INDIA ENERGY WEEK 2025

DGH

Breakaway sessions on upcoming Bid Rounds & Policies

OALP X Blocks overview

12.02.2025

Contribution of Hydrocarbons

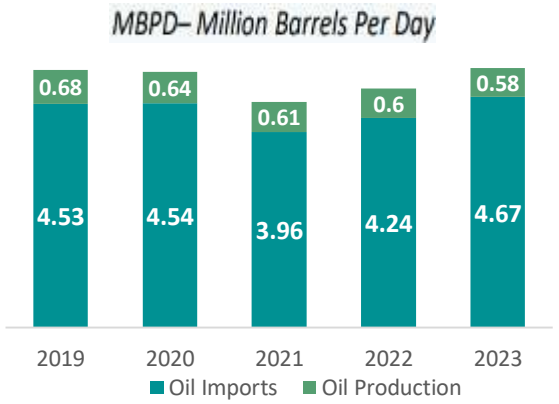
HYDROCARBON AT GLANCE

15% India's GDP
(Approx. $465 Billion USD)

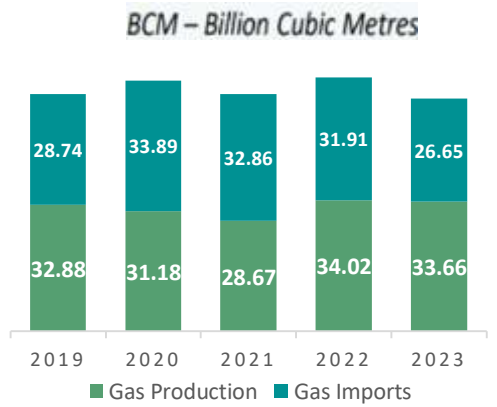
Asia's 2nd Largest Refiner
(251 MMTPA| 23 refineries)

Asia's Largest Petroleum Product Exporter(Since 2009)

Import vs Domestic Oil Production (MBPD)

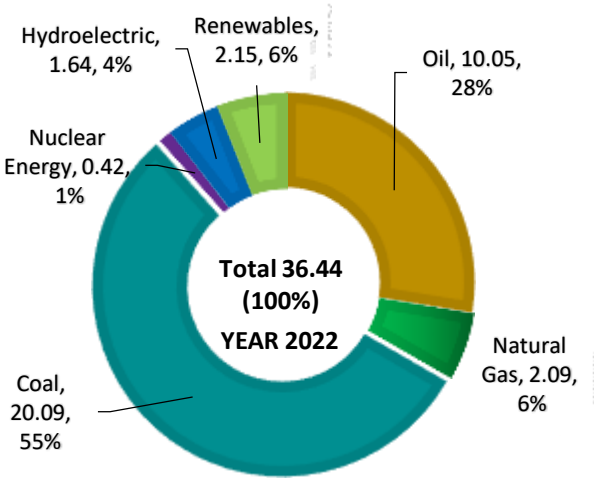


Import vs Domestic Gas Production (BCM)



***Sources**: IEA, MoPNG, IBEF Reprot Dec 2023*

India Primary Energy Consumption by Fuel (Exajoule)



89%
Fossil Fuel

Exajoule (EJ): 1 EJ = 1018 J

***Source:** Energy Institute Statistical Review of World Energy, 2023*

3rd Largest Oil Consumer

Imported 4.67 MBPD OIL & 26.65 BCM Gas in 2023
(MBPD – Million Barrels Per Day)
(BCM – Billion Cubic Metres)

4th Largest LNG Importer

Energy Demand Projection: India

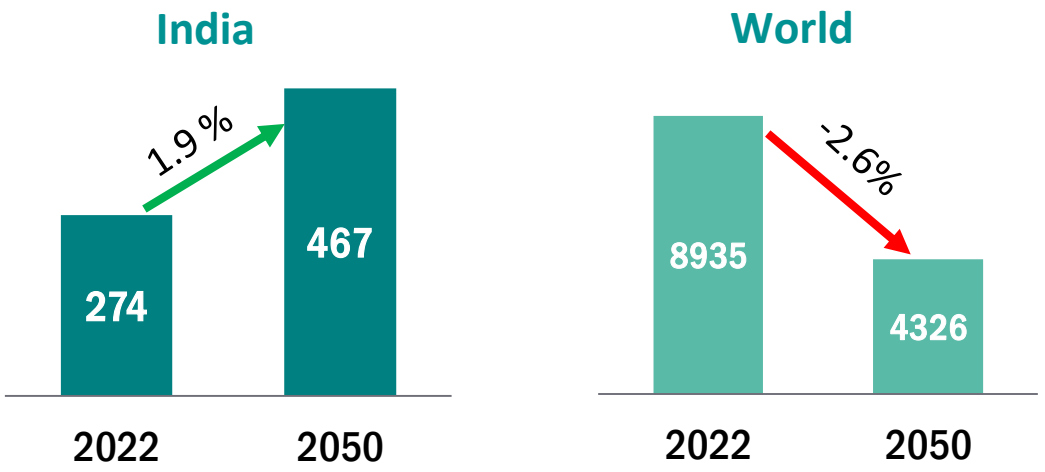
FACTS TO KNOW

The primary energy demand is expected to double by 2050.
(Average growth per year 2.4% - 2.6%)

Accounts for around 14% of the global primary energy demand in 2050
(up from around 7% in 2019)

Per capita energy consumption is 1/3rd of global average,
(Growing @ 4.9%)

4500 Million Barrels of Proved Oil Reserves which is just 0.3% of total Global Proved Oil Reserves



Projected Oil and Gas consumptions (MMTOE)

(***Sources***: *For 2050, Accelerated Scenario of BP stats considered)*

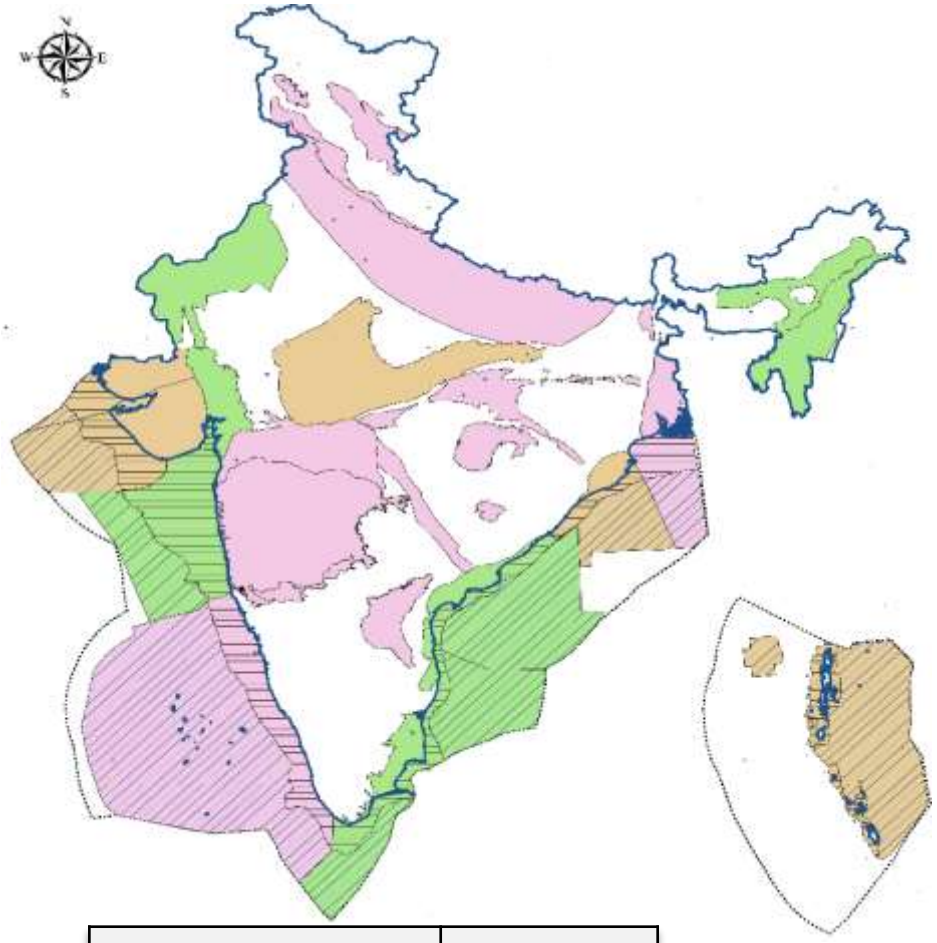
India's Oil and Gas consumptions expected to grow @ 1.9% till 2050

World's Oil and Gas Consumption expected to be decrease @ 2.6% till 2050

https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2023-country-insight-india.pdf

https://www.energyinst.org/statistical-review/home

Indian Sedimentary Basins and categories



26 sedimentary basins || **3.36** Million Sq. Km.

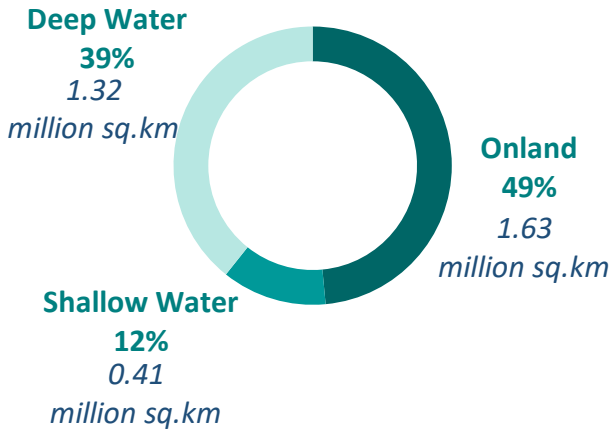
Basin Category Description

Category-I
7 Commercially Producing Basins
Area: 1 Mn Sq Kms
Resource: 21,487 MMTOE

Category-II
5 Discovered Basins but not yet commercially developed
Area: 0.78 Mn Sq Kms
Resource: 1.951 MMTOE

Category-III
14 Prospective Basins but Undiscovered
Area: 1.59 Mn Sq Kms
Resource: 1,543 MMTOE

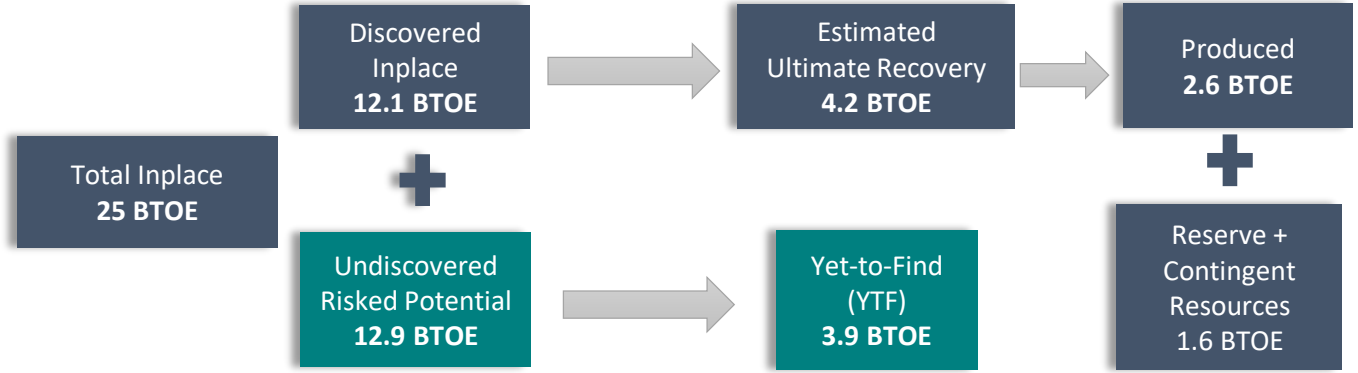
Basins Types



Geographical Area	Million sq.km
Mainland & Islands	3.29
Exclusive Economic Zone	2.36
Total Area	5.65
Sedimentary Bain	3.36

Area appraised: 76 %

Active acreages: 10 %



OALP Round-IX

28
Blocks offered

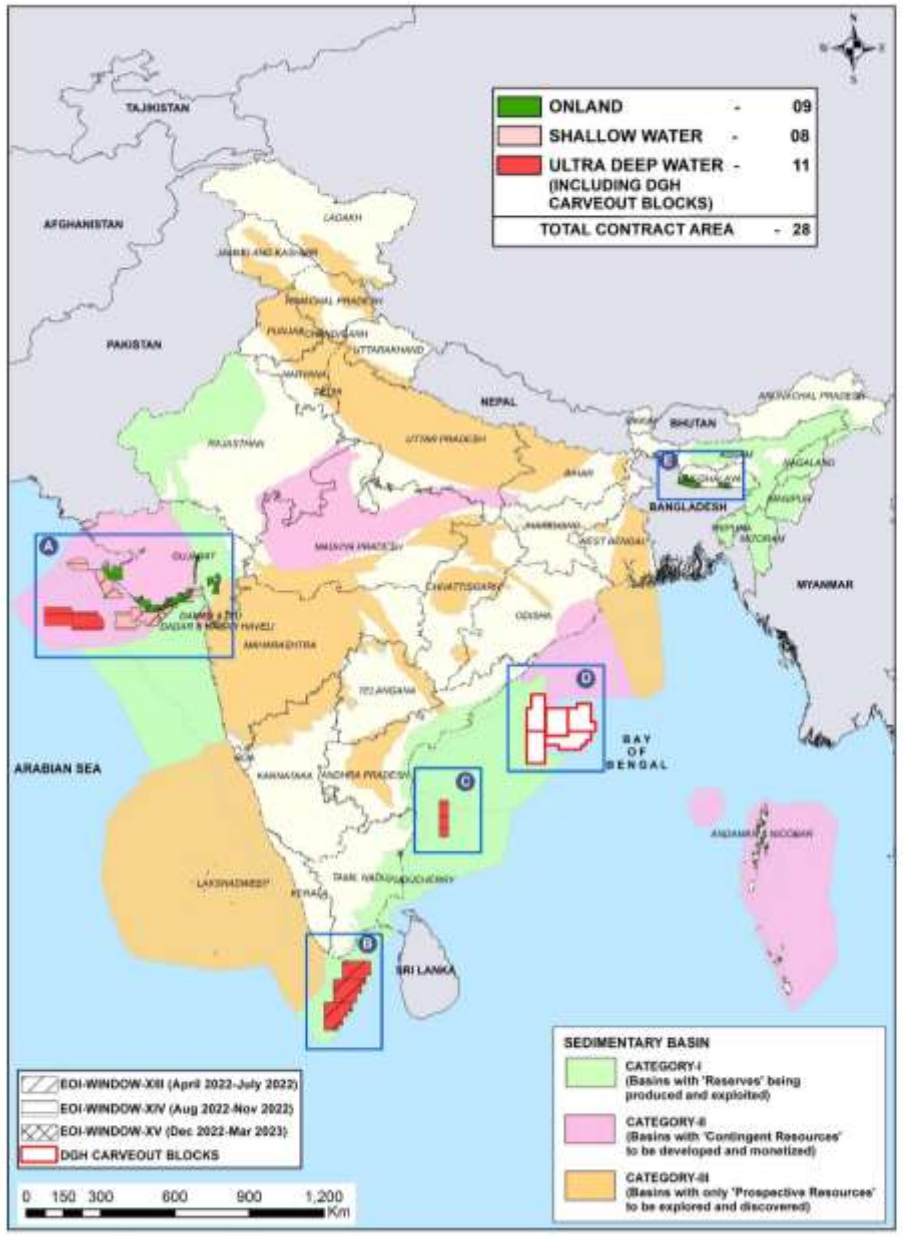
136,596 Sq.km
Area

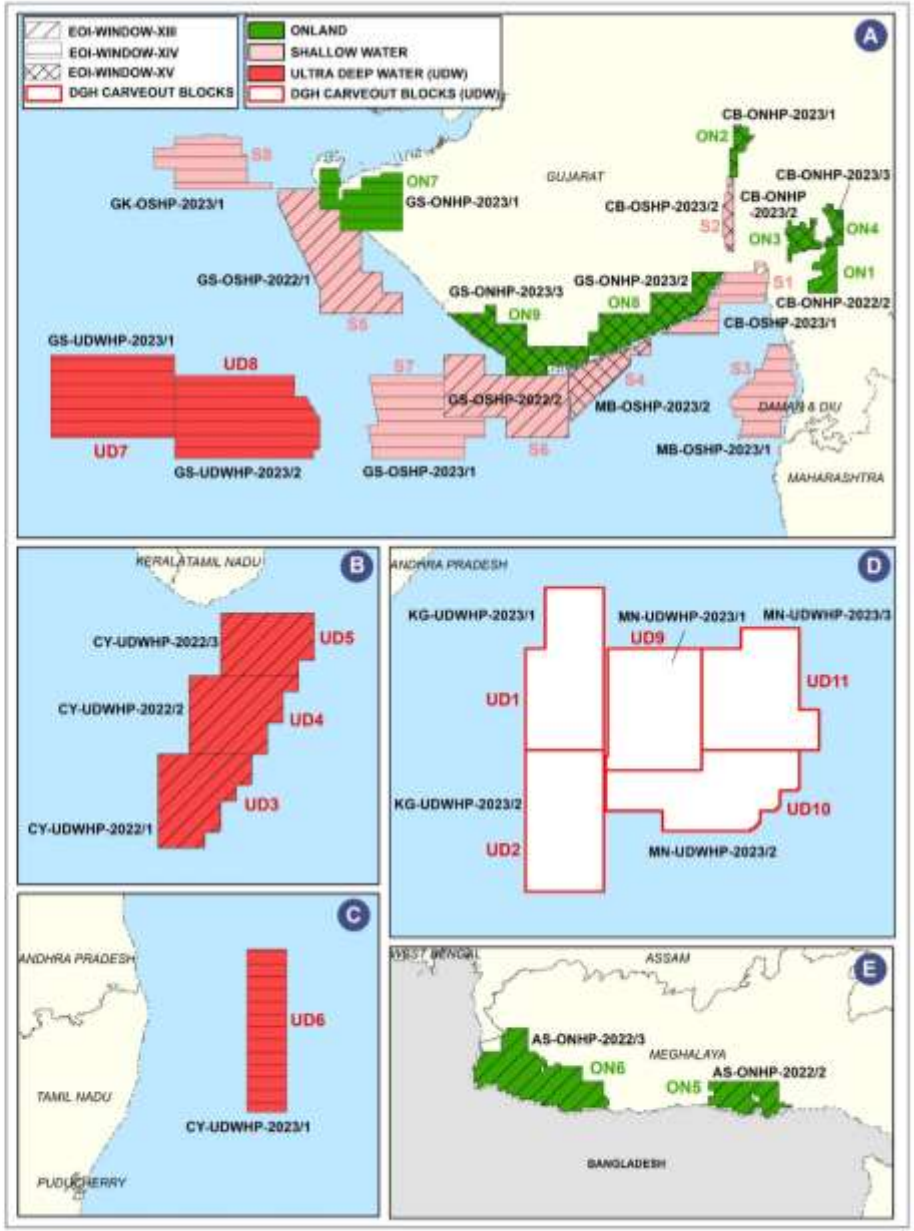
8
Sedimentary Basins

9 Blocks (13875 Sq.km)
Onland

8 Blocks (26648 sq.km)
Shallow Water

11 Blocks (96073 sq.km)
Ultra Deep Water





OALP X Blocks on Offer

25
Upcoming Blocks

1,91,986 Sq.km
Area

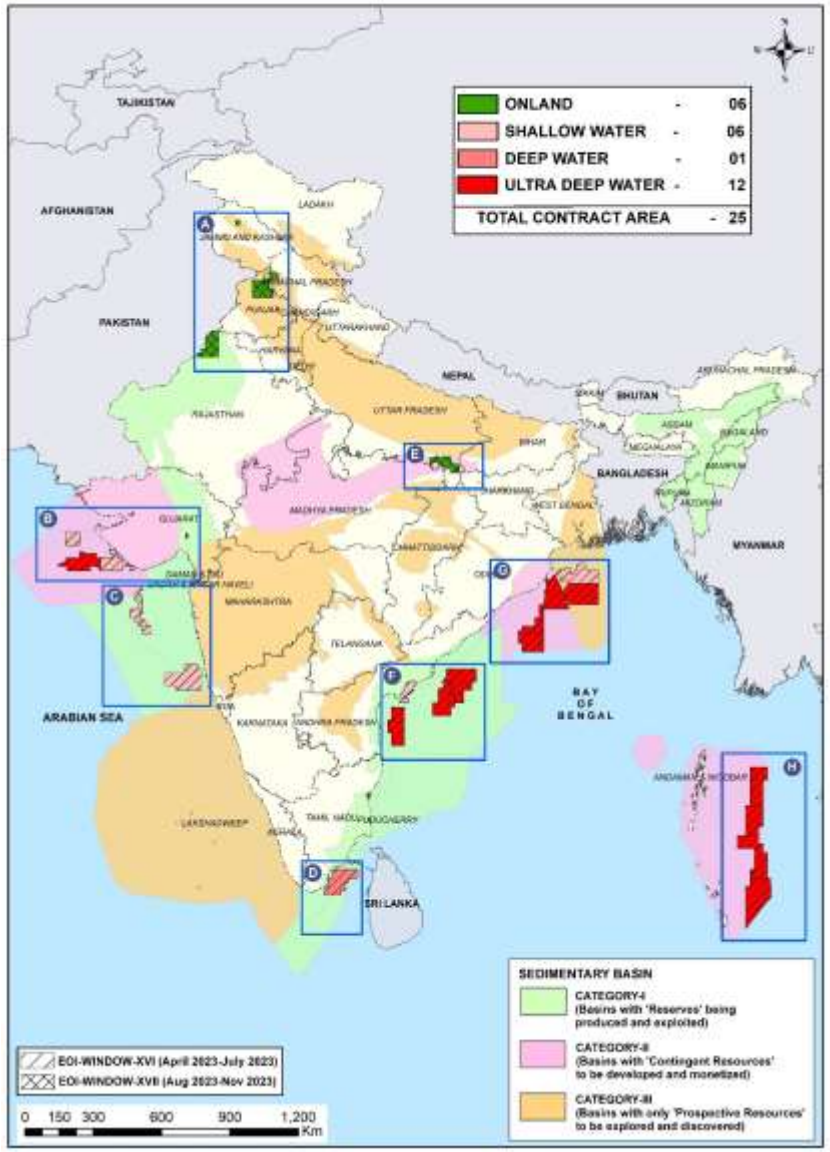
13
Sedimentary Basins

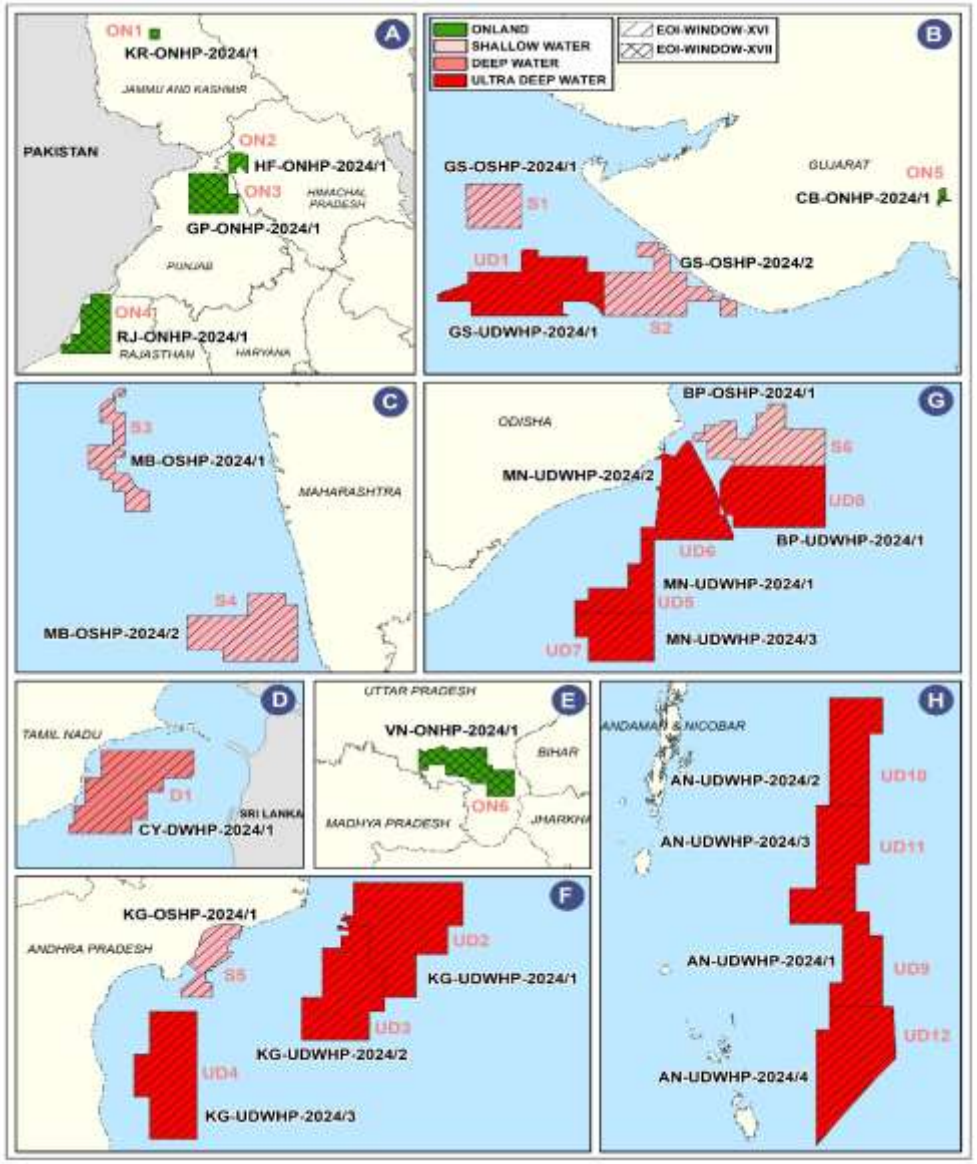
6 Blocks (~16871 Sq.km)
Onland

6 Blocks (~ 41391 sq.km)
Shallow Water

1 Block (~ 9991 sq.km)
Deep Water

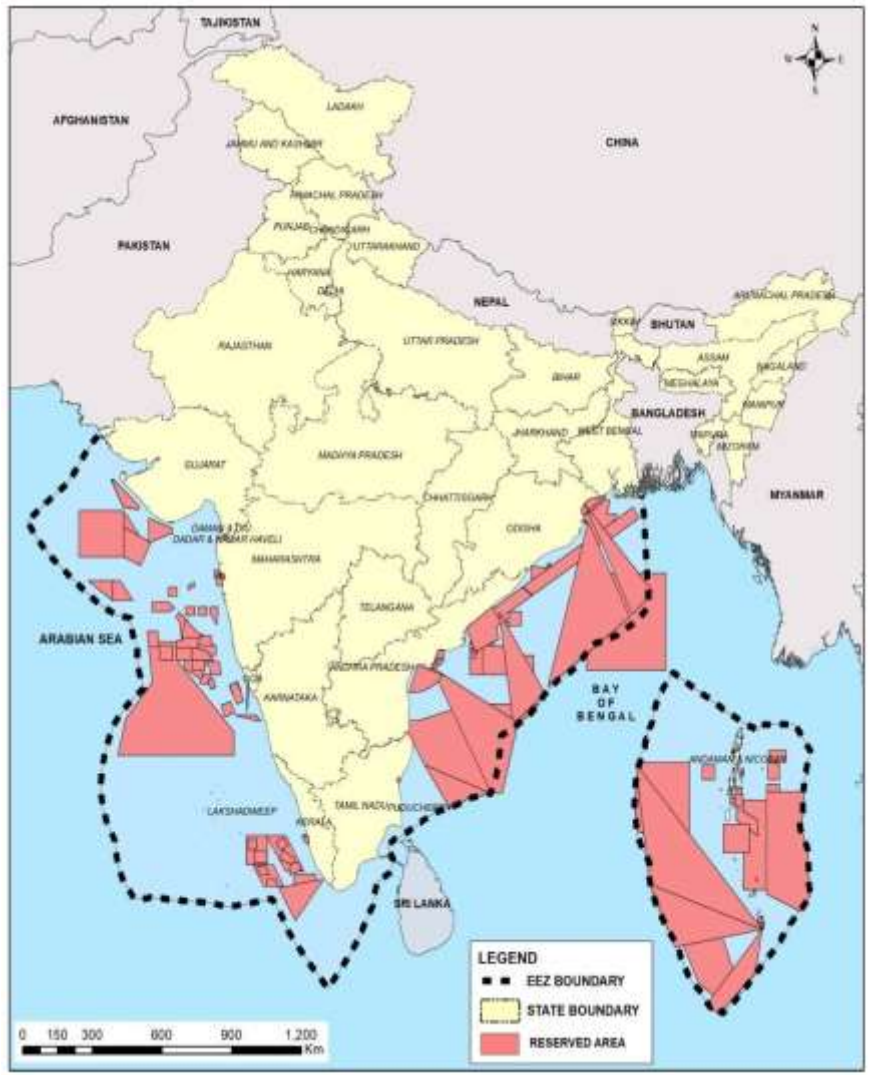
12 Blocks (~123733 sq.km)
Ultra Deep Water



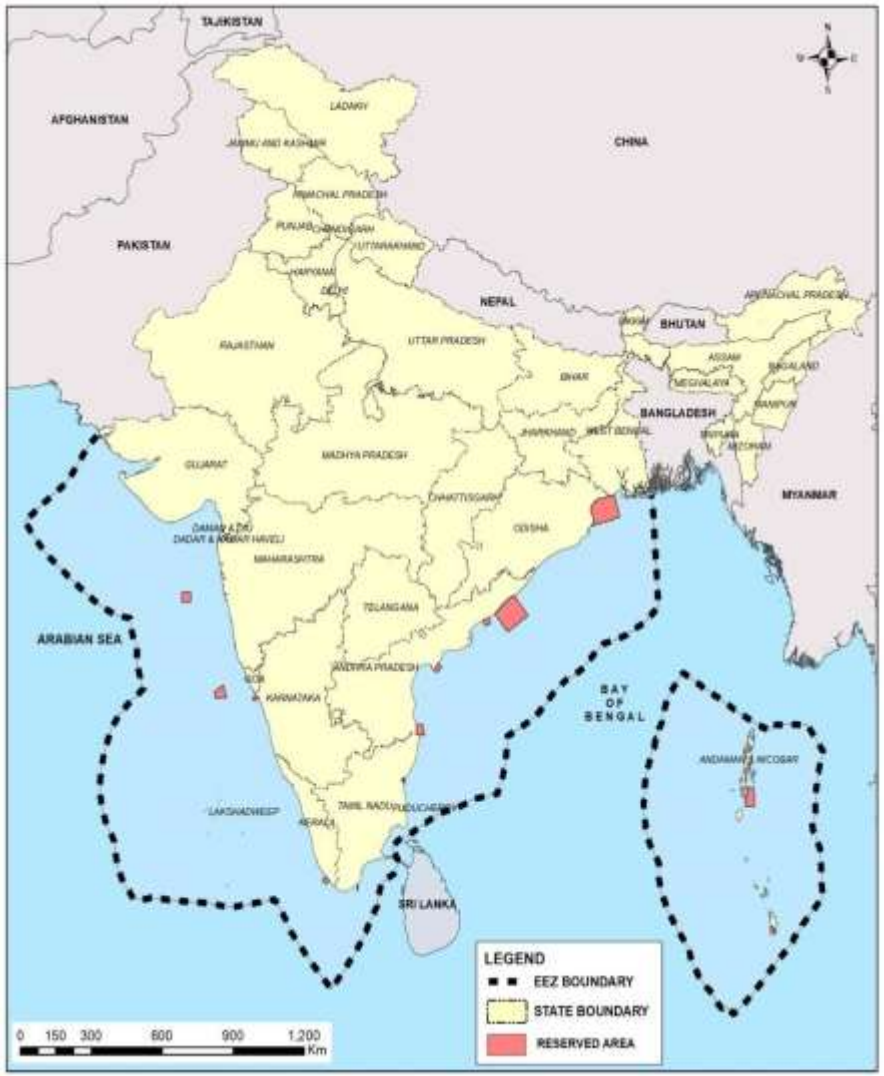


Expanded Offshore Arena

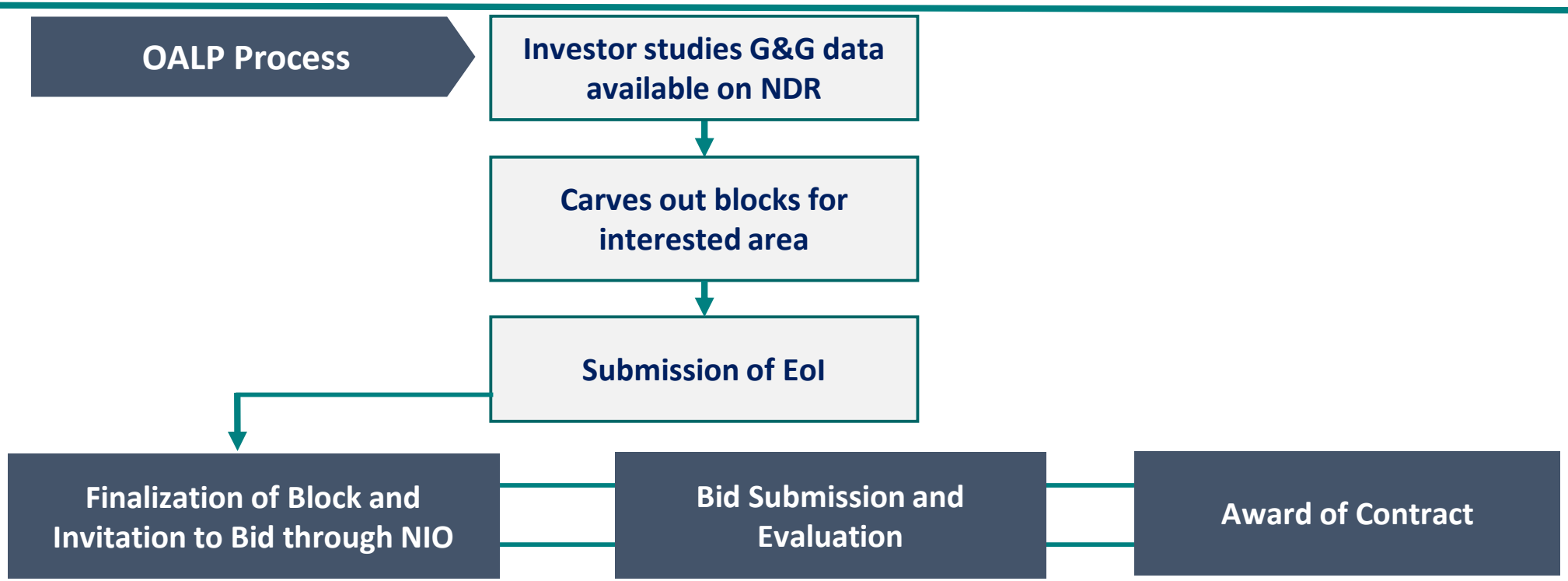
‘No Go’ Areas Earlier



‘Prohibited’ Areas Now



The Open Acreage Licensing Policy (OALP) Bidding Process



- EoI **'Originator'** eligible for **Originator Incentive**
- Three cyclic EoI Windows in a year
- Fully **secured & transparent e-bidding** platform
- EoIs/blocks allowed in **single Basin category**

New Frontiers: Targeting New Acreages

2016 HELP POLICY || 2019 REFORMS || 2023 REFORMS

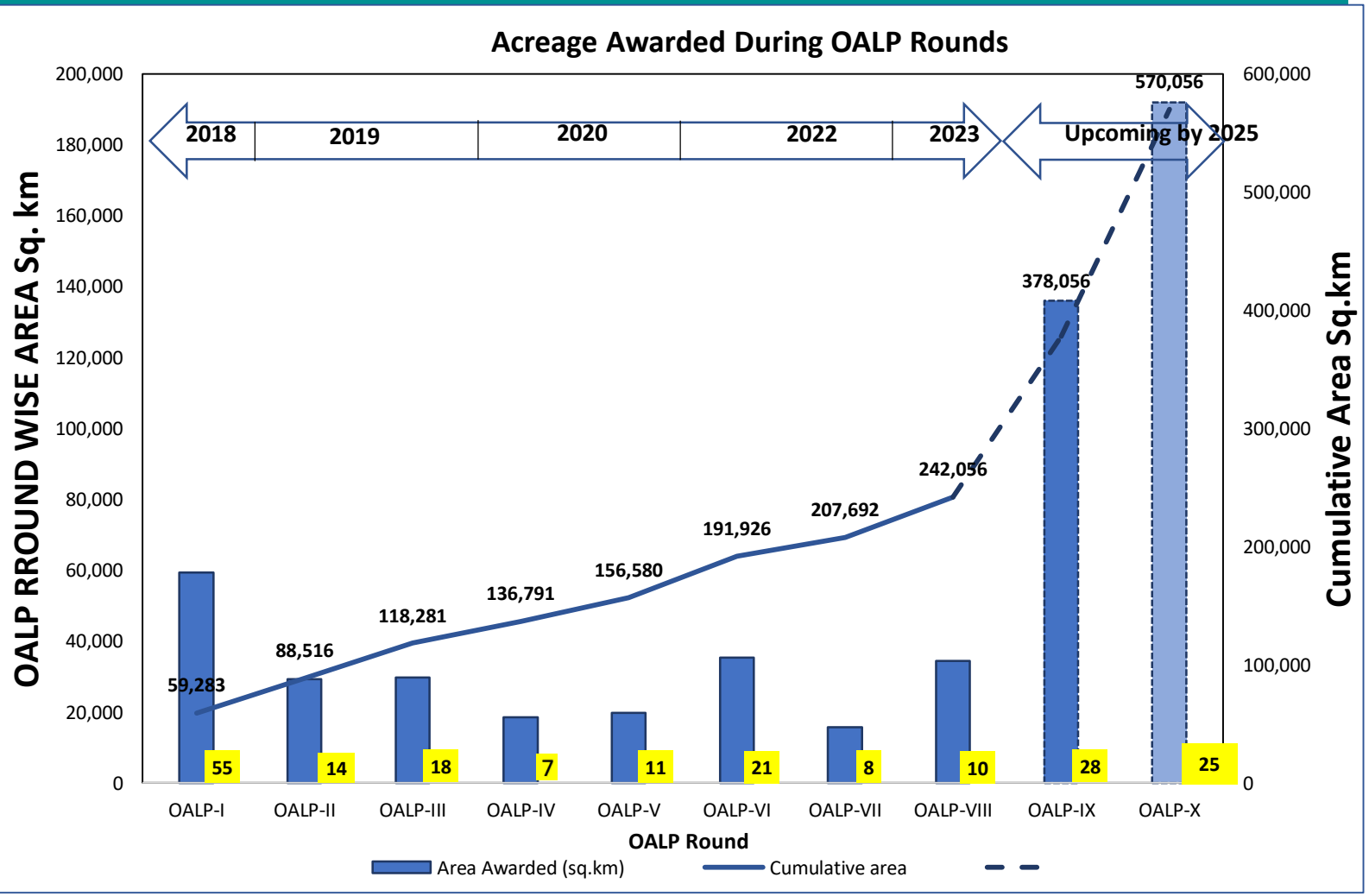
8
Bid Rounds Concluded

USD 3.36 Billion
Committed Investment

144
Blocks Awarded

2,42,056 Sq. Km
Awarded

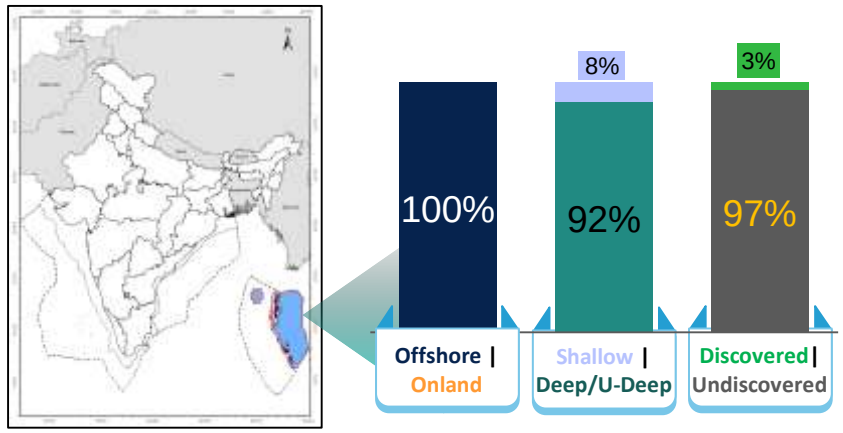
51,725 LKM 2D Seismic
66,843 SKM 3D seismic
499 Exploratory Wells

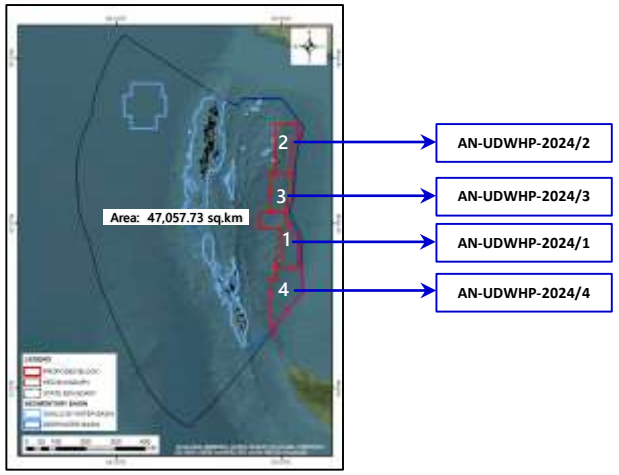


7 Oil and 6 Gas discoveries~ 18.5 MMTOE

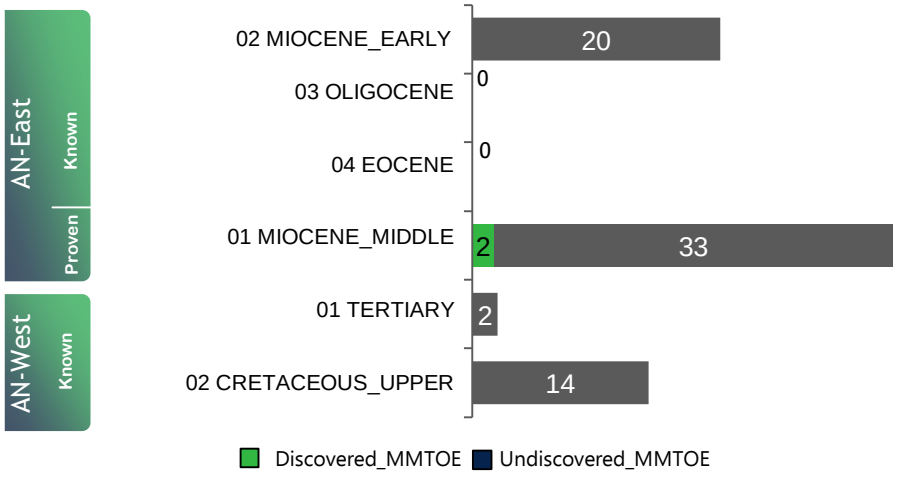
ANDAMAN-NICOBAR BASIN

4 Blocks on Offer





Basin's risked resource potential – 70 MMTOE



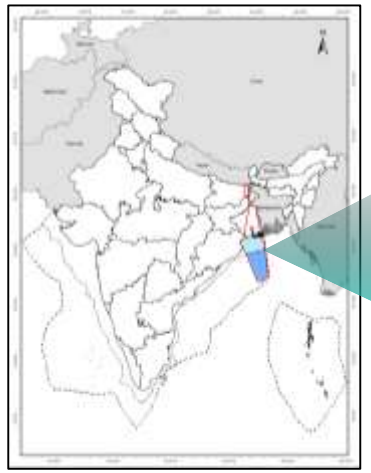
Key Characteristics

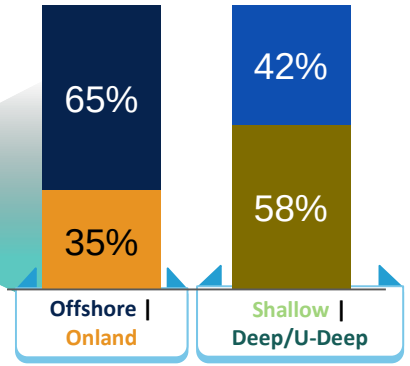
- Fore-arc has a significant **Gas discovery in Miocene**, analogous to producing reservoirs of Myanmar and Indonesia gas fields
- **Back-arc area** has sediments with significant prospectivity in the **Eastern Part**
- **Gas hydrate** is established in Fore-arc

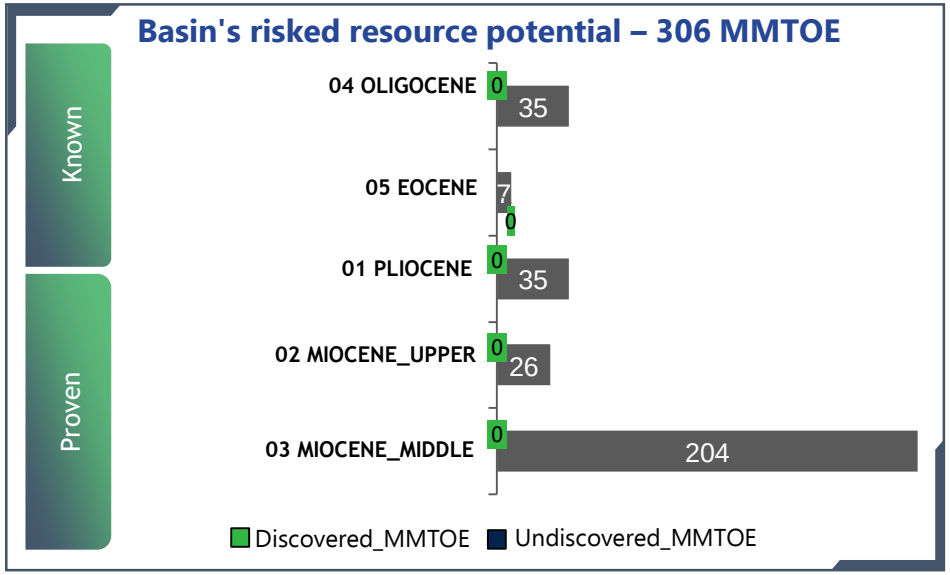
BENGAL – PURNEA BASIN

Significant Resource in Miocene

2 Blocks on Offer







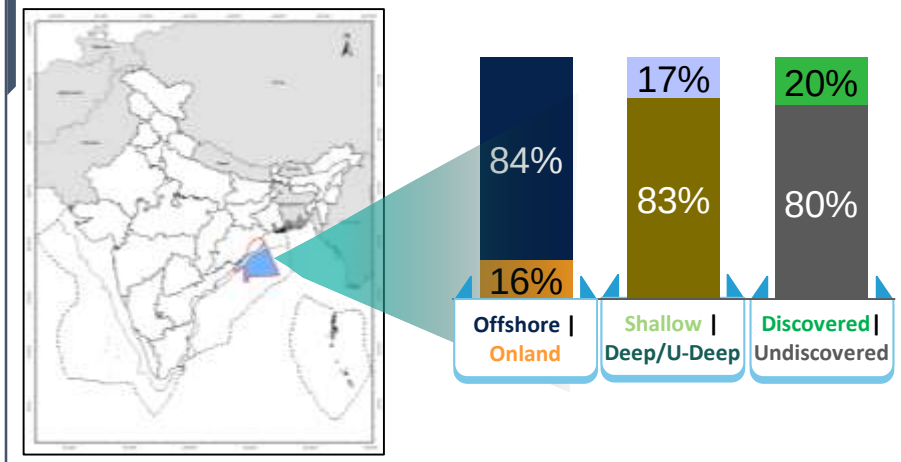
Key characteristics

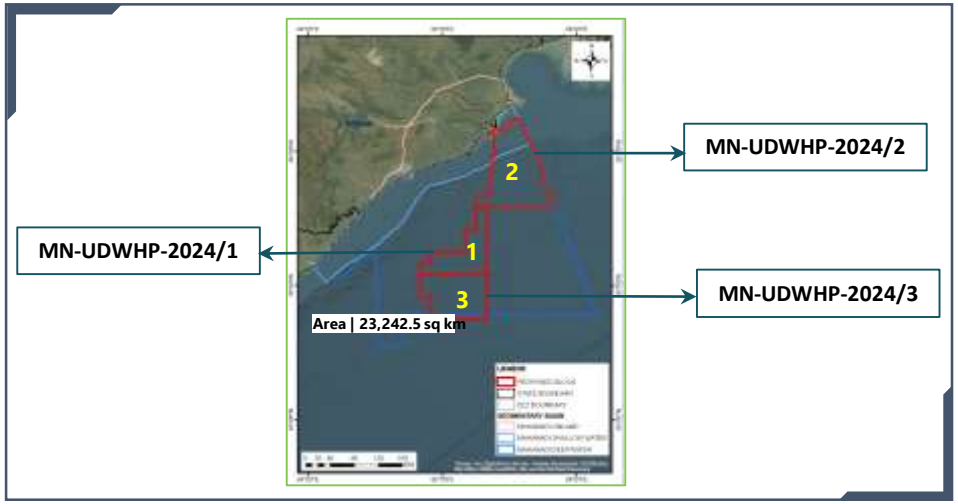
- 2/3rd potential lies in Middle Miocene play
- Blocks close to a contract area with 6 gas discoveries, contemplated for development
- Occurrence of channelized deposits associated to subtle structures in the east-central area

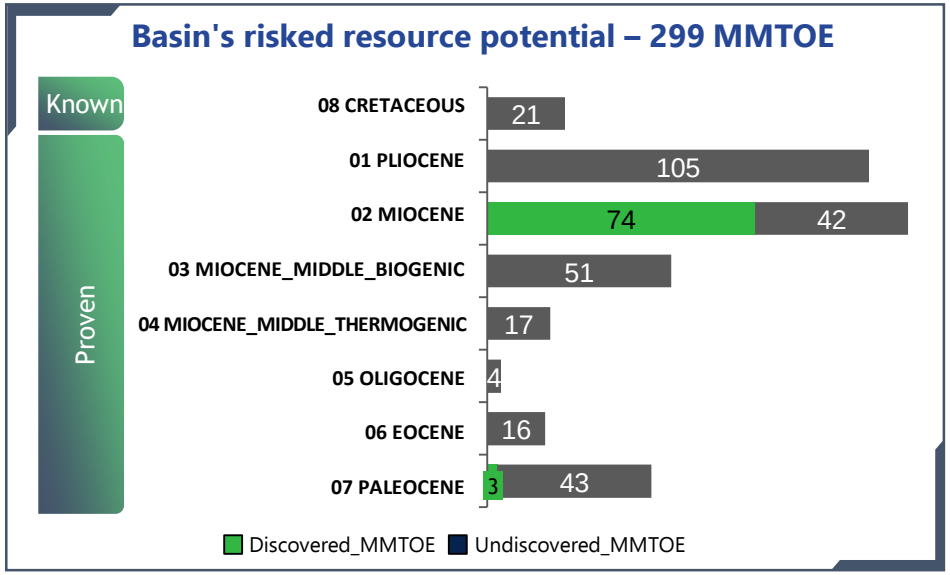
MAHANADI BASIN

Significant resource in Mio-Pliocene

3 Blocks on Offer



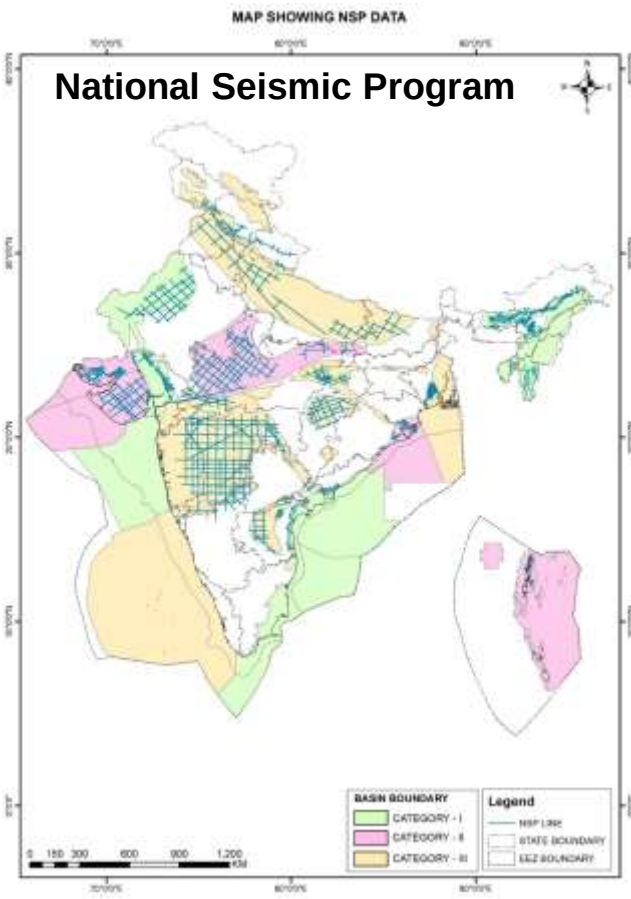




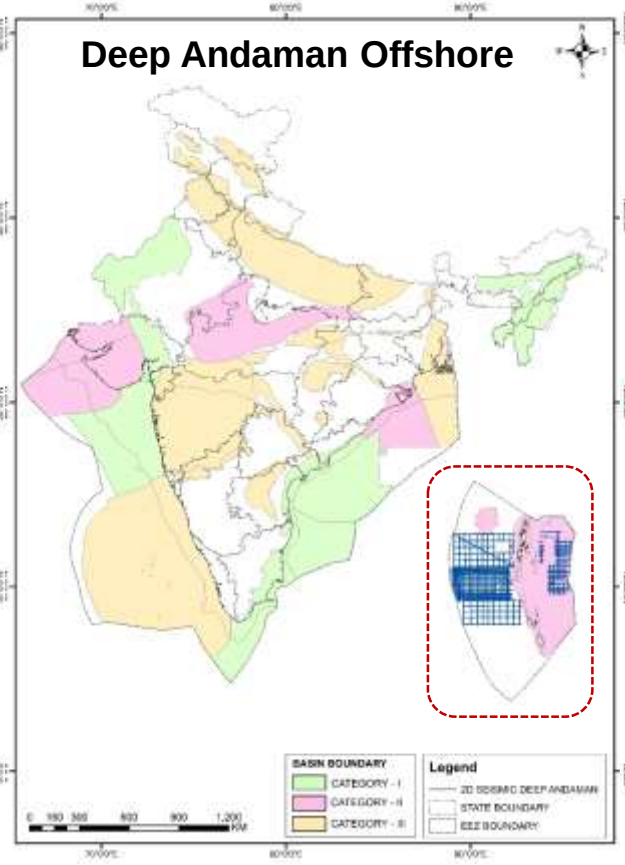
Key characteristics

- Strong analogy with easterly Bengal offshore that has numerous small-to-medium discoveries
- Discovered Miocene play occurs as discrete and stacked reservoirs
- Opportunity to explore significant prospective resource of Pliocene Play

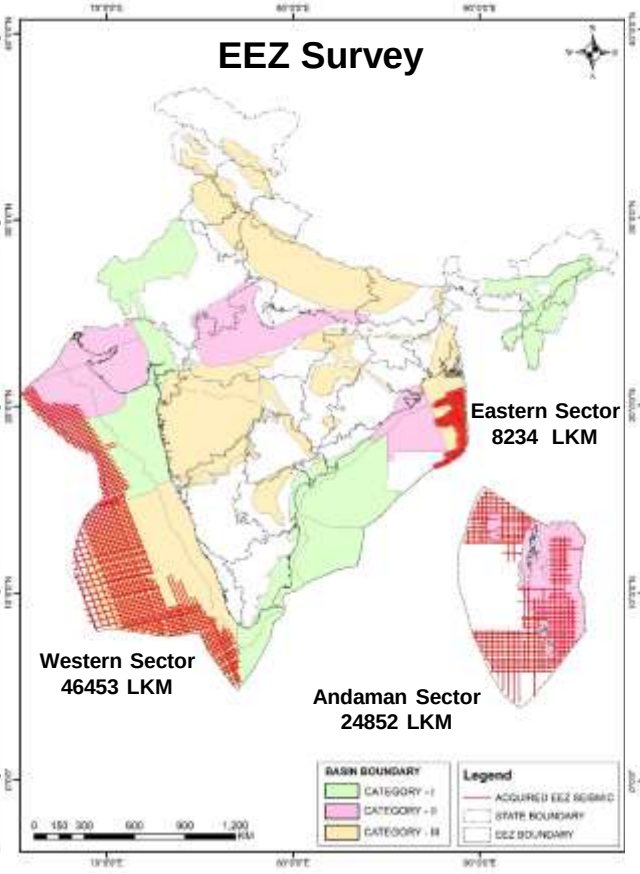
G&G Data Driven Exploration: **Projects Completed**



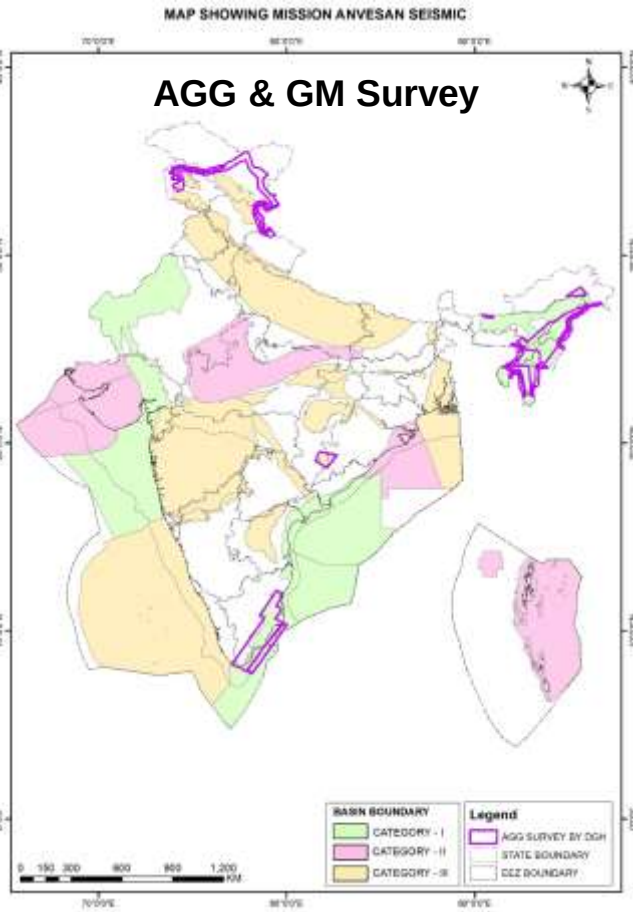
Duration: 2016 to 2022
46960 LKM of 2D seismic data across 26 Sedimentary Basin



Duration: 2021 to 2023
22,554 LKM of Broadband Seismic data



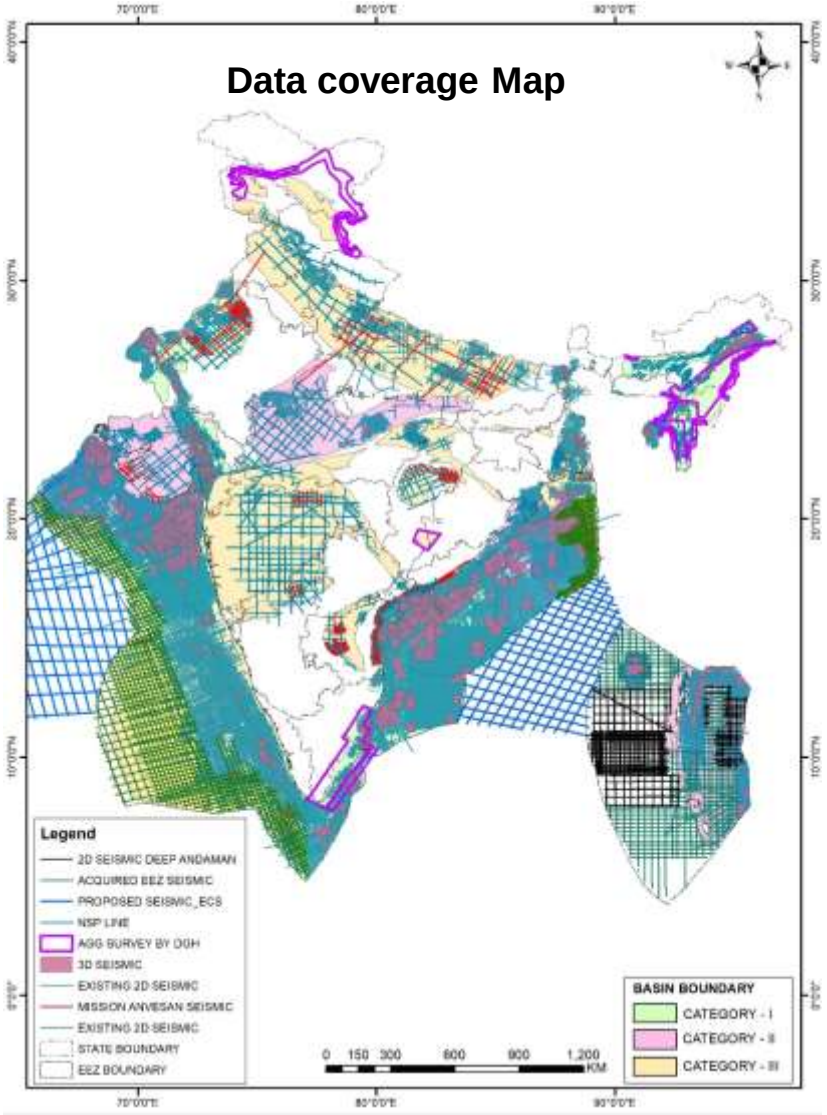
Duration: 2023 to 2024
79,540 LKM of Broadband 2D seismic data (API) completed



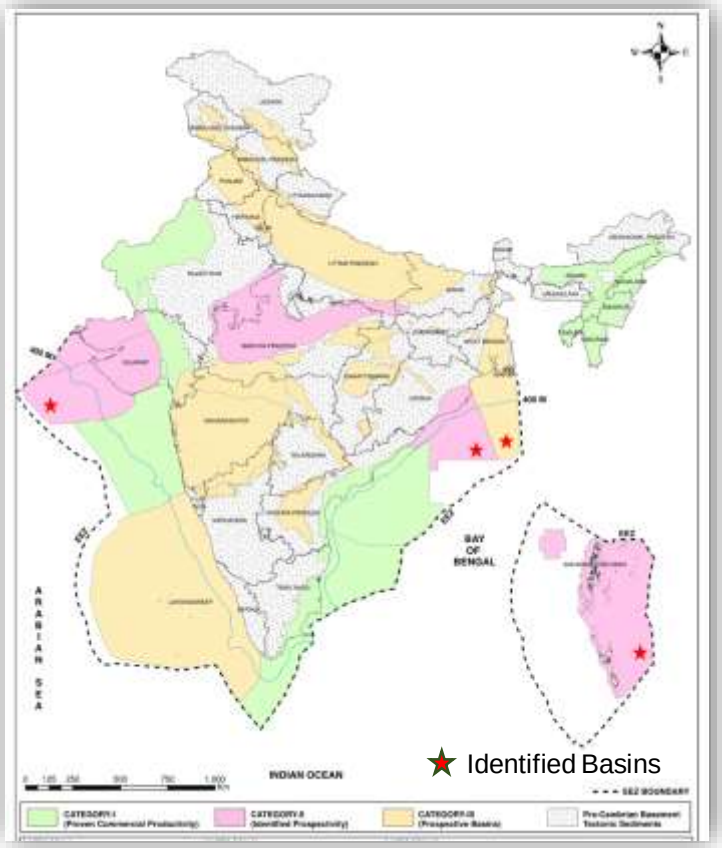
Duration: 2023 to 2024
API of 42,943 LKM Completed

G&G Data Driven Exploration: Projects under progress

Data coverage Map

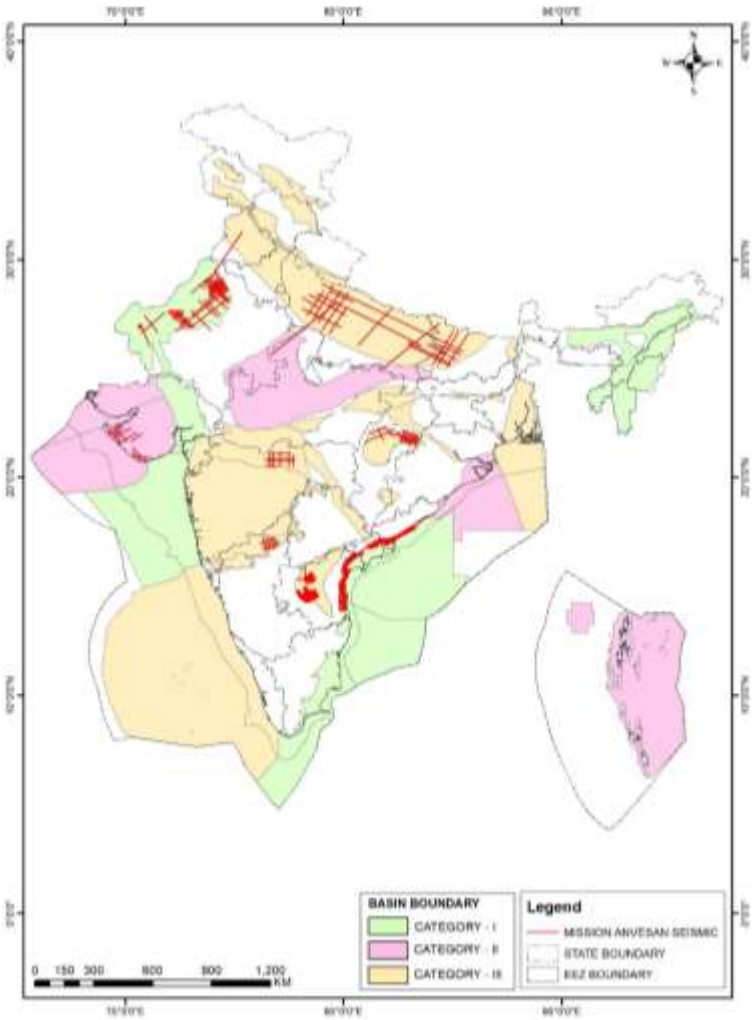


Drilling of Offshore Stratigraphic wells



Andaman (Cat II)
Saurashtra (Cat II)
Mahanadi (Cat II)
Bengal (Cat III)

Mission Anveshan



Duration: 2024-26
20275 LKM of 2D seismic data across 07 Sedimentary Basins

Exploration Strategy

PANCHAMRIT
Exploration Strategy

Goal

Energy Security

Hydrocarbon Import Reduction

1. New Acreage Acquisition
2. Monetization of Discoveries
3. Targeting YTF Resources
4. New Geological Energy
5. Hydrocarbon Efficiency

- Aggressive Exploration in Cat-II & III Basins with Special Focus in EEZ Offshore Area
- Converting new discovered basins into Cat-I Basins (Vindhyan, Kutch Offshore & Bengal)
- Exploration for Emerging Plays and Field growth, focus on Deep Plays (Mesozoic) & Basement
- Exploration for New Geological Energy Portfolio with New Technology Induction
- Focus on Efficiency Part with Integration of Enhance Oil Recovery Techniques with use of CCS

Showcasing of Geo-scientific data – Virtual Data Room

Digital Workspace
- *Virtual Desktop Infrastructure*
- *File Sync/Share*

24/7 Operational & Support
- *24/7 operational for 60 days*
- *Extended technical support*

Global Access
- *From anywhere and anytime across Globe*

Cloud and Data Centre
- *Hosted on Indian Cloud data centre*
- *Storage management*

Secure and Encrypted
- *IP/Hostname based Authentication protection*
- *Data backup*

1st cloud-based Data Rooms in Indian E&P Sector

Data Purchase

Data Package
Contains available technical data 2D/3D Seismic, Well logs and reports; Available for purchase through NDR

Information Docket
Contains brief information about the offered fields; To be purchased in sets of all Onshore/ Offshore

“India is driving not only its growth but also the growth of the world, with the energy sector playing a significant role.”

Sh. Narendra Modi
Hon’ble Prime Minister

Thank You

OALP Bid Round X

The Exploration Potential of the Deep Water, Andaman, Mahanadi and Bengal Basins

An Evaluation conducted by:

The UH/DGH Centre for Petroleum Exploration

What is the Center for Petroleum Exploration?

A partnership between the U of H and the Directorate General of Hydrocarbons

Our mandate is to:

1. Provide a third-party, independent evaluation of the work conducted on the Anadaman and Mahanadi/Bengal Basins using all data provided by the DGH.
   i. We are pleased to announce the successful completion of this phase, marked by the creation of a structured and cleaned database.
   ii. We are excited to offer a data room, providing companies with the opportunity to access this valuable data for their oil and gas exploration endeavors.
2. Allow the faculty and students at the University of Houston to research the basins.
   i. The aim is to add additional value to the work conducted to date and make the prospects for future exploration more attractive to a broader oil and gas community.
   ii. It will also allow students access to actual data and will challenge them to solve real issues associated with exploration while they pursue their graduate degrees.
   iii. The results of this work will be published and made available through the UH/DGH data room.

OALP Bid Round X

25 Blocks on offer

1,91,986 Sq.km Area

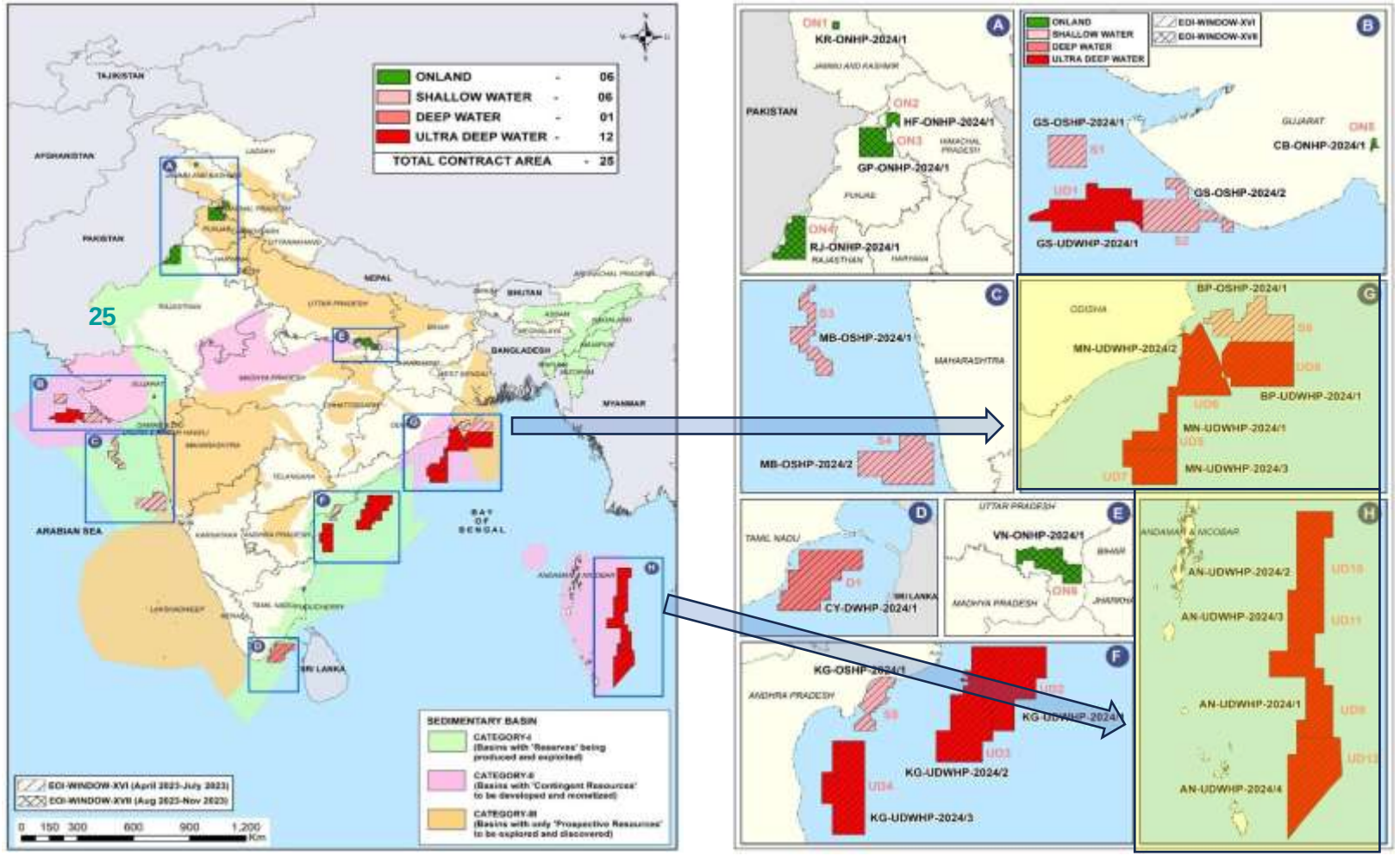
13 Sedimentary Basins

6 Blocks (~16871 Sq.km) Onland

6 Blocks (~ 41391 sq.km) Shallow Water

1 Block (~ 9991 sq.km) Deep Water

12 Blocks (~123733 sq.km) ULTRA DEEP WATER



Andaman and Mahanadi have deep-water and ultra-deep water blocks up for bid

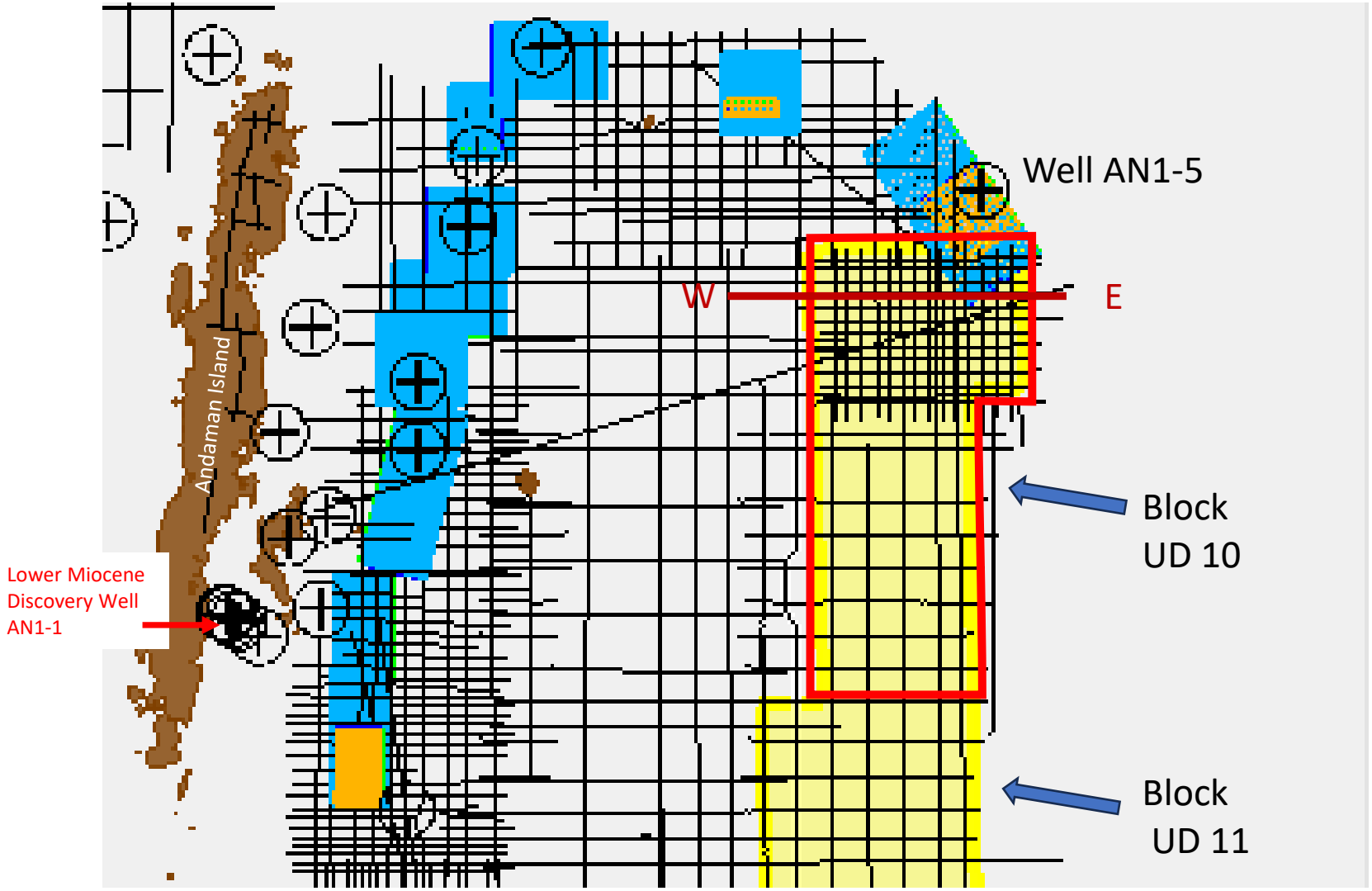
Andaman Nicobar Basin: Four Ultra-Deep-Water blocks are up for bid

S. No.	Basin Name	Basin Category	Block Name	Ref. No.	Block Area (Sq.km)
ULTRA-DEEP-WATER					
21	**ANDAMAN-NICOBAR**	**II**	AN-UDWHP-2024/1	UD9	12816.65
22			AN-UDWHP-2024/2	UD10	10027.9
23			AN-UDWHP-2024/3	UD11	8732.15
24			AN-UDWHP-2024/4	UD12	15481.03

Available Data

Block Name	2D-LKM	3D-SKM	Wells
AN-UDWHP-2024-1	5,205.97	0	0
AN-UDWHP-2024-2	3,167.88	0	0
AN-UDWHP-2024-3	2,152.91	0	0
AN-UDWHP-2024-4	4,556.89	2521.28	0

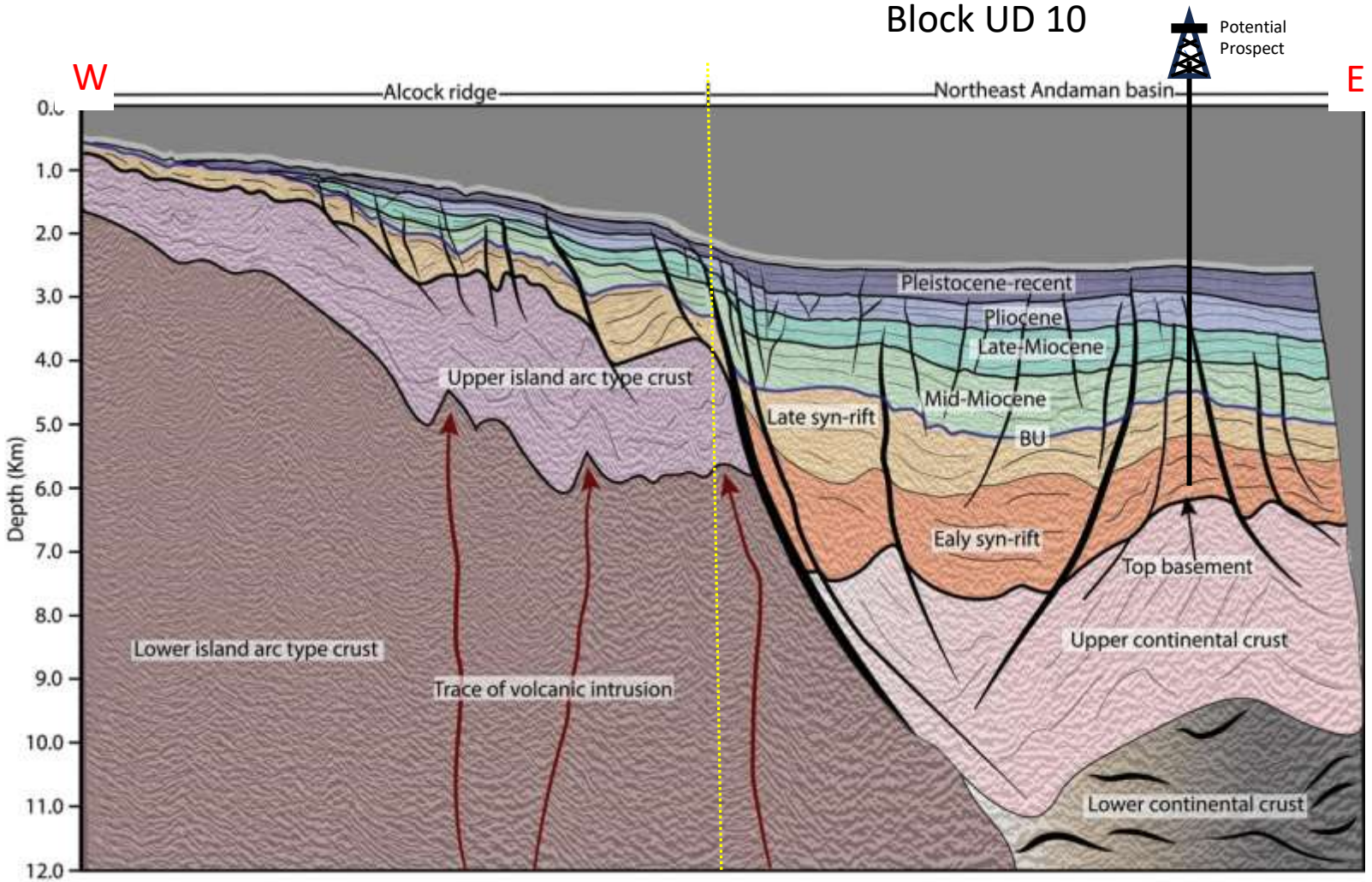
Block 22
UDWHP-24/2
UD10
Area:10,027.9 km^2
Available Seismic 3,167.88 LKm



Seismic Key: Black - 2D, Blue - 3D Time, Orange 3D Depth

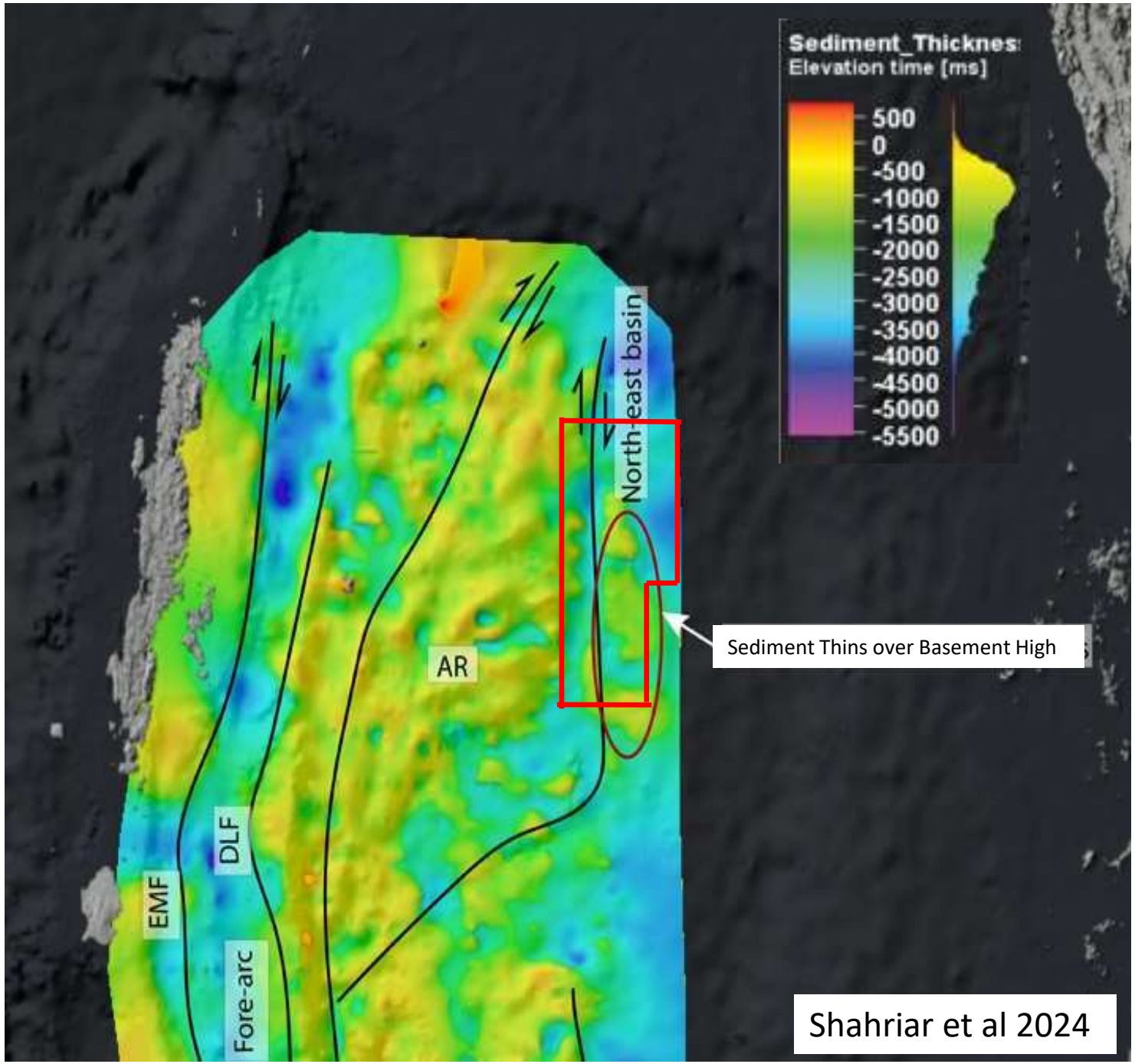
⊕ Well Location

NE Andaman Basin. Regional 2-D seismic line highlighting a potential prospect



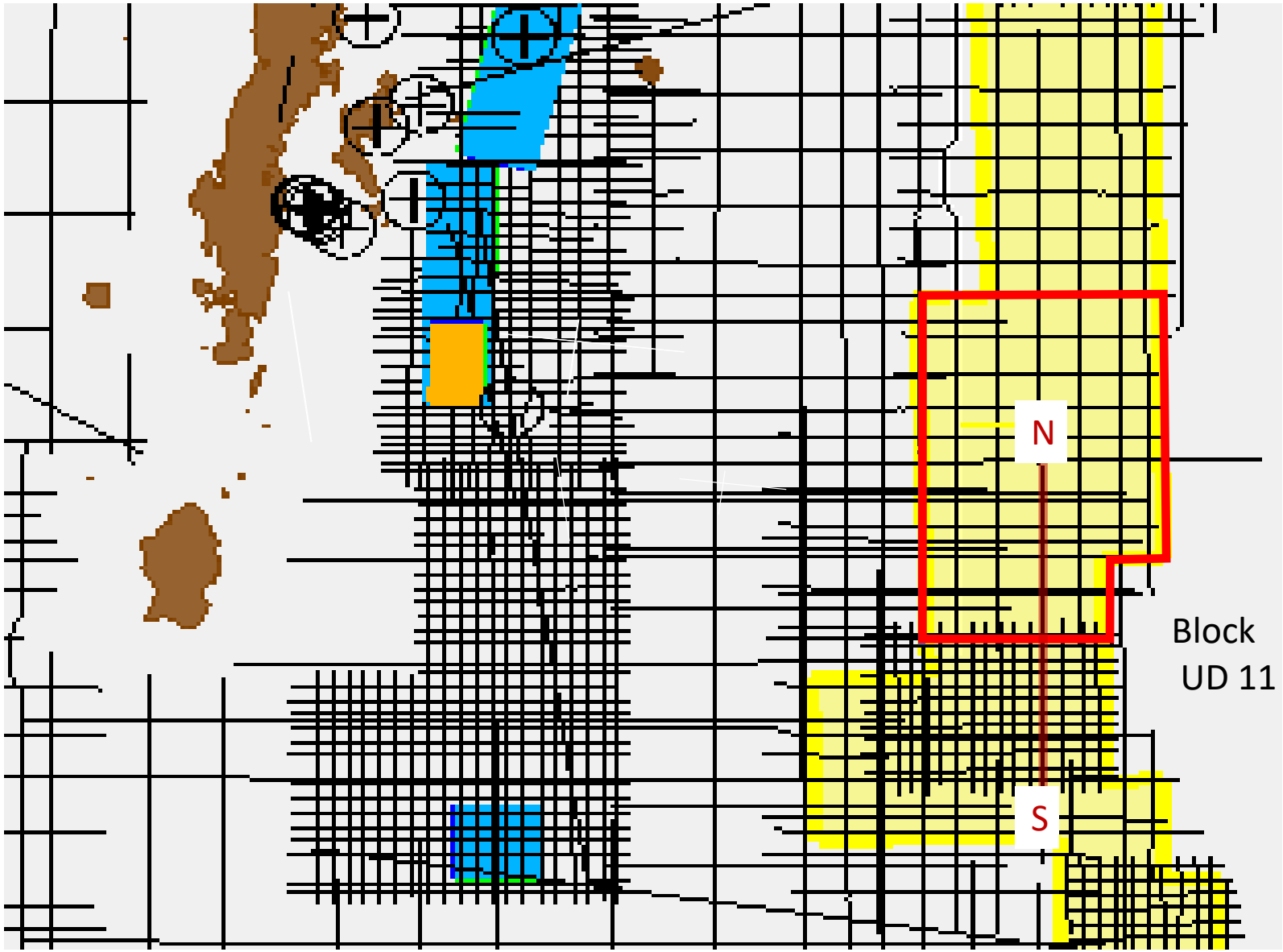
Shahriar et al 2024

The thickest sediment occurs in the northeast potion of Block UD10



Block 23
UDWHP-24/2
UD11
Area:8732.15 km^2

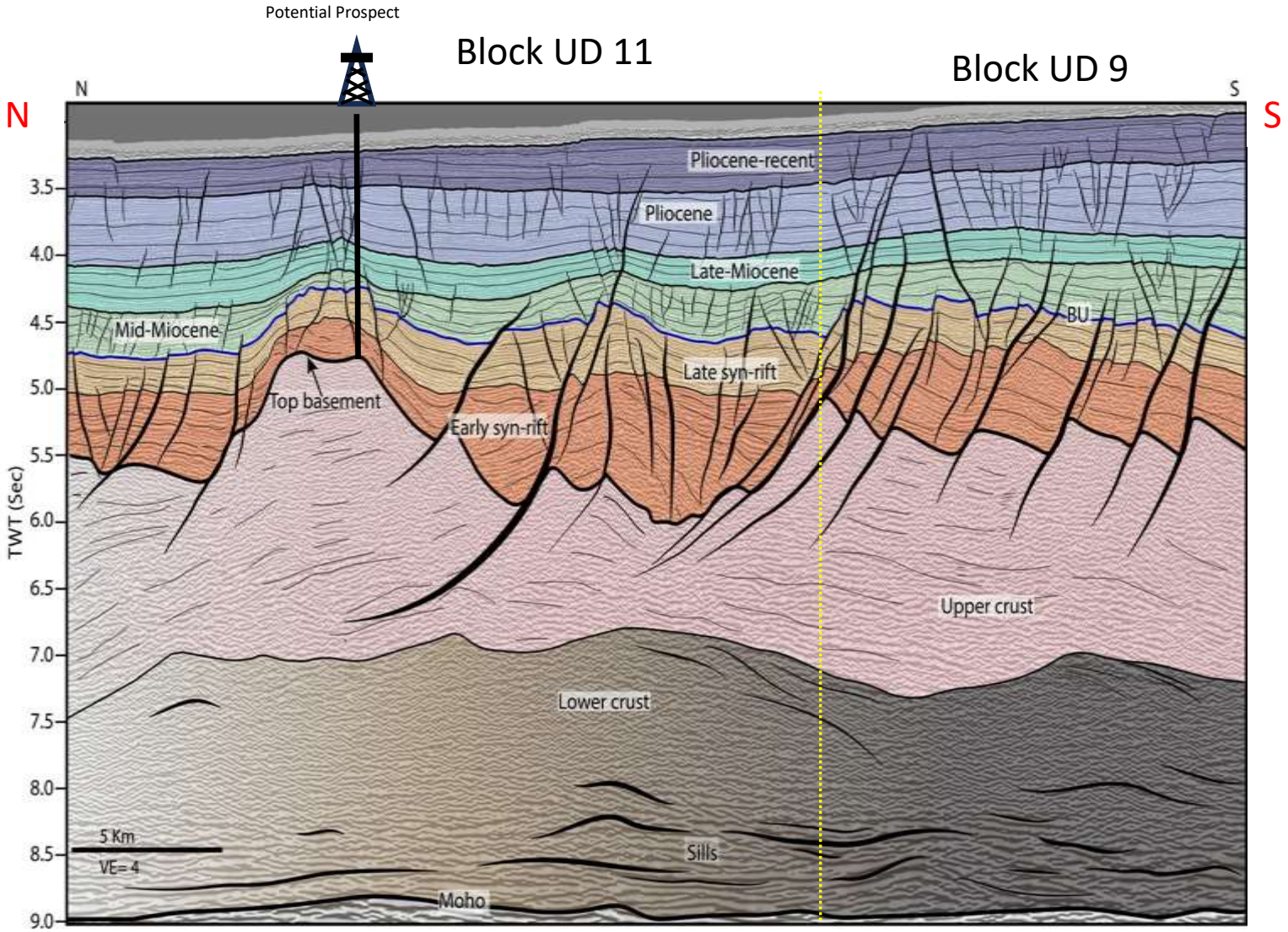
Available Seismic 2152.91 LKm



Seismic Key: Black - 2D, Blue - 3D Time, Orange 3D Depth

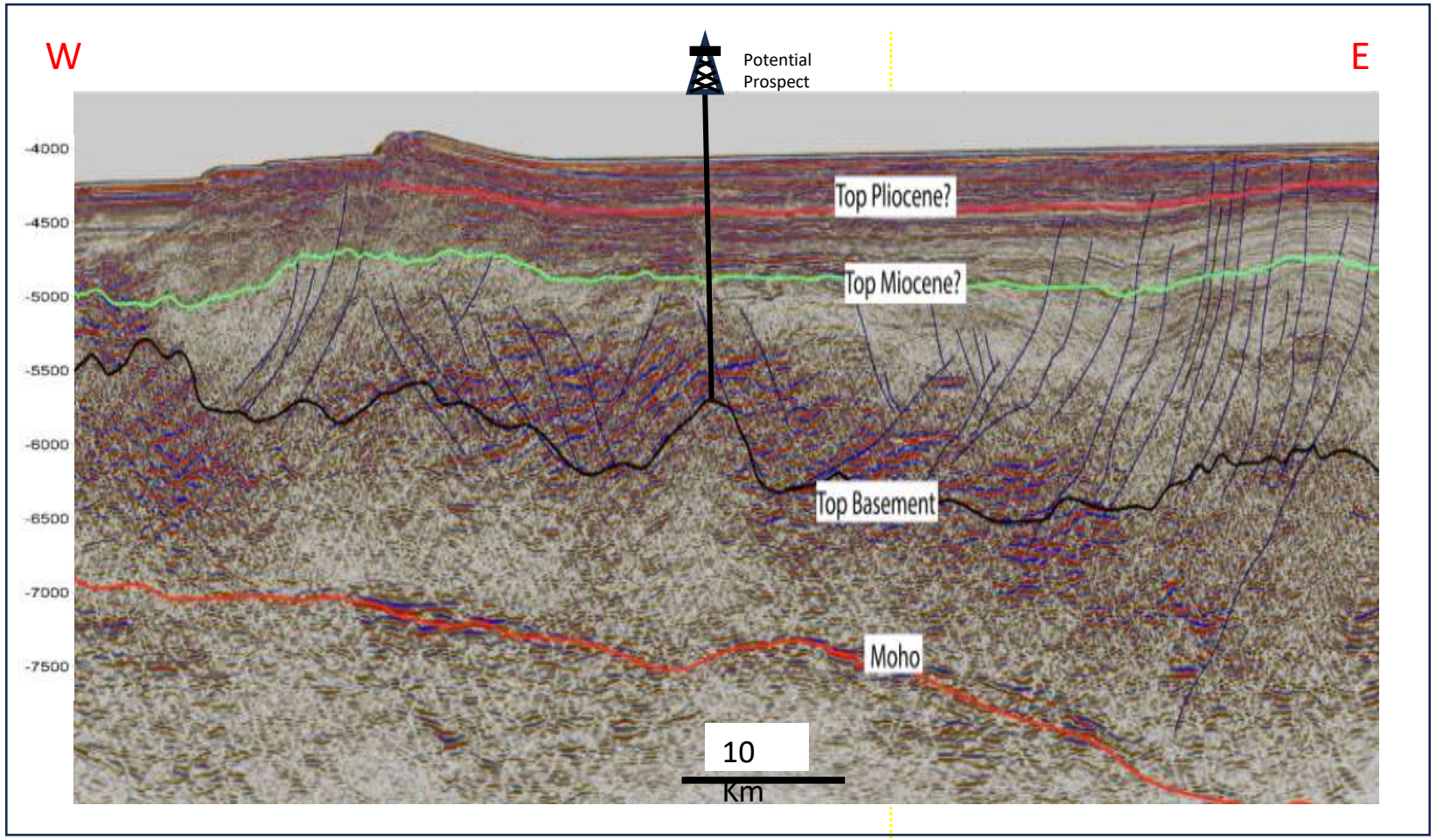
Well Location

N-S Seismic Line Across UD 11 and UD 9



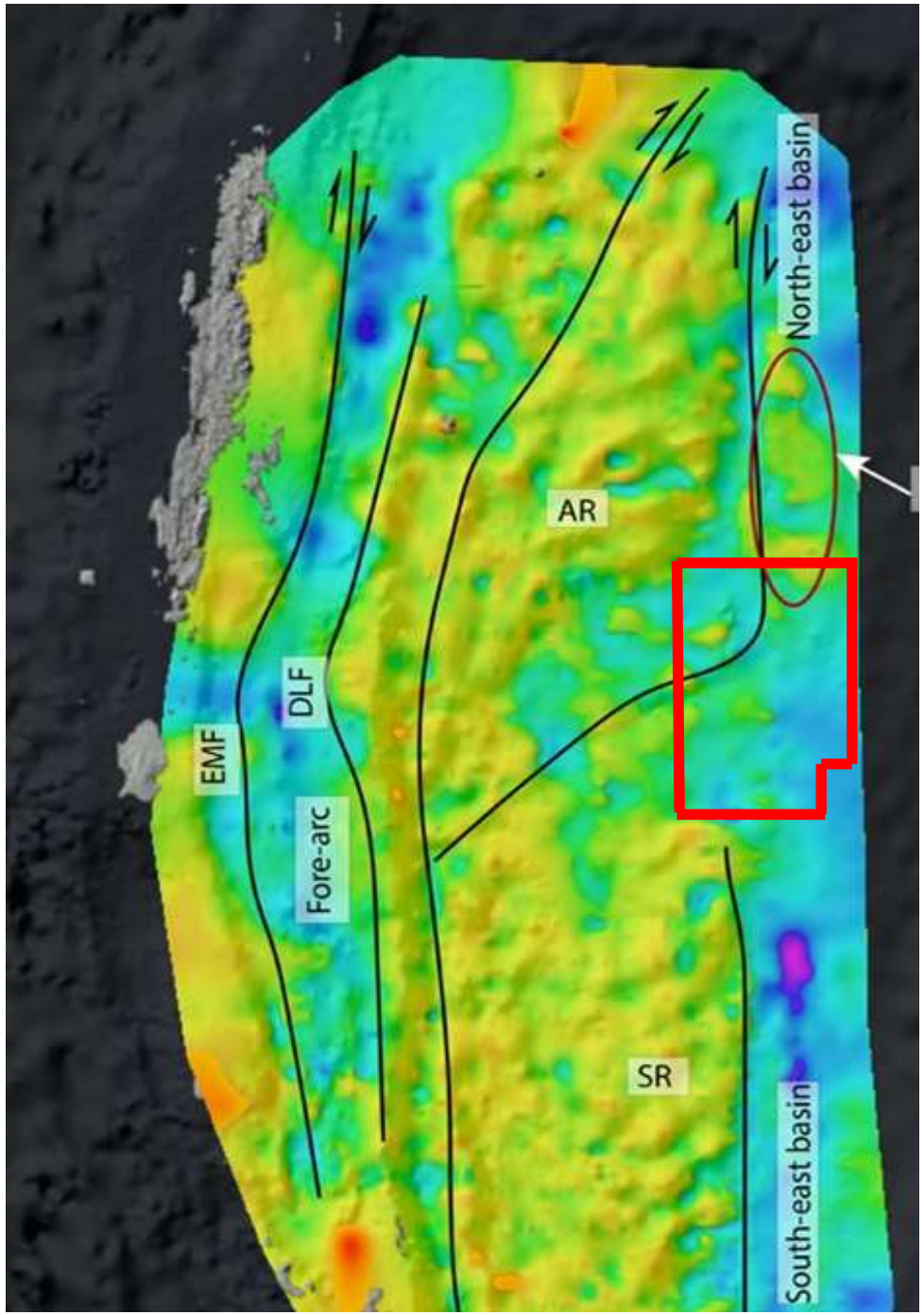
Shahriar et al 2024

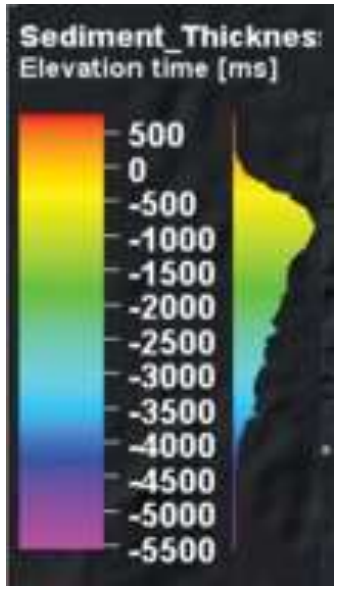
W-E Seismic Line Across Block AN-UDWHP-2024/2



Shahriar et al 2024

Relatively thick sediment package in Block UD11





Block UD 11

Shahriar et al 2024

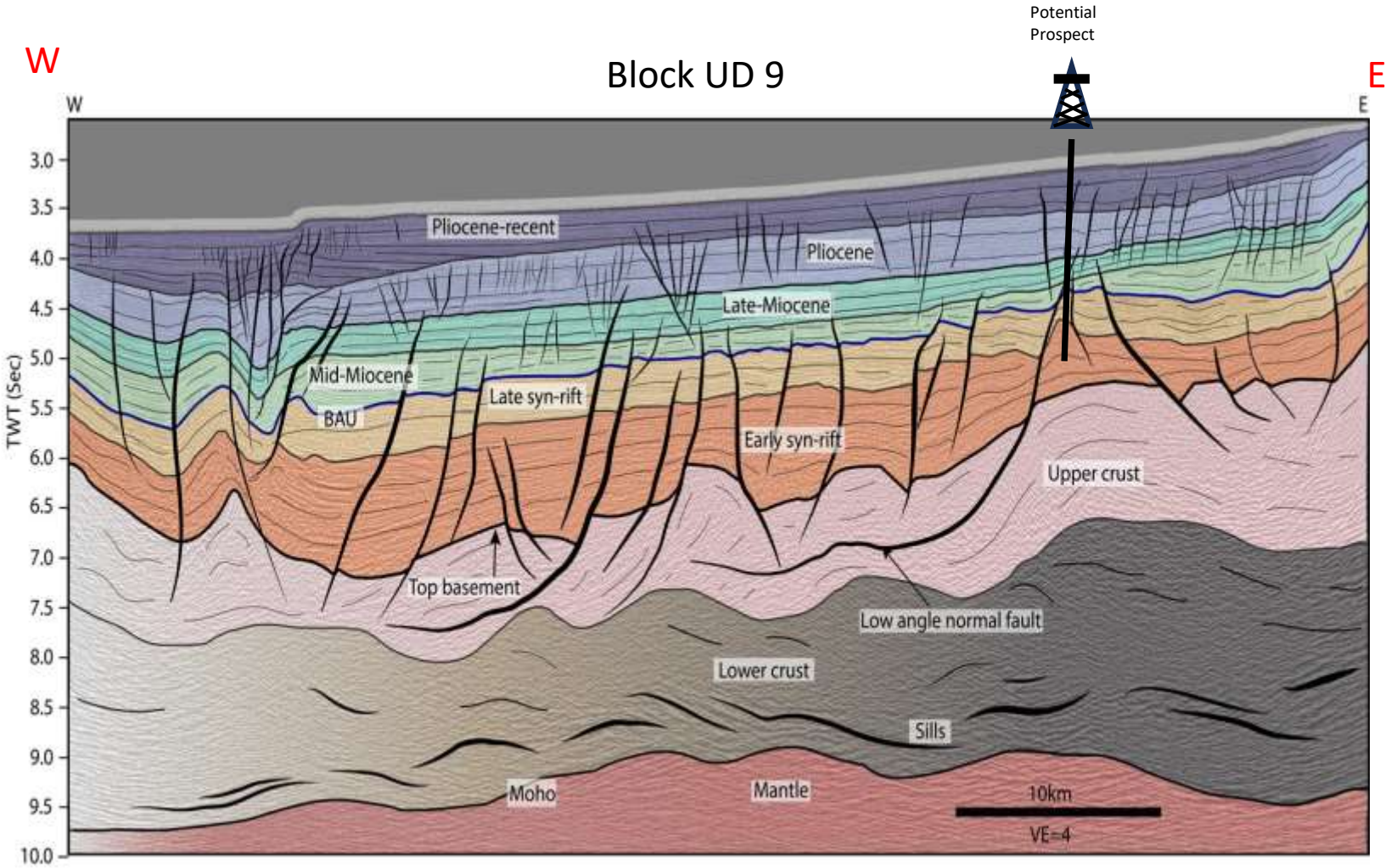
Block 21
UDWHP-24/1
UD9
Area:12,816.65km^2

Available Seismic 5205.97 LKm

Seismic Key: Black - 2D, Blue - 3D Time, Orange 3D Depth

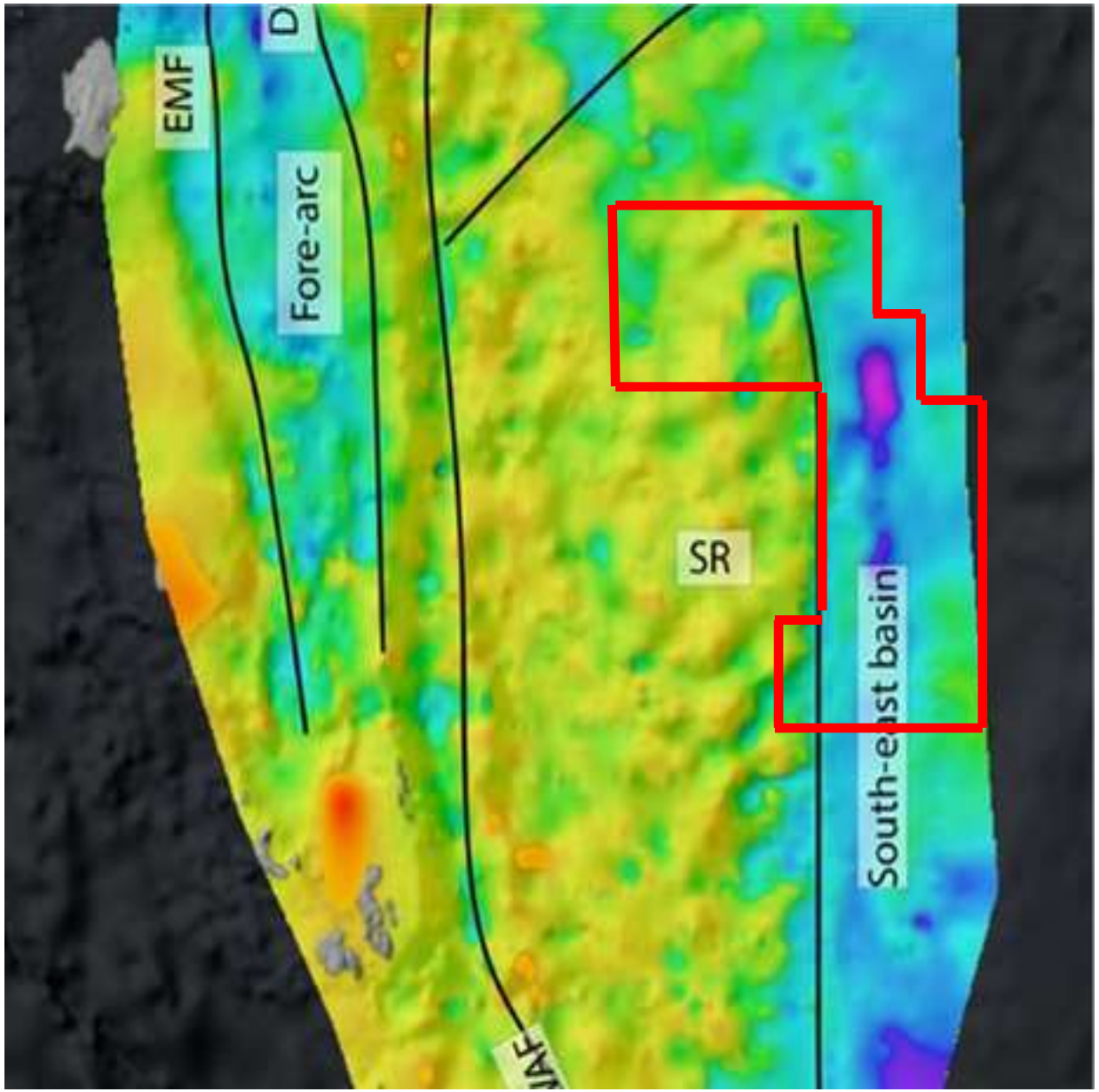
Well Location

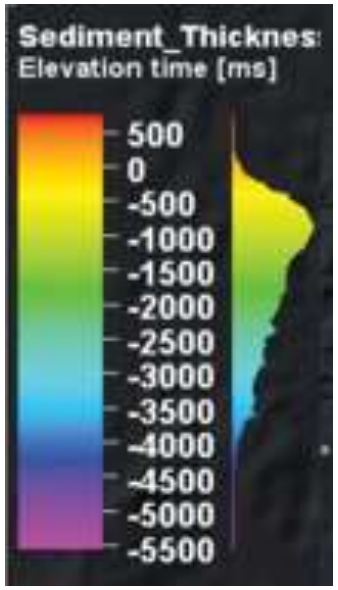
W to E Seismic Line Block UD 9



Shahriar et al 2024

Excellent Sediment Thickness in Block UD-9



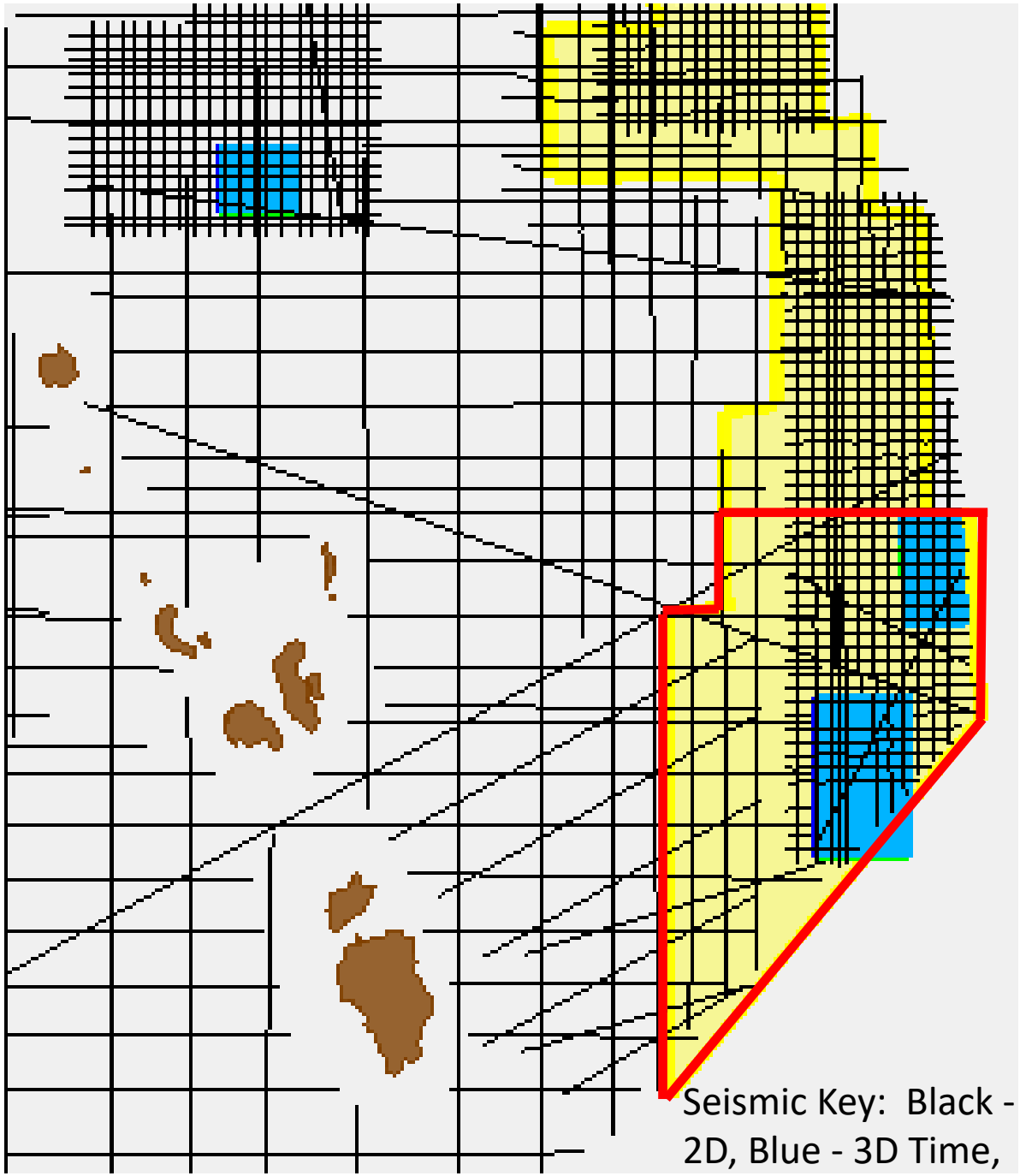


Block
UD 9

Shahriar et al 2024

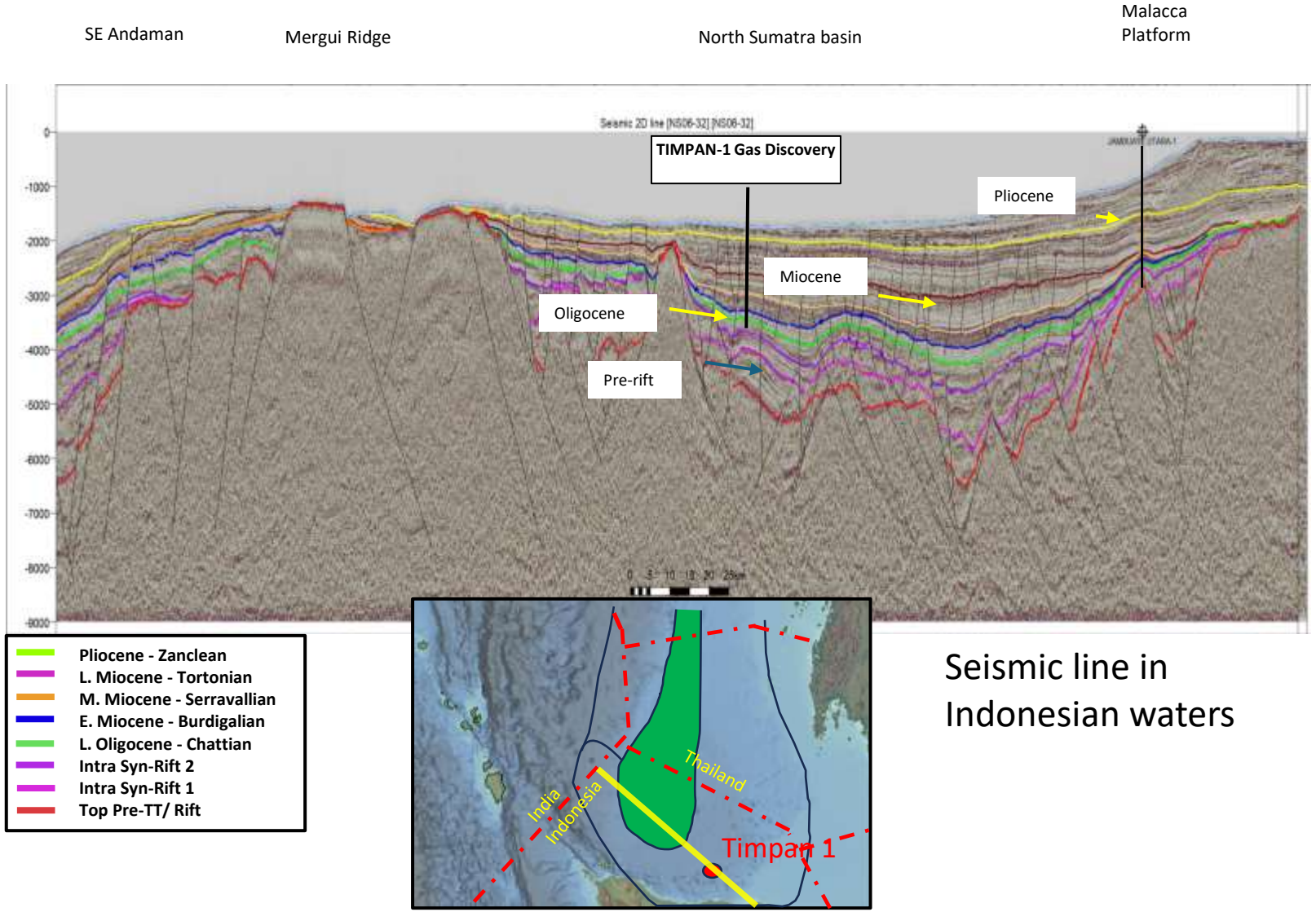
Block 24
DWHP-24/4
UD12
Area:15,481.03km^2

Available Seismic 4556.89 LKm
Available 3-D 2528.31 Km2



Timpan 1: Oligocene Bampo Formation

Timpan 1 is a major deep-water discovery in Indonesia. Seismic shows that the stratigraphy and the structural style extend across the Mergui Ridge into India

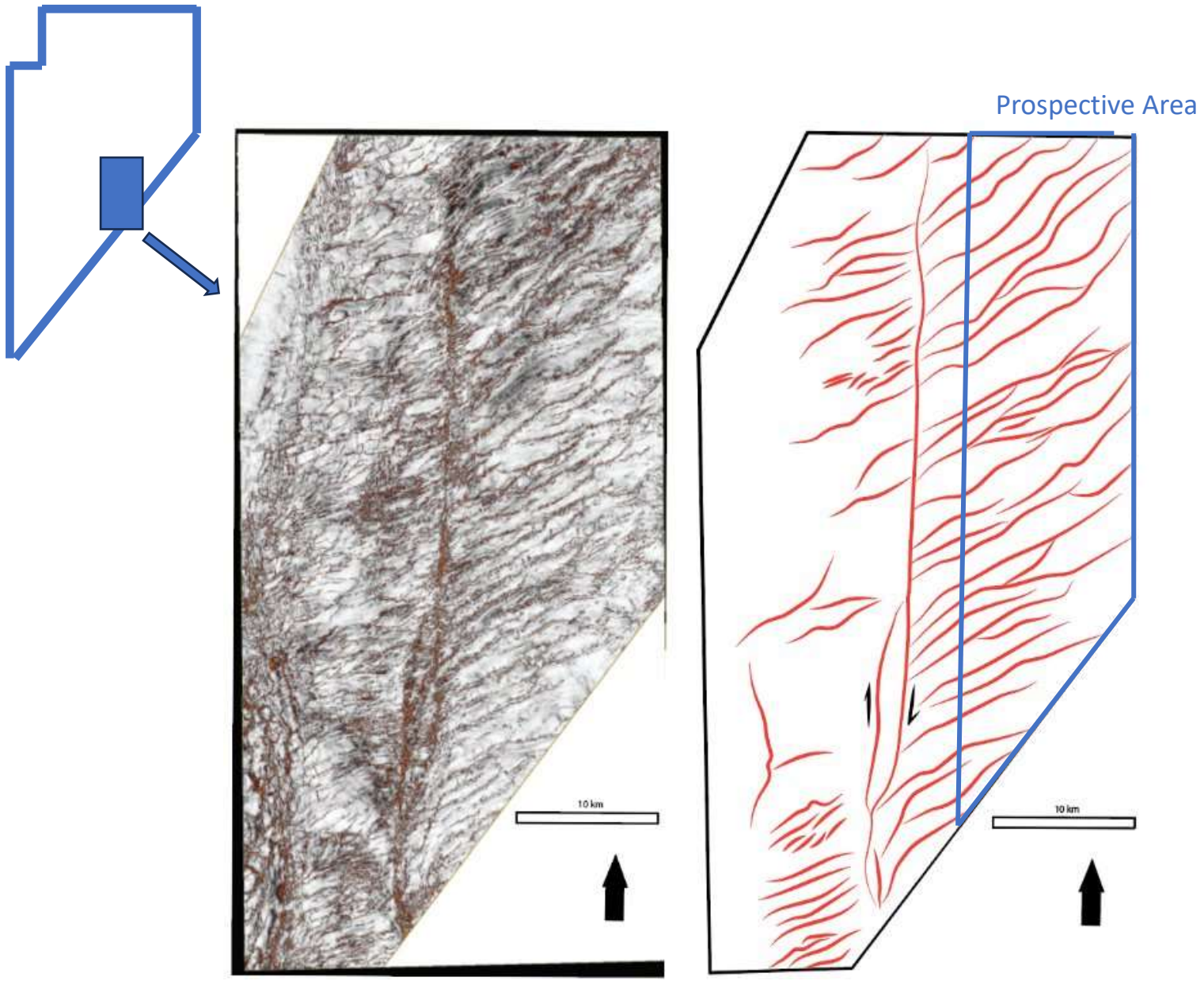


Seismic line in Indonesian waters

Seismic line source: https://www.linkedin.com/feed/update/urn:li:activity:7185480482204053504/

Mann et al 2024

3 –D Extraction showing N-Sumatran Sunda Style fault Structures



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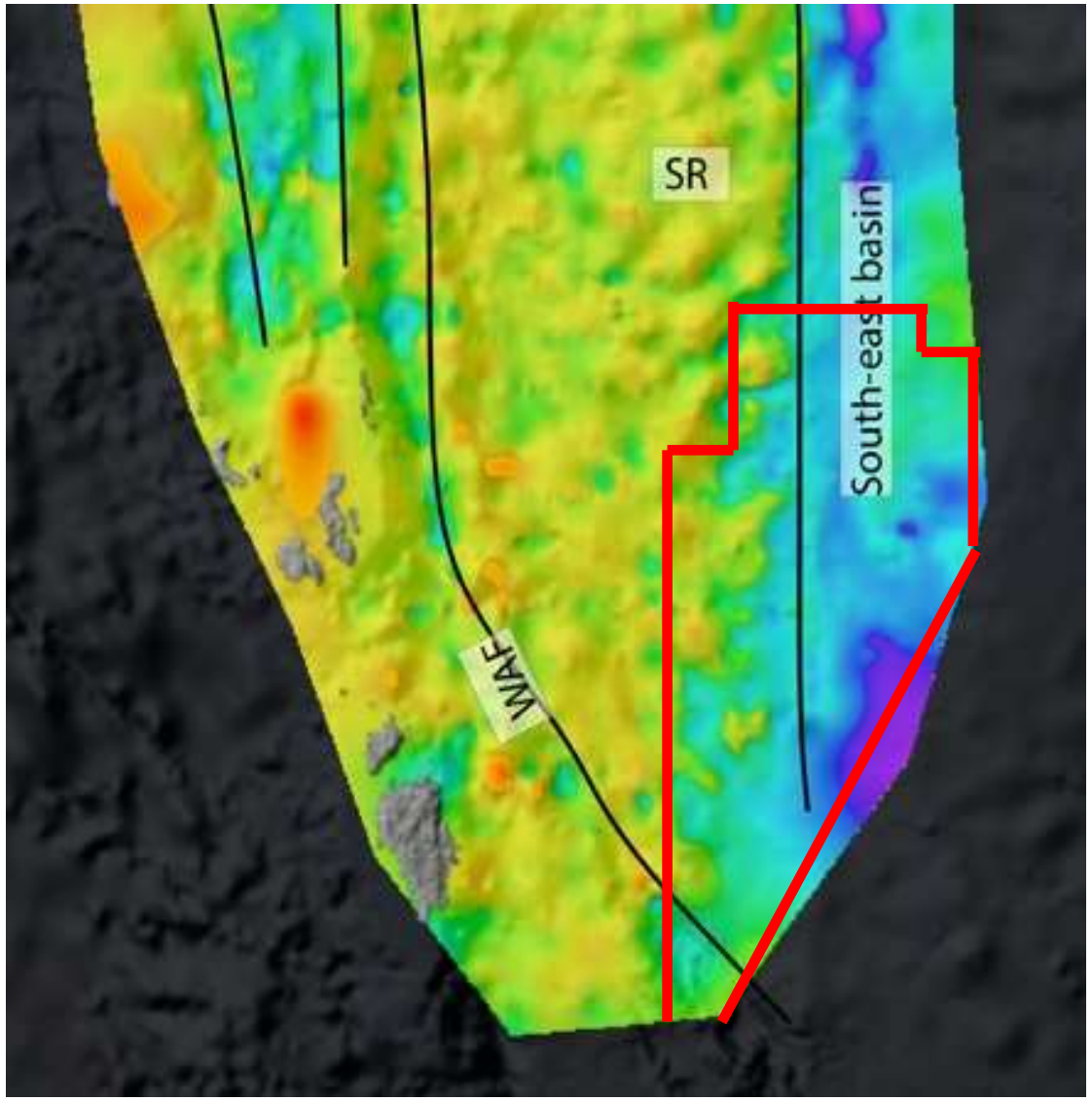
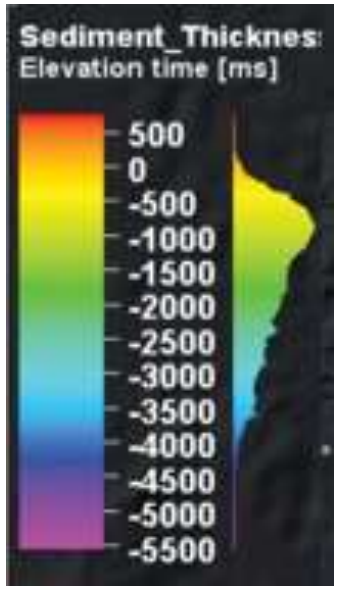
Excellent Sediment Thickness in Block UD-12 West of the Murgui Ridge



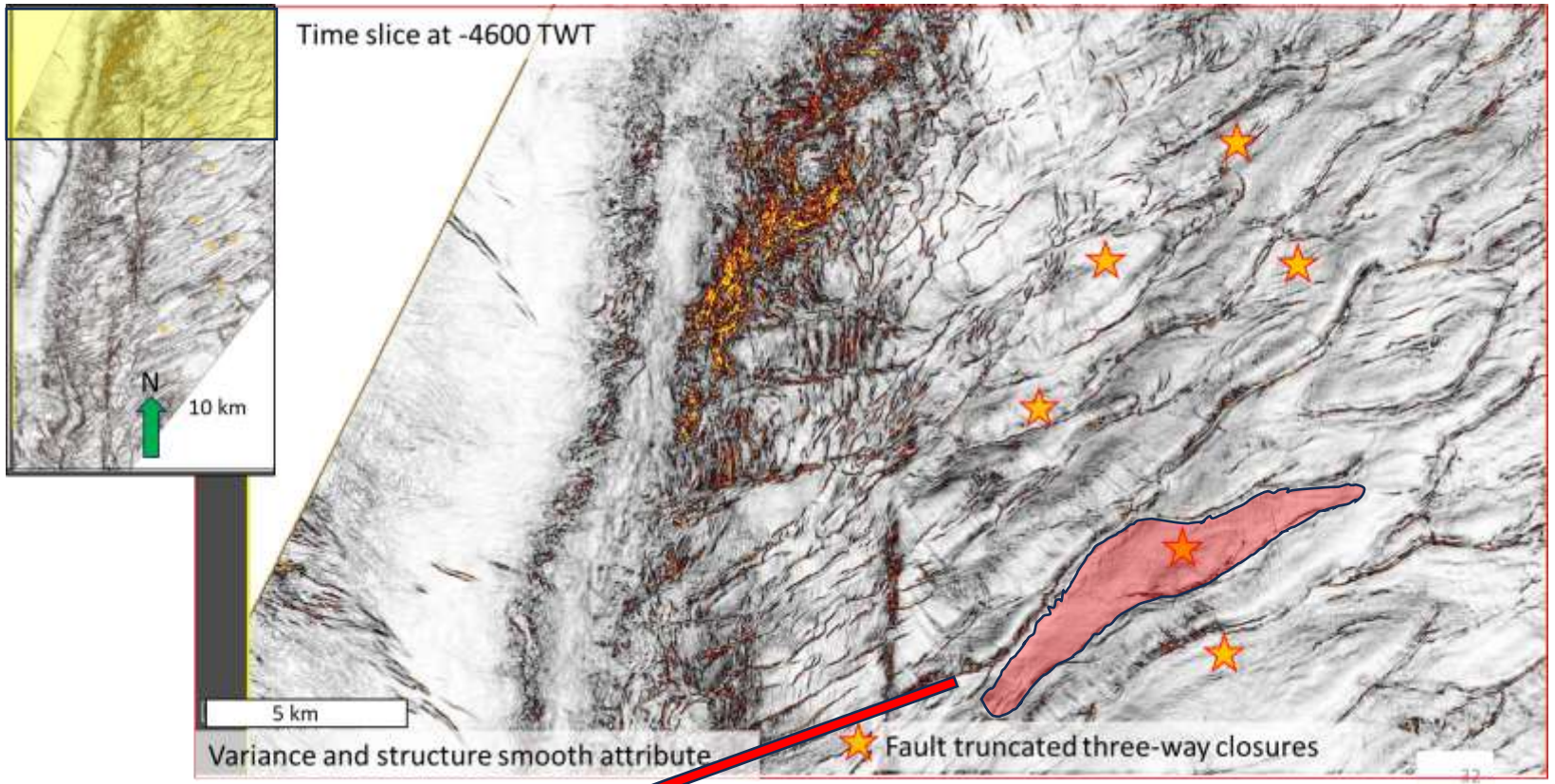


Block
UD 12

Shahriar et al 2024

Sunda Style Structural Prospect Leads with hypothetical reserve estimate for an individual structure

(Reservoir parameters based on Timpan data)



Mann et al 2024

Reservoir Parameters
Area: 12km X 2.5km
Reservoir Thickness 100m
Porosity 16%
Sw 35%
Water Depth 1500m
Depth 5000m
Pi 48000 KPa (hydrostatic gradient)
B_g .006

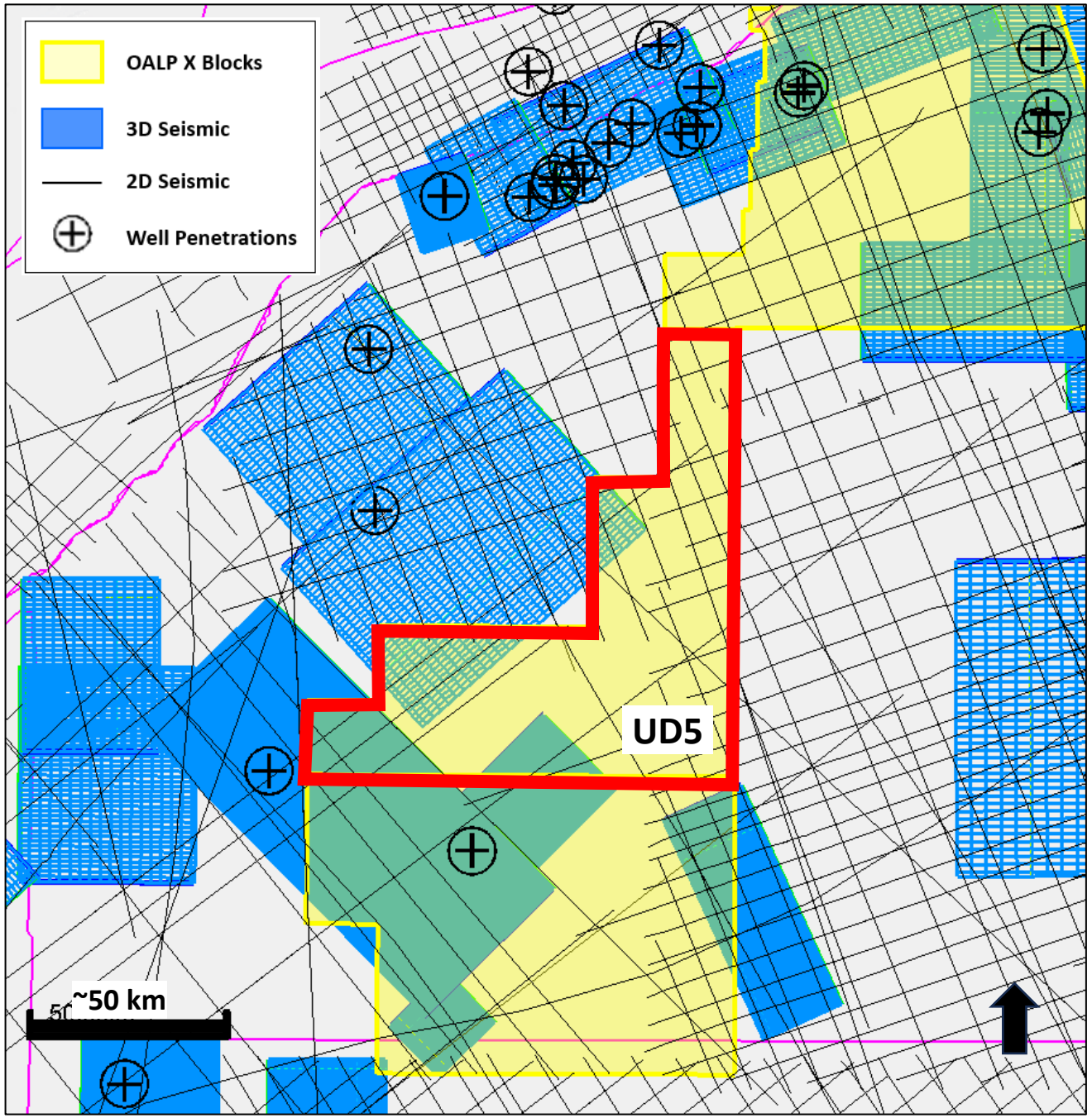
Volumetric Reserve Estimate of GIP is 3.2 TCF

Evaluation of Individual Mahanadi and Bengal Bid Round X Blocks

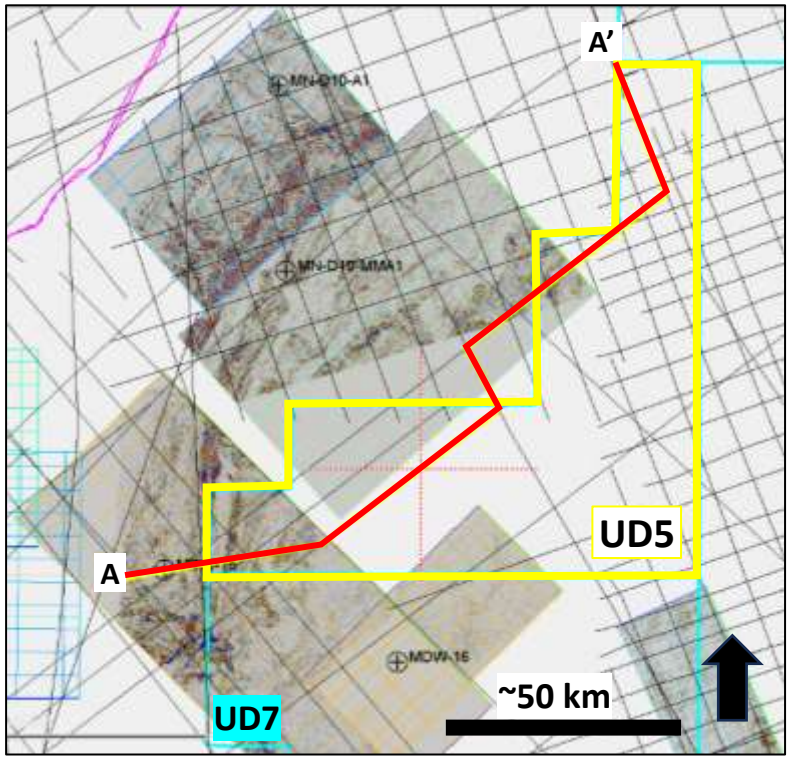
This evaluation is drawn from ongoing research conducted by L. Gungor, PhD candidate and A Lopez Galindo, MSc candidate as requirements for their Degrees at the University of Houston

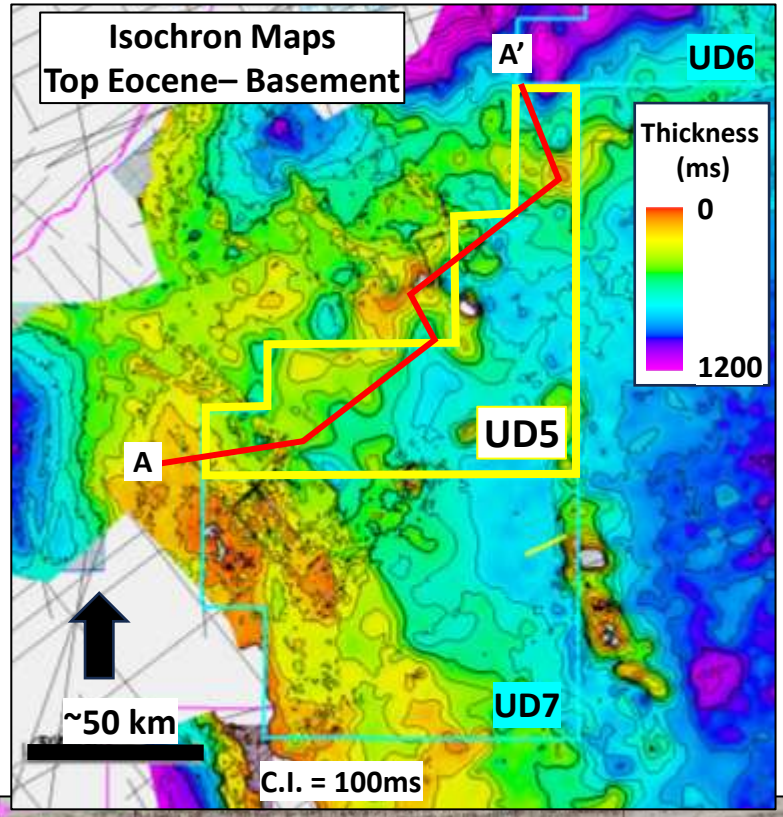
MN-UDWHP-2024/1
UD5

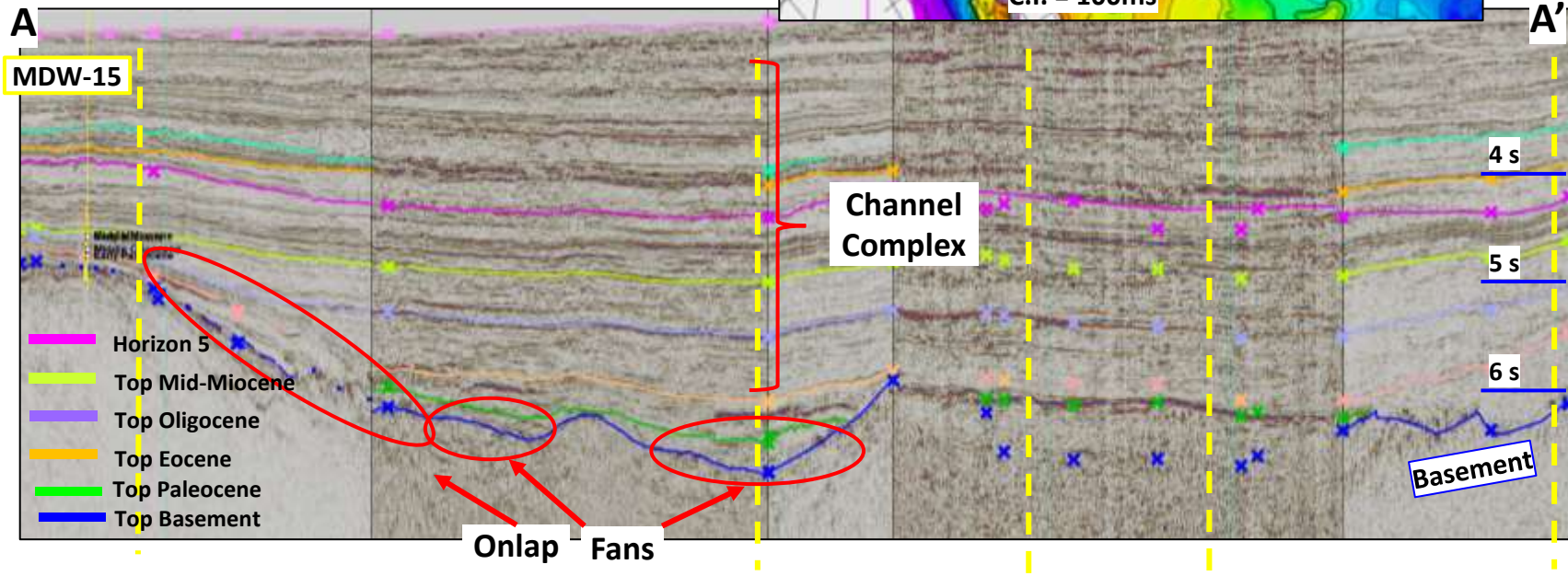
Category: II
Block Area: 5,520 SKM
2D Seismic: 1,022 LKM
3D Seismic: 759 SKM



Although block UD5 has limited 2-D and 3-D data, there is the potential for onlap and subcrop plays in the older sediments

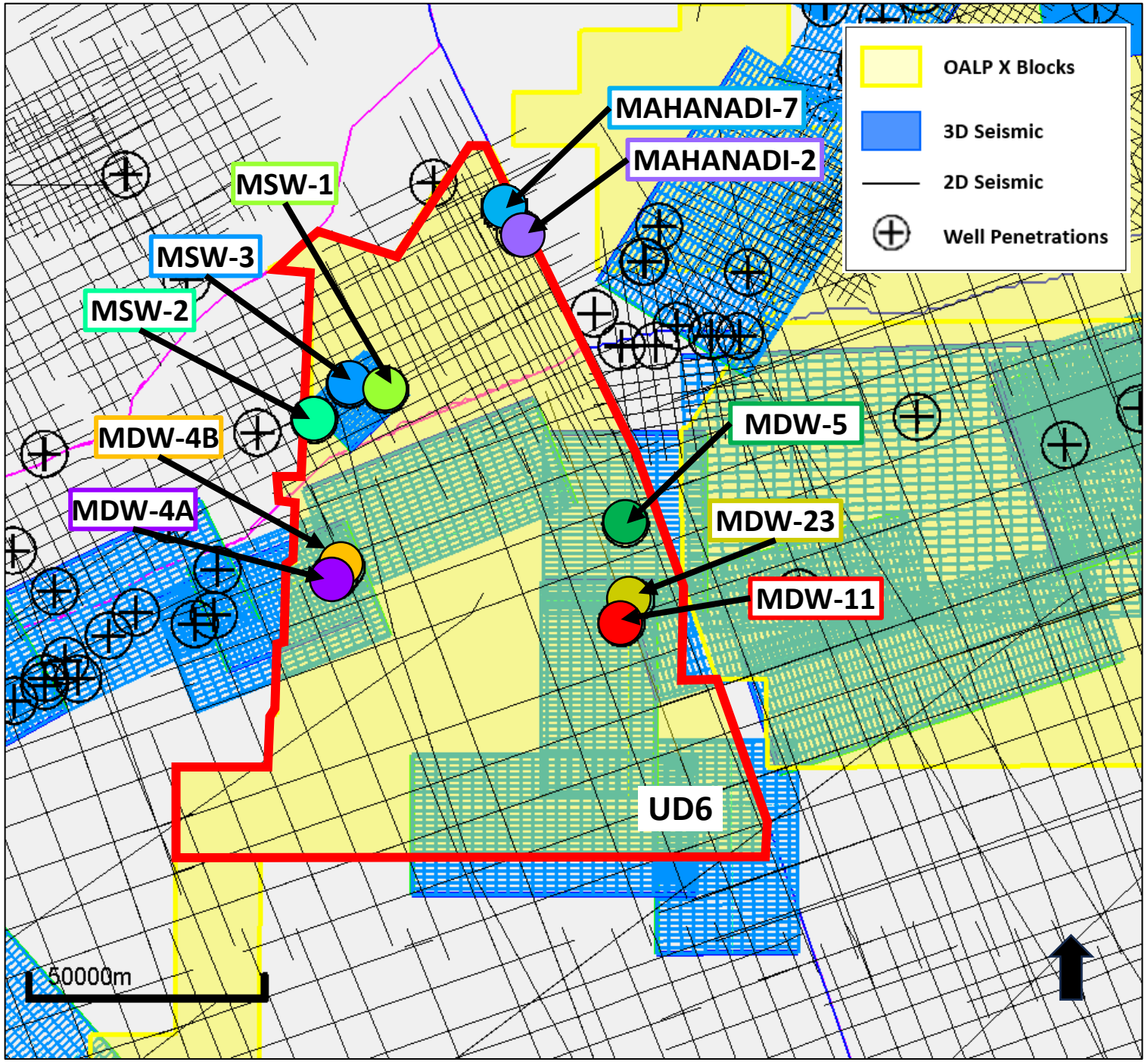




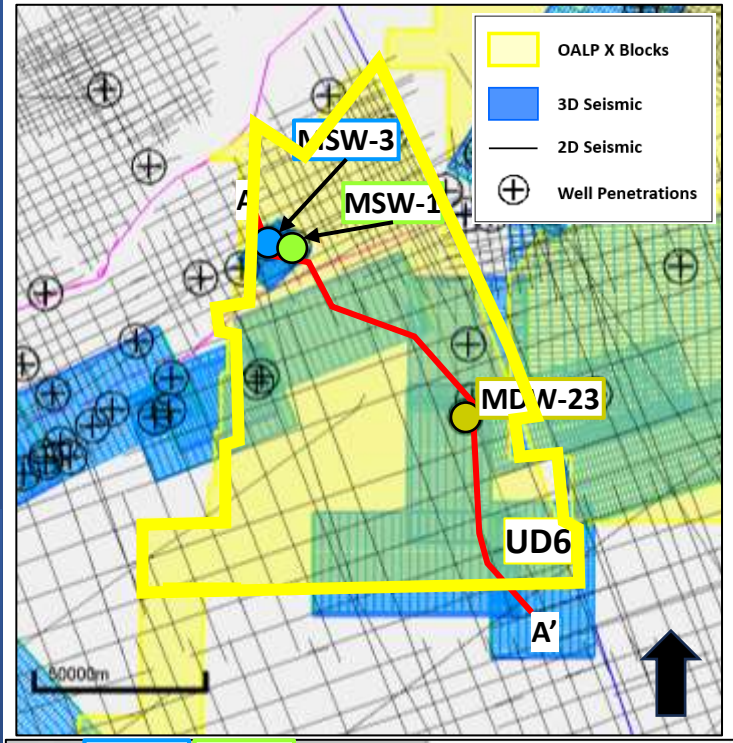


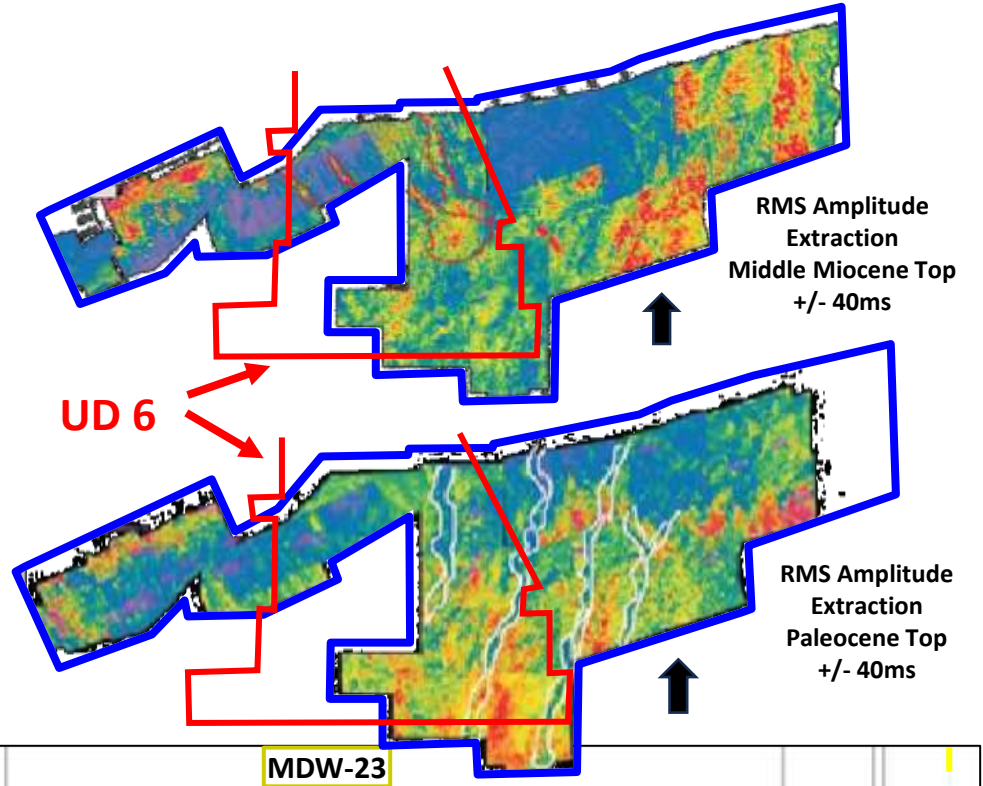
MN-UDWHP-2024/2
UD6

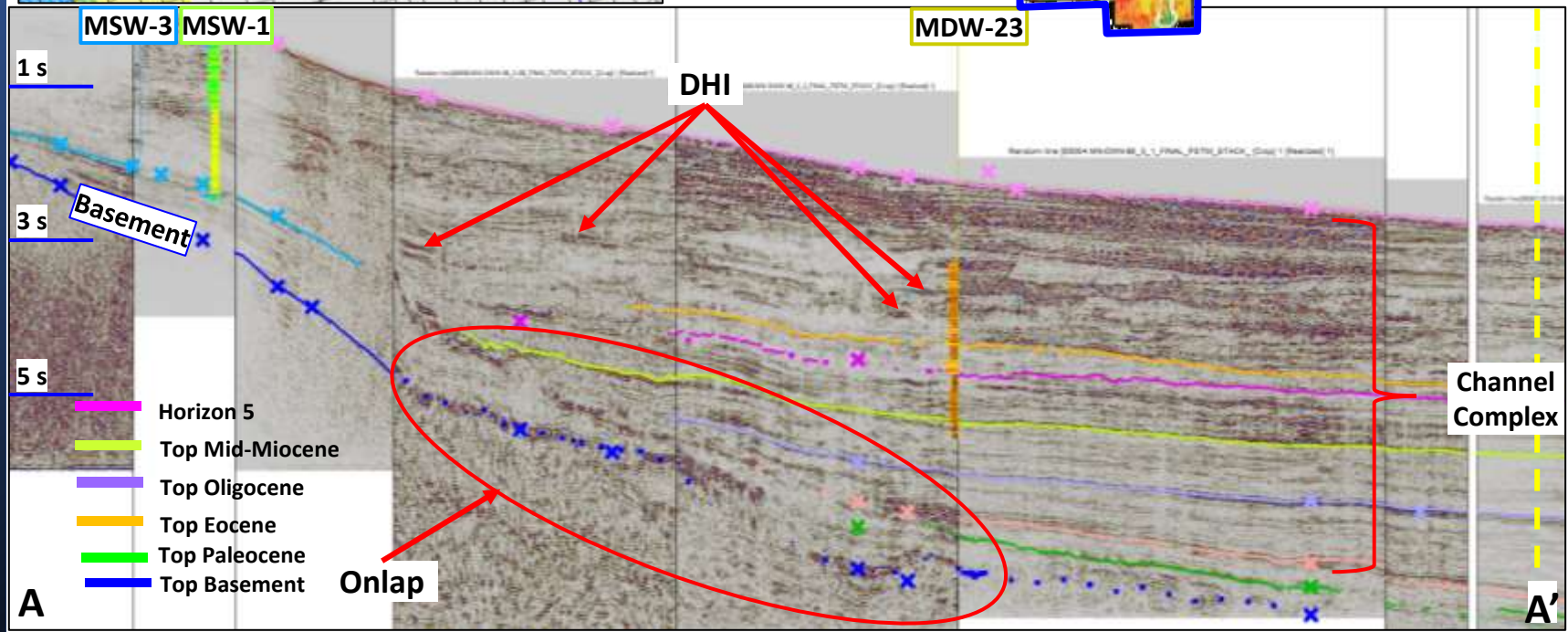
Category: II
Block Area: 10,553 SKM
2D Seismic: 786 LKM
3D Seismic: 4,541 SKM



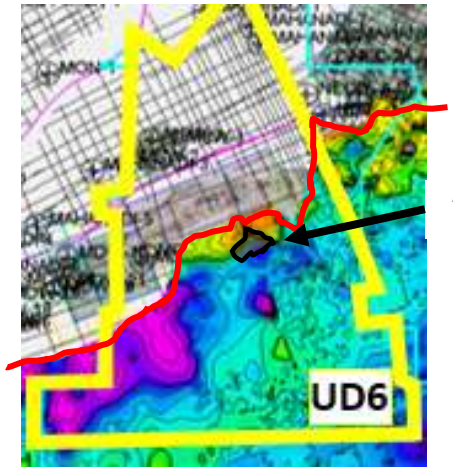
RMS amplitude extractions for the Mid Miocene and Top Paleocene show the development of subsea channel systems and distributary fans.





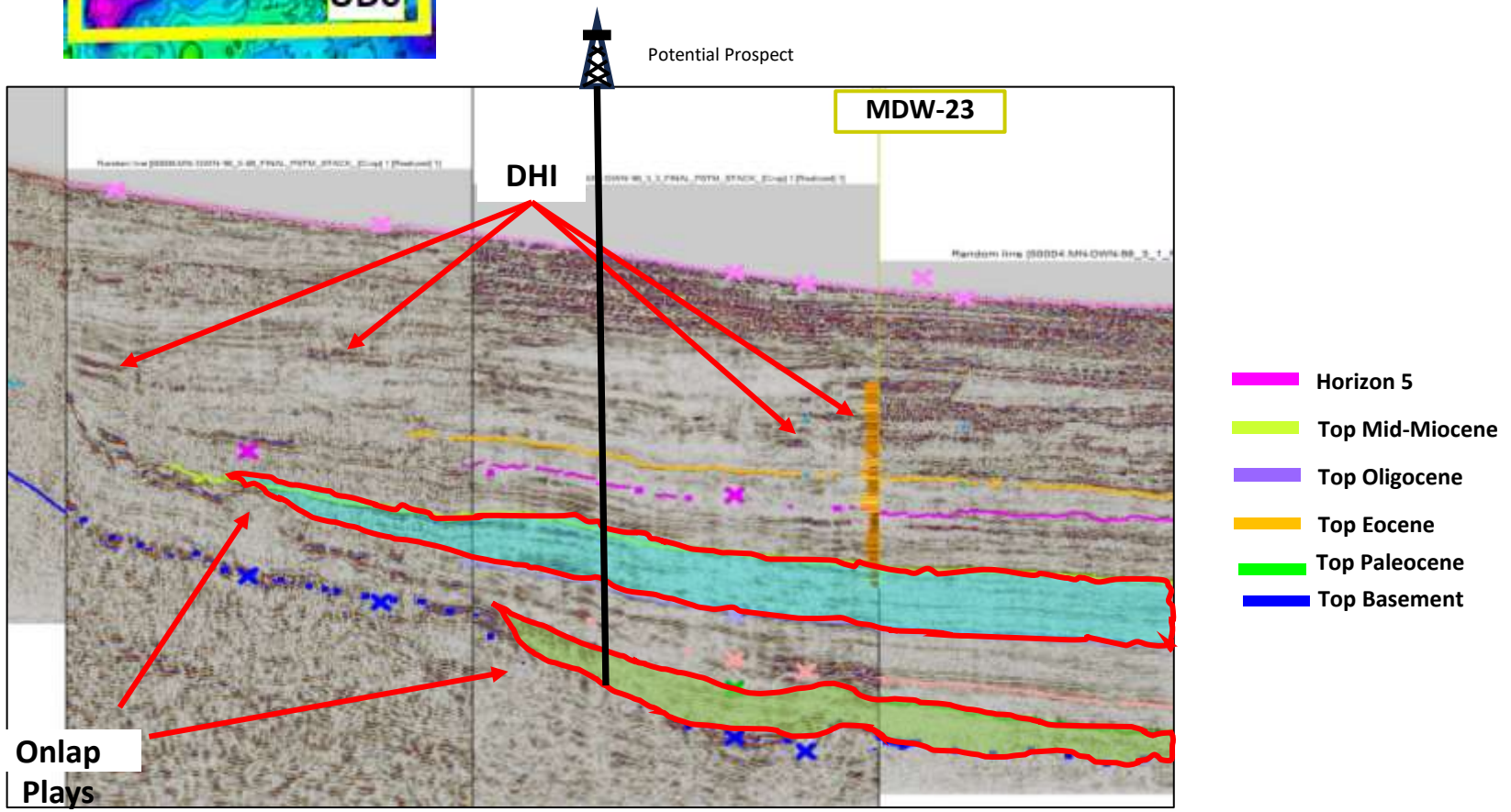


A basal subcrop play in the Eocene has the potential to trap over 524 BCF of gas



Subcrop Play Resource Estimate

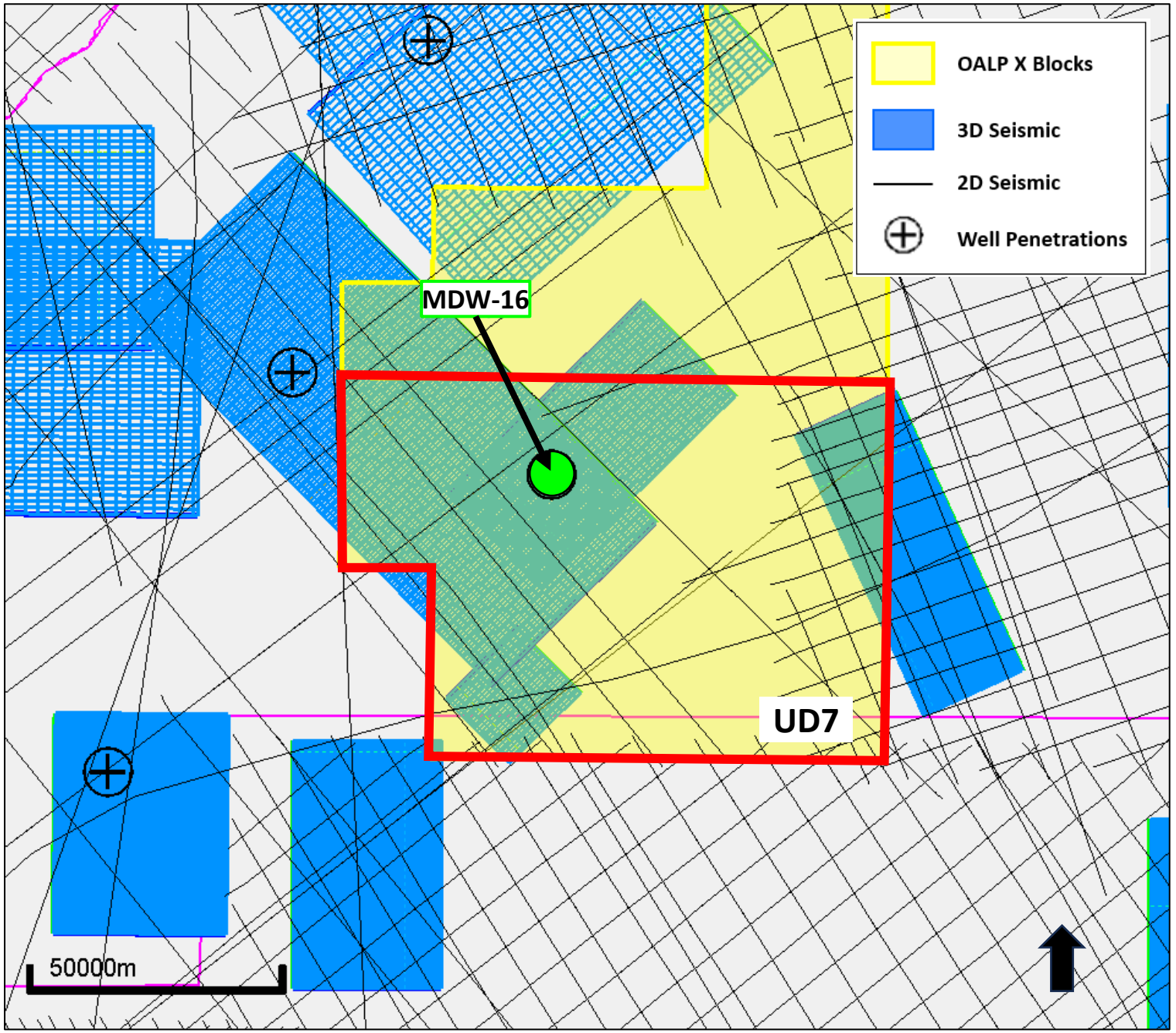
- Area of closure: 15×10^6 m^2
- Estimated average reservoir thickness: 50m
- Estimated porosity: 21%
- Estimated Sw: 33%
- Depth: 4000m
- PI: 38400 kPA
- B_g: .006
- Estimated OGIP: 14.8×10^9m^3 (524 BCF)



DGH

MN-UDWHP-2024/3
UD7

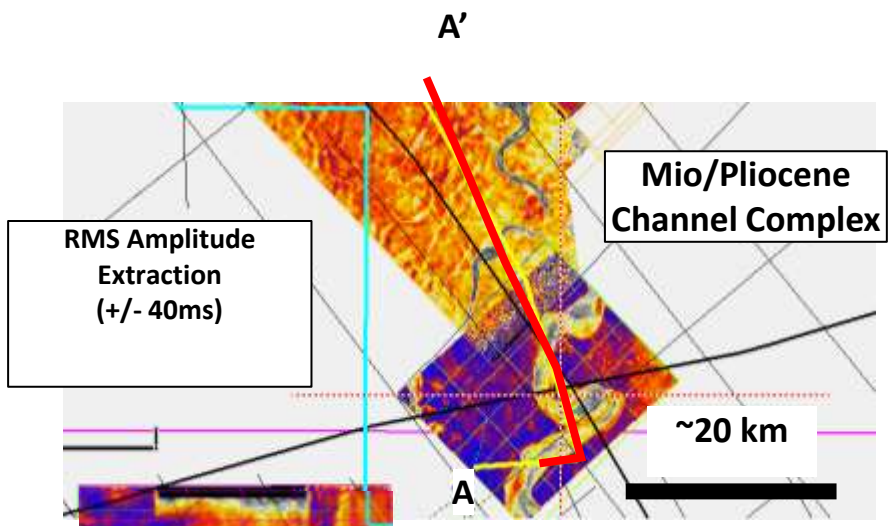
Category: II
Block Area: 7,169 SKM
2D Seismic: 885 LKM
3D Seismic: 6,019 SKM

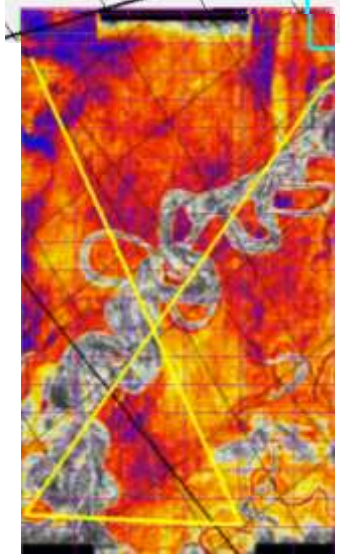


RMS Amplitude Extractions from the Mio/Pliocene show sinuous distributary channels that are potential play targets.

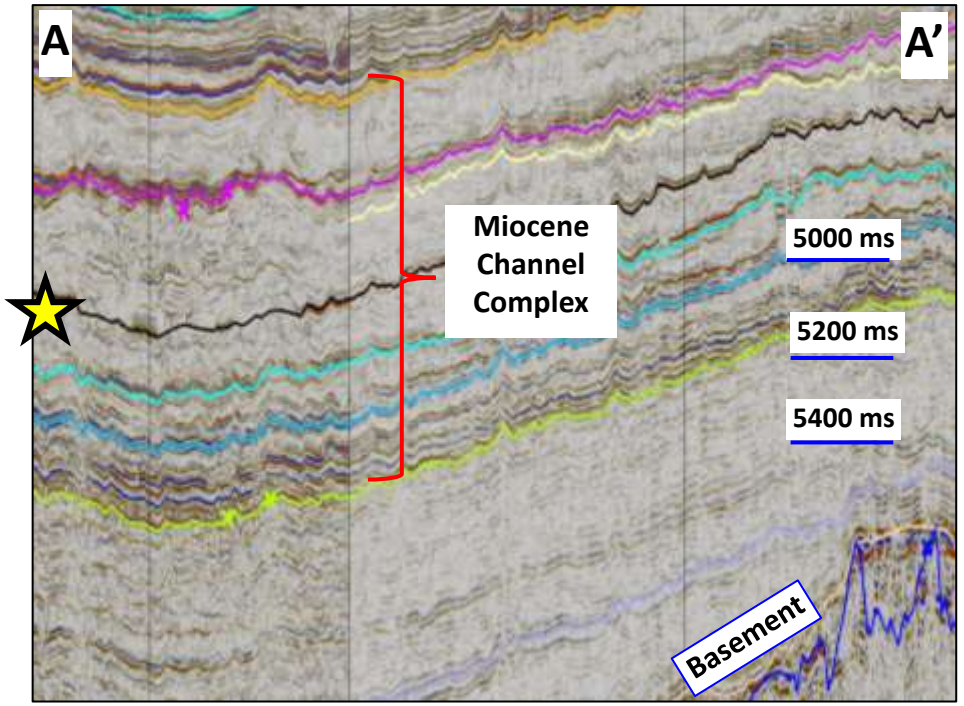
Some channels are up to 1.5km across with a closure length of 4km and 30 meters of thickness.

Estimated in place resource potential is 268 BCF





Horizon 5
Top Mid-Miocene
Top Oligocene
Top Eocene
Top Paleocene
Top Basement

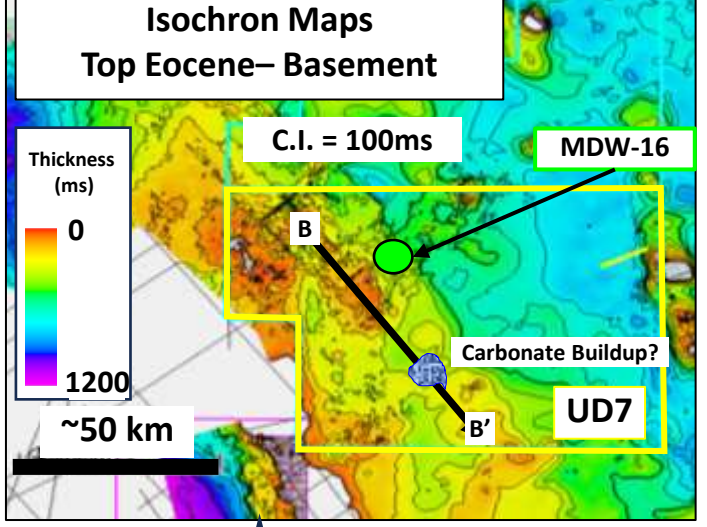


Channel Play Resource Estimate

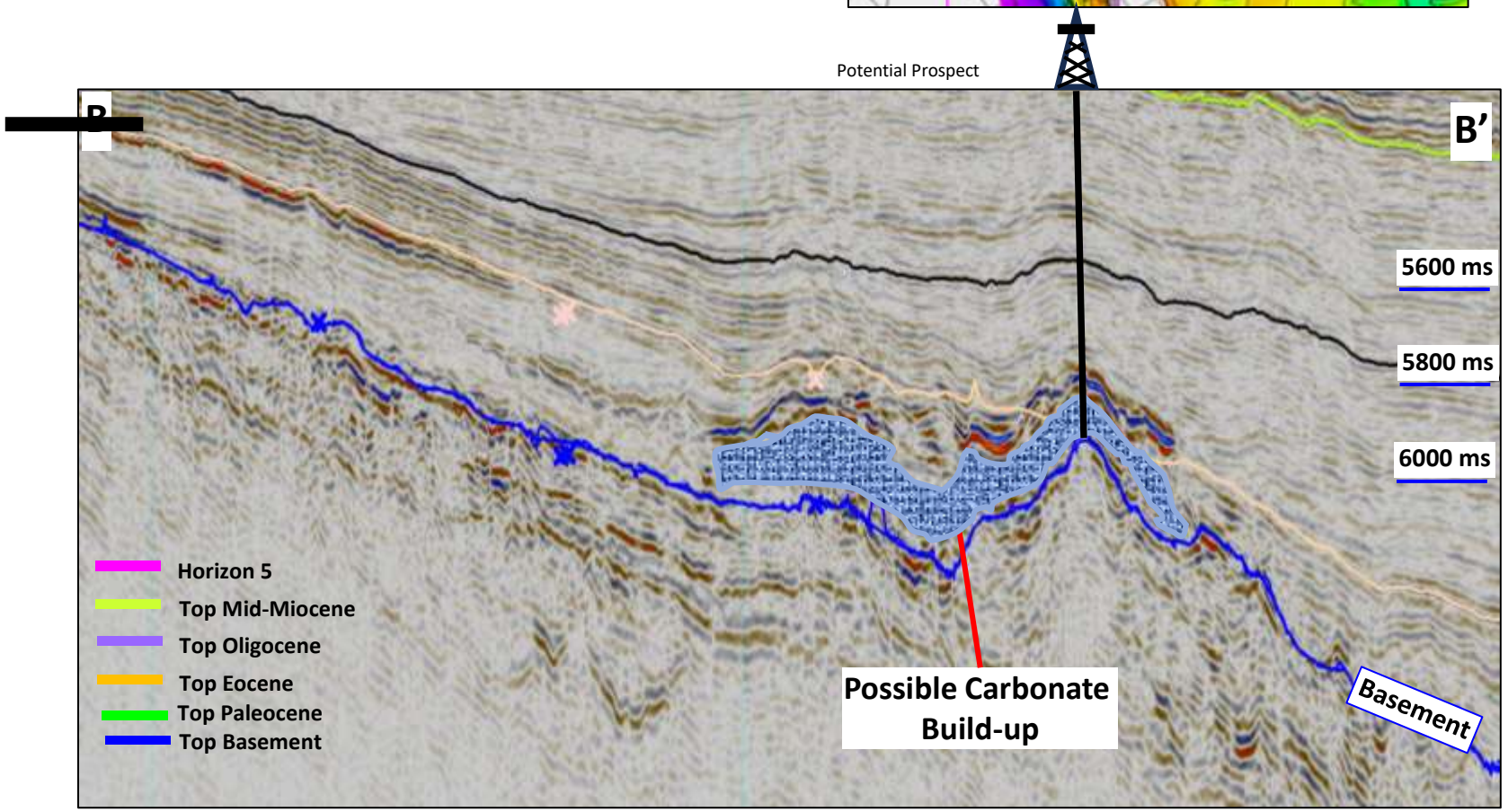
Area of closure: $6x10^6$ m^2
Estimated average reservoir thickness: 30m
Estimated porosity: 26%
Estimated Sw: 37%
Depth: 3000m
PI: 28800 kPA
B_g: .007
Estimated OGIP: $7.5x10^9m^3$ (268 BCF)

Carbonate Play Resource Estimate

Area of closure: 3.5×10^6 m^2
Estimated average reservoir thickness 75m
Estimated porosity: 12%
Estimated Sw: 25%
Depth: 4000m
PI: 38400 kPA
B_g: .006
Estimated OGIP: $7 \times 10^9 m^3$ (248 BCF)



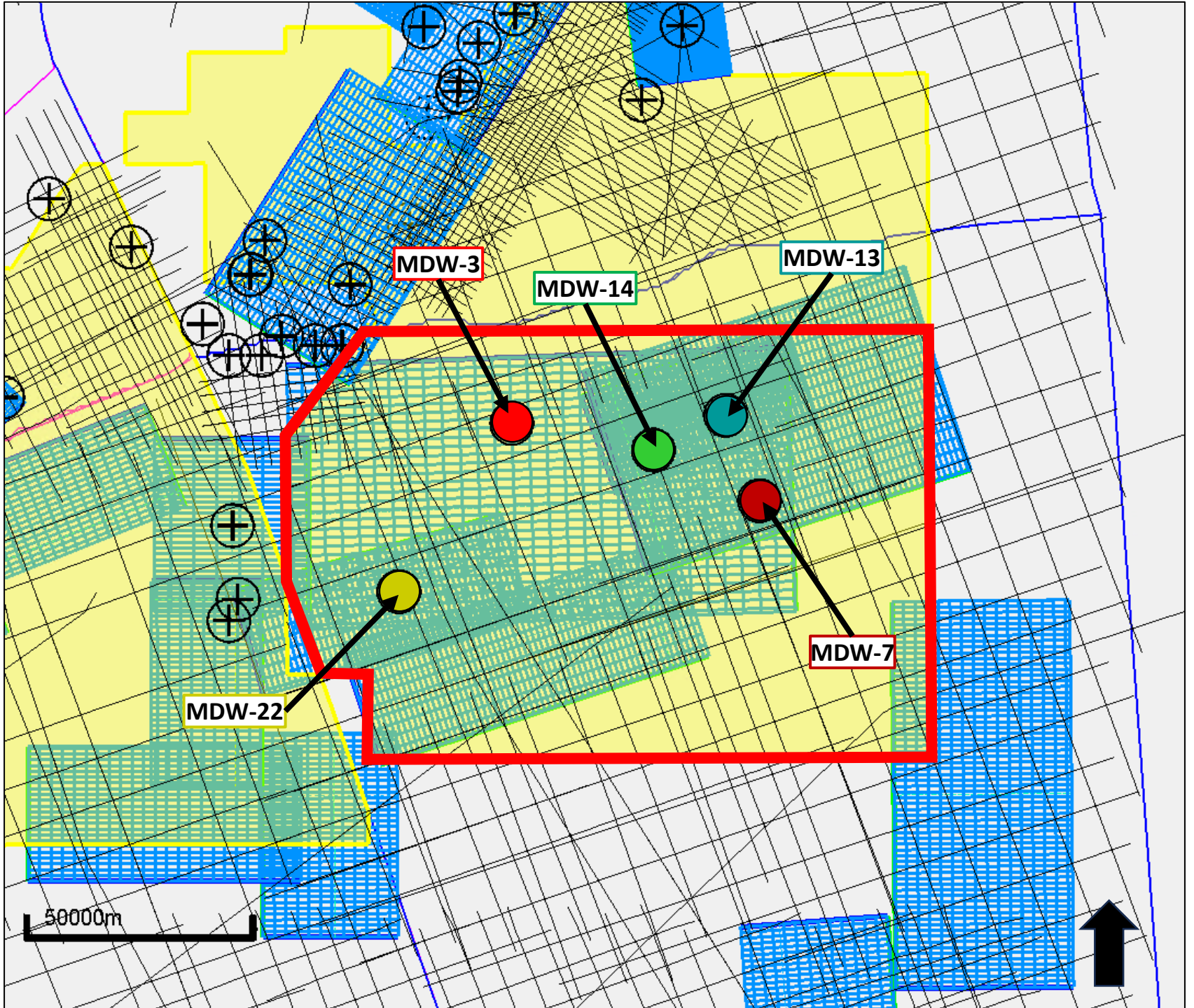
By assuming some average parameters for a carbonate reservoir, a potential 248 BCF of gas could be trapped



UD8

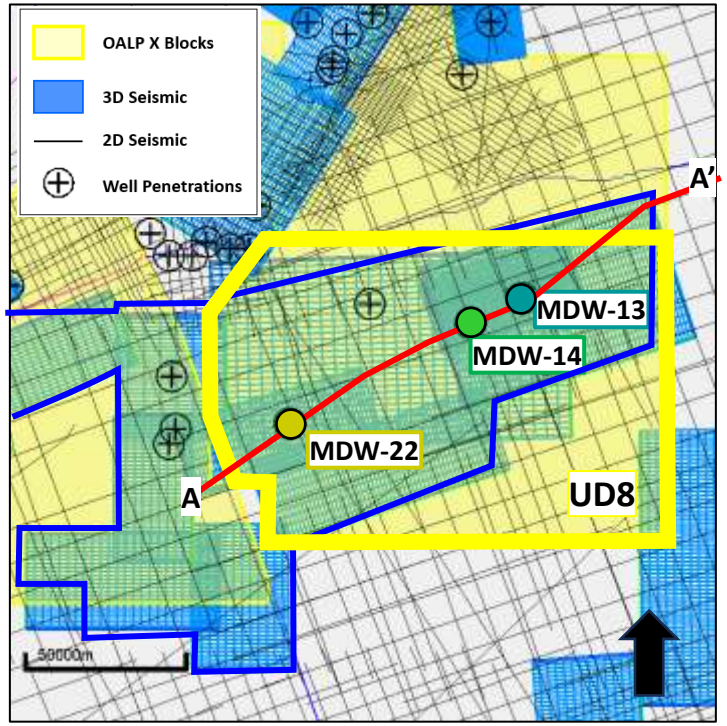
BP-UDWHP-2024/1

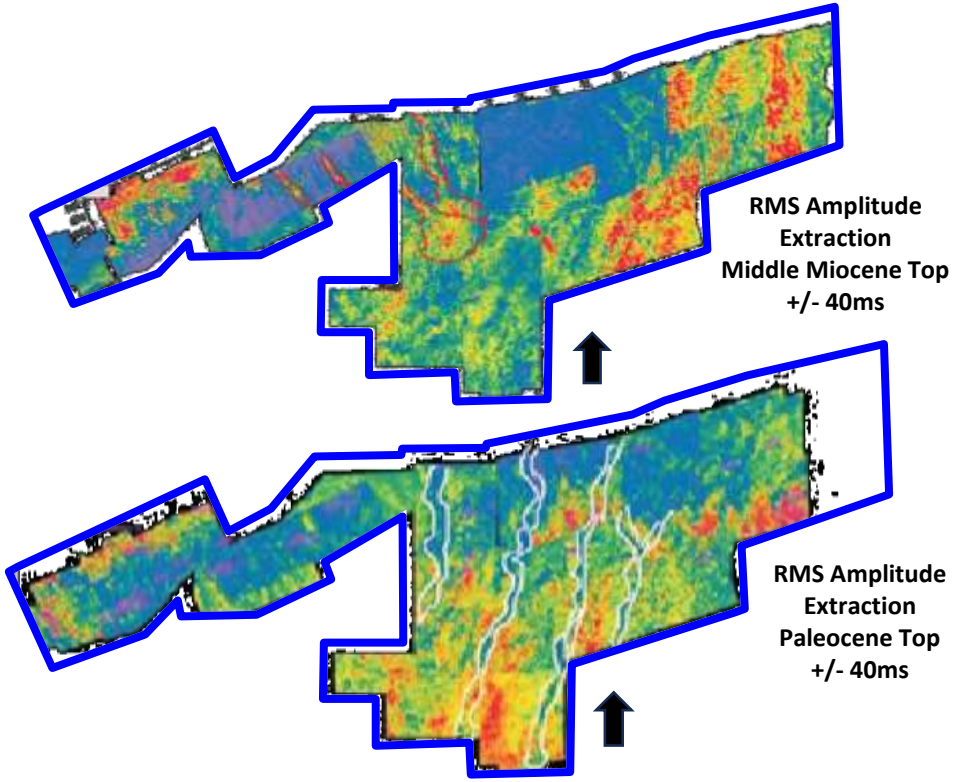
Category: III
Block Area: 12,316 SKM
2D Seismic: 912 LKM
3D Seismic: 8,392 SKM

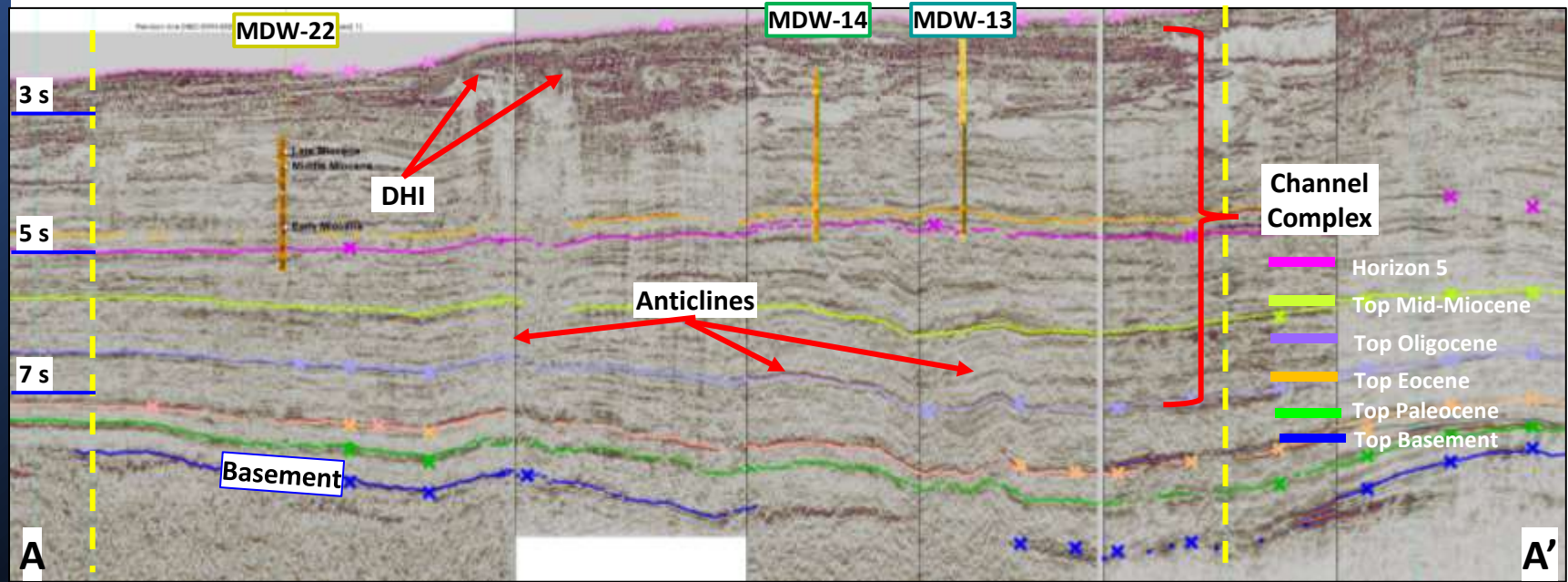


DGH

Amplitude extractions illustrate the presence of channel systems in the Miocene and Paleocene



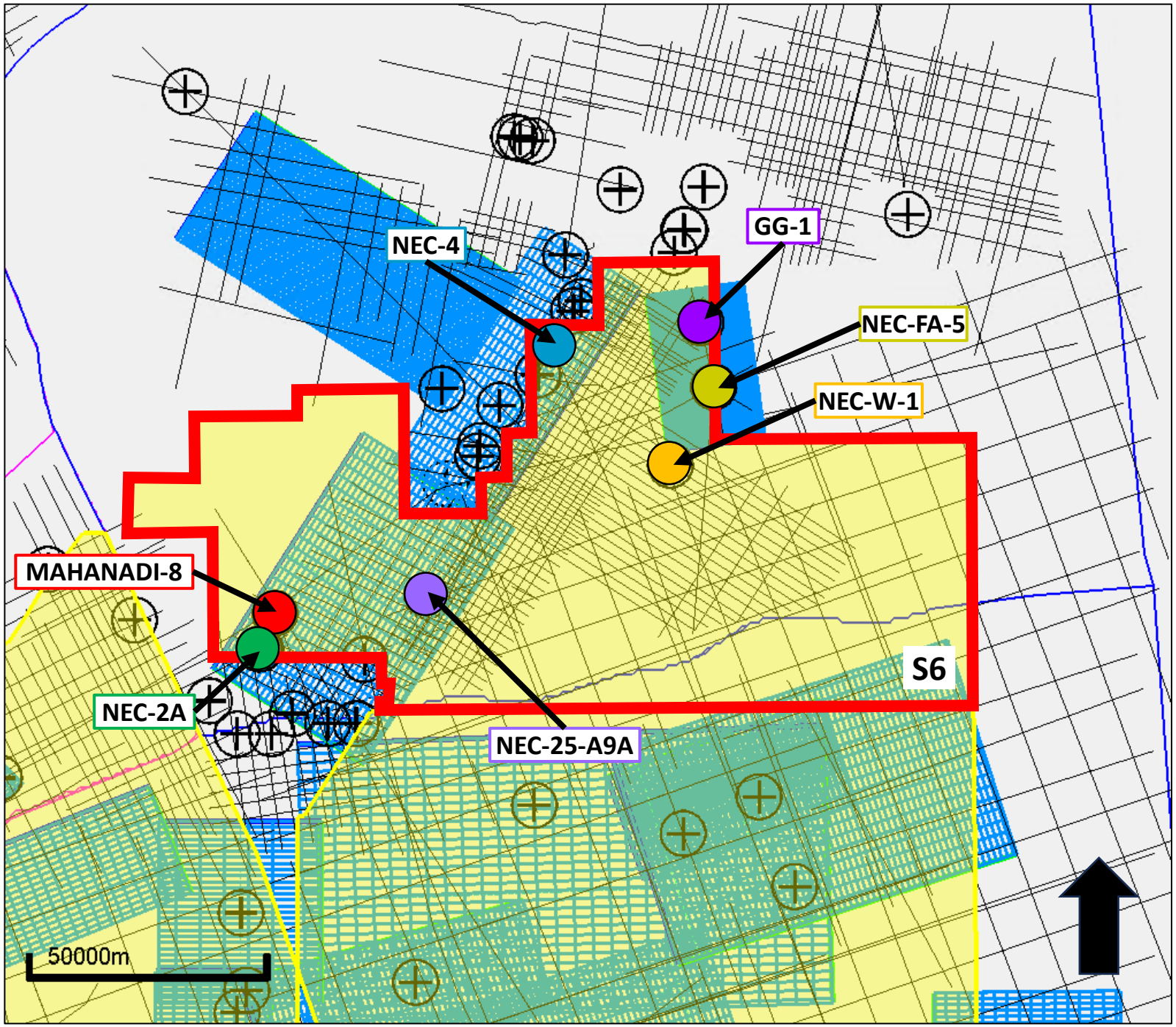




S6

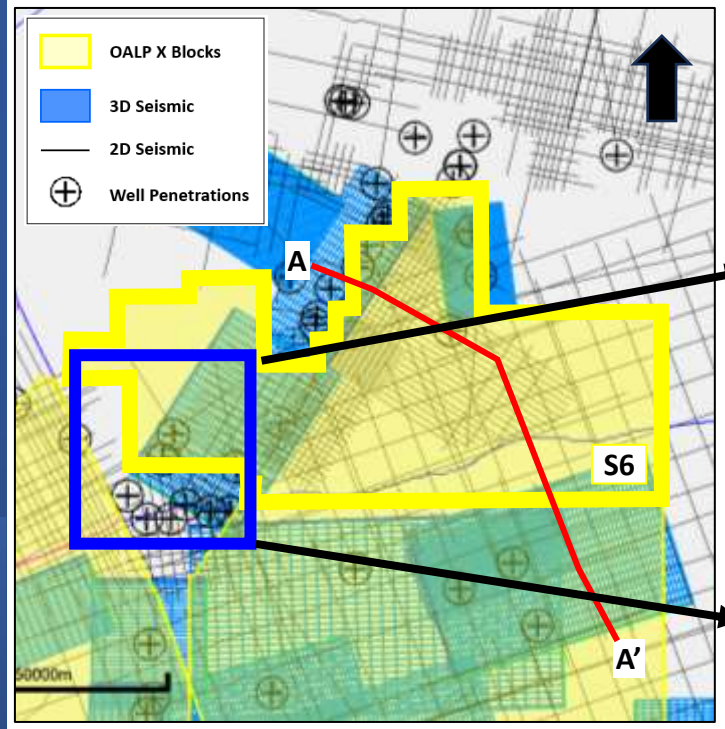
BP-OSHP-2024/1

Category: III
Block Area: 9,827 SKM
2D Seismic: 775 LKM
3D Seismic: 2,600 SKM

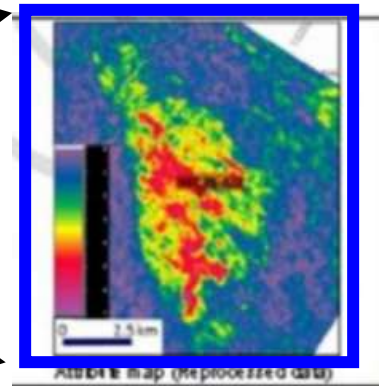


Block S6 has 3D coverage in the west and 2D in the east. The regional section shows a monoclinal setting.

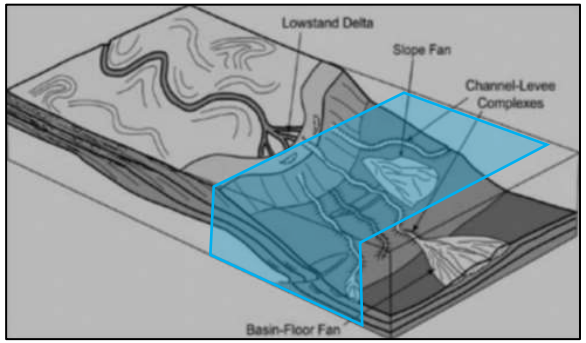
An extraction from the 3D shows slope fan sediments consistent with a mid to deepwater depositional system

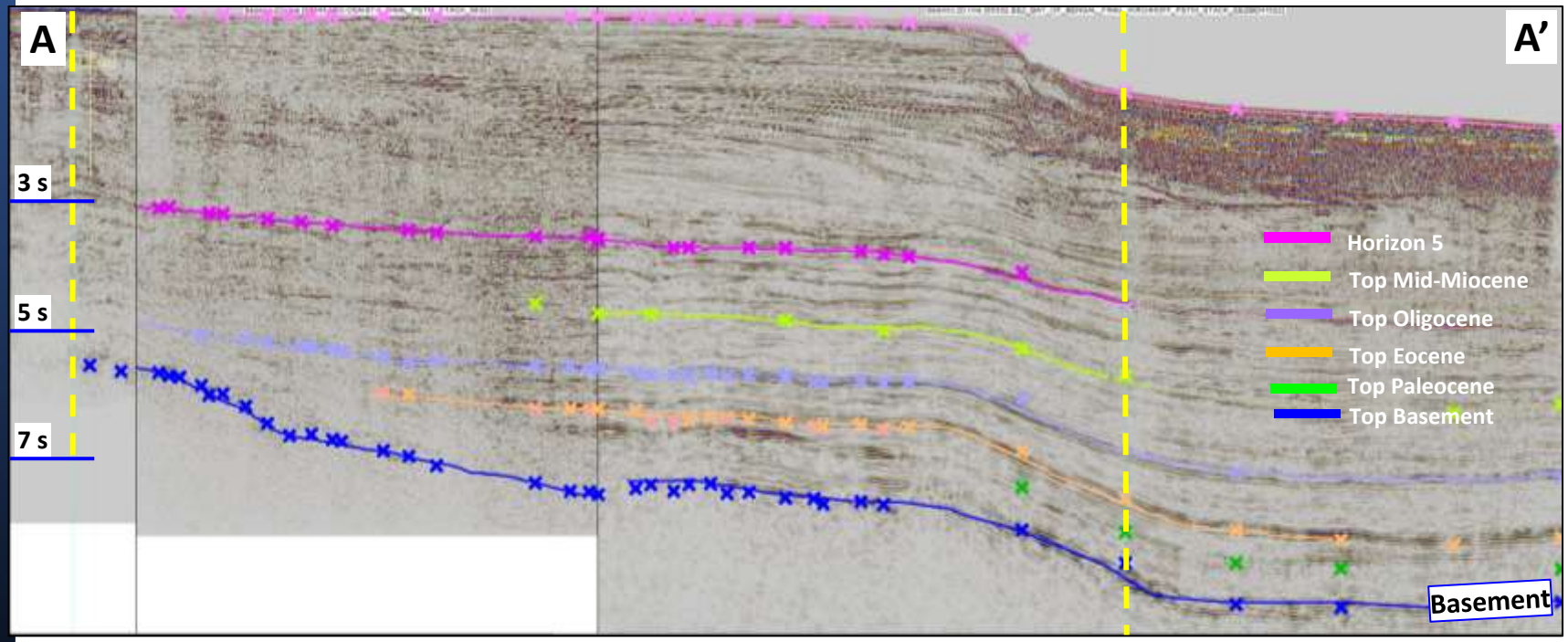


Amplitude Extraction Slope Fans



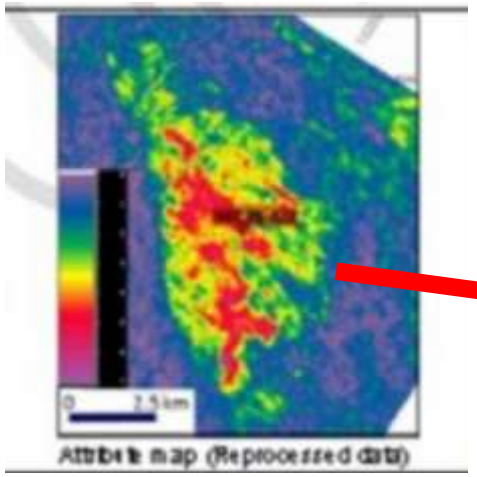
Depositional Environment





There is excellent potential for shallow biogenic gas in Block S6.

A resource potential 27 BCF can be calculated for biogenic slope fan stratigraphic trap at 1000m depth.

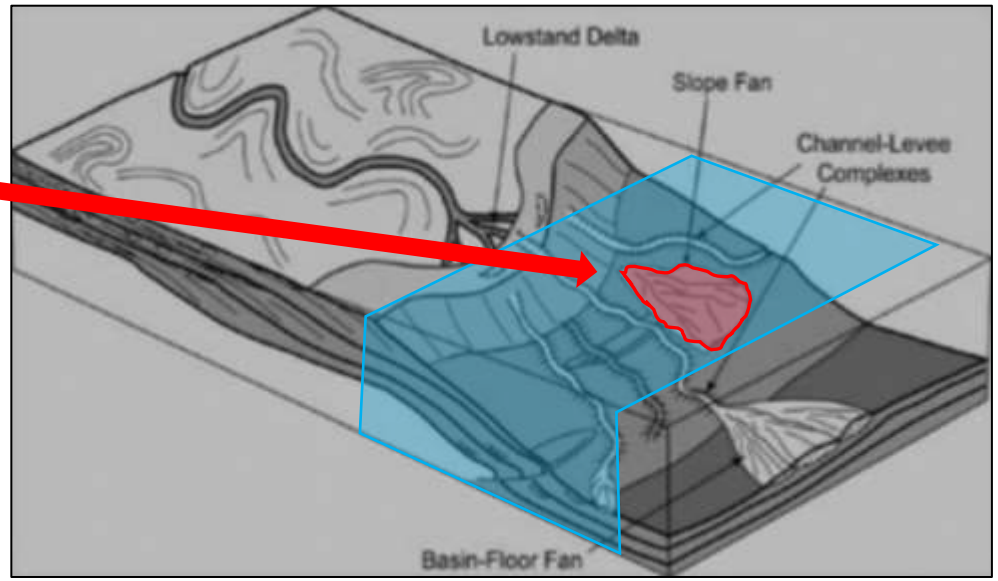


Attribute map (Reprocessed data)

A slope fan at a shallow depth has the potential for biogenic gas accumulations. DHI's may indicate the presence of gas from the Pliocene up to the Pleistocene.

The resource potential for a shallow play can be estimated using reservoir parameters from adjacent wells.

Depositional Environment

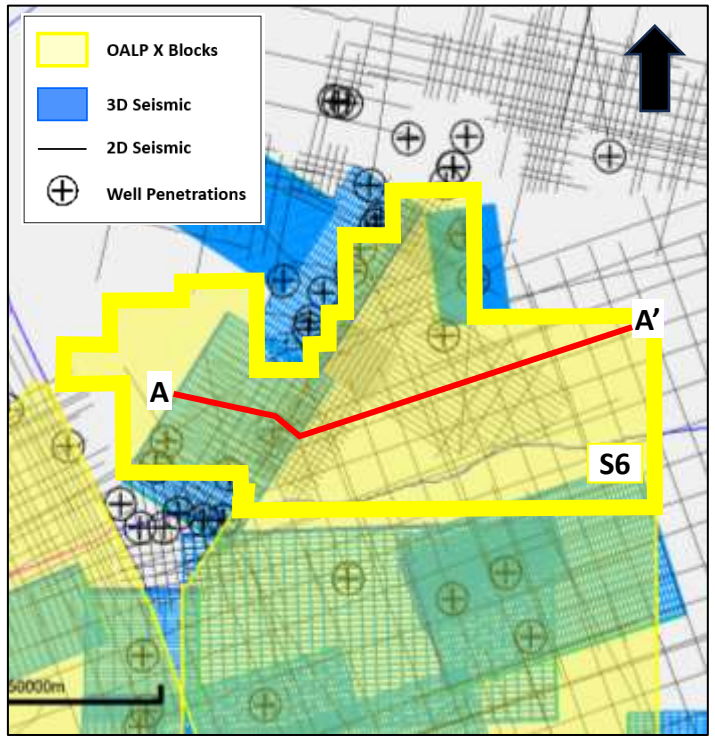


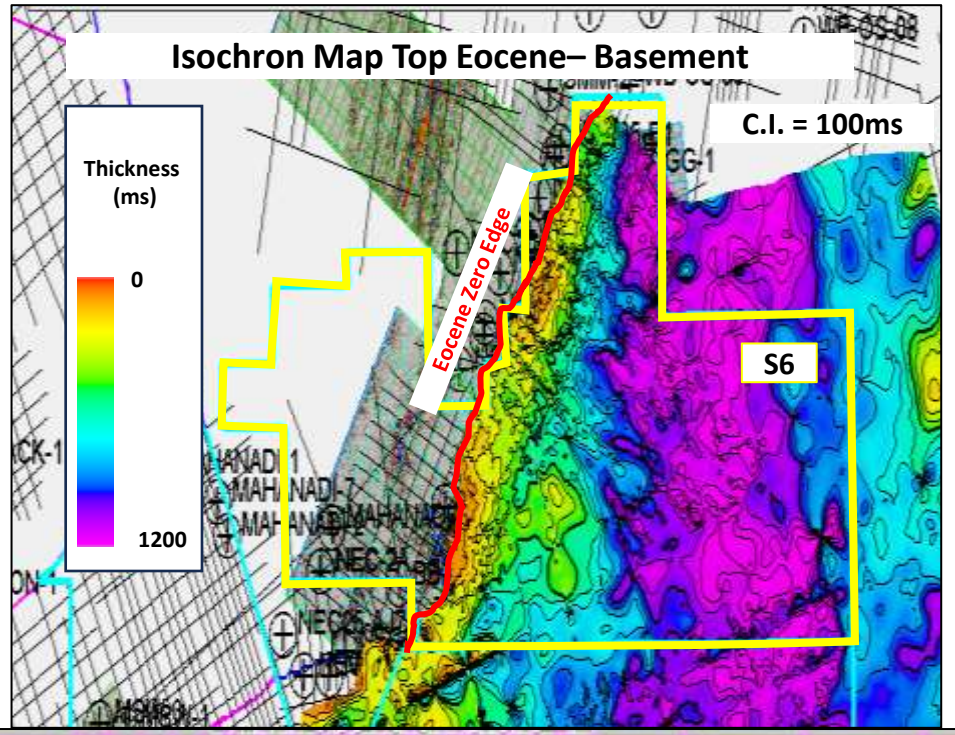
Shallow Biogenic Play Resource Estimate

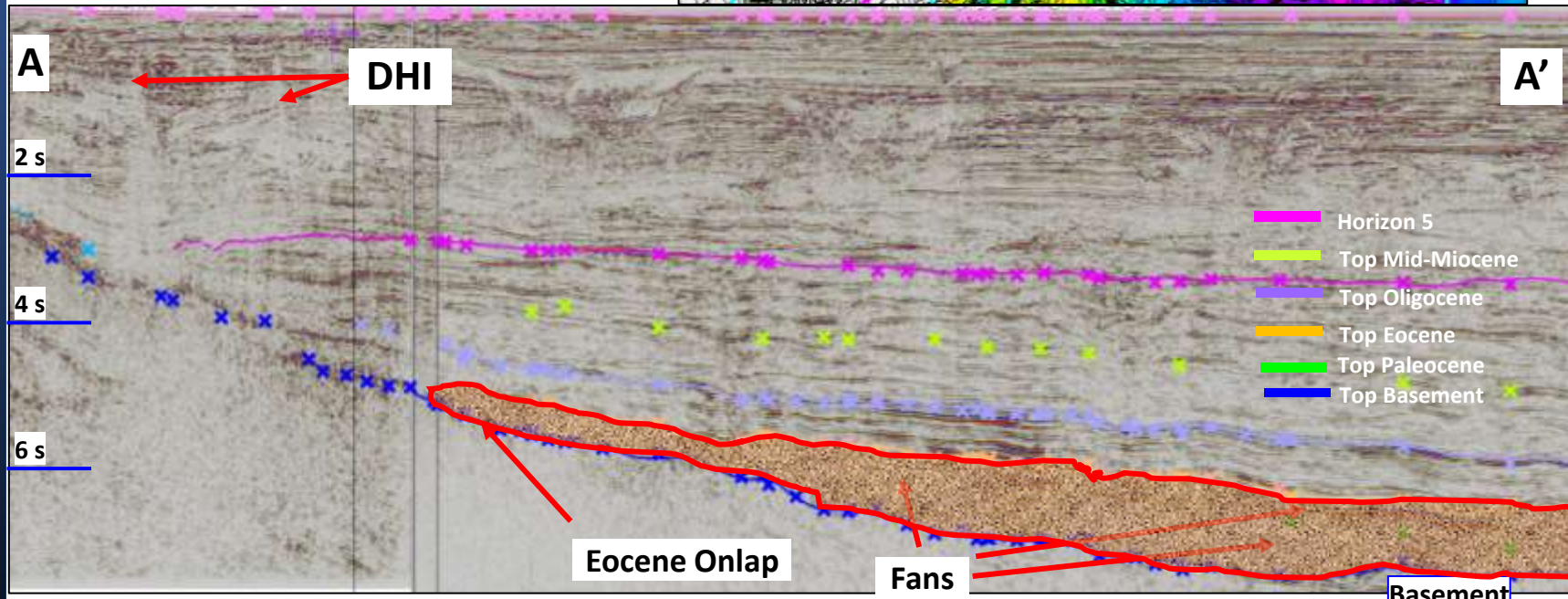
Area of closure: 13.5×10^6 m^2
Estimated average reservoir thickness: 10m
Estimated porosity: 21%
Estimated Sw: 18%
Depth: 1000m
PI: 10 mPA
B_g: .052
Estimated OGIP: $764 \times 10^6 m^3$ (27 BCF)

DGH

The Eocene subcrops across the middle of the block setting up a potential updip punchout play







Thank You

शुक्रिया

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February 2025

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Prospectivity Highlights

OALP-X – Shallow Water Blocks

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DIRECTORATE GENERAL OF HYDROCARBONS
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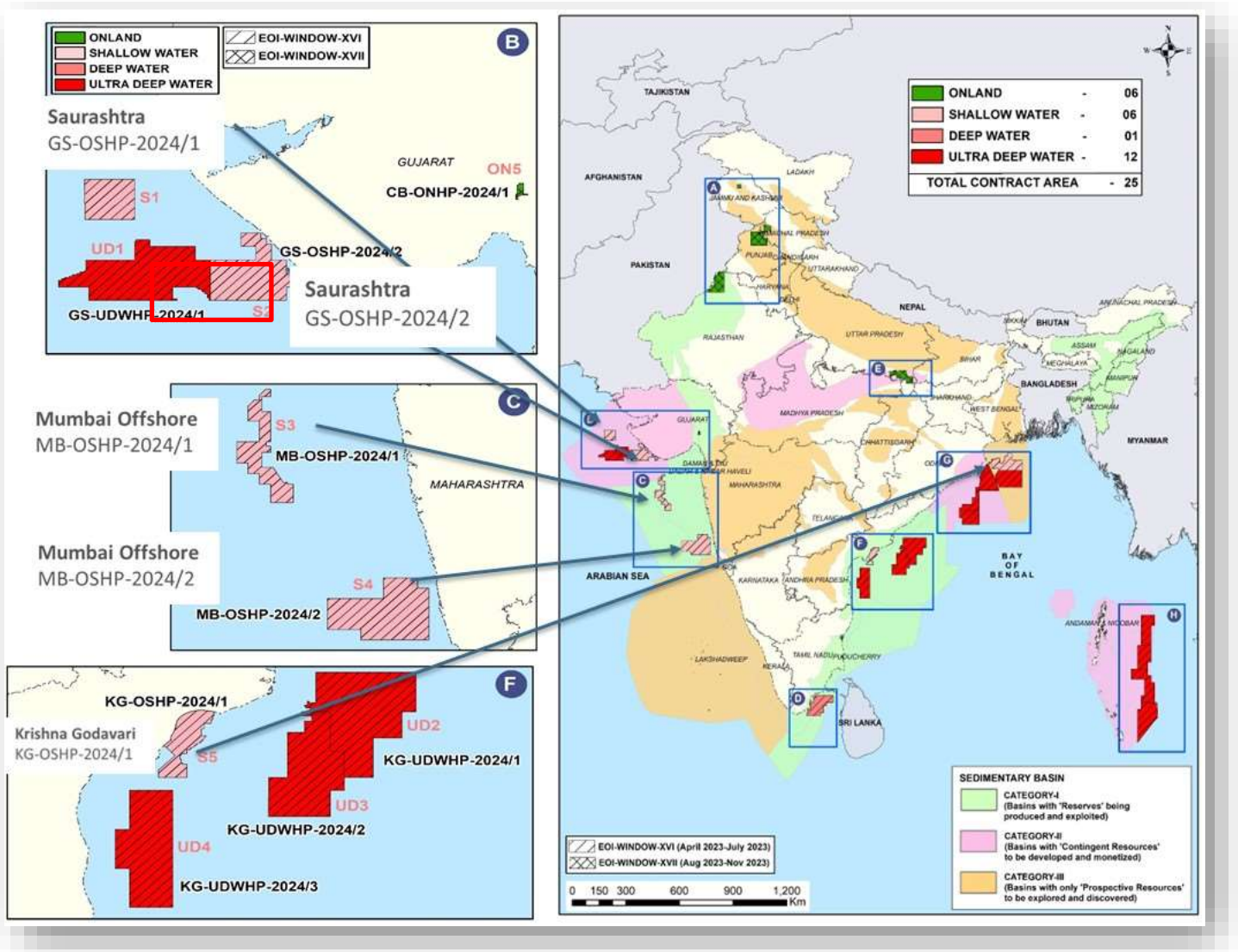
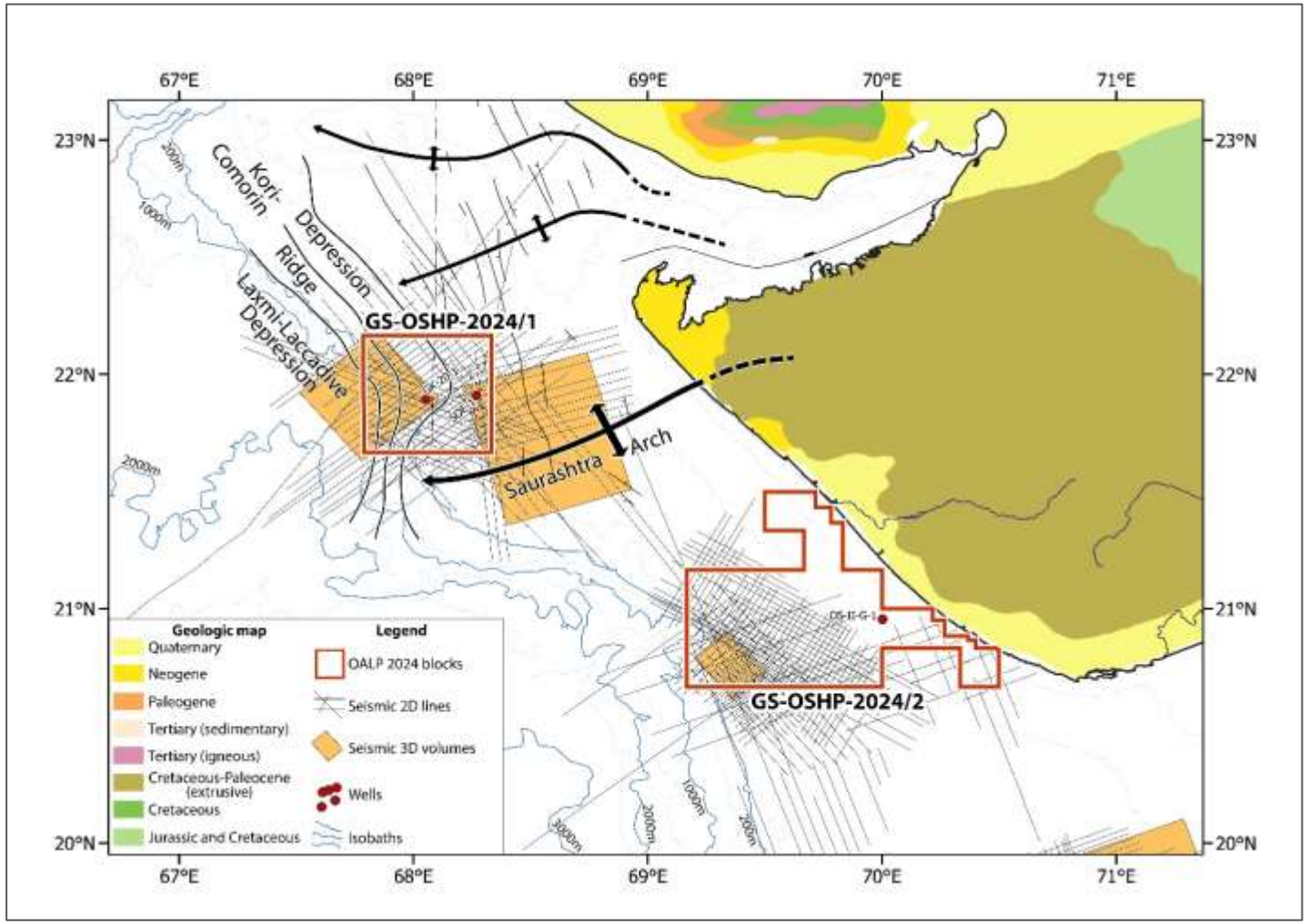
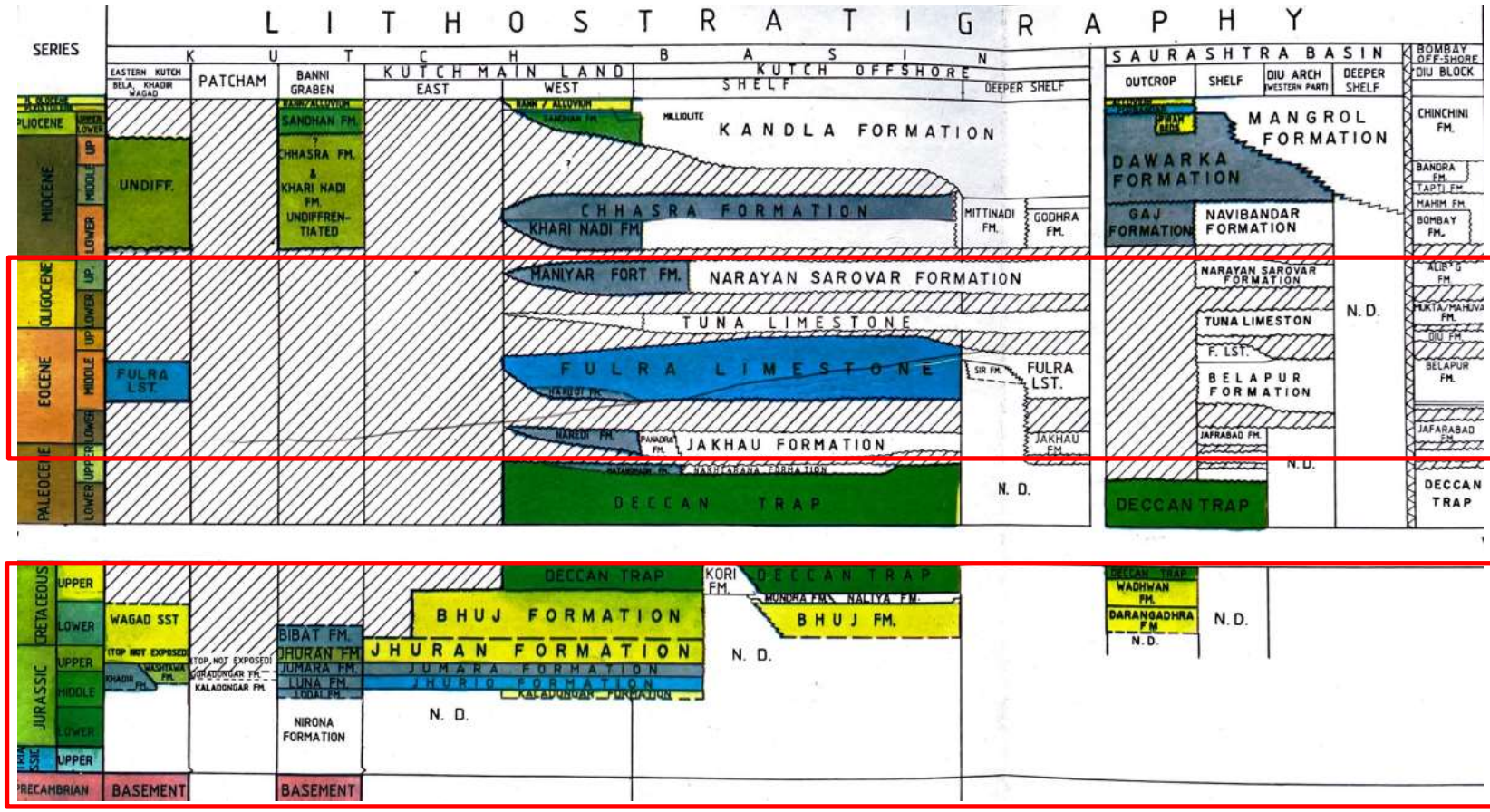
Block Location



Saurashtra Basin and blocks on offer



Saurashtra basin and petroleum plays in block GS-OSHP-2024/1 & 2



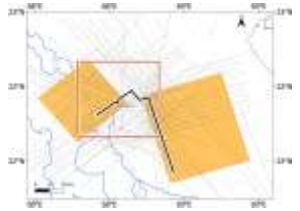
Oligocene Clastics

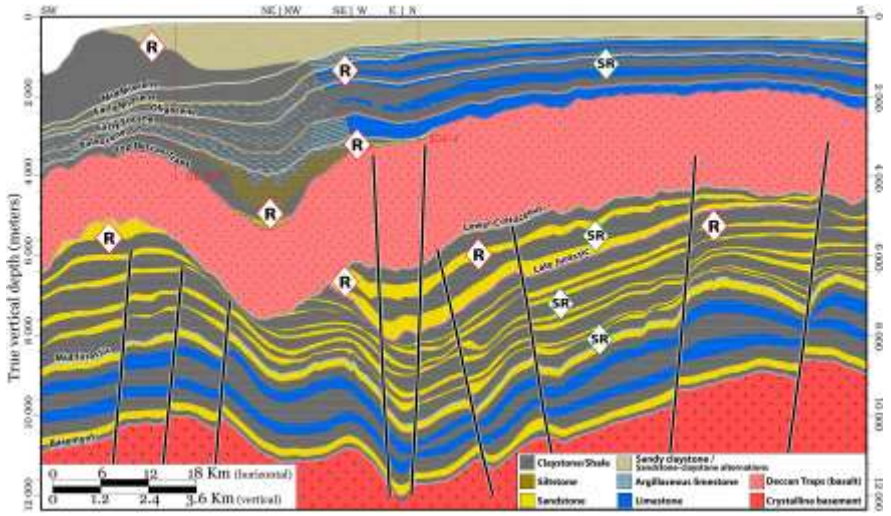
Paleogene Carbonates

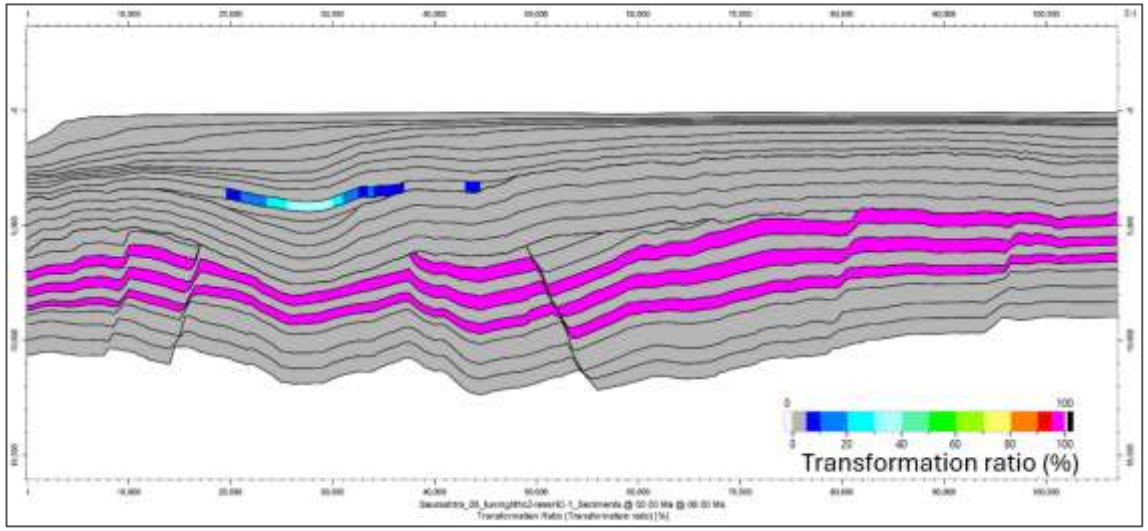
Lower K

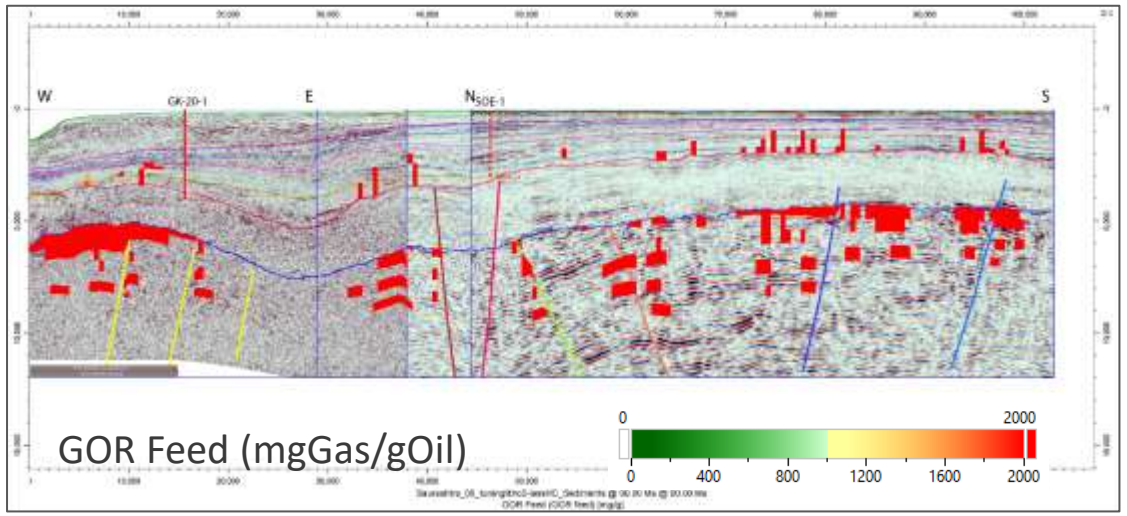
Upper Jurassic

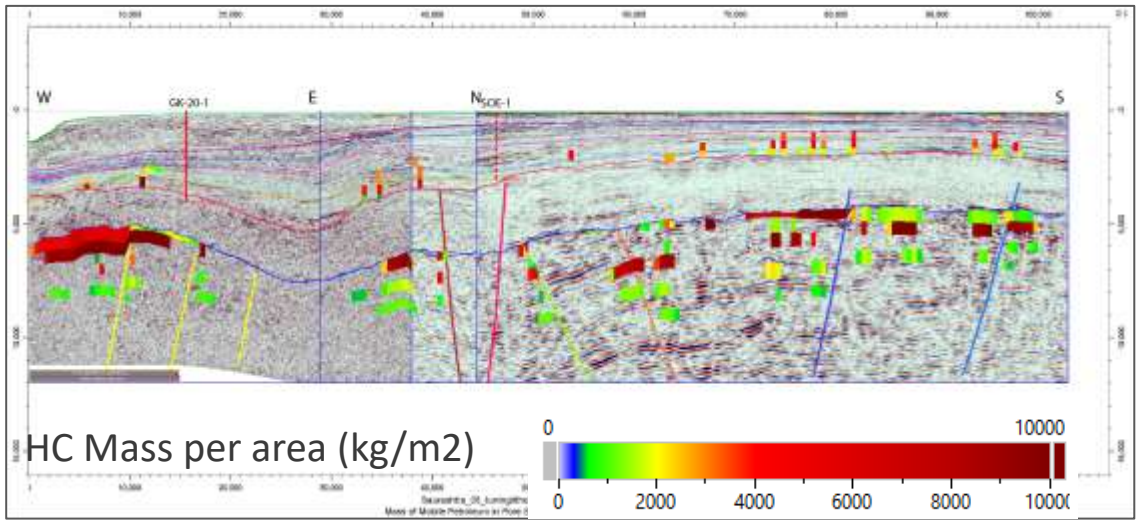
GS-2D PSM on regional section results











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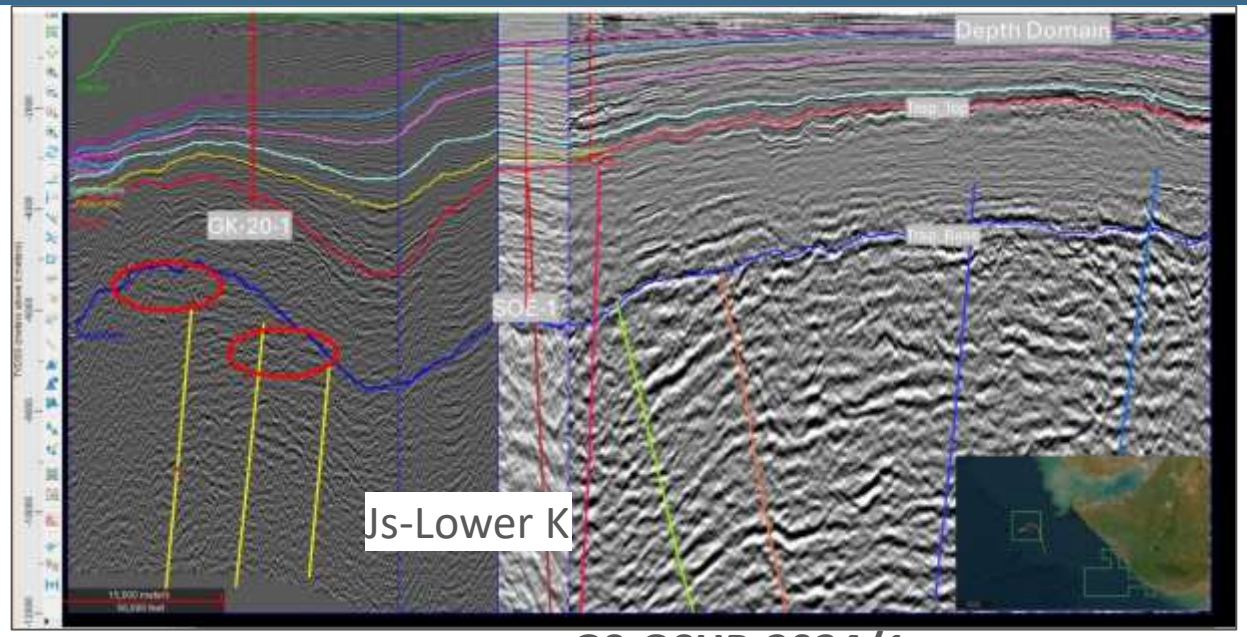
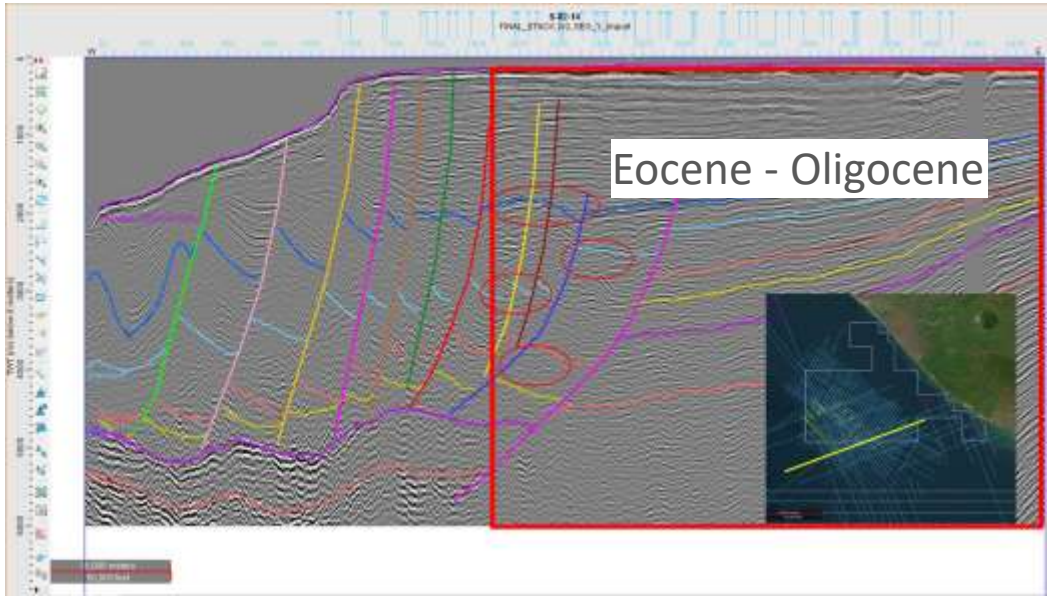
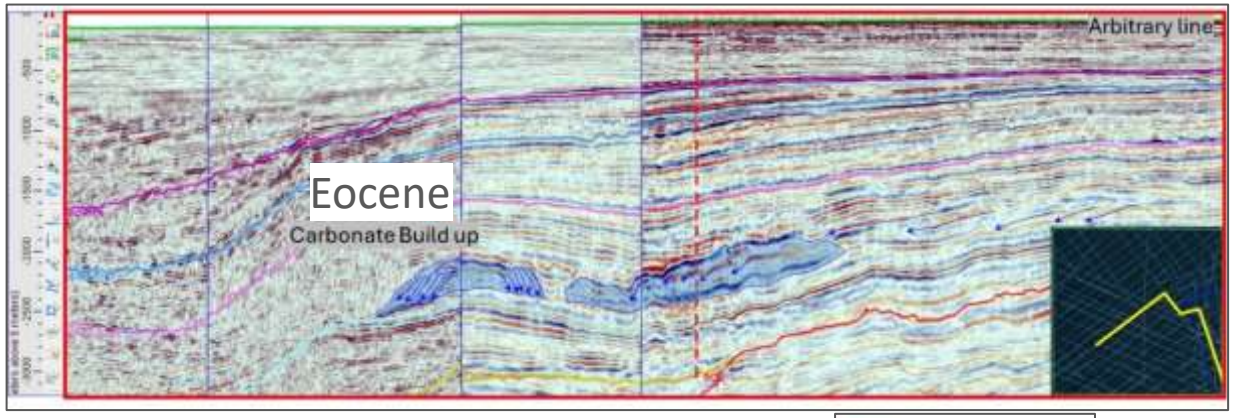
Play illustration



GS-OSHP-2024/1



GS-OSHP-2024/2



Block Boundary

GS- Volumetrics

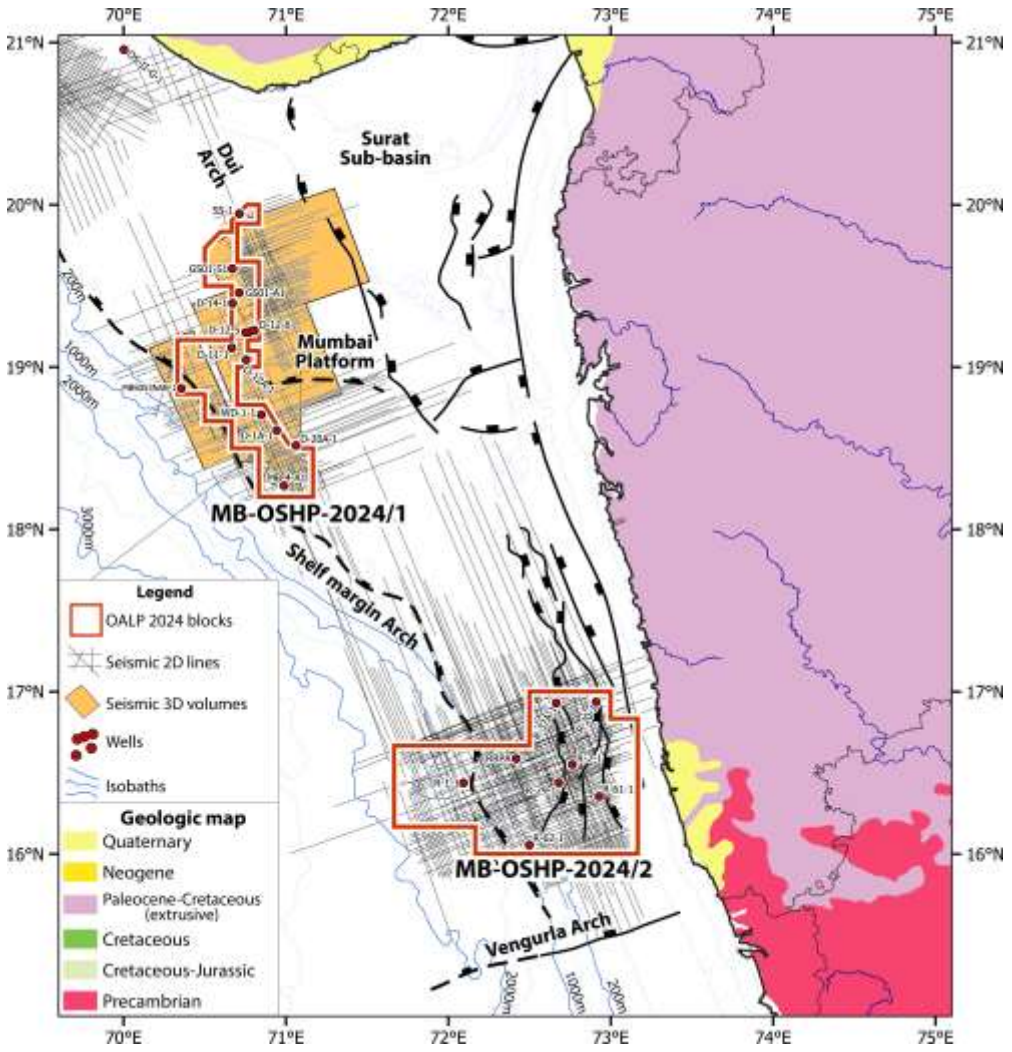
Play	Unrisked Volumes in Place (P50)	Fluid	Recoverable volumes
Paleogene Carbonates	10.7 Bsm3	Gas	6.3 Bsm3
Lower Cretaceous Upper Jurassic	11 Bsm3	Gas/Condensates	6.5 Bsm3

GS-OSHP-2024-1

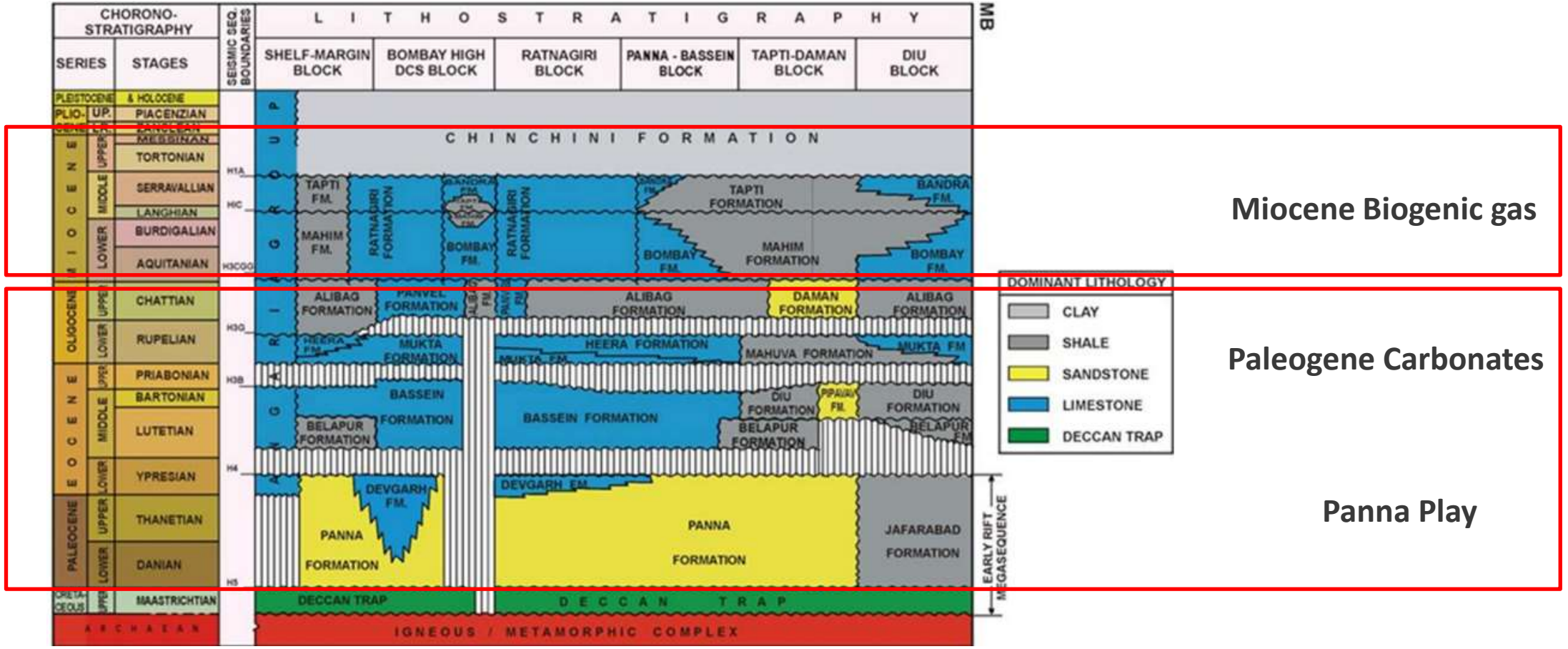
Play	Unrisked Volumes in Place (P50)	Fluid	Recoverable volumes
Deep Paleogene > 4s	3.8 Bsm3	Gas	2.4 Bsm3
Paleocene/Eocene/ Oligocene <3s	33.5 MMsm3	Oil	10.1 MMsm3

GS-OSHP-2024-12

Mumbai Basin and blocks on offer



Mumbai basin and petroleum plays in block MB-OSHP-2024/1&2



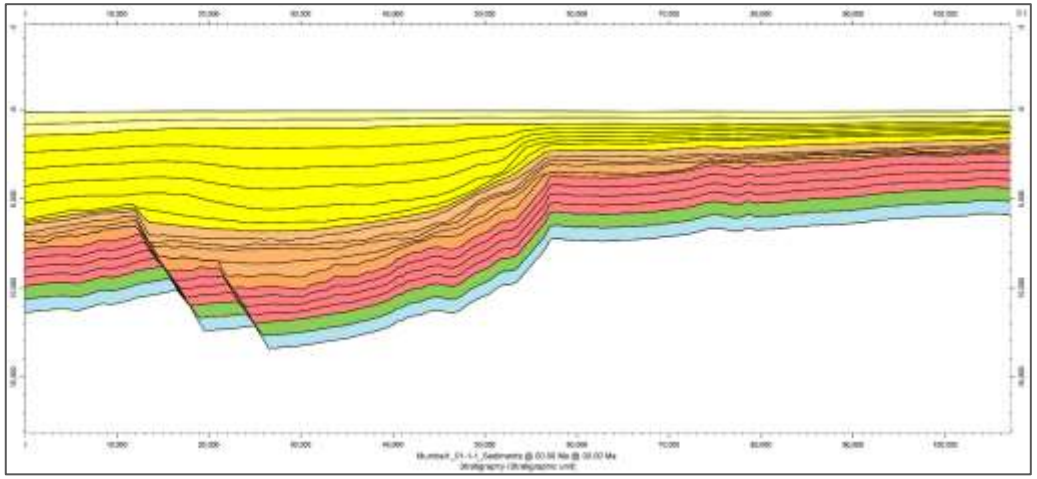
Miocene Biogenic gas

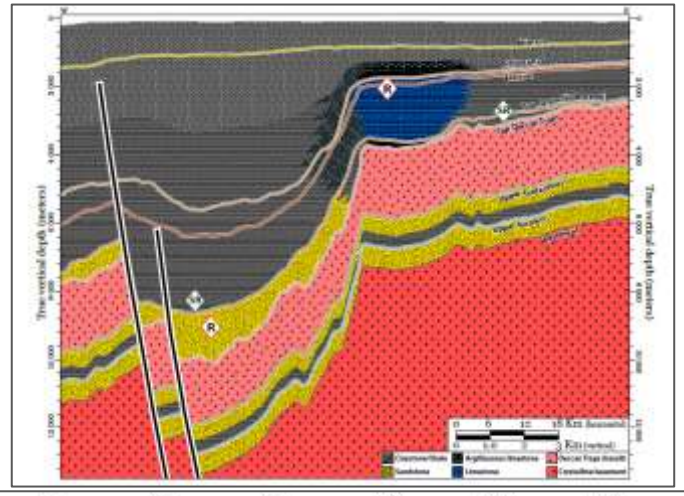
Paleogene Carbonates

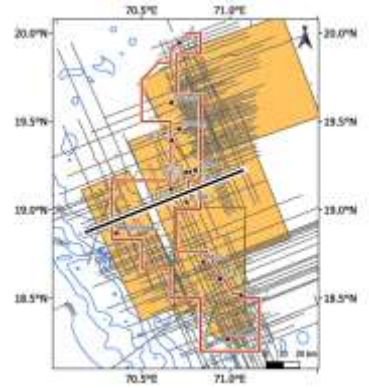
Panna Play

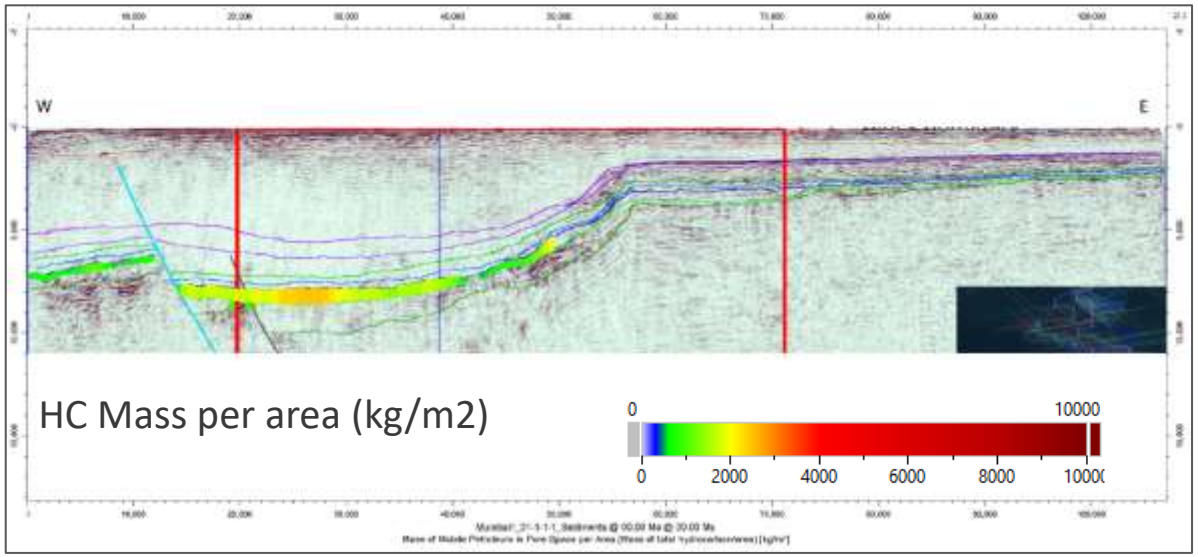
Possible Mesozoic play (S extension Saurashtra)

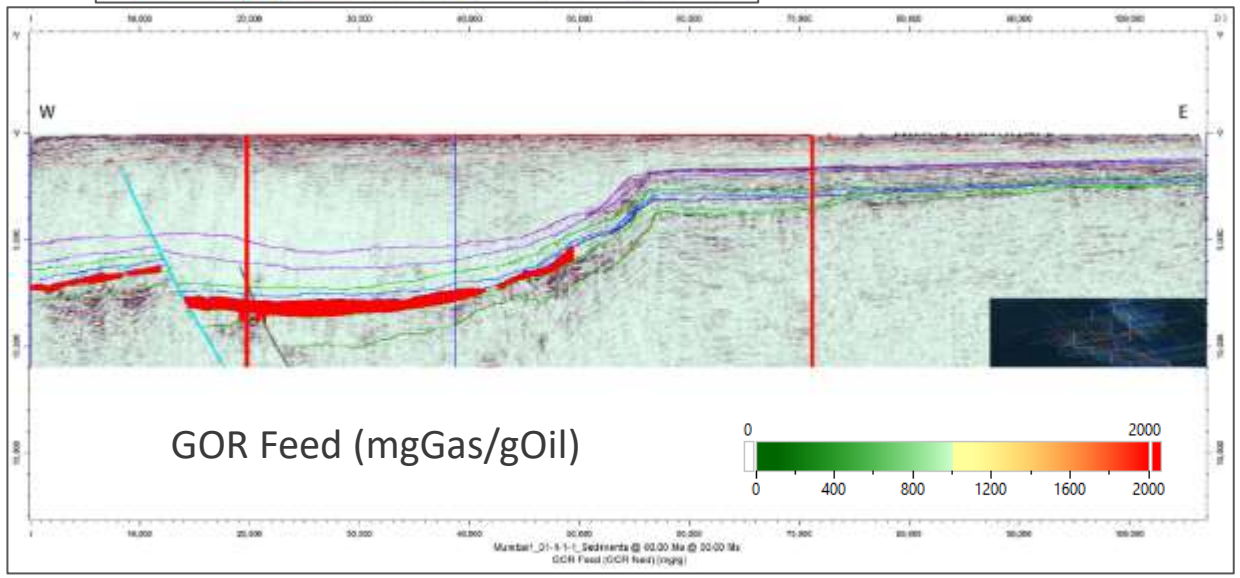
Example of 2D PSM MB-OSHP-2024/2



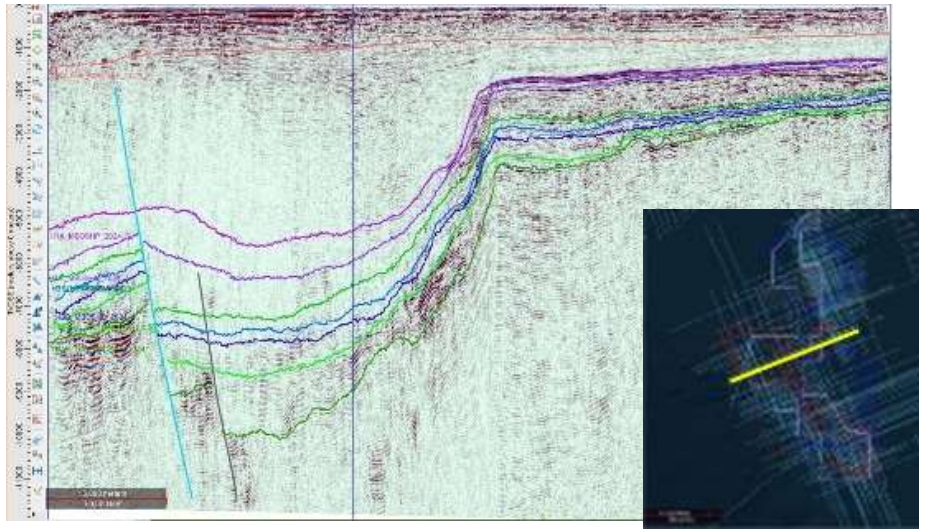




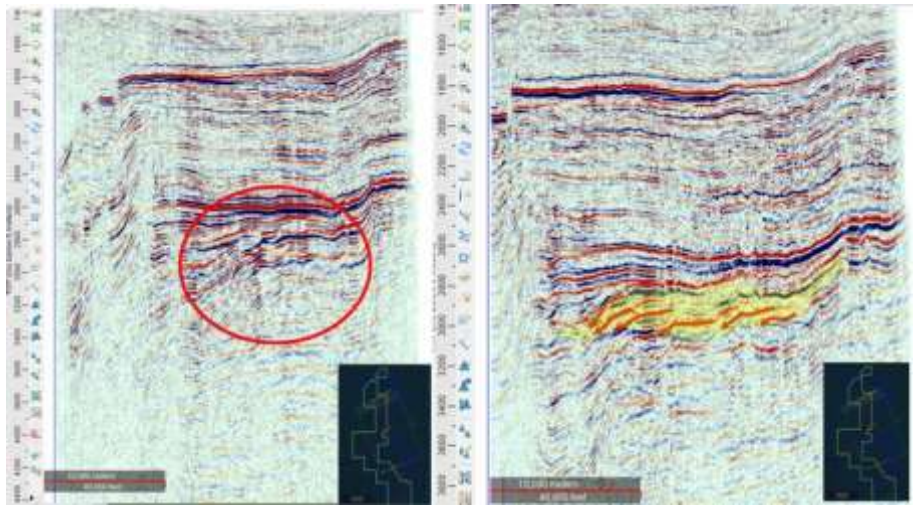


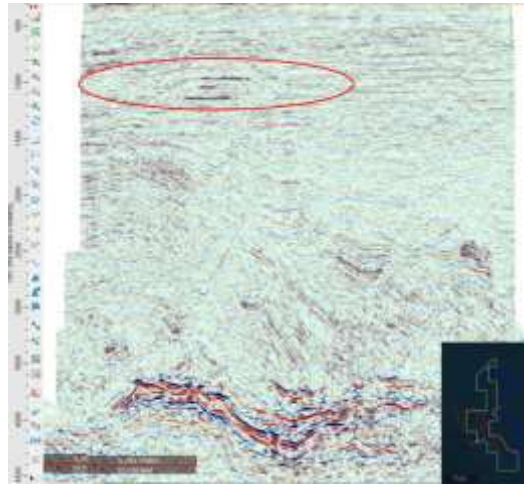


Play illustration MB-OSHP-2024/1 &2

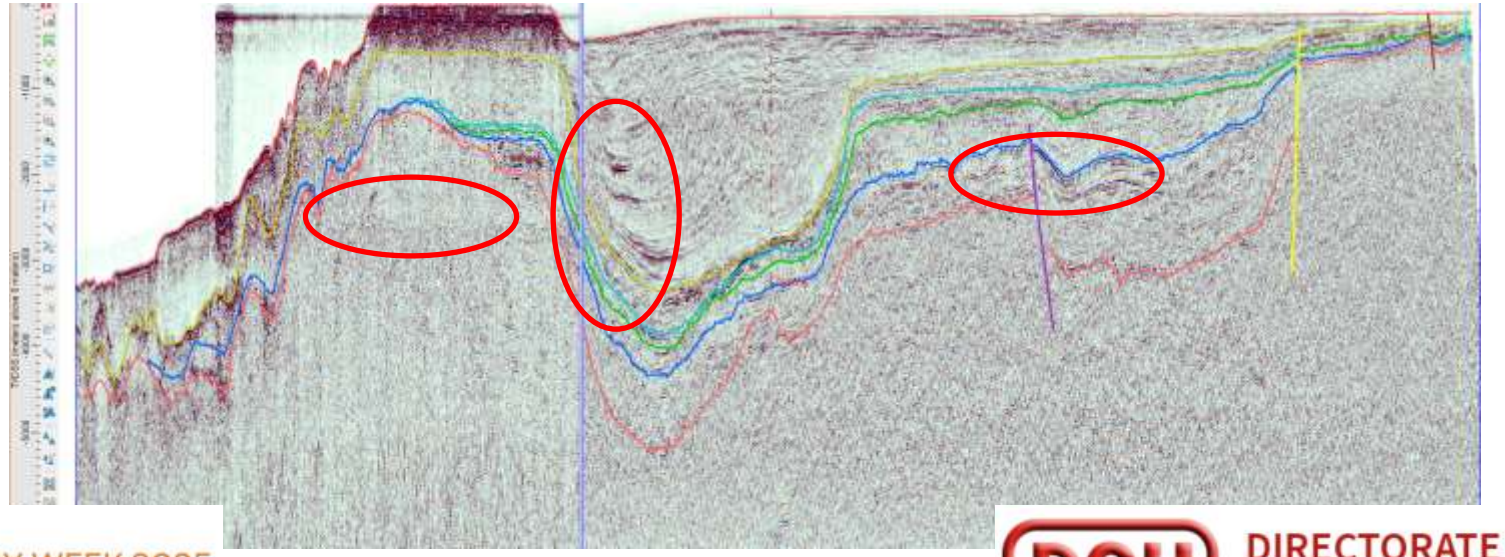


MB-OSHP-2024/1





MB-OSHP-2024/2



MB Volumetrics

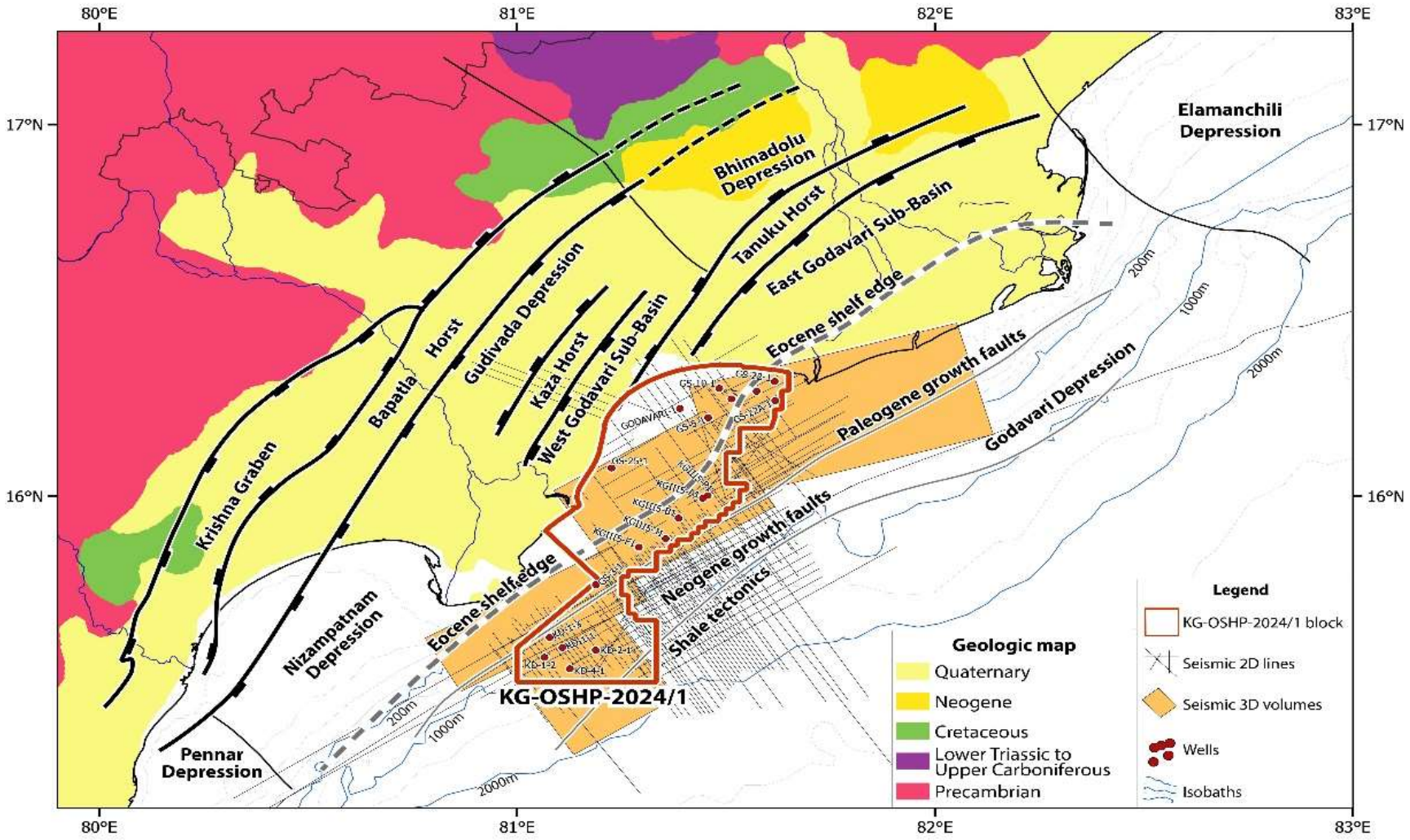
Play	Unrisked Volumes in Place (P50)	Fluid	Recoverable volumes
Paleogene Panna play	32.9 Bsm3	Gas/Condensate	19.6 Bsm3
Paleogene carbonate build-ups	68 Bsm3	Gas/Condensate	39.8 Bsm3
Mio-Pliocene	3.6 Bsm3	Dry Gas	2.2 Bsm3

MB-OSHP-2024-1

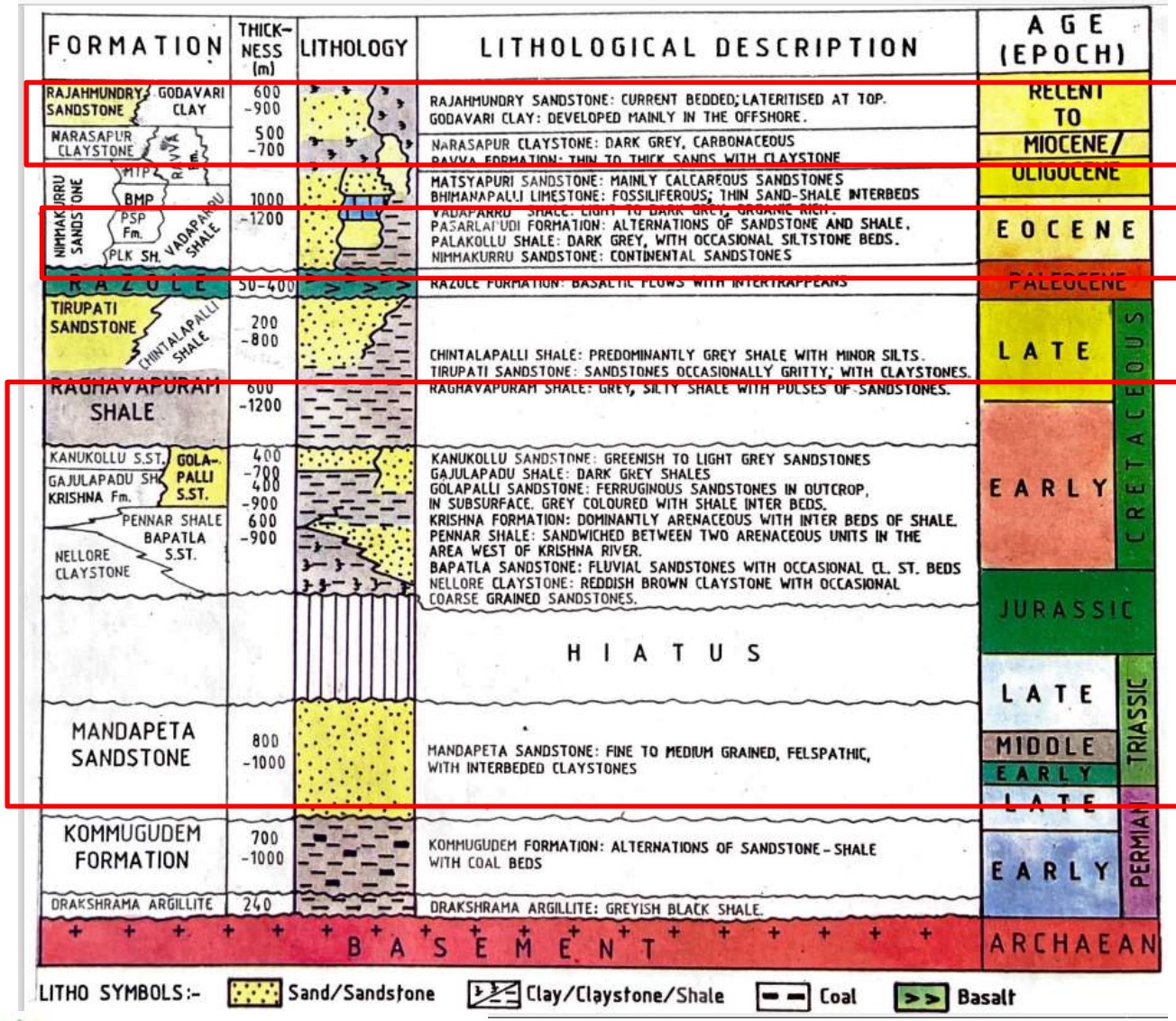
Play	Unrisked Volumes in Place (P50)	Fluid	Recoverable volumes
Jurassic below trap	7 .4 MMm3 5.2 Bsm3	Oil Gas	2.2 MMm3 3.6 Bsm3
Paleogene Panna play	15.9 MMsm3	Oil	5 MMBsm3
Neogene	49.7 MMsm3	Oil	15.9 MMsm3

MB-OSHP-2024-2

Location map KG-OSHP-2024/1



KG basin and petroleum plays in block KG-OSHP-2024/1

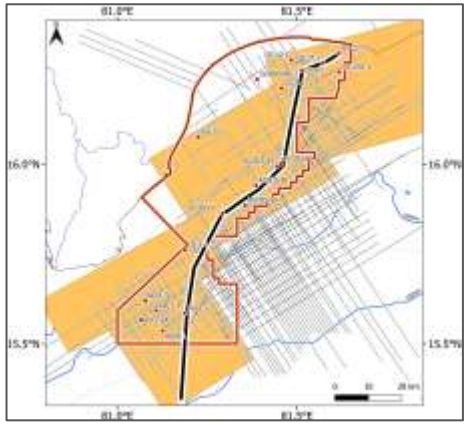


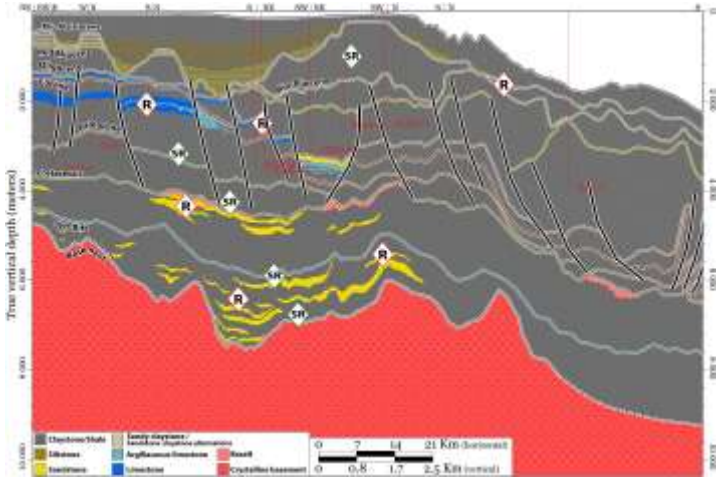
Miocene Biogenic gas

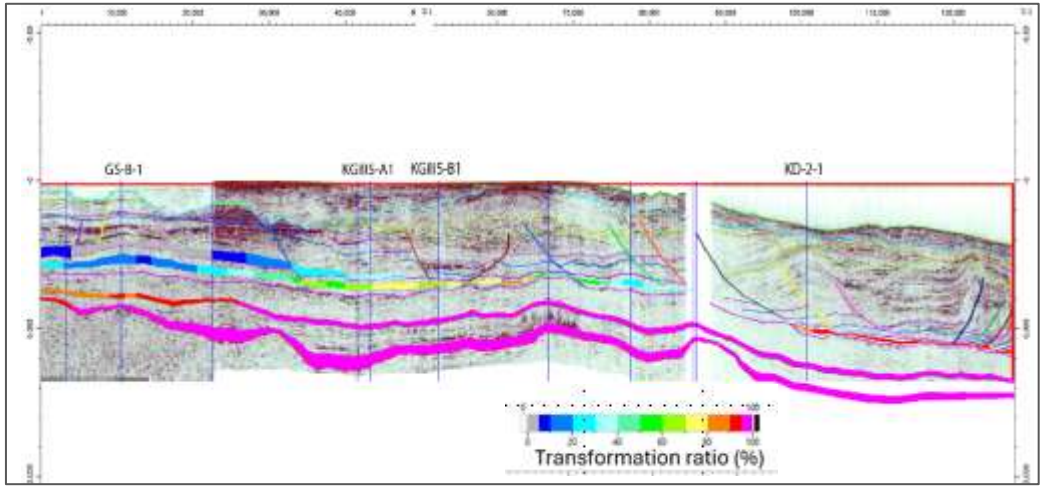
Paleogene Carbonates

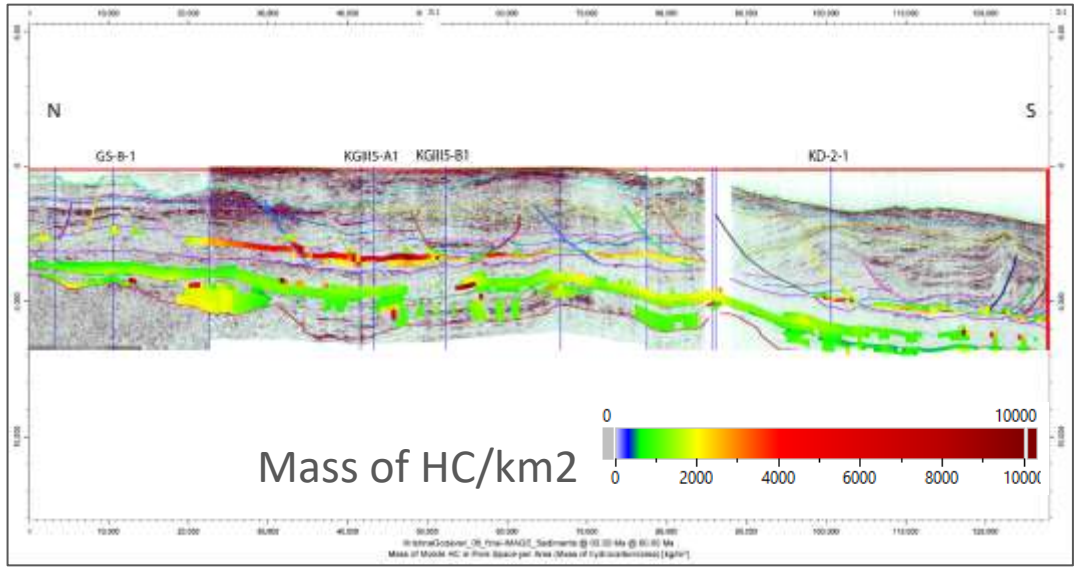
Synrift play

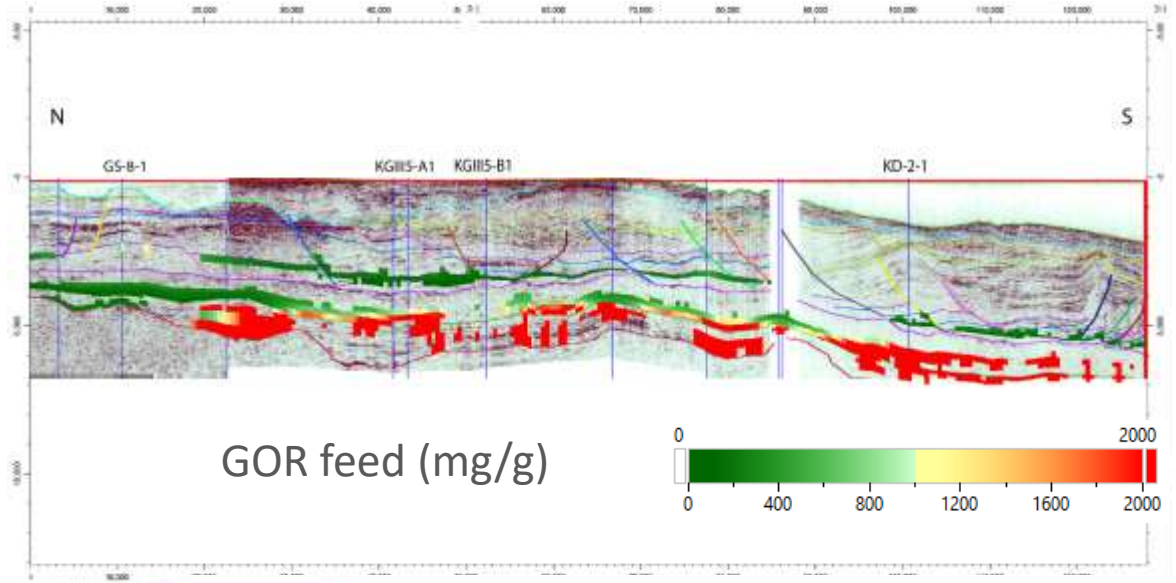
2D PSM transect KG











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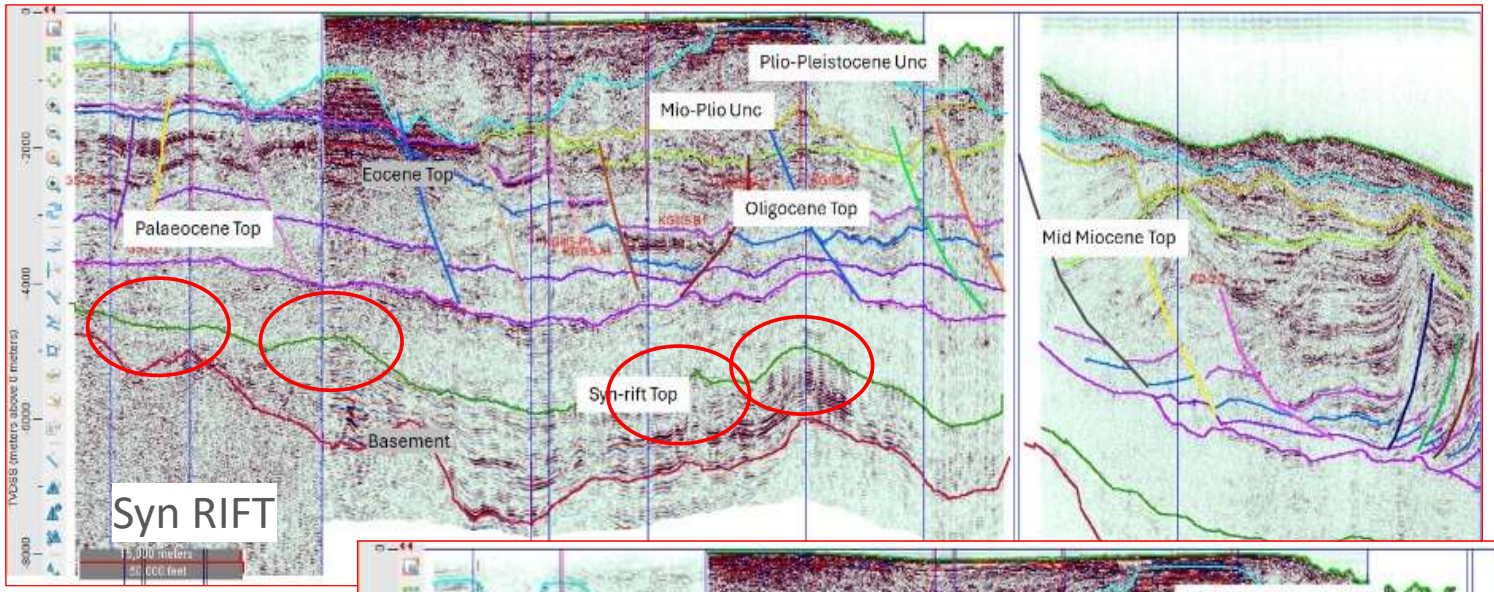
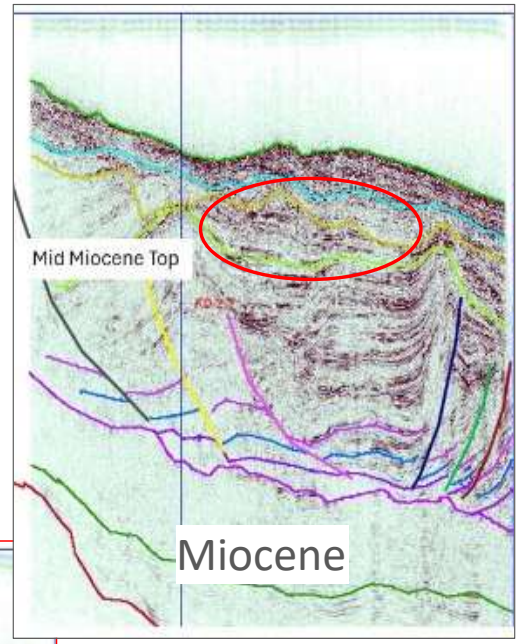
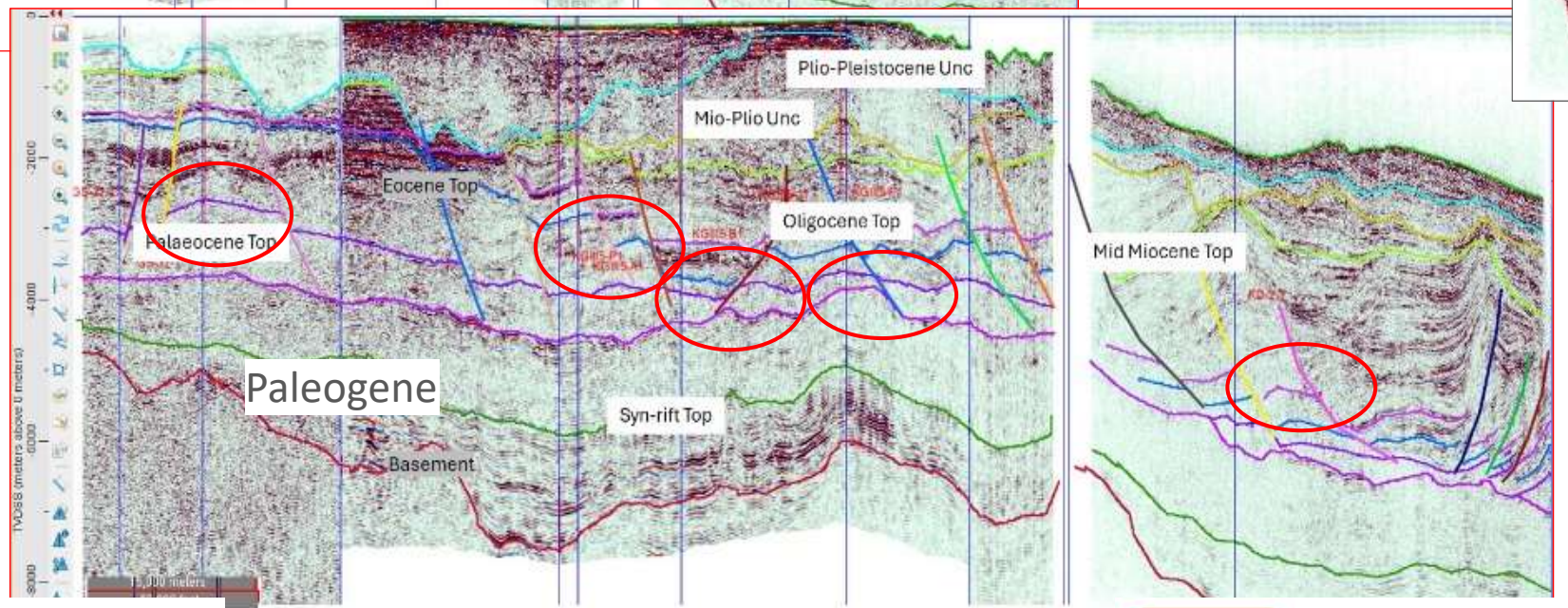
KG Play illustration

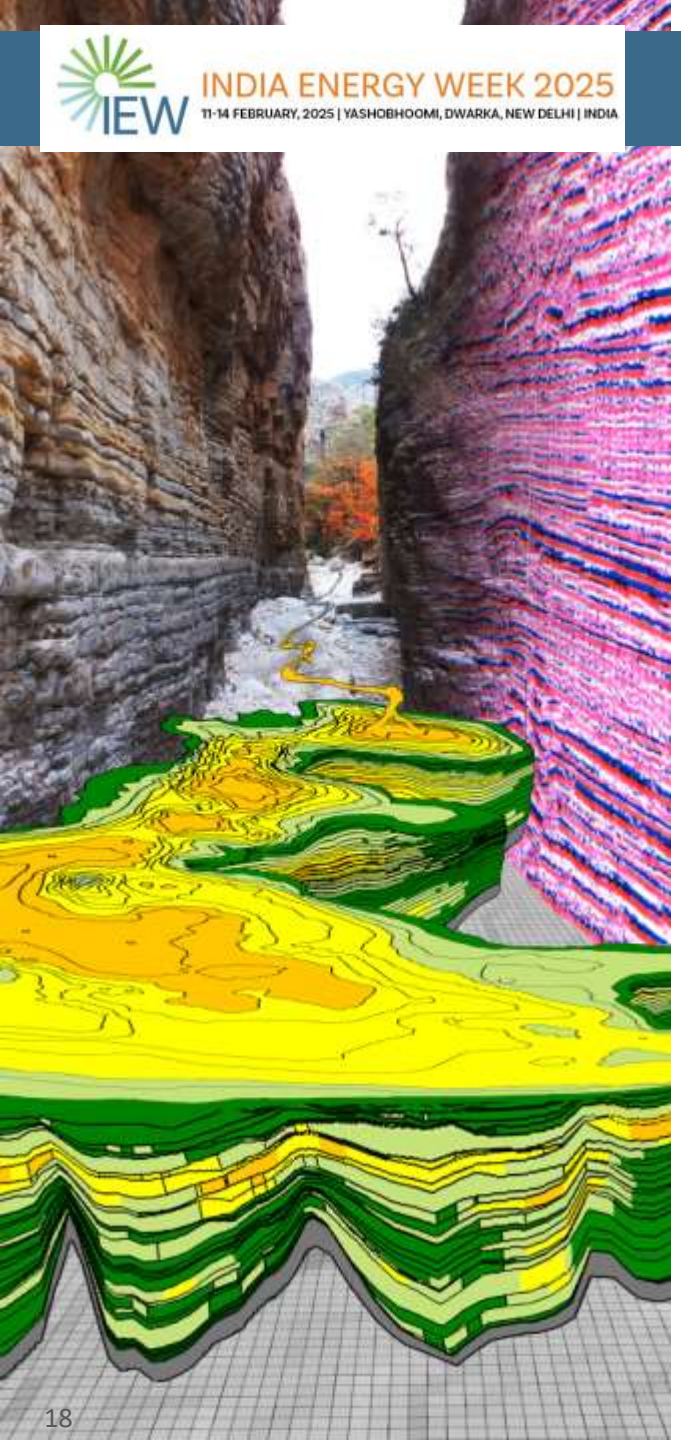


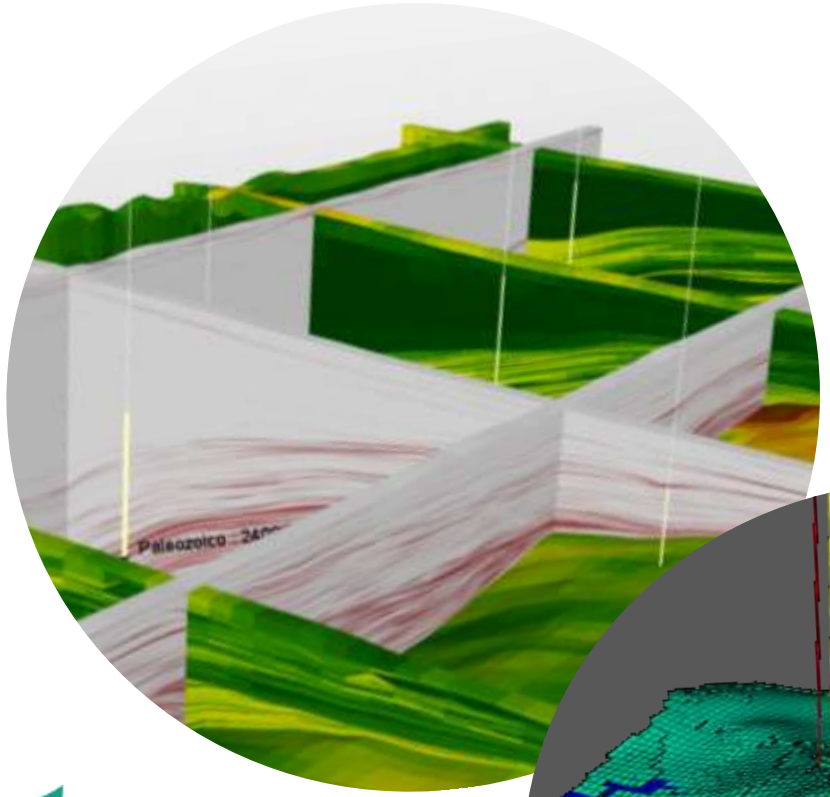


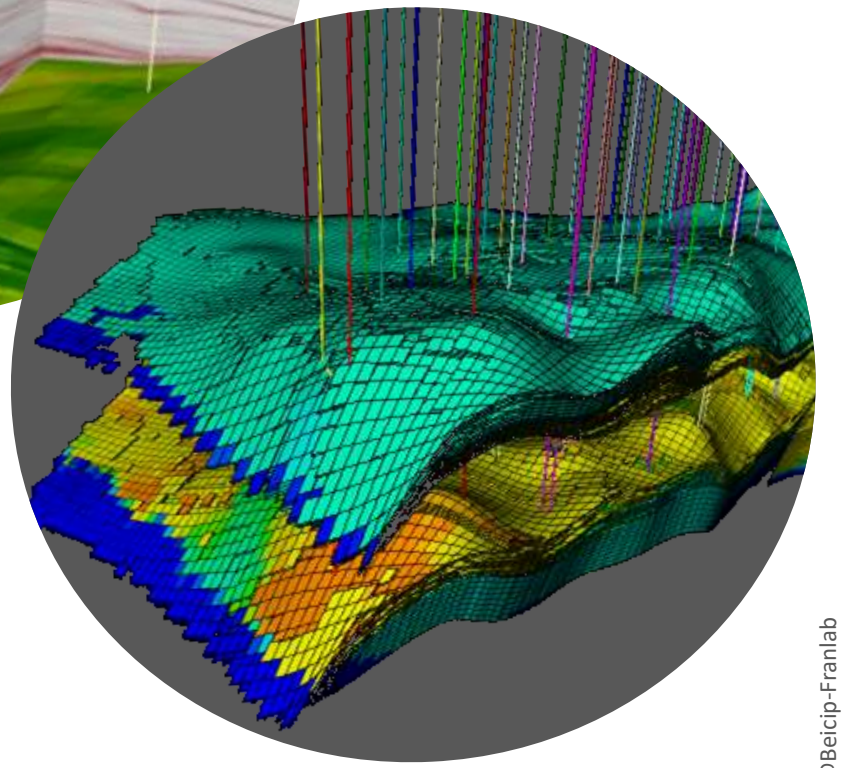


Volumetrics

Play	Unrisked Volumes in Place (P50)	Fluid	Recoverable volumes
KG-Synrift	34 Basm3	Gas	20 Bsm3
KG Paleogene	88.7 MMsm3	Oil	26.5 MMBsm3
Oligo-Mlo-Pliocene	38.2 Bsm3	Gas	23 Bsm3







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Thank You

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MINISTRY OF PETROLEUM AND NATURAL GAS
Government of India

Preview of Blocks under OALP Bid Round X

Directorate General of Hydrocarbons (DGH), Noida

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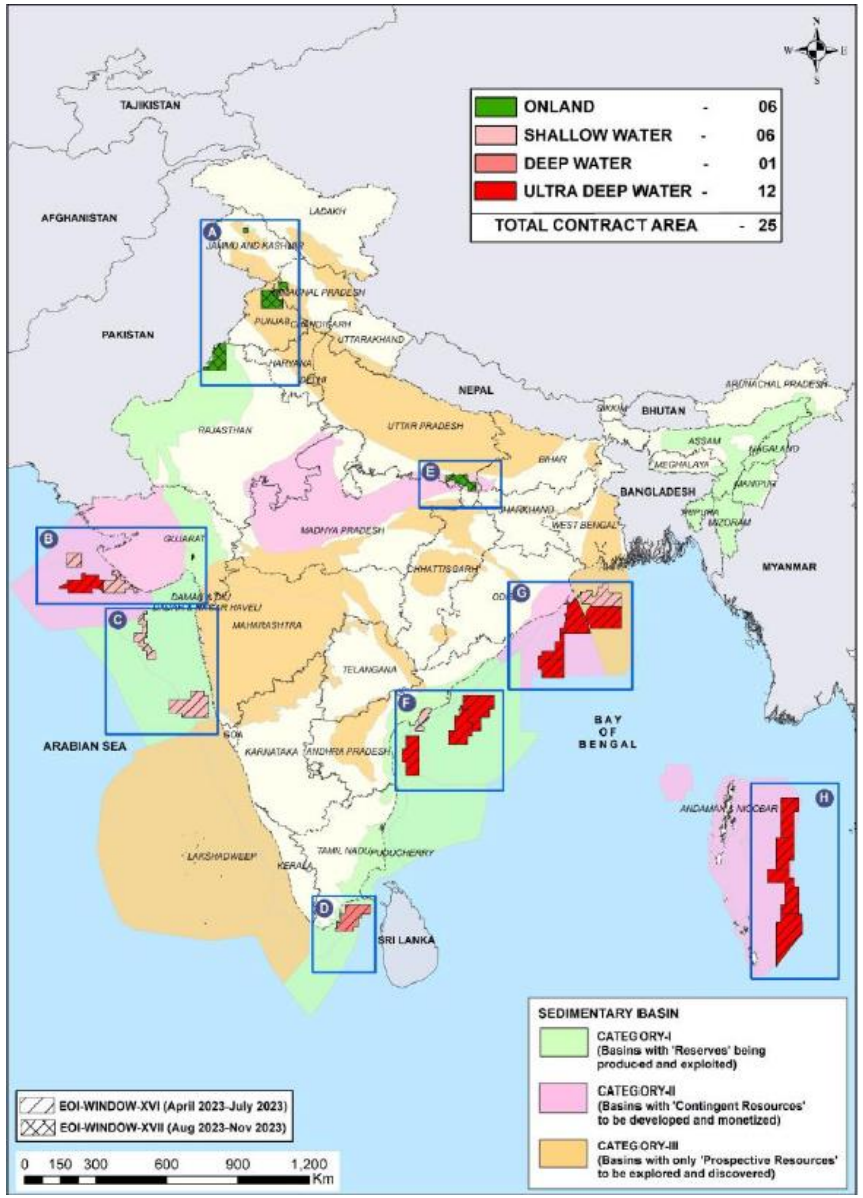
Agenda



1. OALP Bid Round –X Blocks
2. Brief Technical Notes on OLAP Bid Round X Blocks
3. Q&A

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OALP Bid Round - X Blocks

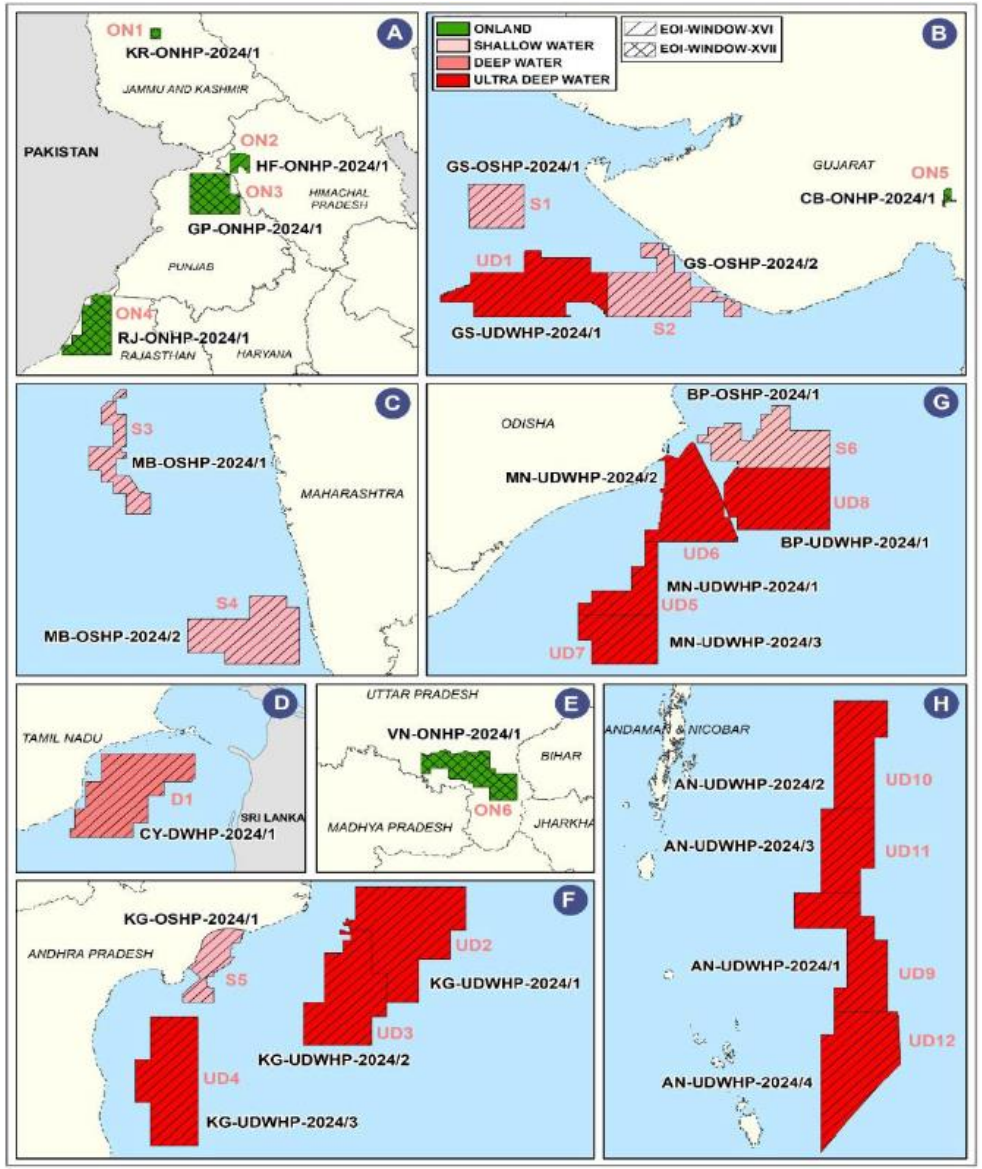
25 Blocks on offer

13 Sedimentary Basins

Blocks under offering

1,91,986 Sq.km Area

6 Blocks (~16871 Sq.km) Onland
6 Blocks (~ 41391 sq.km) Shallow Water
1 Block (~ 9991 sq.km) Deep Water
12 Blocks (~123733 sq.km) Ultra Deep Water



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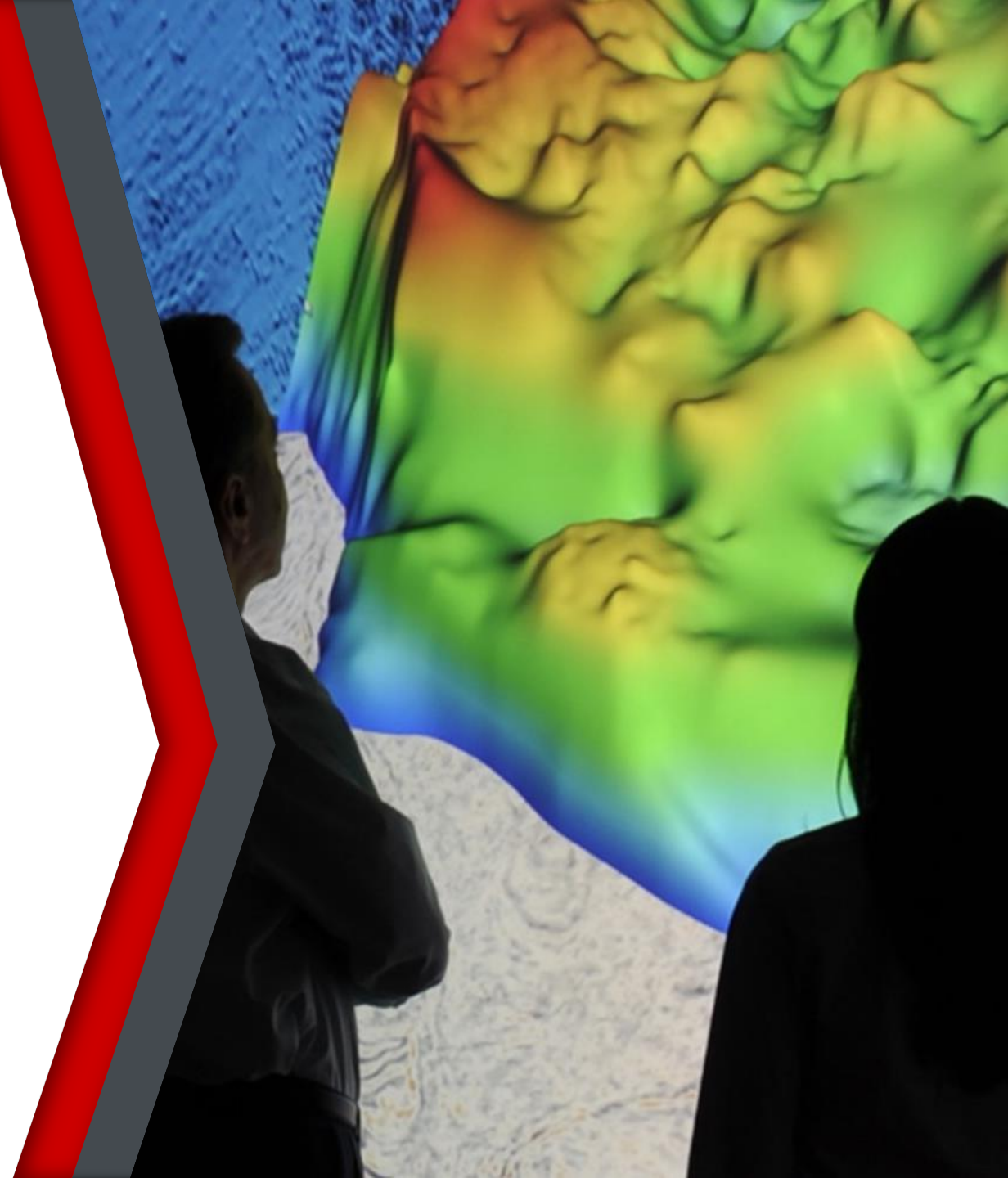
Brief Technical Notes

OALP Bid Round – X Blocks



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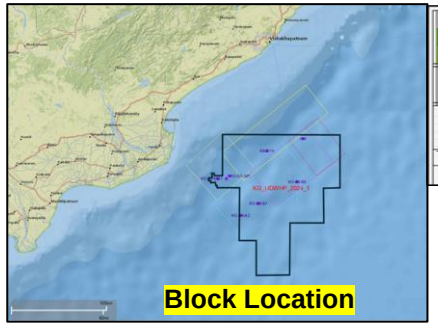
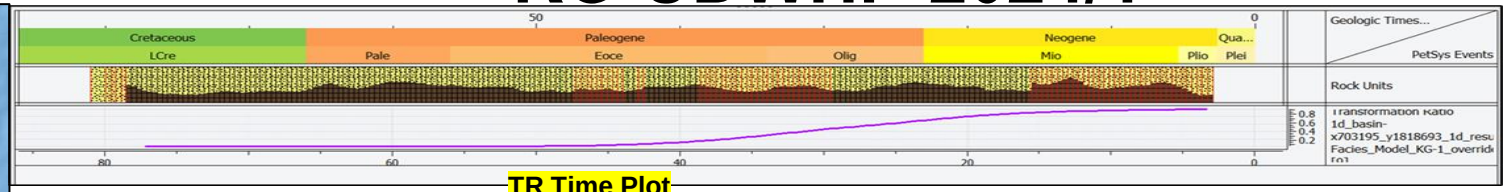
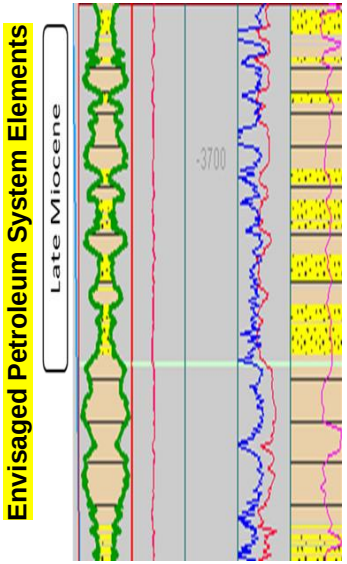
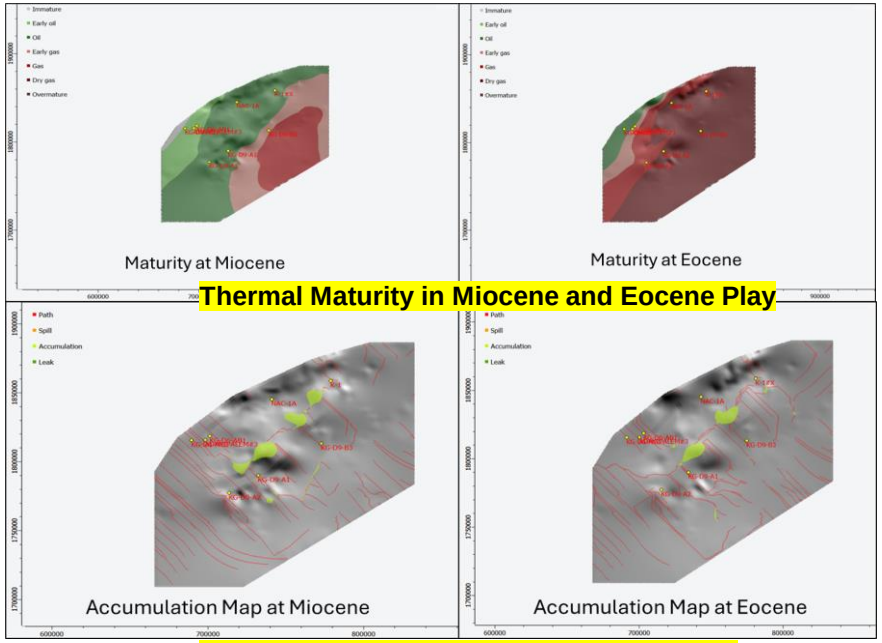


Block Location



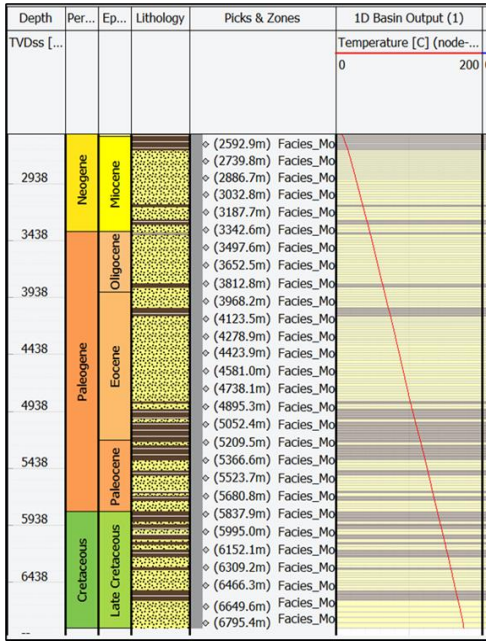
TR Time Plot





Thermal Maturity in Miocene and Eocene Play

Accumulation in Miocene and Eocene Play



Temperature Depth Plot

LEAD/PROSPECT RISKING			
1. Source	Presence	1	Proven from the Gas shows of the wells in the block.
	Maturation	1	From PSM model it is observed that the source is matured for both the Oil and Gas phase.
2. Timing / Migration	Timing of Closure / Trap	1	More than 50% Transformation Ratio was observed at the later stage of Eocene level.
	Timing of Expulsion	1	The TR is more tha 50% is conducive for the expulsion.
	Effective Migration Pathway	1	Faults acts as great migration pathway.
3. Reservoir	Reservoir Presence	0.5	It is envisaged that the reservoir is the form of channel bodies which may be clay filled also.
	Reservoir Effectiveness	0.5	
4. Trap/Closure	Closure	0.5	There are no strucutral trap. It is strati structural in nature. The stratistructural trap is always probailistic.
5. Containment	Top/Base Seal Effectiveness	0.5	The shale is present with higher thickness, so seal is effective.
	Final CoS	**13%**	

Prospect/Lead Risk Matrix

Global Analogue:

- **Niger Delta Basin (Gulf of Guinea, West Africa)**

Notes and Disclaimer:

- The Facies model, volumetric parameters and risk perception are data driven, some by analogy and some through perspectivity based on prior knowledge.
- There are other possible ways to carry out the PSM modelling, volumetrics and risk analysis.

2D LKM: 4991
3D SKM: 7714
Wells: 9

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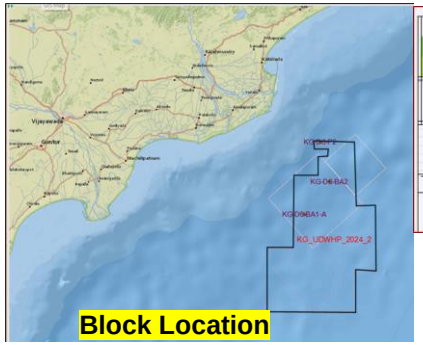
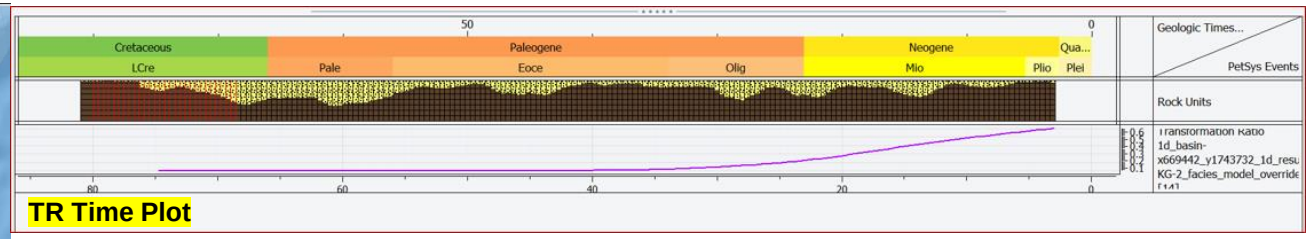
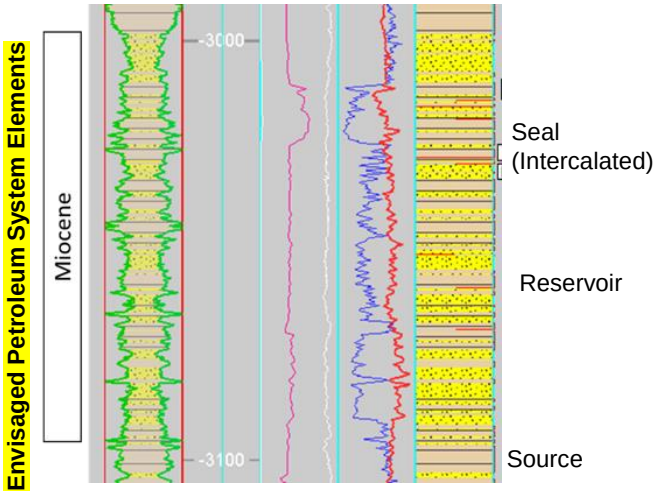
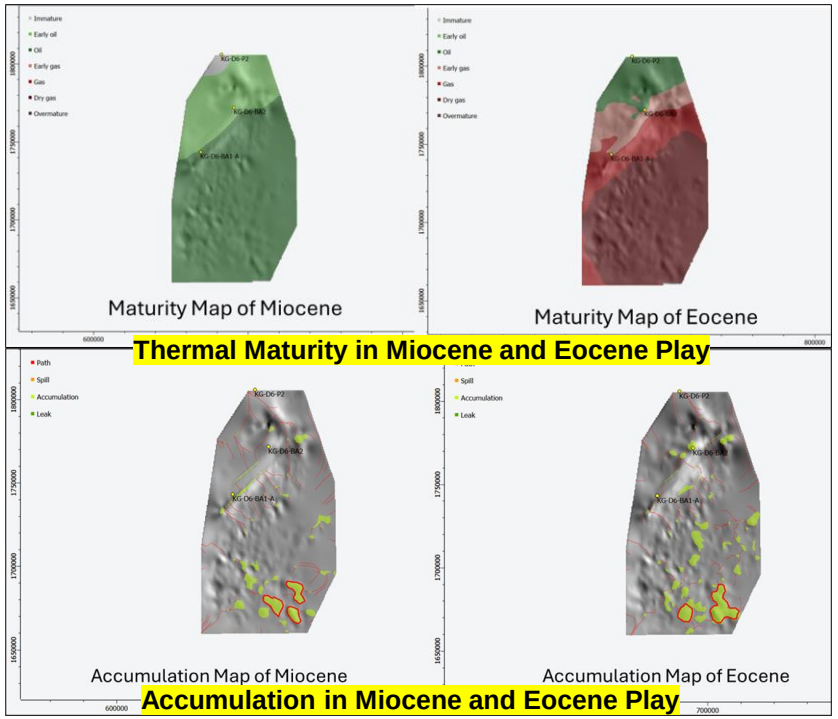


Block Location



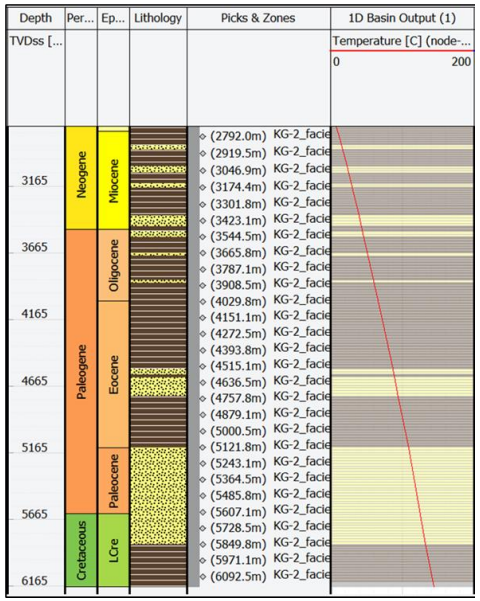
TR Time Plot





Thermal Maturity in Miocene and Eocene Play

Accumulation in Miocene and Eocene Play



Temperature Depth Plot

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2D LKM: 3996
3D SKM: 6019
Wells: 4

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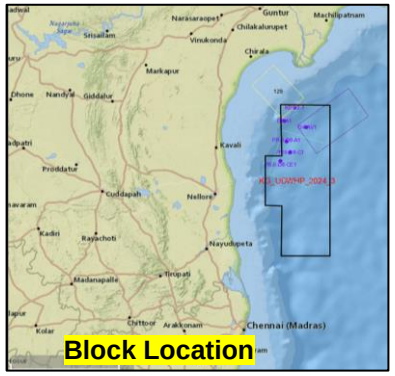
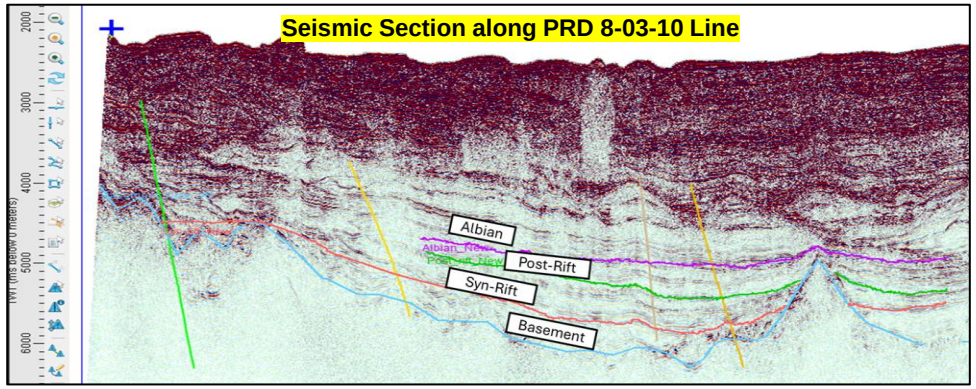
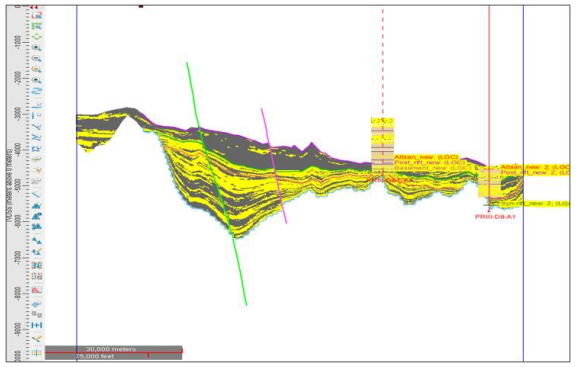
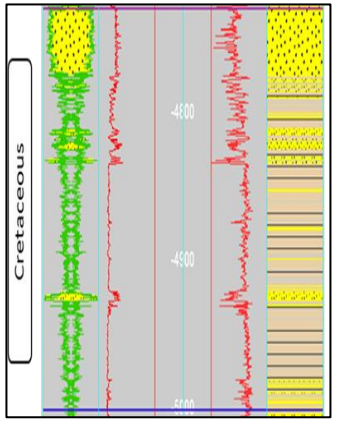
KG-UDWHP-2024/3







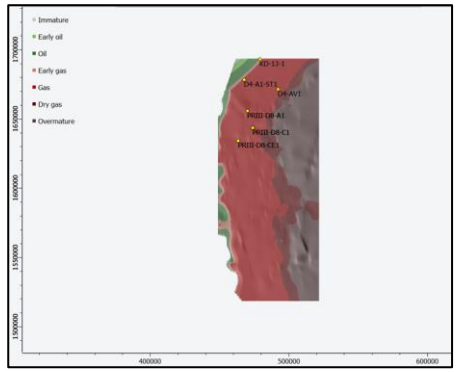
Envisaged Petroleum System Elements



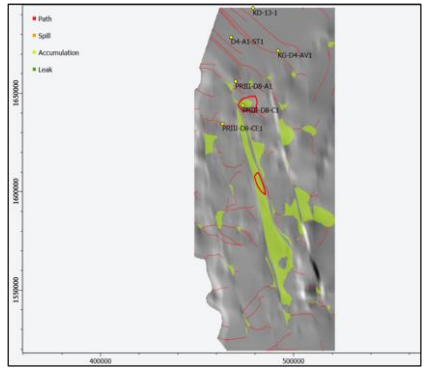
Seal

Reservoir

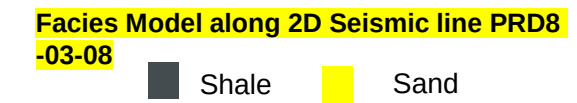
Source



Thermal Maturity of Cretaceous Play



Accumulation in Cretaceous Play



Facies Model along 2D Seismic line PRD8-03-08

Global Analogue:

- **Niger Delta Basin (Gulf of Guinea, West Africa)**

Notes and Disclaimer:

- The Facies model, volumetric parameters and risk perception are data driven, some by analogy and some through perspectivity based on prior knowledge.
- There are other possible ways to carry out the PSM modelling, volumetrics and risk analysis.

PROSPECT RISKING			
1. Source	Presence	1	Proven from the Gas shows of the wells in the block
	Maturation	1	From PSM model it is observed that the source is matured for both the Oil and Gas phase
2. Timing / Migration	Timing of Closure / Trap	1	More than 50% Transformation Ratio was observed at the later stage of Eocene level
	Timing of Expulsion	1	The TR is more tha 50% is conducive for the expulsion
	Effective Migration Pathway	1	Faults acts as great migration pathway
3. Reservoir	Reservoir Presence	0.5	It is envisaged that the reservoir is the form of channel bodies which may be clay filled also
	Reservoir Effectiveness	0.5	
4. Trap/Closure	Closure	0.5	There are no strucutral trap. It is strati structural in nature. The stratistructural trap is always probailistic
5. Containment	Top/Base Seal Effectiveness	0.5	The shale is present with higher thickness, so seal is effective
	Final CoS	**13%**	

Prospect/Lead Risk Matrix

2D LKM:4132
3D SKM: 5035
Wells: 9

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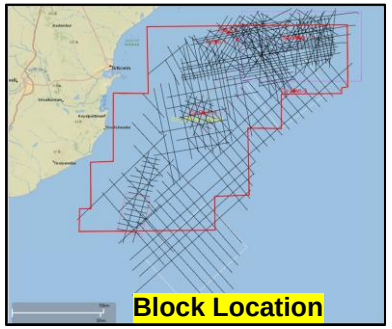
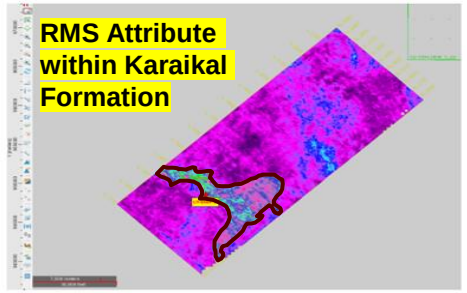
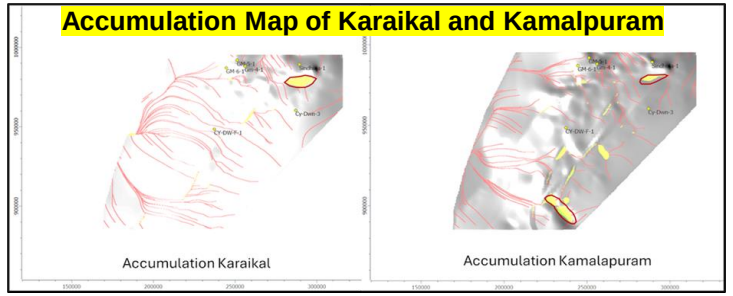
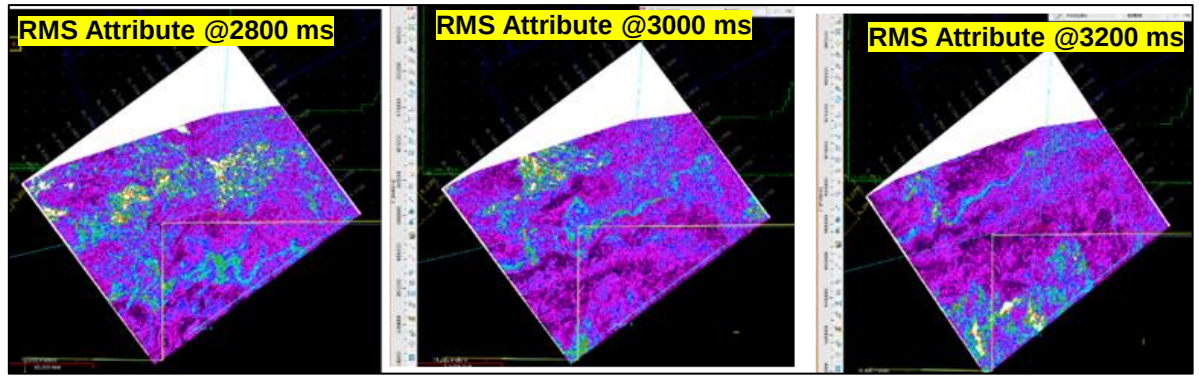
CY-DWHP-2024/1

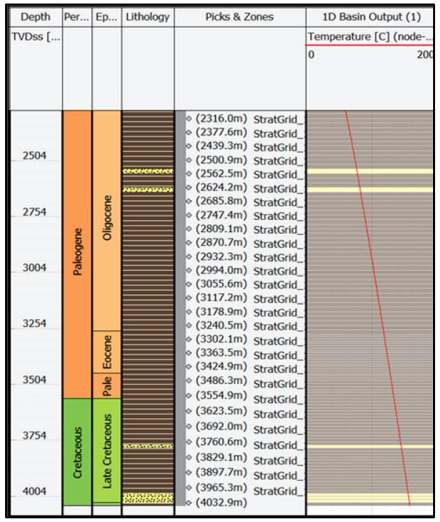


Block Location

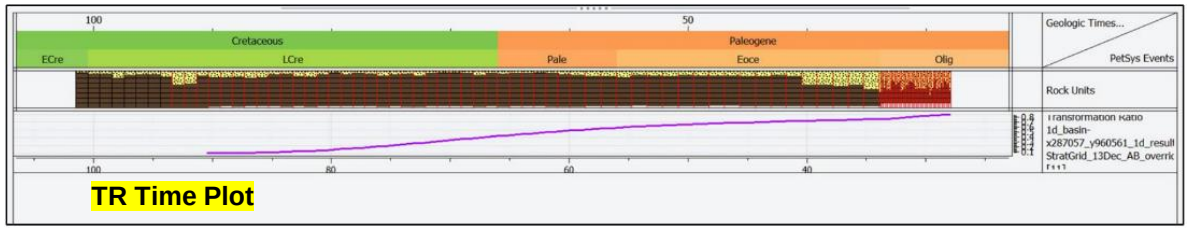








Temperature Depth Plot



TR Time Plot

Prospect/Lead Risk Matrix

PROSPECT RISKING			
1. Source	Presence	1	Proven from the Gas shows of the wells in the block
	Maturation	1	From PSM model it is observed that the source is matured for both the Oil and Gas phase
2. Timing / Migration	Timing of Closure / Trap	1	More than 50% Transformation Ratio was observed at the later stage of Eocene level
	Timing of Expulsion	1	The TR is more tha 50% is conducive for the expulsion
	Effective Migration Pathway	1	Faults acts as great migration pathway
3. Reservoir	Reservoir Presence	0.5	It is envisaged that the reservoir is the form of channel bodies which may be clay filled also
	Reservoir Effectiveness	0.5	
4. Trap/Closure	Closure	0.5	There are no strucutral trap. It is strati structural in nature. The stratistructural trap is always probailistic
5. Containment	Top/Base Seal Effectiveness	0.5	The shale is present with higher thickness, so seal is effective
	Final CoS	**13%**	

Global Analogue:

- **Central European Basins and Northen Gulf of Mexico (Mancini etal., 1996)**

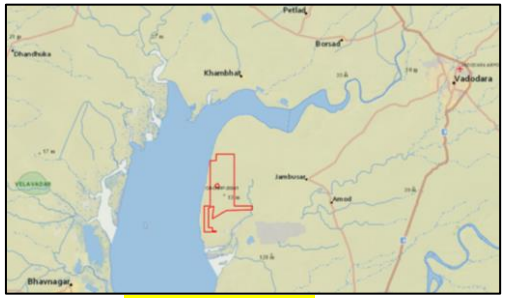
Notes and Disclaimer:

- There is very good indication of Albian-Aptian channel geometry in one of the many 3D data.
- Due to the lack of full coverage by 3D in the block the channel geomorphology cannot be captured entirely to understand the reservoir fairway.
- The Facies model, volumetric parameters and risk perception are data driven, some by analogy and some through perspectivity based on prior knowledge.
- There are other possible ways to carry out the PSM modelling, volumetrics and risk analysis.

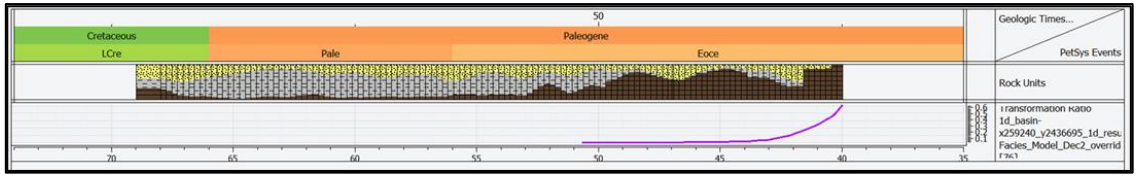
2D LKM: 3409
3D SKM: 3345
Wells: 6

HALLIBURTON

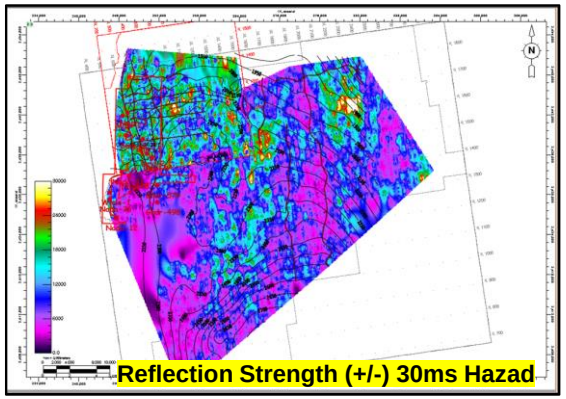
CB-ONHP-2024/1



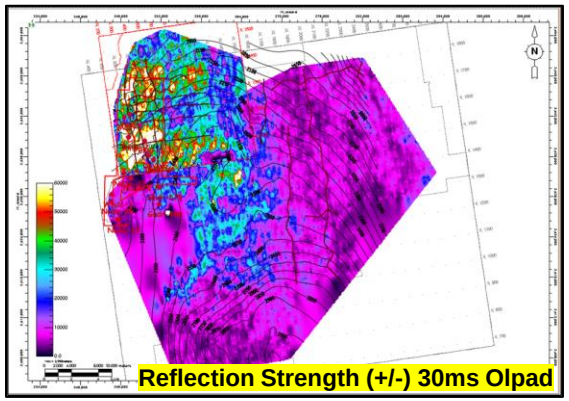
Block Location



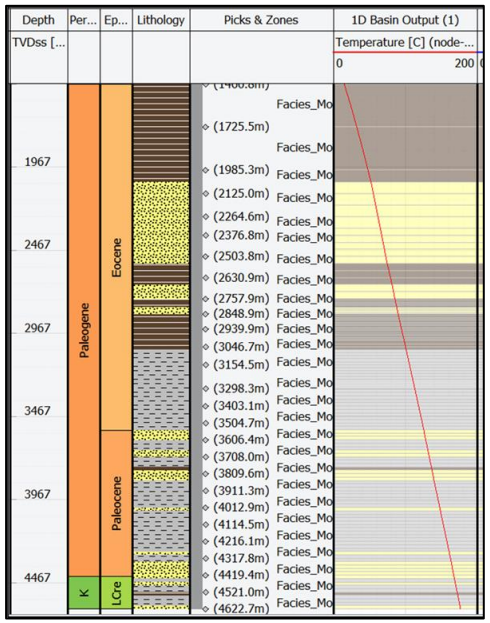
TR Time Plot



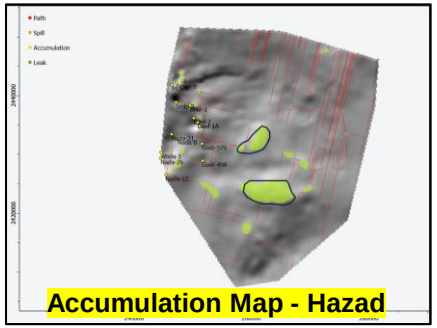
Reflection Strength (+/-) 30ms Hazad



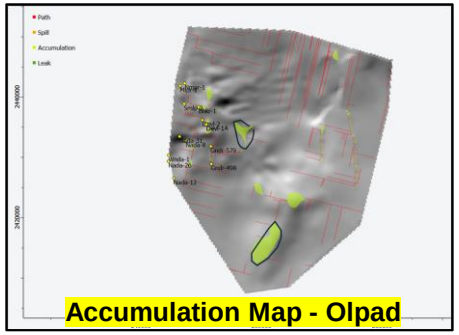
Reflection Strength (+/-) 30ms Olpad



Temperature Depth plot



Accumulation Map - Hazad



Accumulation Map - Olpad

Global Analogue:

- **Beaufort-Mackenzie Basin, North-West Canada**

Notes and Disclaimer:

- :The block has many Oil and Gas shows.
- Additional insights may be given to explore more deep prospects.
- The Facies model, volumetric parameters and risk perception are data driven, some by analogy and some through perspectivity based on prior knowledge.

Prospect/Lead Risk Matrix

PROSPECT RISKING			
1. Source	Presence	1	Being part of a well developed basin, it is proven.
	Maturation	1	PSM study suggest the source is well matured.
2. Timing / Migration	Timing of Closure / Trap	1	The petroleum events from PSM suggests the critical timing.
	Timing of Expulsion	1	Is very well established in PSM as well as evidenced from different literature.
	Effective Migration Pathway	1	The faults and fractures act as effective migration pathways.
3. Reservoir	Reservoir Presence	1	Hydrocarbon production from several wells are the
	Reservoir Effectiveness	1	Porosity-depth plot suggest that the reservoir is effective.
4. Trap/Closure	Closure	0.5	There are no structural closure only stratistructural trap present, thus probability may be 50%.
5. Containment	Top/Base Seal Effectiveness	0.5	The well proven Cambay shale is peresent here but the chance of acting as seal may be probabilistic.
	Final CoS	**25%**	

2D LKM: 140
3D SKM: 119
Wells: 13

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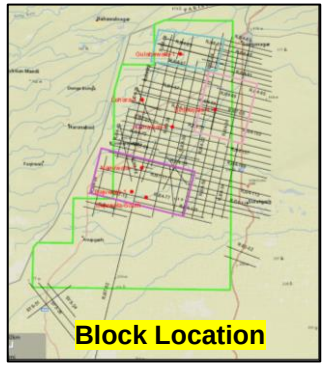
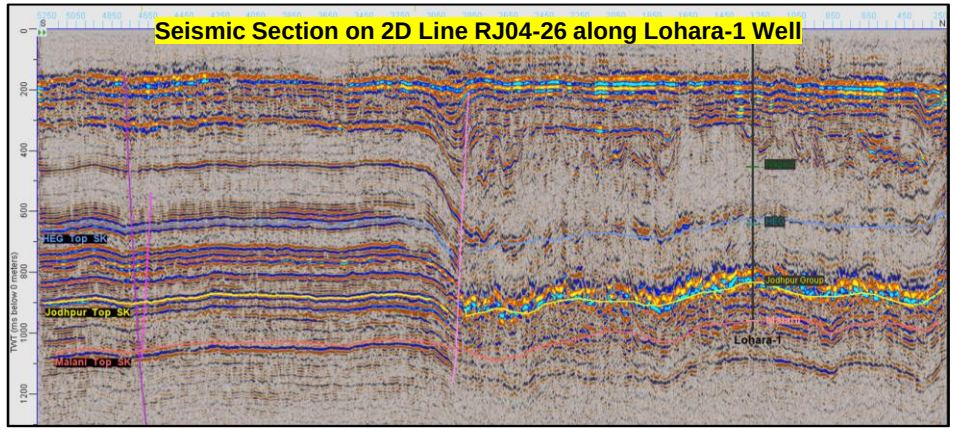
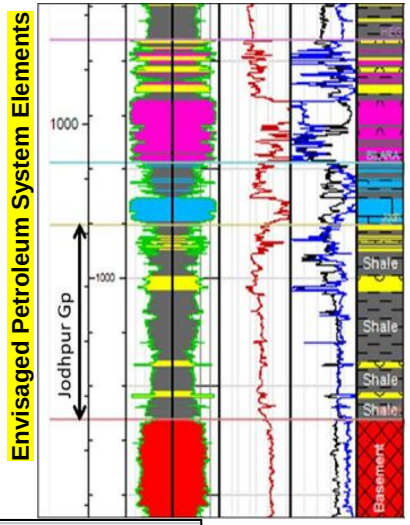
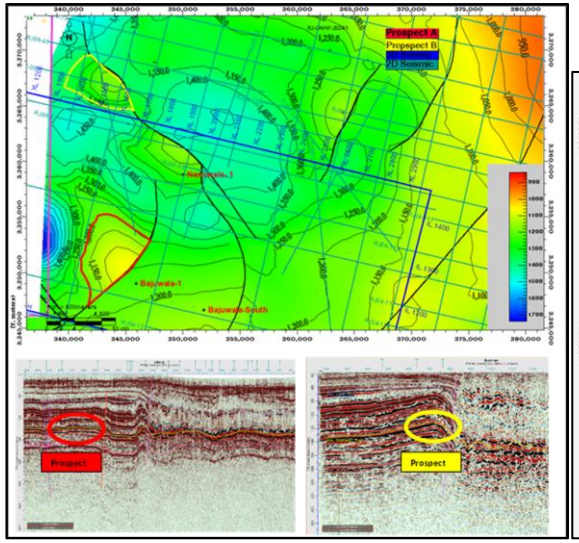
RJ-ONHP-2024/1

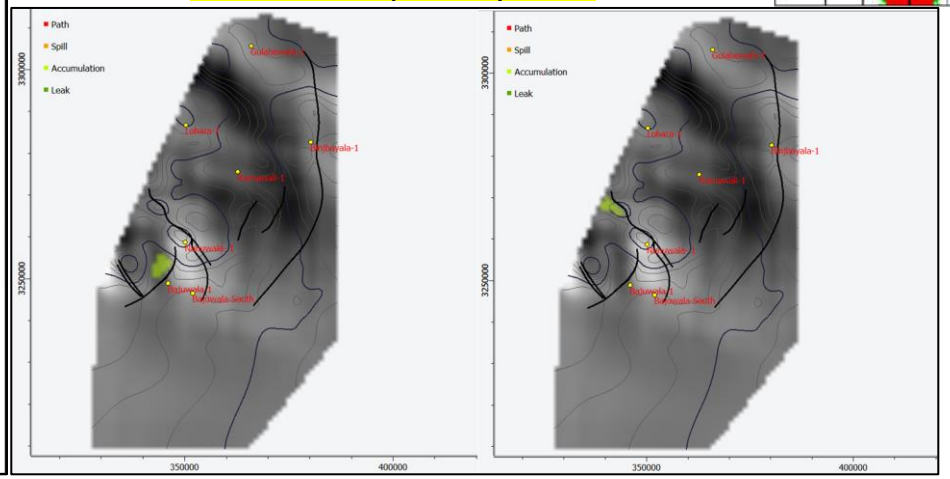








Accumulation map at Jodhpur level



PROSPECT RISKING			
1. Source	Presence	1	In this Block there are proven source from both and India and Pakistan is proven. Bajuwala-5 well Geochemistry there are proven source.
	Maturation	1	
2. Timing / Migration	Timing of Closure / Trap	1	The timing is conducive for the generation of hydrocarbons.
	Timing of Expulsion	1	The TR is more tha 50% is conducive for the expulsion.
	Effective Migration Pathway	1	Faults acts as great migration pathway.
3. Reservoir	Reservoir Presence	1	Already proven in other Wells.
	Reservoir Effectiveness	1	The reservoir is effective in terms of porosity and saturation is concerned.
4. Trap/Closure	Closure	0.5	Three (3) way fault bound closure with chance of fault sealing as 50%.
5. Containment	Top/Base Seal Effectiveness	0.5	Not proven seal in terms is Shale presence but faults may act as lateral seal.
	Final CoS	**25%**	

Global Analogue:

- **Huqf Group of South Oman**

Notes and Disclaimer:

- .In the present study the Jodhpur reservoir was considered for the analysis.
- Additionally, from the WCR reports it was evident that the HEG group can also be considered for the further study on prospectivity.
- The Facies model, volumetric parameters and risk perception are data driven, some by analogy and some through perspectivity based on prior knowledge.

2D LKM: 2149
3D SKM: 1112
Wells: 7

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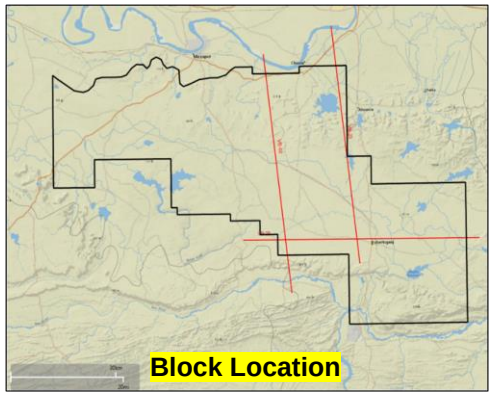
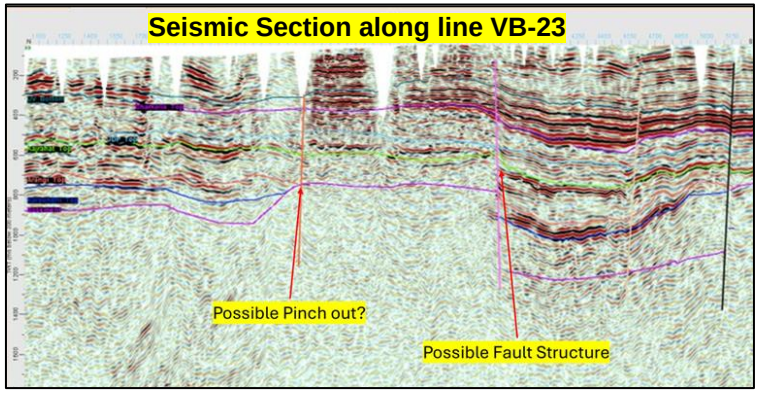
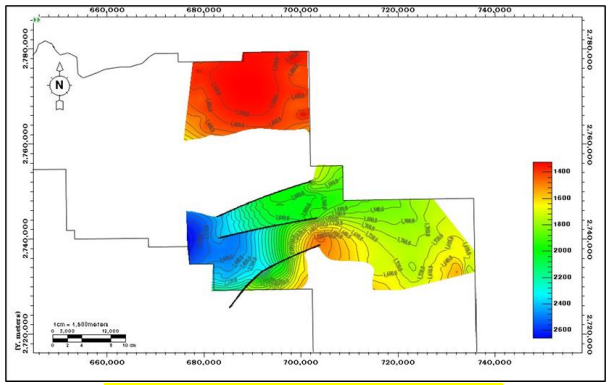
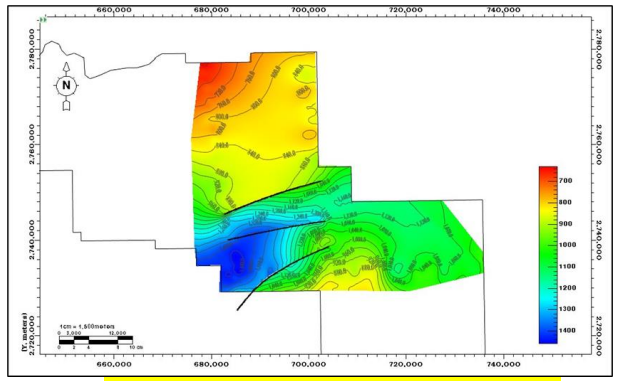
VN-ONHP-2024/1







Depth Map of Arangi Formation



Depth Map of Jardepahar Formation

Play Chance Calcaultion	Value	Comments
Trap Closure	0.7	The closure is not evident in the block, but it prevalent.
Trap Seal	0.5	Chances are 50-50, due to the presence of clay/fine sandstone
Reservoir Facies	1.0	The reservoir is proved in the surrounding
Reservoir Quality	0.7	The porosity is not good due to compaction
Source	1.0	Source is proven due to the some Oil and Gas shows
Migration	0.6	Migration is possible due to the complex strucutres
Play Chance	**0.15**	

Play Chance of Success of Neo Proterozoic Play

Global Analogue:

- **Vindhyan basin was studied further in detail to understand the analogous feature that are present in the nearby blocks of the basin. It was found that the closest analogue of the Vindhyan basin is the Mac Arthur Basin of Australia.**

Notes and Disclaimer:

- More 2D seismic coverage as well as 3D seismic coverage in could have unfolded the prospectivity in the block area in better way.
- No wells data present. The closest well is 300 Kms from the block under study.
- .Volumetrics is subjective provided there are data to calibrate.

2D LKM:155

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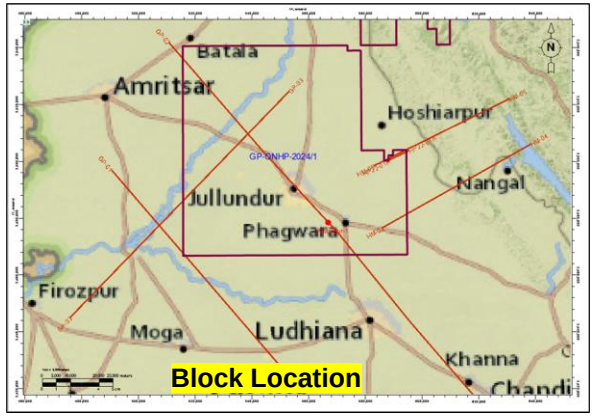
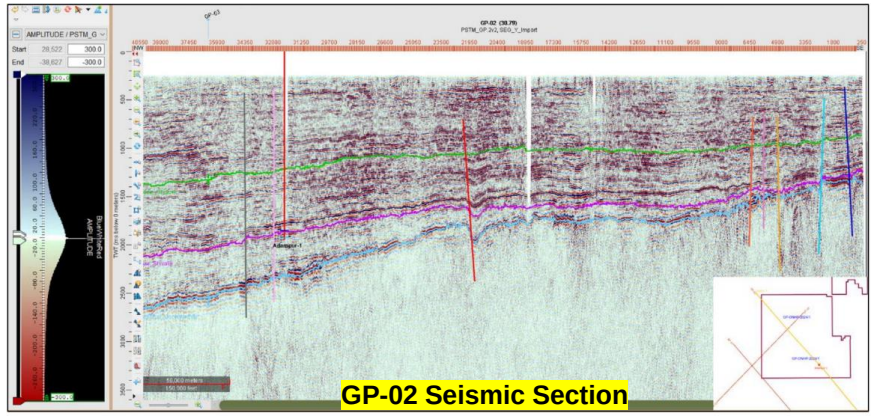
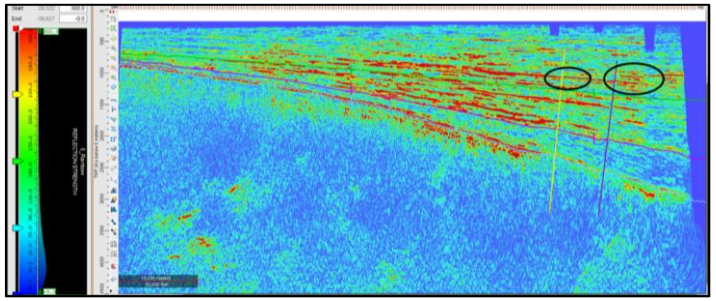
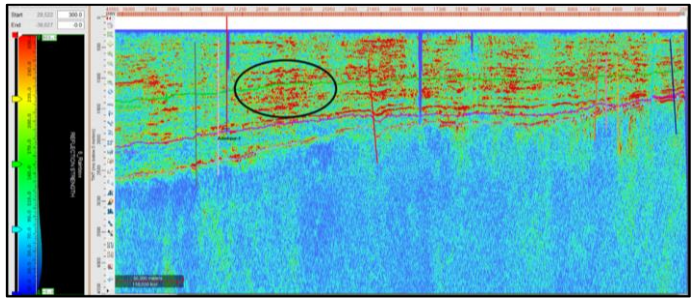
GP-ONHP-2024/1



Block Location


GP-02 Seismic Section





Identified Prospect Area

Play Chance Calcaultion	Value	Comments
Trap Closure	0.7	The closure is not evident in the block, but it prevalent.
Trap Seal	0.5	Chances are 50-50, due to the presence of clay/fine sandstone
Reservoir Facies	1.0	The reservoir is proved in the surrounding
Reservoir Quality	0.7	The porosity is not good due to compaction
Source	1.0	Source is proven due to the some Oil and Gas shows
Migration	0.6	Migration is possible due to the complex strucutres
Play Chance	**0.15**	

Play Chance of Success

Global Analogue:

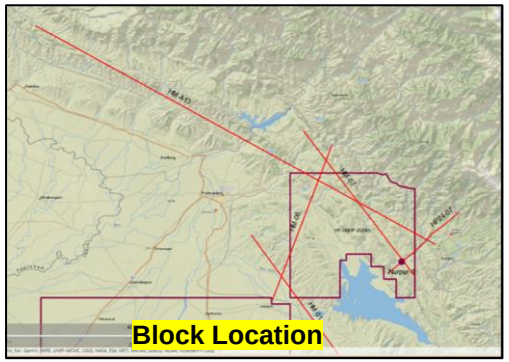
- **In terms of age of the reservoir and tectonic setting, the Vindhyan basin is the possible analogue.**

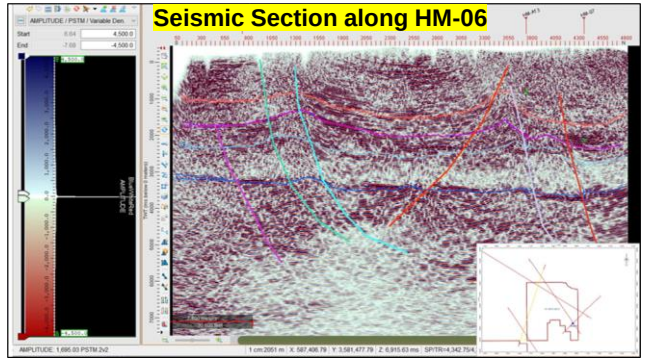
Notes and Disclaimer:

- There are recorded hydrocarbon discovered in the basin analogue i.e., Vindhyan basin.
- The potential of the block is very much there provided it is well sampled by seismic and well data to understand and support the play dynamics in detail.
- Volumetrics is subjective provided there are data to calibrate the GP basin.

2D LKM:176
Wells: 1

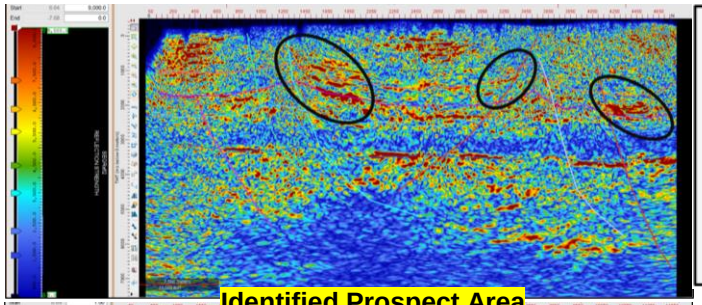
HF-ONHP-2024/1

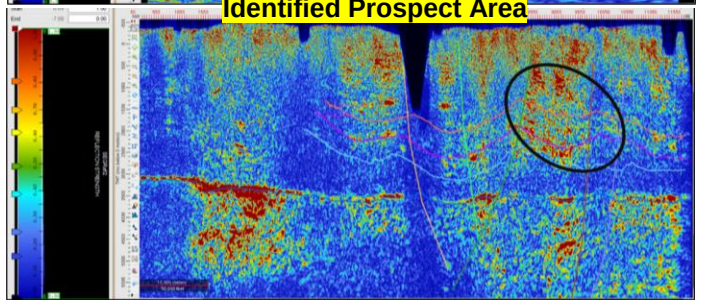


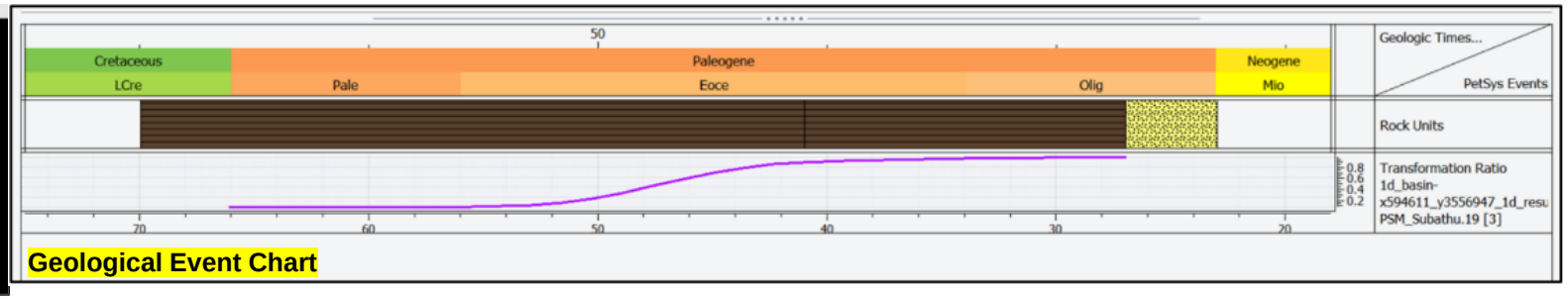


Play Chance Calcaultion	Value	Comments
Trap Closure	0.7	The closure is not evident in the block, but it prevalent.
Trap Seal	0.5	Chances are 50-50, due to the presence of clay/fine sandstone
Reservoir Facies	1.0	The reservoir is proved in the surrounding
Reservoir Quality	0.7	The porosity is not good due to compaction
Source	1.0	Source is proven due to the some Oil and Gas shows
Migration	0.6	Migration is possible due to the complex strucutres
Play Chance	**0.15**	

Play Chance of Success







Geological Event Chart

Global Analogue:

- **Potwar Basin in Pakistan is the basin analogue based on the structural symmetry and the reservoir rock age.**

Notes and Disclaimer:

- There are recorded hydrocarbons shows in the vicinity of the block, but no commercial hydrocarbon discovery was made.
- The block is not well sampled by seismic and wells, thus, to understand the potential at least close grid seismic should be attempted along with many exploratory wells..
- Volumetrics is subjective provided there are data to calibrate the Himalaya Foreland basin.

2D LKM: 107
Wells: 1

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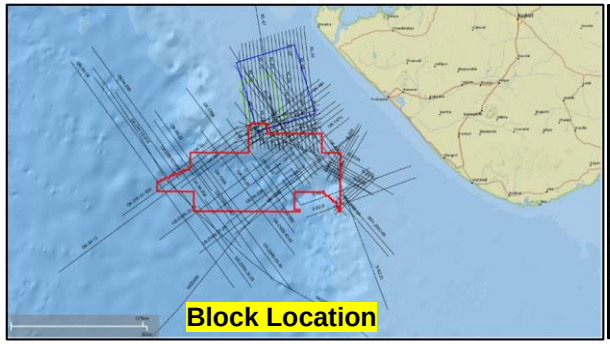
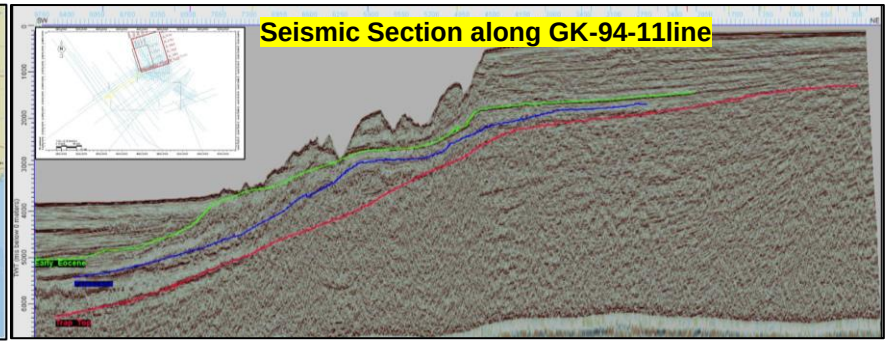
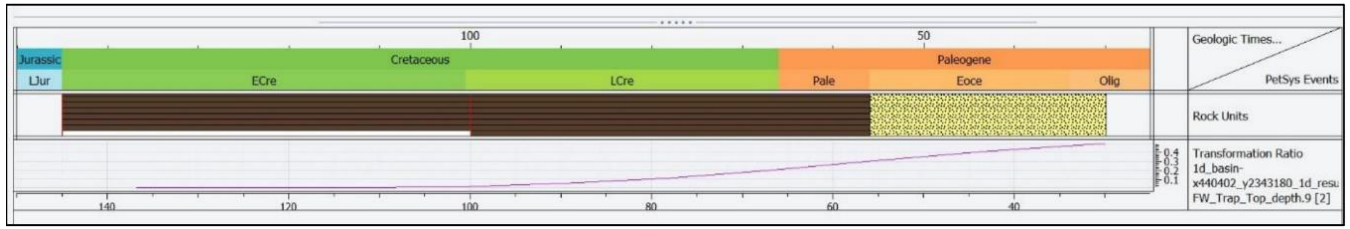
GS-UDWHP-2024/1





Play Chance Calcaultion	Value	Comments
Trap Closure	0.7	The closure is not evident in the block, but it prevalent.
Trap Seal	0.5	Chances are 50-50, due to the presence of clay/fine sandstone
Reservoir Facies	1.0	The reservoir is proved in the surrounding
Reservoir Quality	0.7	The porosity is not good due to compaction
Source	1.0	Source is proven due to the some Oil and Gas shows
Migration	0.6	Migration is possible due to the complex strucutres
Play Chance	**0.15**	

Play Chance of Success of Early Eocene Play



TR Time Plot

Global Analogue:

- **The Flemish Cap Basin and the Gujarat Saurashtra Basin share similar extensional tectonics, leading to the development of fault-controlled sedimentary basins.**

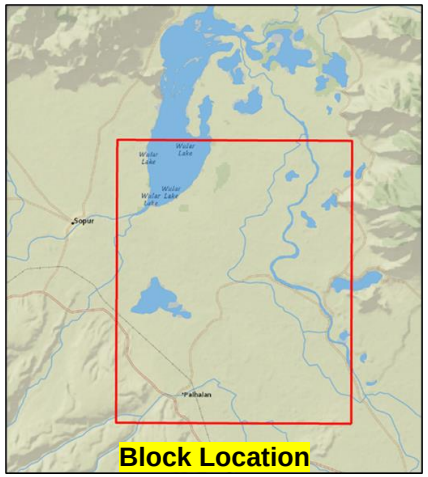
Notes and Disclaimer:

- With more seismic data coverage and well data, the structure maps can be improved.
- Due to the scanty data the volumetric was based on areal yield method taken cue from the Flemish Cap basin as calibration area.
- The nearby wells, including GSS041NAA-1 and GSS041NAA-2, has facilitated the identification of key reservoir facies in the region.

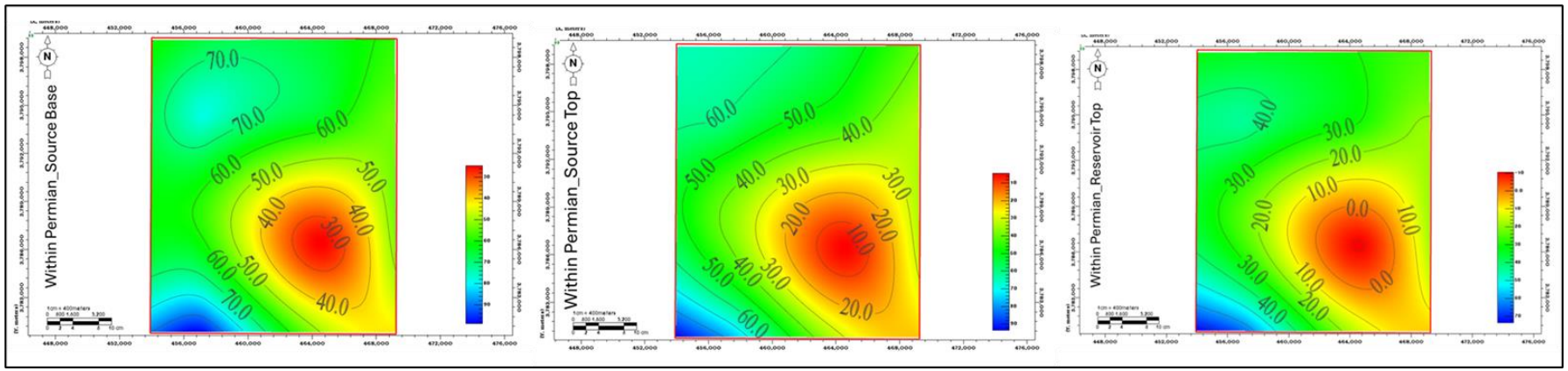
2D LKM: 4677
3D SKM: 78

HALLIBURTON

KR-ONHP-2024/1



Block Location



Envisaged Depth Map from Published Literatures (Sharma et al, 2015)

Global Analogue:

- **Kohat- Potwar Basin in Pakistan**

Notes and Disclaimer:

- No data present in this block
- Form the analogue and open-source study it is evident there could be possible hydrocarbon residence in the Permian section at a depth of 50-100 meter from the reference elevation of approximately 1800m elevation above MSL.
- A detailed analogue with the US Permian basin may also be carried out to understand the hydrocarbon dynamics in the block.

No Data

THANK YOU

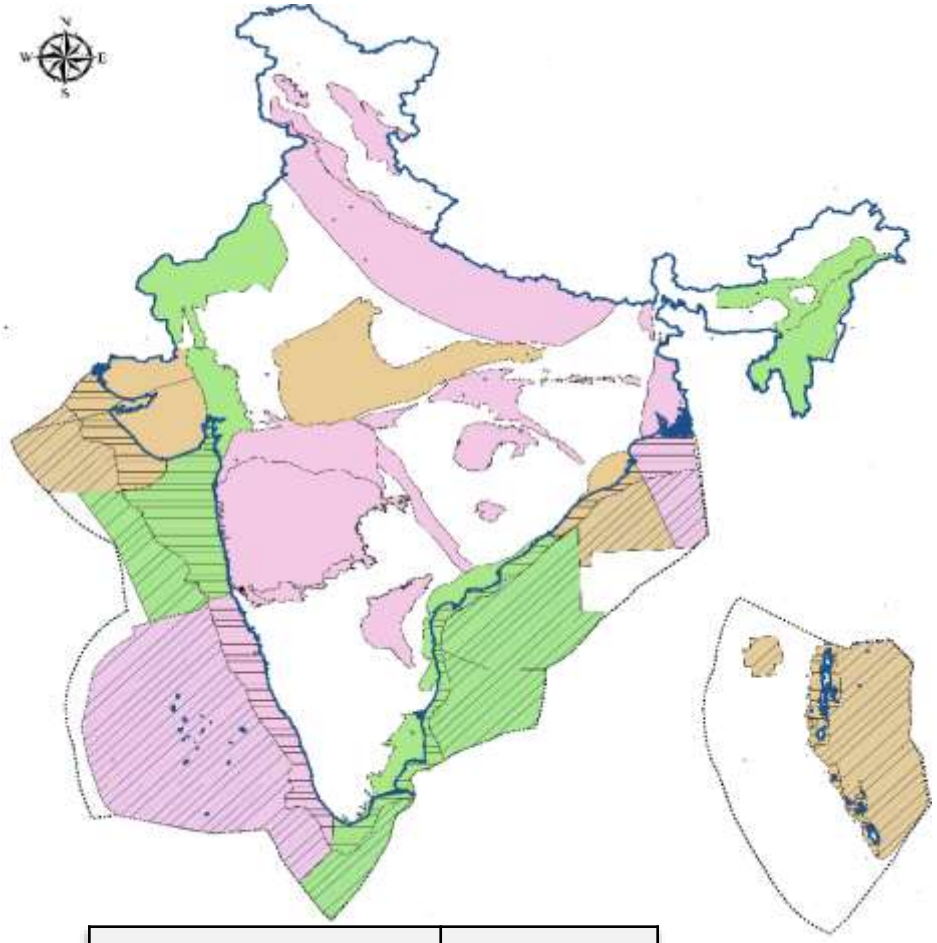
पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय
MINISTRY OF
PETROLEUM AND NATURAL GAS

DGH

Policy Interventions by GoI for Upstream Oil & Gas Sector

India Energy Week 2025
New Delhi
12.02.2025

Indian Sedimentary Basins: Overview



26 sedimentary basins || **3.36** Million Sq. Km.

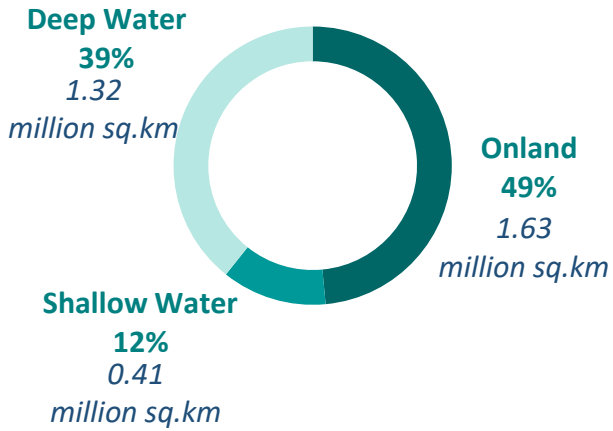
Basin Category Description

Category-I
7 Commercially Producing Basins
Area: 1 Mn Sq Kms
Resource: 21,487 MMTOE

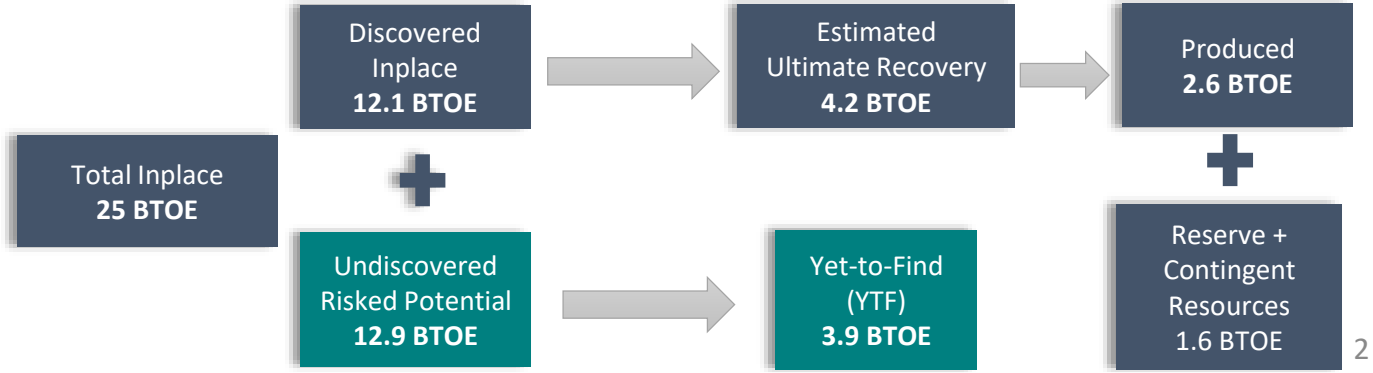
Category-II
5 Discovered Basins but not yet commercially developed
Area: 0.78 Mn Sq Kms
Resource: 1.951 MMTOE

Category-III
14 Prospective Basins but Undiscovered
Area: 1.59 Mn Sq Kms
Resource: 1,543 MMTOE

Basins Types



Geographical Area	Million sq.km
Mainland & Islands	3.29
Exclusive Economic Zone	2.36
Total Area	5.65
Sedimentary Bain	3.36



Hydrocarbon Exploration and Licensing Policy (HELP)

2016 HELP POLICY || 2019 REFORMS || 2023 REFORMS

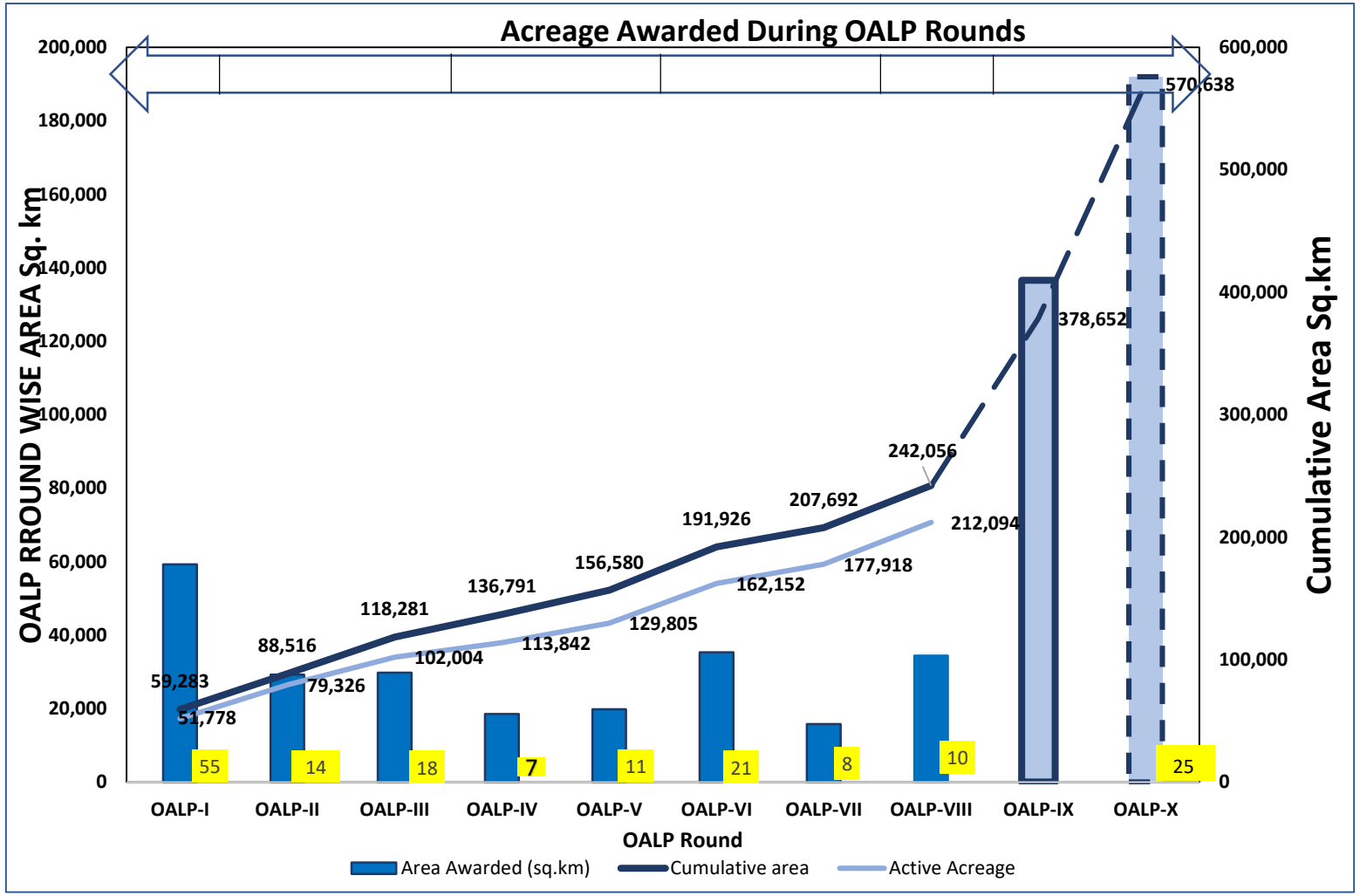
8
Bid Rounds Concluded

USD 3.36 Billion
Committed Investment

144
Blocks Awarded

2,42,056 Sq. Km
Awarded

51,725 LKM 2D Seismic
66,843 SKM 3D seismic
499 Exploratory Wells

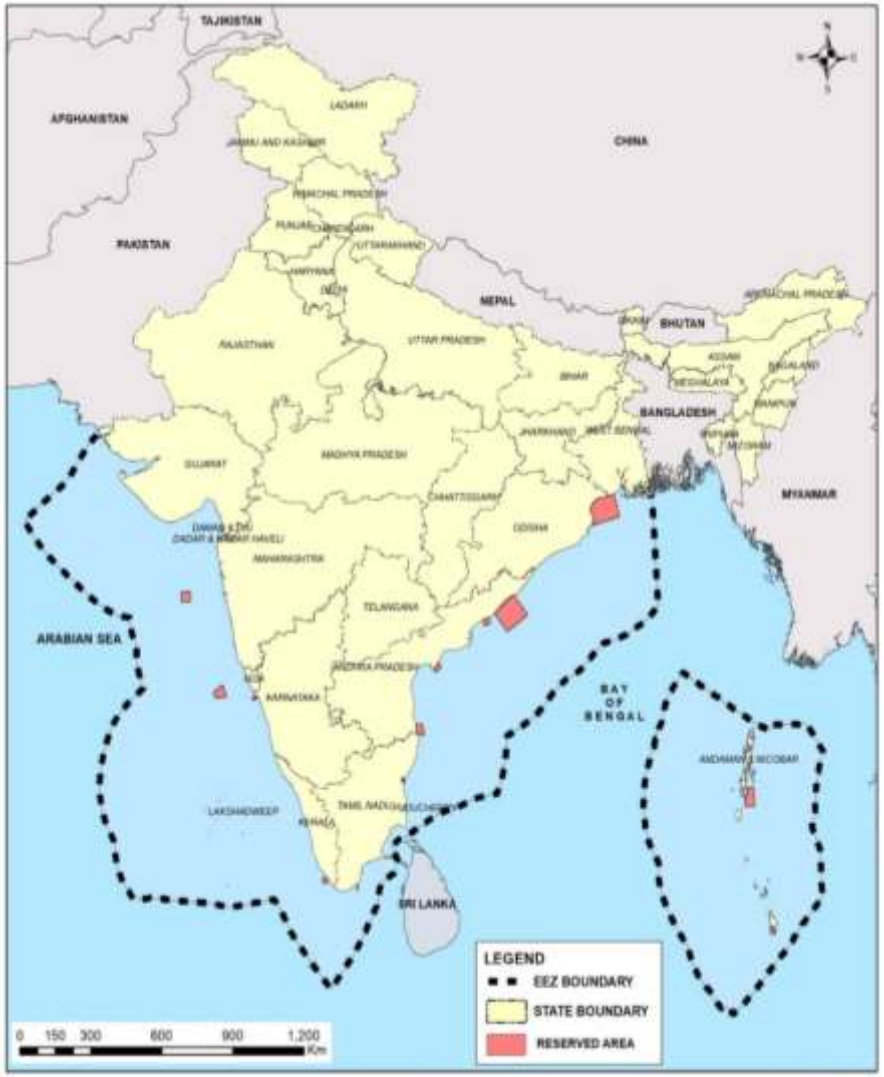


88+11(U/D) exploratory wells, 7 Oil and 6 Gas discoveries

Prospects in ~99% of EEZ Opened up for E&P

Earlier

Present



Note: Exclusive Economic Zone (EEZ) extends to a maximum of 200 Nautical miles from the baseline

Govt. initiatives to foster investments

Anytime & Anywhere Access of Data:

- **Next Gen "NDR 2.0"** : Cloud Platform, Virtual Data room for Visualization and Analysis
- **Data Centre opened** at Houston, USA

Geoscientific Surveys:

- **National Seismic Program**: 2D Seismic of ~47,000 LKM
- **Offshore Surveys:** 2D Seismic of ~100,000 LKM
- **AGG Survey:** ~43,000 Flight LKM

Projects Planned:

- **Mission Anveshan** : 20,000 LKM of Close Grid 2D Seismic Survey
- **Continental Shelf Exploration:** 2D Seismic API of 30,000 LKM in East & West Coast of India
- **Stratigraphic Wells:** 4 Wells (Andaman, Bengal, Mahanadi, Saurashtra)

Amendment to the ORD Act

Need for Amendment

Investors'/ E&P companies' **feedback** and study of competing geographies

Delinking petroleum operations from **mining**, capitalize on recent policy mechanisms

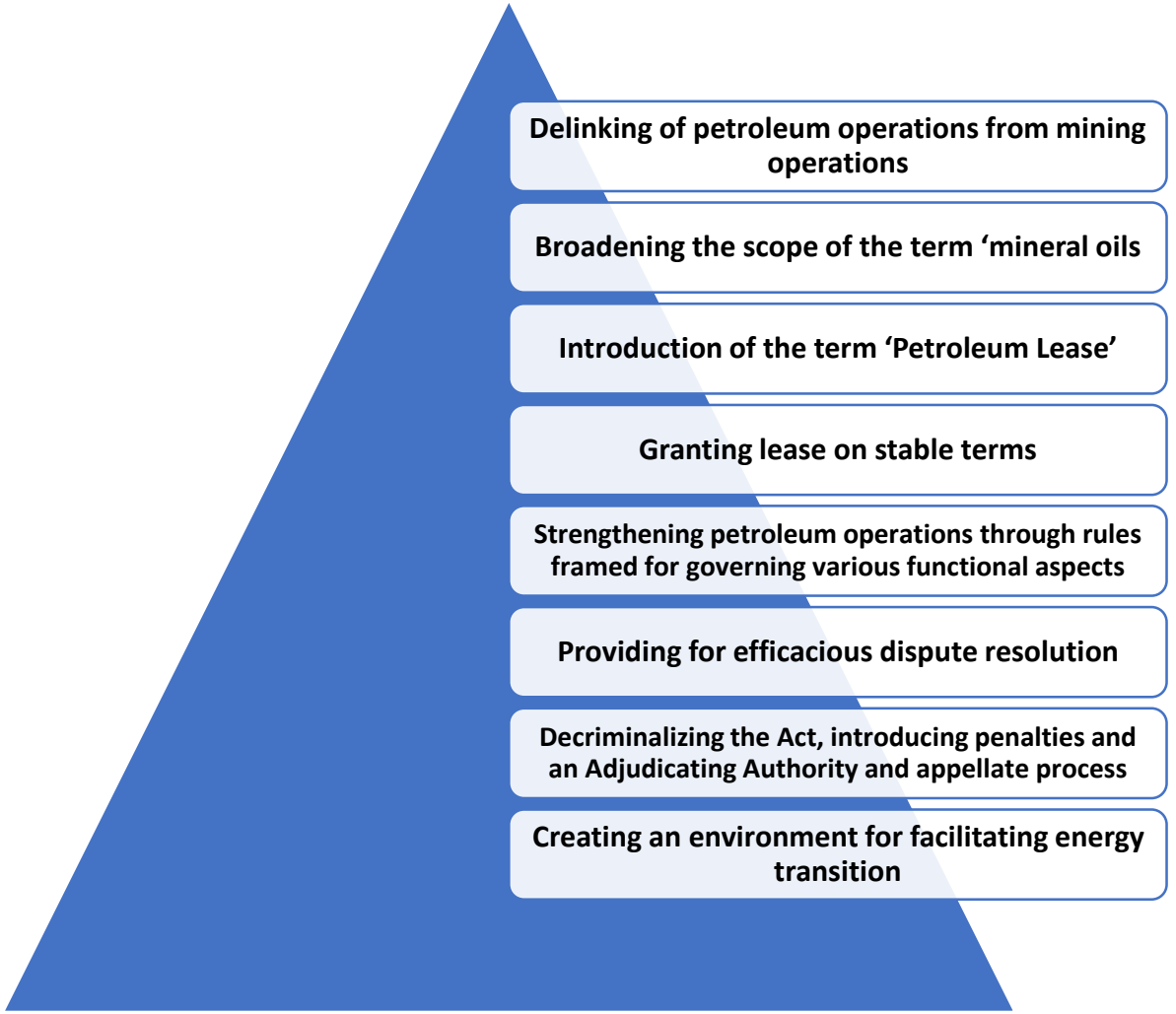
Ease of Doing Business: Decriminalize provisions, Establishing adjudicating mechanisms

Facilitating **data collection** and modern green energy projects (hydrogen production, CCUS, renewables)

Encouraging presence of **independent/ small** producers

Sharper focus on **energy security** with increased development focus

Proposed Amendments



OALP Round-X

25
BLOCKS ON OFFER

~1,91,986 Sq.km
AREA

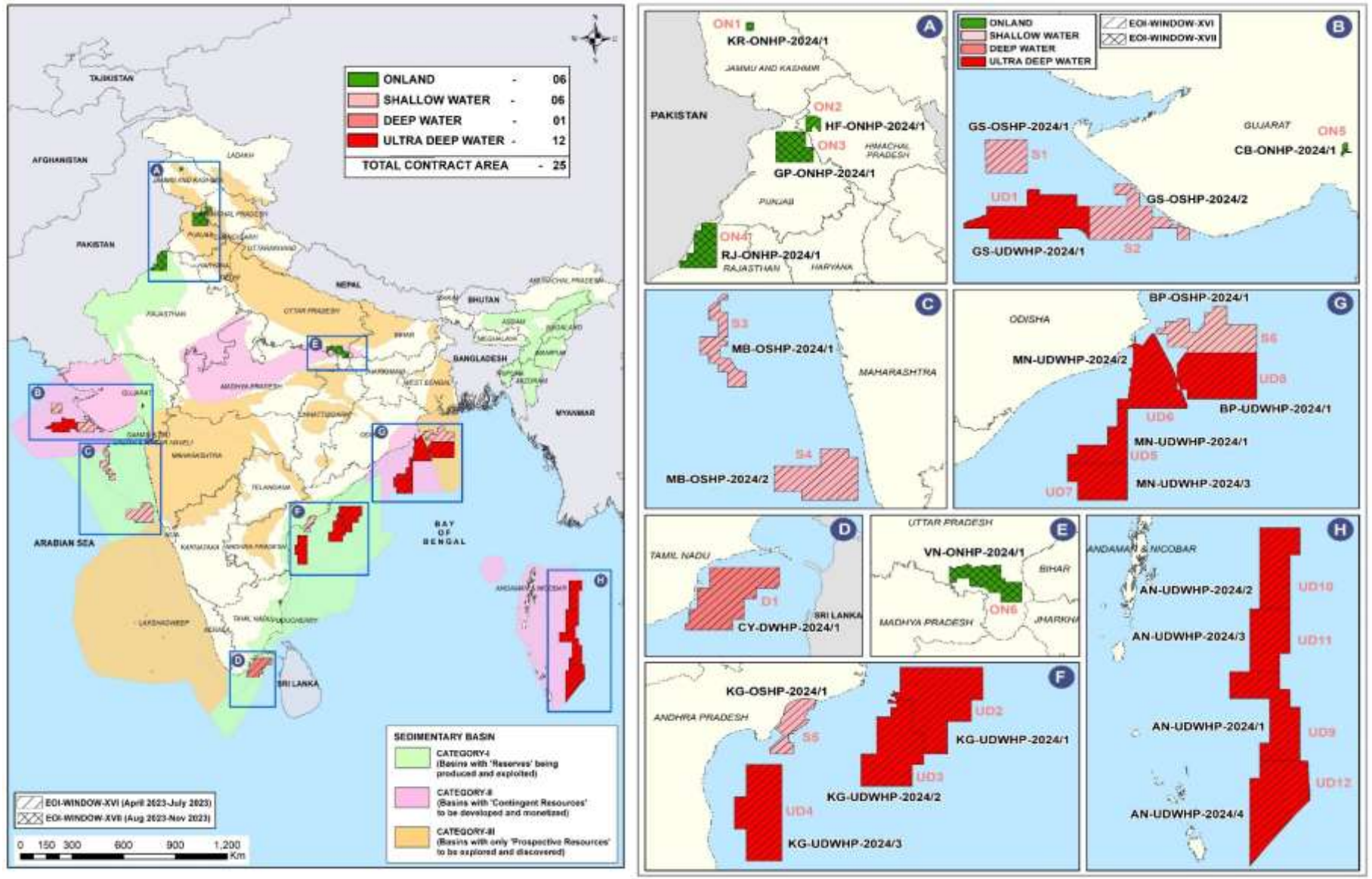
13
SEDIMENTARY BASINS

6 Blocks (~16,871 Sq.km)
ONLAND

6 Blocks (~ 41,392 sq.km)
SHALLOW WATER

1 Block (~ 9,991 sq.km)
DEEP WATER

12 Blocks (~1,23,733 sq.km)
ULTRA DEEP WATER



Salient Features of HELP

Open Acreage Licensing Programme (OALP)

Round the year EoI carving

Consortium Bids allowed

100% Foreign PI allowed

Single License for all Hydrocarbon types

Operator has right to explore Oil, Gas including CBM with single License

Transparent Encrypted e-Bidding

Only Bid Bond needs to be submitted in physical.

Set-off of CWP with Multi-Client Speculative Survey Data

Seismic data generated under Multi-Client Speculative Survey can be set off against similar CWP

Salient Features of HELP

Revenue Sharing Model in Cat-I Basins

Only 30% weightage to Fiscal Bid during Bidding

No Revenue Share in Cat-II & III Basins

Unless Windfall Gains

Incentivized and Graded Royalty Rates

7-year Royalty Holidays in Offshore

Stabilization Period, Early Monetization Scheme

Concessional Royalty for Early Monetization

Marketing and pricing freedom under the RSC

Sale within India through Arm's Length Sale

Key Incentives Introduced in 2023

All Types of Basins Incentives

1. **Block size up to 20K sq.km for play based exploration**

2. **Enhanced Scope of Force Majeure and Excusable delays**

   Included pandemics, National trade sanctions & embargoes under Applicable Laws of India, terrorism under ambit of Force Majeure and all types of statutory clearances.

3. **Stabilization period for revenue share at LRP rate up to 7 yrs**

   Stabilization Period of 4,5,7 years from commercial production under FDP.
   Revenue Share at LRP for production under Early Monetization Plan during Exploration Phase.

4. **3 Year Retention Period for Sub-Commercial Discoveries**

   Retention Period to establish market linkage, develop infrastructure/technology for sub-commercial discoveries

   .

5. **Change in consortium prior to bidding, Free Basic Data package, Reduced Bid Bond, Rationalized Operatorship experience**

Frontier Areas Incentives (Category II and III)

Extended & Phased exploration of 7 years period

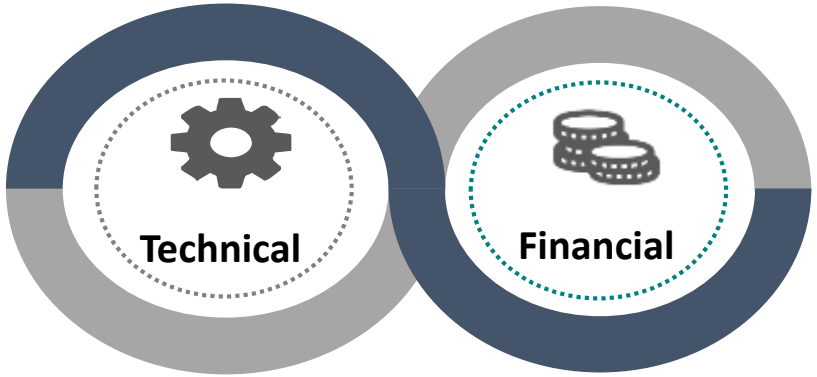
- 3 years : Seismic CWP
- 2 Years : 1 Expl. Well Commitment
- 2 Years : 1 Expl. Well Commitment

Bidding only on 2D & 3D Seismic with originator incentive of 10 points

Swapping of CWP with other surveys and Exploration Wells allowed

Bidding Structure Under OALP

1 Qualification Criteria



TECHNICAL QUALIFICATION

- **Operatorship Experience**

  Minimum 1 year Operatorship Experience

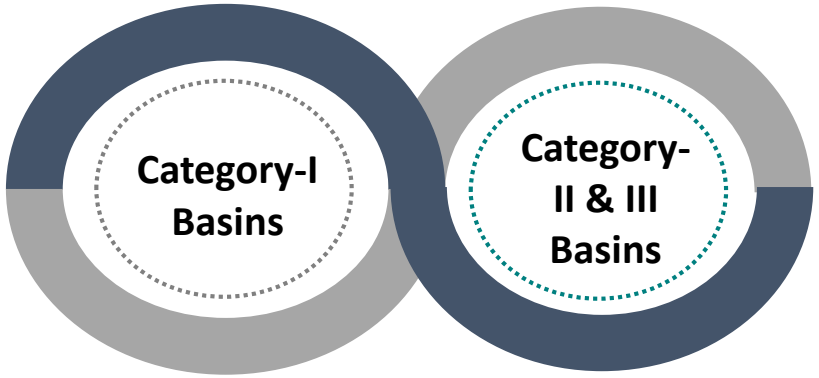
  - Shallow /Deep /Ultra-Deep Water experience relevant for **ALL** blocks
  - Onland Experience relevant for Onland & Shallow Water blocks
  - CBM Experience relevant for Onland blocks

- **Positive Acreage Holding in preceding 10 years, or**
- **Positive Average Annual Production in preceding 10 years**

FINANCIAL QUALIFICATION

Net Worth depending on number of Sectors of Block
(pro-rated up to 1'x1' grids)

2 Bid Evaluation Criteria

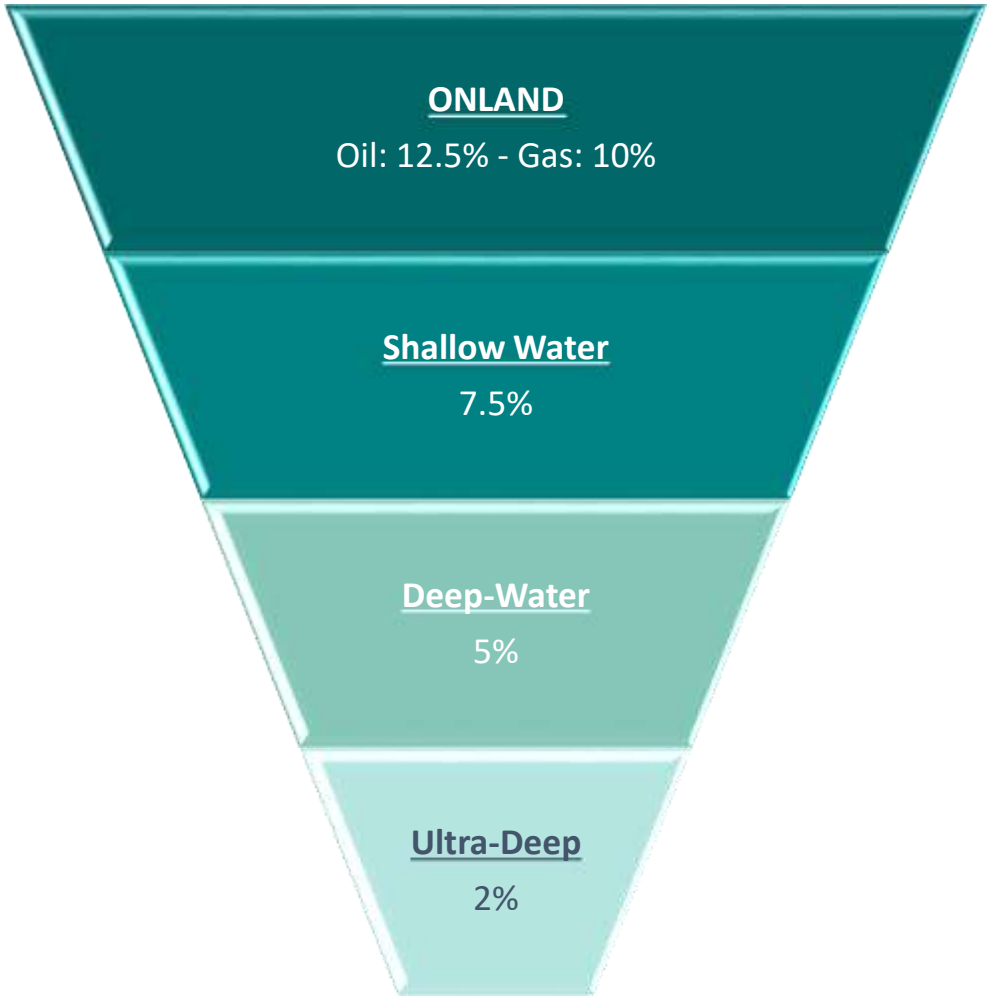


Bid Parameter	Category I weightage	Category II & III Weightage
Work Programme	65%	90% (Seismic API only)
Revenue Share	30%	0%
Originator Incentive	5%	10%

Royalty Structure under HELP

ROYALTY RATES

GRADED ROYALTY STRUCTURE



INCENTIVISED ROYALTY STRUCTURE

Incentive for Offshore Exploration
Reduced Royalty Rates in Offshore

Long Royalty Holiday period
7 Years for Deep & Ultra Deep Waters

Incentive for Gas & CBM –
2% Reduced Royalty rates for Onland blocks

CONCESSIONAL ROYALTY

(Incentive for Early Production)

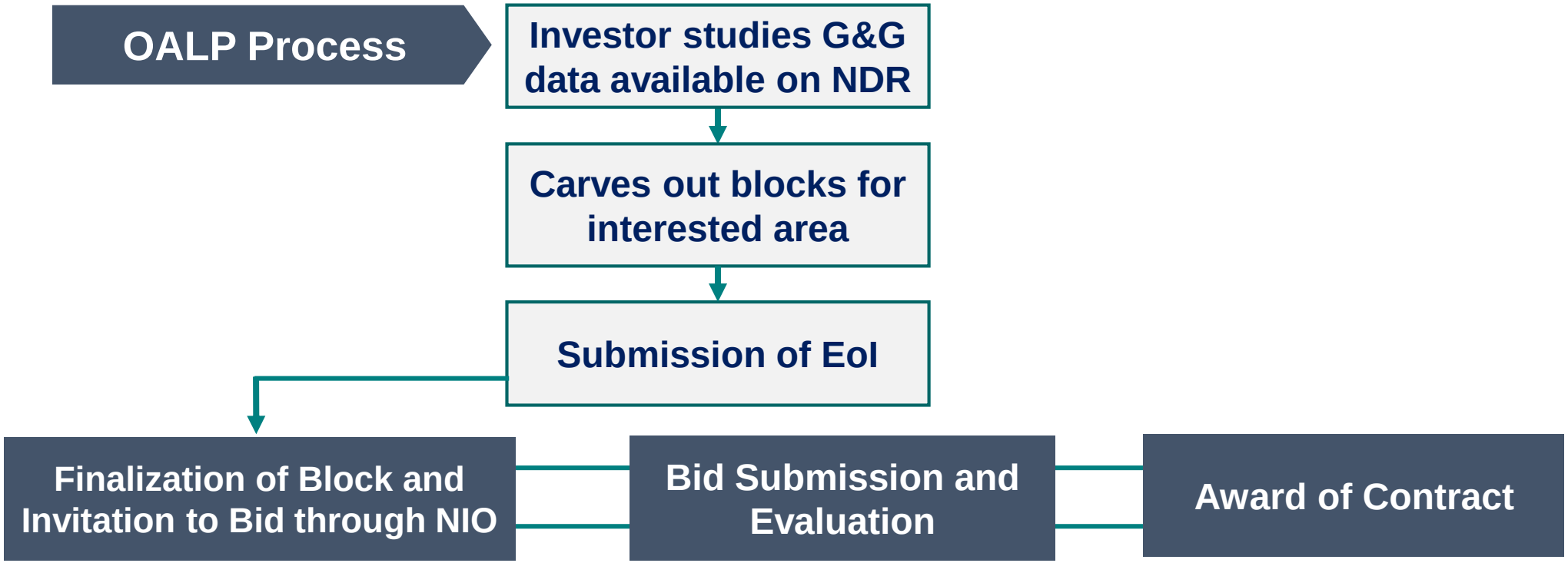
Category I Basins
10% Concession

Category II Basins
20% Concession

Category III Basins
30% Concession

Applicable on Commercial Production within **4 years in Onland & Shallow water**;
Applicable on Commercial Production within **5 years in Deep & Ultradeep water;**

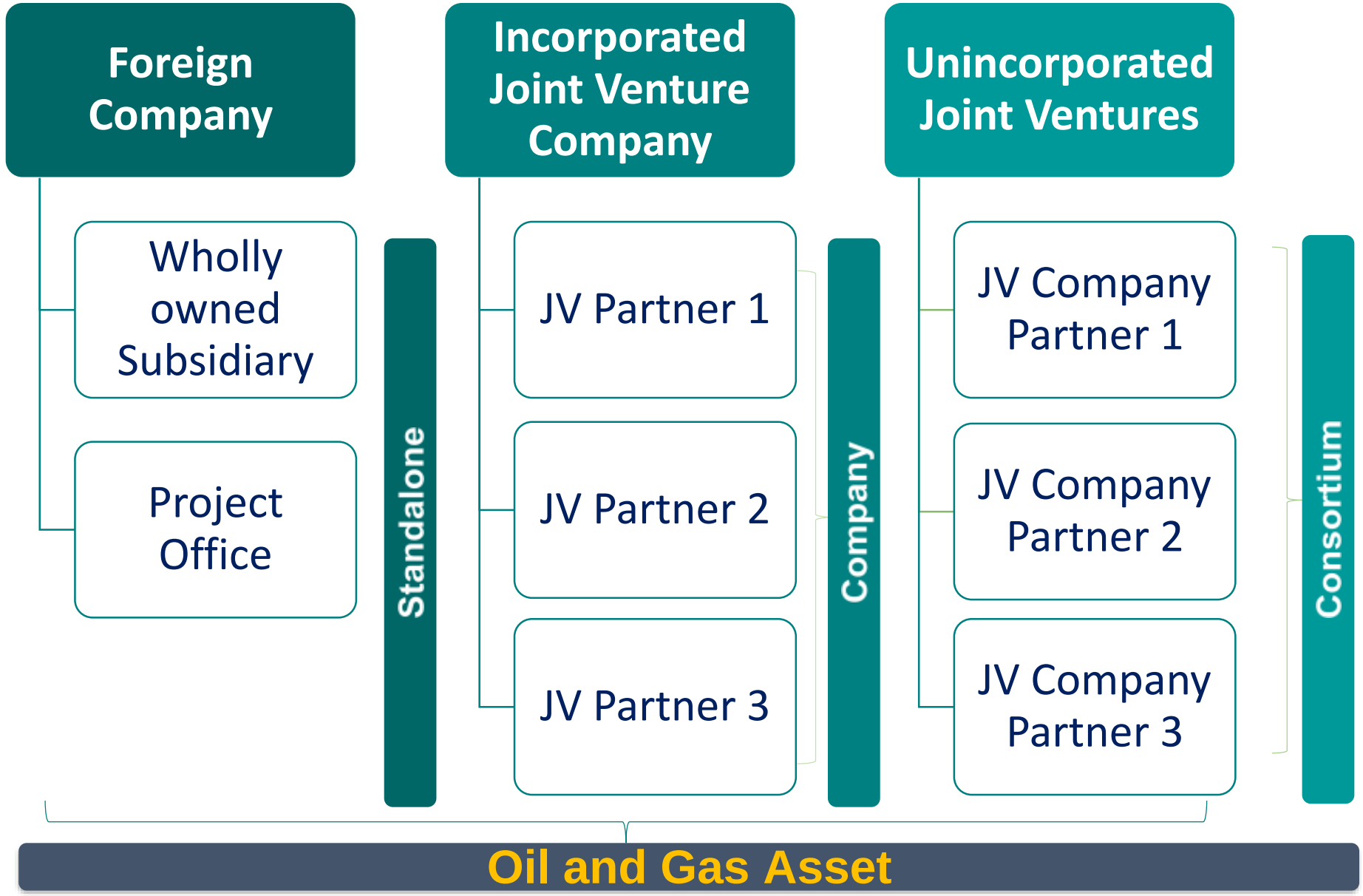
The OALP Bidding Process



- EoI **'Originator'** eligible for **Originator Incentive**
- Three cyclic EoI Windows in a year
- Fully **secured & transparent e-bidding** platform
- EoIs/blocks allowed in **single Basin category**

Entry Pathways for Foreign Investors

100% FDI allowed in Indian E&P through automatic Route



Discovered Small Field (DSF) Policy- Revenue Sharing Model

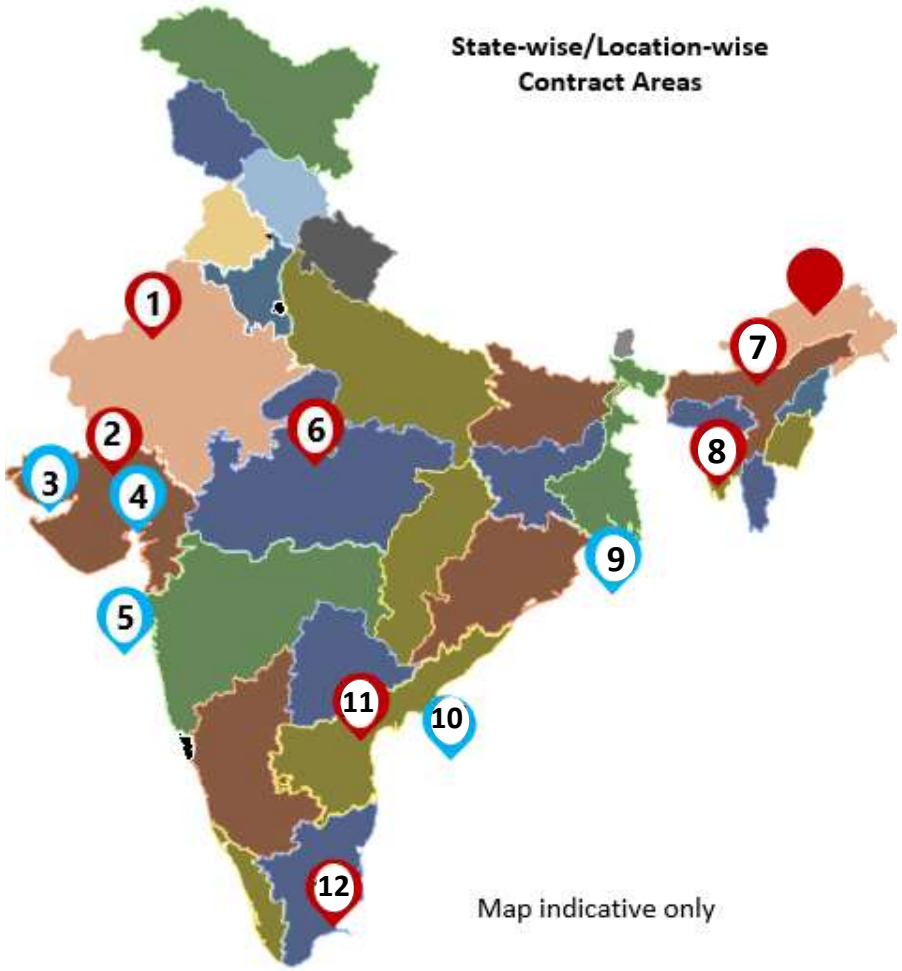
DSF Policy Features

- Single License for Conventional and Unconventional Hydrocarbons
- Exploration allowed during entire contract period
- Royalty in line with HELP and no Cess
- No upfront Signature Bonus
- 100% participation from foreign companies/ Joint ventures

Features of Revenue Sharing Contract (RSC)

- Revenue Sharing Contract: Based on quoted Lower & Higher Revenue point
- Marketing & pricing freedom for sale of Crude Oil & Natural Gas
- Biddable Work Program: Drilling of appraisal / development wells
- Development Period: Drilling of committed wells in pre-defined timelines
- Provision of Unit Development & Joint use of common infrastructure

DSF Contract Areas across Onland and Offshore



Onland: 34

Offshore: 29

Total : 63

1 – Rajasthan (3)

2 – Gujarat (8)

3 - Kutch Offshore (2)

4 - Cambay Offshore (2)

5 - Mumbai Offshore (16)

6 – Madhya Pradesh (1)

7 – Assam (8)

8– Tripura (1)

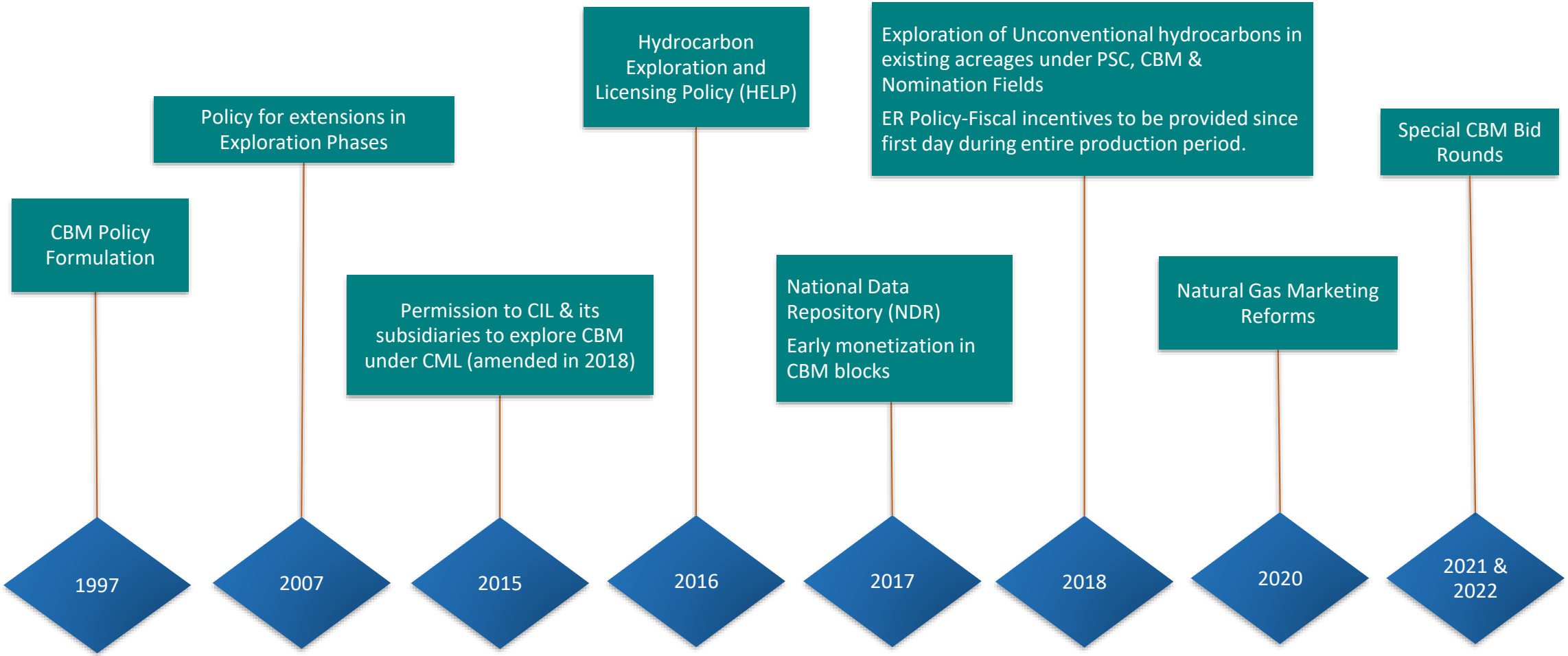
9 - Mahanadi Offshore (1)

10 - KG Offshore (8)

11 - Andhra Pradesh (10)

12 – Tamil Nadu (3)

Unconventional hydrocarbon framework

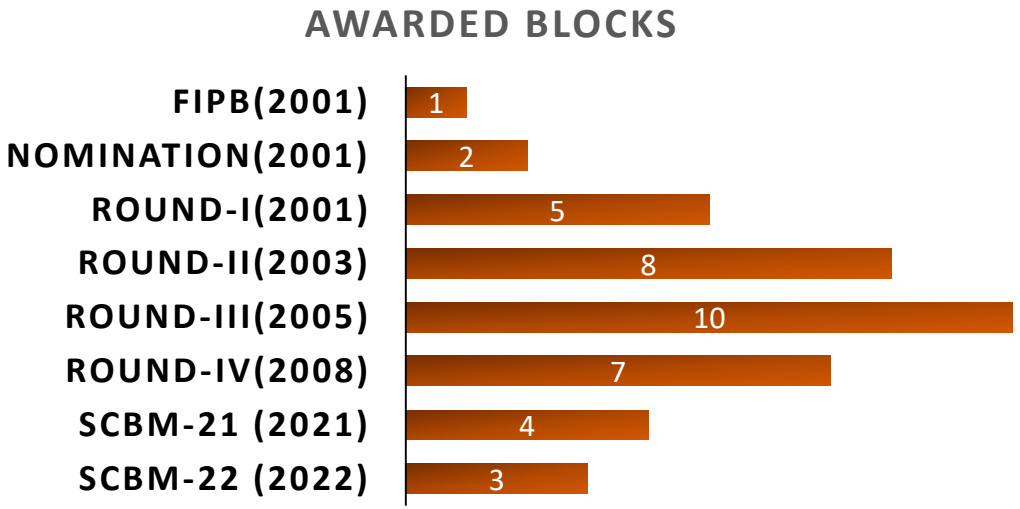


Demystifying unconventional resources of Hydrocarbon

Coal Bed Methane

Status

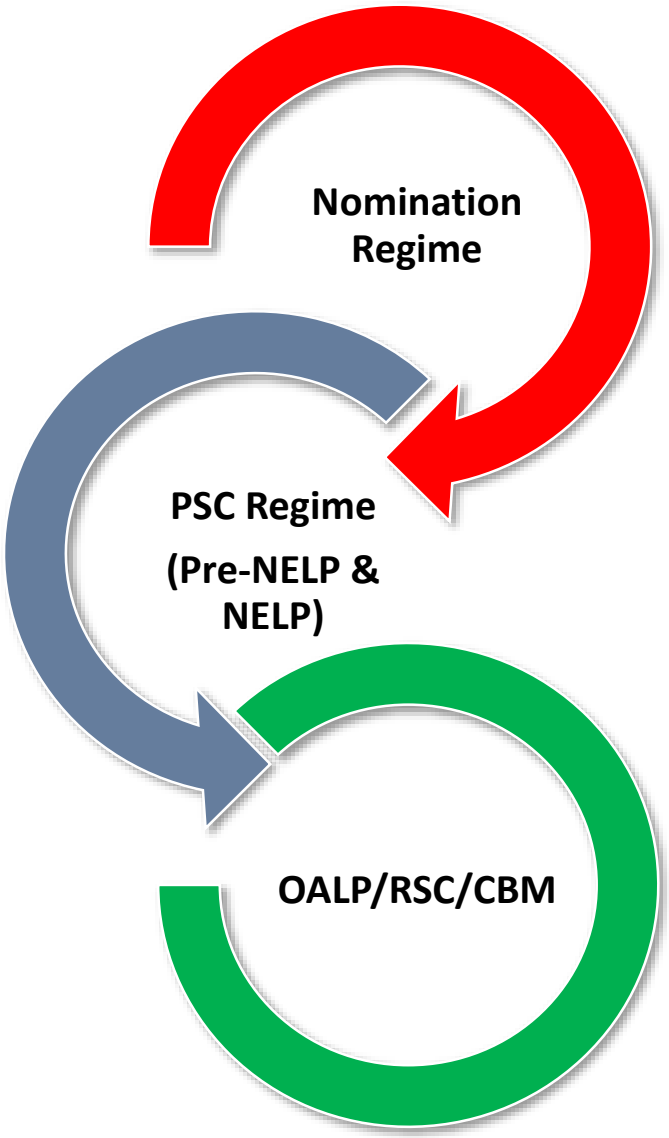
- Operational Blocks- 15 Blocks (7009 sq.km)
- Total production- 6.9 BCM
- Production Rate- 2.2 MMSCMD
- Development Wells- 1187
- Investment- 2.6 Billion USD



Special CBM Bid Rounds: Features

- **All Blocks on offer in Category-III basin i.e. no revenue sharing until windfall gain.**
- **Single License for Conventional & Un-conventional Hydrocarbon**
- Royalty in line with HELP and no Cess
- No upfront Signature Bonus
- 100% participation from foreign companies/ Joint ventures

Gas Pricing Regimes & Policies



- Based on the Govt notification dtd 7th April,2023 on "Review of New Domestic Gas Pricing Guidelines,2014"
- Floor Price $4.0/MMBTU
- Ceiling Price $6.50/MMBTU
- For FY 2023-24 and 2024-25 and then increased by $0.25/MMBTU each year

- Broadly based on individual PSC provisions.
- Ceiling Price for Deep water, Ultra Deep Water, HP-HT areas is determined as per Guidelines dtd 21.03.2016. Ceiling Price is calculated as the lowest of (1) landed price of imported fuel oil (2) weighted avg import landed price of substitute fuels and (3) landed price of imported LNG.
- Price discovery through Natural Gas Marketing Reforms 2020 (Electronic Bidding through DGH empanelled Agencies).

- Complete Marketing and Pricing Freedom.
- Price discovery through Natural Gas Marketing Reforms 2020 (Electronic Bidding through DGH empanelled Agencies)

Natural Gas Marketing & Pricing Reforms Introduced Over The Years

Ease of Doing Business

Faster Clearances

Urja Pragati Platform

Statutory clearances in coordination with state government and other ministries

Empowered Coordination Committee

Apex body for inter-ministry coordination

Easier Compliances

Approvals on Self Certification

Reduction of no. of approvals and submission on self certification basis

Urja Suraksha Samanvay

GIS based monitoring and decision support system for swift information exchange.

Online Clearances

- For Expats and Offshore Vessels

Greater Collaboration

UPSTREAM INDIA
Operators' Own Forum

Upstream India Portal

Collaboration amongst E&P stakeholders in terms of knowledge sharing, resource sharing

DGH Revenue Management System

Revenue Management System

Monitoring of Royalty & Profit Petroleum. System integrated with Bharatkosh

सत्यमेव जयते

DGH

सत्यमेव जयते

Ministry of Petroleum & Natural Gas

Government of India

http://mopng.gov.in/

OALP Round-X, 25 Blocks, 191,986 sq.km.

S. No.	Basin Name	Basin Category	Block Name	Map Ref. No.	Block Area (Sq.km)	Well Target Depth (m)	Minimum Net worth (MMUSD)	Bid Bond (USD)
ONLAND BLOCKS, 6 Blocks (16871 Sq.km)								
1	**RAJASTHAN**	**I**	RJ-ONHP-2024/1	ON4	5953.44	1400	23.98	200000
2	**CAMBAY**		CB-ONHP-2024/1	ON5	126.44	2600	5	9000
3	**VINDHYAN**	**II**	VN-ONHP-2024/1	ON6	4275.13	Not Biddable	17.95	200000
4	**KAREWA**	**III**	KR-ONHP-2024/1	ON1	283.83	Not Biddable	5	20000
5	**HIMALAYAN FORELAND**		HF-ONHP-2024/1	ON2	990.86	Not Biddable	7.44	68800
6	**GANGA-PUNJAB**		GP-ONHP-2024/1	ON3	5241.1	Not Biddable	21.94	200000

**For Onland areas Target Depth is TVD from MSL & For Offshore areas Target Depth is TVD from Seabed*

OALP Round-X, 25 Blocks, 191,986 sq.km.

S. No.	Basin Name	Basin Category	Block Name	Map Ref. No.	Block Area (Sq.km)	Well Target Depth (m)	Minimum Net worth (MMUSD)	Bid Bond (USD)
SHALLOW WATER BLOCK, 6 Blocks (41392 Sq.km)								
7	**MUMBAI OFFSHORE**	**I**	MB-OSHP-2024/1	S3	5838.03	2950	54.6	200000
8			MB-OSHP-2024/2	S4	13131.72	2070	98	200000
9	**KRISHNA-GODAVARI**		KG-OSHP-2024/1	S5	2967.83	2750	37.08	170600
10	**SAURASHTRA**	**II**	GS-OSHP-2024/1	S1	3125.84	Not Biddable	37.8	192000
11		**II**	GS-OSHP-2024/2	S2	6501.38	Not Biddable	58.66	200000
12	**BENGAL-PURNEA**	**III**	BP-OSHP-2024/1	S6	9826.81	Not Biddable	79.34	200000

**For Onland areas Target Depth is TVD from MSL & For Offshore areas Target Depth is TVD from Seabed*

OALP Round-X, 25 Blocks, 191,986 sq.km.

S. No.	Basin Name	Basin Category	Block Name	Map Ref. No.	Block Area (Sq.km)	Well Target Depth (m)	Minimum Net worth (MMUSD)	Bid Bond (USD)
DEEP WATER BLOCK, 1 Blocks (9991 Sq.km)								
13	**CAUVERY**	**I**	CY-DWHP-2024/1	D1	9990.96	2000	131.35	200000
ULTRA-DEEP WATER BLOCK, 12 Blocks (123733 Sq.km)								
14	**KRISHNA-GODAVARI**	**I**	KG-UDWHP-2024/1	UD2	12610.14	2950	202.17	200000
15			KG-UDWHP-2024/2	UD3	9511.65	1600	174.57	200000
16			KG-UDWHP-2024/3	UD4	9935.27	2600	177	200000
17	**MAHANADI**	**II**	MN-UDWHP-2024/1	UD5	5520.09	Not Biddable	138	200000
18			MN-UDWHP-2024/2	UD6	10553.23	Not Biddable	187.14	200000
19			MN-UDWHP-2024/3	UD7	7169.14	Not Biddable	153	200000
20	**SAURASHTRA**		GS-UDWHP-2024/1	UD1	9059.6	Not Biddable	171.99	200000
21	**ANDAMAN-NICOBAR**		AN-UDWHP-2024/1	UD9	12816.65	Not Biddable	201	200000
22			AN-UDWHP-2024/2	UD10	10027.9	Not Biddable	177	200000
23			AN-UDWHP-2024/3	UD11	8732.15	Not Biddable	165	200000
24			AN-UDWHP-2024/4	UD12	15481.03	Not Biddable	226.65	200000
25	**BENGAL-PURNEA**	**III**	BP-UDWHP-2024/1	UD8	12315.99	Not Biddable	202.14	200000

**For Onland areas Target Depth is TVD from MSL & For Offshore areas Target Depth is TVD from Seabed*

HALLIBURTON

National Data Repository 2.0

NDR 2.0 -Smart Exploration: Leveraging Modern Digital Technolog

Drive Investments

- Enhance accessibility to E&P data for global stakeholders.
- Easy and fast data sharing
- Advance User experience
- Virtual Data rooms.
- Foster transparency and efficiency in data-driven decision-making
- Align with the objectives of Digital India for energy sector digital transformation

GOVERNANCE

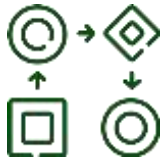
- Available 24*7
- Upgrade to a modern, cloud infrastructure.
- Centralize and standardize all E&P data in a secure digital repository
- Storage Efficiency
- Enable real-time data ingestion, processing, and sharing
- Reduce operational inefficiencies through automated workflows.

Data-Driven Insights & Decision Making

- OSDU enabled- globally Standardized
- Data Quality Monitoring
- Foundation for Cloud Deployment, Machine Learning, Data Science, Advanced Analytics
- Modern Enterprise Architecture – CI/CD

NDR 2.0- Key Features

Continuous Operation



Efficient Information and Data Flow

Enhanced **Performance**

Improved **Data Quality**

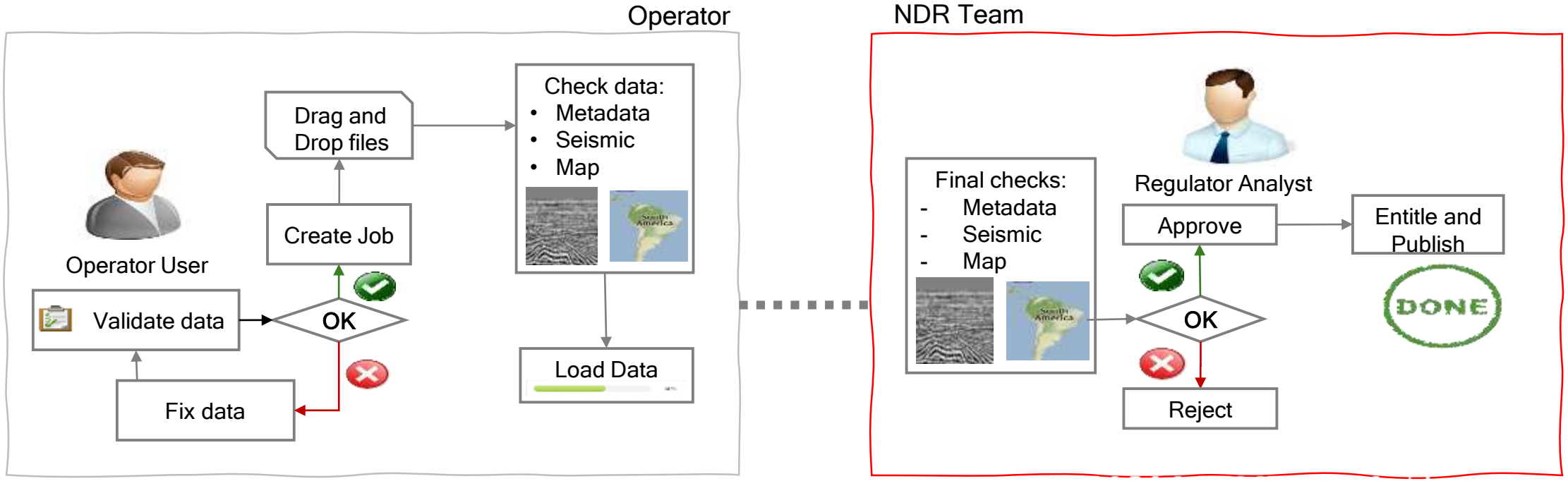
Minimize Data Duplication

Interoperability

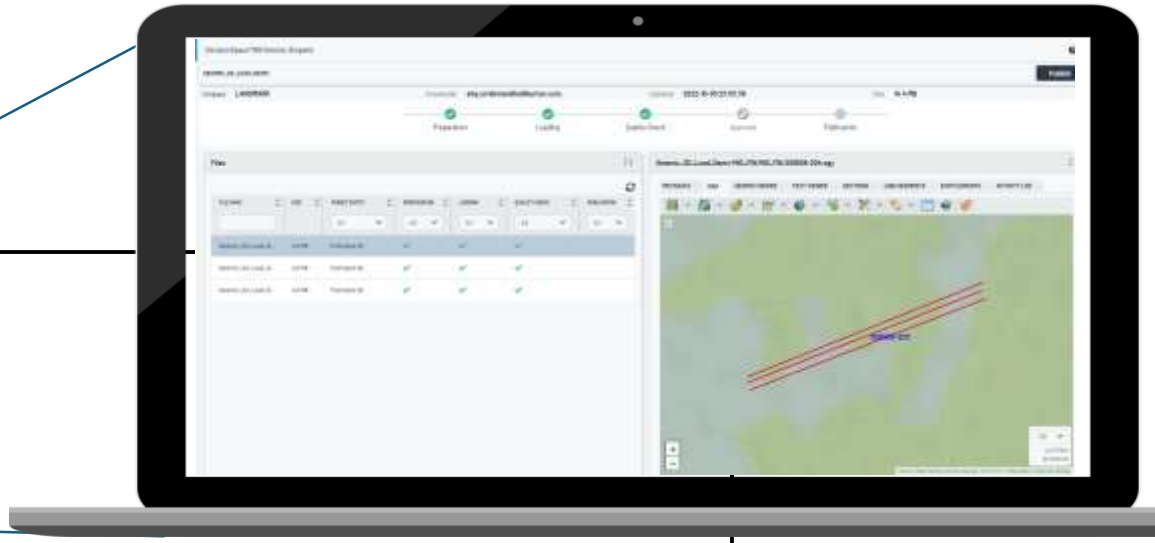
NDR – Value for Operators

SELF-SERVICE AUTOMATED DATA SUBMISSION & JOB TRACKING

- **Clearly defined process** - Standard QC process based on NDR rules
- **Time saving** - notification on data issues
- **Compliance -** audit trail applied



NDR 2.0- Dropsite



NDR 2.0

DSG

Maintain

Enterprise Search

Dropsite Loading (SDM, BHDM, PDM, DDM

Primary Data Centre

Grav Mag Apps

Virtual Data Room

NDR Front End

DecisionSpace Enterprise Platform

Entitlement / Controlled Access

SDM

BHDM

PDM

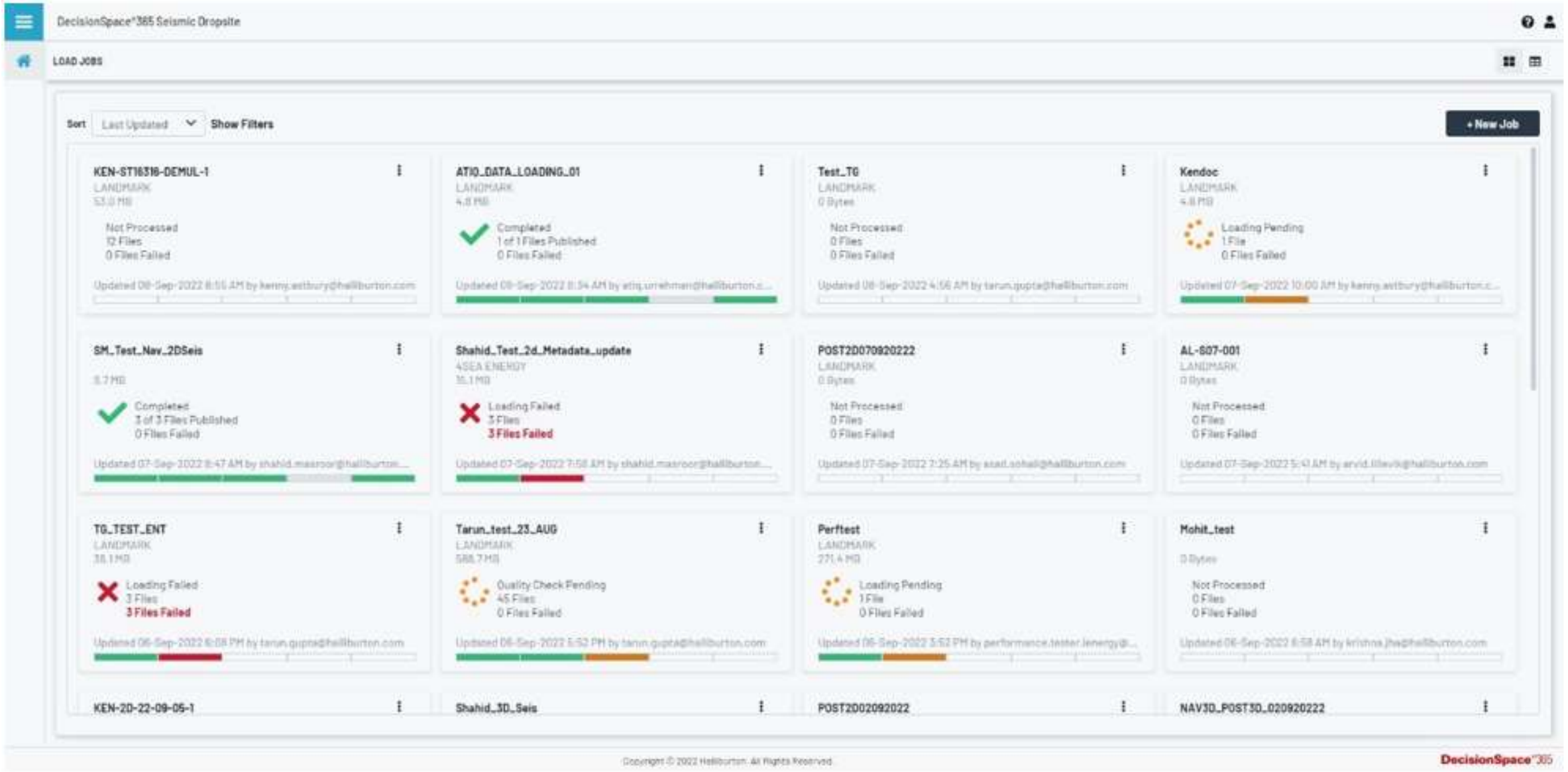
DDM

DR Center

Backup

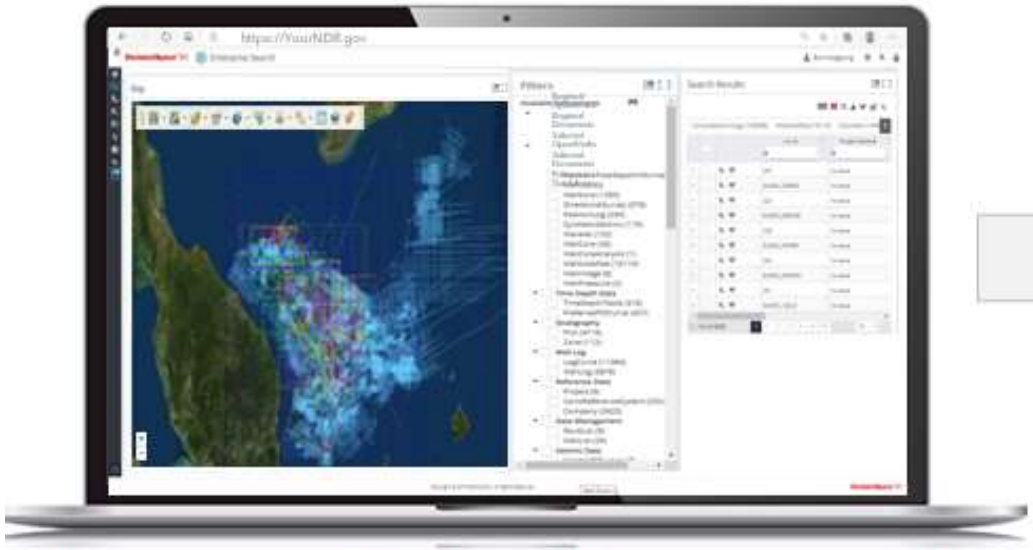
- Self-service for operators, partners submitting seismic post/pre stack data, Borehole data production and drilling Data
- Automated, streamlined workflow
- Data verification against local standards
- Approval Steps
- User notifications

NDR 2.0- Track your Data Loading Jobs

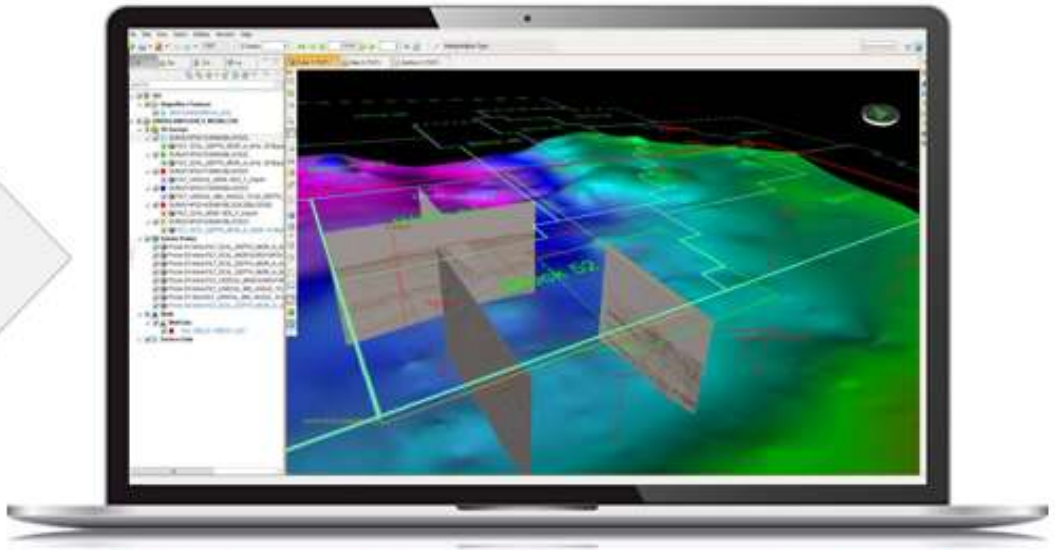


NDR 2.0 Value Proposition- Investors

- **One Stop Shop** – Data Searching and Interpretation performed in one place
- **Time-Saving** - No requirement to transfer data – data and application immediately available
- **Collaboration Decision** - Review team can be located in various locations working on the same data.



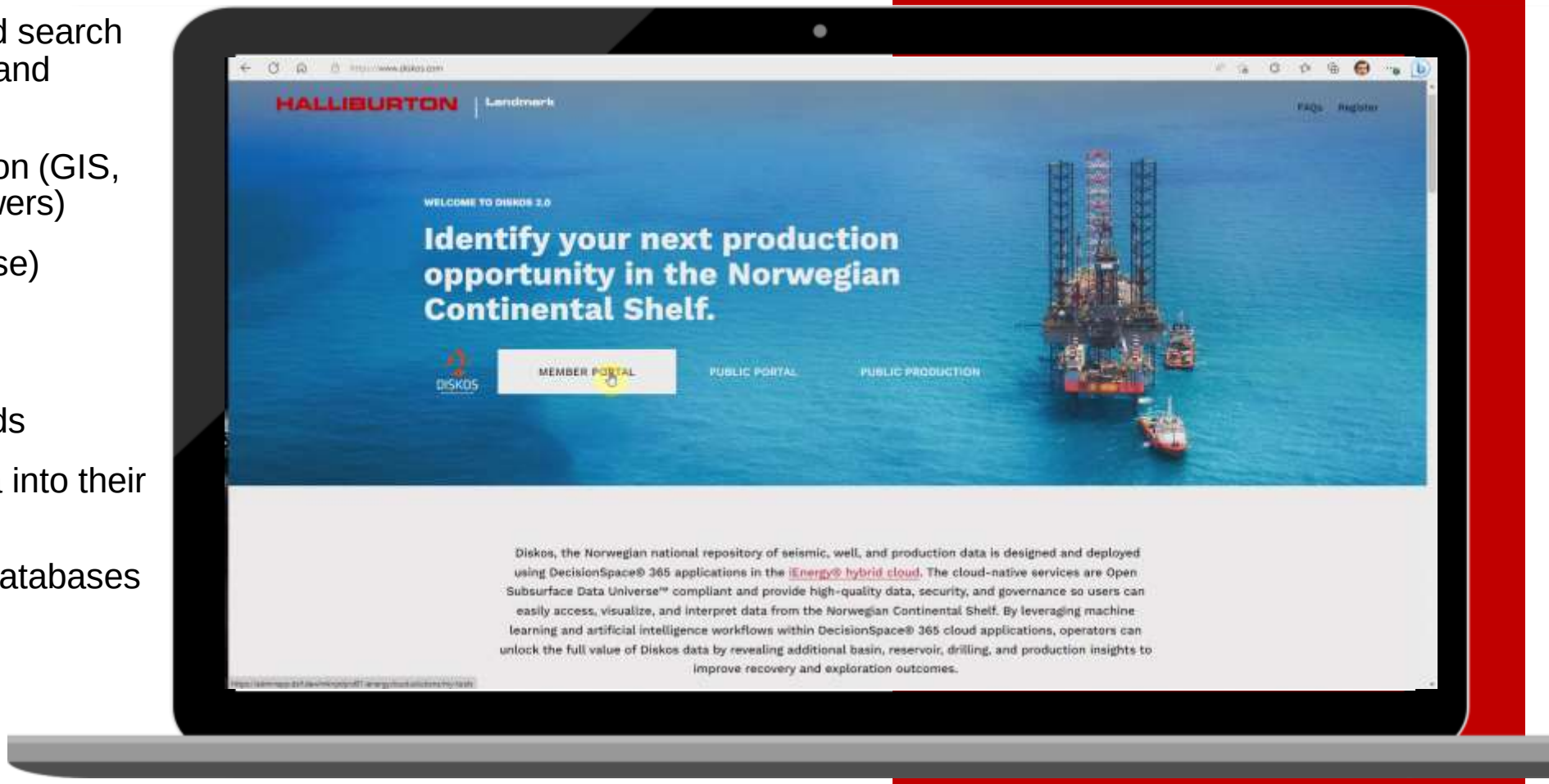
Data Searching



Data Interpretation and Document Review

Search and Deliver Enterprise Search

- Spatial, Text, Query based search across seismic, borehole and production data
- In context E&P visualization (GIS, 2D, 3D, Seismic, Log viewers)
- Hybrid (cloud to on-premise) workflow integration
- Save and share searches
- Persona based dashboards
- API access to deliver data into their application, environment
- Integration with external databases
- Notifications



Data Sale & Delivery

1. While browsing through the NDR 2.0 Portal, users can place the order for data purchase and add it to cart.
2. Preview the cart, and place the order
3. Track order in “My Orders” Dashboard
4. Review Order
5. Payment link generated and payment processed
6. Order delivered online/offline based on user preference

Virtual Data Room

`Global Access:` Investors can review the data from anywhere in the world and bring their experts together virtually to evaluate opportunities

Real time collaboration and Rapid decision-making through industry standard G&G applications

Data security & confidentiality: Data security is a key requirement for any decision and deal making in oil and gas. The solution provides the security in terms of identity of any investor or their company and also ensure that only the correct people are getting access.

Online document Access: The online document accessibility provides a secure collaborative environment for companies to share highly sensitive asset-related documents and information with invited peers for acreage promotion.

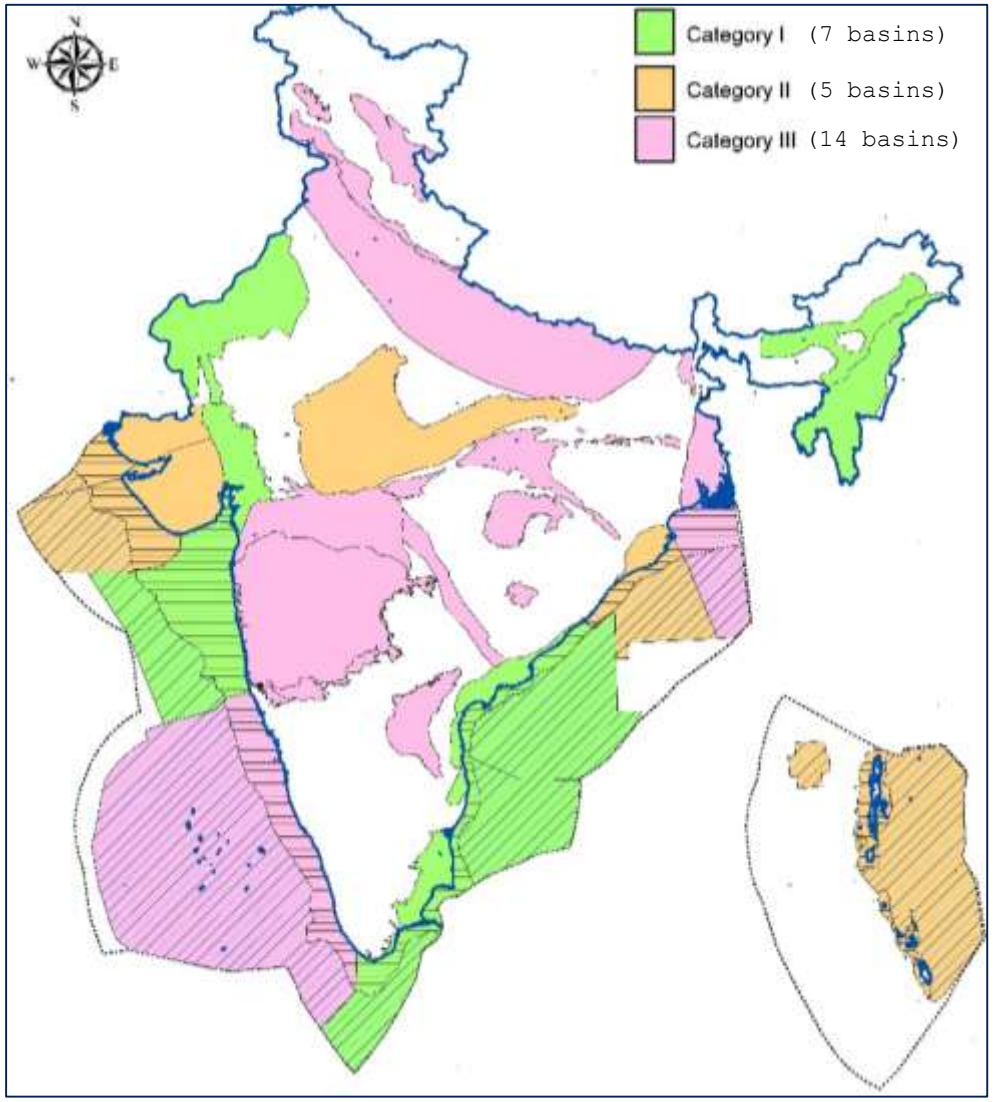
HALLIBURTON

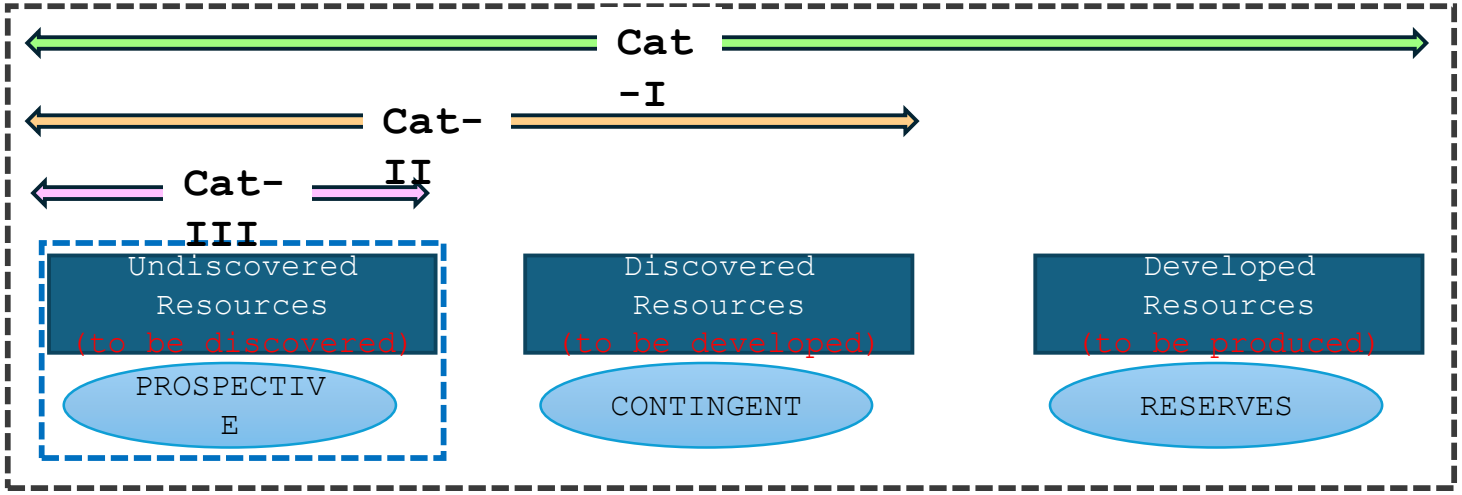
Thank You

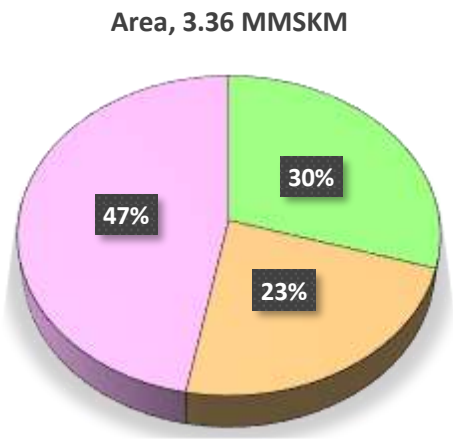
Hydrocarbon Resource Assessment Study (HRAS)-2025

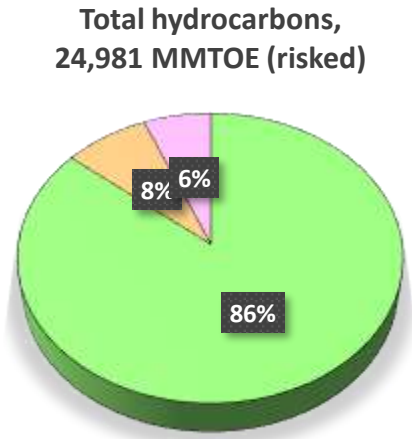
key features of the Study

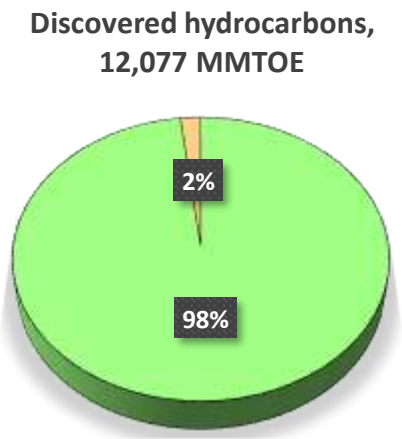
Sedimentary Basins: Key elements











HRAS 2025: An improvement over 2017 study (1/3)

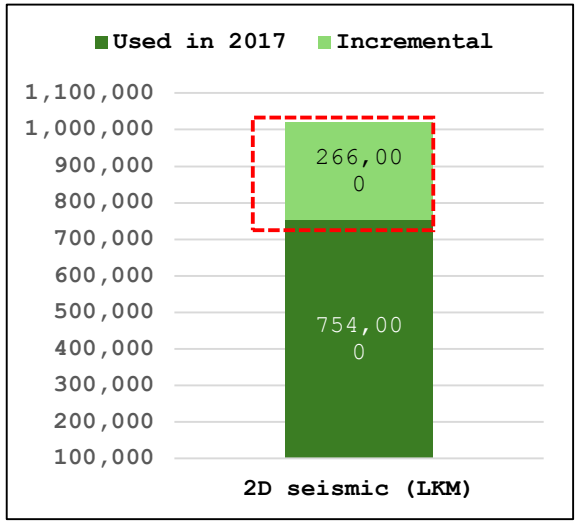
1) Need for a periodically updated and evergreen hydrocarbon resource base

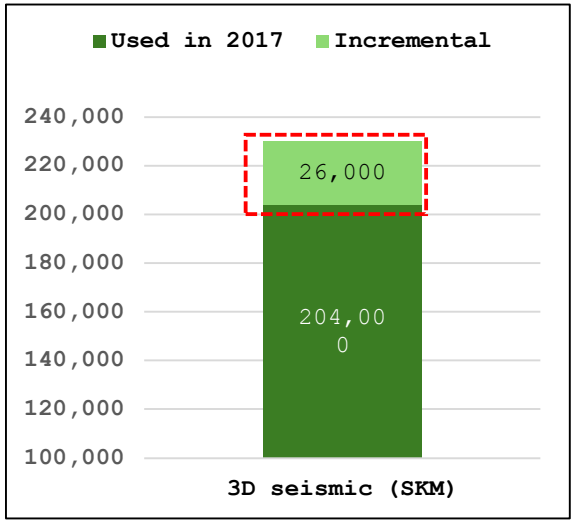
As of April 1, 2024, NDR datasets include:

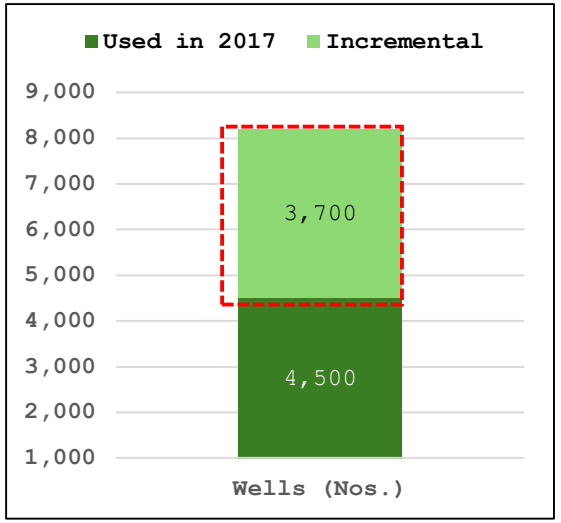
a) 3.7 million LKM of 2D seismic
b) 1.2 million SKM of 3D seismic
c) 23,600 wells

2) Incremental Data (New/ Re-processed/ Value-added) :

a) New (NSP, Andaman, EEZ)
b) Re-processed
c) Value-added







HRAS will integrate significant new data of 2D seismic (2,66,000 LKM), 3D seismic (26,000 SKM) and wells(3,700) along with information on new discoveries, to update the HRAS-2017 resource base.

HRAS 2025: An improvement over 2017 Study (2/3)

3) Assessment of **Unconventional** (Shale/Coal Seam Gas/Gas Hydrate) for the first time, to have a holistic Resource Base

4) Geological Risk analysis will be done, to integrate risk perception in forward exploration strategy

5) HRAS will be **participated** by all E&P Players (NOCs & Private) and **audited** by international third party for greater transparency and wider acceptance

6) HRAS will generate a **National Hydrocarbon Atlas** at country level by mapping resources for different plays

- To provide a **segregated view** of all forms of resources
- Form an **auto-updatable database** with models for quick integration with new data

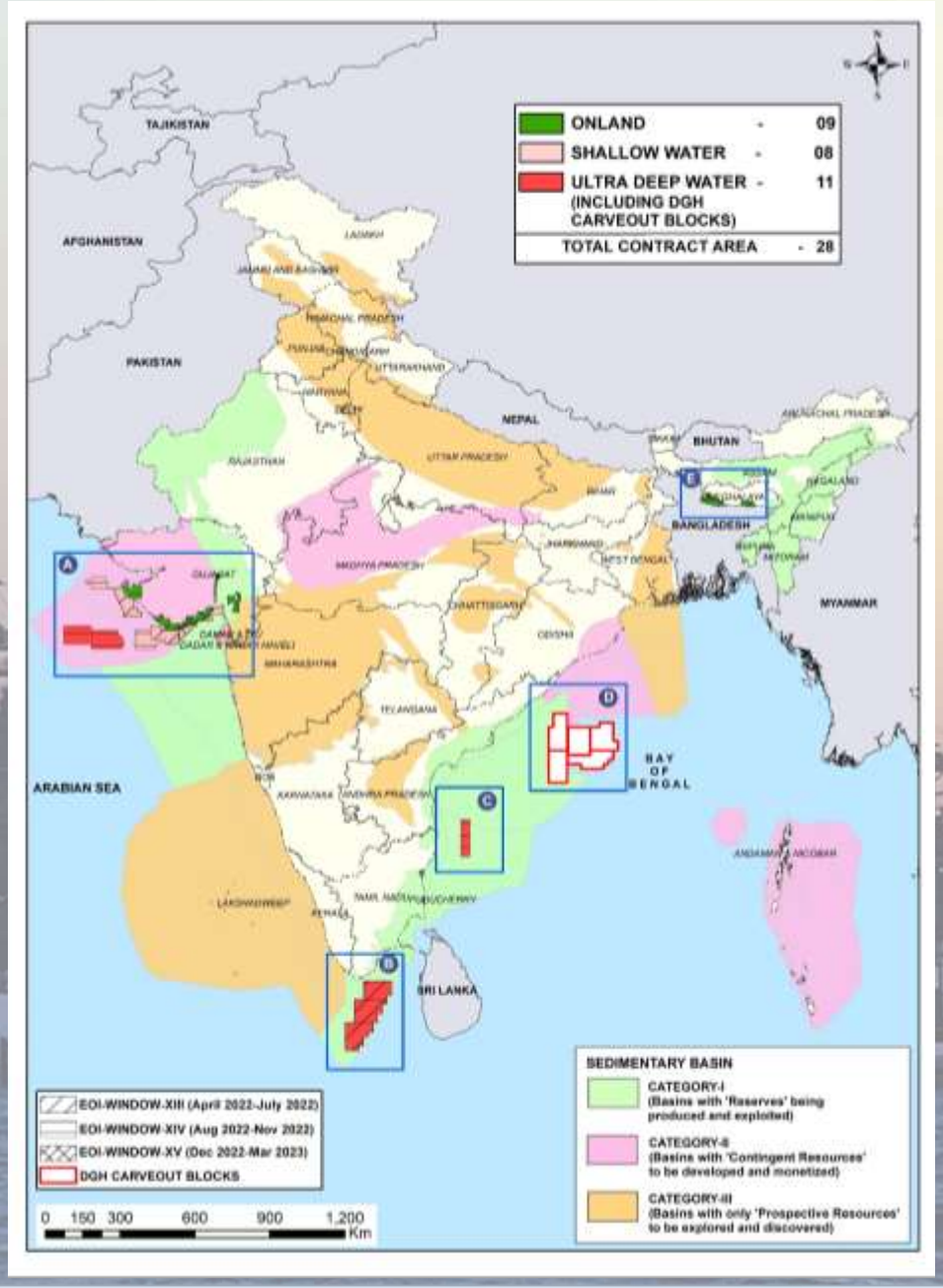
HRAS 2025: An improvement over 2017 Study (3/3)

- ✓ **NDR enrichment**
  - NDR will be populated with **value-added datasets** like Basin Reports, Comprehensive Report and Hydrocarbon Atlas
- ✓ **Data evergreening**
  - Resource Base will be **updated through new and valued-added data** on a continuous basis unless there is material change in terms of improved software tools and methodology

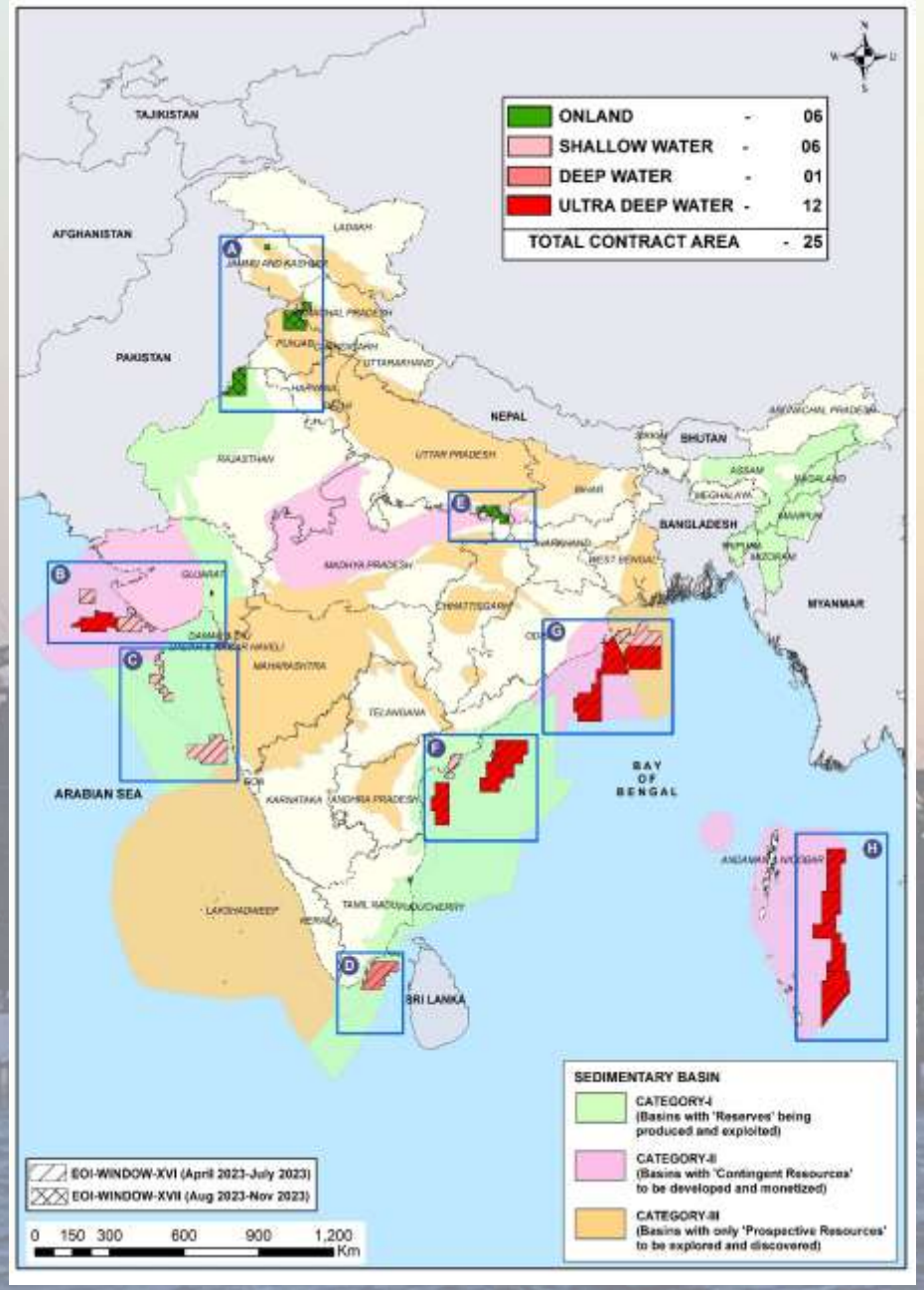
Thank you

SECURITY OF OFFSHORE OIL & GAS INSTALLATIONS

OALP ROUND-IX



OALP ROUND-X


ONLAND - 06
SHALLOW WATER - 06
DEEP WATER - 01
ULTRA DEEP WATER - 12
TOTAL CONTRACT AREA - 25
TAJIKISTAN
AFGHANISTAN
PAKISTAN
NEPAL
BHUTAN
BANGLADESH
MYANMAR
SRI LANKA
ARABIAN SEA
BAY OF BENGAL
A
B
C
D
E
F
G
H
EOI-WINDOW-XVI (April 2023-July 2023)
EOI-WINDOW-XVII (Aug 2023-Nov 2023)
0 150 300 600 900 1,200 Km
SEDIMENTARY BASIN
CATEGORY-I
(Basins with 'Reserves' being produced and exploited)
CATEGORY-II
(Basins with 'Contingent Resources' to be developed and monetized)
CATEGORY-III
(Basins with only 'Prospective Resources' to be explored and discovered)

OFFSHORE SECURITY

19 NOV 23

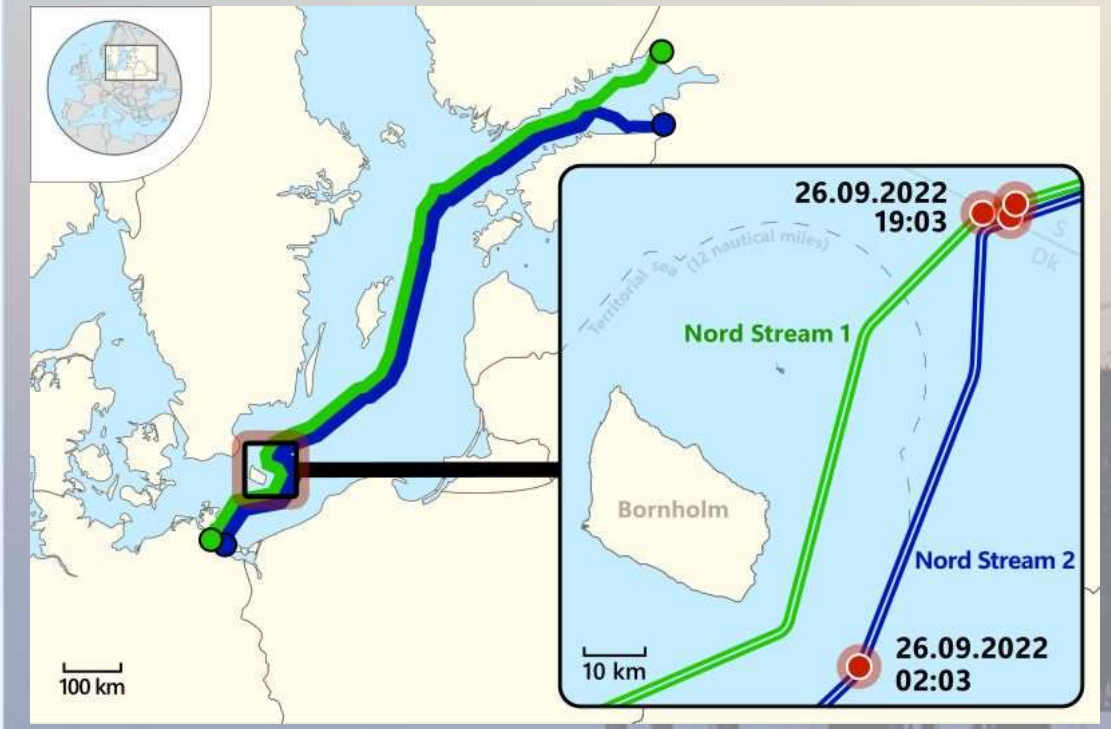
OFFSHORE SECURITY

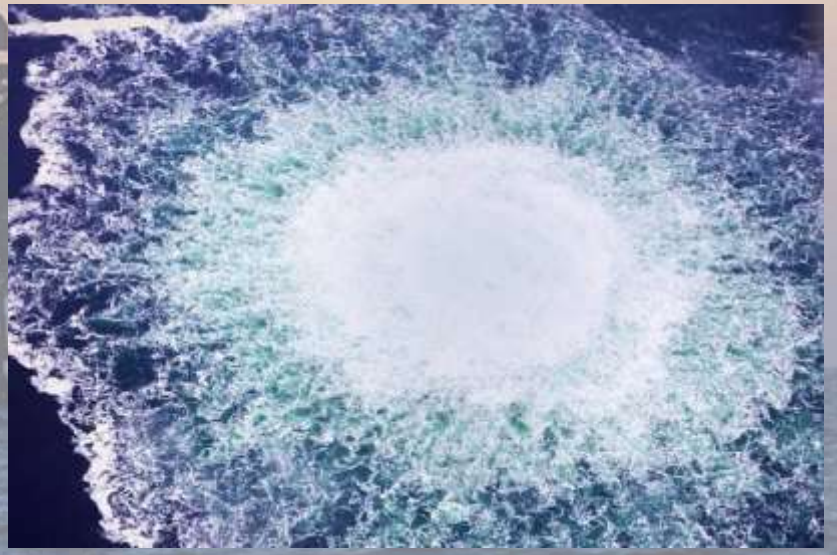
Chem Pluto, 23 Dec 23

220 nm South West of Porbandar, Gujarat

OFFSHORE SECURITY

26 SEP 22





OFFSHORE SECURITY

Thefts – benign; colossal impact

Solar Panels

Battery connecting links

GDS batteries

Power cables

OFFSHORE E&P AND SECURITY

- Whole of govt approach
- Deconflicting requirements
- Coordinated navigational warnings
- Optimum interface between safety & security

SECURITY OF OFFSHORE OIL & GAS INSTALLATIONS