



Ministry of Energy and Energy Industries

TRINIDAD AND TOBAGO SHALLOW WATER & ONSHORE BID ROUNDS 2018



Overview of Presentation



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Why Trinidad and Tobago?

- Reasons to Invest in T&T
- Energy Sector Key Production 2017
- T&T Energy Value Chain

T&T 2018 Competitive Bid Rounds

- Acreage Available for Bidding
- Overview of the Bid Round Process
- Contents of the Data Package
- Profit Sharing Matrix
- EZ Data Room



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Why Trinidad and Tobago?

Reasons to Invest in Trinidad and Tobago



Energy and Energy Industries

1. Strategic Location
2. Stable Democracy
3. Legal System
4. Competitive Gas Price
5. Fiscal Regime
6. Transparent Decisions
7. Liberalized Currency
8. Skilled Workforce
9. Trade Liberalization
10. Strategic Alliances



*Distances in Miles

Energy Sector Key Production Jan – June 2018



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Crude Oil Production

67,354 bpd

Oil Refining Throughput

128,857 bpd

Natural Gas Production

3.687 Bcf/d

LNG Production

6.4 MTPA

NGL Production

4.65 MMbbls

Ammonia Production

2.4 million MT

Methanol Production

2.65 million MT

The Trinidad and Tobago Energy Value Chain



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OIL & GAS

Capital Build Projects

- Platforms
- Refineries
- Primary Petrochemicals (Ammonia & Methanol)
- Downstream Petrochemicals



Upstream

Operators



Service Providers



Downstream



Indirect Support



Regulatory Agencies



Point Lisas Industrial Estate



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- **11 Ammonia Plants**
- **7 Methanol Plants**
- **5 Major Power Generation Sites**
- **1 Ammonia-Urea Ammonium Nitrate-Melamine (AUM) Complex**
- **Urea Plants**

Atlantic LNG



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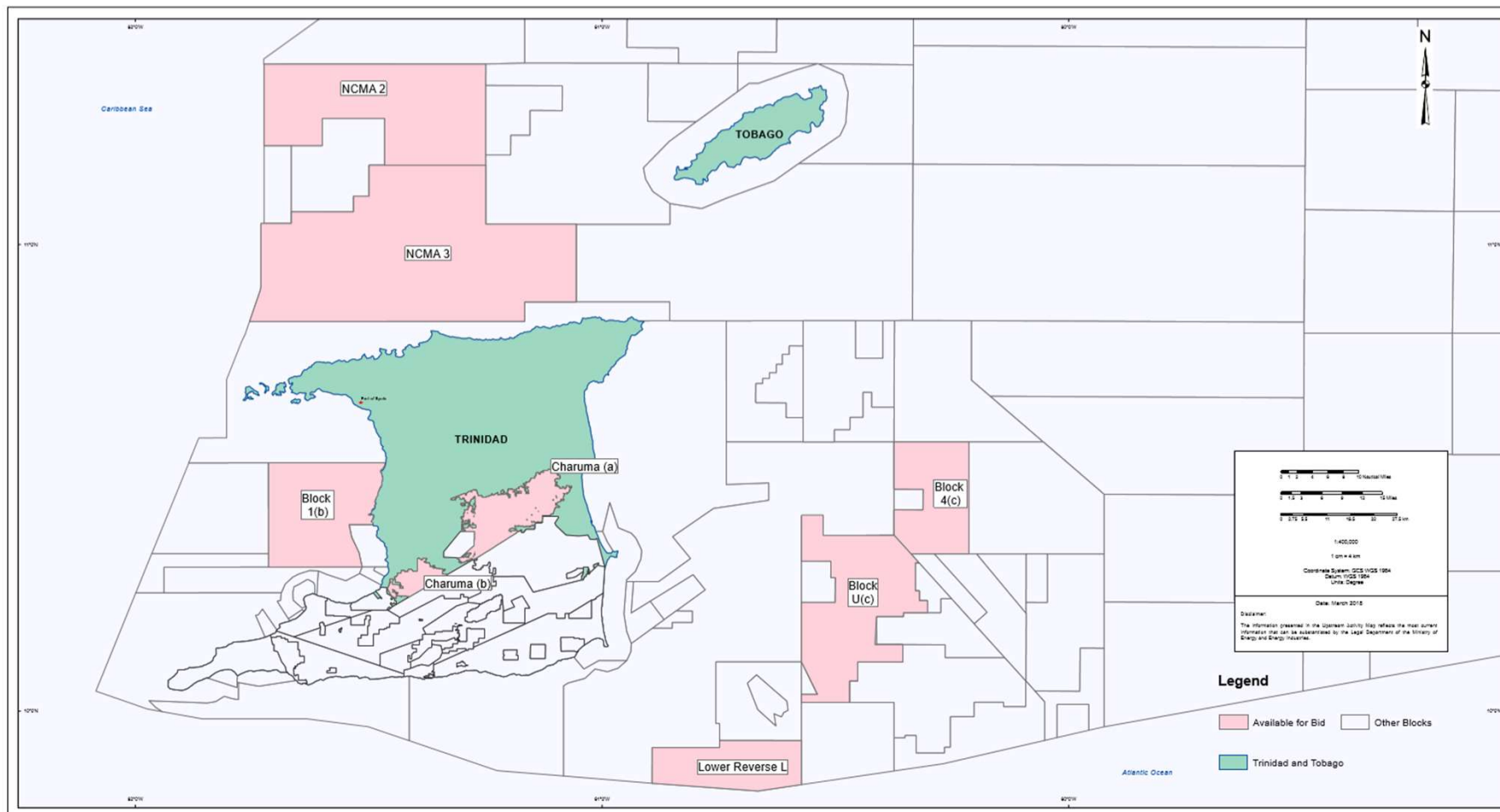
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Acreage Available for Bidding



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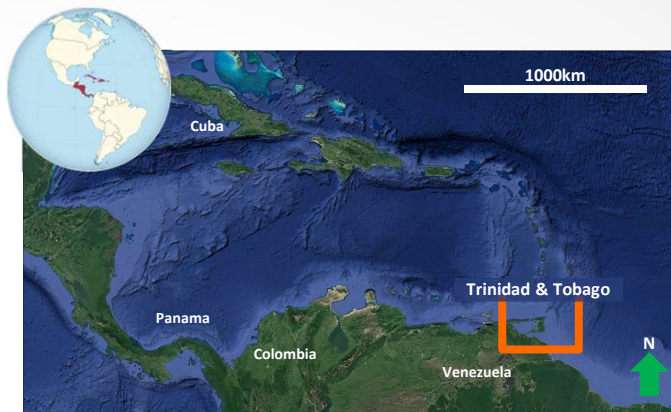
Trinidad and Tobago Competitive Bid Rounds 2018



North Coast NCMA 2 and NCMA 3

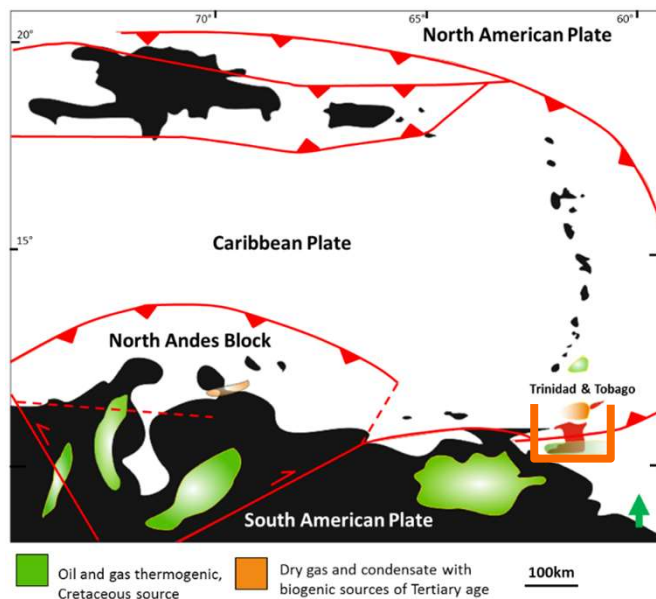


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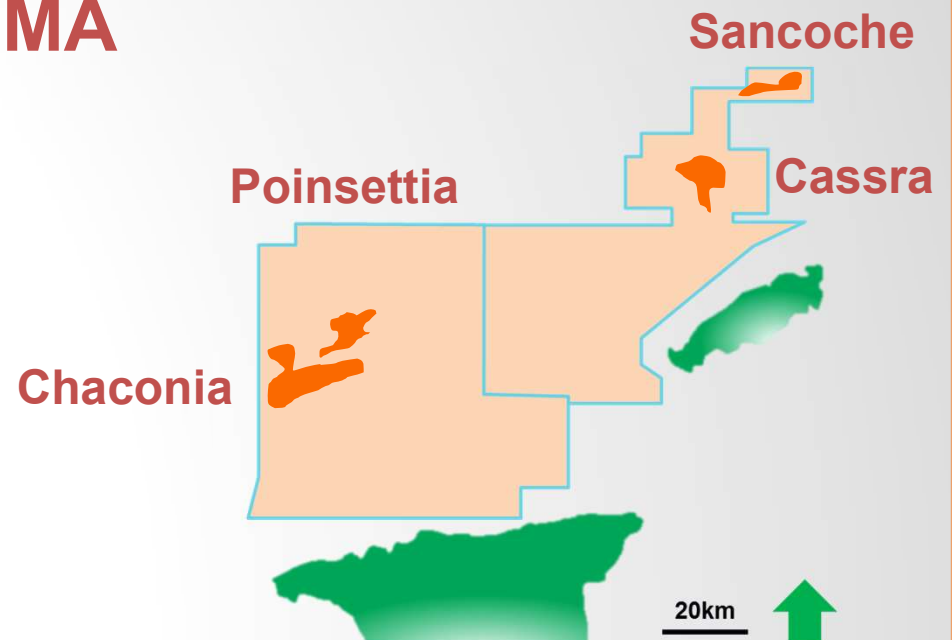


Adapted from Google Earth (2018)

- Trinidad and Tobago is located in the Caribbean, the northern margin of the South American Plate
- Study Area: North Coast Marine Area (NCMA)
- Proven biogenic gas province, producing from Plio-Pleistocene reservoirs



NCMA



North Coast NCMA 2 and NCMA 3



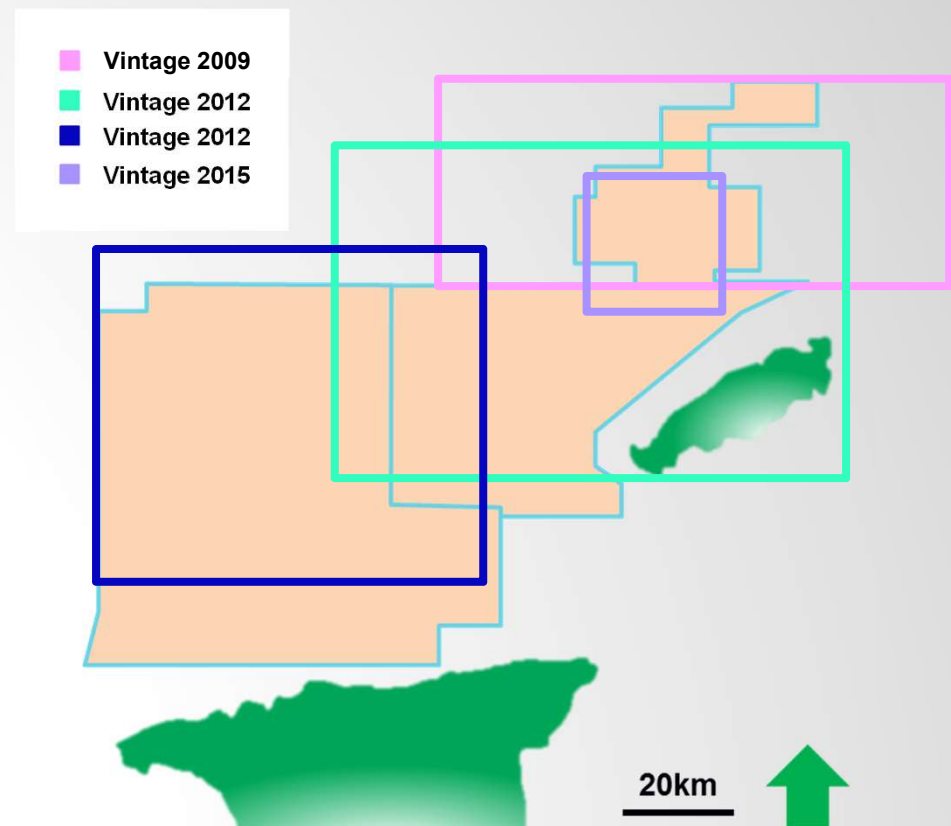
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- **Seismic Data**

- 3D Volumes
- 2D Lines

- **Well Data**

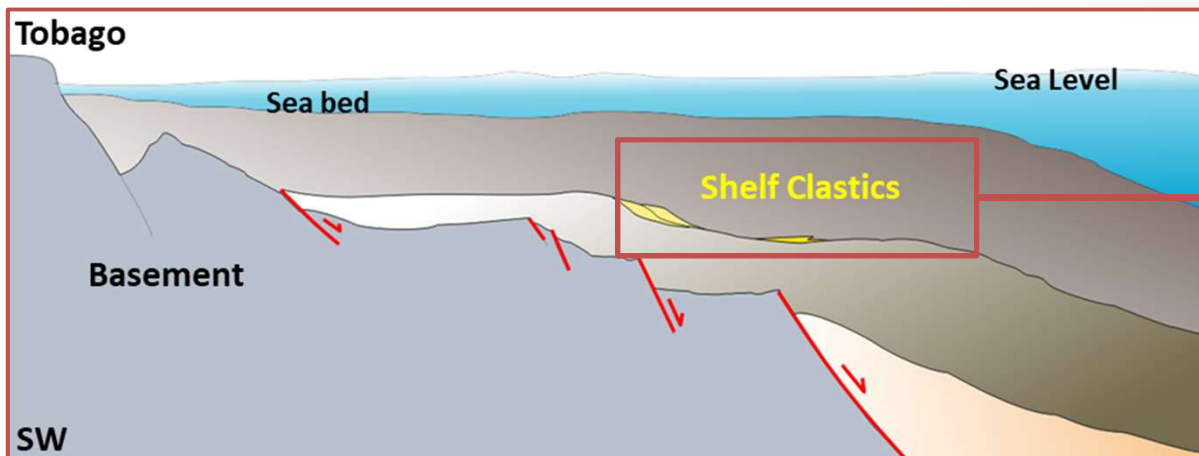
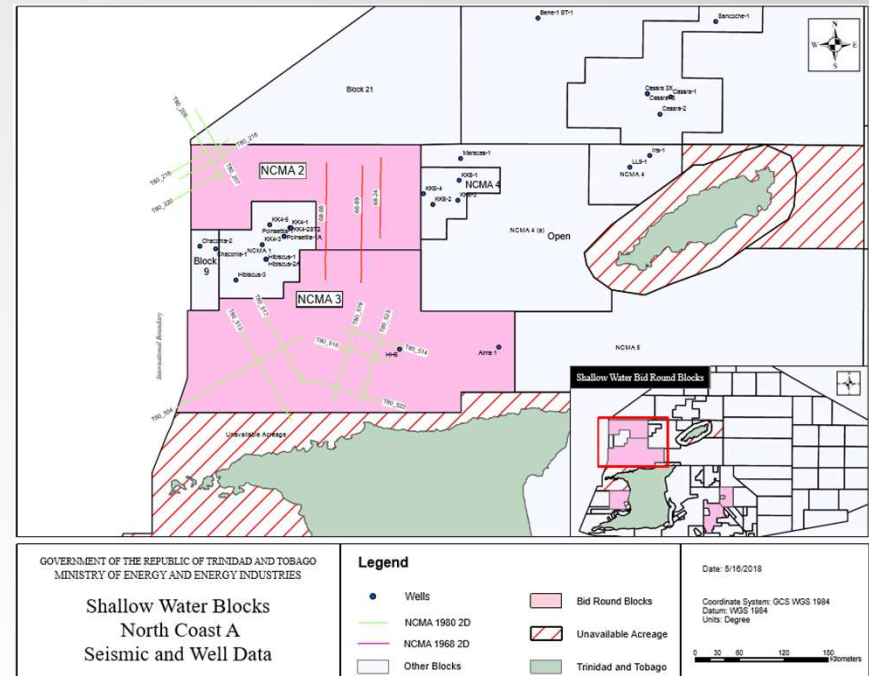
- Well logs: Gamma ray, resistivity
Neutron-density
- Full hole cores, sidewall
- Biostratigraphic Data



North Coast NCMA 2 and NCMA 3



- Reservoir properties are generally good:
 - Fine to medium grained
- Porosity averages 25 –30%
- Permeability measured from DSTs ranges from 70 to 270 mD
- Production tests have achieved rates from 3 to 30 mmscfd



Self contained biogenic
petroleum system

North Coast NCMA 2 and NCMA 3



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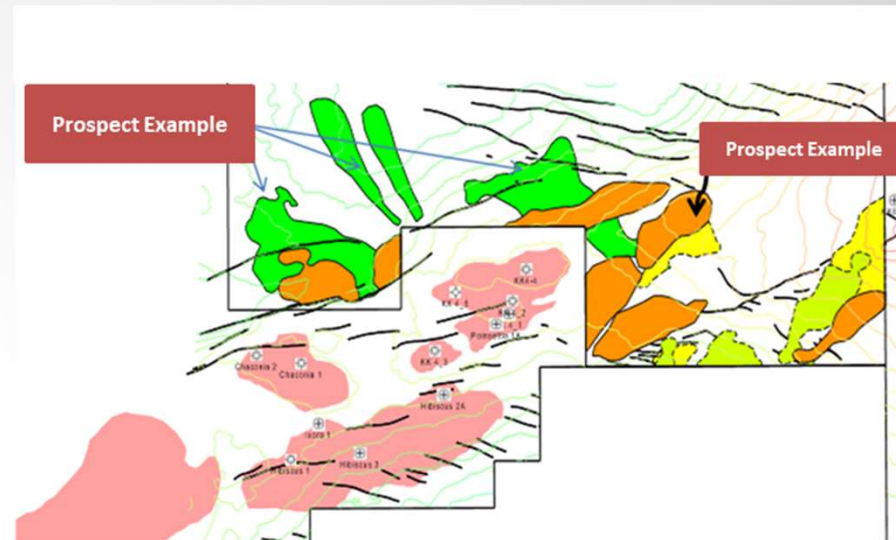
PROSPECTS

■ NCMA 3

- Prospect sizes range from 200 BCF to 2TCF
- Chance of Success as high as 51%
- Average Target Depth: 3400 m

■ NCMA 2

- Prospect sizes range from 200 BCF to 1TCF
- Chance of Success as high as 54%
- Average Target Depth: 3500 m



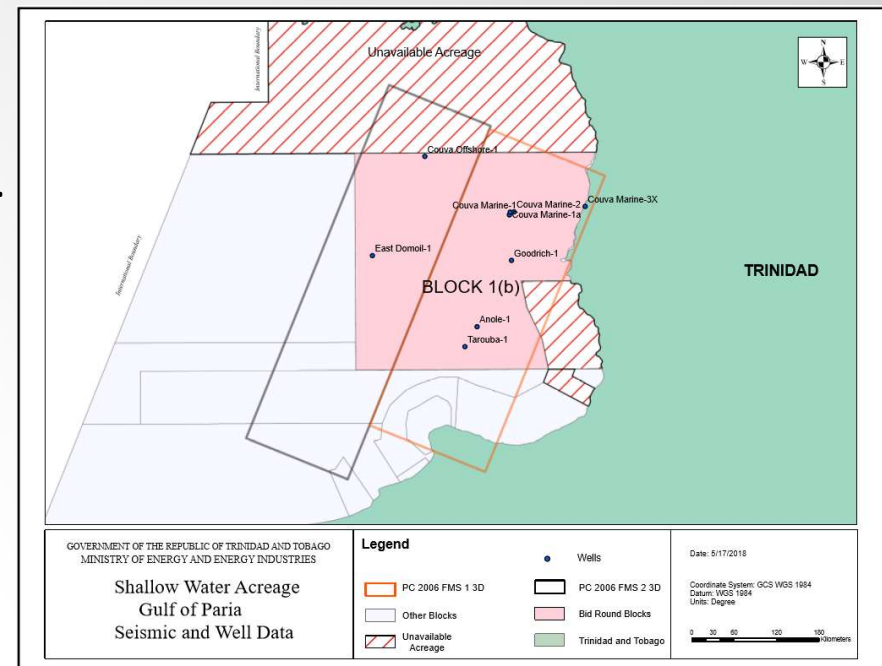
West Coast Block 1(b)

Petroleum System

- Block 1(b) has proven oil, condensate and biogenic gas shows in the reservoir sands.
- Source - the source rock is the Miocene-Pliocene aged Brasso/ Manzanilla formation.
- Reservoir - there are three main Pliocene aged reservoir units:
 1. Manzanilla formation
 2. Springvale formation
 3. Talparo formation (Durham, Caparo, Sum Sum and Chin Chin members)
- Seal - the Brasso formation acts as the main seal with intraformational seals being the major seal type.
- Trap - Mostly structural with 3-way dip closures.



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West Coast Block 1(b)



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Reservoir

Reservoir properties:

1. Porosities:

Manzanilla/ Springvale Sands- 17-24%

Talparo Sands- 15-33%

2. Water Saturation: 45-60%

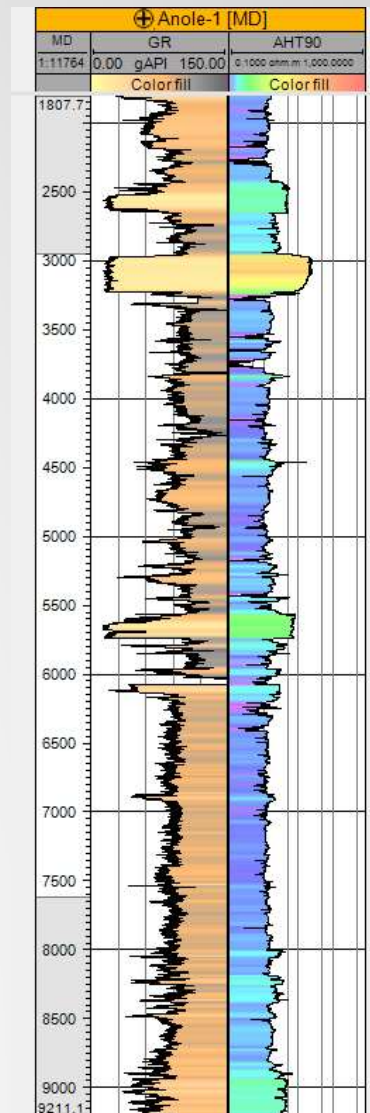
3. Net-to-Gross Ratios:

Manzanilla/ Sprinvale Sands- 0.04-0.17

Caparo Sands- 0.03-0.10

Sum Sum Sands- 0.35-0.65

Chin Chin Sands- 0.01



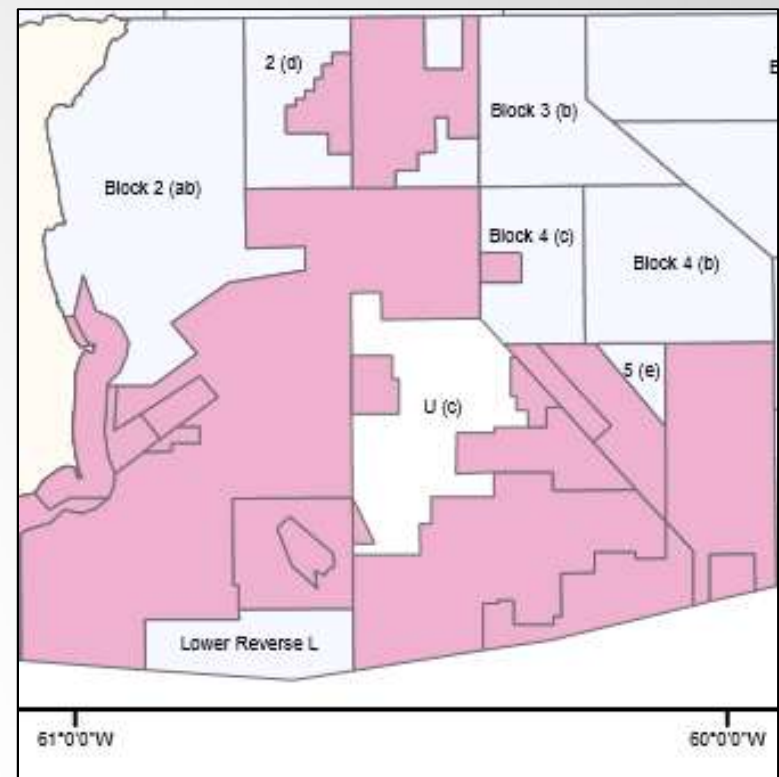
East Coast Block 4(c), Block U(c), Block Lower Reverse L



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Introduction

- Large scale development began with the Teak, Samaan, Poui and Cassia Fields.
- Presently supplies to both the Domestic Market and ALNG.
- Columbus Basin is the major geological structure.
- High condensate ratios in the deeper zones and the shallow zones contain biogenic gas



Map showing Shallow Water Blocks of the East Coast Acreage

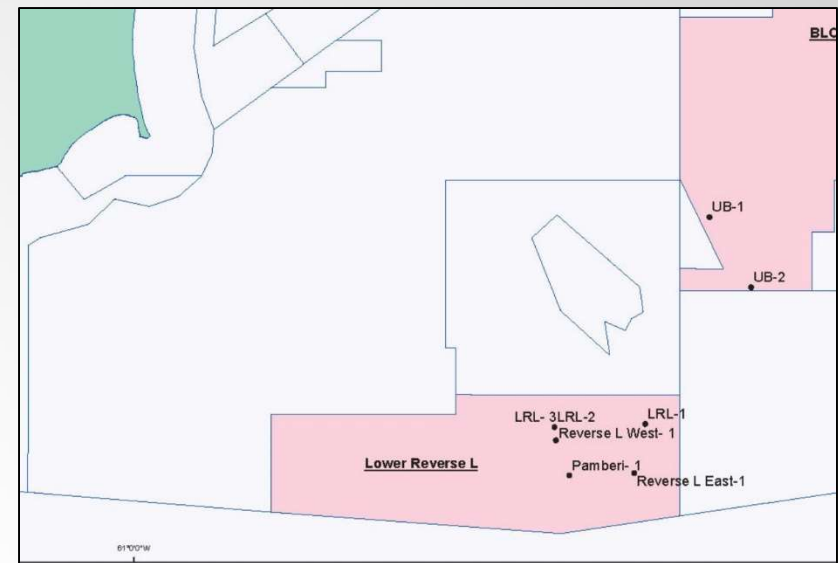
East Coast Block 4(c), Block U(c), Block Lower Reverse L



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Block LRL

- Block Size: 36 208 hectares.
- Water Depths vary between 80 - 100m.
- Nearby producing field is the Cassia Field.
- Area consists of three-way fault closures.
- Six (6) Exploration Wells have been drilled within the Block.
- Wells encountered over 50' of Net Pay in both the Miocene and Pliocene Sands.



Exploration Wells Location

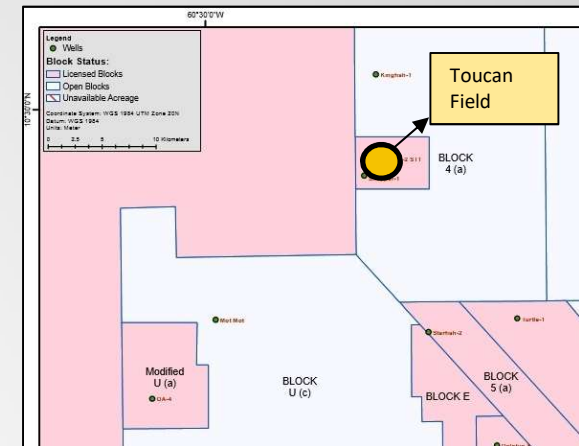
East Coast Block 4(c), Block U(c), Block Lower Reverse L



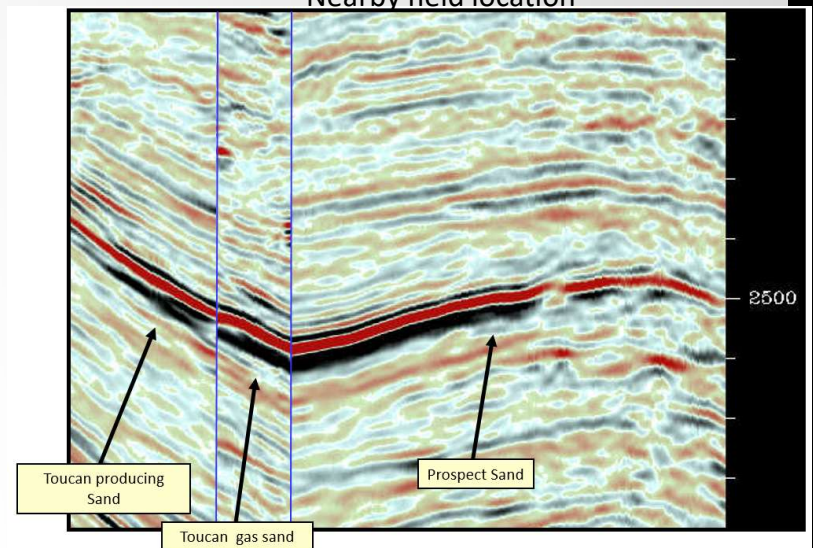
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Block 4C

- Block Size: 42 359 hectares.
- Water depths vary between 200 - 400m.
- Prospects within the block have similar amplitudes to producing sands in the Toucan Field.
- These prospects have structural fault closures as well as three-way fault closures.
- Prospect sizes range from 500 - 700 acres.
- Cumulative estimate of the gas reserves are approximately 325 bcf.



Nearby field location



TGS Final TWT Volume

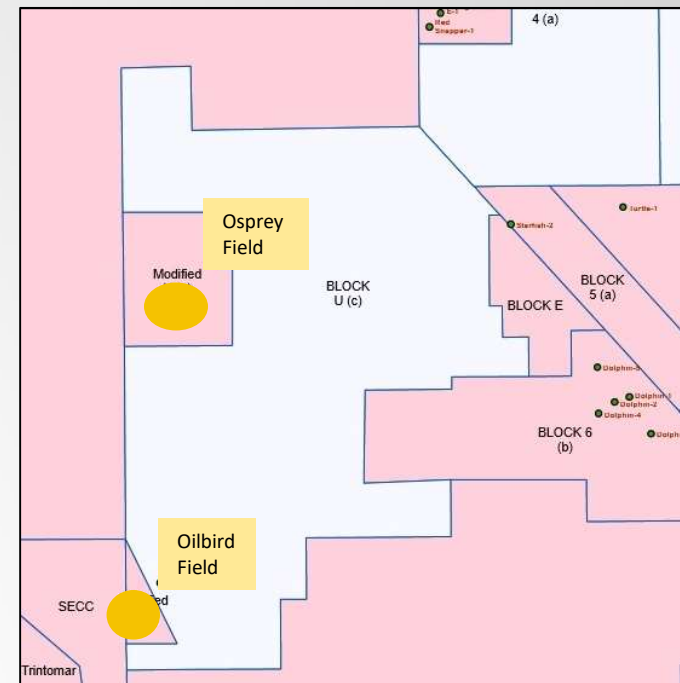
East Coast Block 4(c), Block U(c), Block Lower Reverse L



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Block UC

- Block Size: 77 451 hectares.
- Water depths vary between 75- 250m.
- Nearby producing fields include the Osprey and Oilbird Fields.
- Prospects within the block consist of three-way and four-way fault closures.
- Prospect sizes range from 200 - 500 acres.
- Cumulative estimate of the gas reserves are approximately 400 bcf.



Nearby fields location

East Coast Block 4(c), Block U(c), Block Lower Reverse L



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Block UC

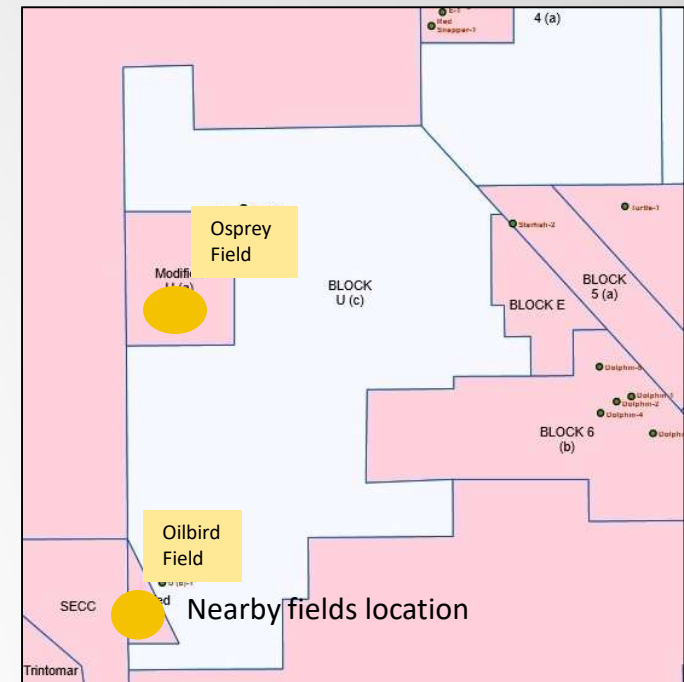
Nearby Fields and Facilities

➤ Osprey Field

- Condensate/ gas field first discovered by the Omega-1 Well.
- Currently producing from Pliocene Sands.
- A 16" gas pipeline from Osprey to Teak Field with a subsea tie to NGC 24" pipeline.
- A 6⁵/₈" condensate pipeline from Osprey to Pelican Platform.

➤ Oilbird Field

- Unitization between Blocks UC and S.E.C.C.
- First discovered by the Oilbird-1 Well with gas being discovered in four (4) sand intervals.
- Field development began in 2006.



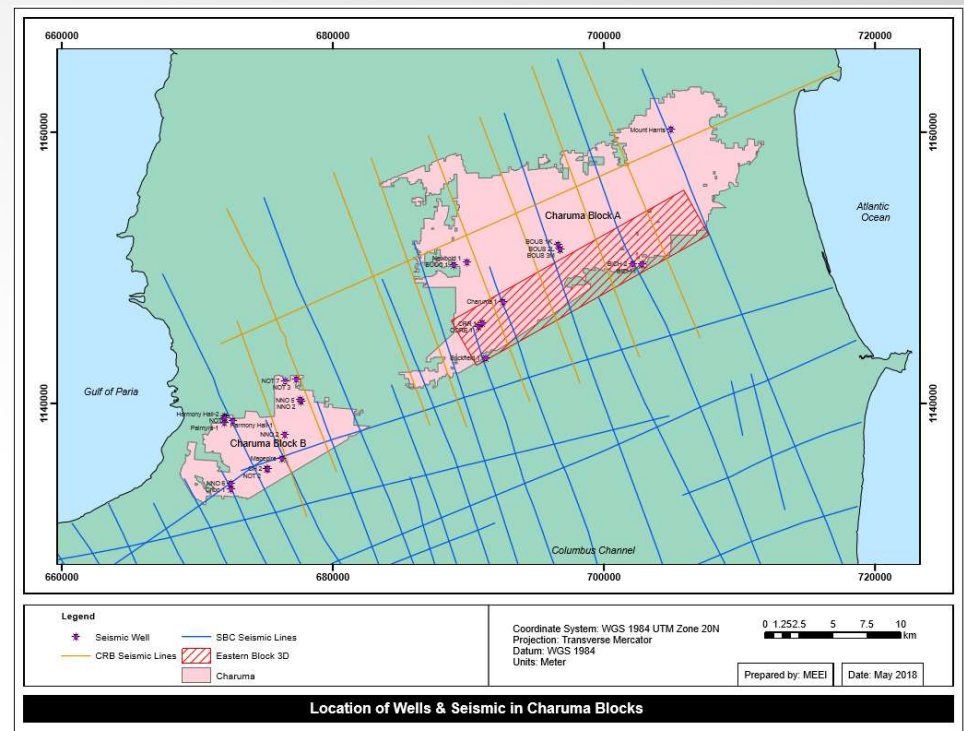
Onshore



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Reservoir

- There are two main play types within Charuma A & B:
 1. Miocene Sandstone Shallow Structural/ Stratigraphic Play
 2. Oligocene- Cretaceous Deep Sub-Thrust Structural Play
- Reservoir properties:
 1. Porosities: 15-20%
 2. Permeabilities: 50-250mD
 3. API: 25-40°
- Two main exploration wells:
 1. Cribo- TD @ 5987.8' TVD. Well encountered several sandstones with oil shows and good resistivities.
 2. Mapepire- TD @ 7372' TVD



Shallow Water Bid Round Process



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Pre-Bid

- US\$40,000 pre-bid fee.
- This fee entitles the bidder to receive a data package.

Bid

- US\$50,000 bid fee per block.
- Technical and commercial evaluation.
- The minimum work program.
- The minimum expenditure obligation.

Post Bid

- Technical Presentation Required.
- Successful bidders awarded the block and sign Production Sharing Contract.

Contents of Data Package



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The Petroleum Regulations (Shallow Water Competitive Bidding Order 2018)

The Model Production Sharing Contract 2018 for Shallow Water Areas

The Local Content and Local Participation Policy Framework for the Republic of Trinidad and Tobago dated October 7th 2004

Relevant Information with respect to all six (6) blocks

Production Sharing Contract



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A Production Sharing Contract will be granted in accordance with Section 10 of the Petroleum Act



Initial period of six years



Upon the achievement of a commercial discovery, PSC extended for 25 years from effective date



If no commercial discovery, PSC terminates automatically

Profit Sharing Matrix



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Crude Oil

Price MBOPD	A	B	C	D
	< \$40.00	\$40.00 - \$55.00	\$55.00 - \$70.00	> \$70.00
%				
< 6	X	X	X	X
6 - 20	X	X	X	X
20 - 50	X	X	X	X
50 - 75	X	X	X	X
> 75	X	X	X	X

Windfall Feature:

$$BR + 70\% * [(P - US\$70.00) / P] * (1 - BR)$$

Where:

BR is the base rate at Column D
P is the market price

Natural Gas

Price MMCFD	A	B	C	D
	< \$3.00	\$3.00 - \$4.50	\$4.50 - \$6.00	> \$6.00
%				
< 60	X	X	X	X
60 - 150	X	X	X	X
150 - 300	X	X	X	X
300 - 450	X	X	X	X
> 450	X	X	X	X

Windfall Feature:

$$BR + 70\% * [(P - US\$6.00) / P] * (1 - BR)$$

Where:

BR is the base rate at Column D
P is the market price

Cost Recovery: 50%

For Further Information



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THANK YOU