

## Reason for Drilling

A significant oil show was encountered in Mt. Winter No. 1 in the basal Stairway Sandstone (Gorter et al., 1982). Several minor shows were also encountered in the underlying Horn Valley Siltstone and top Pacoota Sandstone.

In the basal Stairway Sandstone oil shows were encountered between 150 and 190 metres (KB). According to the daily geological report, the first oil in mud (2%) occurred at 165 metres (KB) and decreased to 1% at 166 metres. This oil sample had bright blue white fluorescence and a moderate to fast streaming yellow cut with a brown residual stain. One percent patchy bright gold fluorescence and a moderate to fast streaming yellow cut and a poor brown residual ring were noted at 165 metres, decreasing to 2-3 chips at 166 metres. The first fluorescence occurred at about 150 metres (KB), but was very rare (eg. less than 5 chips per samples above 162 metres).

A mud sample from the relevant depth was collected and sent to the Australian Mineral Development Laboratories (AMDEL). AMDEL reported (29.1.82) that all the mud samples received from the Mt. Winter No. 1 well from the interval reputed to contain 2% oil, and below this, did not contain oil. However, there was a trace of drilling mud additive present. The drilling fluid at Mt. Winter No. 1 at the time the oil was reported was a water based mud with gel, soda ash, caustic and bicarb. No diesel or oil had been purposefully added to the mud system.

The 13-3/8" casing was run to 166 metres, according to the drilling report of 10.12.81, however, Schlumberger reported the shoe at 163 metres (logs). The well site geologist reported traces of bright yellow fluorescence on drilling out of the shoe from 166-168 metres (drillers depth). Fluorescence and cut persisted below the casing, except through the better permeability sand unit (166-172 metres) and below 180 metres. Core 1 (189.7-191.3 metres drillers depths) had rare oil bleeding from pinpoint pores throughout the core, brown oil staining and patchy fluorescence. Analyses of the oil shows by AMDEL indicated that the oil is migrated: the source rock is probably the underlying Horn Valley Siltstone.

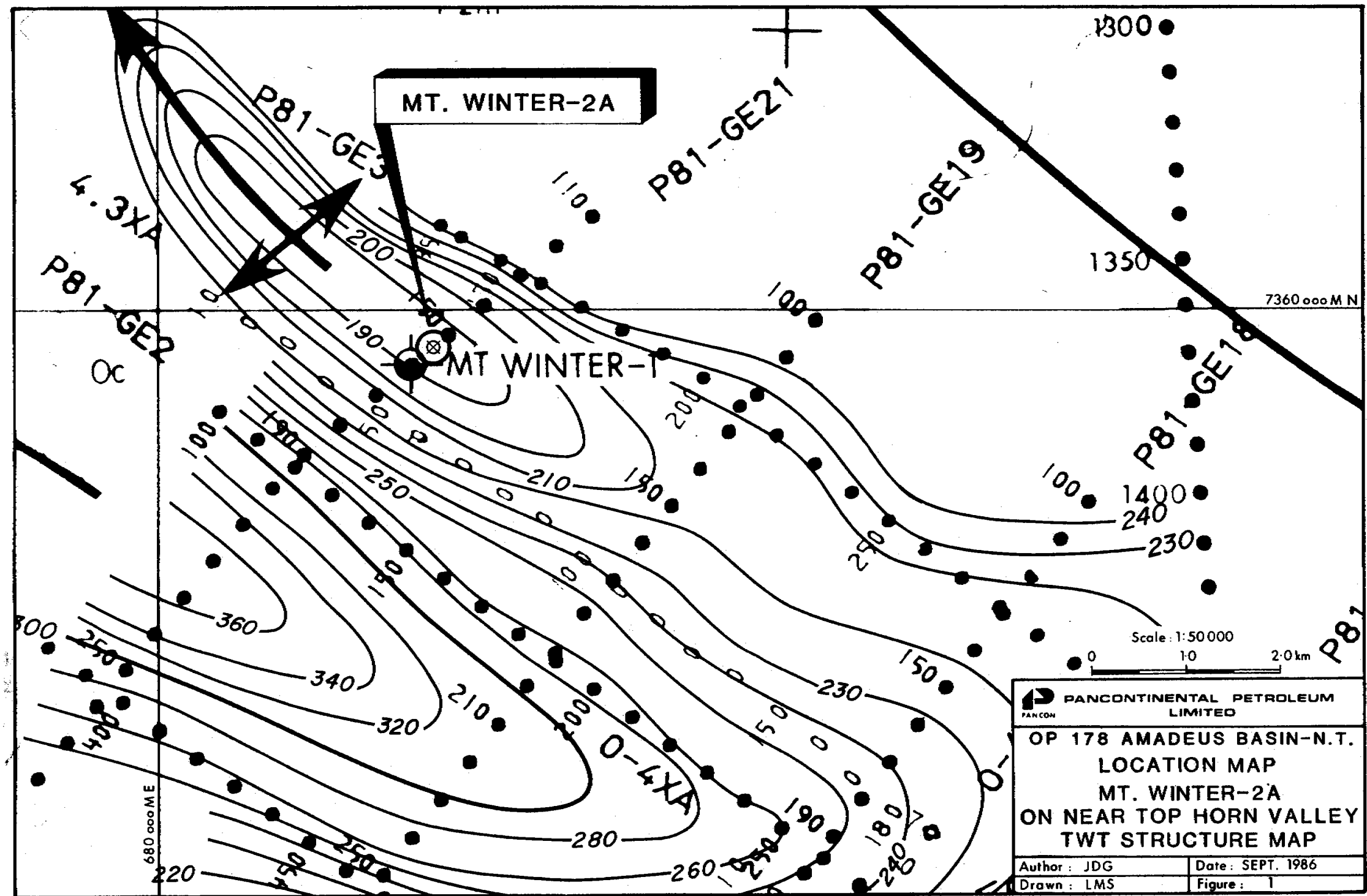
Below the 13-3/8" casing Mt. Winter No. 1 was air drilled with no gas shows on either the hot wire detector or flowed to surface. Thus, below the 13-3/8" casing the well is considered to have been tested adequately.

In addition, while air drilling below the 13-3/8" casing shoe, the hole began to make water with a salinity range of 790-8250 ppm NaCl equivalent. The presence of meteoric water indicates that the structure is flushed and the hydrocarbon shows observed in Mt. Winter No. 1 were interpreted to represent residual oil retained in impermeable lithologies. This interpretation is substantiated by the results of core analyses from Core 1 at Mt. Winter No. 1. These analyses show that hydrocarbons are only retained in the lowest permeability sandstones and are not present in the better reservoir quality sandstones.

However, the question of possible free hydrocarbons at 165-166 metres (drillers depth), which may or may not be behind two sets of casing (based on the loggers measurement to depth of casing shoe) which was not detected by either the electric or density-neutron logs (run below 163 metres loggers depth) was unresolved.

Thus, the Mt. Winter Corehole was programmed to test the oil potential of the basal Stairway Sandstone in a location updip from the original well.

The well was cored through the Horn Valley Siltstone at the request of the Bureau of Mineral Resources, who provided financial assistance to acquire the core below 183 metres. This core is retained at the BMR Core Store, Collie Street, Fyshwick, Canberra. The core above 183 metres is stored at Magellan's core store, Georges Crescent, Alice Springs.



MT. WINTER-2A

MT WINTER-1

Scale: 1:50 000  
 0 10 20 km

**PANCONTINENTAL PETROLEUM LIMITED**

OP 178 AMADEUS BASIN-N.T.  
 LOCATION MAP  
 MT. WINTER-2A  
 ON NEAR TOP HORN VALLEY  
 TWT STRUCTURE MAP

Author: JDG	Date: SEPT. 1986
Drawn: LMS	Figure: 1