



**PENDOLEY  
ENVIRONMENTAL**

MARINE CONSERVATION  
ENVIRONMENTAL SERVICES

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The Hon Gary Hardgrave  
Administrator Norfolk Island  
Commonwealth of Australia

**RE: WATER QUALITY IN EMILY BAY**

Dear Sir

Following my recent visit to Norfolk Island, Dr Martin Goldsmith and I would like to bring to your attention our concerns regarding the quantity and quality of water entering Emily Bay. Primary risks are;

- Death of coral and increased algal growth, short term loss of all corals and associated habitats in the bay (5-10 years)
- Population level impact on the EPBC listed Booths pipefish and green turtles and their habitats
- The health and safety of people swimming in Emily Bay
- Management of the groundwater in the KAHVA catchment

Additional detail is provided below;

1. Large fresh water flows together with elevated nutrient levels have killed the coral in Emily Bay along a transect extending from the outfall, across the bay to Lone Pine and to the reef outlet channel. Personal observations over the past 50 years, together with anecdotal feedback from numerous island residents, indicate that the die-off of coral, increased algal growth, both on the floor of the bay and covering the dead coral habitat, plus the decrease in the number and diversity of small fish, has accelerated the past 5 years. We have serious concerns that this accelerated rate of decline will wipe out the entire Emily and Slaughter Bay lagoon within 5 – 10 years. Recovery of the ecosystem will be delayed by the lack of immigration of coral spawn from external reef systems (e.g. Lord Howe) due to the isolated nature of Norfolk Island.
2. The Emily and Slaughter Bay lagoon supports the EPBC listed *Halicampus boothae* (Booths pipefish) and *Chelonia mydas* (green turtle). These species are at risk of disease, reduced health and habitat loss due to the

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## WATER QUALITY EMILY BAY

water entering the bay and under the EPBC Act the responsible Governing Authority is obliged to protect these species and the ecosystems that support them.

3. While the existing sand plug in the creek has temporarily stopped water flowing from the creek into the bay, water continues to percolate through the sand and enter the bay in the intertidal zone near the mouth of the creek mouth in Emily Bay. The filtration action of the sand will remove solids but it will not remove the dissolved nutrients and pathogens which can cause a range of illnesses in people swimming in the bay. The pathogens found in sewage contaminated water waste can cause very serious illness and death include viruses (gastroenteritis, Hepatitis A, cystitis, skin rashes etc.) bacteria (e. coli., salmonella, diarrhoea, Staphylococcus aureus, (golden staph), Pseudomonas aeruginosa. (ear, nose and throat infections) Legionella (as in legionella disease) Streptococcus pneumoniae, cholera etc.), fungus (Candida albicans). Dr Pendoley's 83 year old father swims in Emily Bay daily and he, together with other local resident we have discussed this with, have experienced persistent ear infections, indicative of bacterial infection.
4. The pathogens' in the Emily Bay outfall were measured by Dr Goldsmith between 2014 and 2015 are beyond the safe limits for human activity such as swimming, based on DoE Water Quality Guidelines. This is especially true after heavy rain washes human and animal waste from the catchment into the Kingston area. Commonwealth NHMRC Water quality standards for primary contact (e.g. swimming) require the water to contain little or no e.coli (<40 e. coli pre 100ml) however sampling carried out in June 2015 reported E. Coli levels in excess of 670 per 100 ml and Coliform counts in excess of 1860 per 100ml. The water entering Emily Bay is contaminated and a risk to human health. I am attaching the Commonwealth NHMRC Guidelines for Water Quality for your information.

We have serious concerns over the welfare of residents and tourists using Emily Bay, particularly the age groups most vulnerable, i.e. the elderly and the very young. There is a Duty of Care on the regulatory bodies governing Norfolk Island to protect the public health, and given the lack of medical facilities on the island at the moment this could have serious implications for the survival of an at risk infected patient.

We recommend the following actions be considered as a matter of urgency

### Short Term recommendations

1. Stop the flow/seepage of water into Emily Bay immediately.
2. Sample the water quality in Emily Bay daily and close the beach when standards for primary contact are exceeded (links to guidelines are attached).
3. Install signage to make people aware of the risk of swimming in Emily Bay due to potential water contamination so they can make an informed decision as to their usage of the bay.

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Long Term recommendations

1. Investigate other options for directing water containment and flow, i.e. to pond in situ on the Commons behind Slaughter Bay and/or allow the water to flow and pond in the public open space that is currently occupied by the Golf Course.
2. Pipe the water offshore from Cemetery Beach where the high energy will ensure rapid dilution and mixing.
3. Clean up the water quality in the catchment.

Thank you for your attention and if there is anything we can do to assist with resolving this problem please do not hesitate to contact Dr Goldsmith or myself.

Yours Faithfully

Kellie Pendoley BSc MSc PhD MRACI

**WATER QUALITY EMILY BAY**

Attachment 1

Reference Standards

Commonwealth Drinking Water quality Guidelines, 2011  
<https://www.nhmrc.gov.au/guidelines-publications/eh52>

Commonwealth Govt, NHMRC 2008 Water quality guidelines  
<https://www.nhmrc.gov.au/guidelines-publications/eh38>

Commonwealth Govt Geosciences Australia.  
[http://www.ozcoasts.gov.au/indicators/marine\\_pathogens.jsp](http://www.ozcoasts.gov.au/indicators/marine_pathogens.jsp)