

SANDAKAN BASIN, SULU SEA – REVISITED

THE PHILODRILL CORPORATION

MANILA HOTEL, PHILIPPINES

DECEMBER 5, 2019

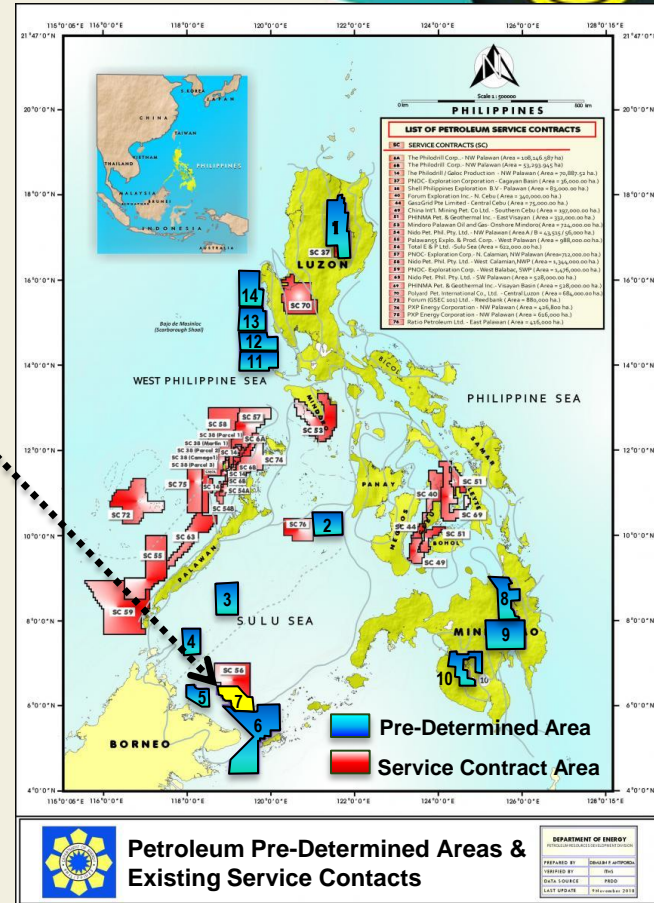
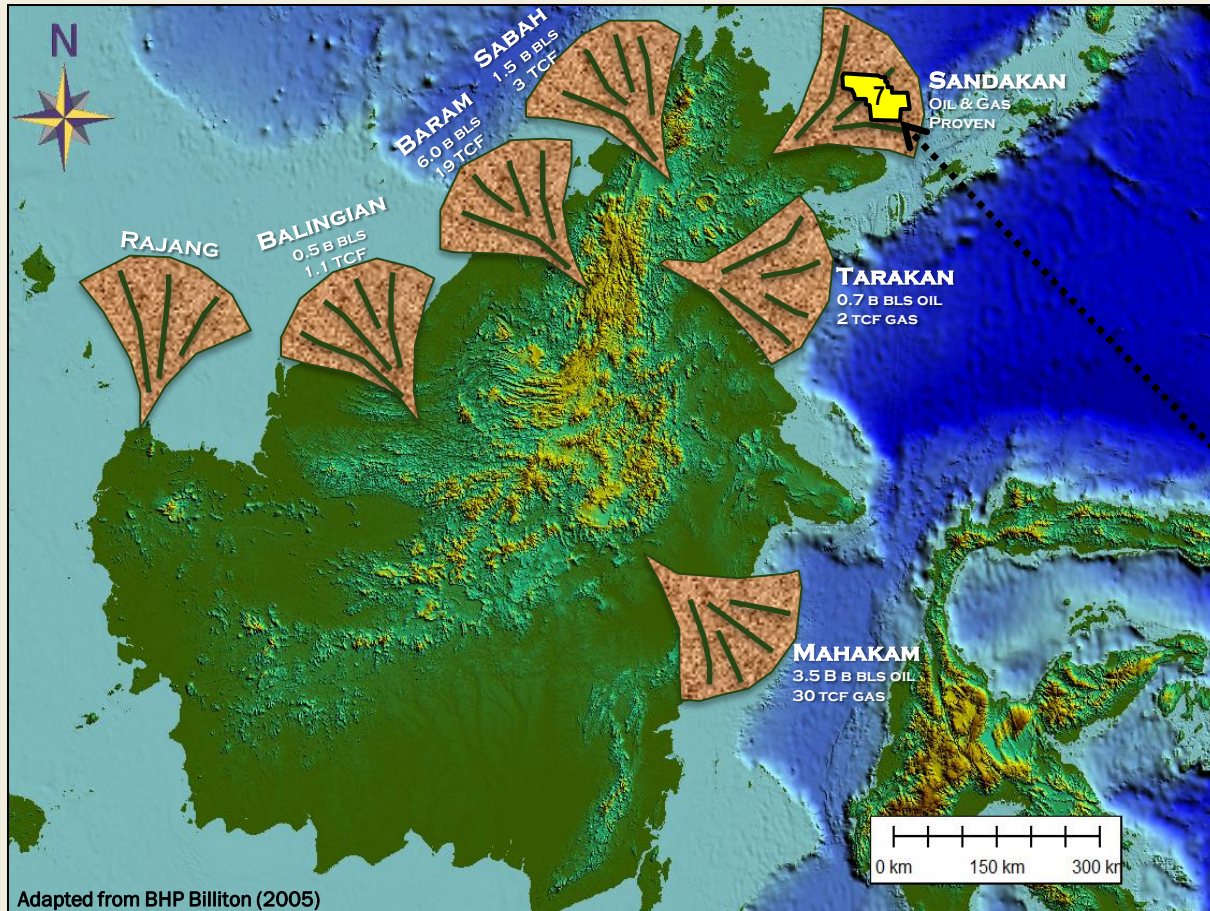


PRESENTATION OUTLINE



- **LOCATION AND SETTING**
- **REGIONAL STRATIGRAPHY**
- **EXPLORATION HISTORY**
- **PROSPECTS AND LEADS**
- **PETROLEUM SYSTEM**
- **EXPLORATION PLAYS**
- **CONCLUSION**

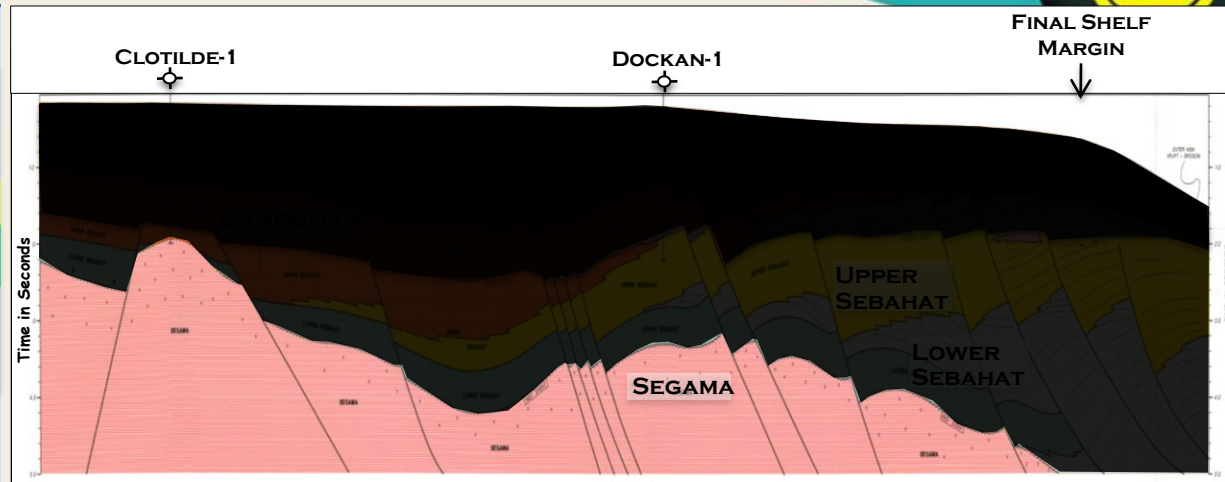
LOCATION AND SETTING



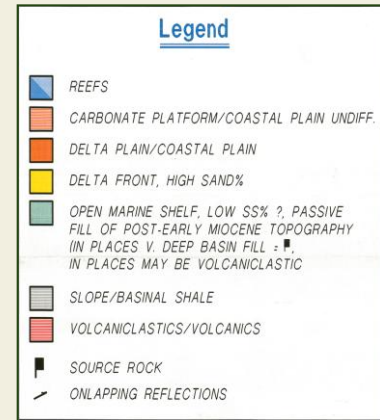
REGIONAL STRATIGRAPHY



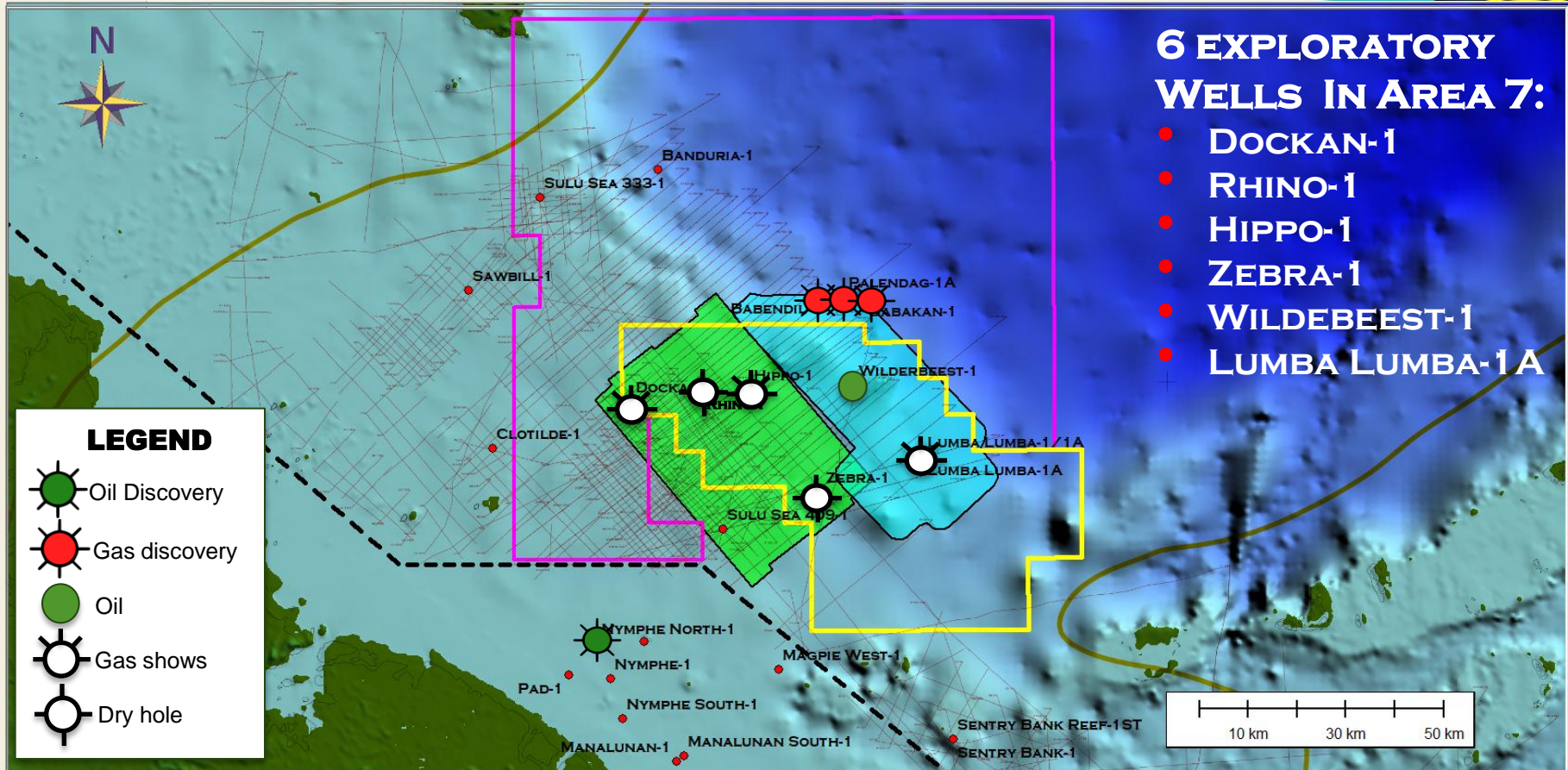
| AGE | LITHOLOGY | HYDRO CARBON | UNITS | COMMENTS |
|-------------|-----------|--------------|-------------------------------|--|
| RECENT | | | TOGOPI FORMATION | SHALLOW MARINE INCLUDING REEFS |
| PLEISTOCENE | | | GANDUMAN FORMATION | DELTAIC TO SHALLOW MARINE |
| MIOCENE | U | ☀ | SEBAHAT FORMATION | SECONDARY OBJECTIVE FLUVIO DELTAIC |
| | M | ☀ | SEGAMA GROUP | MAIN OBJECTIVE REEFS MIXED CLASTICS AND PYROCLASTICS |
| | L | ☀ | RAJAH AND KINABATANGAN GROUPS | FLYSCH SEDIMENTS INCLUDING CROCKER FORMATION |
| | L | ☀ | CHERT SPILITE FORMATION | PILLOW BASALTS RADIOCARBON CHERTS AND PELAGIC LIMESTONES |
| Eocene | U | | | |
| | M | | | |
| | L | | | |
| PALAEOCENE | | | CRYSTALLINE BASEMENT | PREDOMINANTLY ULTRABASIC INTRUSIVES |



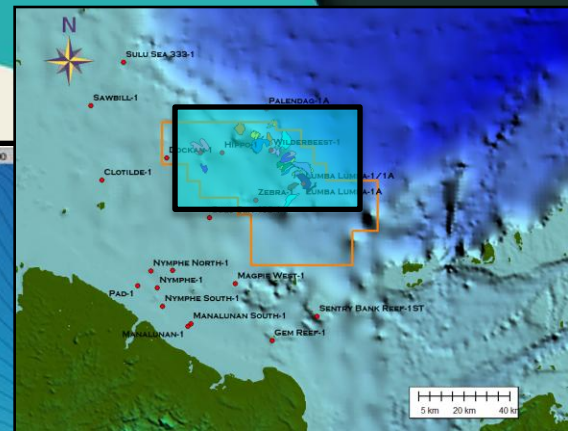
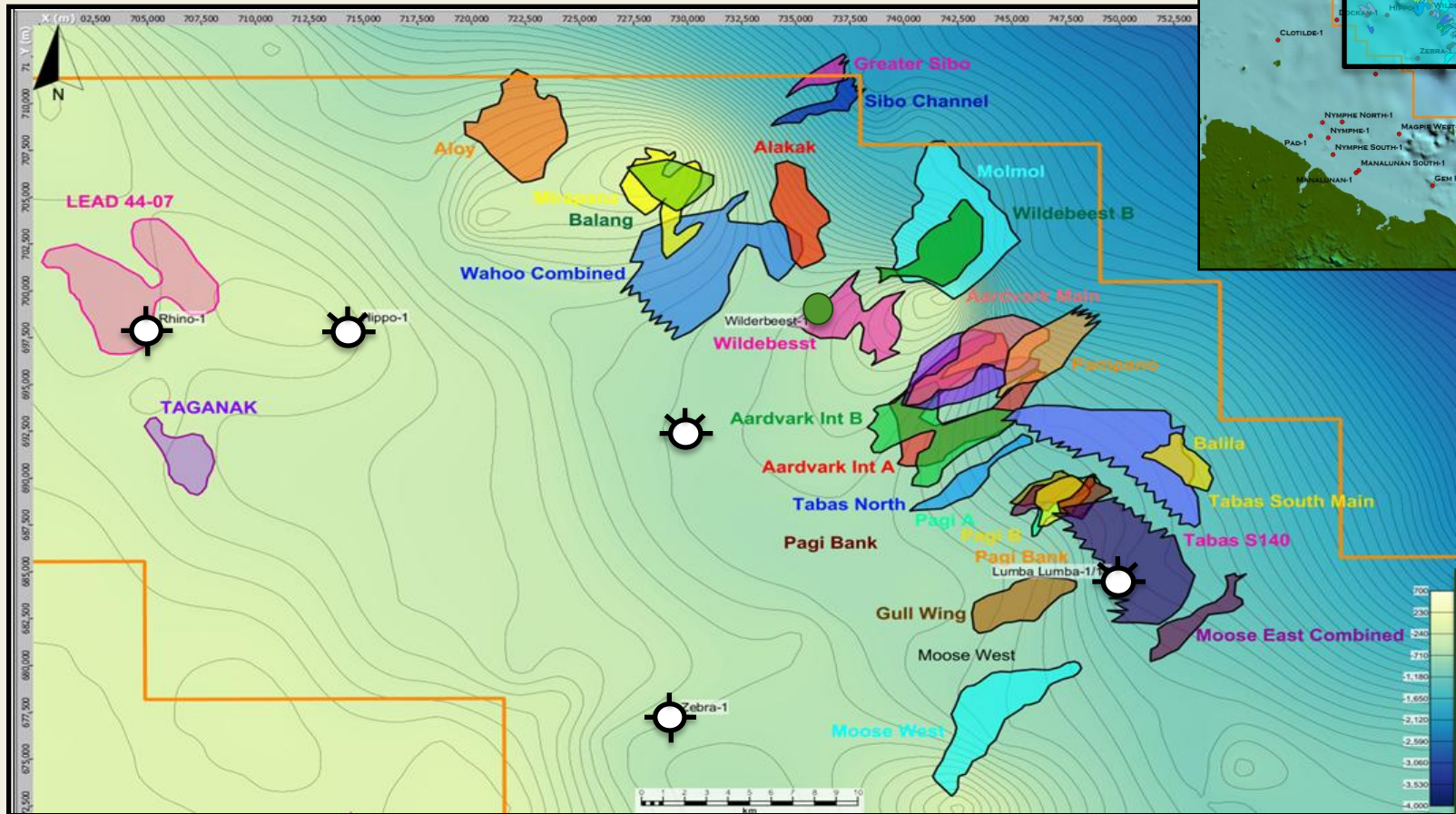
Taken from Sandakan Basin Study- OIEPC (1992)






EXPLORATION HISTORY



PROSPECTS AND LEADS



LEGEND

-  Oil
-  Gas shows
-  Dry hole

EXPLORATION CHALLENGES

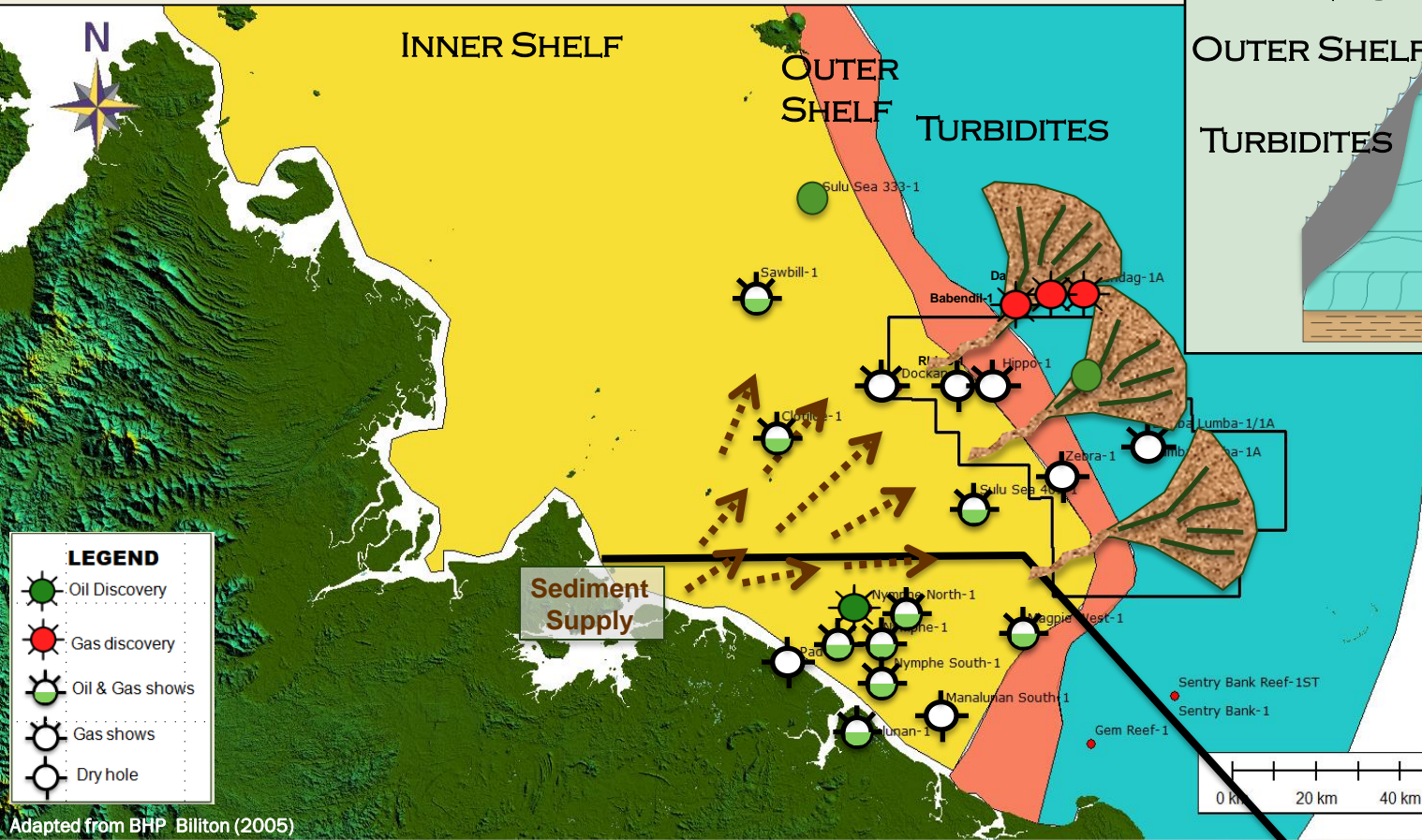
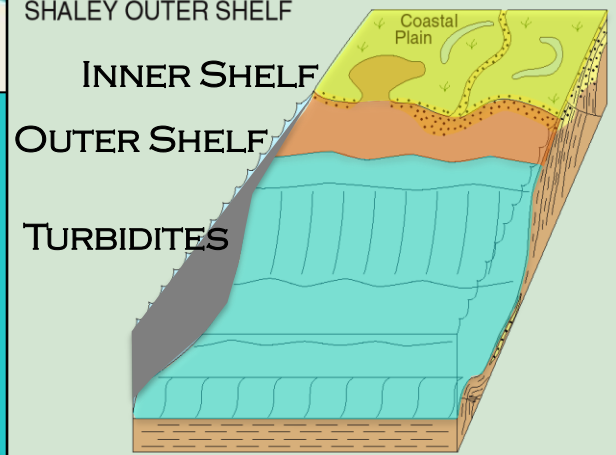


TWO MAIN PROBLEMS:

- 1. RESERVOIR FAIRWAY MODEL FAILED TO PREDICT RESERVOIR DISTRIBUTION.**
- 2. VERTICAL MIGRATION OF HYDROCARBONS TO THE RESERVOIR TARGETS WAS UNSUCCESSFUL.**

RESERVOIR FAIRWAYS

HIGHSTAND DEPOSITIONAL MODEL FOR A SAND-RICH INNER SHELF AND SHALEY OUTER SHELF

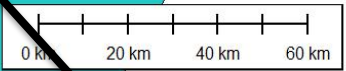


LEGEND

- Oil Discovery
- Gas discovery
- Oil & Gas shows
- Gas shows
- Dry hole

LEGEND

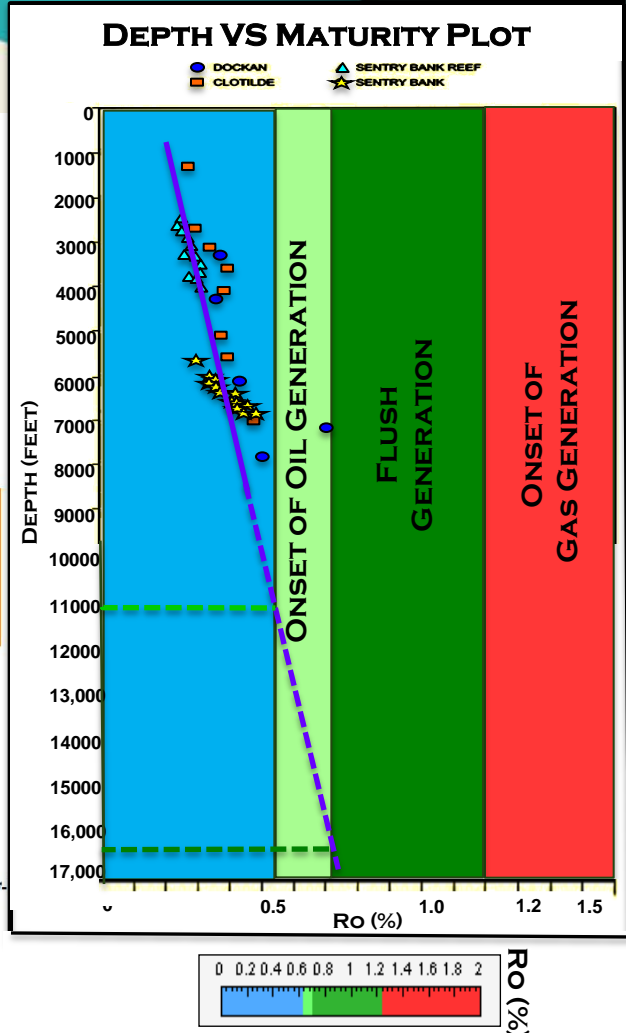
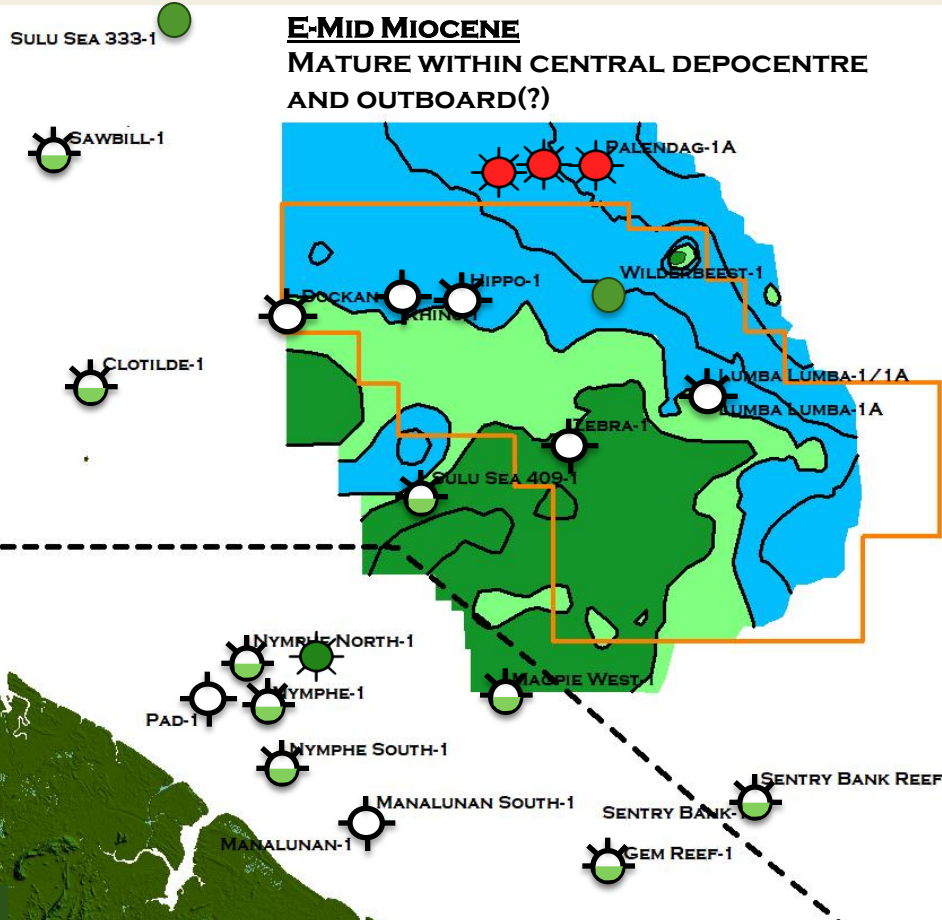
- Inner Shelf
- Outer Shelf
- Basin Floor
- Sediment Migration



Adapted from BHP Billiton (2005)

SOURCE ROCKS AND MATURITY

- LEGEND**
- Area of Thermally Mature section
 - Areal Extent of Overpressure Zone
 - Depth to Basement (km)
 - Direction of HC
 - Sediment Supply



Adapted from BHP Billiton, 2005

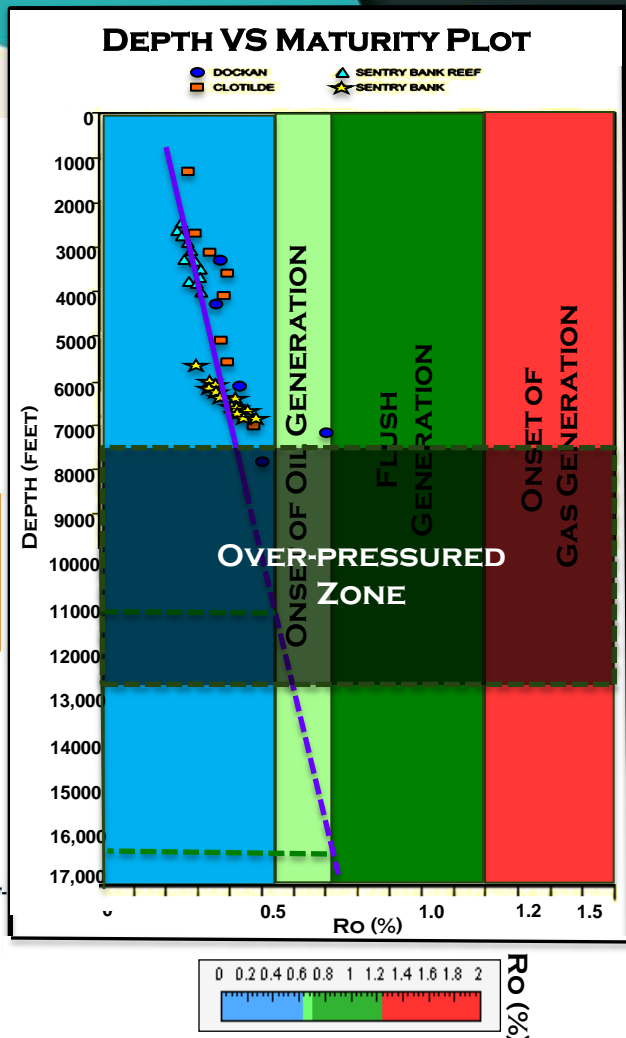
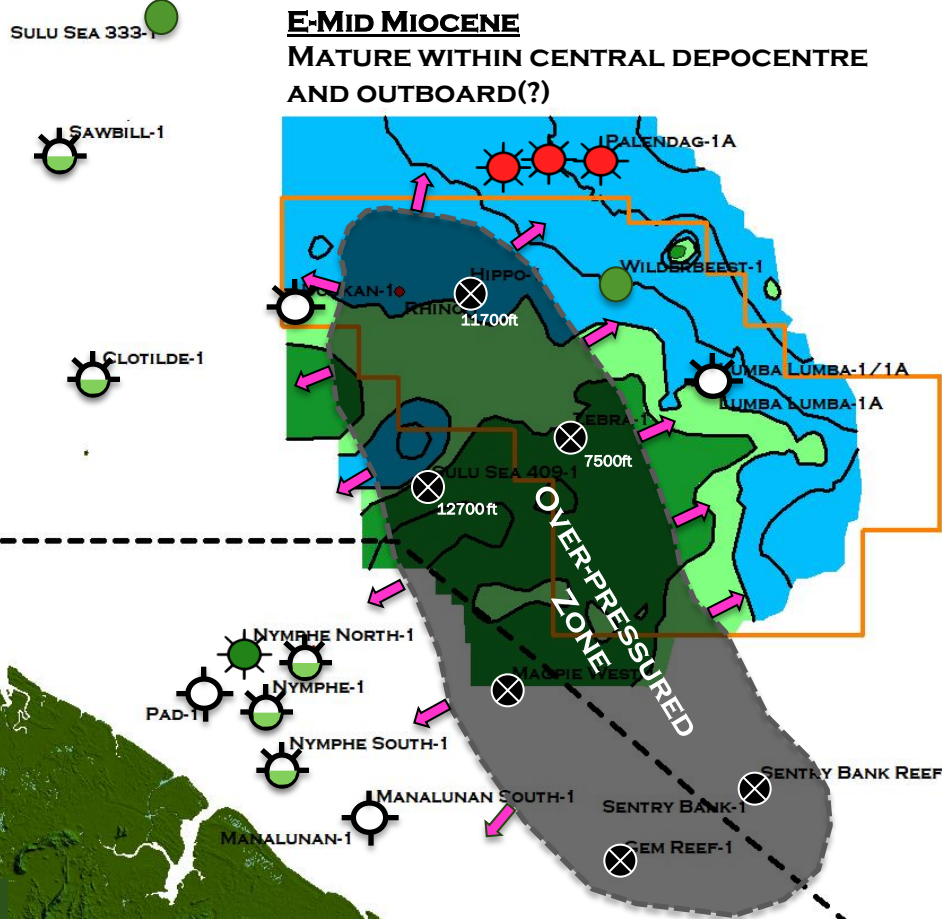
OVERPRESSURED ZONES



| WELLS | Over pressured Zones |
|------------------|--|
| Dockan-1 | No overpressure observed. |
| Rhino-1 | No mention of overpressure. |
| Hippo-1 | High-pressured sands at 11,700 to 11,740 feet |
| Wildebeest-1 | Not much data available. |
| Sulu Sea 409-1 | High-pressured shale at 12,700 to 13,700 feet |
| Zebra-1 | Gopressure zones at 7,500 feet below. |
| Lumba Lumba 1/1A | No formation pressure test was attempted. |
| Nymphe North-1 | High pressure reservoirs were found from 10,160 feet. |
| Sentry Bank-1 | Geo-pressure zones observed. |
| Gem-Reef-1 | High pressured zones are encountered in this well. |
| Manalunan-1 | No mention of overpressure. |
| Magpie West-1 | High pressured zones as observed from the Borehole Compensated Sonic logs. |

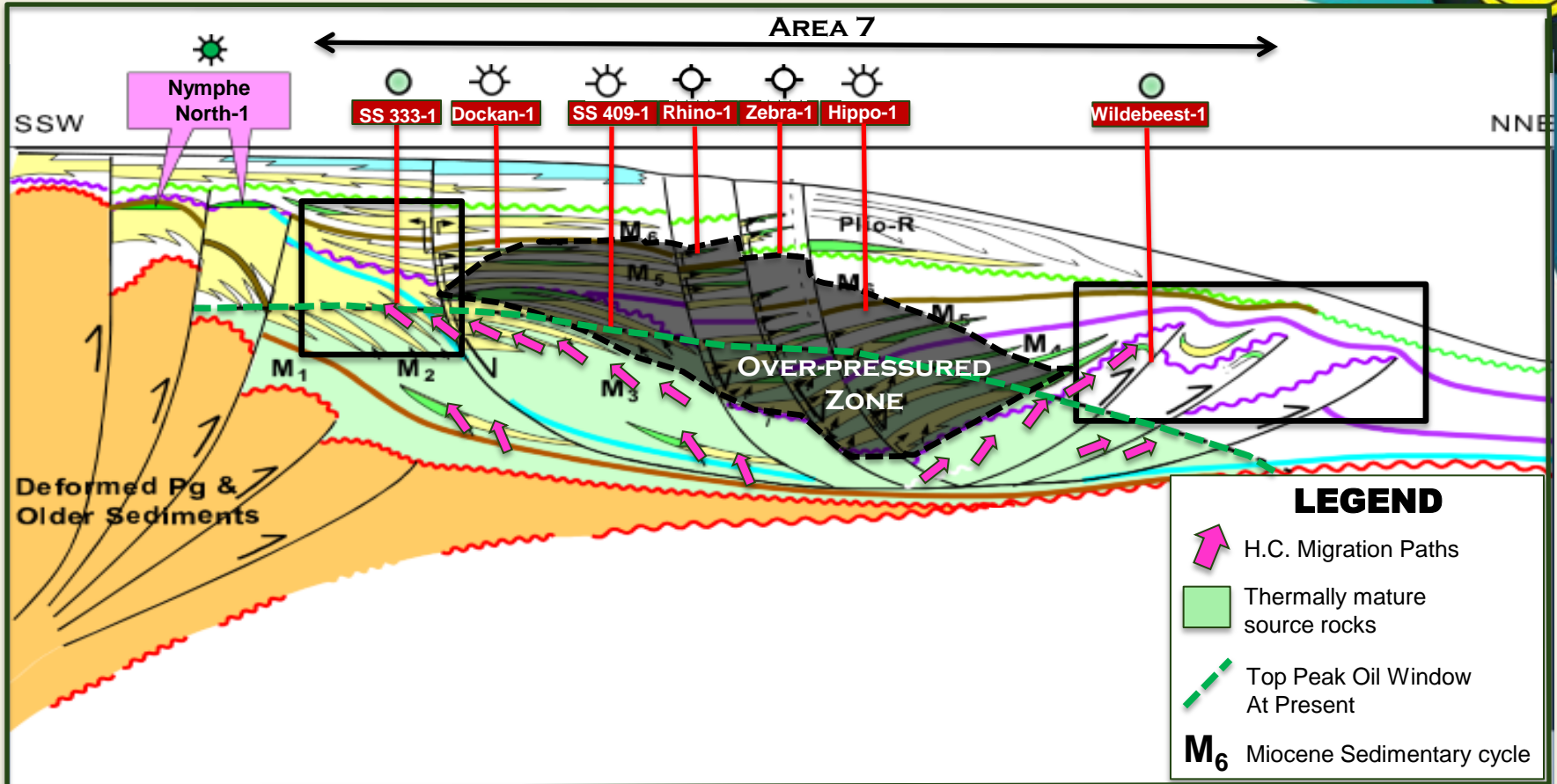
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Adapted from BHP Billiton, 2005

EXPLORATION PLAYS



CONCLUSION



➤ 2 MAIN EXPLORATION CHALLENGES IN THE STUDY AREA:

1. RESERVOIR FAIRWAY MODEL FAILED TO PREDICT RESERVOIR DISTRIBUTION.

- ❑ ATTRIBUTE ANALYSIS AND SPECTRAL DECOMPOSITION

2. VERTICAL MIGRATION OF HYDROCARBONS TO THE RESERVOIR TARGETS WAS UNSUCCESSFUL - OVER-PRESSURED SECTION ACTS AS A VERTICAL BARRIER

- ❑ MAPPING OF THE OVER-PRESSURED ZONE THROUGH IN THE 3D SEISMIC VOLUME VELOCITY DATA



THANK YOU
