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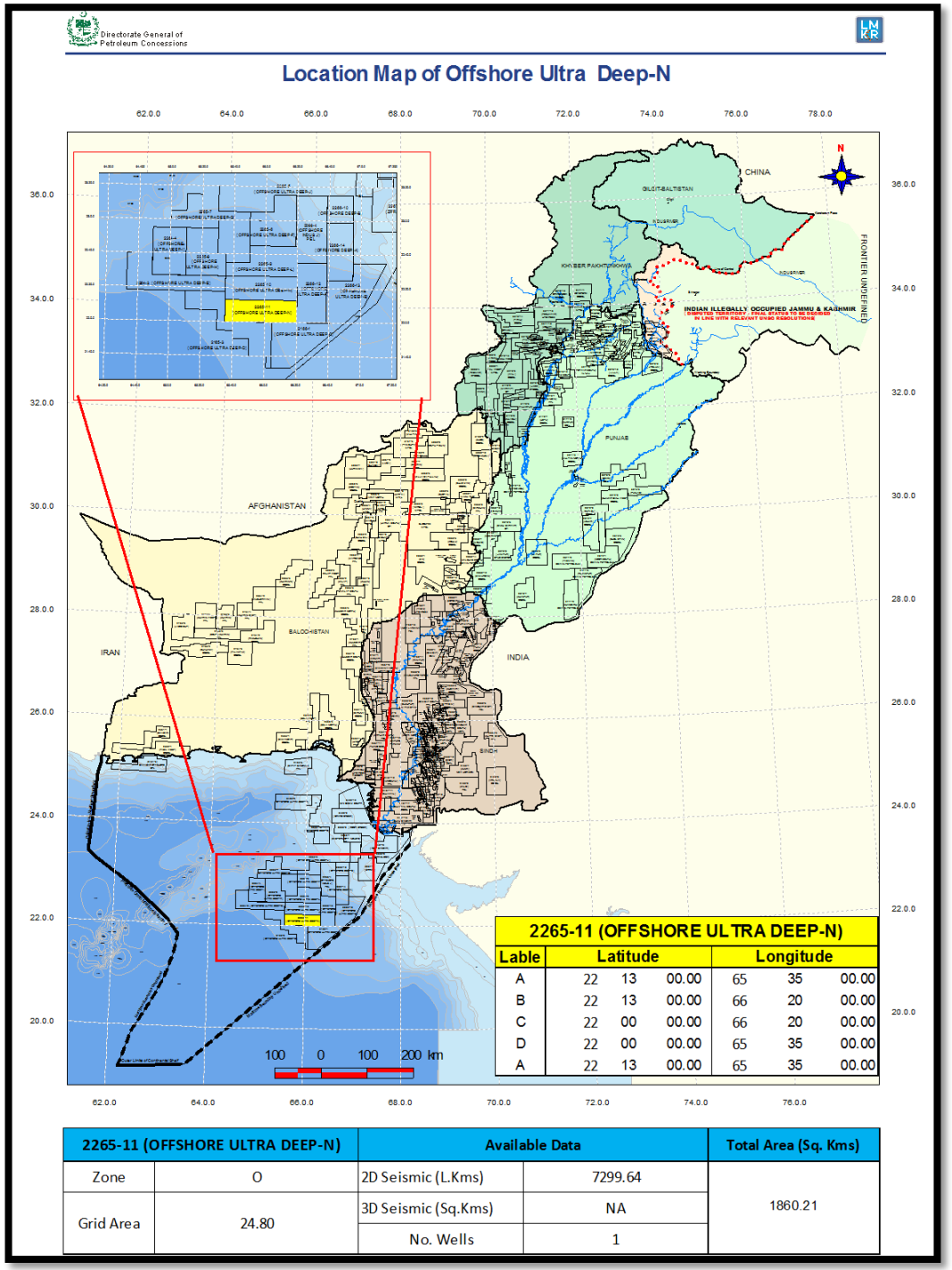
BLOCK: OFFSHORE ULTRA DEEP N

OFFSHORE BIDDING BLOCK BIDDING ROUND 2022

MINISTRY OF ENERGY PETROLEUM DIVISION (DGPC)

INTRODUCTION

- Offshore Ultra Deep N Block covers an area of 1860.21 Sq. Kms.
- Geological Basin: Offshore Indus, Basin Pakistan.
- The block falls in Prospectivity Zone O.
- BP, ELF, Total, NIOP and WGC acquired 2D seismic data approximately 7299.64 L. Kms in the block within the years 1977, 1999, 2000, 2006 and 2007 respectively.
- The Block is surrounded by Offshore Deep M (North), Offshore Ultra Deep D (West), Offshore Ultra Deep A (East) and Offshore Ultra Deep E (West) blocks.
- The well drilled in the block is Kekra-01.



2265-11 (OFFSHORE ULTRA DEEP-N)		Available Data		Total Area (Sq. Kms)
Zone	O	2D Seismic (L.Kms)	7299.64	1860.21
Grid Area	24.80	3D Seismic (Sq.Kms)	NA	
		No. Wells	1	

GEOLOGICAL HISTORY

Late Cretaceous – Early Paleocene:

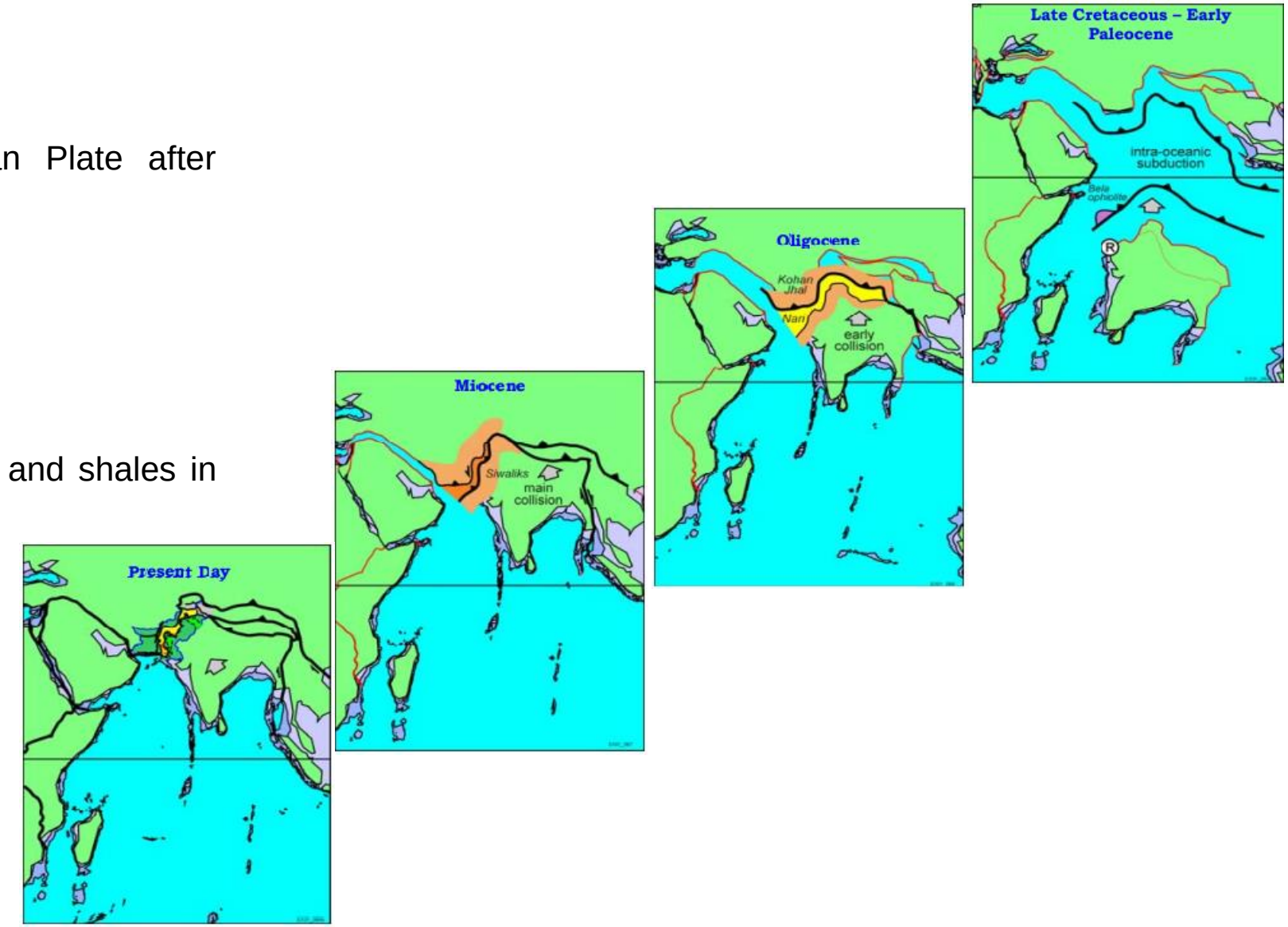
- Rapid northward movement of Indian Plate after separation from Madagascar
- Bela ophiolites obduction
- Extrusion of Deccan Volcanics

Paleocene - Eocene:

- Deposition of limestone on seamounts and shales in lows / depressions

Oligo-Miocene:

- Himalayan orogeny
- Indus Delta-Fan deposition



Syed Asif Ahsan et,al., (2012) Physico-Chemical Controls on Source Rock in Offshore Indus – Comparative Study of Some Major Tertiary Deltas of the World : PAPG/SPE Annual Technical Conference

PETROLEUM SYSTEM

Source Rock:

- Paleocene condensate section can be the source rock.
- Oligocene and Miocene section can also act as source rock in Offshore Indus Basin.

Reservoir Rock:

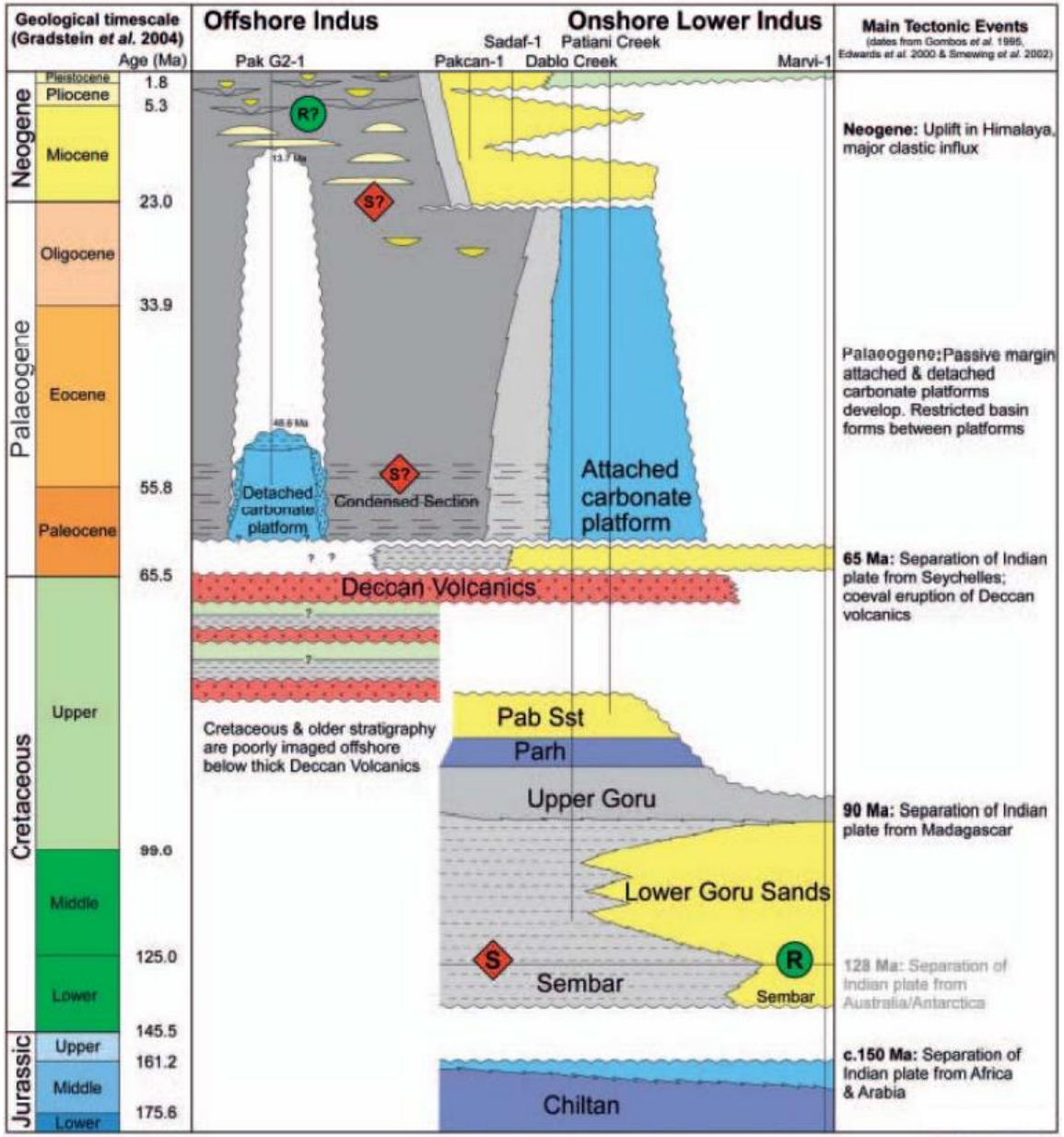
- Miocene sandstones are proven reservoir, Individual sandstone units vary in thickness from 2-50m with porosity ranging between 15-20%.
- In deep offshore, reefal or shoal limestone of Eocene-Oligocene age with more than 20% porosity.

Seal:

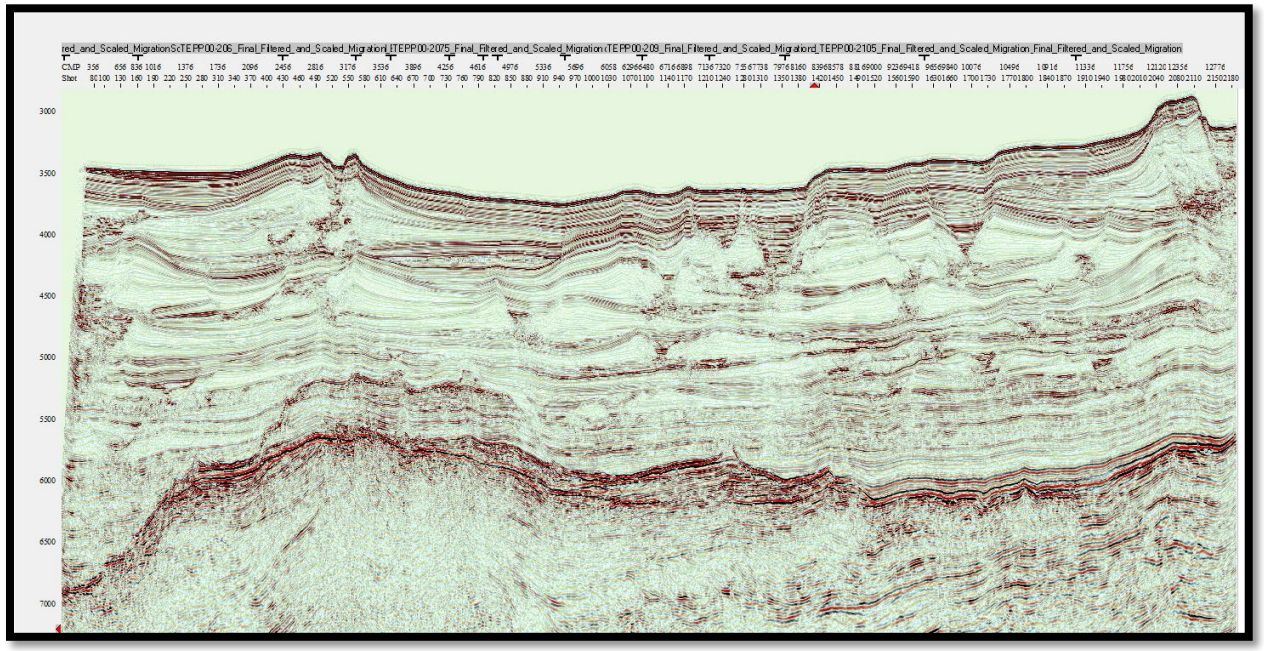
- Mud dominated sediments packages will provide seals for potential reservoirs.
  - Transgressive mudstone and marls provide seals for Eocene-Oligocene reservoir.
  - Intra-formational shales of Miocene would provide seal for the Miocene sands.

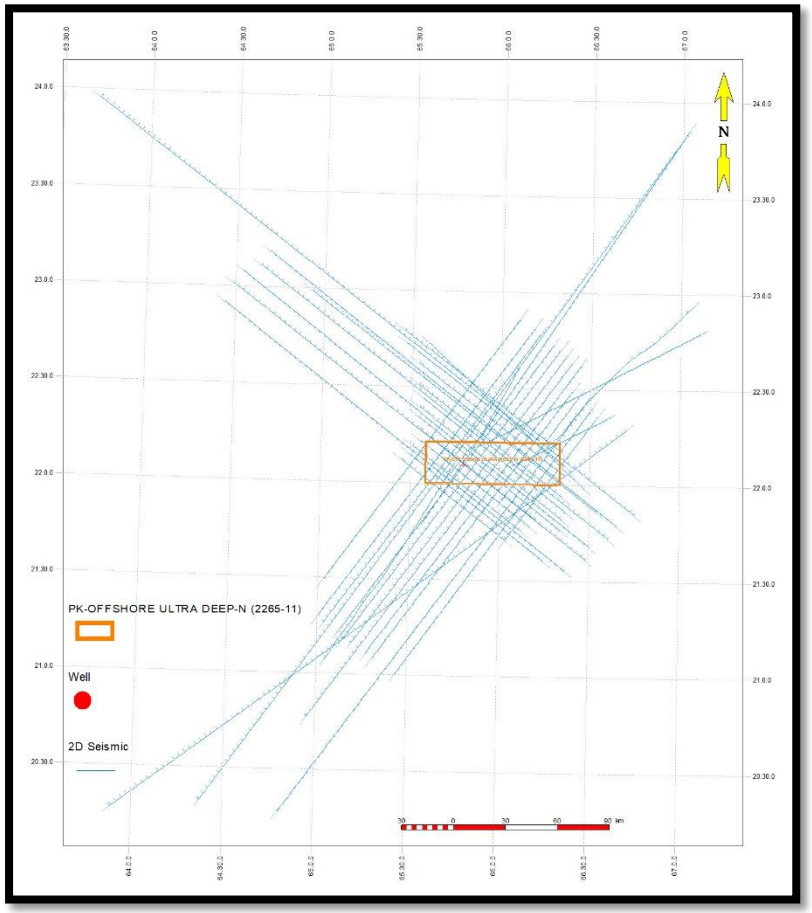
Trap:

- Both structural and stratigraphic traps
- Eocene carbonates build ups over seamounts, growth faults, roll-over anticlines and stratigraphic traps within deltaic fan system (e.g., bars, barrier islands and pinch-out / facies change etc.) are likely trapping mechanisms



PROSPECTIVITY





- High resolution seismic data can allow to delineate true potential of the block
- Both structural and stratigraphic traps

EXPLORATION RISKS

- Source & Charge: Medium to High risk
- Reservoir: Low to Medium risk
- Seal: Low to Medium risk
- Trap: Low to Medium risk
- Key challenges for future exploration in Tertiary Petroleum System are to establish:
  - Distribution and timing of effective source intervals' development within the drainage area of prospect.
  - Timing of over-pressuring (up to 7000 psi at 2800m in Indus Marine-1A well) within Miocene section (for Miocene and younger targets) with respect to source rock maturation and expulsion.

OPPORTUNITY

Comparison suggests that discoveries in offshore deltas have been made in:

- Extension of proven onshore petroleum system to offshore at drillable depth (e.g. Niger, Nile, Irrawady & Mahakam deltas)
- Reservoir –Seal pairs associated with good quality but less mature source rock drilled onshore (at shallow depths) progressively mature in offshore (e.g. Krishna-Godavri and Nile deltas)
- Biogenic gas found in shallow younger Tertiary section (e.g. Krishna-Godavri and Nile deltas)

International offshore exploration efforts in delta areas have generally been successful due to:

- Extension of established onshore petroleum system to offshore at drillable depths
- Good quality less mature source rock drilled onshore progressively mature in offshore
- Gas discoveries of biogenic origin

THANK YOU