I. Harris, summarizes the Northern Territory regulations covering exploration for oil and gas. Northern Territory Ordinances No. 5 of 1954 and No. 14 of 1954 are enclosed in the pocket on the back of the report.

Maps and illustrations for the report are bound separately in the Map Folio.

ACKNOWLEDGEMENTS

The Company retained Dr. Charles R. Stelck, Professor of Geology, University of Alberta, to undertake a stratigraphic evaluation of the Amadeus area in 1960-61. Dr. Stelck is well qualified for this work having specialized in the Paleozoic stratigraphy of Western Canada and having worked for various oil companies. He did excellent work for the Company and provided the basic stratigraphic framework for later structural studies.

The full burden of the field investigation was shifted to

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Mr. Roy Hopkins after Dr. Stelck's departure from Australia. Mr. Hopkins, assisted by Messrs. J. W. Gwinn, Keith M. Williams, and C. M. Laing, completed the structural work and did excellent geological work under climatic conditions which, at times, were very difficult. Mr. Gordon W. Hoffer, a relative novice in drafting, did creditable work in the Company's Alice Springs office.

We are deeply indebted to officers of the Bureau of Mineral Resources. Mr. M. A. Condon directed our attention to the Amadeus area in March 1960 and since then he has shared our interest in the geological concepts emerging from the Company's work. Mr. John N. Casey has been most helpful and Mr. Terry Ouinlan, our first guide to the Macdonnell Ranges, has continued to help the Company's field parties in innumerable ways. Messrs. R. F. Thyer, K. R. Vale, S. Watson and B. Barlow, of the Geophysical Branch of the B.M.R., have reviewed the results of the Company's gravity work in the Amadeus area and have made helpful contributions in the interpretation of data. Finally, we are grateful to Mr. H. S. Taylor-Rogers, Chief Petroleum Technologist of the Bureau of Mineral Resources, and his group, who graciously agreed to run residual hydrocarbon analyses on samples of potential source rocks and to run porosity and permeability analyses on some potential reservoir rocks.

This section on acknowledgements would be incomplete without expressing my personal gratitude to Mr. Herbert I. Harris, Chief Geologist of Magellan Petroleum Corporation. He had the difficult job of

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planning field operations which involved many logistic problems, maintaining efficiency in the field and, last but probably not least, keeping me informed. Many of his suggestions have added significantly to the content and appearance of this report and the Map Folio. For all of these contributions, I am very grateful.

SOURCES OF DATA

The technical section of the report is based on field work that started in June 1960 and continued with only short interruptions until January 15, 1962. This field work consisted of surface reconnaissance work supported by photogeologic interpretations, detailed measurements of stratigraphic sections and semi-detailed mapping of individual prospects using either transit or plane table and alidade for control.

This geologic work was supplemented by numerous "cross-structure" gravity profiles. The gravity survey conducted by International Resource Surveys, Incorporated, of Tulsa, Oklahoma, started in December 1960 and was completed in July 1961.

Geologic and gravity data obtained by trades with other operators were used in planning field work and were found to be particularly useful in defining problems that required further study.

PERMITS

Figure 1 shows the location of the Company's permits in the

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southern part of the Northern Territory. The Company's permits cover 9,957 square miles divided between O.P.46 (2,818 square miles) and O.P.43 (7,139 square miles). The area of these holdings is close to the Northern Territory legal limit of 10,000 square miles.

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