

South Wanganui Basin

Is it Truly Barren?

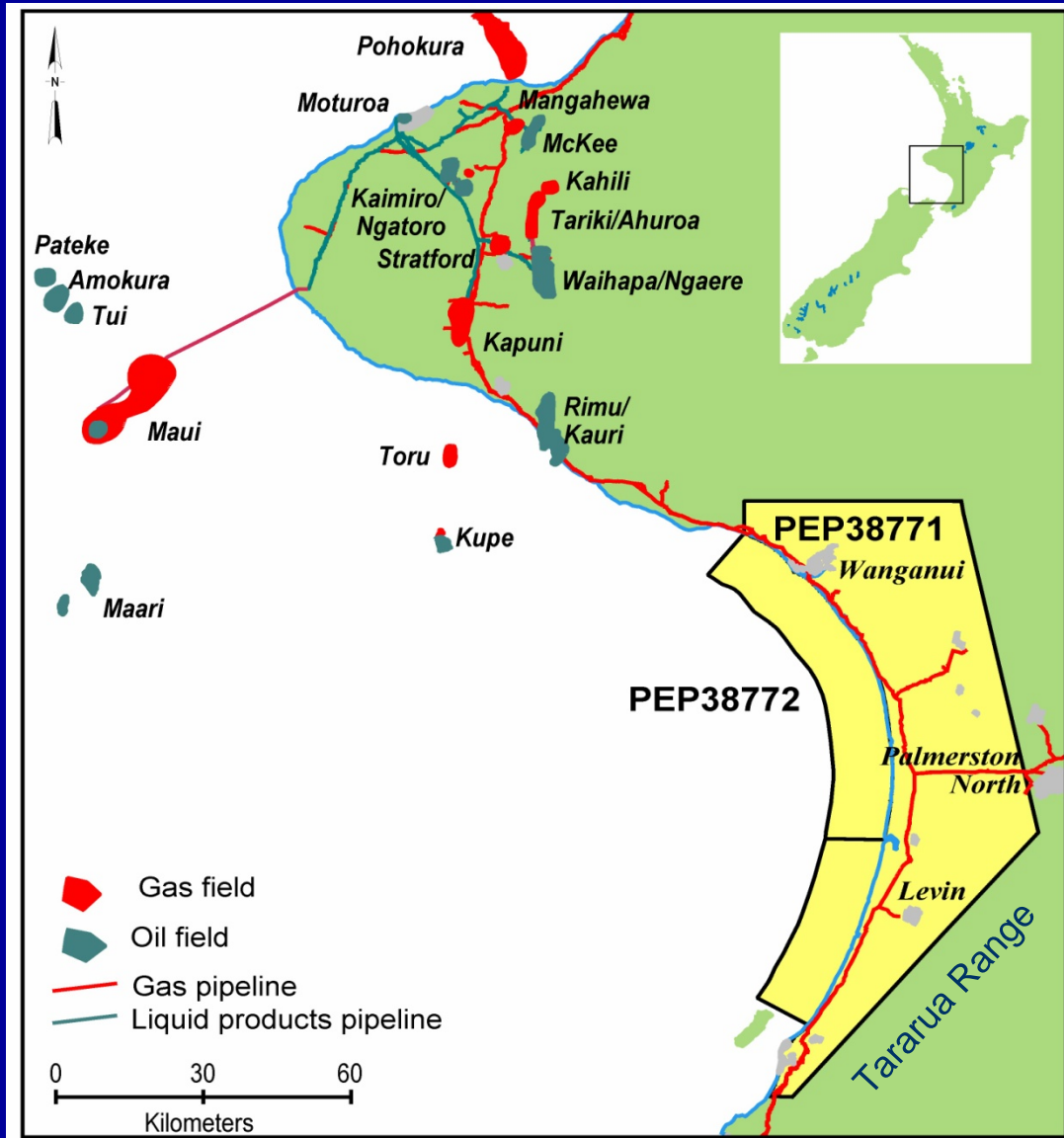
John Frederick
Hugh Green Energy Limited

New Zealand Petroleum Conference
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HUGH GREEN
ENERGY LIMITED

Wanganui Basin



Located southeast of the prolific Taranaki Basin separated by the Patea-Tongaporutu High.

Basin center offshore Wanganui City.

5,000m of late Miocene to Recent sediments dominated by shelf and shoreline sandstones with coquina limestones interbedded in massive mudstones.

Source – carbonaceous members of Matemateonga and overlying Tangahoe mudstones. Coaly intervals and dark brownish-grey mudstones of Matemateonga. Shallow peats. Paleogene shales?

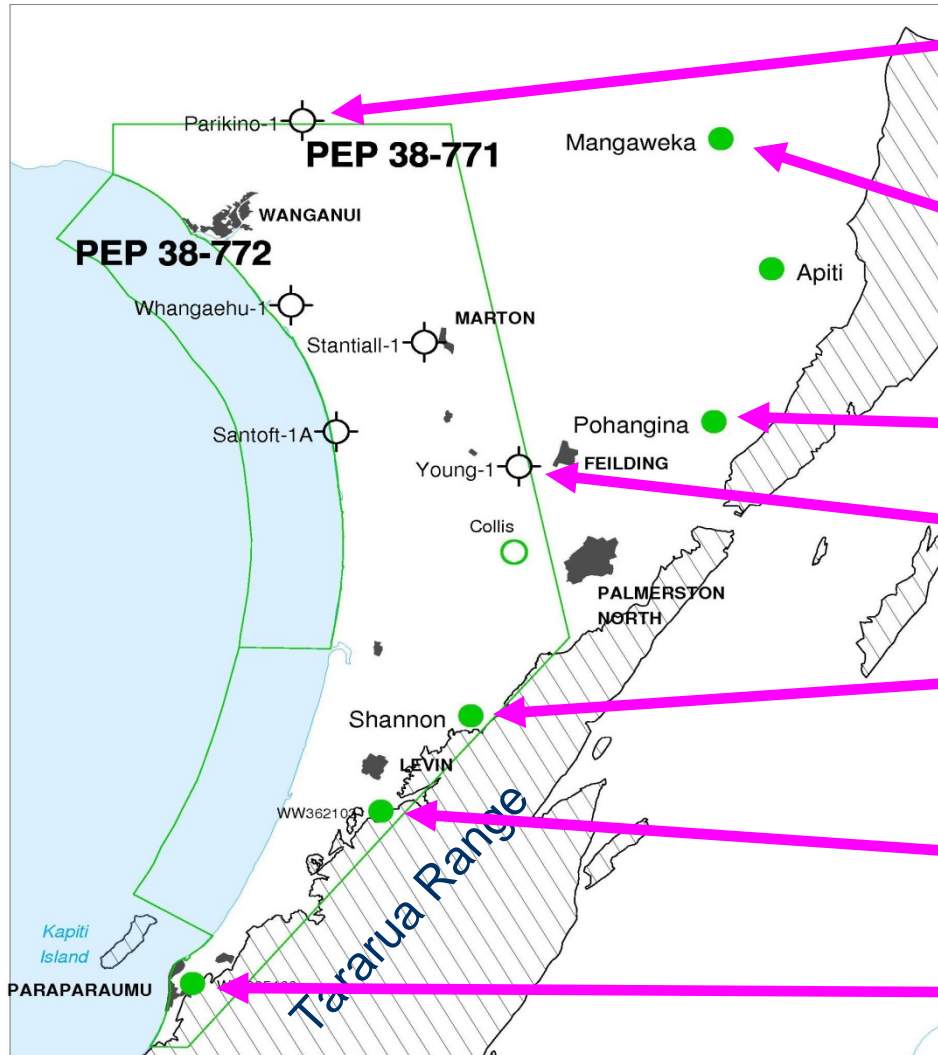
Hugh Green Energy holds two exploration permits
PEPs 38771/38772 – 4566 km²



Presentation Outline

- Oil Occurrences
- Gas Occurrences
- Offshore seismic hydrocarbon expression
- Water well database as exploration tool
- Volatile light hydrocarbon (VOC) analysis
- Angelo well flow test
- Summary and Conclusions

Oil Occurrences



Parakino-1 (1964) Matemateonga SWC
"fair oil generating potential, significant
quantity already generated" Robertson
Research 1980 PR 768

Mangaweka GCMS biomarkers in 5 of 7
samples indicative of mature, marine
Cretaceous oil (Murphy 1994)

Oil near Pohangina (Morgan 1927)

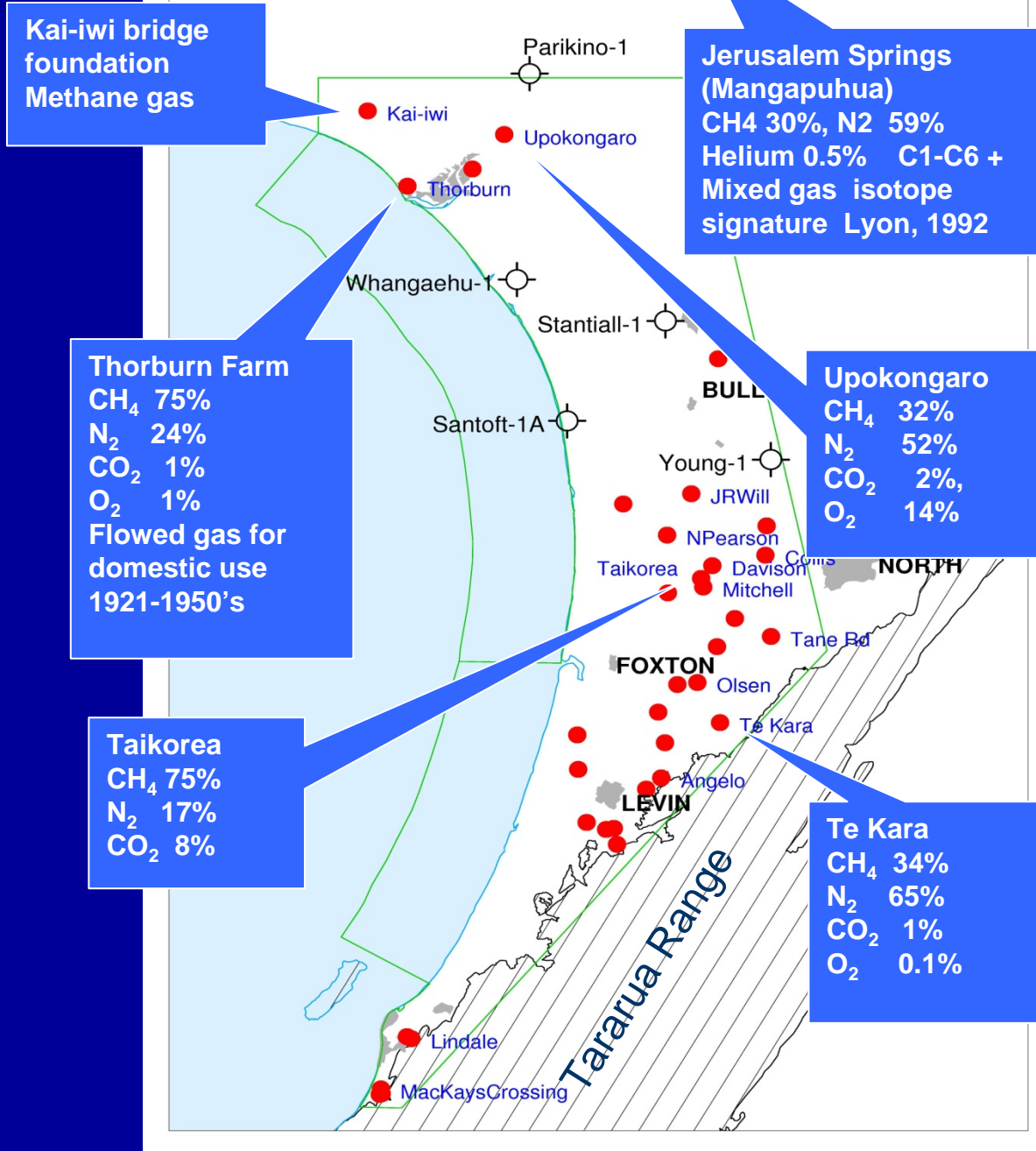
Young-1 (1942) petroliferous odour when
cored

Shannon Area oil shale outcrop – 9% fixed
carbon, 22% volatile HCs (McLaurin
1910)

Muhunoa School (1990) water well "dark
grey clay and gravel; oily"

Paraparamumu – water well drillers bailed
oil from gravel beds (1971)

Gas Occurrences



Kai-iwi bridge: gas encountered when drilling foundation (1962)

Thorburn Farm water well (1921) supplied domestic gas into the 1950's (Fleming, 1953)

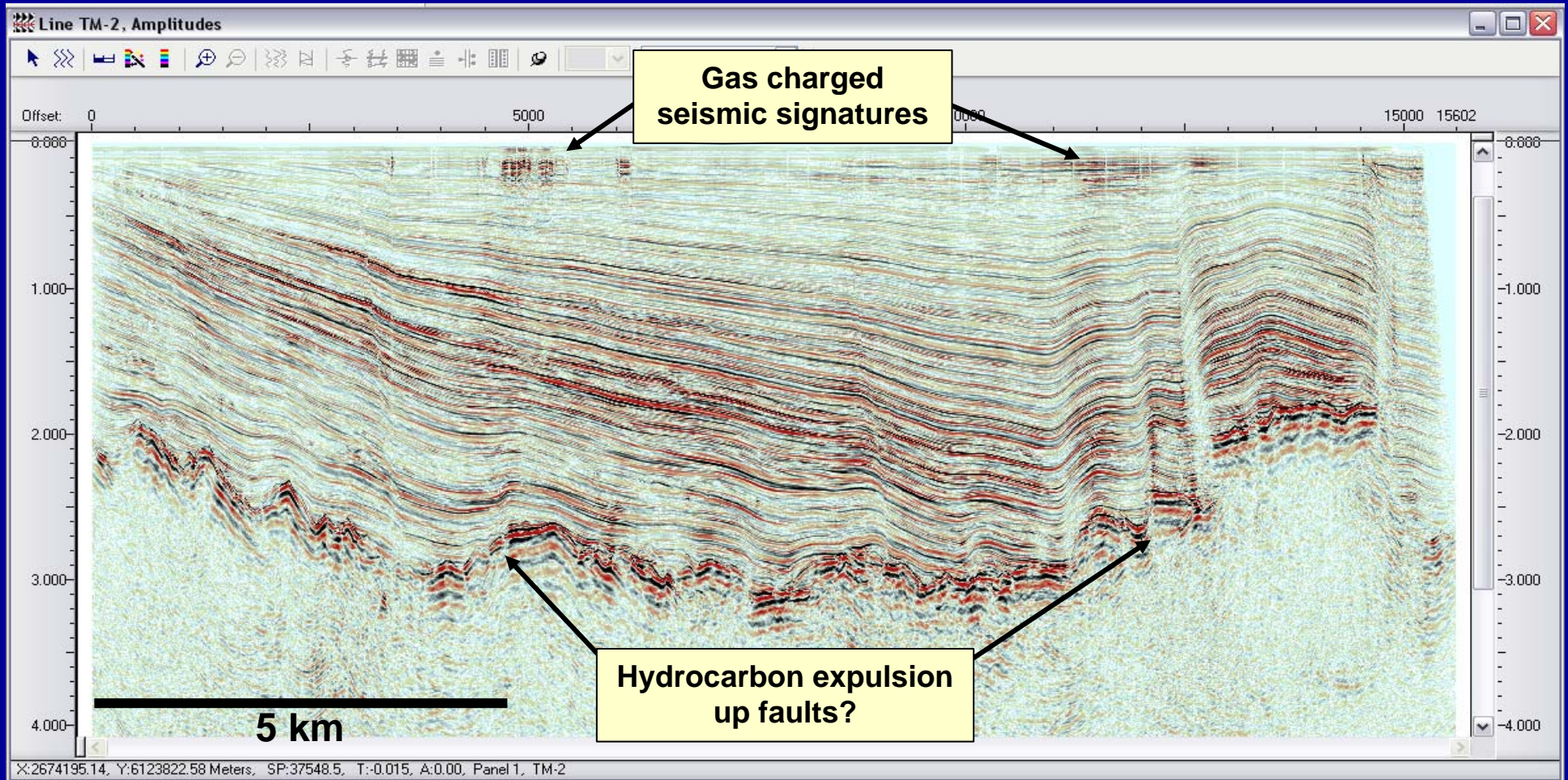
Upokongaro (1945) artesian water well drilled to 644 m contained abundant natural gas

Taikorea (water well – 1961) 75% methane

Te Kara (water well – 1917) (McLernon, 1978, PR839)

Jerusalem Springs (Mangapuhua) mixed gas isotope signature (Lyon 1992) .

Offshore Seismic Hydrocarbon Expression gas charged seismic signatures

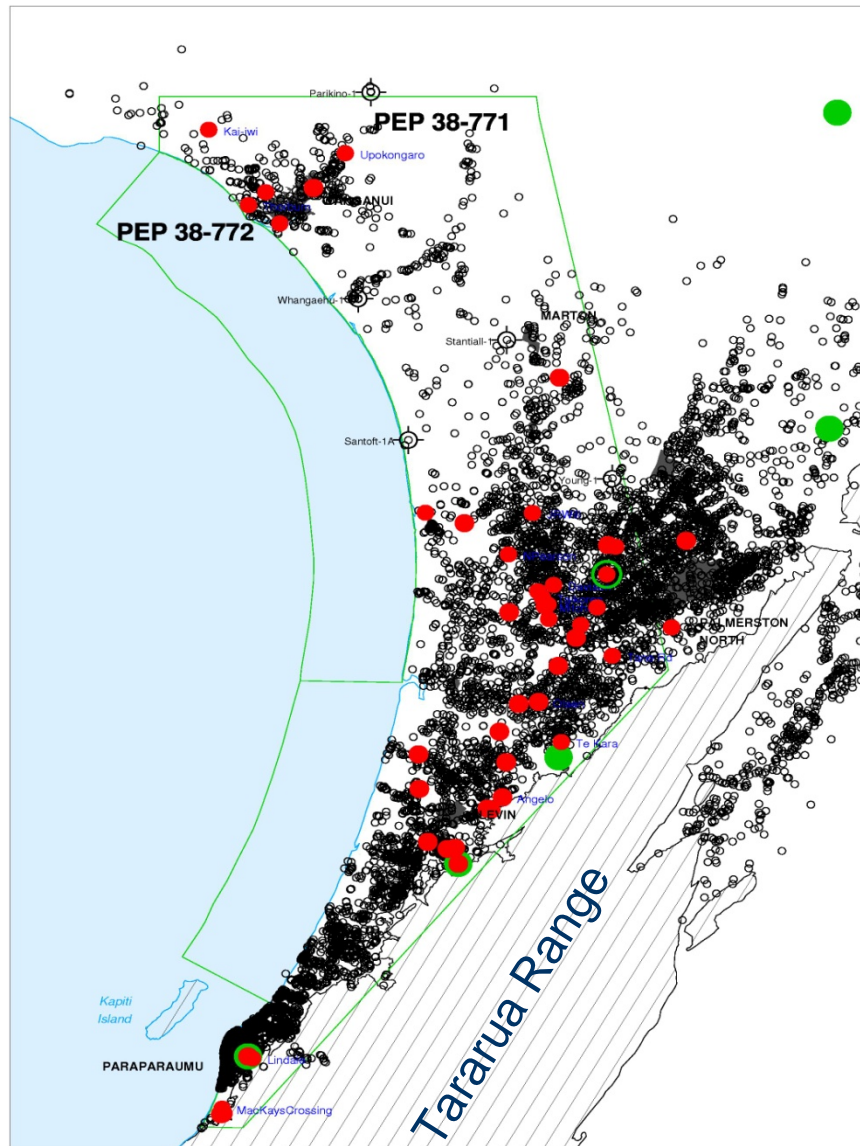


Water Well Database

~ 10,000 water wells

Reported gas shows = red circle

Not all gas shows recorded in database



VOC Gas Analysis

Headspace gas analysed for light petroleum hydrocarbons by SYFT (Selected Ion Flow Tube Mass Spectrometry).

Mitchell water sample

JR Will – C1 & C5-C6

Tane Rd - C2-C4

Collis Farm –
C1 – 85%, C2-C5 – 15%
Thermogenic component

**Angelo well –
dry gas production**

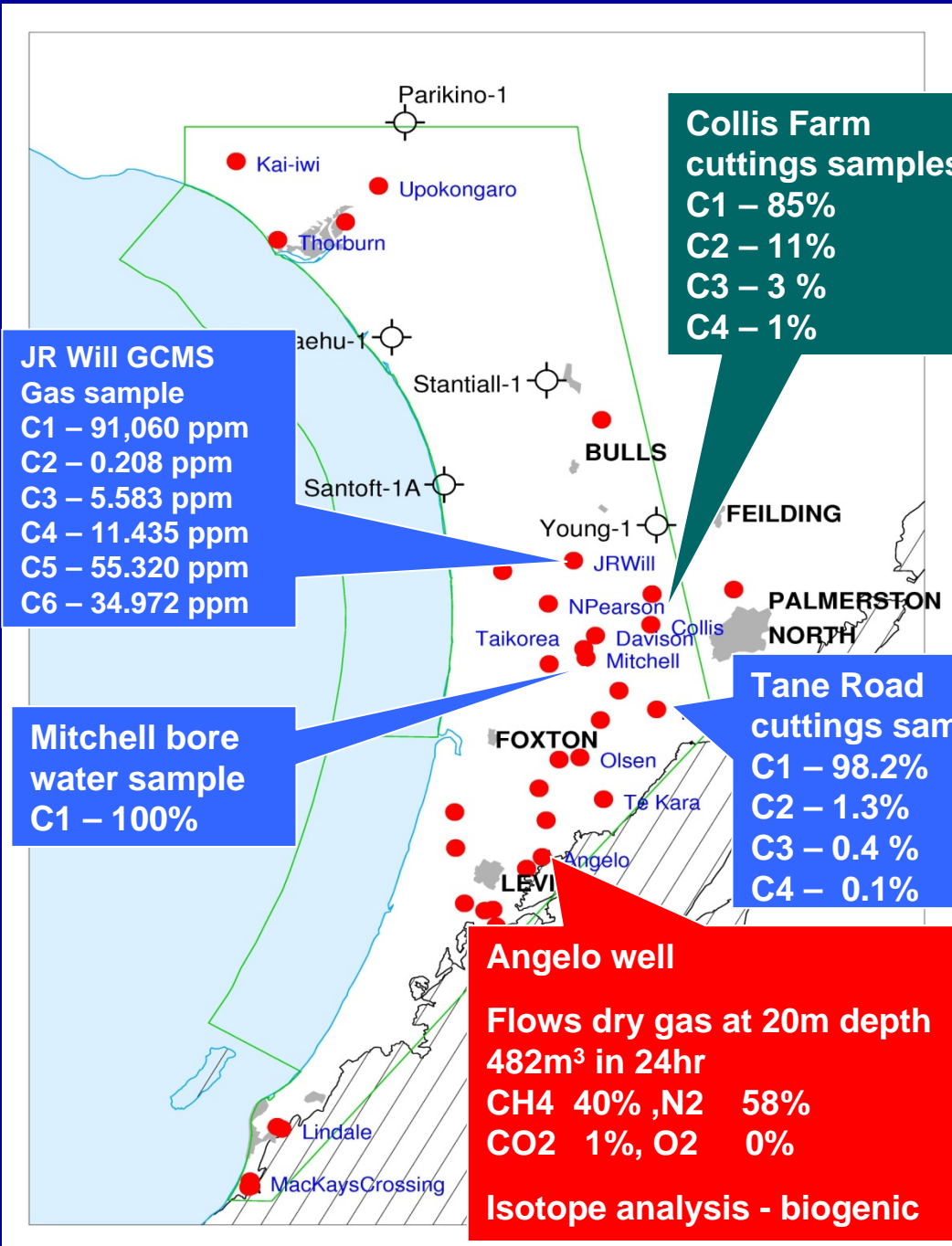
Collis Farm cuttings samples
C1 – 85%
C2 – 11%
C3 – 3 %
C4 – 1%

JR Will GCMS Gas sample
C1 – 91,060 ppm
C2 – 0.208 ppm
C3 – 5.583 ppm
C4 – 11.435 ppm
C5 – 55.320 ppm
C6 – 34.972 ppm

Mitchell bore water sample
C1 – 100%

Tane Road cuttings sample
C1 – 98.2%
C2 – 1.3%
C3 – 0.4 %
C4 – 0.1%

Angelo well
Flows dry gas at 20m depth
482m³ in 24hr
CH4 40%, N2 58%
CO2 1%, O2 0%
Isotope analysis - biogenic



Angelo well description

- Water well drilled in 1970 encountered significant gas at 20 meters. After 2 days casing pushed through gas zone and water produced in deeper interval.
- In 1990 an adjacent bore was drilled to 20 meters, encountered gas, cased, and capped.
- June 2007 HGEL flow tested well.

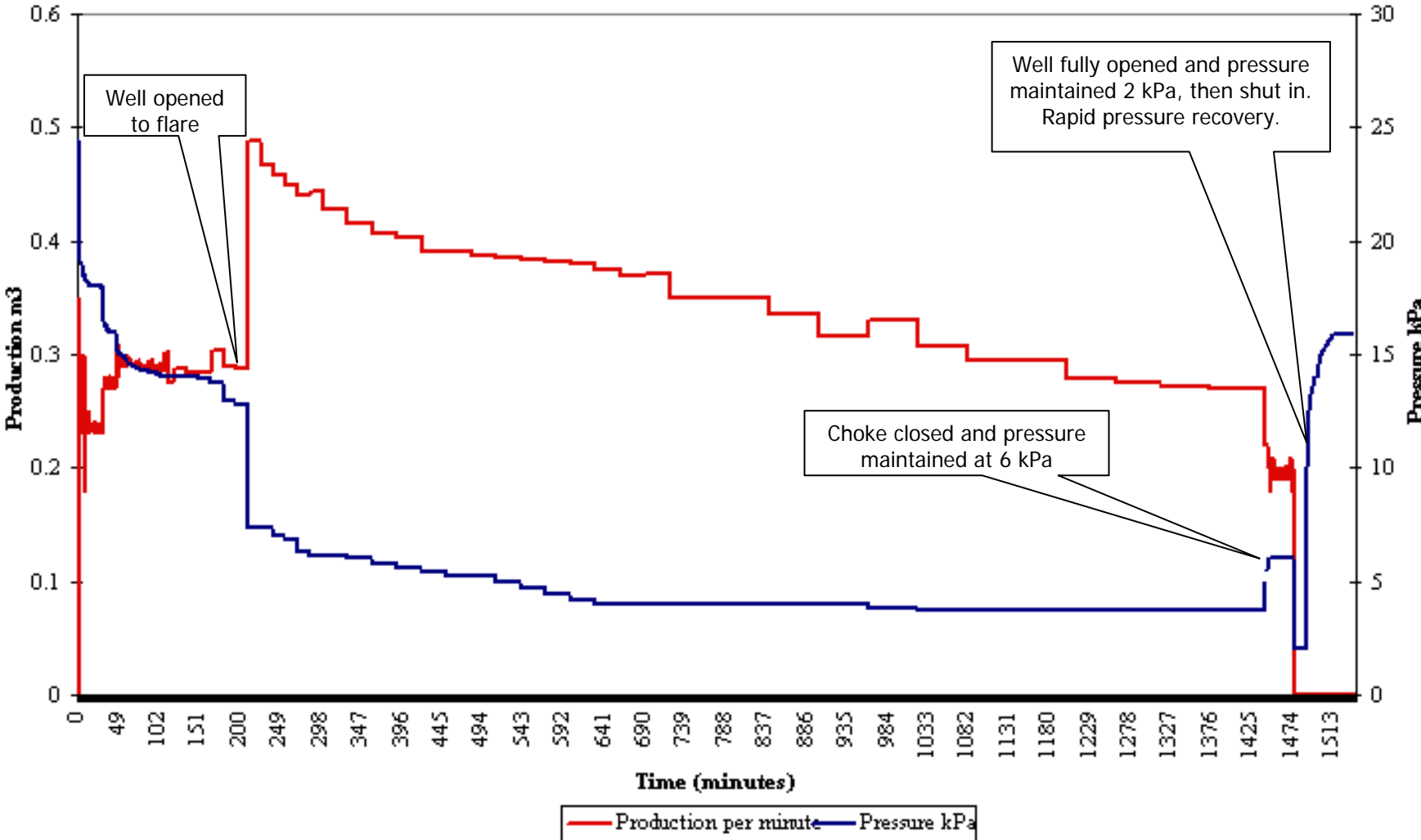


Angelo Well Flow Test Results

- 24 hour production – 482 m³ (17,000 ft³) from depth of 20 meters.
- Rapid recovery in wellhead pressure indicates excellent permeability
- Inability to drop flow pressure to zero indicates boundary conditions were not achieved



Angelo Gas Flow Test Production, Pressure vs Time 25.7 hours



Summary and Conclusions

Oil potential

- Parakino-1 sidewall cores “oil generating potential”
- Cretaceous marine oil biomarkers in outcrop
- Oil shows reported by water well drillers

Gas Occurrences

- Offshore seismic expression
- Shallow gas production used for domestic purposes (Thorburn Farm)
- Widespread gas shows in water wells
- Dry gas production test

Volatile Hydrocarbon Analysis

- Biogenic gas at shallow depths
- Thermogenic gas composition (Collis Farms, Jerusalem Springs)

Sustained gas production

- Flow test of gas at 20 meters @ 482 m³/day (17,000 ft³/day)

Is the Wanganui basin truly barren?