BEFORE THE BOARD OF INQUIRY
TAMARIND DEVELOPMENT DRILLING APPLICATIONS

EEZ100016

IN THE MATTER	of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012
AND	
IN THE MATTER	of a Board of Inquiry appointed under s52 of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 to decide on Tamarind Taranaki Limited's marine consent and marine discharge consent applications

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SUMMARY OF STATEMENT OF EXPERT EVIDENCE OF DR BRIAN KING FOR TAMARIND TARANAKI LIMITED

Dated: 6 November 2018

Govett Quilliam
THE LAWYERS

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MAY IT PLEASE THE BOARD

1. In this summary statement of evidence, I set out the key conclusions of my primary evidence dated 20 July 2018 and the joint statement of experts dated 18 September 2018 of which I was a signatory.

Summary of the key findings of my primary evidence

2. My primary evidence described the modelling RPS has undertaken to quantify the potential fate of hypothetical oil spills during the proposed drilling operations at the Tamarind Oil Field. Given that a spill of oil is an unplanned event and potentially a serious event if the volumes are significantly large, the RPS reports used stochastic oil spill modelling and long-term metocean datasets and a methodology that was a best practice approach. Indeed after a lengthy and diligent review by the Board of Inquiry's experts from Coffey Services Limited (based in Canada and New Zealand) it was ultimately concluded by all experts that the reliability of the models was "high".

3. Reliable modelling is important as the models are designed to not only inform the approvals process, but also the oil spill contingency plan. The modelling also aids oil spill preparedness and is used as a reference by oil spill responders in the extremely unlikely case that a significant spill was to occur. The high level of reliability of the modelling is achieved by undertaking hundreds of spill simulations using maximum credible spill volumes and analysing all of those simulations to report worst case outcomes. Hence the reporting of the modelling intentionally presents the worst of the worst outcomes, but that level of conservatism helps significantly with planning and removes the possibility of any surprise outcomes should oil ever be spilt. Ultimately this is the best practice approach.

4. Specifically, the RPS Reports quantified the full range of potential fates of a maximum credible unplanned discharge of Tui Crude Oil and Marine Diesel. While these RPS reports described the outcomes from hundreds of spill simulations, a spill, if it was to occur, will remain within the extents shown in the reporting, will cover a significantly smaller area than indicated and be at concentrations and volumes less than what is shown. Further, each outcome is quantified with a likelihood of happening. It is for these reasons, that the

modelling approach adopted provides a high level of certainty for decision makers.

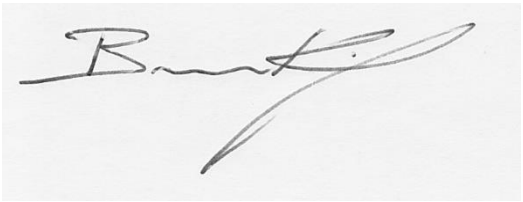
5. The diesel spill modelling shows that a maximum credible release will form a heavy sheen once spilt. The diesel is predicted to evaporate significantly while on the surface and will also disperse significantly during moderate to strong wind events as well. If strong wind events abate quickly, it is possible that the diesel slicks can resurface to a degree. Given the distance from shore and depth of water at the field, it is unlikely that any diesel slicks would reach shallow coastal waters.

6. The 'loss of well control' modelling shows that a seabed release of Tui Crude oil will be rapidly transported to the surface with the gas plume to form surface slicks. These slicks will be thicker during calm conditions and will be naturally dispersed during rough weather. It is unlikely that any thick surface slicks will travel more than 58 km from the release location. The worst case of the many simulations conducted for this maximum credible scenario (the worst of the worst) indicated the potential that isolated thin visible slicks may be detectable as far as 395 km away but far offshore. When the conditions are right (persistent onshore light to moderate winds), visible surface slicks may reach shorelines but would take at least 56 hours to do so, allowing time for evaporation and weathering of those slicks. Otherwise slicks will remain offshore and will disperse naturally overtime in deep water.

7. With respect to the issue raised by Mr Rogers in the Coffey Report dated 31 August 2018, regarding validation of the models using current data, it was agreed that there is limited offshore current data all over New Zealand as this would require current meters to be installed and maintained at multiple offshore locations on an ongoing basis. The modelling is however validated using multiple datasets (satellite data and the global drifter program) and has been used by Maritime New Zealand since 2007. Mr Rogers agreed the best available data was used. Ultimately Mr Rogers also agreed that the "deficit" he was concerned about is such that it should not have a bearing on decision making.

8. The second issue raised by Mr Rogers in the Coffey Report dated 31 August 2018, was in respect to the choice of oil concentration and/or thickness thresholds in the Applicant's spill modelling. Mr Rogers produced a 2016

conference paper from Dr French-McCay that detailed her recent review of toxicity tests to determine screening thresholds. Indeed it was the same author that produced the screening thresholds we used in the Applicant's modelling but from her more comprehensive 1999, 2002 and 2003 peer reviewed papers on this subject and these are still in wide spread use today. The summary table in our joint statement shows that the difference between the old and new thresholds for screening purposes is minor (1ppb compared to 6ppb) being of similar magnitude. Consequently, it was agreed that this minor difference had little significance on decision making.



BRIAN KING
6 November 2018