Namibia Oil and Gas Conference

3rd Edition

From exploration to action:
Positioning Namibia as the next energy frontier

ENDORSED BY

Ministry of Industries, Mines and Energy, Republic of Namibia

Reassessing acreage off South Africa's south coast through the enhancement of legacy 2D seismic data

(Rilwele Tshikovhi and Anthea Davids)

Presented by:

Rilwele Tshikovhi

(Geoscientist at Petroleum Agency SA)

HOST

IN PARTNERSHIP WITH

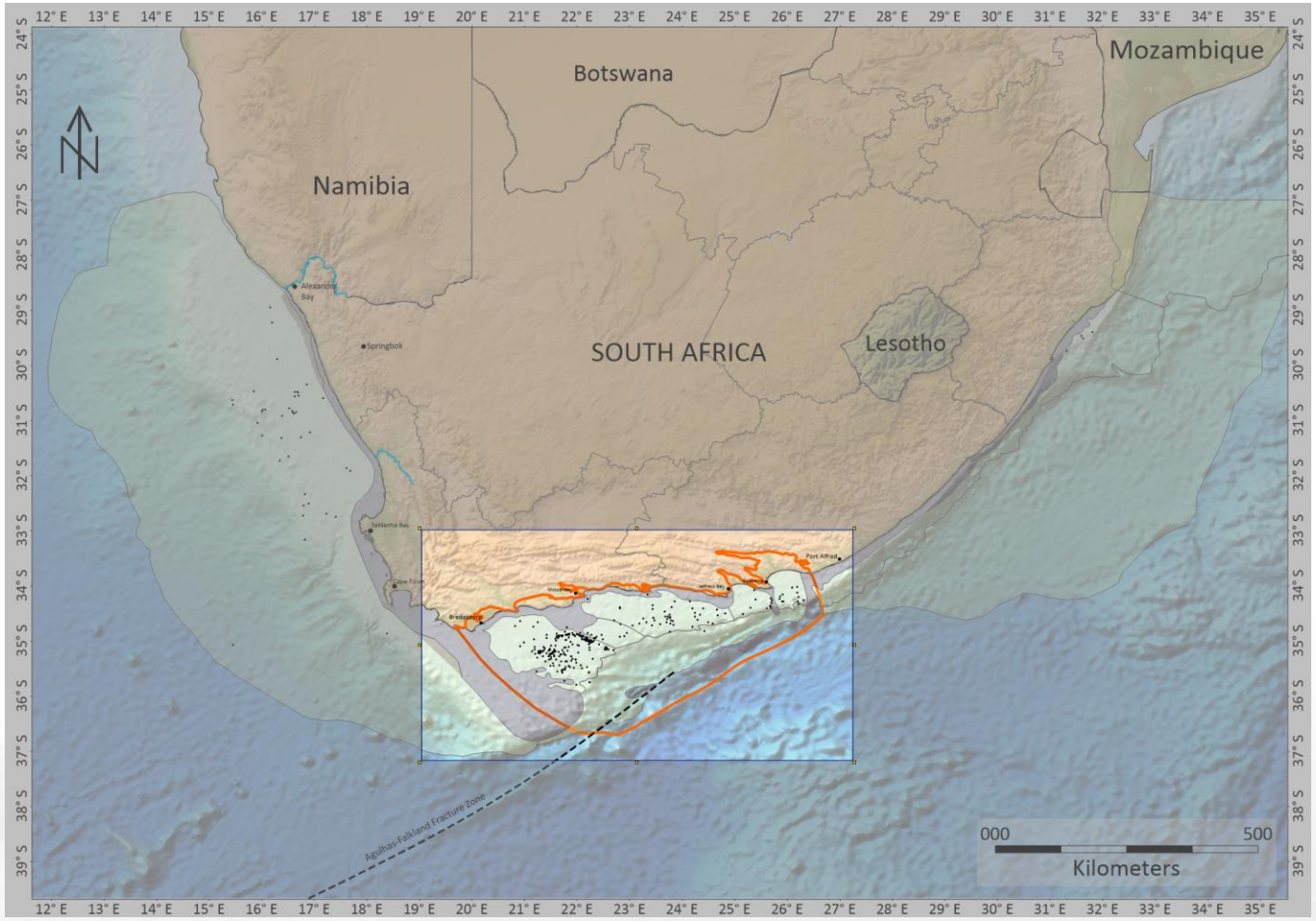
STRATEGIC PARTNERS

13 August 2025

#NamibiaOGC25

Presentation Outline

- **Background** – Context & framework
- **Objective** – Purpose of the study
- **Geology** – Basin structure & setting
- **Reprocessing & Prospectivity**
  - ***Block 7: Western Bredasdorp***
  - ***Block 10: Infanta Embayment***
- **Conclusions** – Key takeaways
- **References** – Data sources



BACKGROUND

Upstream Petroleum Resources Development Act (UPRDA)

- Assented to in **October 2024**
- Draft regulations **gazetted in April 2025**
- Provides a **legal framework** for upstream petroleum exploration and licensing

Exploration & Licensing Strategy

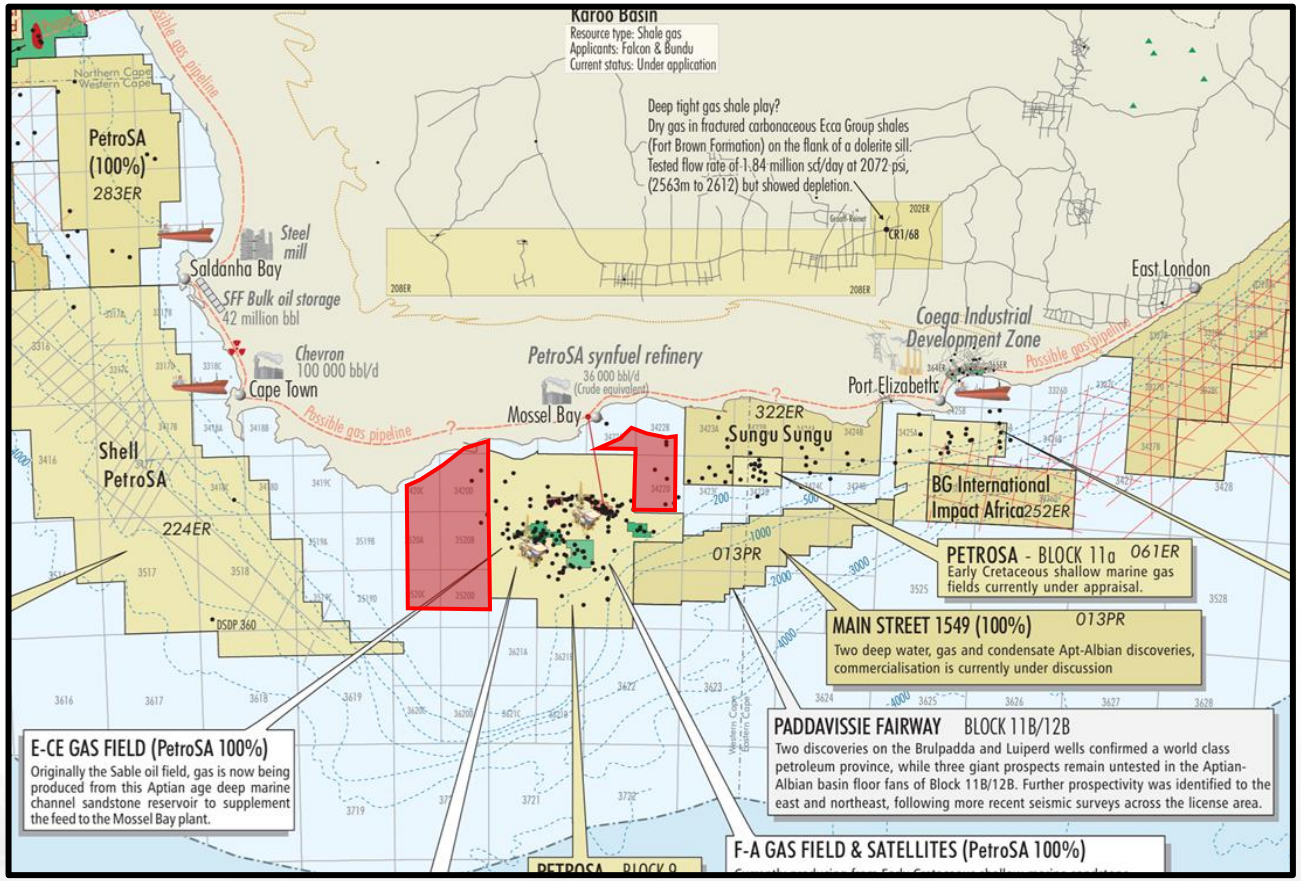
- Developed to support the **first UPRDA license round**
- Aimed to **facilitate and accelerate exploration**
- Focused on **open acreage release**

Geophysical Data Acquisition Initiative

- **Geophysical Data Acquisition Initiative**
- **Bids invited** for:
  - Acquisition of new geophysical data
  - **Reprocessing of legacy 2D seismic data**
- Objective: **Enhance data quality** and attract new explorers

Focus Areas: South Coast

Two offshore blocks selected for seismic reprocessing:
Block 7 – Western Bredasdorp Basin
Block 10 – Infanta Embayment



Objective of Study

Study Objective

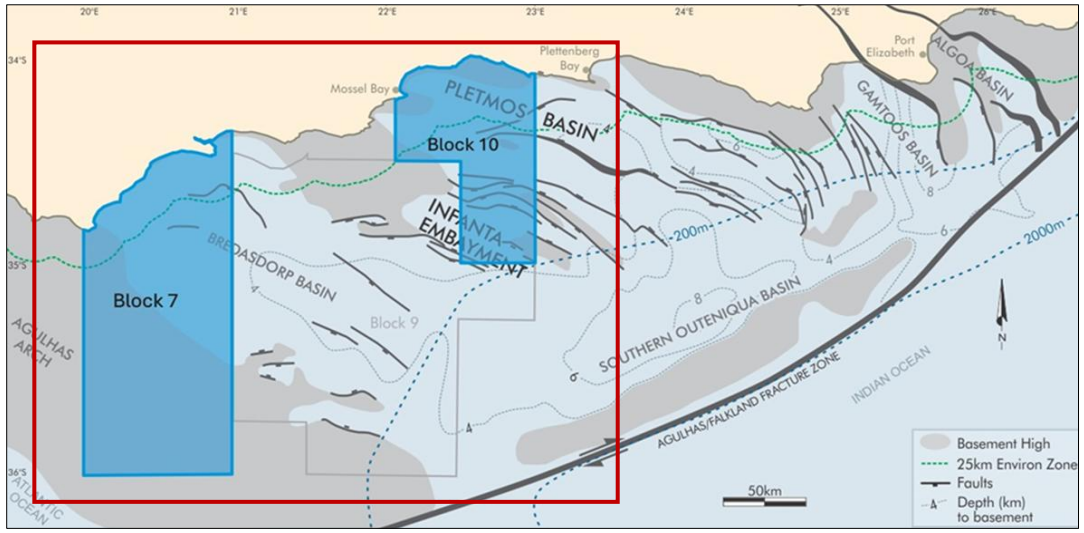
*To reassess the **Western Bredasdorp Basin (Block 7)** and **Infanta Embayment (Block 10)** using newly reprocessed legacy 2D seismic data, with the aim of improving subsurface understanding and prospectivity assessment .*

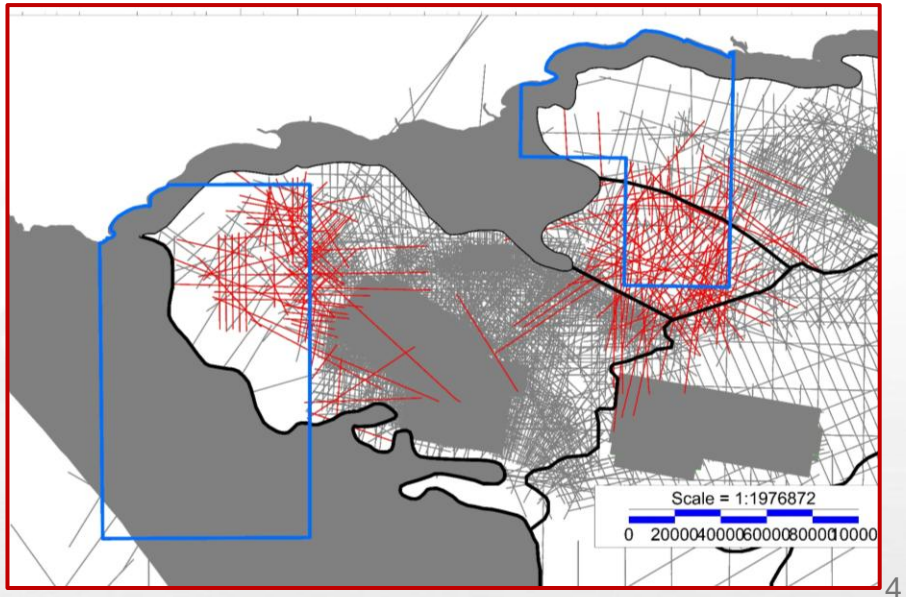
Block 7 & Block 10 Reprocessing Project

- **Total reprocessed data:** 7,292 km of 2D seismic
- **Data vintages:** 1974 – 1991
- **Reprocessing completed by:** ***TGS, October 2024***

Key Data Enhancements *(applied line-by-line where required)*

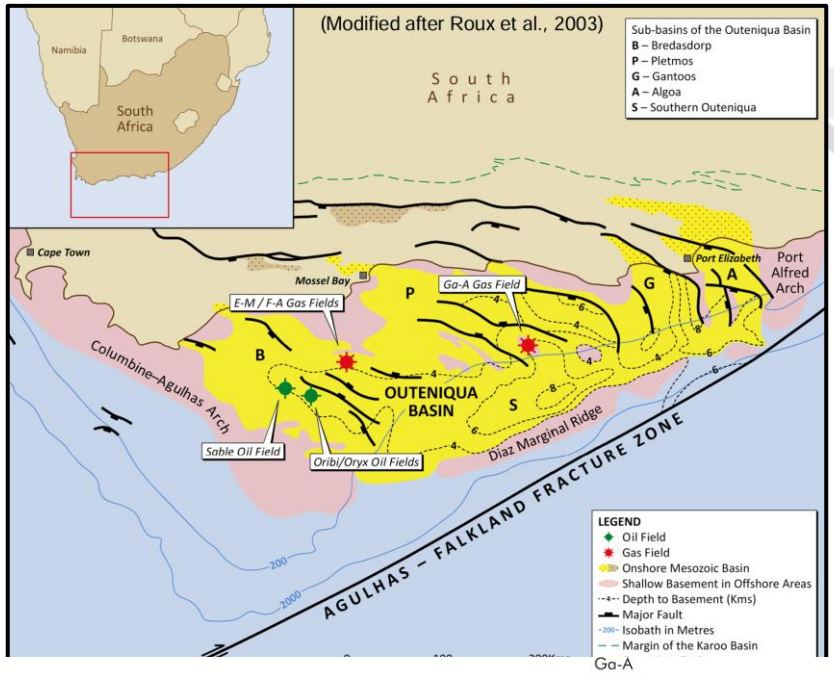
Reprojection
Despiking
Denoising (Cadzow filter)
Amplitude compensation
Demultiple
Spectral shaping
Filtering
Missing trace interpolation
Embayment

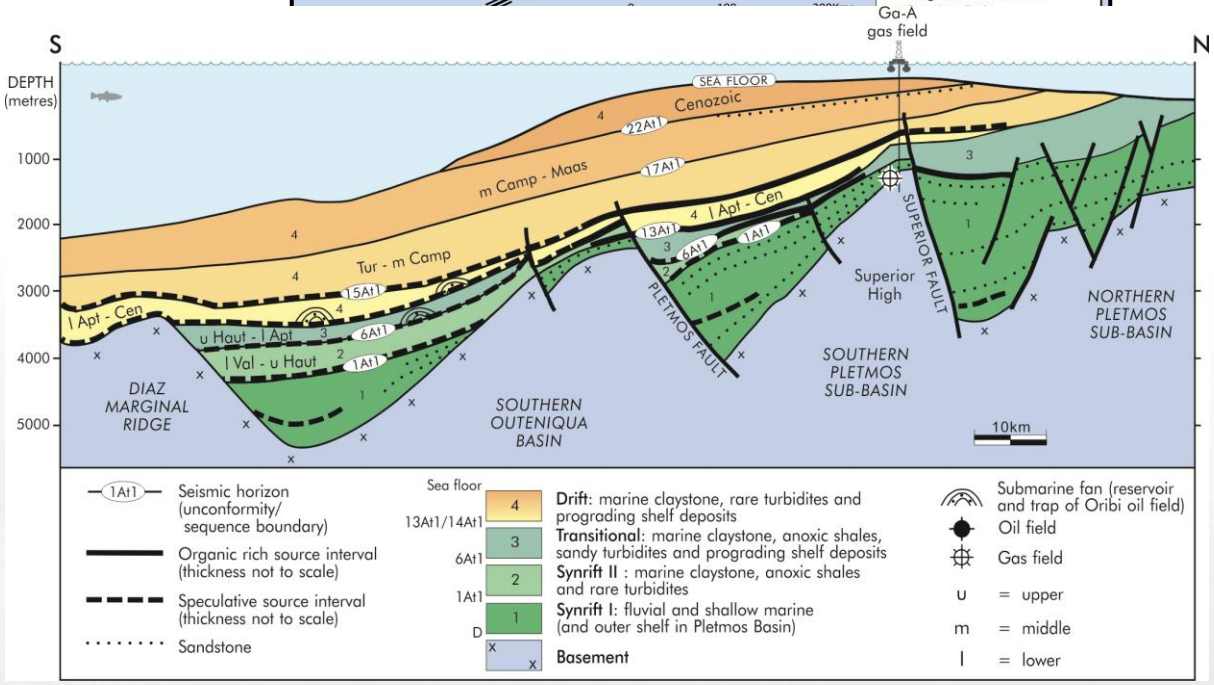




Geological Overview: Outeniqua Basin

- Extends from **Columbine Agulhas Arch** to **Port Alfred Arc**
- Southern boundary: **Diaz Ridge**
- Composed **of five rift-related sub-basins**, divided by **basement highs**
- Dominated by **NW–SE trending half-graben faults** (Cape Fold Belt influence)
- **Synrift** sediments show classic half-graben geometry
- **Drift sequence** varies in thickness
- **Bredasdorp Sub-basin**: most explored, past production
- Recent deepwater discoveries in **Southern Outeniqua Basin**





WESTERN BREDASDORP

Western Bredasdorp Basin

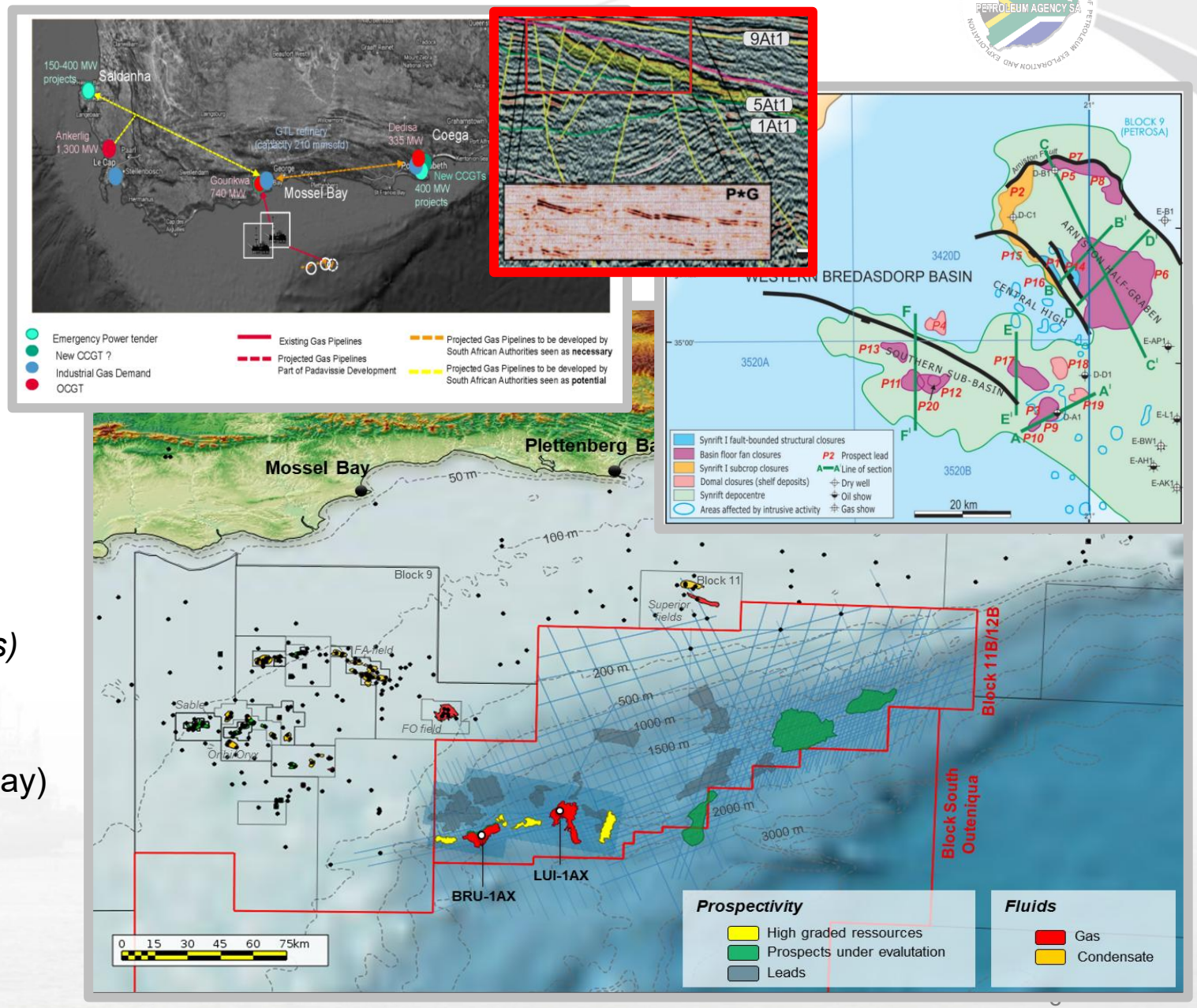
- Forms part of the of the Bredasdorp Basin
- Area: ~10,000 km²
- Water depth: 50 m (NW) to 116 m (SW)

Prospectivity

- Presence of **high-amplitude anomalies**
- **P50 recoverable volumes:** ~1,799 MMbbl
- **In-place volumes:** ~6,062 MMbbl
- ***P6 prospect excluded*** *(NW updip of Rinkhals)*

Infrastructure

- ~70 km from PetroSA GTL Refinery (Mossel Bay)
- Close to pipeline infrastructure in Block 9



Petroleum System Overview

Source Rock

Likely **Kimmeridgian lacustrine shales** (based on well data and onshore equivalents)
Additional **Hauterivian–Aptian wet gas-prone** source intervals

Reservoir

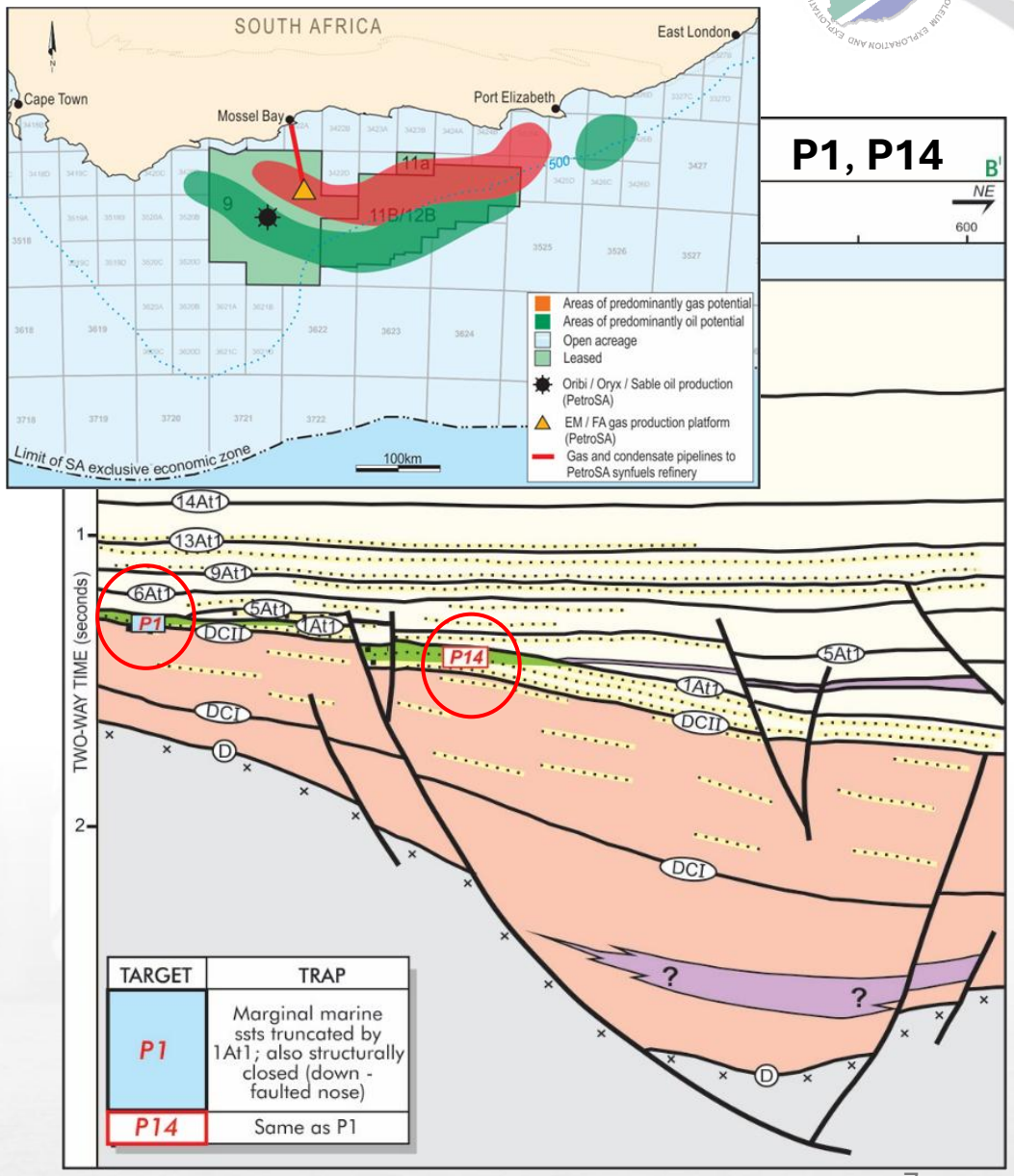
Synrift sandstones (fluvial through shallow marine) (Synrift I & II)
Slope and basin floor fan systems (Hauterivian to Aptian)

Seal

Regional **marine shales** and **unconformities**
Overlying **drift-phase claystones** and intraformational seals

Trap Types

Structural: Domes, anticlines, rollovers (e.g., against **Arniston Fault**)
Stratigraphic: Subcropping sands, pinch-outs, truncations (1At1 & 6At1)
Combination: Mixed traps (e.g., **P1**, **P14**)



WESTERN BREDASDORP EXAMPLES AND PROSPECTIVITY

NW

SE

Reprocessed

Multiple Removal

1.000

2.000

Improved imaging of prograding sequence

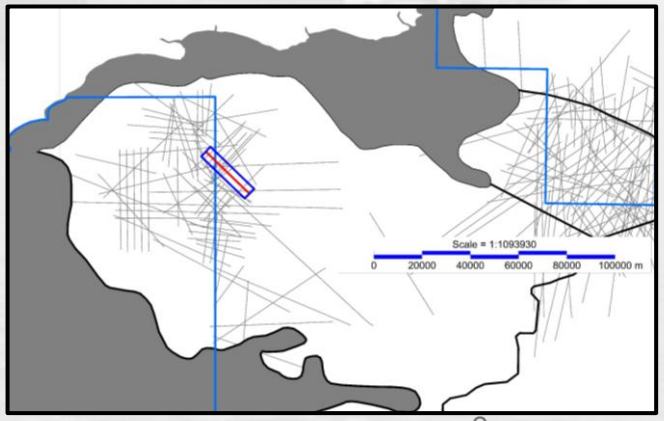
300 ms

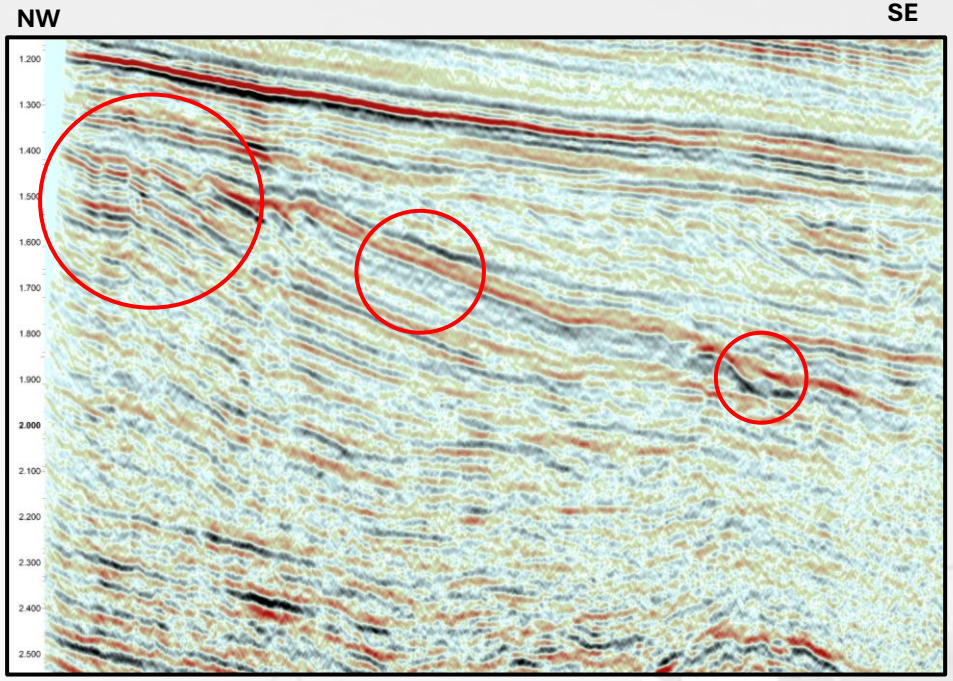
2 km

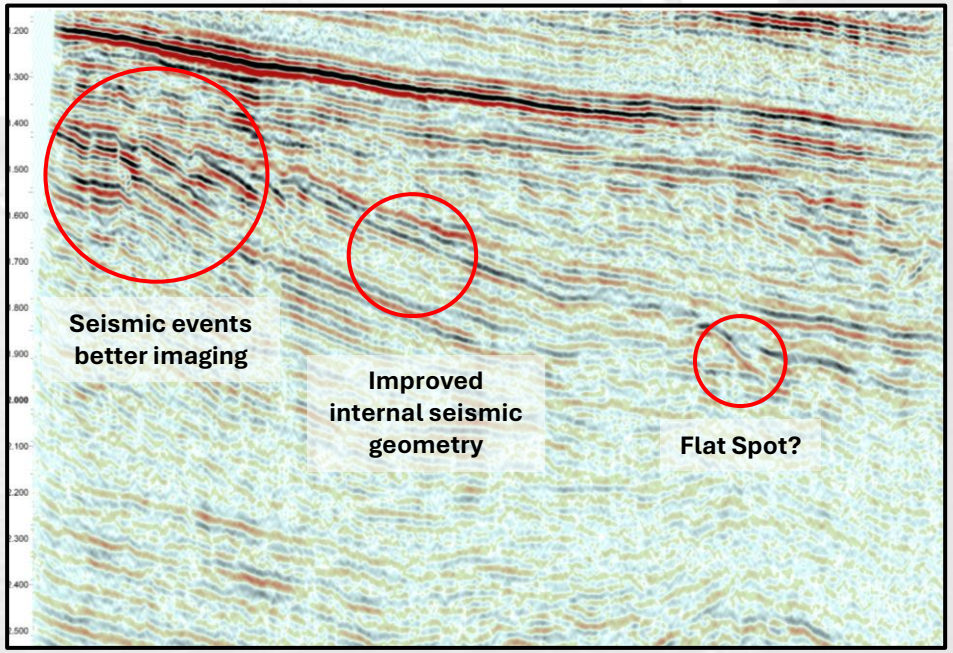
Improved Imaging

- Multiple removal enhances imaging of true seismic reflectors

- Reflectors more continuous and better defined across the profile



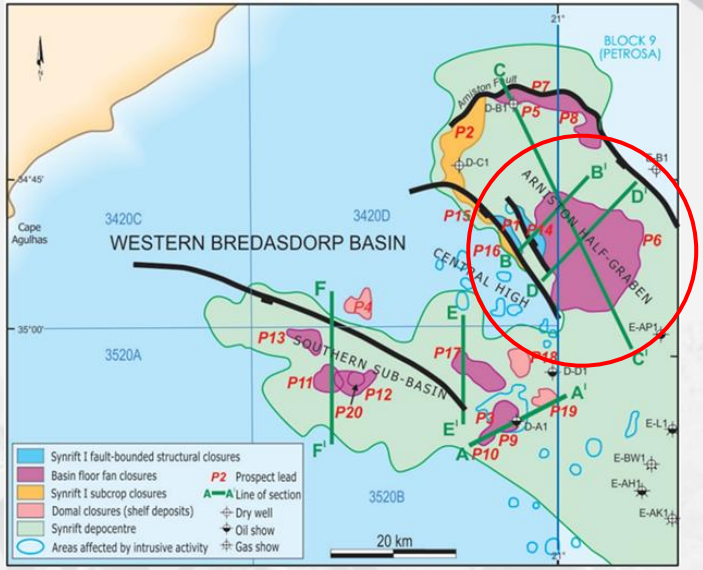


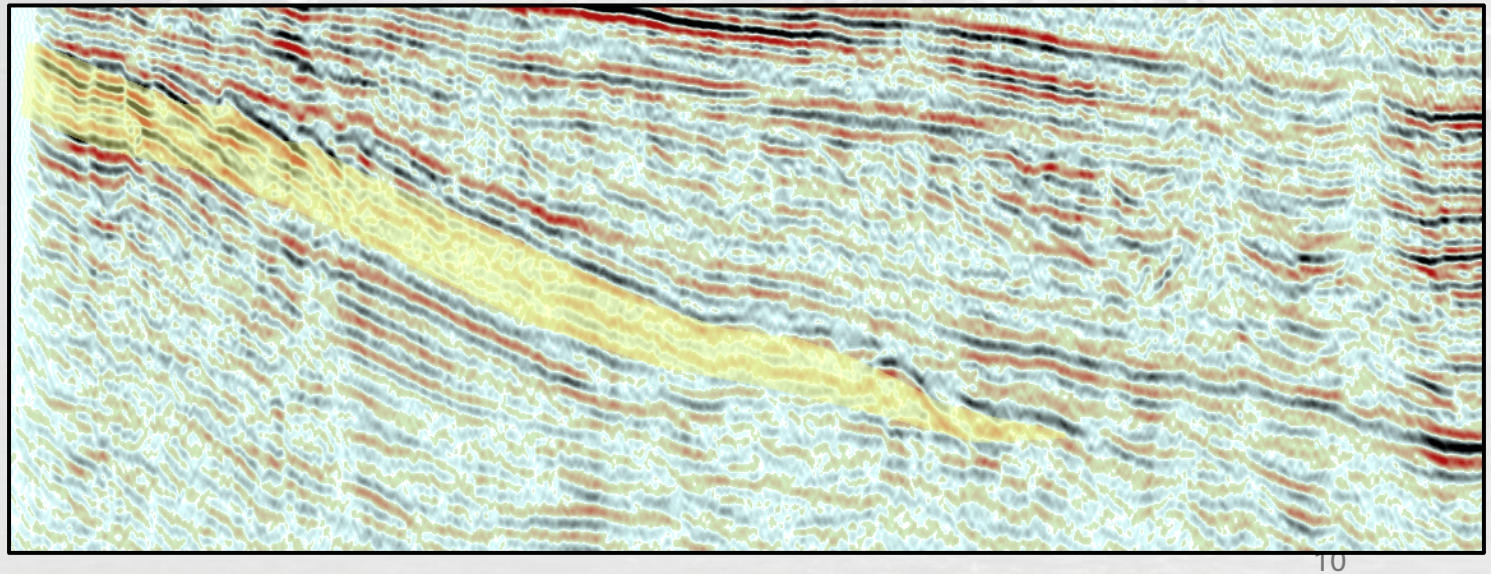


- Better imaging of reservoir
- Overall improved event continuity

Rinkhals Prospect (P6)

- Hauterivian mass-flow feature
- Updip stratigraphic pinchout, stretched over a large area into Block 9
- Supported by an AVO anomaly
- P50 Resources of 129 MMbbl





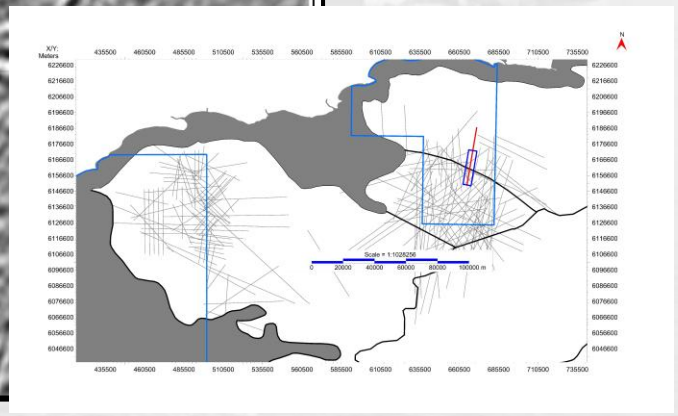
S

N

Reprocessed

2.000

Significant **Improvement of signal-to-noise ratio** resulting in better seismic imaging



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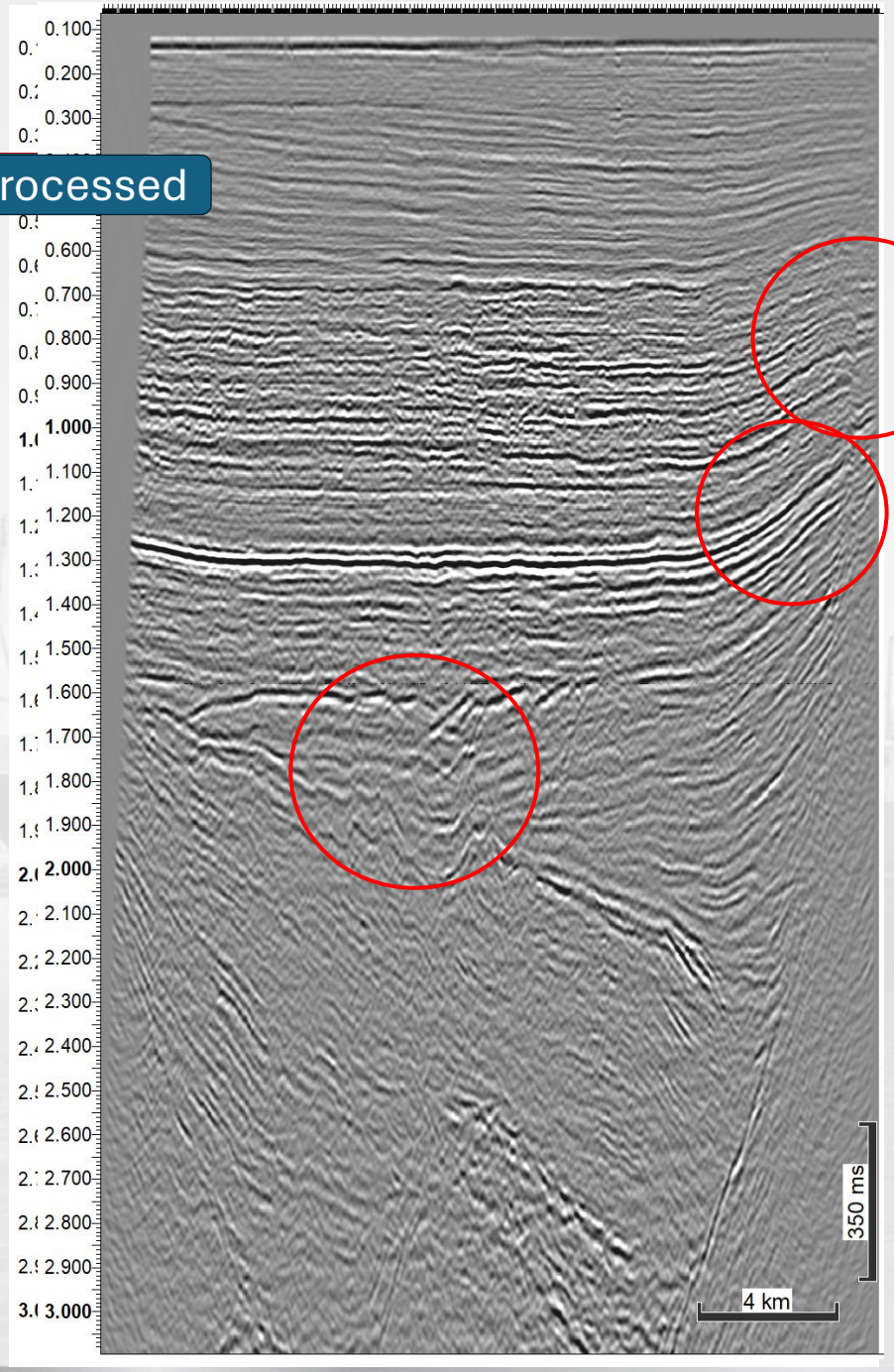


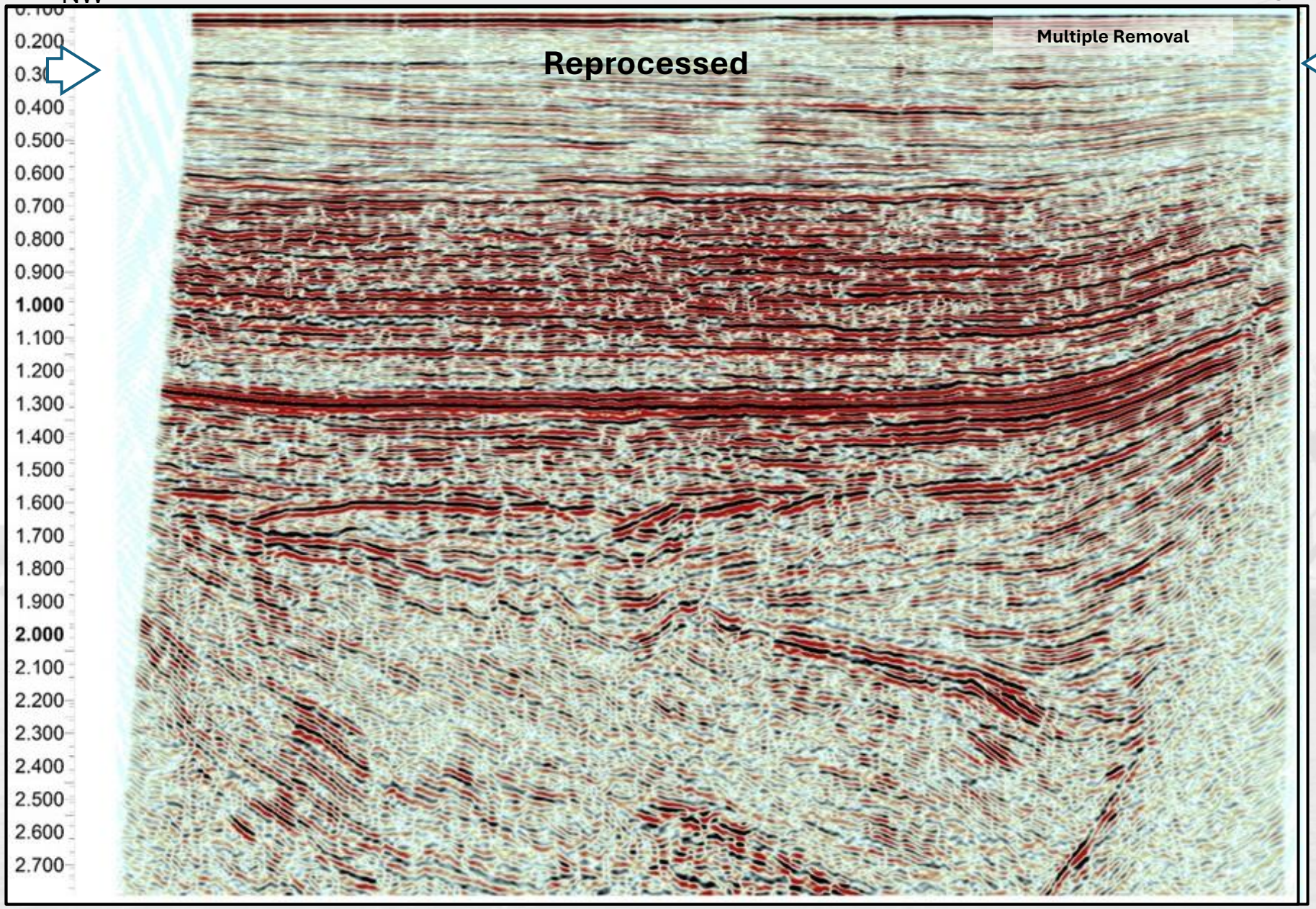
Improved Fault Imaging

Frequency Improvement
Enhanced internal geometry

Improved imaging of antithetic faults

NW

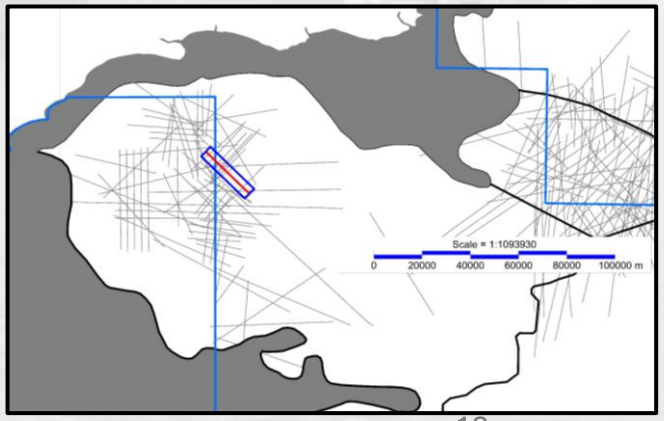
SE

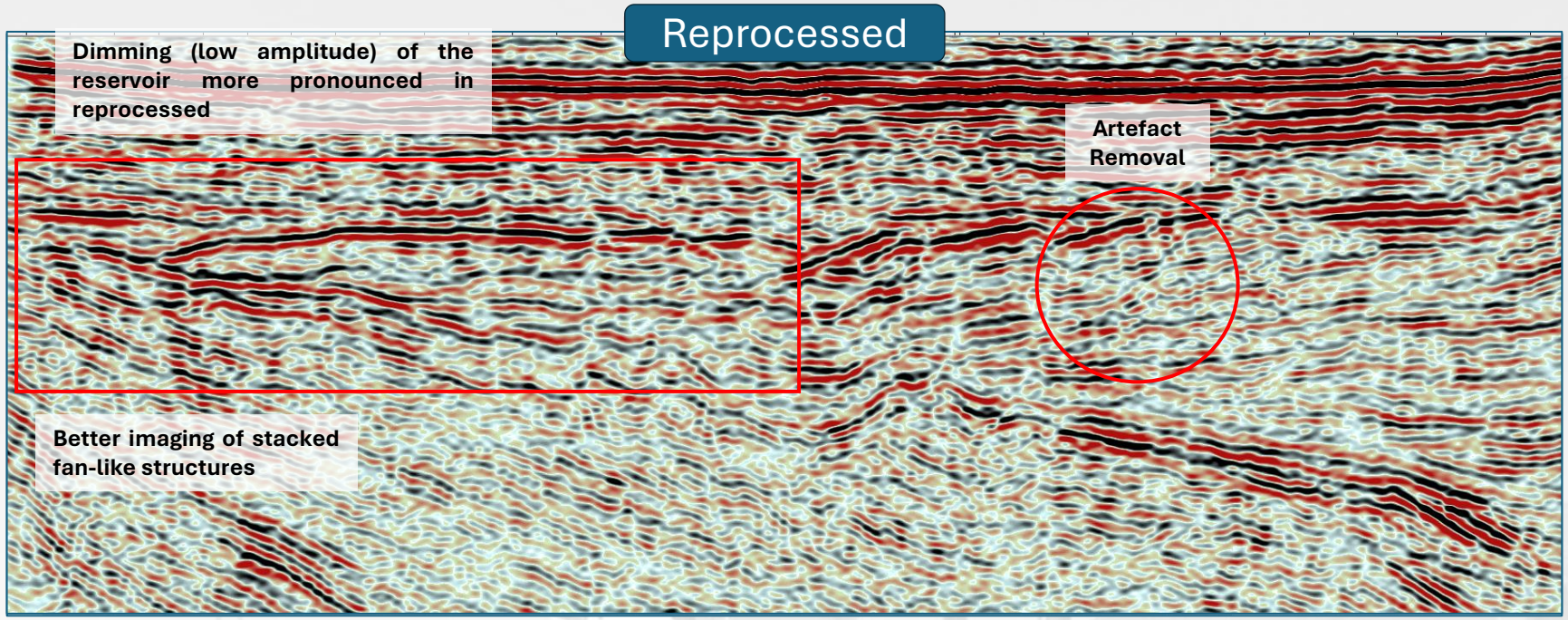


Improved Seismic Imaging

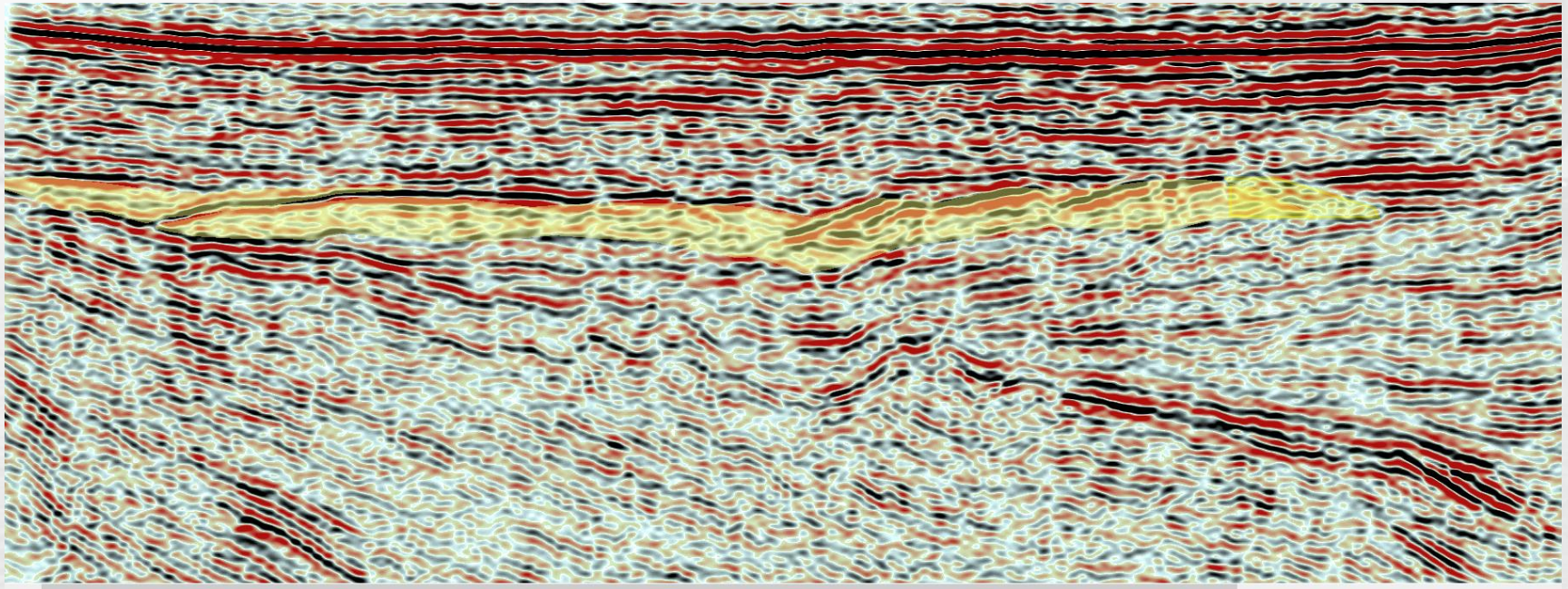
- Multiple removal enhances imaging of true seismic reflectors

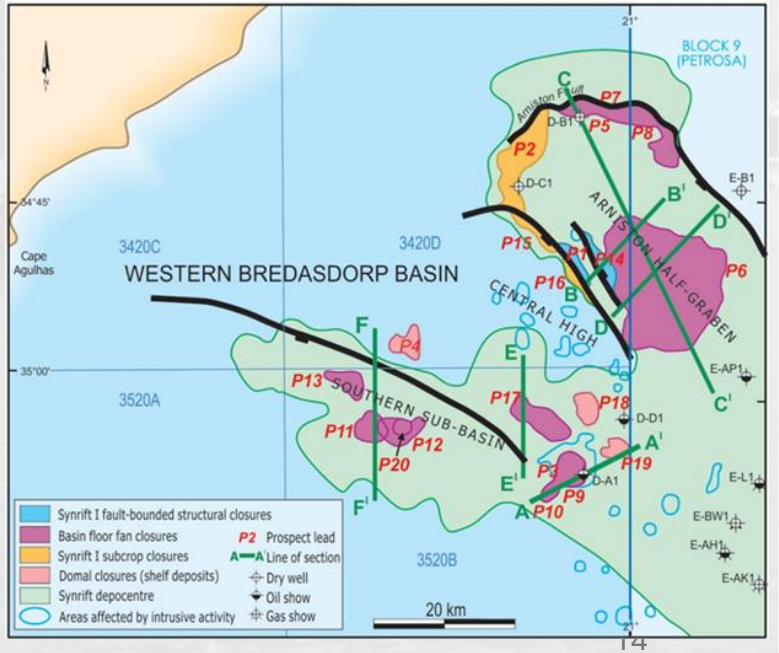
- Reflectors more continuous and better defined across the profile





- Significant noise reduction
- Continuity of seismic events
- Better imaging of the base and top of reservoir





INFANTA EMBAYMENT EXAMPLES AND PROSPECTIVITY

INFANTA EMBAYMENT

Infanta Embayment (IE):

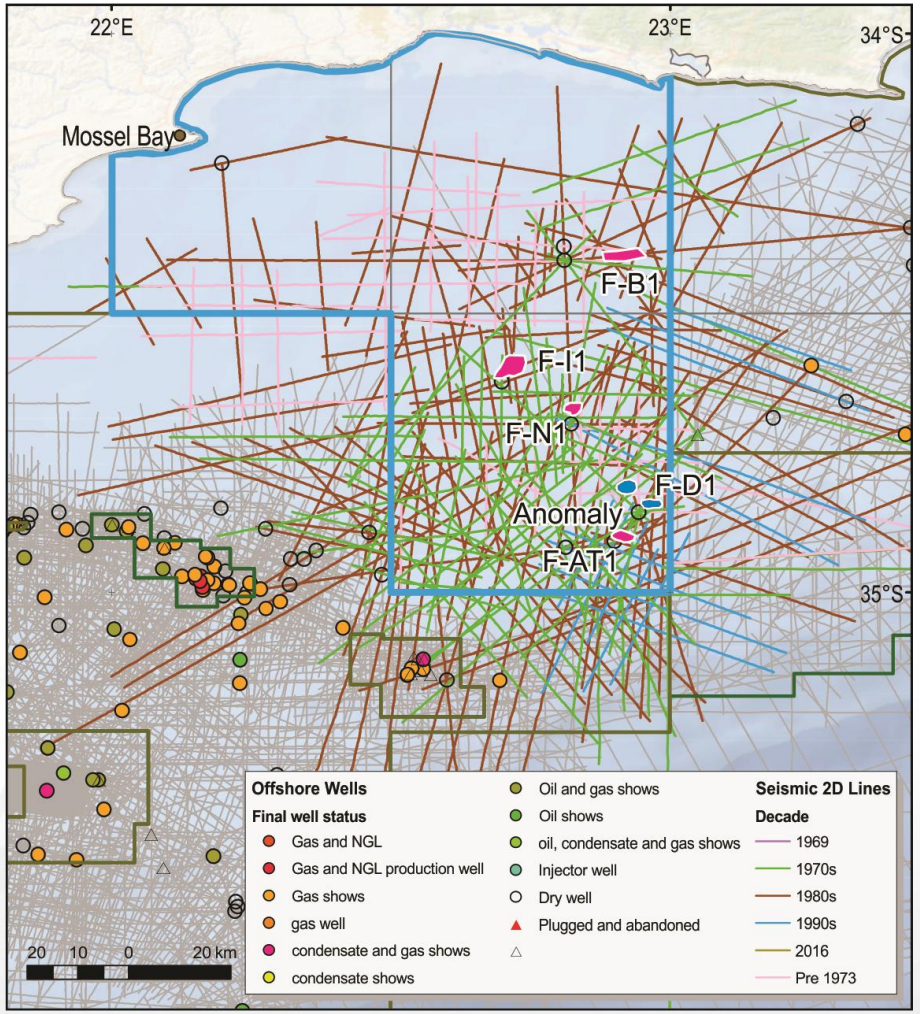
- Forms part of the greater Outeniqua Basin (South Coast, SA)
- Basin extent: ~3000 km^2

Prospectivity

- Six prospects: four with stratigraphic traps
- F-D1 Structural trap
- Anomaly: combination trap

Infrastructure

- Adjacent to existing pipeline in Block 9: PetroSA GTL Refinery in Mossel Bay, ~70km.



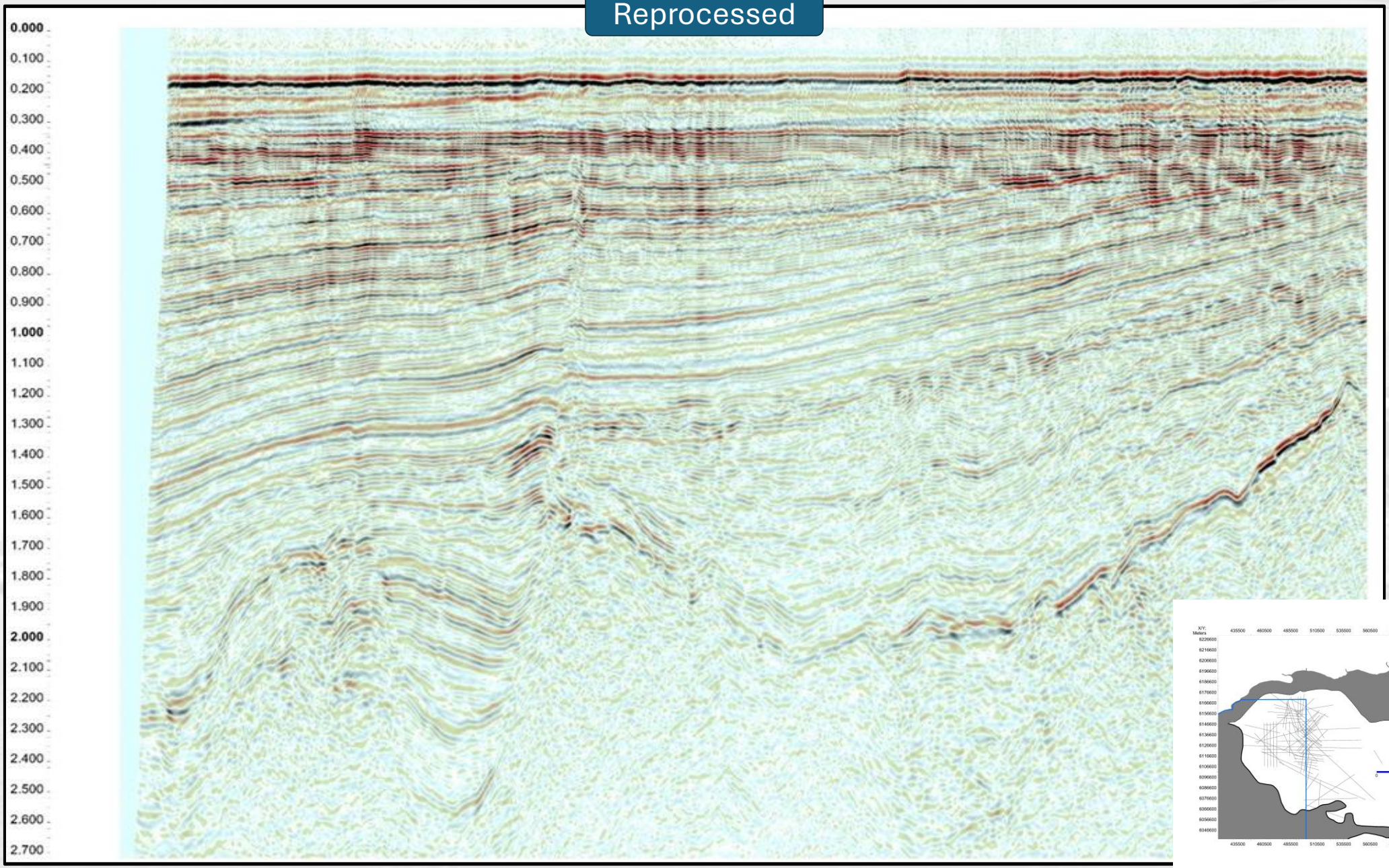
INFANTA EMBAYMENT

ID	Prospect	Water depth	Total Depth	Charge	Source	Seal	Reservoir	Trap Type
3422B1	F-B1	183	1500	Synrift	Lower Cretaceous	Shale	Shallow marine	Stratigraphic
3422D1	F-AT1	150	2500	Synrift	Mid Cretaceous	Shale	Non marine	Stratigraphic
3422D2	F-D1	163	3000	Pre - Synrift	Synrift	Shale	Jurassic TMS	Structural
3422D3	F-I1	120	2000	Synrift	Synrift	Shale	Shallow marine	Stratigraphic
3422D4	F-N1	244	2000	Synrift	Synrift	Shale	Shallow marine	Stratigraphic
3422D5	Anomaly	120	2200	Lower Cretaceous	Lower Cretaceous	Shale	Shallow marine sandstone	Structural/ Stratigraphic

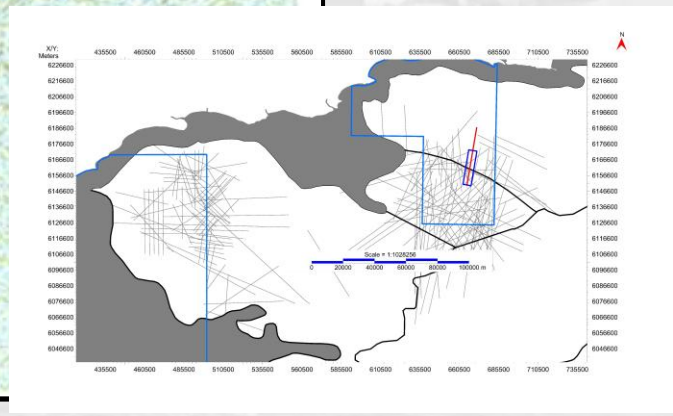
S

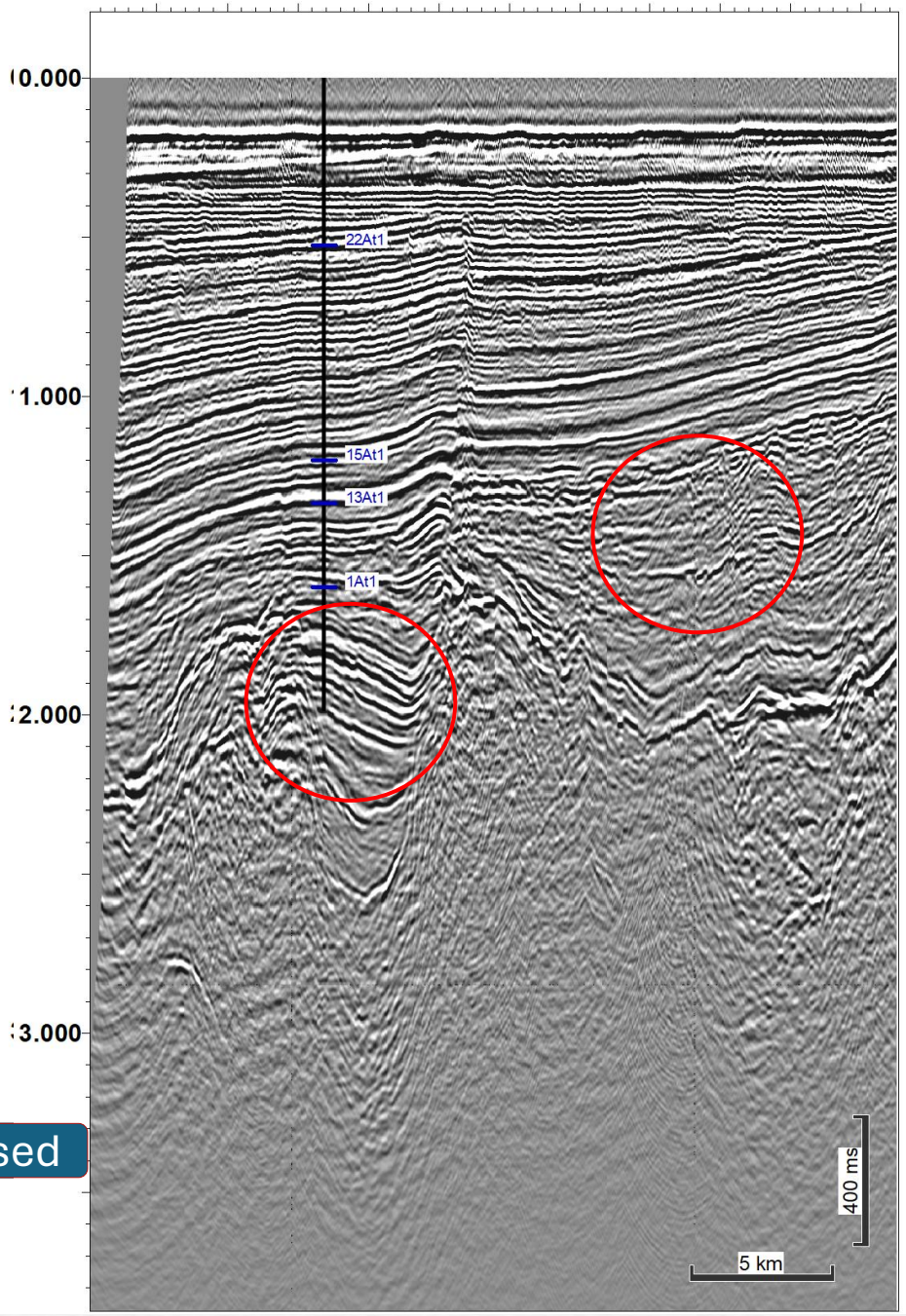
N

Reprocessed



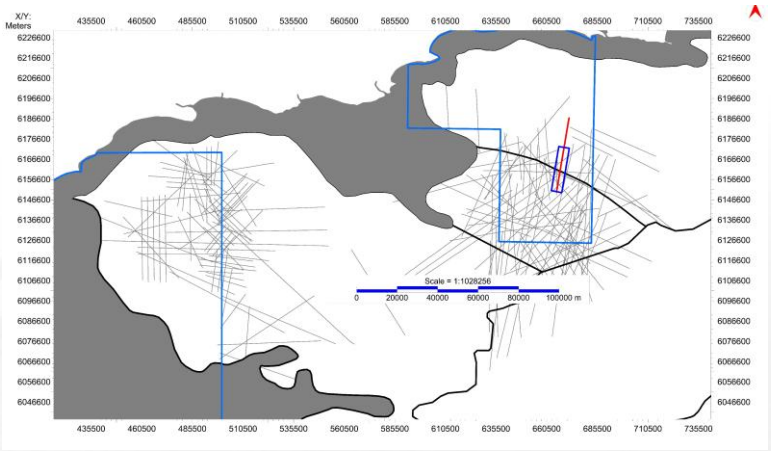
Improvement of signal-to-noise ratio resulting in better imaging of the reservoir



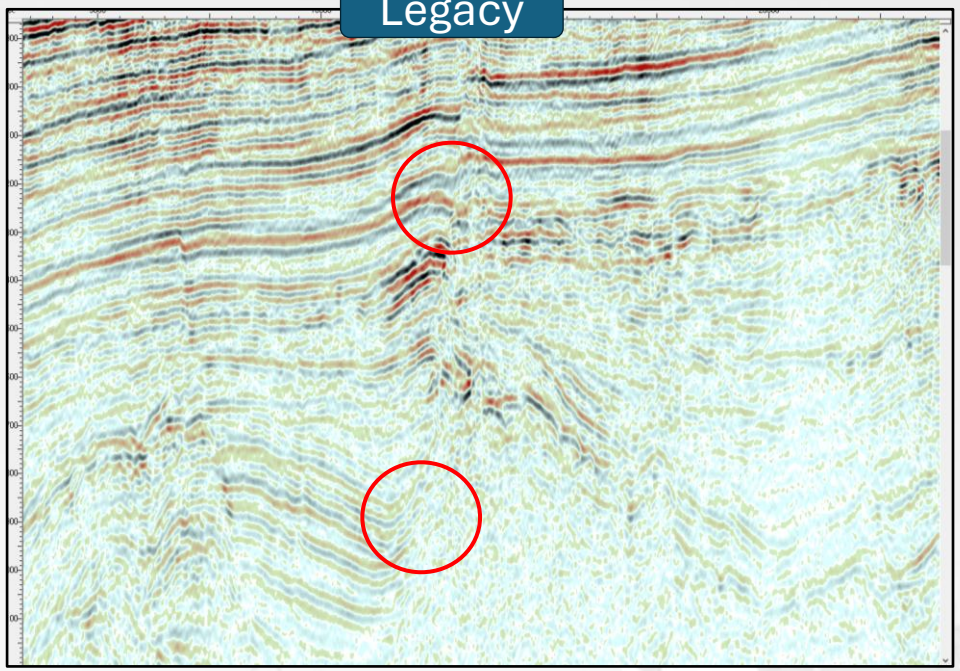


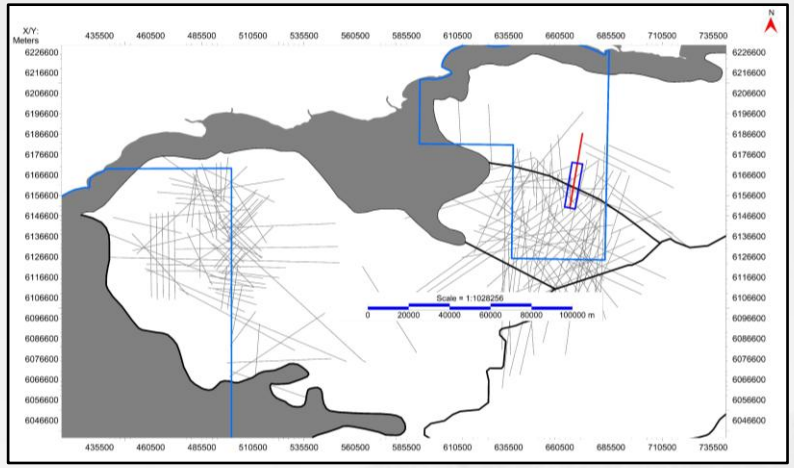
Reprocessed

- Better imaging of seismic events
- Reflector continuity



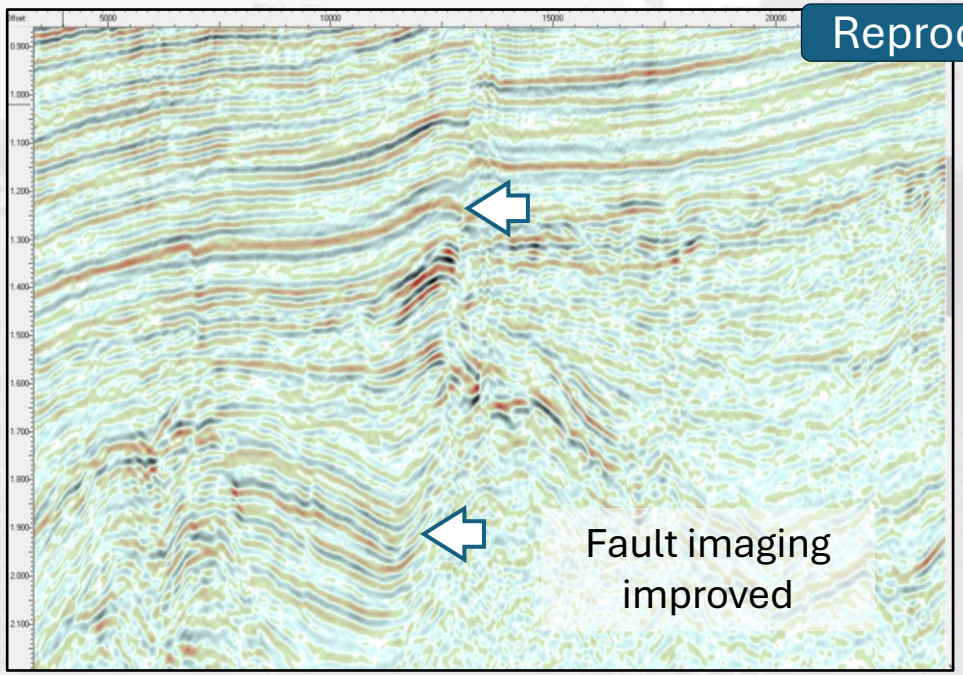
Legacy

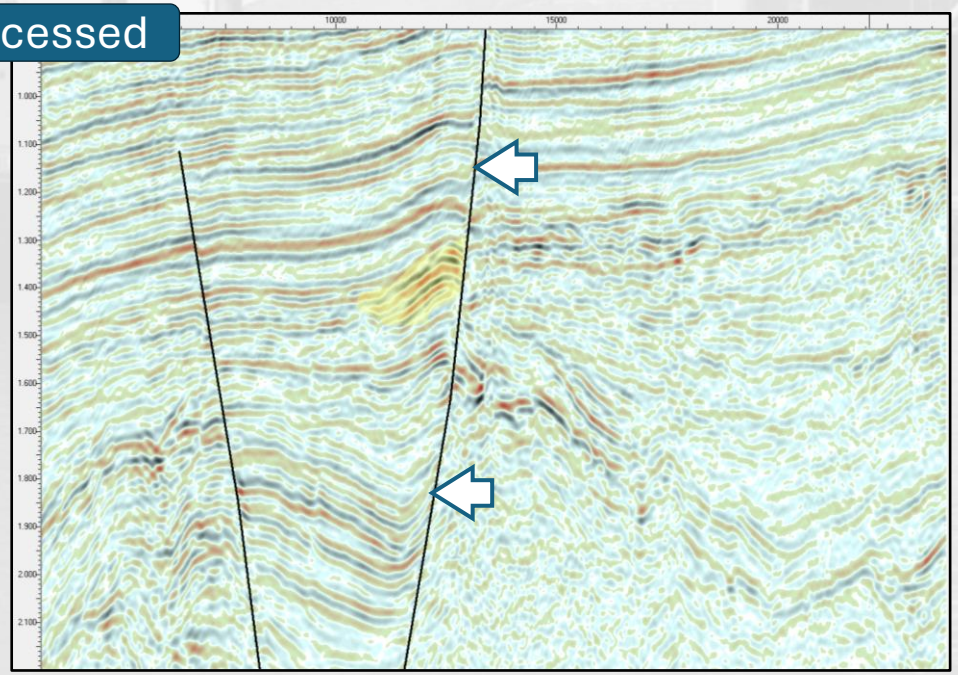




Prospect F-N1 Comprises a Cretaceous roll-over anticline structure along a fault, with a P50 recoverable oil estimate of 12.63 MMbbl.

Reprocessed





Fault imaging improved – resulting in well-defined rollover anticline structure

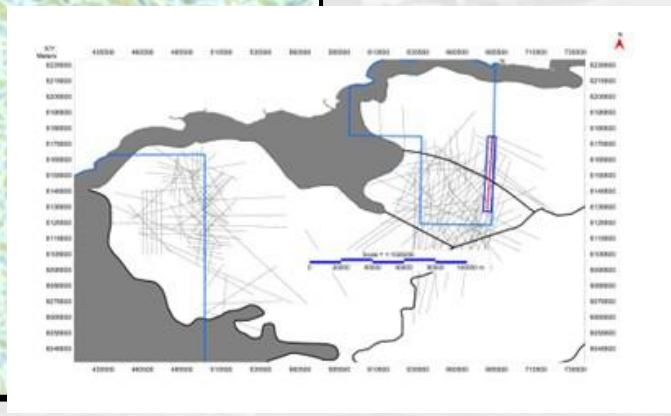
S

N

Reprocessed

Multiple Removal

- Significant **Improvement of signal-to-noise ratio**
- **Better fault imaging**



CONCLUSIONS

Reprocessing of seismic data resulted in the following

📈 Sharper Imaging: Better reflector continuity and clearer definition of structure and stratigraphy.

🛢️ Reservoir Visibility: Reservoir zones more clearly defined — aiding in characterization.

🧠 Interpretation Confidence: Higher resolution = more accurate geological interpretations.

📦 Strategic Value: Enhanced datasets make the acreage more attractive to explorers ahead of bidding rounds

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Thank You