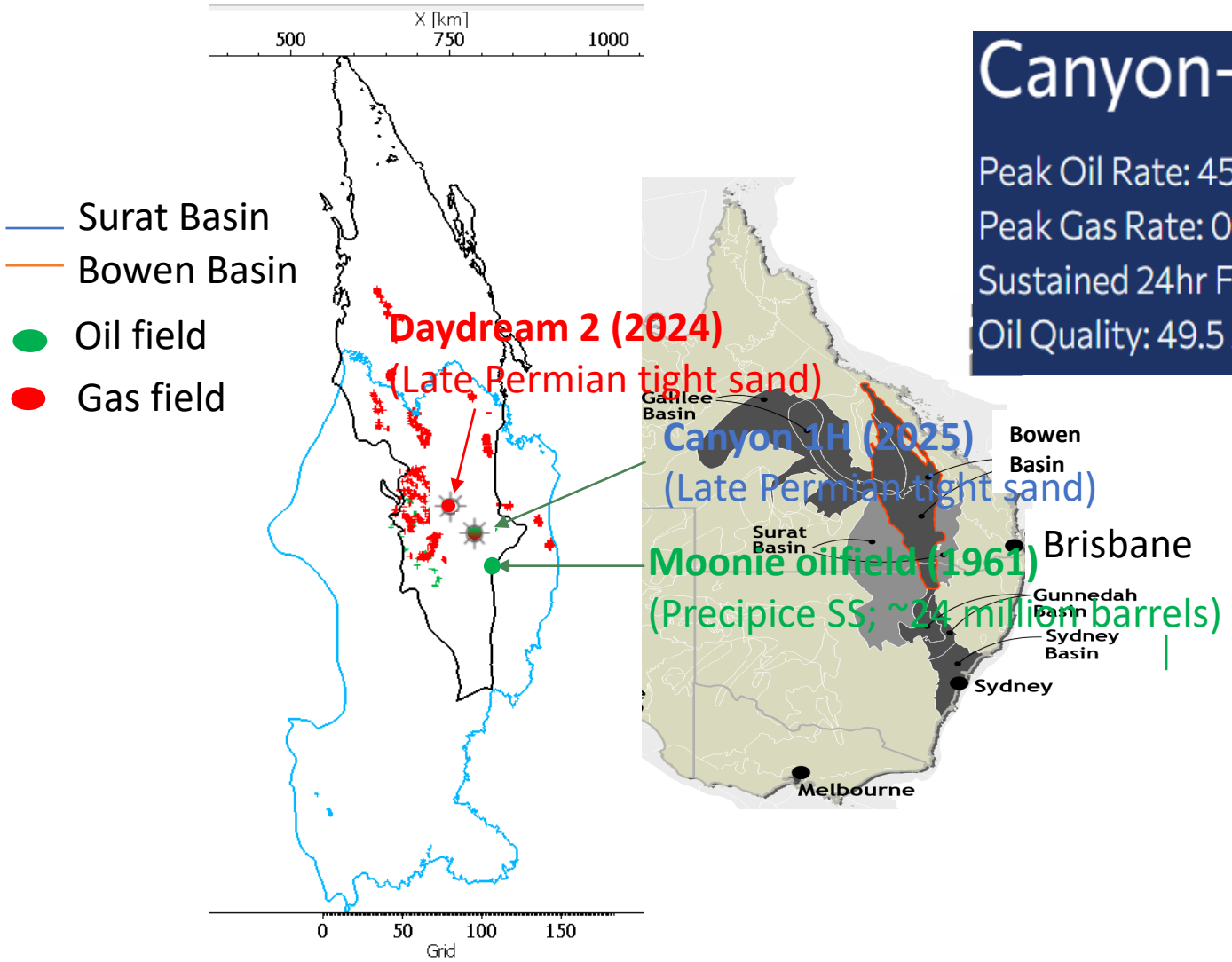
SPE Workshop:
Unconventional Resources

09–10 SEPTEMBER 2025 | BRISBANE, QUEENSLAND, AUSTRALIA

Petroleum systems model for the Taroom Trough, Bowen Basin

Mohinudeen Faiz

Oil and gas fields in the Bowen-Surat Basin



Canyon-1H Flow Test Results

Peak Oil Rate: 452 BOPD

Peak Gas Rate: 0.6 MMSCFD

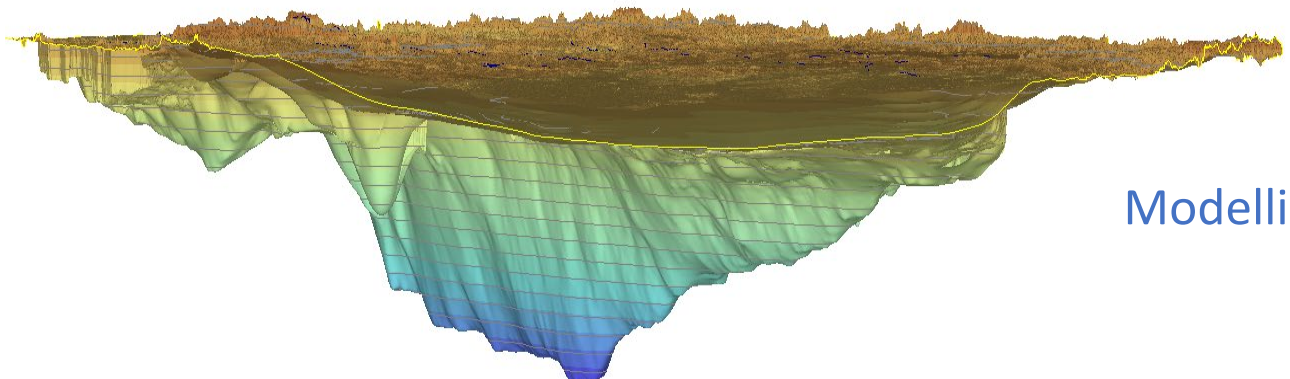
Sustained 24hr Flow: 321 BOPD and 0.472 MMSCFD

Oil Quality: 49.5 API – a high quality light crude oil

Petroleum Systems Model closely predicts composition of the fluids

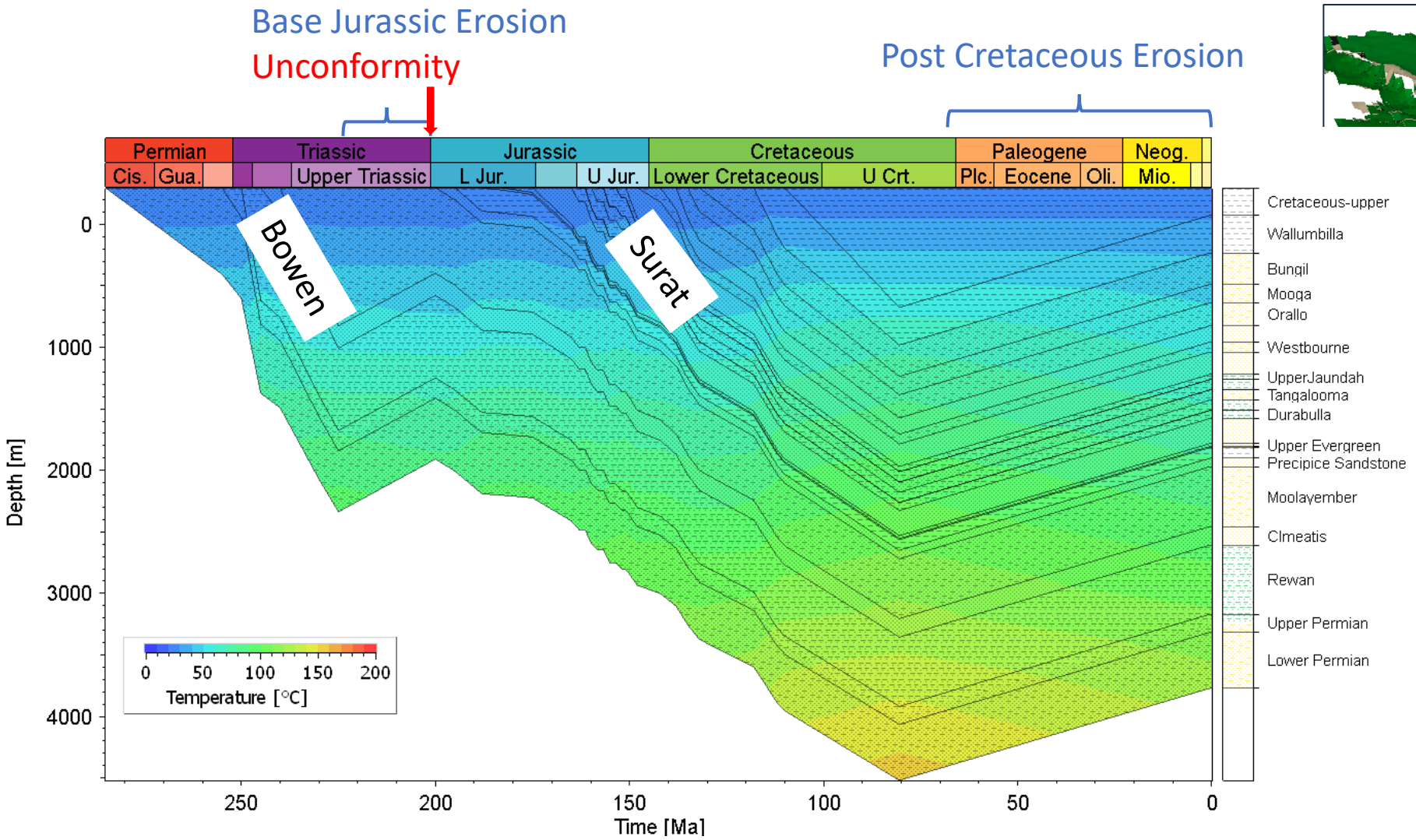
Petroleum system model – data sources

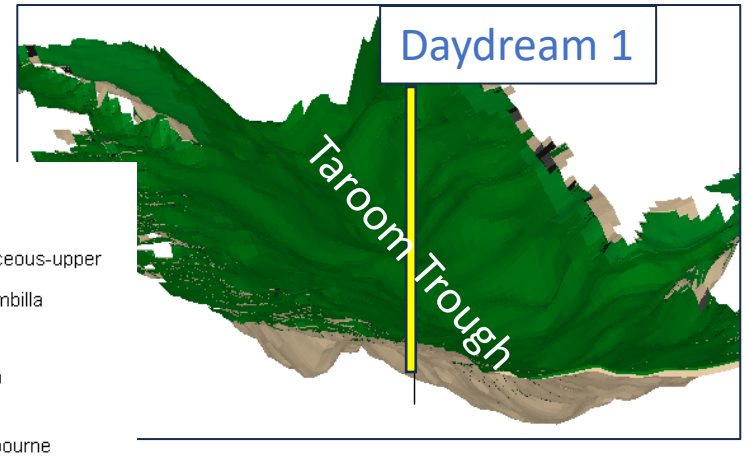
- Regional geological model - OGIA
- Coal distribution - Origin and Santos
- Vitrinite reflectance ~100 wells - CSIRO, Origin, WCR
- Temperature for ~300 wells - WCR
- Oil-source rock geochemistry - CSIRO, Origin



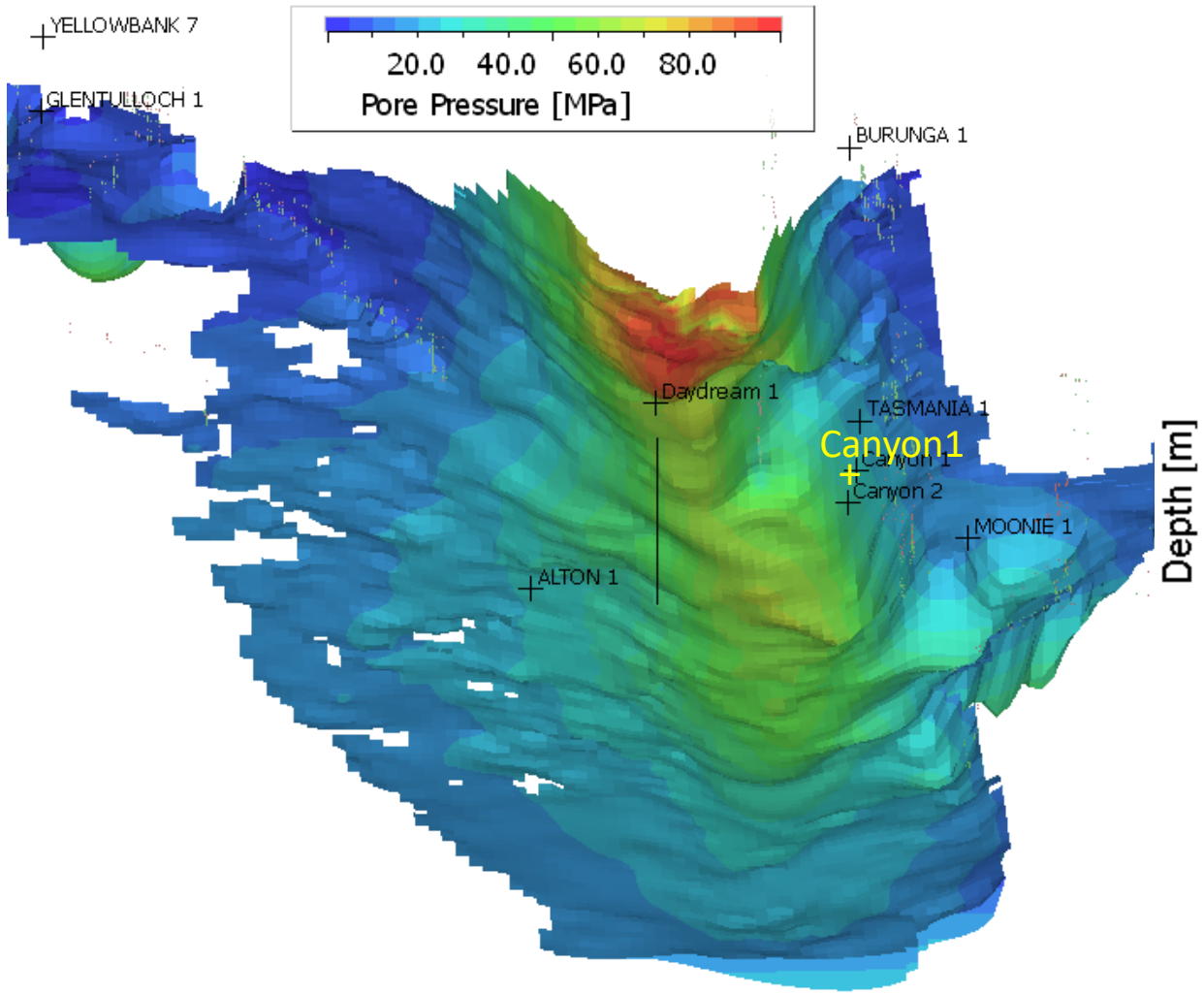
Modelling project sponsored by GISERA

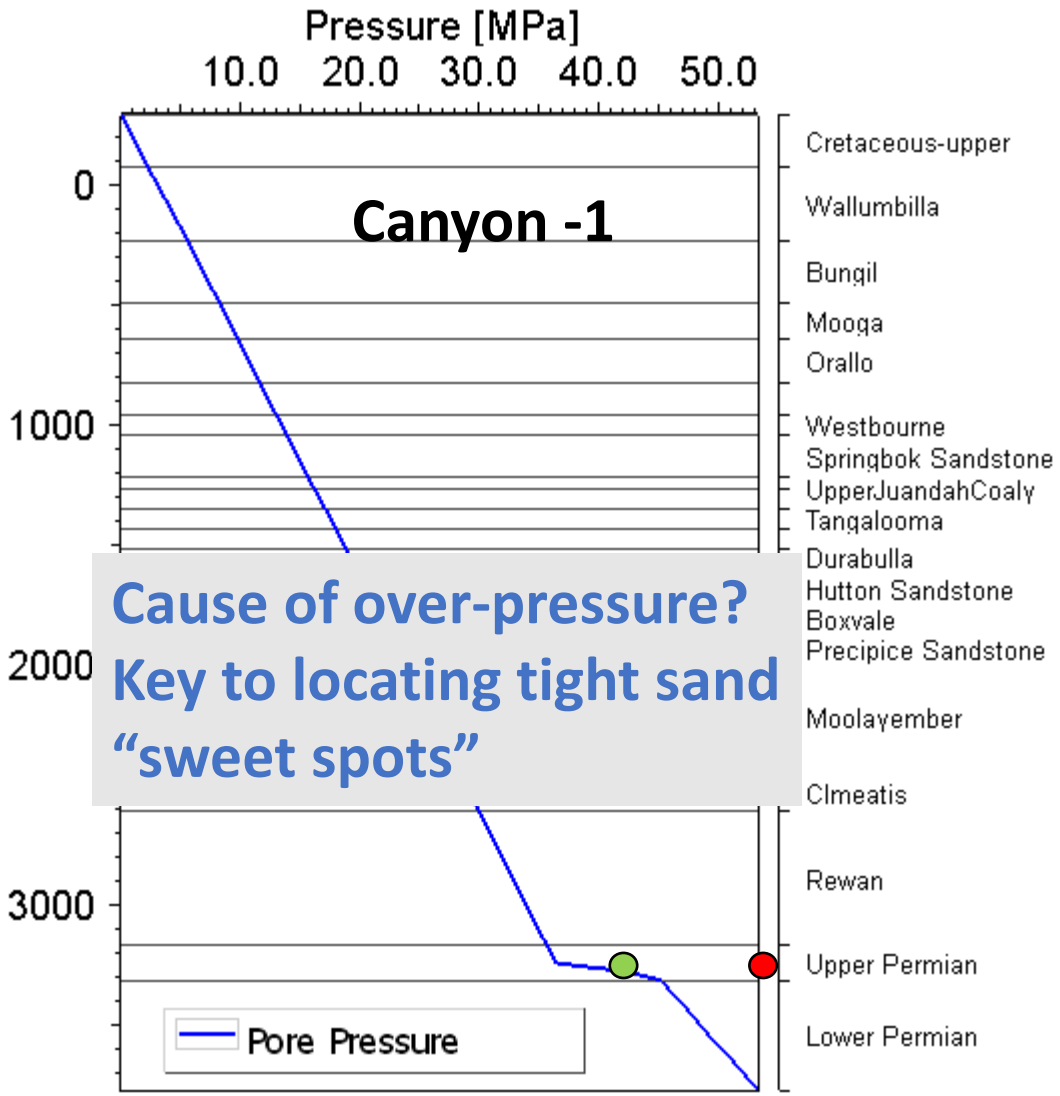
Burial & temperature history – Taroom Trough





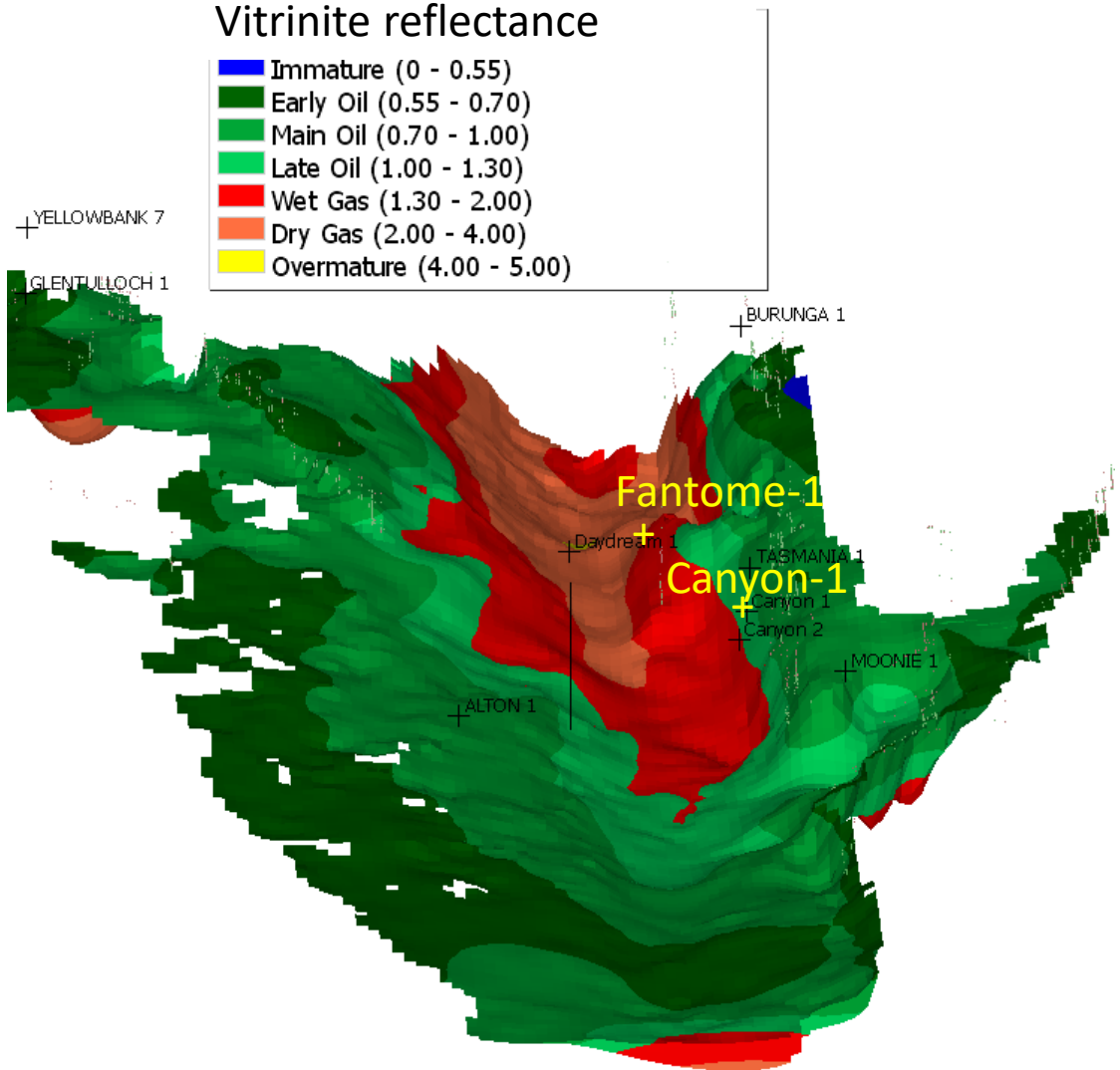
Pressure model – Mid Permian

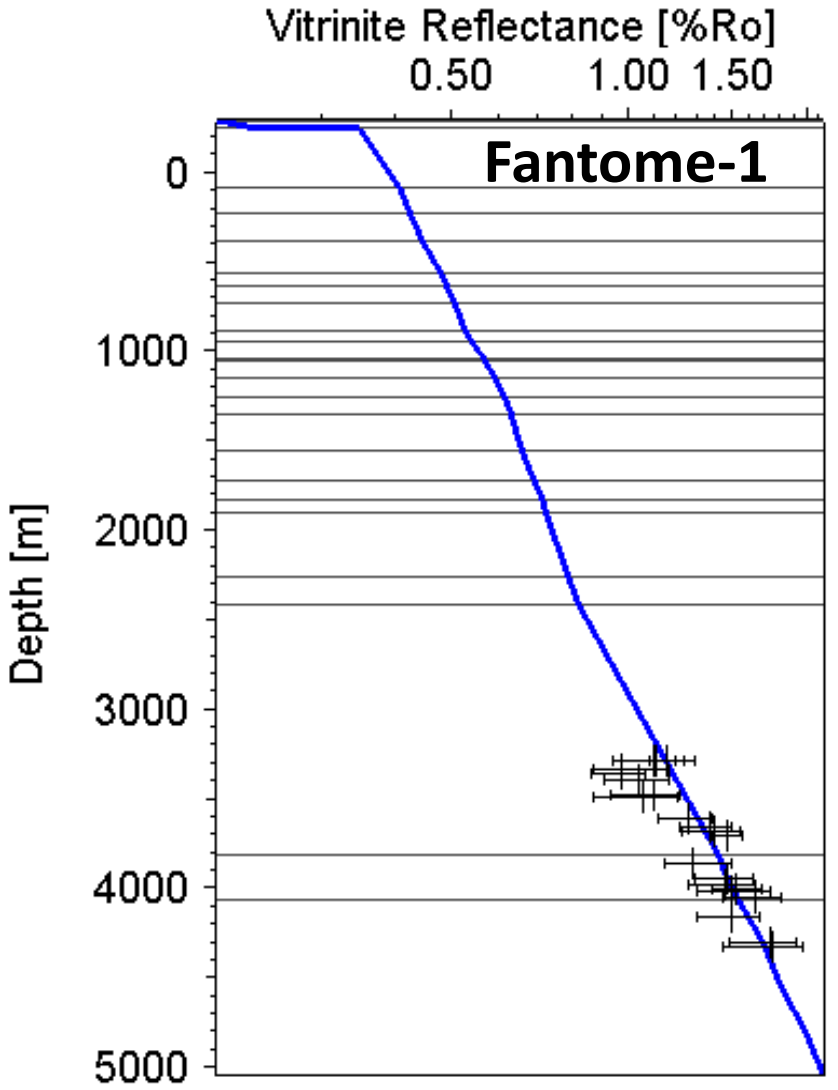




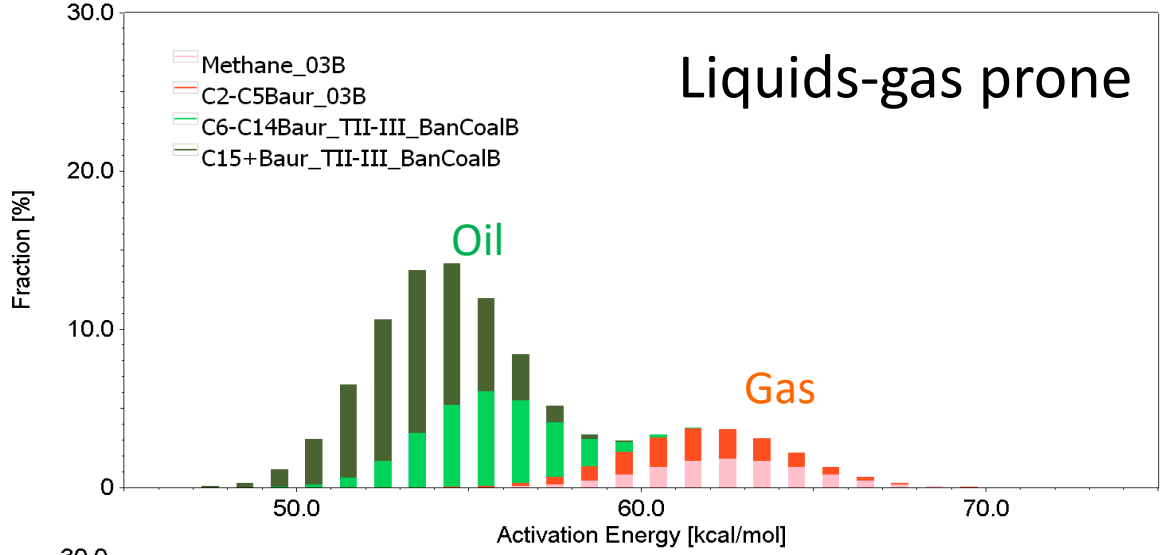
Cause of over-pressure?
Key to locating tight sand "sweet spots"

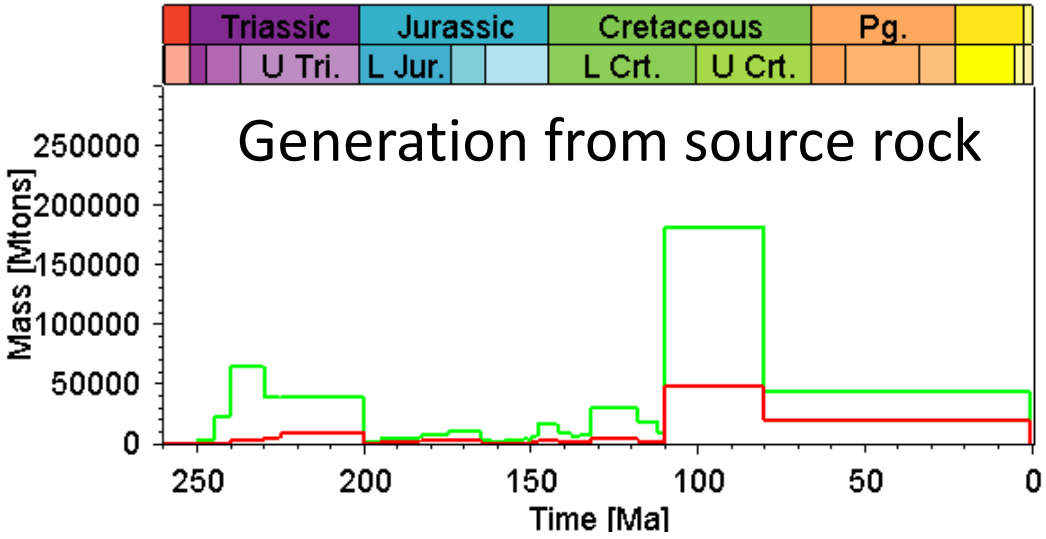
Thermal maturity model – Mid Permian

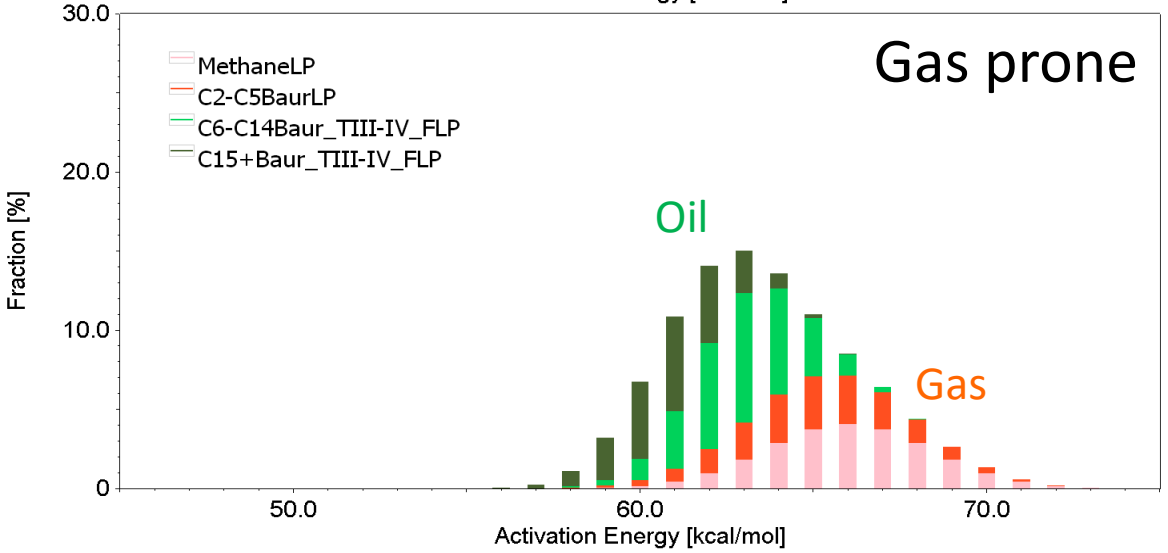


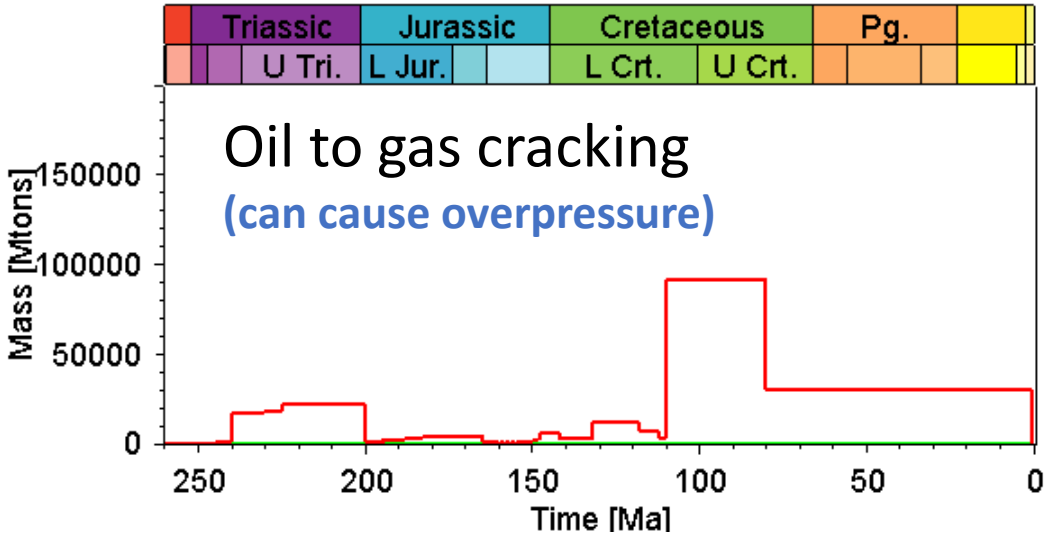


Source rock kinetics and fluid types generated

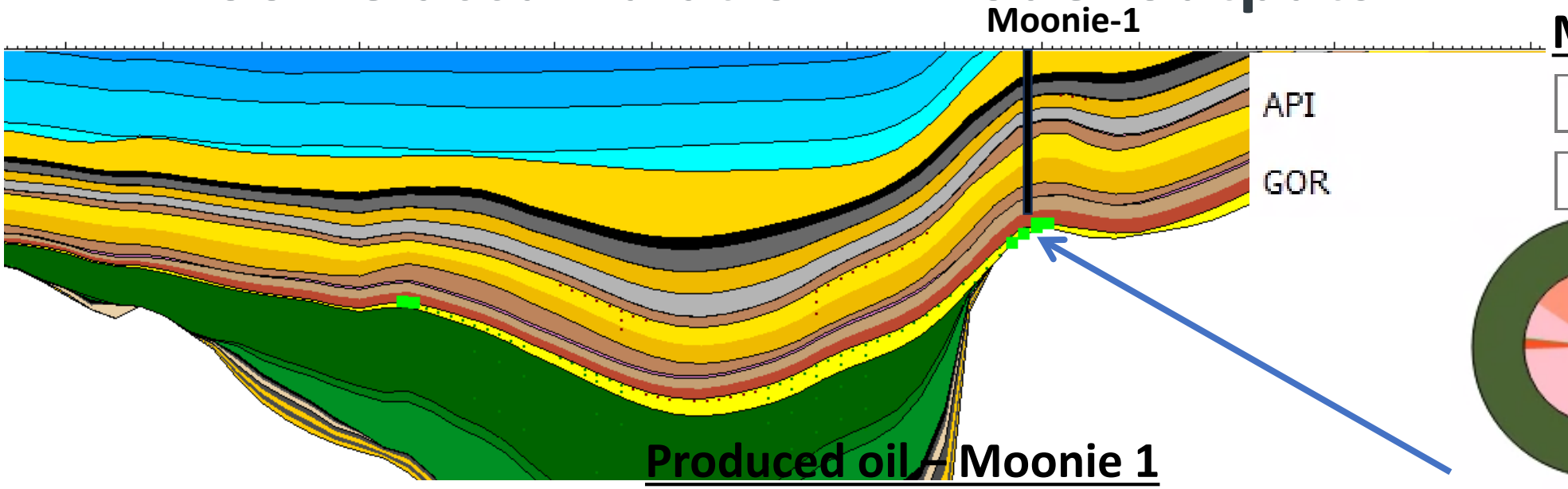






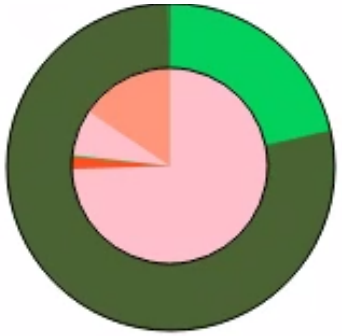


Moonie accumulation – model outputs



Model prediction

API	47.04	[degAPI]
GOR	112.32	[m^3/m^3]



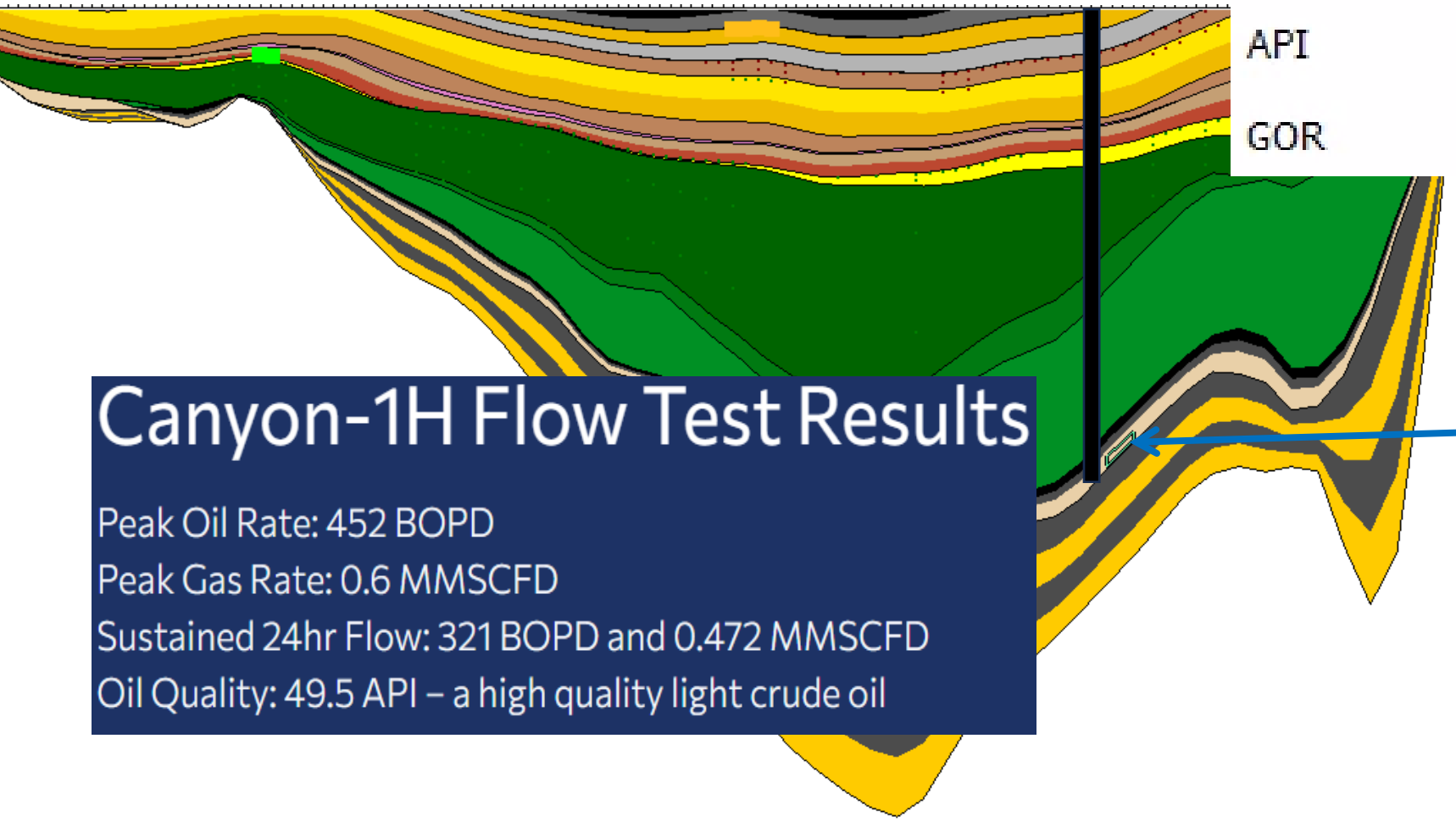
Produced oil – Moonie 1

FLUID PROPERTIES	OIL Precipice Ss (56-4 Sand)	OIL Precipice Ss (58-0 Sand)
API Gravity @ 60°F	50.0°	44.4°
Base	Napthenic to Paraffinic	Napthenic to Paraffinic
Sulphur (% wt)(ppm)	0.002%	0.002%
Initial GOR (ft^3/bbl)	110 to 315	110 to 315

Component	[mass%] Liquid	Vapor
Methane_03B	00.0	74.5
C2-C5Baur_03B	00.0	02.1
C6-C14Baur_TII-III_BanCoalB	21.4	00.2
C15+Baur_TII-III_BanCoalB	78.3	00.0
MethaneLP	00.0	01.8
Methane_06K	00.0	05.9
C6-C14Baur_TII-III_KiangKOP	00.1	00.0
C15+Baur_TII-III_KiangOP	00.1	00.0
BioMethane	00.0	15.5

Canyon 1H - Permian tight sand gas-oil reservoir

Canyon 1



Canyon-1H Flow Test Results

Peak Oil Rate: 452 BOPD

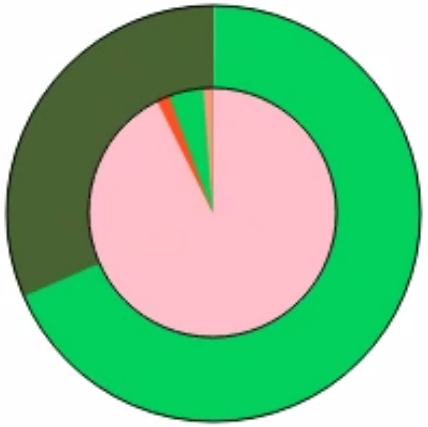
Peak Gas Rate: 0.6 MMSCFD

Sustained 24hr Flow: 321 BOPD and 0.472 MMSCFD

Oil Quality: 49.5 API – a high quality light crude oil

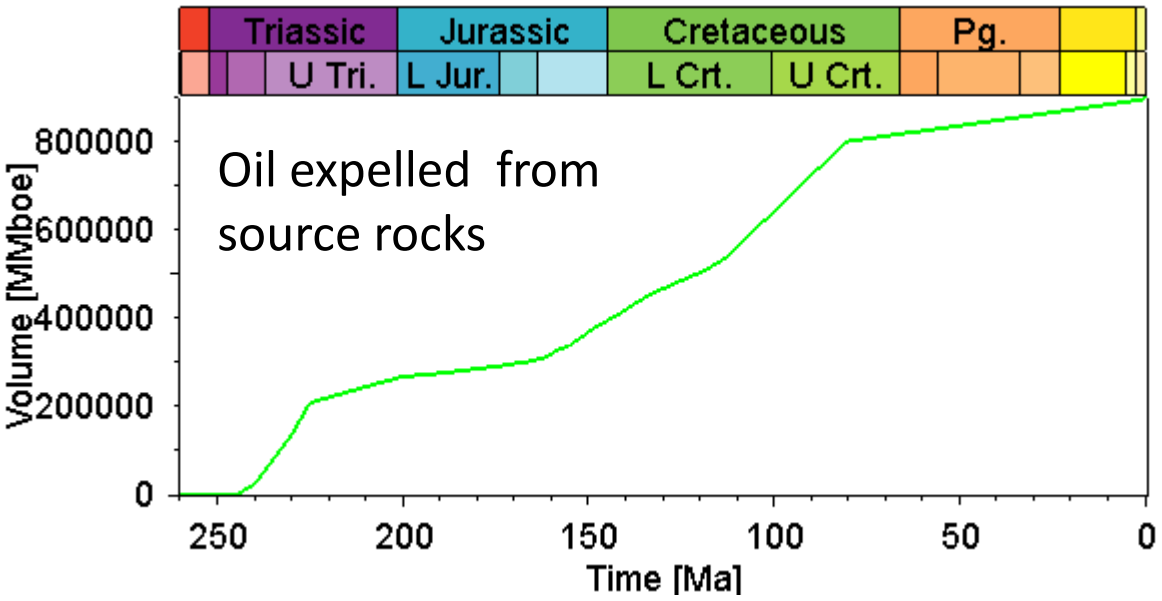
Model prediction

API	49.95	[degAPI]
GOR	1294.50	[m^3/m^3]



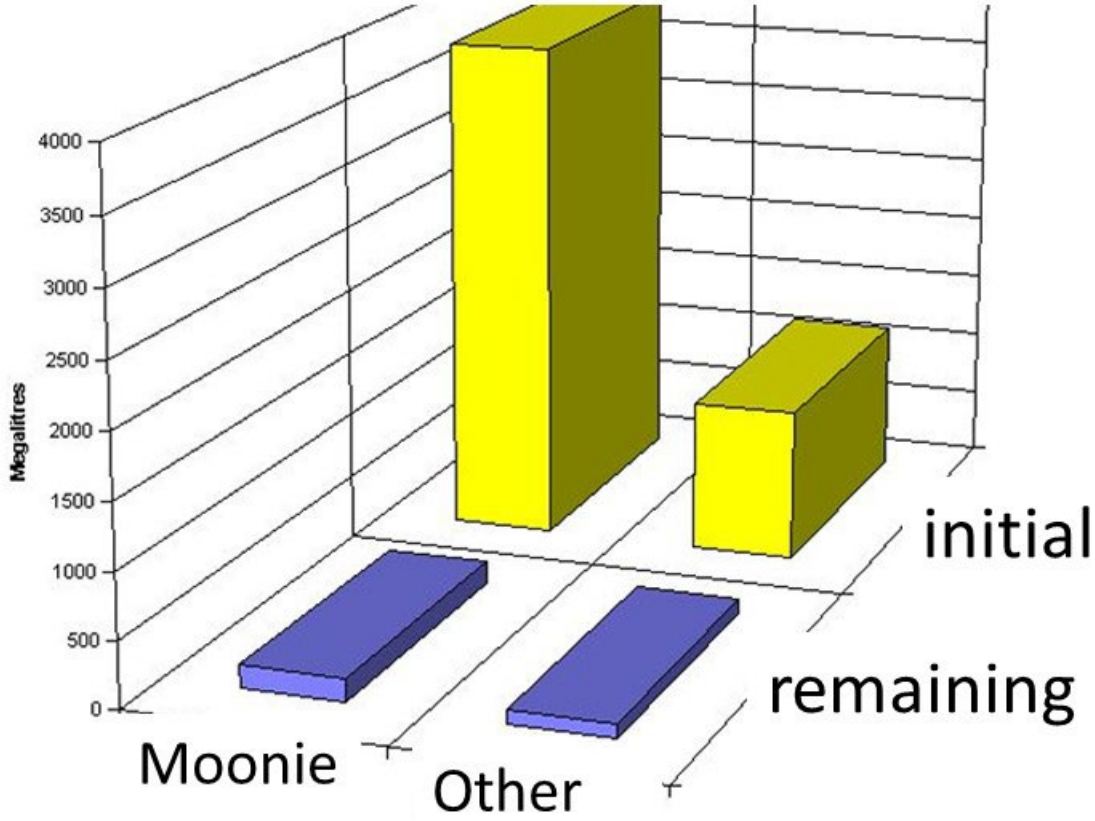
Component	[mass%]	Liquid	Vapor
Methane_03B		00.0	02.4
MethaneLP		00.0	02.7
Methane_06K		00.1	87.4
C2-C5Baur_06K		00.0	01.7
C6-C14Baur_TII-III_KiangKOP		68.4	04.5
C15+Baur_TII-III_KiangOP		31.5	00.0
BioMethane		00.0	01.2

Oil expelled from Upper Permian & reserves identified



as at 1996 (Cadman et al 1998)

Conventional reserves = 25 MMbbls



Remaining reserves = 1.8 MMbbls

Where is rest of the oil hiding?

Discussion points

- Where are the big undiscovered conventional accumulations ?
- A significant gas-liquids resource in the tight sands
- GOR related to source and pressure variations
- Overpressure, what caused it?
  - In-reservoir oil-to gas cracking
  - Lateral facies changes