REVIEW OF HYDROCARBON POTENTIAL IN THE EASTERN SABAH OFFSHORE

by

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OUTLINES OF THE PRESENTATION

- Introduction
  - Location
  - General Geology
  - Exploration History
  - Previous Studies

- Objectives

- Method of study
  - Current Approach
  - Limitations

- Results / Findings
  - Stratigraphy
  - Source Rocks, Reservoirs & Seals
  - Structural Reconstruction
  - Amplitude Anomalies

- Conclusions

LOCATION

INTRODUCTION
INTRODUCTION

PREVIOUS STUDIES

- Field work (1959 - 1977)
  SSPC and Exxon confirmed the presence of thick sedimentary sequences, reservoirs and source rocks.

- Aeromagnetic survey
  Confirmed the structural trend of the offshore Dent Peninsula.

- 2D Seismic (1965 - 1999)
  Elf Aquitaine, WMC, and PETRONAS have studied and mapped the structure of the prospects. Sequence stratigraphic studies have also been carried out.

- Geochemical Studies.
  WMC has confirmed the presence of type II & III source rocks.

EXPLORATION HISTORY

- Petroleum systems of the Sandakan Basin, Philippines.
  - J. E. Graves and D. A. Swauger, 1997

- Sequence stratigraphy of the Middle Miocene - Pliocene southern offshore Sandakan Basin, East Sabah.

- Dent Group and its equivalent in the offshore Kinabatangan area, East Sabah.
  - Ismail Che Mat Zin, 1993

- Sandakan basin prospects rise following modern reappraisal.

- The geology and mineral resources of Dent Peninsula.
OBJECTIVES

- To reassess the potential of some of the prospects which have been evaluated before by previous contractors with some new tools and data.
- To identify new prospects and new hydrocarbon plays by interpreting new seismic lines and reinterpreting some of the old lines.
- To improve the understanding on the stratigraphy and geological evolution of the basin by integrating the findings of previous studies by various contractors.

METHOD OF STUDY

CURRENT APPROACH

- Integrates the available data from the offshore based on the previous G&G studies and reports.
- Reexamine the seismic lines focusing on the structure of the prospects and identify amplitude anomalies within these prospects.
- Reexamine the seismic events at the reservoir intervals of the reported oil shows and reassess their potential.

LIMITATIONS

- Biostratigraphic information is not sufficient to provide good control on the stratigraphic correlation. Poor microfossils recovery has been reported by many workers in this area.
- The seismic data available are mainly of moderate quality and of different vintages, as such, detail interpretation could not be carried out in certain areas and level of confidence in the seismic correlation is rather low.
- The study emphasizes more on the geophysical aspect of the prospects while other geological information are based on previous studies in this area.

RESULTS / FINDINGS

PROPOSED STRATIGRAPHIC SCHEME

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</table>
RESULTS / FINDINGS

SOURCE ROCKS, RESERVOIRS & SEALS

- The reported occurrences of oil and gas in many of the prospects that have been drilled suggests that matured source rocks of type II & III exist in this sub-basin.
- Good reservoirs have been encountered in the Sebahat, Ganduman and Tungku Formations.
- Intraformational shales act as the seals.

STRUCTURE RECONSTRUCTION

- Study the structures formed prior to the predicted HC generation and migration
  - Study the structuring processes
  - Identify seismic packages of known HC intervals and correlate with the surrounding area.
  - Flatten the seismic at various important events.
  - Study the structures that were formed at various phases across the area.
- Relate the HC generation and migration to these untested structures.
- Several structures with high potential of HC accumulation have been identified.

EARLY MIocene

NW  SE

AYER FORMATION
Structures formed earlier may have oil and gas as proven in Nymph.

Some of the drilled structures were not properly appraised and may have additional potentials.

There are few structures which are not yet tested and stratigraphic traps occurred within the Lower Sebahat Formation.
RESULTS / FINDINGS

AMPLITUDE ANOMALY

GANDUMAN

NEAR BASE SEBAHAT
UNDRILLED LEAD
"GANDUMAN"

SEISMIC AMPLITUDE ANOMALY ON UNDRILLED PROSPECT "GANDUMAN"

TIME MAP
HIGH-RISK VORTEX UNDRILLED LEAD
"GANDUMAN"

AMPLITUDE ANOMALY

3.0sec NW SE 3km N

AMPLITUDE ANOMALY

NYMPHE

PETROLEUM RESOURCE ASSESSMENT DEPARTMENT, PMU

GSM PETROLEUM GEOLOGY CONFERENCE AND EXHIBITION 2001
MUTIARA HOTEL, K.LUMPUR, MALAYSIA
**RESULTS / FINDINGS**

**AMPLITUDE ANOMALY**

**AMPLITUDE ANOMALY ON UNDRILLED FAULT BLOCK NYMPHE**

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**CONCLUSIONS**

- Blocks SB305 and SB306 are still under explored.

- The stratigraphy of the Sandakan sub-basin needs to be further refined in order to fully understand the geological evolution of the sedimentation.

- Good source rocks, suitable for generating oil and gas, and good reservoir rocks are present in this sub-basin.

- Some prospects seem to indicate greater hydrocarbon potential than what have been reported earlier thus their economic potential should not be ruled out.

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**CONCLUSIONS**

- The Seismic Hydrocarbon Indicators and Amplitude Anomalies found in the studied area could possibly be correlated to the oil accumulation.

- Stratigraphic traps could be the major future hydrocarbon plays in the Sandakan sub-basin.

- There are still great potential for hydrocarbon in the Blocks SB305 and SB306 in the Eastern Sabah offshore.
THANK YOU