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Namibia: hunting for giants

GLOBAL PETROLEUM
LIMITED

Paul Howlett

Global Petroleum Limited

Global Petroleum – a snapshot

- Australian-registered public company

- Quoted on the London Stock Exchange's AIM market

- The management team is based in London

- Successful capital raises of over £4 million in last 2 years to progress the PEL94 exploration licence in Namibia & for working capital

- Active since 2010 in Namibia

Namibia: a new world-class oil province
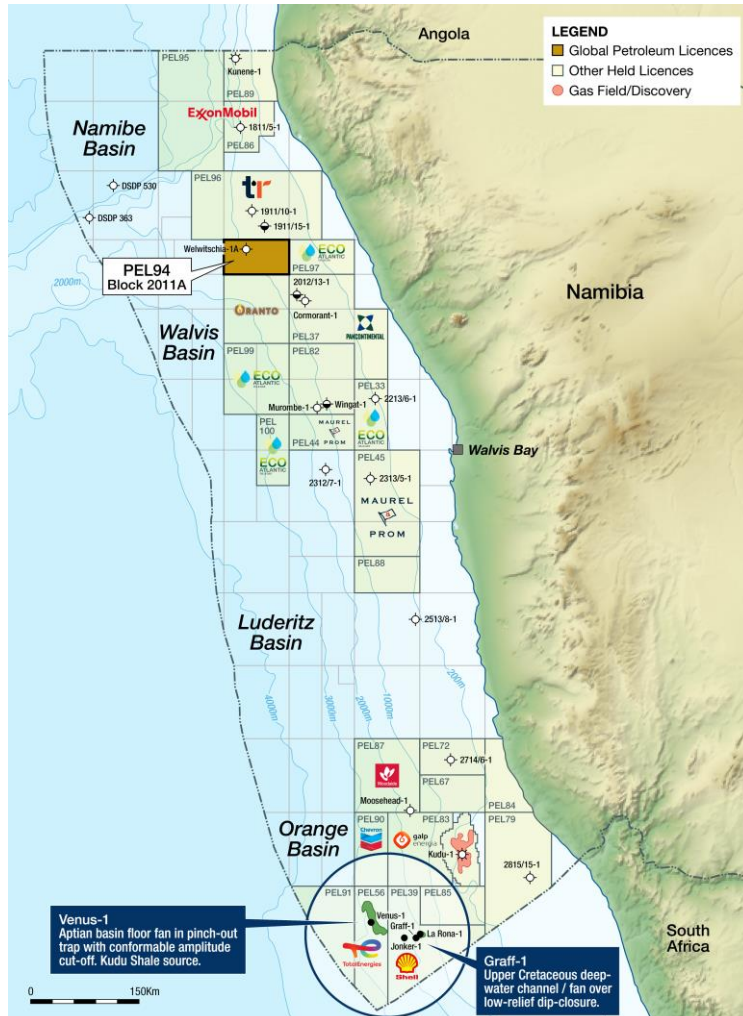
- World-class source rock: Kudu Shale. Chased by Impact, GALP & others
  - Shell, TotalEnergies & ExxonMobil farmed in years ago
  - QatarEnergy farmed in for the Graff and Venus exploration wells
- Discovery of multiple billions of barrels of oil at Venus, Graff and Jonker have proven a new petroleum province in Namibia
  - Chevron and Woodside have farmed in to nearby acreage
- Kudu Shale source rock extends to Walvis Basin and Global's licence
  - Companies now competing to secure Walvis Basin licences
  - All acreage across the margin that is near the source kitchen is either licensed or under exclusive negotiations – only way to access acreage now is to farm in
- Stable jurisdiction, excellent fiscal terms

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Global Petroleum in Namibia
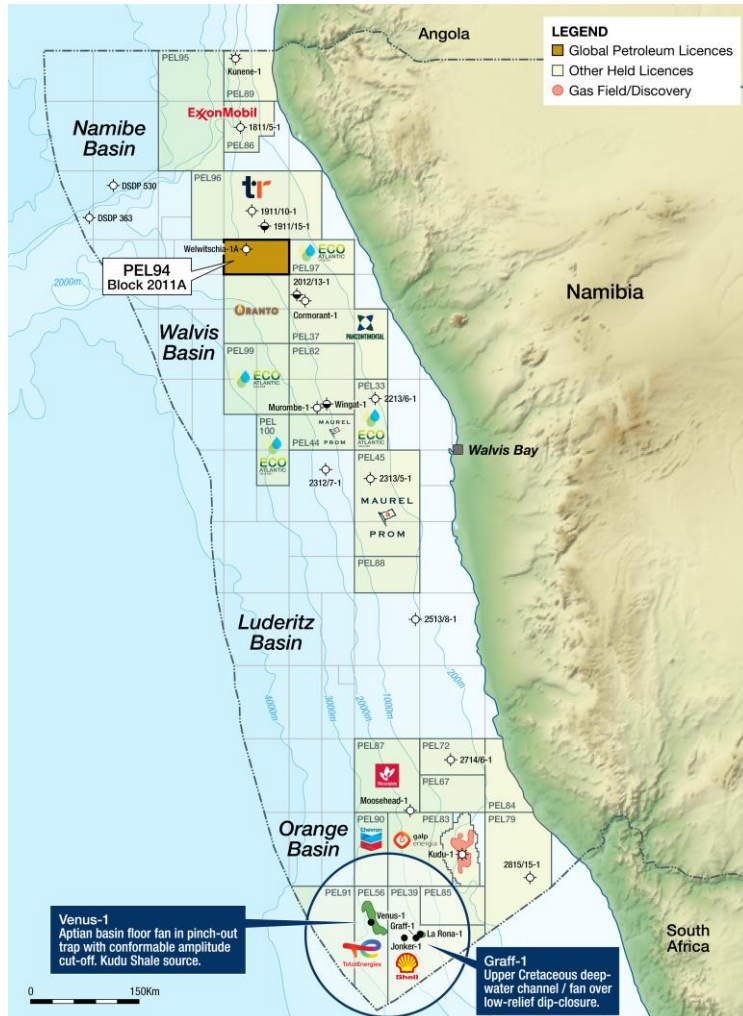
- Global's licence PEL94, 5798 sq. km, 78% and operator

- Previously held adjacent PEL29 licence for 10 years from 2010

- PEL94 commitment: acquire 2,000 sq. km of 3D seismic data

- Main prospects are Welwitschia Deep and Marula with 881 and 411 MMbbl gross mean prospective resources respectively

- 1000m water depth, targets 2,600-2,800m (Venus well TD c.6,300m)

- Last 2 deep water wells (2018) in this basin cost US$29 million and US$16 million

- Large prospects, good terms and relatively cheap deep water drilling costs read through to significant NPVs

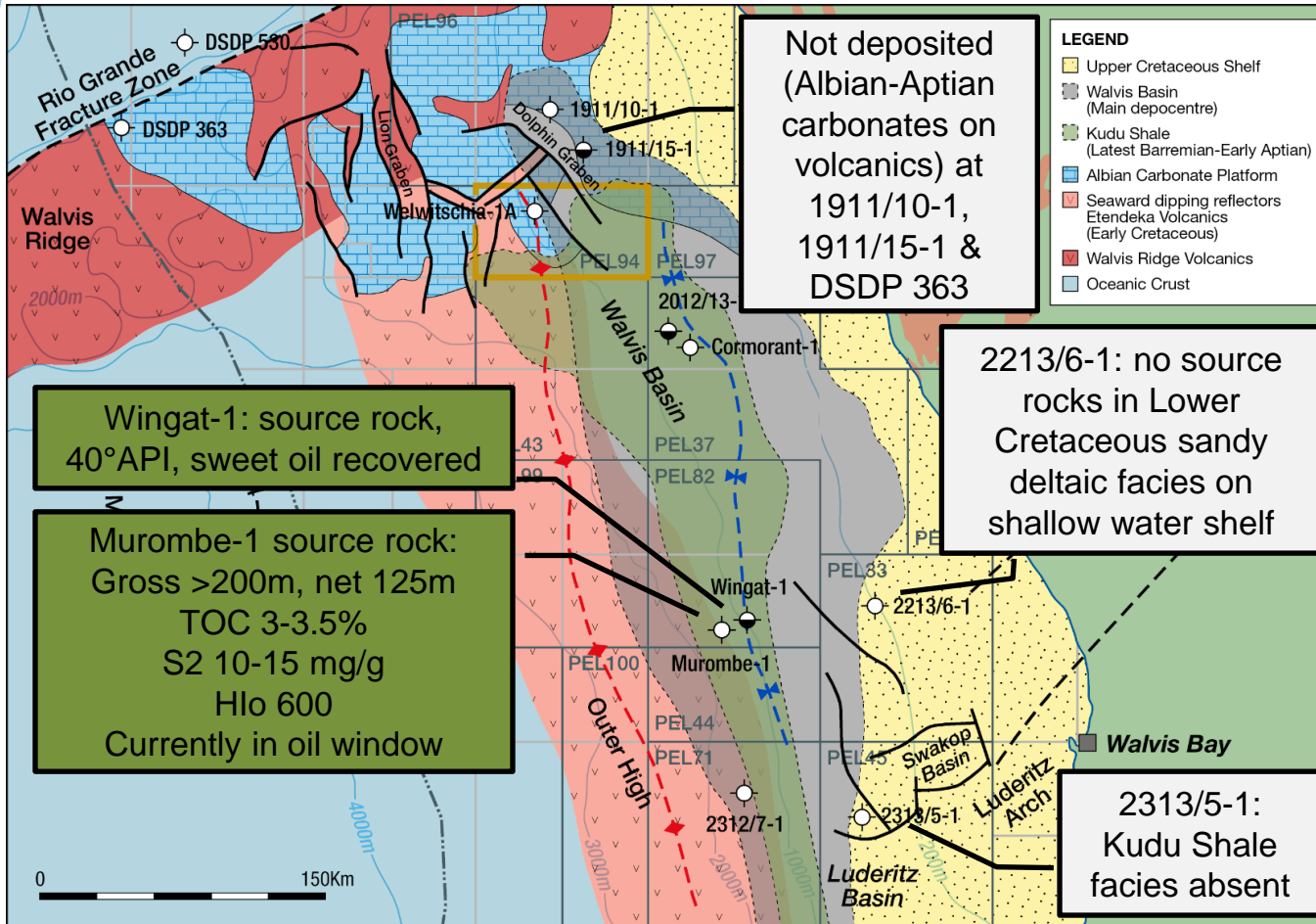- Plus there is further running room.......

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PEL94: prospects and leads

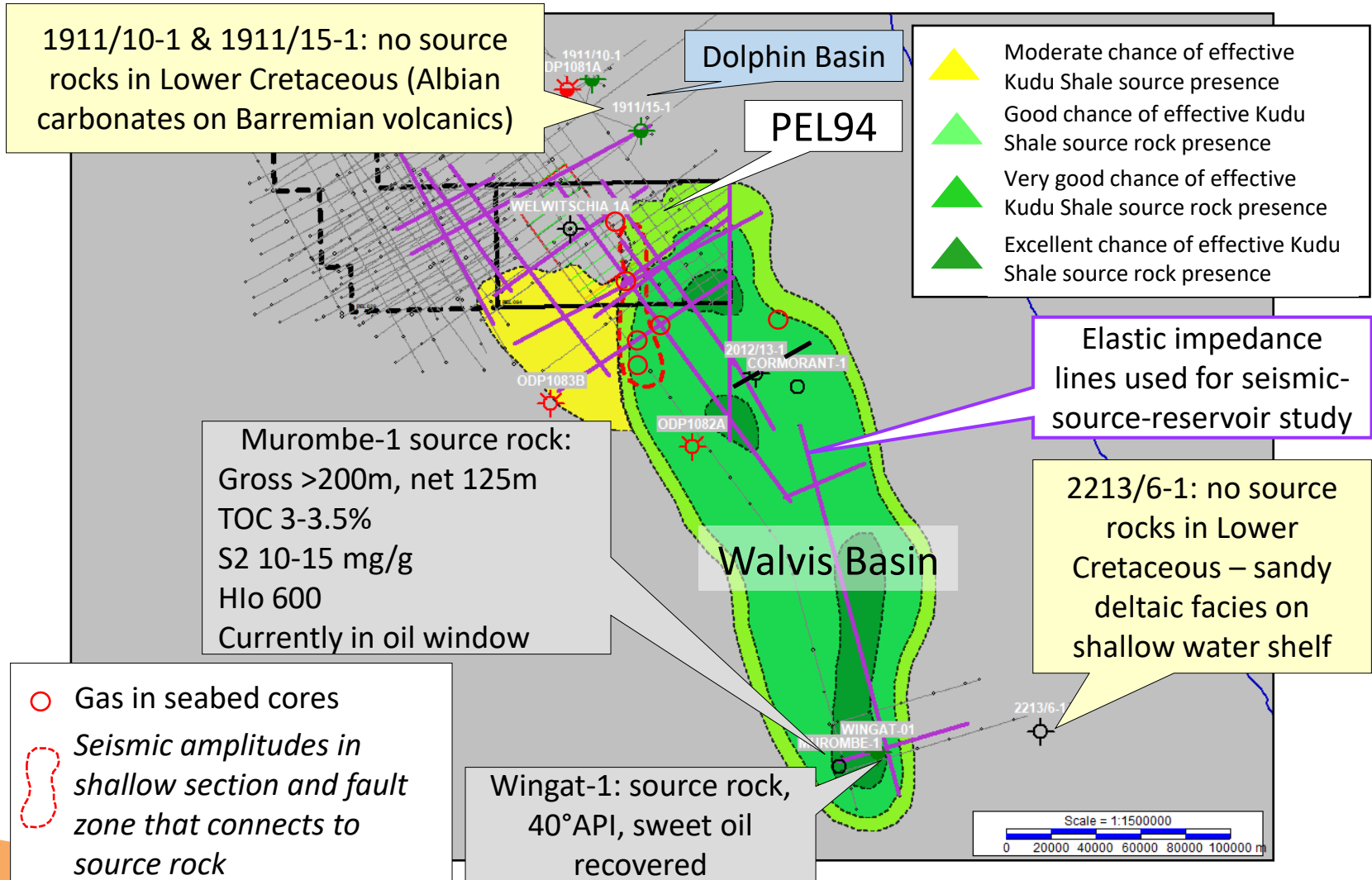- Portfolio of >3.5 billion barrels Gross Mean Prospective Resources (within PEL94) across 9 prospects & leads
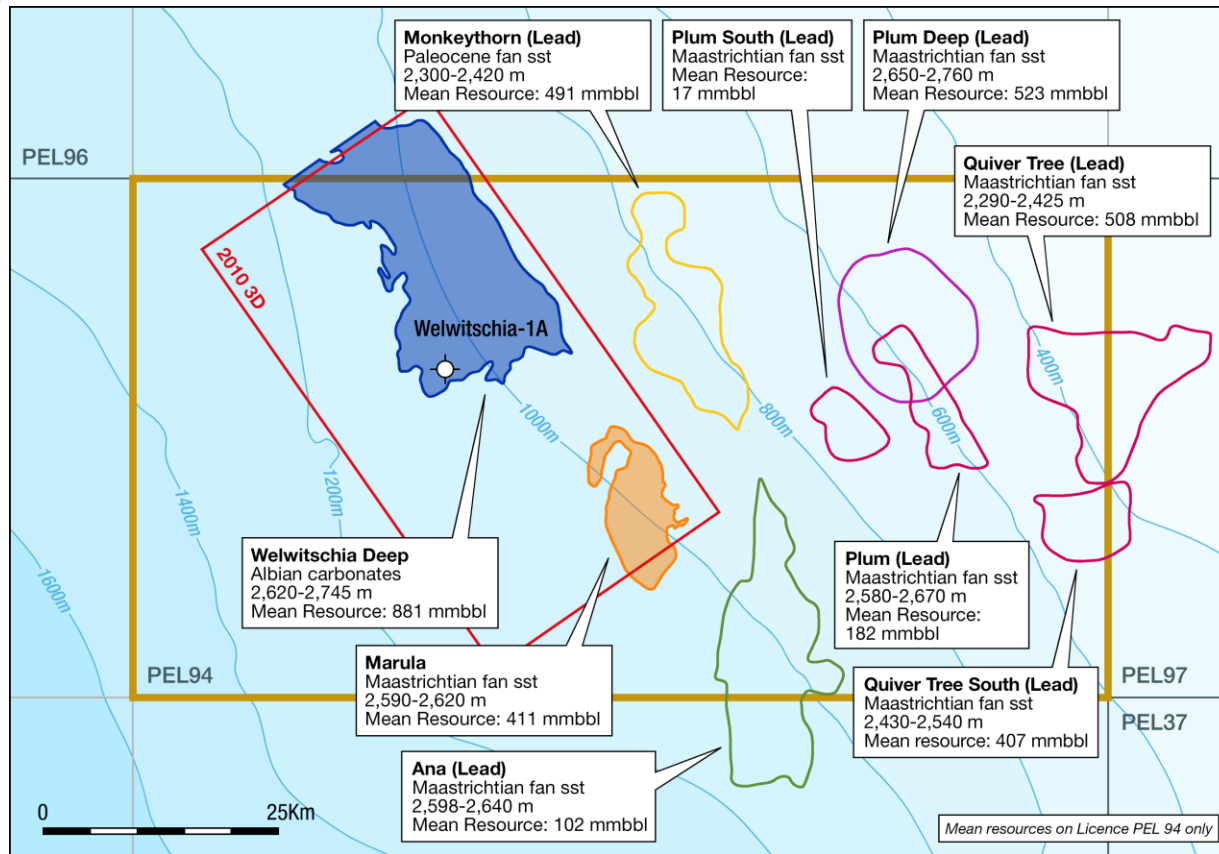
	Gross Prospective Resources			
	1U P90, MMBO	2U P50, MMBO	3U P10, MMBO	Mean, MMBO
Prospect				
Welwitschia Deep	162	671	1,863	881
Marula	237	392	606	411
Leads				
Ana	42	91	175	102
Quiver Tree	275	476	786	508
Quiver Tree South	262	396	566	407
Plum	79	164	311	182
Plum South	4	13	36	17
Plum Deep	226	466	894	523
Monkeythorn	220	442	831	491
Total				**3,522**

Kudu Shale source rock in Walvis Basin

LEGEND
- Upper Cretaceous Shelf
- Walvis Basin (Main depocentre)
- Kudu Shale (Latest Barremian-Early Aptian)
- Albian Carbonate Platform
- Seaward dipping reflectors Etendeka Volcanics (Early Cretaceous)
- Walvis Ridge Volcanics
- Oceanic Crust

Not deposited (Albian-Aptian carbonates on volcanics) at 1911/10-1, 1911/15-1 & DSDP 363

Wingat-1: source rock, 40°API, sweet oil recovered

Murombe-1 source rock:
Gross >200m, net 125m
TOC 3-3.5%
S2 10-15 mg/g
HIo 600
Currently in oil window

2213/6-1: no source rocks in Lower Cretaceous sandy deltaic facies on shallow water shelf

2313/5-1: Kudu Shale facies absent

- Source rock present, is of excellent quality and generating oil in southern Walvis Basin (Murombe-1 & Wingat-1)

- Not present on sandy shelf or on the Walvis Ridge

- Not reached by Welwitschia-1A, 2012/13-1 & Cormorant-1

- So how far north does it reach?

Kudu Shale source rock in Walvis Basin

1911/10-1 & 1911/15-1: no source rocks in Lower Cretaceous (Albian carbonates on Barremian volcanics)

Dolphin Basin

PEL94

- Moderate chance of effective Kudu Shale source presence
- Good chance of effective Kudu Shale source rock presence
- Very good chance of effective Kudu Shale source rock presence
- Excellent chance of effective Kudu Shale source rock presence

Elastic impedance lines used for seismic-source-reservoir study

Murombe-1 source rock:
Gross >200m, net 125m
TOC 3-3.5%
S2 10-15 mg/g
HIo 600
Currently in oil window

Walvis Basin

2213/6-1: no source rocks in Lower Cretaceous – sandy deltaic facies on shallow water shelf

○ Gas in seabed cores

Seismic amplitudes in shallow section and fault zone that connects to source rock

Wingat-1: source rock, 40°API, sweet oil recovered

Scale = 1:1500000
0   20000 40000 60000 80000 100000 m

- Inverted, de-tuned and blocked amplitudes (using zero crossings) on 2D seismic lines

- Characteristic response for "hot" shale in the lower part of the Kudu Shale source rock

- Can map the rich, oil-prone source rock from Wingat-1 and Murombe-1 to the eastern part of PEL94

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Walvis Basin: Maturity and expulsion

**Transformation Ratio Present Day (0 Ma)**
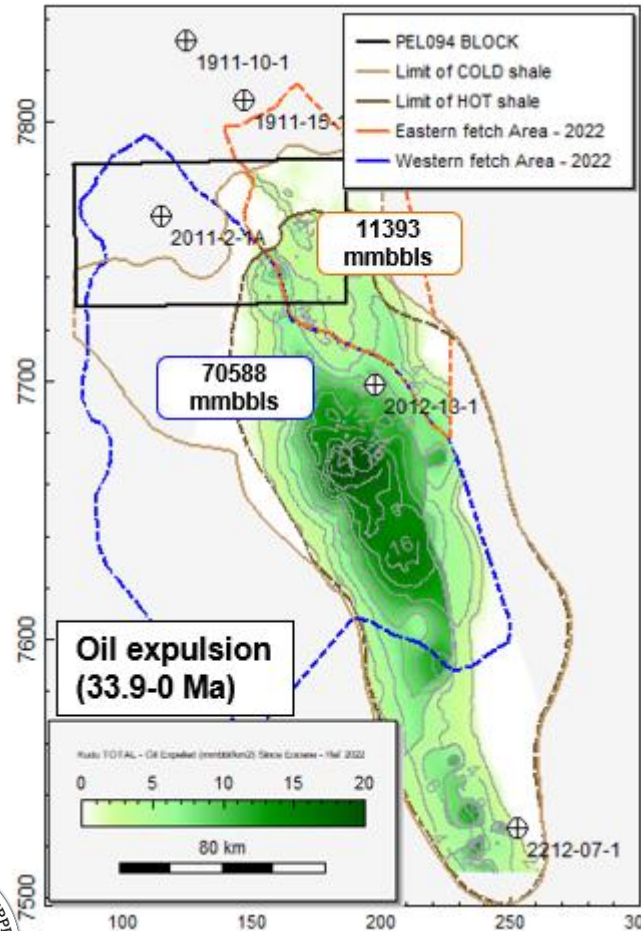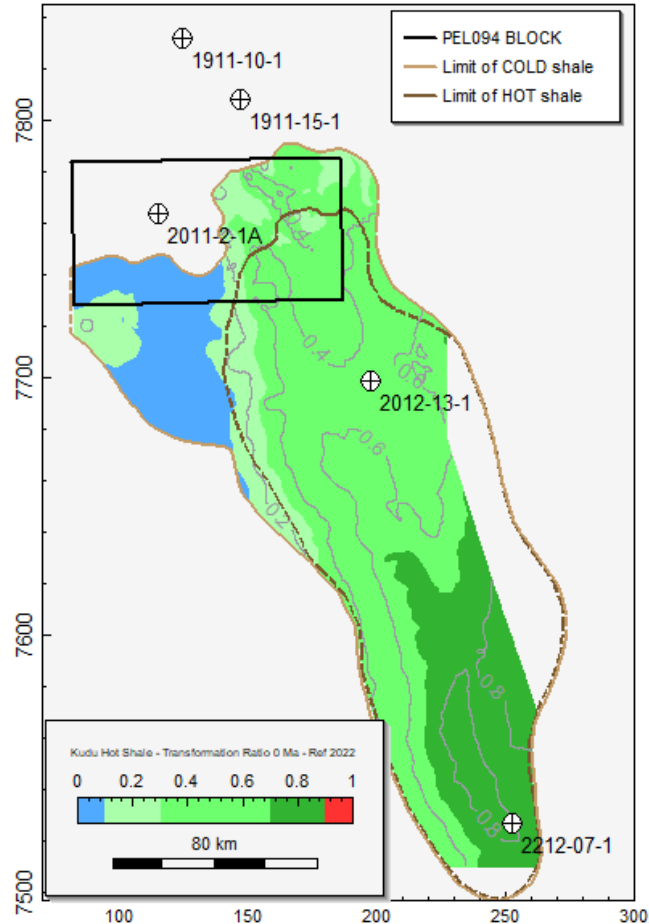
- Worked with IGI on a number of petroleum systems models

- On the left is the source rock maturity map (Transformation Ratio) for the Kudu Shale: the eastern half of PEL94 is mature

- On the right is the oil expulsion map since 33 Ma (Eocene) for the most likely of the petroleum systems models tested

- The 2 migration polygons (blue and orange) where hydrocarbons migrate into PEL94 have expelled over 70 and 11 billion barrels of oil respectively

PEL94 licence: migration & oil seeps
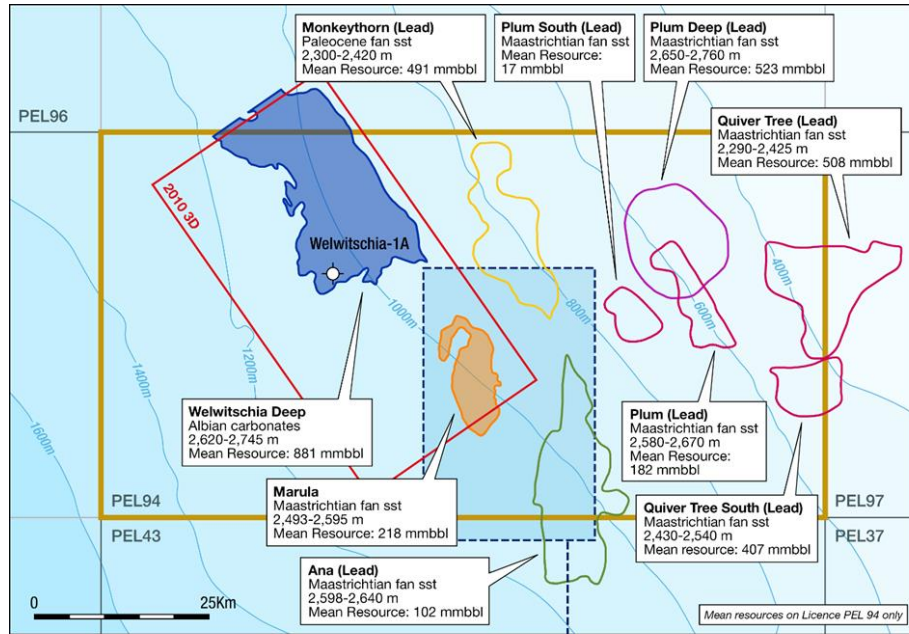
Data from Clément Blaizot
SAR Satellite Oil Seep Expert
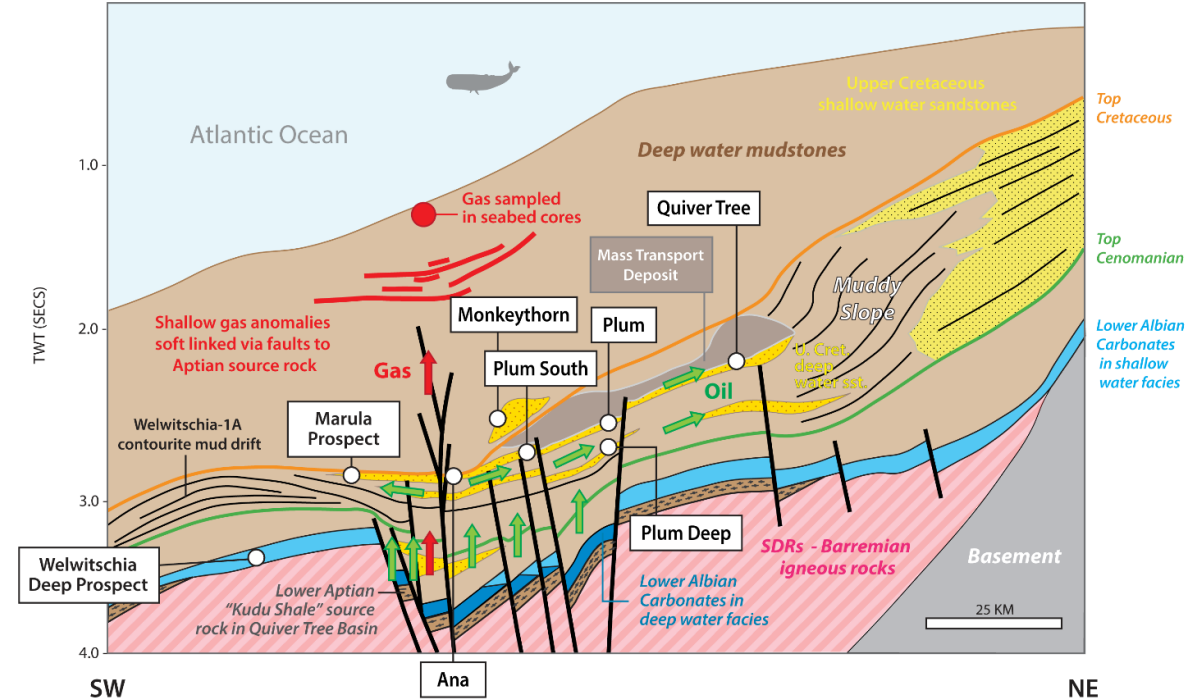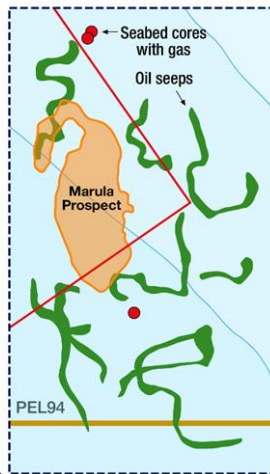
- The inset (centre) shows interpreted oil seeps (green) around the Marula prospect (orange)

- Some seeps are spatially associated with seabed cores in which gas has been sampled and which themselves are above shallow seismic (gas) anomalies and a major fault zone that links down from near the seabed to the Kudu Shale source rock

Walvis Basin: Albian carbonate reservoir
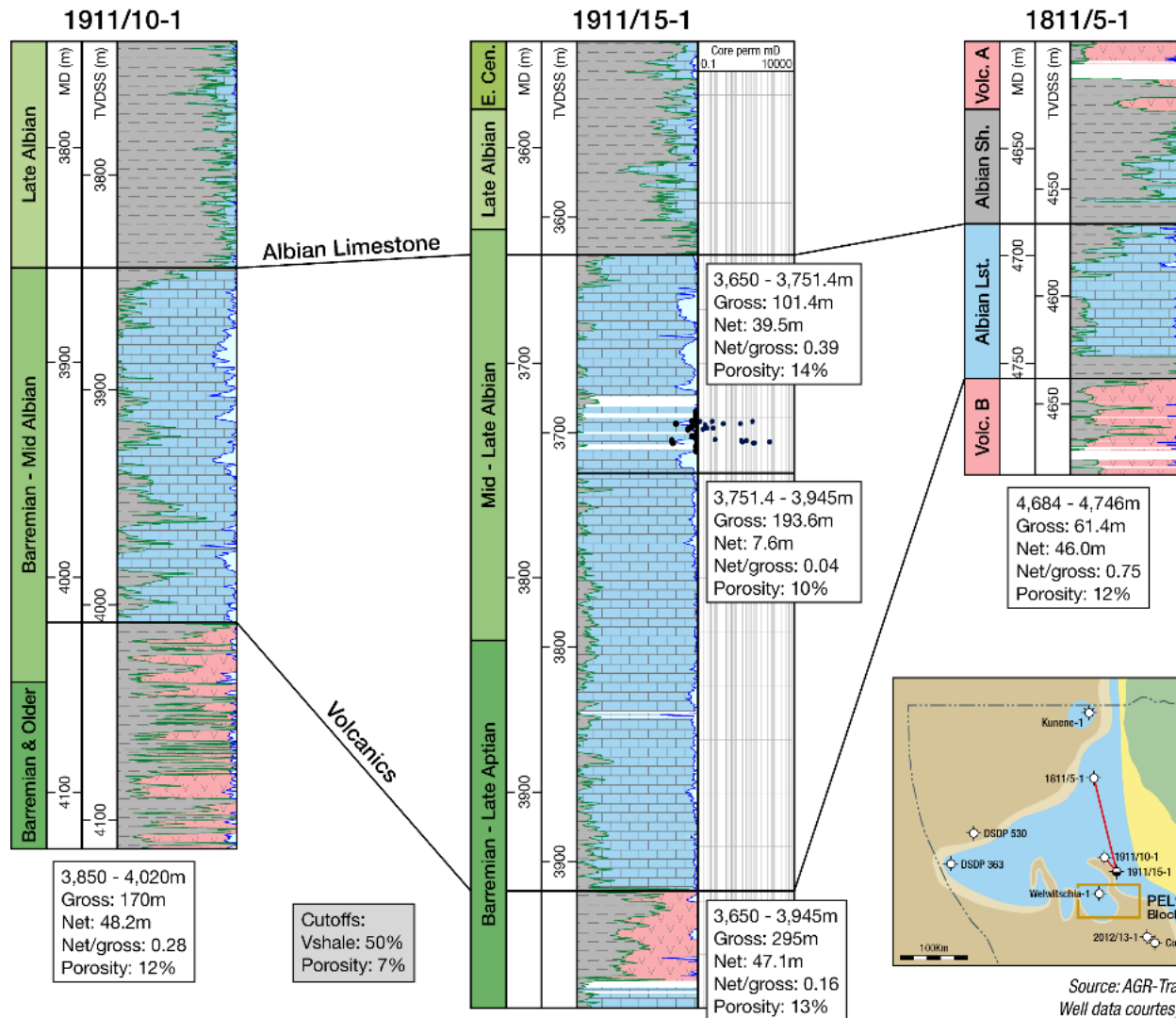
- Albian shallow water, oolitic carbonates

- Reservoir for the Welwitschia Deep prospect

Source: AGR-Tracs CPR 2018
Well data courtesy of NAMCOR

Welwitschia Deep prospect

- Very large tilted fault block

- Albian carbonate reservoir analogous to production in Angola, Congo and Brazil

- Regional migration focus: petroleum systems model predicts >11 billion barrels migrates to the structure

- Gross Prospective Resources on PEL94 only: mean 881 mmbbls, P10 1863 mmbbls
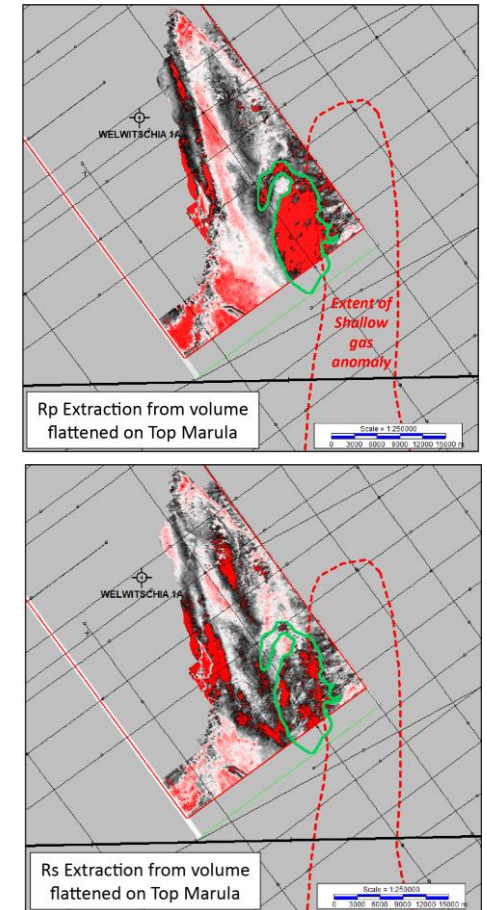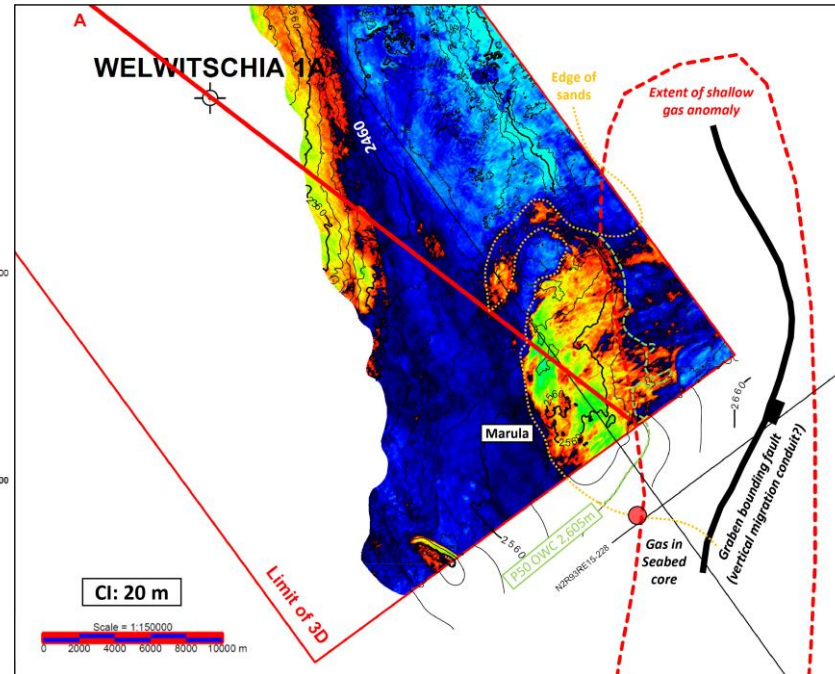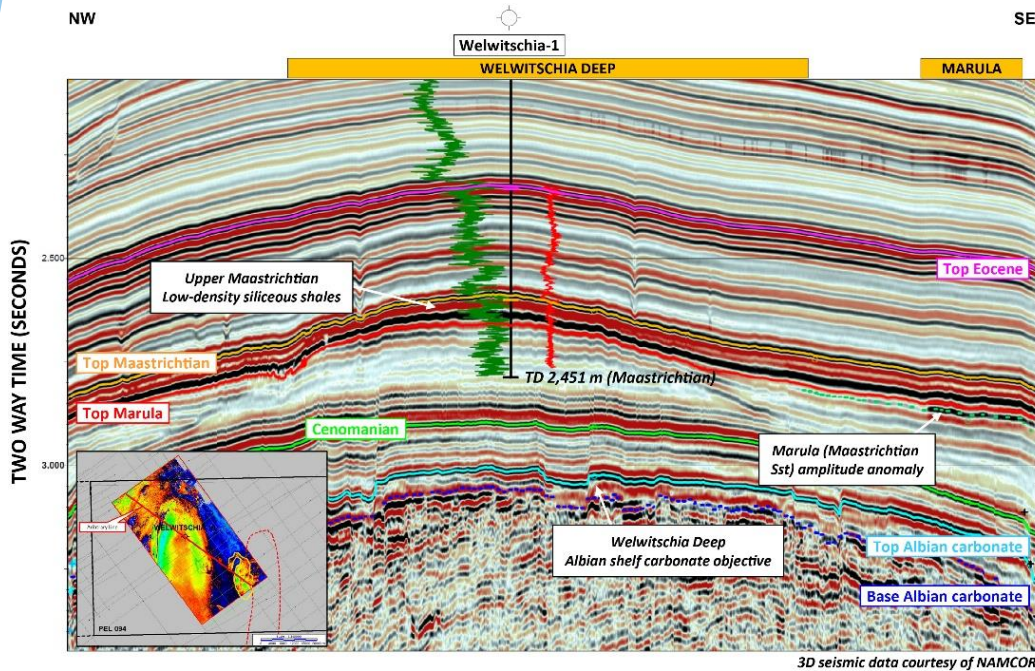

3D seismic data courtesy of NAMCOR

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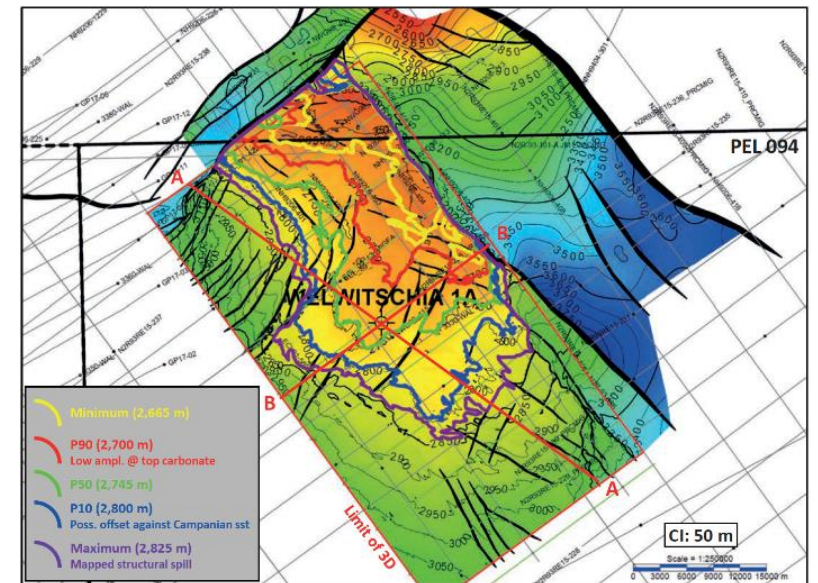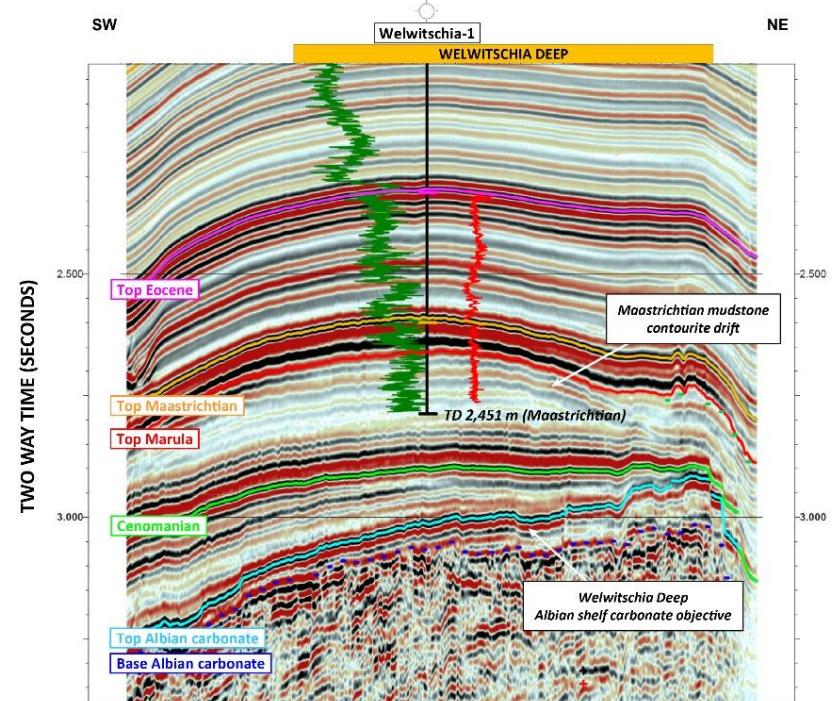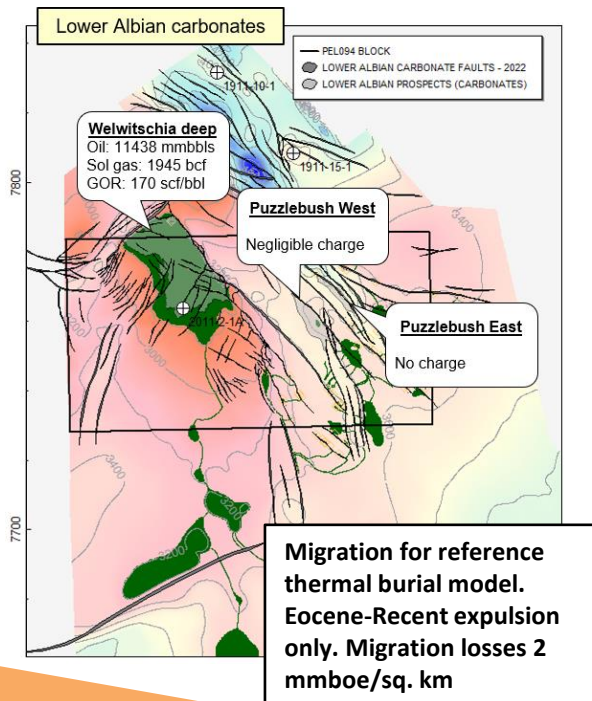
Walvis Basin: deep water clastic reservoirs
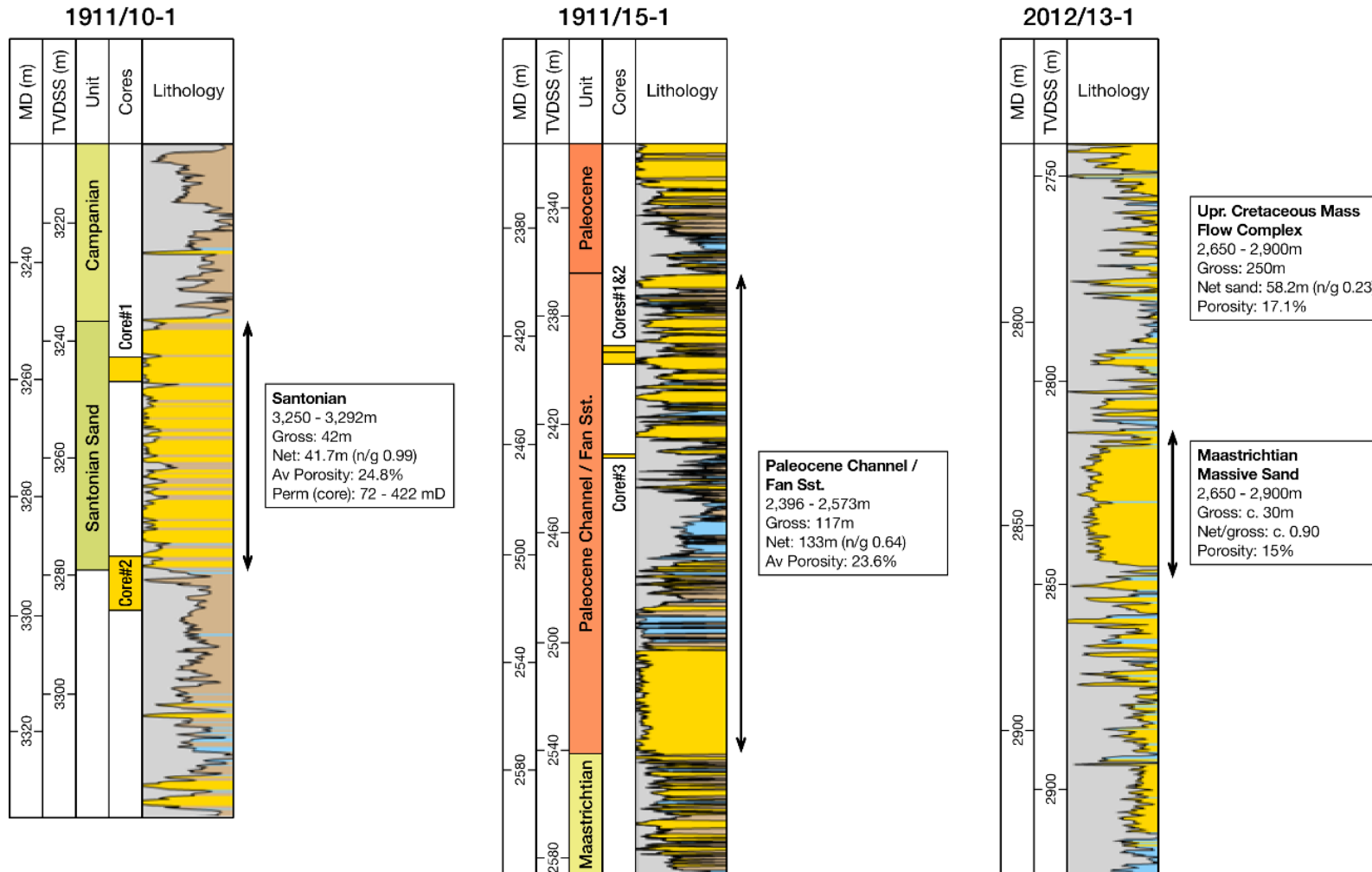
- Upper Cretaceous and Lower Paleocene deep water sandstones

- Reservoirs for the Marula prospect and the eastern leads

Marula prospect

3D seismic data courtesy of NAMCOR

- Upper Cretaceous deep water sandstone reservoir

- Dip-closed towards sand input direction, distal pinchout (proven by Welwitschia-1A well)

- Migration via fault to reservoir and up-dip into trap: amplitude and AVO anomalies conform to structure

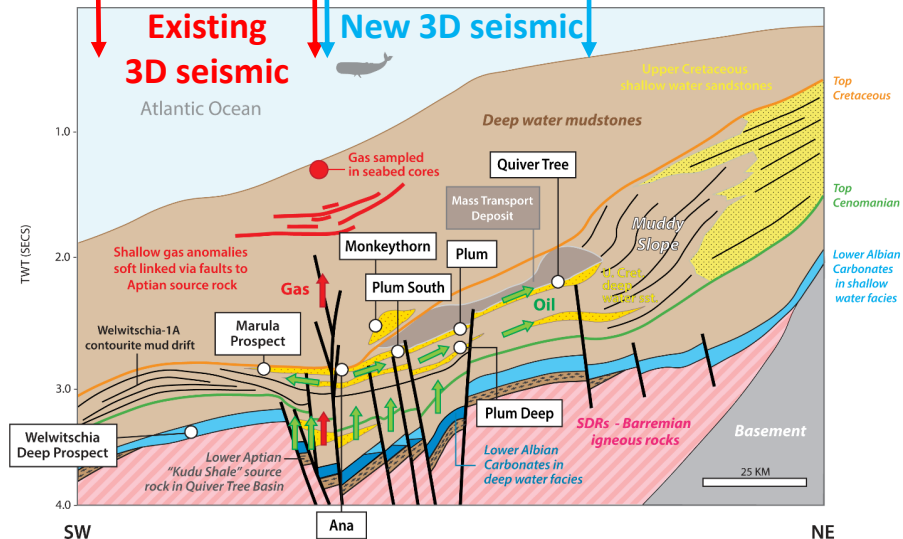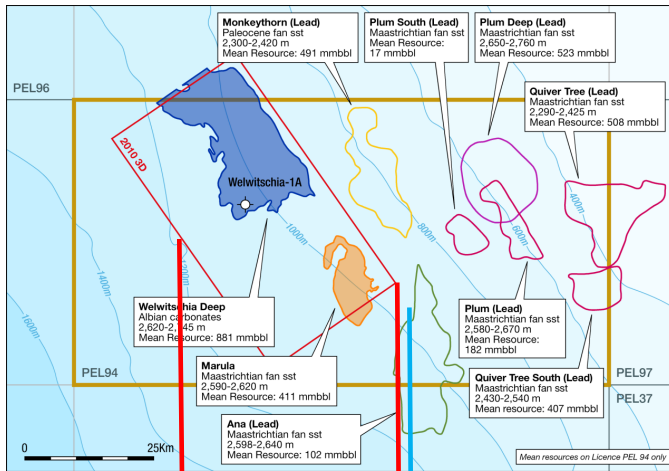- Gross Prospective Resources: Mean 411 mmbbls, P10 606 mmbbls

Eastern leads: seismic example
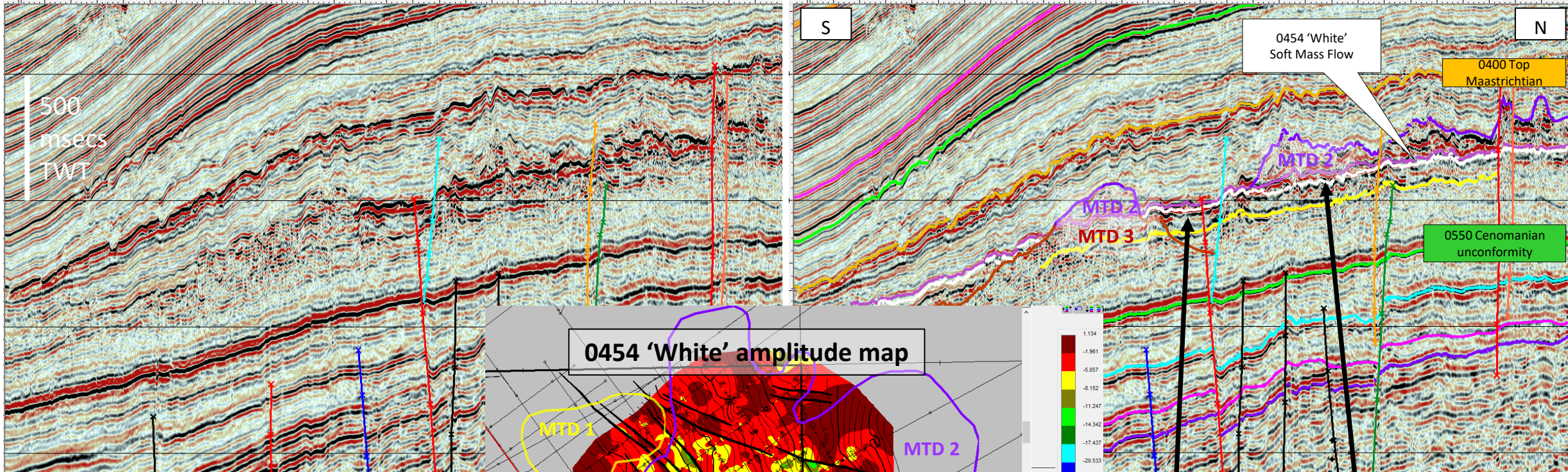
- Existing prospective resources based only on 0454 'white'
- Mapping leads at other levels
- Needs 3D seismic coverage

Seismic data shown with the kind permission of

Eastern leads & new 3D seismic

- Existing 3D seismic data over Welwitschia Deep and Marula prospects

- >2 billion bbls prospective resources in the leads in the eastern PEL94

- Further interpretation ongoing in this area, so these numbers will change: number of leads increasing

- Planning best options for new 3D seismic data coverage over these

  - Global sponsored Searcher Seismic's EIA for its planned Walvis Basin multi client 3D seismic survey

Fiscal Regime and Economics

- Namibian fiscal terms are highly competitive on a global scale:

Fiscal Regime	Tax / Royalty
Royalty	5%
Petroleum Income Tax	35%
Additional Profits Tax*	1st Tier – 25%; 2nd Tier – 25%; 3rd Tier – 30%
Namibian Participation	PEL94: Namcor (17%) carried to First Oil & Aloe (5%) carried through exploration

- Economics for both the Marula and Welwitschia Deep prospects are very robust

Material opportunity in a new oil province
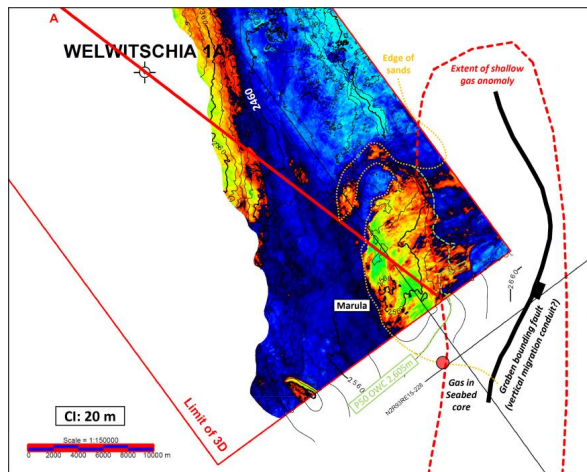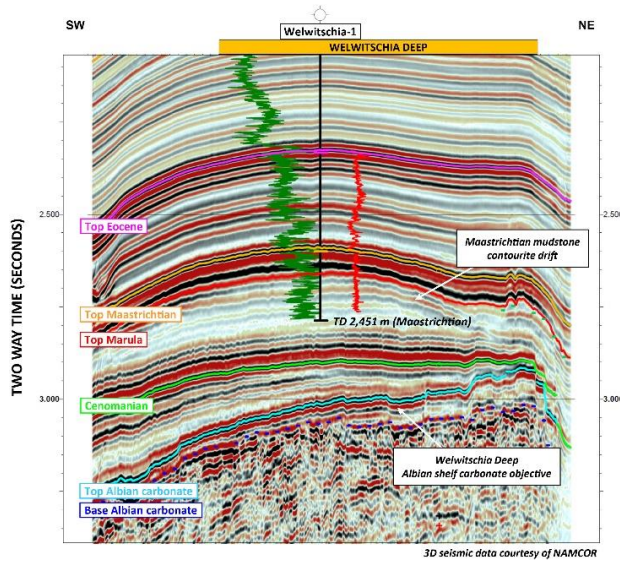
- Venus, Graff & Jonker have proven a new petroleum province, underpinned by the Kudu Shale source rock, which extends to Global's licence PEL94

- >3.5 BBO Gross Mean Prospective Resources in 9 prospects & leads

- Drill-ready prospects already covered by 3D seismic: Welwitschia Deep (881 MMbbl Gross Mean); Marula (411 MMbbl Gross Mean)

- 2.2 billion bbls upside in leads that would benefit from 3D seismic coverage

- Relatively cheap drilling: water depth c.1,000m; targets 2,600-2,800m

- Stable jurisdiction, excellent fiscal terms, robust economics

- Global has been in Namibia since 2010 and has excellent relationships with the government and Namcor

- Significant equity position and operatorship available in consideration for contribution to past costs and a carry on the forward work programme

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