



19/6/18

SEPP Waters Manager,
Level 10, 8 Nicholson Street,
East Melbourne, 3002

Re: Submission to SEPP (Water) consultation

This submission draws attention to the impacts of littered plastic and microplastics as an emerging risk to waterways, including Port Phillip Bay. Beneficial uses¹ impacted by plastic pollution include: water dependent ecosystems and species; human consumption of aquatic foods (natural populations - commercial and recreational catch); and, aquaculture.

Worldwide, at least 690 aquatic species are impacted by plastic pollution (Gall and Thompson, 2015). Ingestion of plastic, including microplastics, can lead to injury (e.g. blocked digestive tracts, and organ rupture) and death. Furthermore, plastics *adsorb* organic micro-pollutants or persistent organic pollutants (POPs), including polychlorinated biphenyls (PCBs), Dichlorodiphenyldichloroethylene (DDE) and nonylphenol. These chemicals bioaccumulate and biomagnify up the food chain. This increasing concentration of toxic chemicals in the tissues of organisms at successively higher levels in a food chain has been linked to disease and death in several top predators (Gall and Thompson, 2015).

In December 2017, 193 countries signed a United Nations resolution to eliminate plastic pollution from the world's oceans. Increased efforts to identify and evaluate the effects of microplastic pollution on marine fauna have commenced in oceans around the globe. Since January 2015 Port Phillip EcoCentre has conducted monthly (X 30 minutes) trawls to document the presence of microplastics in the Maribyrnong and Yarra Rivers. The trawls removed a total of 9,867 litter items from the surface waters of the two rivers. **In total, over 828 million litter items flow into Port Phillip Bay annually from the two rivers' surface waters. Over 612 million (74%) of these are microplastics.** Although large variations in monthly collections were noted through the entire study period, it was found **the Yarra River carries significantly more litter than the Maribyrnong and that its litter loads are increasing.**

The increasing litter load to Port Phillip Bay presents an increased risk to water dependent ecosystems and species. Although there is no comprehensive study documenting these risks in Victorian waters, the AGL Marine Response Unit has responded to hundreds of calls to assist Victoria's marine wildlife including seals, dolphins, whales, turtles and birds.

Increasing levels of microplastics recorded in the Yarra River reflects international research detailing increasing reports of plastic pollution in waterways. Among the international studies, Gall and Thompson

¹ As listed in Schedule 2, Table 1. SEPP (Waters) DELWP Legal as at 16 January 2018

(2015) conducted an extensive literature review, focussing on peer reviewed publications, and divided the collated works (340 original publications) into 4 key topic areas:

- 1) Documenting ingestion of or entanglement in marine debris by organisms;
- 2) Reporting species rafting on debris;
- 3) Where debris creates new habitat for colonisation; and
- 4) Where it causes physical damage to ecosystems.

They found encounters between organisms and marine debris first reported in the 1960s; and, **92% of all encounters between individual organisms and debris were with plastic**. Thirty-five percent more papers reported entanglement ($n = 178$) than ingestion ($n = 132$). Most commonly entangled species were northern right whales and turtles. Greatest numbers of individuals entangled were northern fur seals, Californian sea lions, and Atlantic Puffin. Green sea and loggerhead turtles were most reported as ingesting marine debris. Greatest numbers of individuals ingesting were northern fulmar, Laysan albatross, and greater shearwater. Although the number of reports of fish encountering marine debris remains low (0.68%) the number of species affected had doubled since 1997². Quite conceivably, the fewer reports of fish ingesting plastics may simply be due to lack of investigation; and, entanglement being visually obvious.

These findings highlight the fact that plastic pollution is a global problem affecting diverse species with different feeding strategies. While further study is required to quantify this issue in Victoria, investment in such research is unlikely to be forthcoming if plastic pollution is not addressed in the SEPP (Waters) Policy. This absence is apparent in the current wording for ‘beneficial uses’ that are impacted by plastic pollution.

Among 14 beneficial uses, TABLE 1: BENEFICIAL USES FOR WATER includes the following:

Beneficial use	Beneficial use purpose or intent
Water dependent ecosystems and species	Water quality that is suitable to protect the integrity and biodiversity of water dependent ecosystems. This beneficial use encompasses: <ul style="list-style-type: none"> • Protection and integrity of riparian vegetation as it contributes to the health of water dependent ecosystems and bank stability; • That groundwater quality does not adversely affect surface water ecosystems and other beneficial uses of surface environments; and • Ensures that groundwater quality does not adversely affect natural ecosystems that require groundwater to meet all or some of their water requirements on a permanent or intermittent basis to maintain their communities of organisms, ecological processes and ecosystem services. This includes wetlands and rivers reliant on groundwater baseflow, some terrestrial vegetation and some estuarine and near-shore marine systems, cave ecosystems and subterranean fauna; • Maintenance of fish passage.
Human consumption of aquatic foods (natural populations - commercial and recreational catch)	Water quality that is suitable for the safe consumption of fish and any other aquatic plant, algae or invertebrate.
Aquaculture	Water quality that is suitable for the production of fish for human consumption

² Laist, D. Impacts of marine debris entanglement of marine life in marine debris including a comprehensive list of species with entanglement and ingestion records. In: Marine Debris, Springer, New York. Pp. 99-139.

We suggest that this current shortcoming could be addressed in the wording for **water dependent ecosystems and species** by simply adding a final point in the **Beneficial use purpose or intent** column:

- Ensures that aquatic fauna are not in danger of ingestion or entanglement with plastic pollutants including microplastics

Inclusion of the above point would also address potential risks related to **human consumption of aquatic foods (natural populations - commercial and recreational catch)**; and, **aquaculture**.

Inclusion of these 'beneficial uses' in the existing wording is recognition of the potential human health risks associated with pathogens and contaminants transferred within the food chain; and support the related actions in the current Port Phillip Bay Environmental Management Plan³:

Action 4.1 Establish a baseline estimate of the volume of litter entering the Bay, and support clean-up activities.

Action 4.2 Support capability and capacity building programs that target litter prevention, including reduction of microplastics.

Action 4.3 Identify and prioritise litter sources and pathways, and take action to prevent litter entering the Bay.

I attach a copy of our May 2018 report *Microplastics in the Maribyrnong and Yarra Rivers, Melbourne, Australia* (Charko, Blake, Kowalczyk et al) presenting Victoria's first quantification of microplastics in the river systems of Port Phillip Bay catchments, with results indicating a recent increase in microplastics.

Please do not hesitate to contact the Port Phillip EcoCentre and our research team for further information regarding the content of this submission.

Best regards,



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Attached:

1. Clean Bay Blueprint Microplastics Report May 2018 FINAL.pdf - '*Microplastics in the Maribyrnong and Yarra Rivers, Melbourne, Australia*'

³ Port Phillip Bay Environmental Management Plan 2017-2027