



## CASE HISTORY

Reservoir Optimization

FREECAP® – Swellable Packers

### INTERVENTIONLESS WATER SHUTOFF ALLOWS RECOVERY RATE OPTIMIZATION

FREECAP® Swellable Packers Provide Cost-Effective and Competent Zonal Isolation of Reservoir Intervals Eliminating the Need for Cement.



**CHALLENGES:** A client just completed the 2<sup>nd</sup> phase of development of a field in the Timor Sea. The field is used to develop gas condensate which is sent to the Darwin Australia LNG plant through a 502km (312miles) subsea pipeline. Phase 2 is comprised of 5 new producer wells plus a water disposal well. The 5 producer wells are capable of producing approximately 250MMscf/D of gas each, through 7" (178mm) monobore completion. The completions were run with the well full of synthetic OBM. The client was looking for a water shut-off solution to optimize the recovery rate of the wells which would not require well intervention or cementing process.

**SOLUTION:** TAM FREECAP swellable packers were used to provide a cost effective and competent zonal isolation of reservoir intervals without the aid of cement. The swellable packers provided annular isolation in the slotted liner completions. The isolation system has proven successful in significantly reducing water-cut, thereby leading to lower costs for water disposal, higher production rates, extended field life, and less need for intervention. TAM performed swell tests in the base oil to determine the swell rate of a FREECAP oil swell packer. As a contingency, the client requested that the swell packers also contain a water swellable rubber which would swell with the produced gas condensate. The packers were designed to pass through a 9-5/8" (245mm) 53# casing and set in an 8-1/2" (216mm) open hole at 275degF (135 C). The FREECAP I packers were manufactured on 7" (178mm) 29# 13%-Cr L-80 casing with premium thread connections. The packers comprised of both 5ft (1.5m) oil and 5ft (1.5m) water swellable rubber on the same mandrel. A FREECAP II (slip-on) option was also proposed in case the packers had to be run through a sidetrack whipstock. The rubber OD of the packers was designed to give a swell time of approximately 3-4 days before making wall contact. This would allow the client time to run the completion to TD and back to surface if any problems were encountered.

#### RESULTS AND BENEFIT: US\$700,000

Typical well construction costs for these wells was US\$75MM. By eliminating the need for well intervention, well costs were reduced by approximately US\$700,000. Well incidents were reduced significantly due to lower risks involved and simpler operation. Gas production has either met or exceeded expectation on each well. There is currently no water production due to the installation of swellable packers to optimize the reservoir