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 STATEMENT OF EXPERT EVIDENCE OF ALISON LANE FOR TAMARIND TARANAKI LIMITED

Dated: 7 November 2018

Govett Quilliam
THE LAWYERS

Lauren Wallace / Rebecca Eaton
Phone: (06) 768 3700
Fax: (06) 768 3701
Private Bag 2013/DX NP90056
NEW PLYMOUTH 4342
lauren.wallace@gqlaw.co.nz

MAY IT PLEASE THE BOARD

1. My full name is Alison Lane. I am a Technical Director at ERM New Zealand Limited and have held that position since 1 January 2015.

2. In this summary statement of evidence I set out the key conclusions of my primary evidence, dated 20 July 2018.

Summary of the key findings of my primary evidence

3. My primary evidence provides a discussion of the potential impacts on the environment and existing interests resulting from the planned discharge of harmful substances in offshore processing drainage and from unplanned spill events. My primary evidence also discusses the nature of spill response planning and environmental monitoring that will be applied by Tamarind during the project to assess and mitigate impacts.

Harmful Substances in Offshore Processing Drainage

4. Detailed descriptions of the treatment systems and control measures to avoid and manage any discharges or spills of harmful substances into deck drains have been detailed in the impact assessment, the further information provided by Tamarind and in the evidence of Mr McCallum and Mr Peacock. I will not repeat these other than to note that Tamarind has identified that in a worst feasible case up to 20 litres of any spilled harmful substance may be discharged in offshore processing drainage.

5. The potential impacts of deck drain discharges will be a function of the characteristics of the discharge and the possible exposure levels and mechanisms of different receptors. This will be influenced by discharge volume and dilution and the specific characteristics of how the receptor interacts with the marine environment. For example, pelagic species will be exposed to any substances in the water column, benthic species would only be exposed where the substance reaches the seabed, and seabirds would be exposed if a substance is floating on the water surface when they alight to feed or rest.

6. Given the distance from shore and the nature and quantities of the potential discharges, I consider that exposure of environmental or human receptors outside the permit area that defines the Area of Interest is not feasible.

7. At the time of drafting my evidence, I noted that Tamarind had identified six harmful substances that had the potential to enter deck drains in significant quantities (up to 20 litres), however I understand that Tamarind's intention is use a reduced number of these chemicals where practicable.

8. In assessing the potential for environmental harm from the discharge substances I considered the reported ecotoxicity data for the substances that had been identified as potentially being discharged. It is important to note that these tests use extended exposure periods in most cases, typically between 48 and 96 hours of continuous exposure at the test concentration.

9. In reality, in the marine environment such static exposure would not occur unless a discharge was continuous and an organism remained in the same area for an extended period. Where a pulse of water from the deck enters the sea it would immediately be subject to 3-dimensional dilution so exposure concentrations would rapidly decrease over time (within minutes).

10. Dilution of any spilled material on the decks would occur in stages, firstly in the ~300 cubic metre (m^3) volume of water in the slops tank, and then when the discharge reached the ocean. I have calculated that 20 litres of a substance would dilute to 1 part per million (ppm) within a receiving water volume of 20,000m^3. To assist with visualisation this equates roughly to a box with each side measuring 27m.

11. Of the harmful substances expected to be included in the cement and drilling muds, the reported EC50 values (based on 48-96 hour test exposures) would be limited to an area of 408m^3 in one case and 6m^3 in the other case. As ecotoxicity is a function of both concentration and exposure time, I consider that the very short exposure time at these EC50 concentrations is unlikely to result in measurable effects on any environmental receptor, other than potential temporary reductions in plankton density in the immediate area of the discharge.

12. Due to the small volumes of the discharge and the removal of settled solid materials in the drainage system, I consider it highly unlikely that there is any potential for accumulation of harmful substances in sediments. Based on the predicted dilution of the deck drainage and monitoring studies for the operational discharges from the FPSO, I also consider that there is no potential for cumulative effects from multiple discharge sources in the AOI or beyond.

Potential Impacts from Unplanned Spills of Fuel, Oil or Chemicals

13. Tamarind have assessed the potential sources and risks of an unplanned spill of harmful substances or oil during the drilling activities. Small spills of chemicals or hydrocarbons direct to the ocean may occur during re-supply or as a result of significant events such as vessel collisions or, in the worst case, a loss of well control during drilling. The assessment concludes that these events are highly unlikely or extremely unlikely to occur.

14. Other than for a loss of well control, any exposure of marine organisms to spilled substances would typically be localised and in the form of a short-term pulse and, for most substances, rapid dilution would occur as described previously in relation to deck drainage. The greatest potential risk would be to sensitive column species such as plankton in the immediate area of the spill.

15. Diesel is also used as fuel by support vessels and the worst credible spill of diesel would result from a vessel collision, where a full bunker tank of fuel (being approximately 150m^3) was lost due to damage to the tank. Modelling of 200m^3 of diesel shows that a visible surface slick may extend up to 64km from the release site in the worst case, although 99% of the time would not extend further than 34km).

16. Moderate and high surface exposures from a diesel spill of this size would extend to a maximum of 18km and 6km, respectively. The only potential shoreline contact from the spill scenario was a 1% probability that diesel may reach the shoreline in South Taranaki, affecting not more than 1km of shoreline. The primary risk from a major diesel spill would be to pelagic

species near to the spill site or to seabirds if they were to alight on water surfaces where slicks were present.

17. The most significant risks from a spill would be in the extremely unlikely event of a loss of well control, which modelling shows to have the potential to result in extensive surface and shoreline contamination. In this case there is potential for impacts on marine fauna and seabirds, as well as shoreline species in affected areas and human uses of affected shorelines.

18. Based on the effects identified, I do not consider that the proposed conditions need to include any additional benthic habitat monitoring over and above that which is routinely carried out for monitoring of Production Discharges.

19. I have reviewed the commissioned reports from SEAPEN and concerns raised by submitters and responded to those concerns in my evidence. The submissions have not caused me to change my overall conclusions regarding the potential risks to environmental or socio-economic receptors as a result of the proposed activities.

ALISON LANE
7 November 2018