



*Salmon*  
**TASMANIA**

## Supportive Document - EPBC Submission

### **Dr Ian Wallis (2014) Report on Macquarie Harbour Oxygen Levels**

Today, Salmon Tasmania publicly released their submission to the Federal Government's EPBC review process that has been initiated by federal environment minister, Tanya Plibersek.

As part of the submission Salmon Tasmania has referenced scientific evaluations by Dr Ian Wallis. Dr Wallis has extensive experience in environmental assessments, water quality, oceanographic studies, and is recognised as one of Australia's experts in these fields.

Key findings used from The Wallis Report 2014 are as follows:

- There is a high level of stratification in the harbour waters. The natural levels of dissolved oxygen in the lower layer are, and always have been, low because of the hydrological processes occurring in the harbour.
- Oxygen is primarily introduced into Macquarie Harbour by river and ocean water inflows and surface re-aeration. River inflows are continuous, with volumes varying seasonally and following releases from hydroelectric dams upstream in the Gordon and King Rivers;
- In periods of higher river flow (generally during winter-spring or following a dam release event) inflow of ocean water is restricted and periods of low DO in deep waters are also observed;
- Uplift events where waters with low DO come closer to the surface are natural events driven largely by low river flows and, to a lesser extent, by tides, atmospheric pressure and winds. The events are not caused by, or increased by, salmon farms;
- The current evidence is that the Maugean Skate generally live in the top layer of Macquarie Harbour at a range of 8m to 15m which has satisfactory levels of dissolved oxygen and travel into the lower layer only where there is satisfactory dissolved oxygen.
- 'Salmon farms reduce the DO in the top layer [of the harbour] by 4% or 0.3mg/L'. This minor decrease is said to have negligible effect on the survival of the skates in their normal habitat in the top layer near Table Head;
- Inflows of sea water are responsible for replenishing DO levels of water at the lower layer of the Harbour. The ability of ocean water to enter the harbour is determined by river inflows and is hampered by the large volume of freshwater that must be discharged during a tide cycle and the long channel (8km) from the ocean to the harbour
- The impact of biological processes at depth as a result of salmon farming are minor when considered in the context of the whole harbour. Dr Wallis finds that 'the majority of the oxygen demand on the lower layer' comes from organic material introduced into the harbour as a result of river inflows.

Dr Wallis concludes that the drawdown of oxygen attributable to salmon farming occurs in a manner that would result in negligible impacts to the Maugean Skate in their observed habitat.

These findings highlight that the cessation of aquaculture in Macquarie Harbour alone without addressing other anthropogenic factors causing environmental degradation including changed river flows and the presence of heavy metals from historic mining activities, would be most unlikely to resolve current low levels of dissolved oxygen.

Dr Wallis also undertook a review of scientific literature relied upon in the Reconsideration requests and found that data relied upon and assumptions made in the literature either did not support the conclusions drawn or overstated the impacts of salmon farming on environmental conditions

**Ian G Wallis, B.E., M.Eng.Sc., Ph.D., - Environmental Engineer**

**Qualifications:**

Bachelor of Engineering (Honours) Master Engineering Science  
Doctor of Philosophy, Monash University

**Summary of Professional Experience:**

Lecturer in Hydraulics and Fluid Mechanics

Research Fellow Oceanography, University of Southampton (UK) Modeller, Water Pollution Research Laboratory (UK)

Senior Investigations Engineer, Brown & Caldwell (USA) Principal Engineer, Caldwell Connell Engineers

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