# Lansdowne oil & gas

Celtic Sea Oil & Gas Conference 30 April 2014



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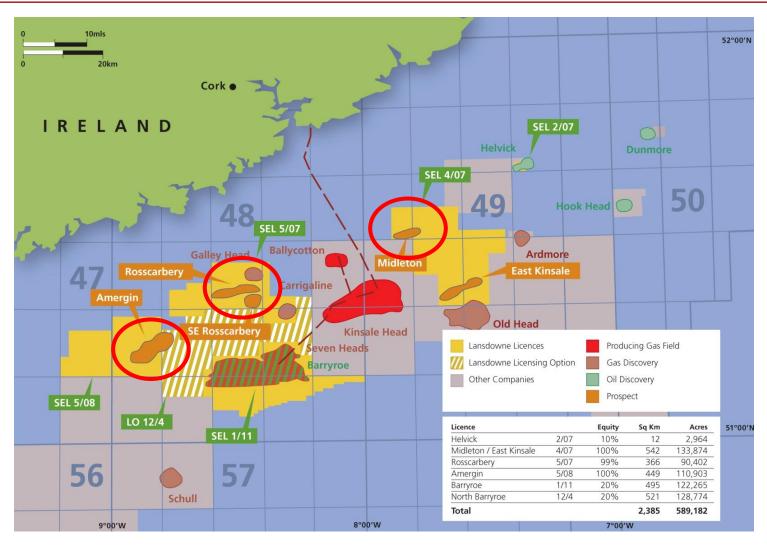
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#### **Lansdowne - Our Business**

- Focus on the North Celtic Sea Basin where there are proven petroleum systems for oil & gas, alongside established gas production infrastructure
- Balanced portfolio of:
  - Contingent oil resources
    - > Barryroe, Helvick
  - Contingent gas resources
    - Galley Head
  - Drill ready, play opening oil prospect
    - > Amergin
  - Drill ready gas prospects close to infrastructure
    - Midleton
    - Rosscarbery
- Technical & commercial expertise
  - Extensive regional knowledge base
  - Utilisation of modern technology



#### **Lansdowne - Celtic Sea Licences**



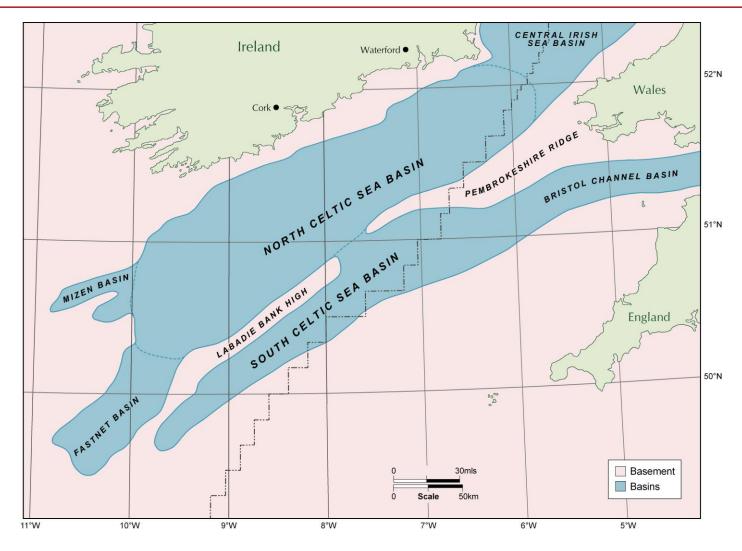


#### Why the Celtic Sea?

- Underexplored
- Proven Petroleum Systems
- Prospects

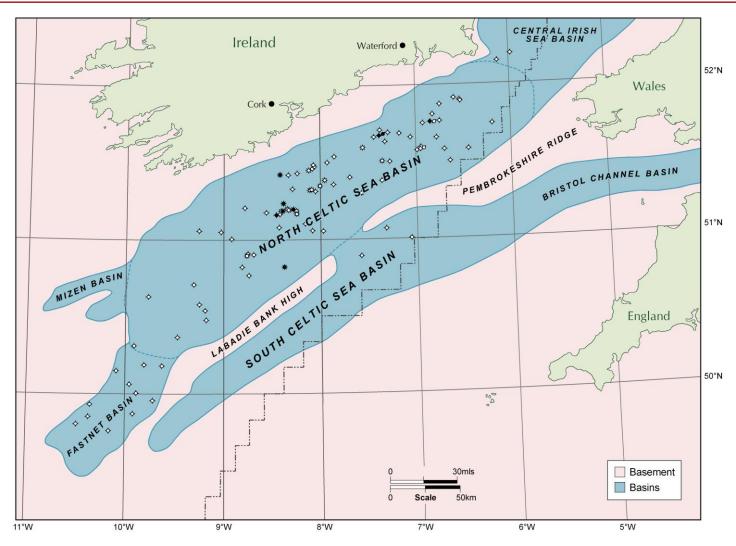


#### **North Celtic Sea Basin Definition**





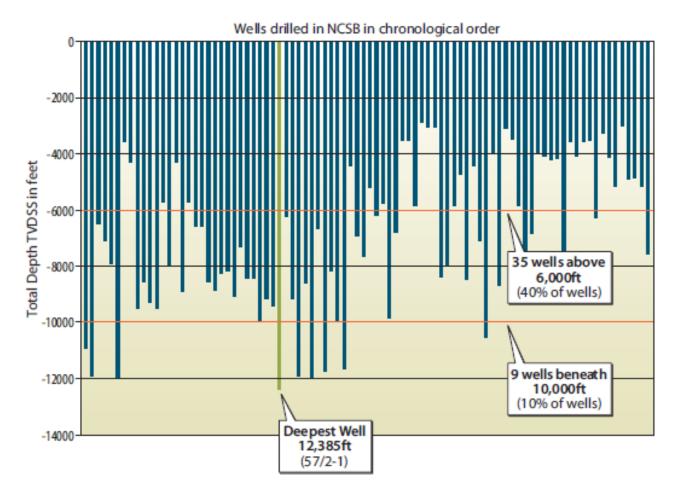
#### **North Celtic Sea Basin - Wells**





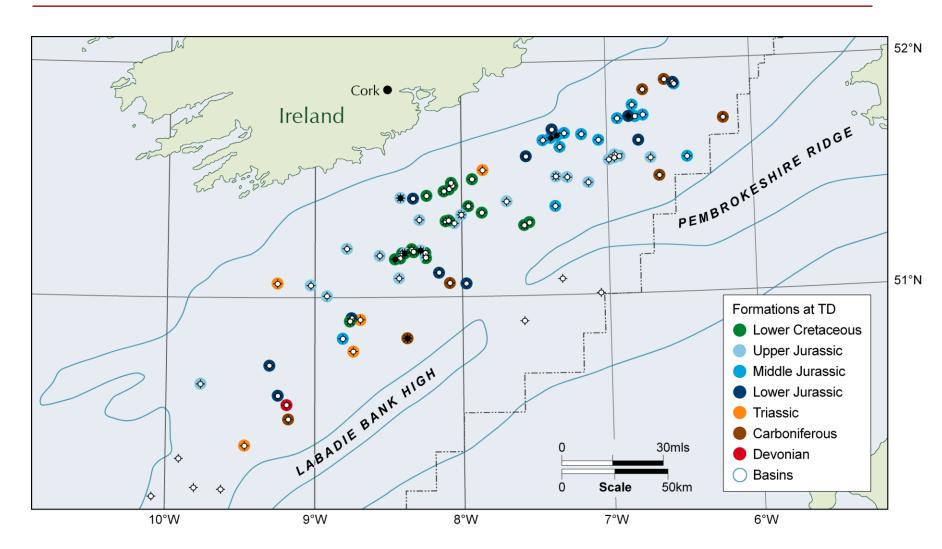
## **Drilling Depths**

#### North Celtic Sea Basin - Drilling Depths



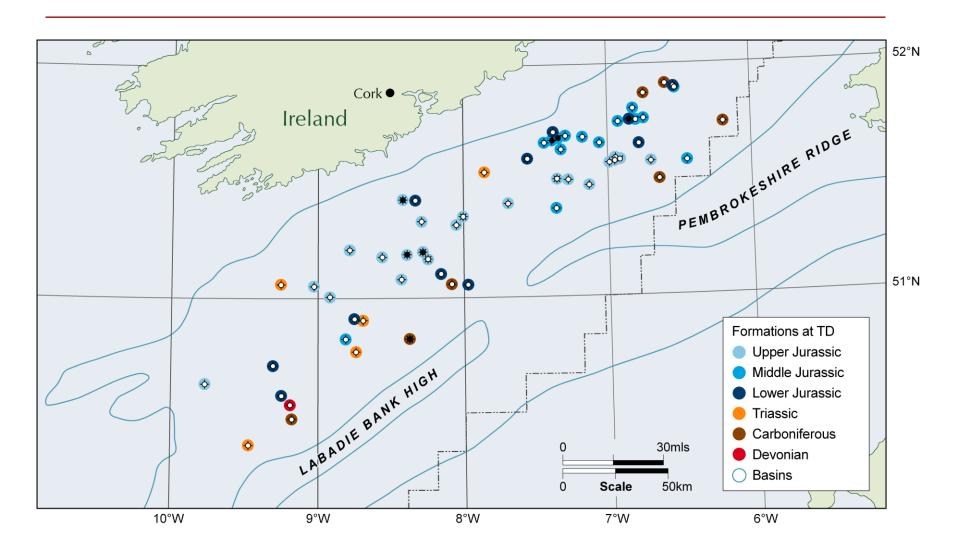


## Formation at Total Depth (TD)



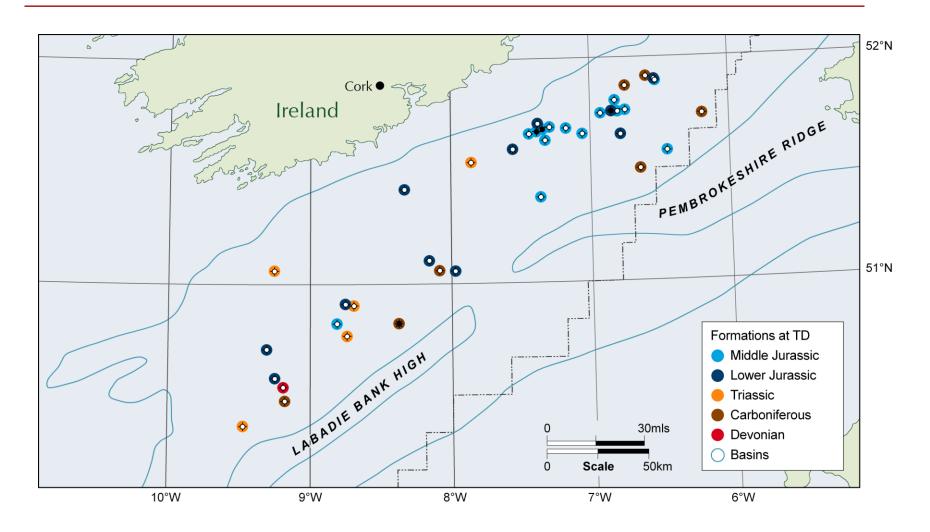


# Formation at TD, excluding wells that TD in the Cretaceous



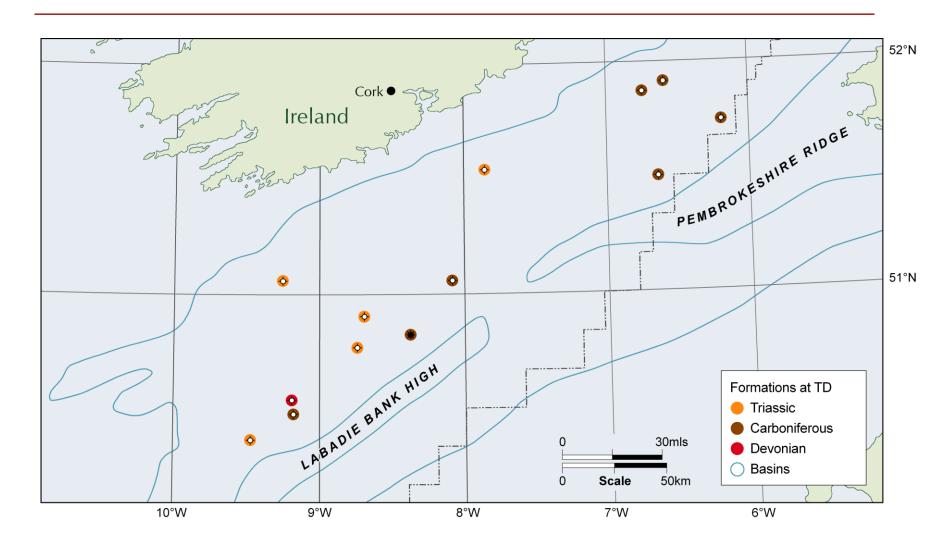


# Formation at TD, excluding wells that TD in the Cretaceous and Upper Jurassic





# Formation at Total Depth, Triassic and older





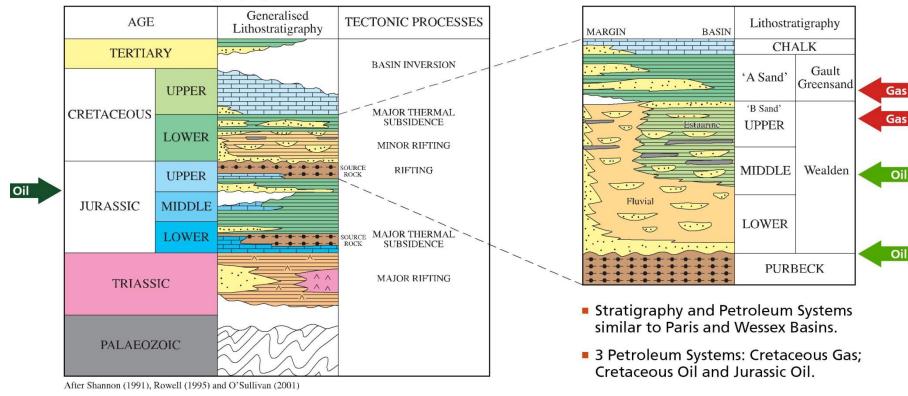
#### Why the Celtic Sea?

- Underexplored
- Proven Petroleum Systems
- Prospects



#### **Celtic Sea Petroleum Systems**

#### Celtic Sea – Stratigraphy





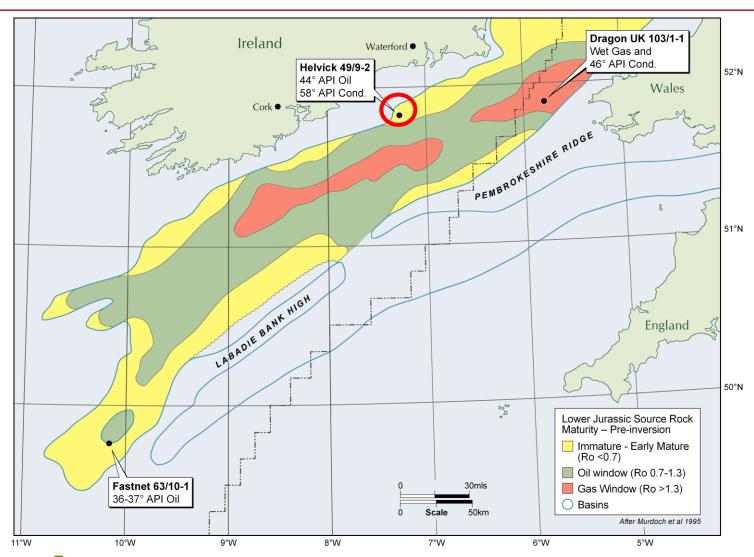
#### **Stratigraphy and Source Rocks**

Age		Generalised Lithostratigraphy	Source Rocks	Hydrocarbon Type	Discoveries
TERTIA	TERTIARY				
CRETACEOUS	Upper				
SILE WISESSO	Lower		Wealden Coals	Biogenic dry gas	Kinsale Head, Ballycotton, Seven Heads Galley Head, Carrigaline, Old Head, Schull
	Upper	****	Purbeck – Kimmeridgian Lacustrine Shales	Waxy oil	Barryroe, Hook Head, Baltimore, Nemo, 49/9-4
JURASSIC	Middle				
	Lower		Lower Jurassic (Liassic) Marine Shales	"Normal" non-waxy oil and wet gas / condensate	Helvick, 63/10-1 Dragon
TRIASSIC		^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^ ^			
PALAEOZOIC					

After Shannon (1991), Rowell (1995) and O'Sullivan (2001)



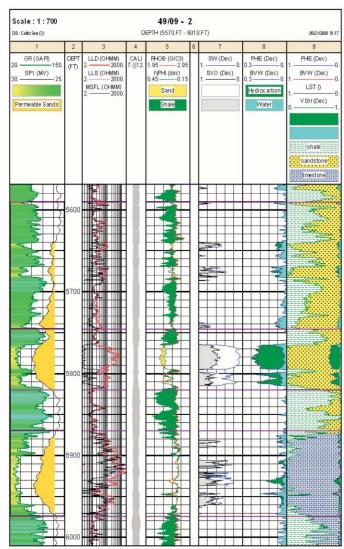
## **Jurassic oil Play Fairway & Discoveries**



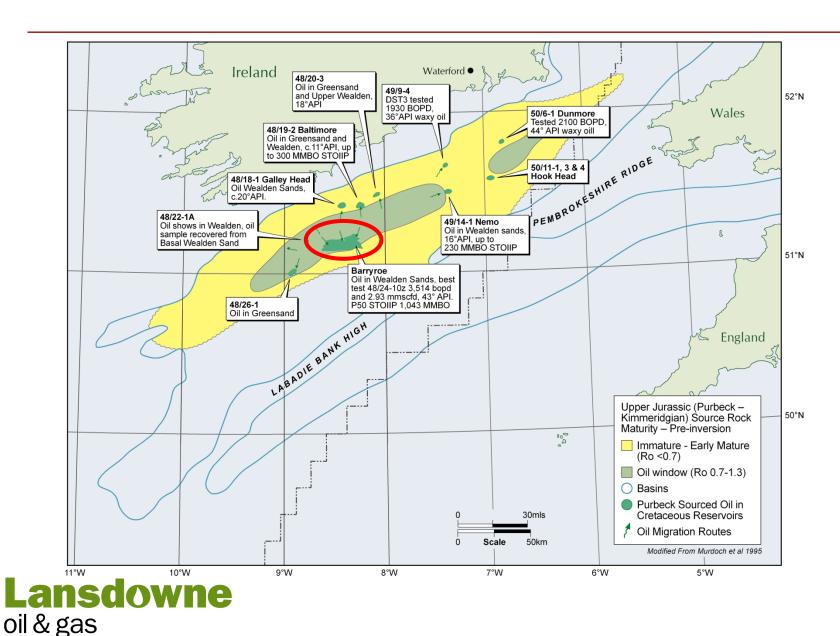


#### **Helvick Oil Field**

- Helvick (49/9-2 well) discovery opened up Jurassic Oil Play Fairway along northern margin of the basin
  - High deliverability (cumulative 9901 bopd) reservoir sands
  - Good quality, light (44 API) and nonwaxy oil sourced from Lower Jurassic (Liassic) source rocks



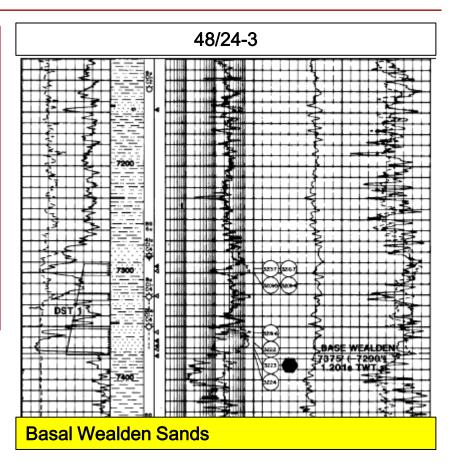
#### Purbeck- Wealden Oil Play & discoveries



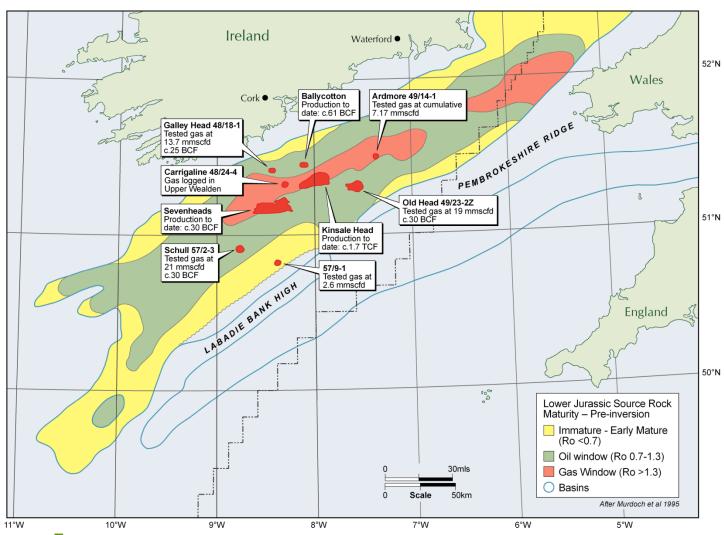
## **Barryroe Oil Field**

Properties	48/24-10z
Oil	43° API
Wax Content	17%
In-situ viscosity	0.8 cP
GOR	c. 800
Flow rate	3,514 bopd & 2.93 mmscfd





#### **Cretaceous Gas Play & discoveries**

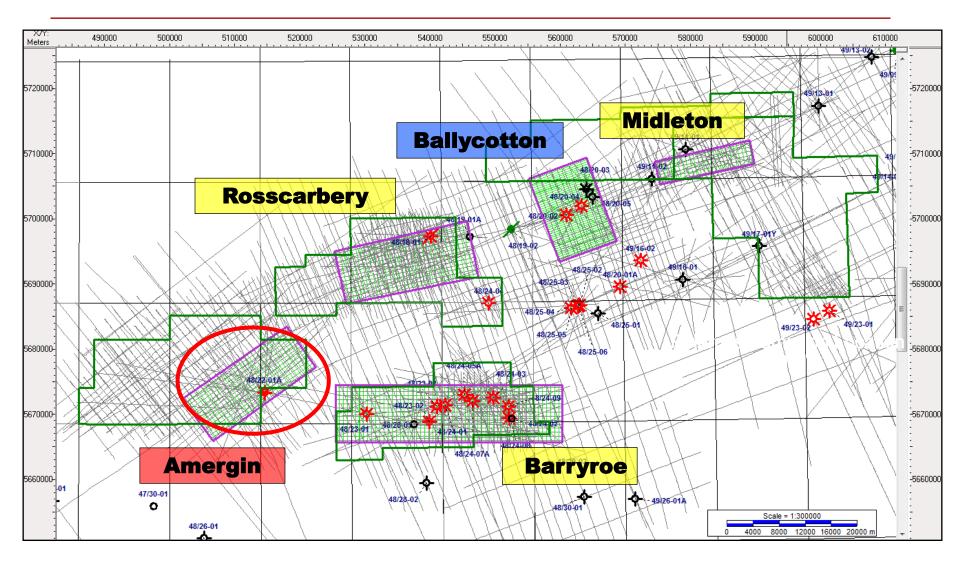


#### Why the Celtic Sea?

- Underexplored
- Proven Petroleum Systems
- Prospects

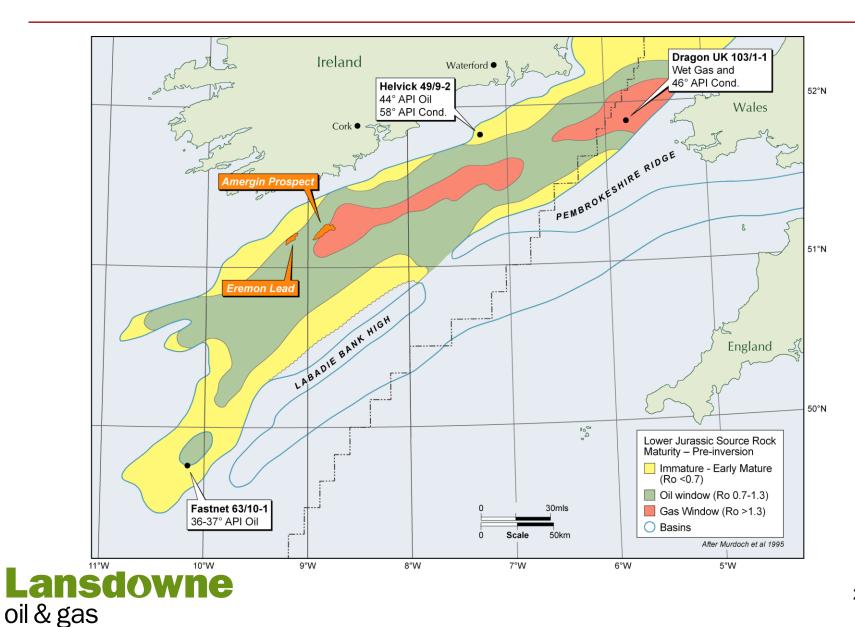


# **Prospect definition requires 3D seismic**

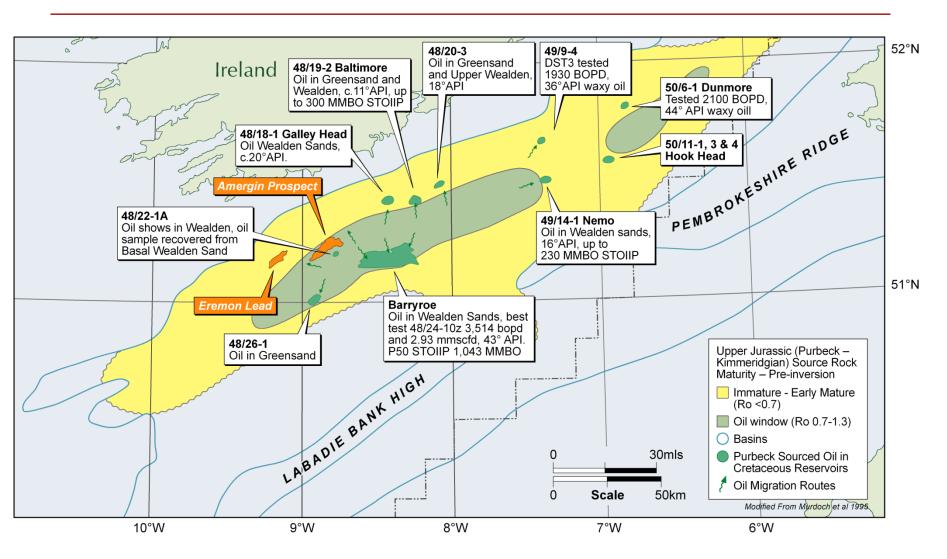




#### **Amergin and Jurassic Oil Play Fairway**

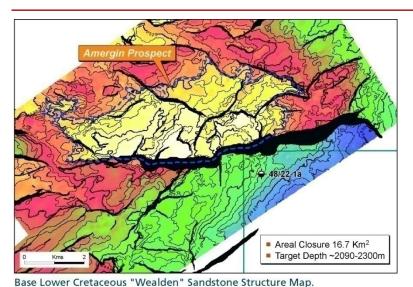


## **Amergin & Cretaceous Oil Play Fairway**





## **Amergin Prospect (Lansdowne 100%)**

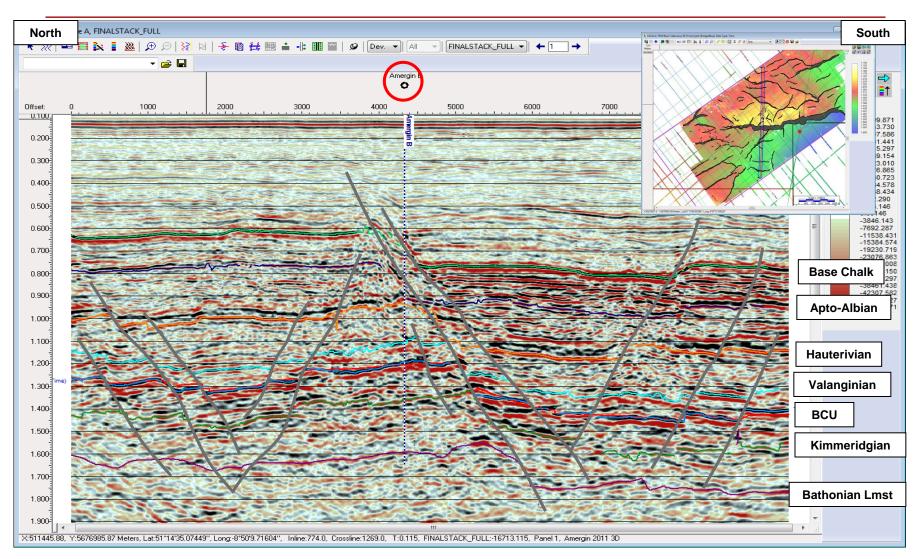


Water Depth :	340 feet
Planned Total Depth :	11,000 feet

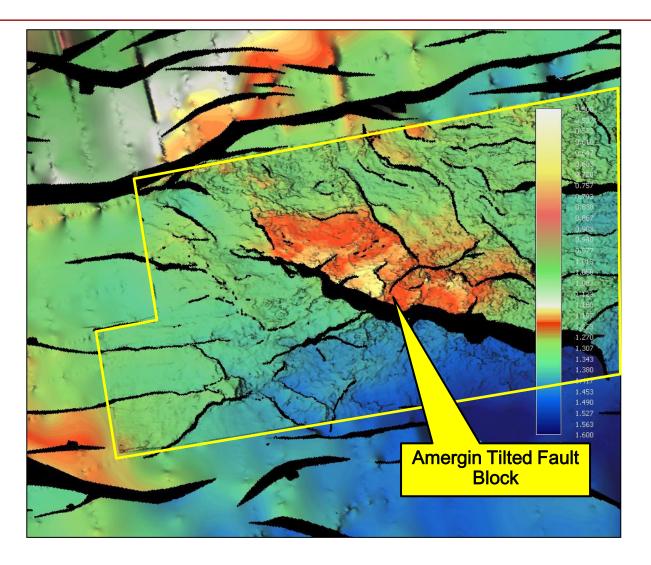
Daje Lowe	referenced wediden sundstone struc	ture wap.
NW	Line 675	SE
TWT (Secs)	to the second se	
0.500 -		
1.000 -		
1.500 -		
1.000		
2.000 0 Kms		
3D Saismir	c Line 1110	

Reservoir	MMbbl STOIIP/Recoverable		
	P90	P50	P10
Hauterivian	87/23	118/35	154/50
Base Valanginian	126/31	149/45	177/60
Basal Wealden	297/73	350/104	409/139
Upper Jurassic	105/36	122/47	142/58
Total	615/163	739/231	894/307

## Amergin – 2011 3D Seismic

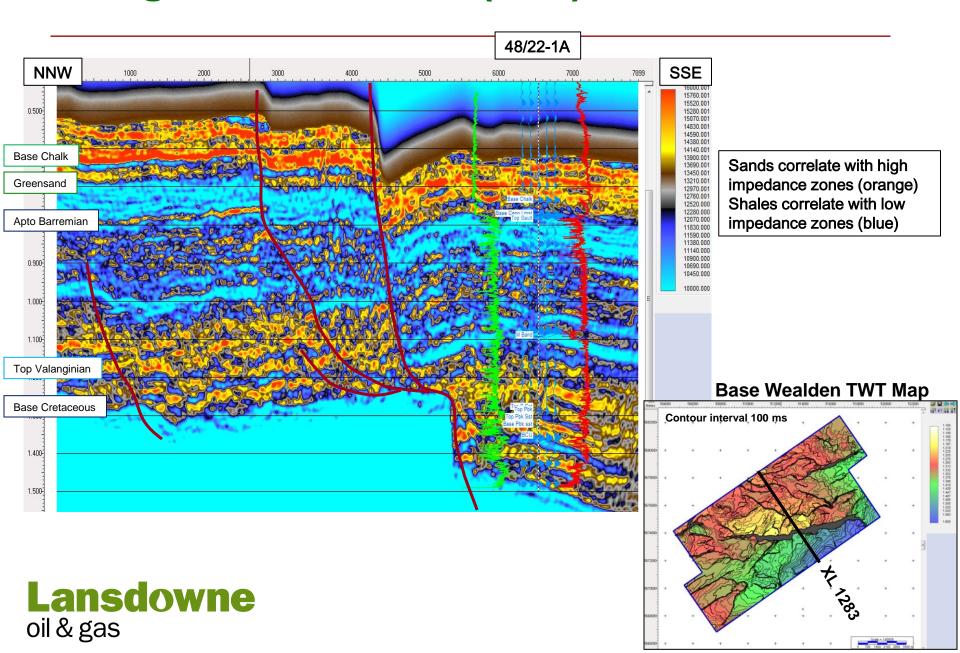


#### **Amergin - Base Wealden Structure (2D + 3D)**

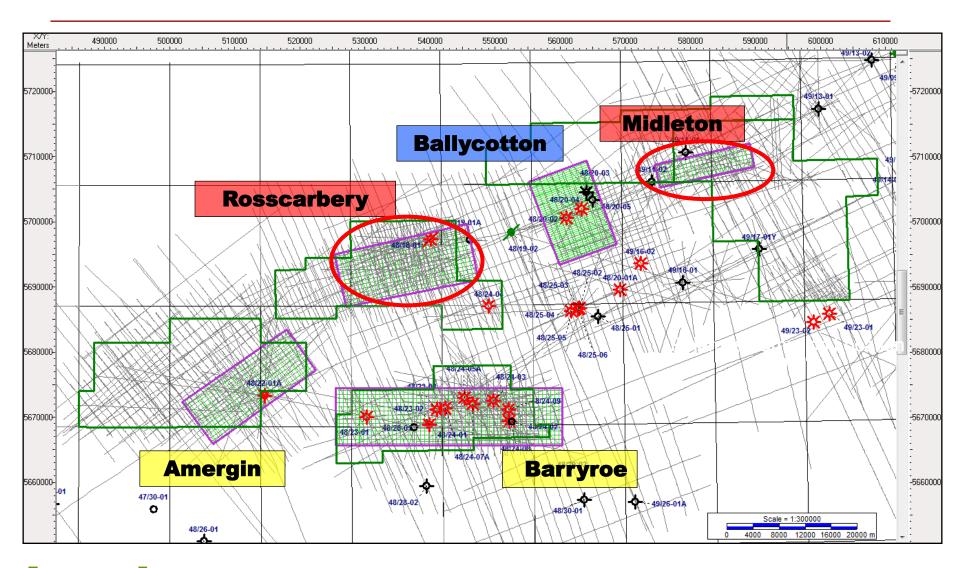




#### Amergin Inversion Psi(-55°) Tie to 48/22-1A

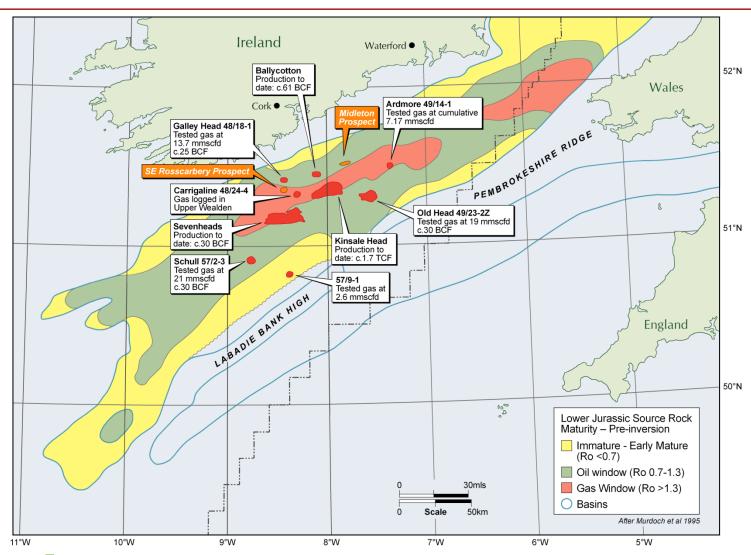


# **Prospect definition requires 3D seismic**





### Midleton/Rosscarbery & Cretaceous Gas Play



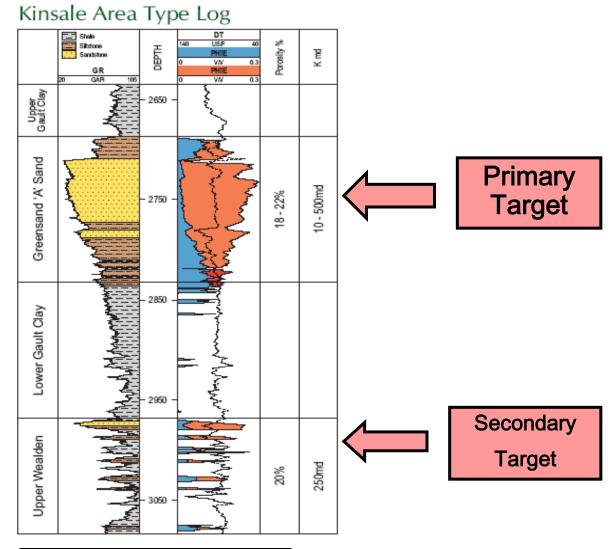


#### **Cretaceous Gas Reservoirs**

Greensand or A Sand		
Producing	Kinsale Ballycotton	
Discoveries	Galley Head	
Target	Rosscarbery Midleton East Kinsale	

Wealden		
Producing	Kinsale Seven Heads	
Discoveries	Old Head, Schull, Carrigaline, Ardmore	
Target	Rosscarbery East Kinsale	

# Lansdowne oil & gas



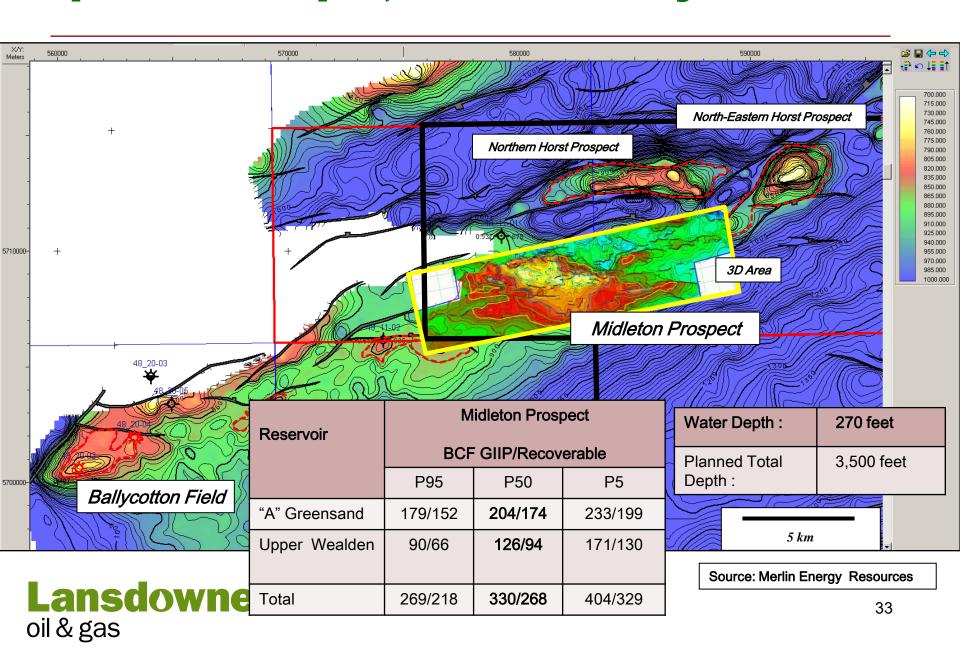
Source: Merlin Energy Resources

#### 3D Seismic Inversion - Cretaceous Gas Play

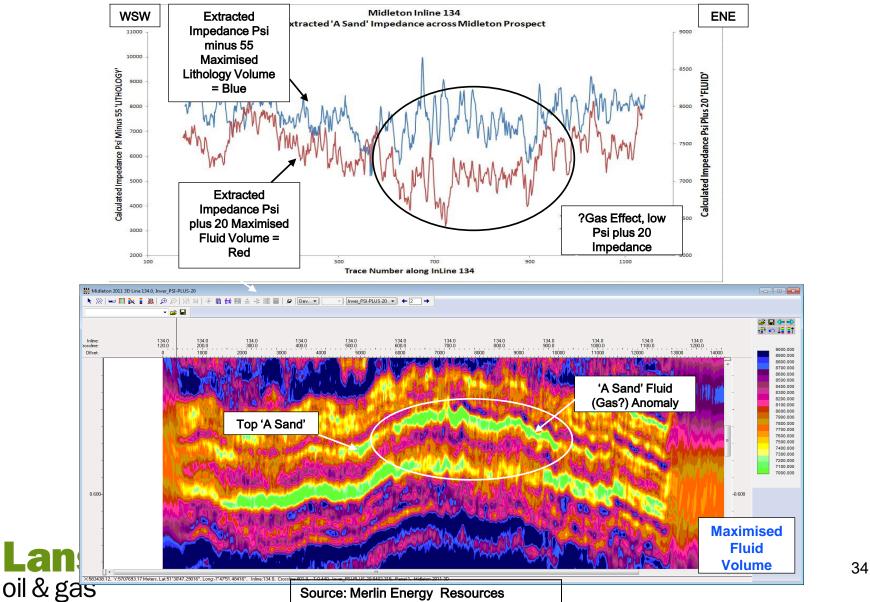
- Log data from wells integrated with the 2011 3D seismic data to look for impedance changes caused by variations in fluids
- Fluid substitution modelling work indicates that gas bearing sands in the Greensand and Wealden should generate a characteristic seismic response
- Fluid anomalies, interpreted as gas bearing Greensand reservoirs, identified in:
  - Galley Head gasfield
  - Midleton prospect
  - SE Rosscarbery prospect
- Fluid anomaly interpreted as possible gas bearing Upper Wealden sands identified in Main Rosscarbery prospect



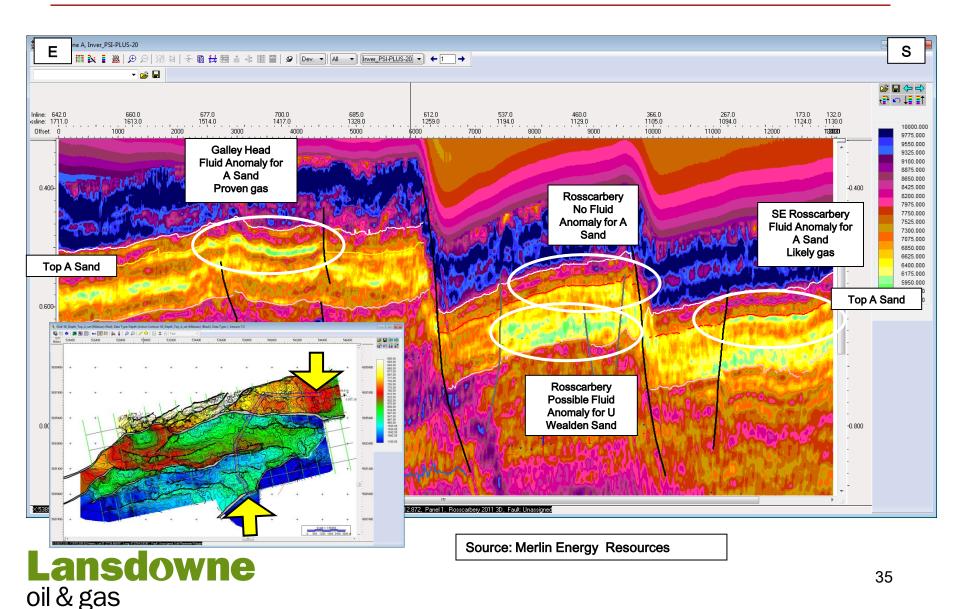
## **Top A Sand Depth, Midleton-Ballycotton**



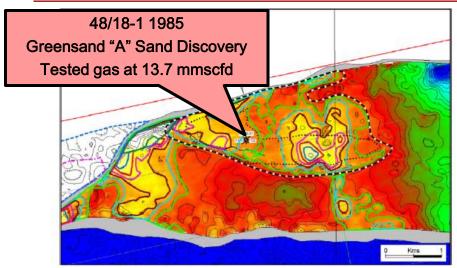
#### **Midleton Prospect (Lansdowne 100%)** Fluid Volume (Psi+20), with Extracted Impedances



# **Arbitrary Line Crossing Galley Head and SE Rosscarbery – Fluid Volume**

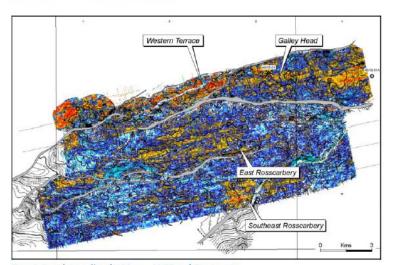


#### **Galley Head Gas Discovery**



Water Depth :	295 feet	
Planned Total Depth :	3,200 feet	

Galley Head, 'A' Sand Volumetrics



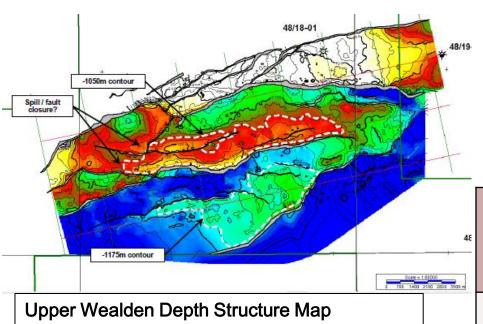
Reservoir	BCF GIIP/Recoverable		
	P90	P50	P10
"A" Greensand	21/18	30/25	41/35
Total	21/18	30/25	41/35





Source: Merlin Energy Resources

#### **Rosscarbery Main Prospect**

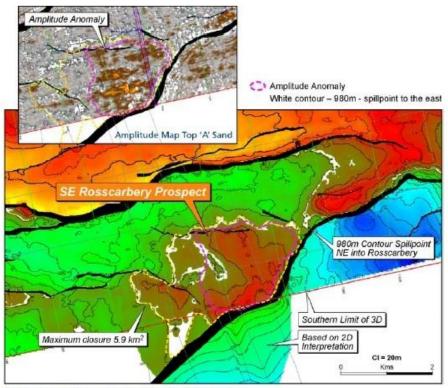


Water Depth:	c. 300 feet
Planned Total Depth :	3,750 feet

R	Reservoir	BCF GIIP/Recoverable		
		P90	P50	P10
U	pper Wealden	168/124	202/151	241/182
Т	otal	168/124	202/151	241/182



#### **SE Rosscarbery Prospect**



SE Rosscarbery - Depth Map to 'A' Sand

Water Depth :	c. 310 feet	
Planned Total Depth :	3,850 feet	

Reservoir	BCF GIIP/Recoverable		
	P90	P50	P10
"A" Greensand	23/20	41/35	55/47
Upper Wealden	62/46	81/61	104/79
Total	85/66	122/96	159/125



#### **Summary**

- Extensive acreage position in North Celtic Sea Basin, offshore Ireland
  - Proven oil and gas petroleum systems
  - Producing basin with established infrastructure
  - Shallow water
  - Good fiscal terms
- Exploration Prospects worked up to drill-ready status on 3D seismic
  - Gas

```
    Midleton – 268 BCF
    Galley Head – 25 BCF
    SE Rosscarbery – 96 BCF
    Rosscarbery Main – 151 BCF
```

- Oil
  - > Amergin 231 MMBO
- Lansdowne seeking partner(s) for multiwell drilling campaign

# Lansdowne oil & gas

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