NHMRC PFAS Guidance for Recreational Water
Frequently Asked Questions

Question	Answer
What are PFAS?	Per- and poly-fluoroalkyl substances (PFAS) are a class of more than 4000 manufactured chemicals that are not found naturally in the environment. There are many types of PFAS, with the best known examples being perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHxS). These individual chemicals are collectively referred to as PFAS in the guidance unless specifically mentioned. PFAS are persistent chemicals that do not breakdown and therefore remain in the environment. PFAS have demonstrated the potential for bioaccumulation and biomagnification (i.e. gradual increase in concentration) in humans.
Where do PFAS come from?	PFAS have been used in a wide range of consumer products, including surface treatments to non-stick cookware, solution treatments for carpets and treatment of clothing for stain resistance and water repellence. As a result of this widespread use, PFAS are commonly found in landfills and wastewater treatment plants. They also have been widely incorporated in aqueous film forming foam (AFFF) used to extinguish hydrocarbon fires. As a result, PFAS have been found to contaminate sites where there has been historic use of PFAS-containing firefighting foams. At some sites, these chemicals have migrated through subsurface environments and contaminated surface water, groundwater and adjoining land areas.
Why are we talking about PFAS?	The release of PFAS into the environment has become a concern because these chemicals do not break down easily by natural processes, which means that they can persist in the environment, animals and humans. As a precaution, governments across Australia are recommending that people minimise their exposure to PFAS while further research on the potential human health effects continues. Due to their widespread usage, persistence and mobility in water and soil, PFAS are present at low concentrations everywhere in the environment. The concentrations of some PFAS chemicals, particularly PFOS and PFOA, have generally been declining in the environment and in humans during the past decade as their use in Australia and the world are reduced. PFAS have been detected at recreational water sites across Australia. While water near some contaminated sites has been monitored for PFAS, monitoring is not done routinely for all Australian recreational waters (more information on recreational water below).

Why has NHMRC released this guidance?	NHMRC has developed advice for local health authorities about what concentrations of PFAS chemicals can safely exist in their local lakes, rivers and coastal waters in order to ensure the health and safety of local communities. These are provided as guideline values for PFOA, PFOS and PFHxS. The guideline values will be used by local authorities when they are managing the safety of recreational water environments and undertaking site assessments of water quality.
Who will use this guidance?	Water treatment operators, water regulators, local councils and the public may use this guidance.
What is recreational water?	Recreational water includes any public coastal, estuarine or freshwater areas where a significant number of people use the water for recreation, such as lakes, rivers and coastal waters. This does **NOT** include aquatic facilities such as swimming pools, spas or water theme parks. Consuming the catch from fishing activities in recreational waters is out of scope of this guidance and requires a separate health risk assessment.
Why are PFAS in recreational water?	PFAS can contaminate recreational water from a variety of sources. In addition to contamination from fire-fighting foams, PFAS can be released into the environment from wastewater and sewage discharges. Leaching from landfill sites where products and materials containing PFAS are sent for disposal can also occur. PFAS may travel long distances in rivers and coastal waters.
How can I be exposed to PFAS from recreational water?	Exposure to PFAS from recreational water may occur while undertaking any activities relating to sport and relaxation that depend on recreational water sources (e.g. swimming, diving, boating, fishing, sailboarding). The most likely route of exposure to PFAS is accidentally swallowing recreational water containing PFAS during activities involving full immersion in water such as swimming. Dermal absorption is slow and does not result in significant exposure. In addition, PFAS chemicals are essentially non-volatile, so inhalation of PFAS while using recreational water is not likely to be a major exposure pathway. Fish caught from some contaminated recreational waterways may also contain elevated levels of PFAS. Persons eating these fish can be exposed to PFAS. Consumption advice to recreational fishers has been necessary near some contaminated sites.

Are there health effects from exposure to these chemicals?	The latest evidence suggests PFAS exposure in humans has been associated with mildly elevated levels of cholesterol, effects on kidney function and effects on the levels of some hormones. However, these effects are small—generally within ranges seen in the general population. PFAS has not been shown to cause disease in humans. For more information on potential health effects please refer to the 2019 enHealth Guidance Statements on PFAS on the Australian Government Department of Health website. Research into the potential health effects of PFAS is ongoing. NHMRC will consider any new evidence as it emerges and will continue to set guidelines using a precautionary approach. As a precaution, people living in or near an area that has been identified as being contaminated with PFAS should take steps to minimise their exposure to these chemicals. State and territory governments can provide localised advice on how to minimise exposure to PFAS.
I'm pregnant. Can I swim in water contaminated with PFAS?	There is no evidence that PFAS is a major contributor to poor health outcomes in pregnant women or their babies. However, as a precaution, pregnant women should minimise their exposure to PFAS. Where there are elevated levels of PFAS in the water, a pregnant woman should reconsider the need to swim. Guideline values will be protective of vulnerable groups, including pregnant women. State and territory governments can provide advice regarding PFAS specific to your location and circumstances.
Are the guideline values protective of children who might swim at recreational water sites?	Yes, the calculations used in the guidance incorporate factors that are conservative and account for vulnerable groups and a range of recreational scenarios. This has resulted in guideline values that protect the majority of the population, including children. Please refer to the guidance for more detail on these calculations. State and territory governments can provide advice regarding PFAS specific to your location and circumstances.
Our local recreational water site may be affected by PFAS contamination. How do we know if the water is safe to swim in?	If a human health risk assessment is being conducted or has been conducted in your area, the local health authority or environmental protection agency responsible should communicate the outcomes and advise the affected community as part of its health risk management activities. Look for signs that may have been erected by your local government agency, recommending that recreational use (fishing or swimming) is not suitable in these waters. State and territory governments may also provide advice on recreational water use. If you live in an affected community, you can check with your relevant state or territory health department or environmental protection agency

	for advice regarding PFAS and recreational water use in your area.
What is a health-based guideline value (HBGV)?	Health-based guideline values (HBGVs) indicate the amount of a chemical in food or drinking water that a person can consume on a regular basis over a lifetime without any significant risk to health. The HBGVs in this guidance are based on a tolerable daily intake (TDI), which refers to the daily amount of a chemical that has been assessed as safe for humans on a long-term basis. More information on how these guideline values were calculated is provided in the guidance. The guideline values are protective of human health and are used as a precautionary measure when conducting recreational water site investigations and providing advice to affected communities. The guideline values include a safety margin and are expected to be well below the level at which any negative effects could occur.
What are the recommended HBGVs for PFAS in recreational water?	The recommended guideline values for PFAS in recreational water are: • **Total sum of PFOS and PFHxS 2 µg/L** • **PFOA 10 µg/L**
What happens if PFAS are detected at a recreational water site?	If testing has identified PFAS concentrations above the recreational water quality HBGV, the site will be managed by your local authority and affected communities will be alerted. If testing has identified PFAS in the water body, but at concentrations below the recreational water quality HBGV, you may still use the recreational water site.
How was this advice developed?	This guidance is based on the most current estimates of how much water people swallow while swimming and on the amount of PFAS chemicals to which the human body can safely be exposed. It is also based on information on TDIs from Food Standards Australia New Zealand. The methods used and the current guideline values are seen as conservative and sufficiently protective of public health by experts and public health officials here in Australia. In line with standard practice, NHMRC will monitor any new developments in how best to calculate safe levels of exposure to chemicals, including PFAS, and will update this methodology if necessary as it revises its recreational water quality guidelines during the next few years. If new data relevant to Australia becomes available, the exposure estimates for recreational activity in natural waters may change and the calculation adjusted in the guidance. Any changes will be subject to public consultation.

Who was involved in developing this advice?	NHMRC's Water Quality Advisory Committee, the experts on public health issues related to water quality, developed the guidance. The guidance is also informed by the risk assessment on PFAS undertaken by Food Standards Australia New Zealand. The Environmental Health Standing Committee was also consulted in the development of this guidance.
How do these guideline values differ from other PFAS advice?	The new recreational water guideline values are slightly higher than previous PFAS advice. NHMRC has used an updated methodology as recommended by the Water Quality Advisory Committee. The use of this methodology involves different estimates of water ingestion while swimming (based on current Australian estimates) as well as TDIs calculated by Food Standards Australia New Zealand. Using the new NHMRC methodology resulted in the guideline values in the 2019 guidance differing slightly from those developed by the Department of Health in 2017: • **Total sum of PFOS and PFHxS is now 2 µg/L** (Health 2017 value was 0.7 µg/L) • **PFOA is now 10 µg/L** (Health 2017 value was 5.6 µg/L) Please refer to the guidance for more information on how NHMRC calculated these guideline values. The resultant recreational water guideline values are slightly higher than those published by the Department of Health in April 2017, but they represent the current Australian estimates on how often Australians use lakes, rivers and coastal water over the course of a year, and how much water people might swallow when participating in these activities.
Why do the HBGVs for recreational water differ from those for drinking water?	The NHMRC recreational water HBGVs for PFAS are higher than the HBGVs for drinking water. For example, the HBGV for total PFOS and PFHxS in recreational water is **2 µg/L** and the HBGV for total PFOS and PFHxS in drinking water is **0.07 µg/L**. This is because people typically swallow less recreational water than they consume drinking water, both in terms of volume and frequency. As this results in a greater amount of drinking water consumed over time, this means that there needs to be a lower level (or HBGV) of PFAS set for drinking water to be safe for daily consumption. Both sets of guideline values are precautionary and protective of human health. The guideline values include a wide safety margin and are expected to be well below the level at which any negative effects could occur. Please refer to the guidance and the PFAS fact sheet in the Australian Drinking Water Guidelines for more information on how NHMRC calculated these guideline values.
Does the new guidance replace the	Yes, the new HBGVs for PFAS in recreational water replace the Department of Health 2017 advice for recreational

Department of Health 2017 advice on PFAS in recreational water?	water.
The NHMRC health-based guideline values for recreational water are higher than the Department of Health 2017 values. Does this mean that the Department of Health values were wrong?	No, both sets of guideline values for recreational water are precautionary and protective of human health. NHMRC has developed its guideline values using an updated methodology as recommended by its Water Quality Advisory Committee to better account for estimated exposure during recreational activities. The use of this methodology involves estimates of ingesting water while swimming, based on a small number of studies on recreational water exposures, as well as information on TDIs from Food Standards Australia New Zealand. The resultant recreational water guideline values are slightly higher than those published by the Department of Health in April 2017, but they represent the current Australian estimates on how often Australians use lakes, rivers and coastal water over the course of a year, and how much water people might swallow when participating in these activities.
How can local authorities use this guidance?	There are two approaches available to local authorities in using this guidance: • Use the common or 'default' guideline values outlined in the guidance that have been developed for all areas in Australia; or • Calculate 'site specific' guideline values if authorities feel their local recreational water usage pattern differs from the 'default value' calculations. The authority can use the algorithm in the guidance with site-specific data that better reflects their community's use of recreational water. This **must** be done in consultation with the local health regulator.
I work for a local health authority. What do I do when we have detected an exceedance of PFAS at our local recreational water site?	When an exceedance is detected, please follow your risk management procedures for managing contaminated recreational water sites. This should also include informing the community of any contaminated areas and closures of recreational water sites. State and territory governments can provide advice regarding PFAS specific to your location and circumstances.
Where can I find more information?	Additional information on PFAS can be found on the following websites: • https://www.pfas.gov.au/ • Australian Government Department of Health website • Australian Government Department of Defence website • Australian Drinking Water Guidelines PFAS fact sheet