

The Senate

Select Committee on PFAS (per
and polyfluoroalkyl substances)

Interim report

March 2025

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Abbreviations and acronyms

ACT	Australian Capital Territory
ADWG	Australian Drinking Water Guidelines
AFFF	Aqueous Film Forming Foams
AHPC	Australian Health Protection Committee
AICIS	Australian Industrial Chemicals Introduction Scheme
Airservices	Airservices Australia
ANU	Australian National University
APCO	Australian Packaging Covenant Organisation
APVMA	Australian Pesticides and Veterinary Medicines Authority
CEO	Chief Executive Officer
crcCARE	Cooperative Research Centre for Contamination Assessment and Remediation of the Environment
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Defence/the department	Department of Defence
enHealth	Environmental Health Standing Committee
Environment Department	Department of Climate Change, Energy, the Environment and Water
EPA	Environmental Protection Agency
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (cth)</i>
EU	European Union
FOGO	Food Organic and Garden Waste
FRV	Fire Rescue Victoria
FSANZ	Food Standards Australia and New Zealand
Health Department	Department of Health and Aged Care
HEPA	Heads of Environmental Protection Agencies in Australia and New Zealand
HFPO	hexafluoropropopylene oxide

IARC	International Agency for Research on Cancer
IChEMS	Industrial Chemicals Environmental Management Standard
Infrastructure Department	Department of Infrastructure, Transport, Regional Development, Communications and the Arts
JBRF	Jervis Bay Range Facility
JBT	Jervis Bay Territory
JSCFADT	Joint Standing Committee on Foreign Affairs, Defence and Trade
LGNSW	Local Government New South Wales
NHMRC	National Health and Medical Research Council
NRE	Tasmanian Department of Natural Resources and Environment
NSW	New South Wales
PFAS	per and polyfluoroalkyl substances
PFAS Independent Review	Independent review of land uses around key Defence bases impacted by PFAS contamination
PFAS NEMP	PFAS National Environmental Management Plan
PFHxS	perfluorohexane sulfonate
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
RAAF	Royal Australian Air Force
SA	South Australia
the Intergovernmental Agreement	The Intergovernmental Agreement on a National Framework for Responding to PFAS Contamination
the NT department	Northern Territory Department of Lands, Planning and Environment
US EPA	United States Environmental Protection Agency
WBACC	Wreck Bay Aboriginal Community Council

List of recommendations

Recommendation 1

1.38 The committee recommends that the Senate reappoints the Select Committee on PFAS (per and polyfluoroalkyl substances) in the 48th Parliament, granting access to the evidence and documents collected during the 47th Parliament.

Recommendation 2

5.71 The committee recommends that the Department of Defence and the Department of Infrastructure, Transport, Regional Development, Communications and the Arts work with the Wreck Bay Aboriginal Community Council, and other relevant stakeholders, to improve signage, messaging and information provided to the community.

Recommendation 3

6.77 The committee recommends that Parliament considers referring an inquiry to the Joint Standing Committee on the National Capital and External Territories which examines governance, representation, and service provision in the Jervis Bay Territory (including the Wreck Bay Aboriginal community settlement).

Chapter 1

Introduction

Referral and conduct of the inquiry

- 1.1 On 22 August 2024, the Senate appointed the Select Committee on PFAS (per and polyfluoroalkyl substances), to inquire into the extent, regulation and management of PFAS. The committee is required to present a final report by 5 August 2025.¹ With a Federal election likely in the first half of 2025, the committee has agreed to table an interim report to reflect some of the evidence received so far.
- 1.2 The committee advertised the inquiry on its website and wrote to relevant organisations and individuals to invite them to make a submission. At the time of writing, a total of 127 submissions have been received and are available on the committee's website. The committee originally called for submissions to be provided by 19 December 2024. However, in February 2025 the committee resolved to reopen submissions and continues to receive and publish submissions. A list of submissions published so far is provided in Appendix 3.
- 1.3 Additional documents, including answers to questions on notice, have also been received. These additional documents have been published on the committee's website and are listed in Appendix 3.
- 1.4 The committee has held four public hearings to date, including: in Canberra on 13 November 2024; in Nowra, New South Wales (NSW) on 21 January 2025; in Penrith, NSW on 22 January 2024; and in Launceston, on 12 March 2025. A list of witnesses is provided at Appendix 4.
- 1.5 The committee also conducted a community visit to Wreck Bay, Jervis Bay Territory (JBT), as part of the inquiry. A summary of the committee's visit is provided in Appendix 2.
- 1.6 The committee intends to hold additional public hearings as the inquiry continues.

Acknowledgments

- 1.7 The committee thanks all the individuals and organisations who have appeared as witnesses or made submissions to the inquiry so far.
- 1.8 The committee also wishes to record its appreciation to the Parliamentary Library for the background paper on PFAS that they provided to the committee. Of note was the Parliamentary Library summary of reports released and key

¹ *Senate Journals*, No. 127, 22 August 2024, pp. 3840–3841.

information about state and territory governments handling of PFAS, which can be found at Appendix 1.

Previous inquiries into PFAS

Parliamentary inquiries into the management of PFAS contamination in and around Defence bases

1.9 In November 2015, the Senate Foreign Affairs, Defence and Trade References Committee commenced an inquiry into the contamination of Australia's Defence Force facilities and other Commonwealth, state and territory sites in Australia. The inquiry focused on the circumstances surrounding the contamination at the Royal Australian Air Force (RAAF) Base in Williamstown and the Army Aviation Centre in Oakey. The terms of reference were centred on perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) contamination.² The committee published two reports and made 17 recommendations.³

1.10 In May 2018, the Joint Standing Committee on Foreign Affairs, Defence and Trade (JSCFADT) commenced an inquiry referred by the Senate into the management of PFAS contamination in and around Defence bases. This initial inquiry reported in November 2018, making nine recommendations, including that the Australian Government:

- appoints a Coordinator-General to coordinate a national response;
- increases investment in the containment of PFAS contamination plumes, and the remediation of contaminated land and water sources;
- reviews existing advice in relation to the human health effects of PFAS exposure;
- improves participation in the voluntary blood testing program for PFAS;
- assists property owners and businesses in affected areas for demonstrated, quantifiable financial losses associated with PFAS contamination that has emanated from Defence bases;
- makes available free, individualised case management and financial counselling services to those affected by PFAS contamination;
- implements legislation to ban the use of products containing PFAS;
- ratifies the listing of PFOS under the Stockholm Convention; and

² Parliament of Australia, [Contamination of Australia's Defence Force Facilities and other Commonwealth, State and Territory Sites in Australia – Terms of Reference](#) (accessed 13 February 2025).

³ See, for example, Senate Foreign Affairs, Defence and Trade References Committee, [Inquiry into firefighting foam contamination Part A - RAAF Base Williamstown](#), February 2016; Senate Foreign Affairs, Defence and Trade References Committee, [Firefighting foam contamination Part B – Army Aviation Centre Oakey and other Commonwealth, state and territory sites](#), May 2016.

- initiates an independent review of environmental regulation and administration of Commonwealth land.⁴
- 1.11 On 18 September 2019, the JSCFADT initiated an inquiry into the elimination and remediation of PFAS-related impacts in and around Defence bases under its annual report powers, continuing the work of the 2018 inquiry. This inquiry was undertaken by the PFAS Sub-committee. The sub-committee tabled progress reports in December 2019 and August 2020.
- 1.12 In February 2020, the Australian Government tabled a response to the report of the 2018 inquiry. Out of the nine recommendations, the Government: agreed with one (Recommendation 3); noted four (Recommendations 1, 4, 5 and 9); agreed in part with two (Recommendations 2 and 6); and agreed in principle with two (Recommendations 7 and 8). The response also noted that the Government was:
- ... [working to] make the functions and activities of the PFAS Taskforce more publicly transparent and accessible ... investing heavily in activities to address PFAS contamination, including PFAS investigations, containment, remediation, and research [and] establishing legislation and processes that will better protect the environment from further high-risk industrial chemical contamination.⁵
- 1.13 The JSCFADT committee's second progress report included recommendations directed to the Department of Defence (Defence) and the Australian Government, including that they should:
- highlight the PFAS Taskforce's role in coordination and review of the national PFAS response through PFAS website changes;
 - improve information on Defence investment in PFAS remediation programs, research and related activities;
 - publish up-to-date maps showing investigation and remediation sites;
 - improve information about compliance with environmental policies and standards and national PFAS regulatory frameworks for timely remediation works in and around Defence bases;
 - improve public information about PFAS to ensure it is targeted and factual;
 - adopt participatory approaches to improve collaboration and involvement with the community;
 - fund research to better understand the mental health impacts of living with PFAS contamination to better inform government services and supports;

⁴ Joint Standing Committee on Foreign Affairs, Defence and Trade (JSCFADT), [Inquiry into the management of PFAS contamination in and around Defence bases](#), November 2018, pp. xix–xxiii.

⁵ Australian Government, [Whole of Australian Government response to the report of the Joint Standing Committee on Foreign Affairs, Defence and Trade Inquiry into the management of per- and polyfluoroalkyl substances \(PFAS\) contamination in and around Defence bases](#), 28 February 2020, pp. 4–5.

- provide all people affected by PFAS with mental health supports and counselling services and regular updates;
- prioritise assisting property owners and businesses in affected areas through compensation for financial losses associated with contamination emanating from Defence bases, including the possibility of buy-backs; and
- expedite work to ban the use of, contain, and ultimately safely destroy, long chain PFAS-based firefighting foams, providing a timeline for this work.⁶

1.14 In January 2022, the Australian Government provided its response to the Second Progress Report. Out of the 10 recommendations, the Government: noted two (Recommendations 7 and 9); agreed in part with three (Recommendations 1, 2 and 8); and agreed in principle with five (Recommendations 3, 4, 5, 6 and 10). The response also outlined that:

Since tabling its response to the 2018 PFAS Inquiry in February 2020, the Government has continued to actively progress PFAS-related activities, despite the challenges presented by the COVID-19 pandemic. The Department of Defence has implemented additional communication channels with communities, and has worked to provide increased accessibility and enhanced content on information regarding PFAS management activities.

...

The Government has also continued work to improve chemicals management in Australia and deliver pragmatic guidance and policies, informed by the latest scientific knowledge.⁷

1.15 The committee's final report was tabled in the Senate on 30 March 2022. It recommended the Australian Government:

- expedites the implementation of recommendations from previous committee reports;
- reviews and adapt its engagement, communication and support to meet the evolving needs of communities affected by PFAS contamination;
- engages the New South Wales Government to assess the case for re-establishing the community reference group process;
- produces and publishes quarterly updates on the work of Commonwealth agencies on PFAS management;
- works with states and territories to produce and publish regular updates;
- increases national coordination of information sharing and investigation for airfield sites;

⁶ JSCFADT, PFAS Sub-committee, *[Inquiry into PFAS remediation in and around Defence bases: Second progress report](#)*, August 2020, pp. xxi– xxiii.

⁷ Australian Government, *[Australian Government response to the Joint Standing Committee on Foreign Affairs, Defence and Trade PFAS Sub-committee report: Inquiry into PFAS remediation in and around Defence bases](#)* [second progress report], January 2022, [p. 2].

- considers suitable options for people with high levels of PFAS, who are otherwise unable to donate blood or plasma, to make therapeutic donations as an intervention to reduce their levels of PFAS; and
- provides funding for further longitudinal studies on potential adverse health effects for firefighters and members of PFAS-affected communities.⁸

1.16 A Government response has not yet been provided for this report.⁹

Independent review of land uses around key Defence bases impacted by PFAS contamination (PFAS Independent Review)

1.17 In September 2023, the Government commissioned an independent review of land uses around key Defence bases impacted by PFAS contamination, led by Mr Jim Varghese AM. The review process included a series of public hearings and stakeholder engagements with Commonwealth, state and local governments, affected communities, industry and academia. The consultation was also open to the public. The review focussed on communities around:

- RAAF Base Williamtown, NSW
- Swartz Barracks, Queensland
- RAAF Base Tindal, Northern Territory.¹⁰

1.18 On 5 December 2024, the Australian Government released the PFAS Independent Review as well as the Government's response to the review.¹¹ The review made 19 recommendations, and the Australian Government agreed or agreed in-principle to 18 of the 19 recommendations.¹²

1.19 Recommendations of the PFAS Independent Review covered:

- Improving national coordination (Recommendation 1);
- better access to information for impacted communities (Recommendations 2–4);
- transparency about PFAS management and remediation (Recommendations 5–8);
- principles to support improved decision-making for land use and planning (Recommendation 9–10);

⁸ JSCFADT, PFAS Sub-committee, [Inquiry into PFAS remediation in and around Defence bases: Final report](#), March 2022, pp. xxi–xxii.

⁹ Department of Climate Change, Energy, the Environment and Water, answers to written questions on notice, 19 September 2024 (received 29 October 2024).

¹⁰ Department of Defence, [PFAS Independent Review](#) (accessed 31 October 2024).

¹¹ The Hon Matt Keogh MP, Minister for Defence Personnel and Minister for Veterans' Affairs, '[Albanese Government to deliver meaningful reform for PFAS-impacted communities](#)', *Media Release*, 5 December 2024.

¹² Australian Government, [Government response to the Independent Review of land uses around key Defence bases impacted by PFAS contamination](#), December 2024.

- managing risk associated with land uses in PFAS management areas (Recommendations 11–15); and
- Social, economic and natural capital precincts (Recommendations 16–19).¹³

1.20 Central to the Government's response to the PFAS Independent Review is the establishment of a PFAS National Coordinating Body. The coordinating body will be:

... led by a Commonwealth Minister with representation from all key Commonwealth portfolios including Health, Environment and Infrastructure, as well as relevant state and territory agencies... Initially this will involve the Commonwealth and New South Wales and expand to include other impacted jurisdictions.¹⁴

State government parliamentary inquiries

1.21 On 4 May 2021, the House of Assembly of the South Australian Parliament passed a motion requesting the Environment, Resources and Development Committee investigate and report on the appropriate and safe disposal of PFAS contaminated waste in South Australia (SA). The committee tabled an interim report on 4 February 2022, presenting early evidence and recommending the PFAS inquiry be re-established following the formation of the 55th Parliament in that state. In its interim report, the committee noted:

There is currently a process for a disposal pathway for PFAS contaminated waste in SA, but no licensed facility. PFAS contaminated waste is currently trucked interstate for treatment and/or disposal. A number of sites in SA need remediation and commercial transport and infrastructure projects within SA may be at risk of not proceeding if a local disposal pathway is not made available.¹⁵

1.22 On 17 October 2022, the ERDC of the 55th Parliament voted not to continue with or establish a new PFAS inquiry.¹⁶

1.23 On 25 September 2024, the New South Wales Legislative Council established the Select Committee on PFAS Contamination in Waterways and Drinking Water Supplies Throughout New South Wales, to inquire into and report on PFAS contamination in waterways and drinking water supplies throughout New South Wales. The committee was due to present its final report by 20 June 2025,

¹³ Australian Government, [Government response to the Independent Review of land uses around key Defence bases impacted by PFAS contamination](#), December 2024.

¹⁴ Australian Government, [Government response to the Independent Review of land uses around key Defence bases impacted by PFAS contamination](#), December 2024, [p. 2].

¹⁵ South Australian House of Assembly, 8th report (interim) of the Environment, Resources and Development Committee, [Inquiry into the safe disposal of per- and polyfluoroalkyl substances \(PFAS\) contaminated waste in South Australia](#), 4 February 2022, p. i.

¹⁶ Mr Adrian Pederick MP, [South Australian House of Assembly Hansard](#), 14 September 2023.

however, the inquiry was extended on 25 September 2024 and is now due to report on 20 August 2025.¹⁷

1.24 The committee held its first hearing on Friday 6 December 2024. Chair of the committee, Ms Cate Faehrmann MLC said:

... the detection of PFAS, commonly known 'as forever chemicals' in some of the state's water catchments is extremely concerning. ... this committee will meet and work with affected communities, experts, regulatory agencies and the whistleblowers who raised the alarm about PFAS in New South Wales.¹⁸

1.25 The NSW Parliamentary committee has since held three additional hearings across NSW, including in the Blue Mountains, Newcastle and NSW Parliament House Sydney.¹⁹

Purpose of the interim report

1.26 This report aims to provide a brief overview of PFAS in Australia and summarise some of the initial evidence received.

1.27 As the committee's first report, this interim report has a focus on the community of Wreck Bay, where the committee was able to see firsthand some of the profound impacts that living in a community affected by PFAS can have. The committee has made two recommendations relating to Wreck Bay and intends to seek further evidence before making further recommendations.

1.28 The committee has also received a large body of evidence on other matters. However, PFAS is a highly complex and ever-evolving issue. As the committee progresses its work, it will continue to gather evidence, examining the issues raised in greater detail, before reporting on a range of other matters and forming the further recommendations.

Structure of the interim report

1.29 The report contains six chapters:

1.30 **Chapter 1** introduces the inquiry, outlines the structure of the report and details findings of previous inquiries relating to PFAS.

1.31 **Chapter 2** provides background information on PFAS, covering:

- what are PFAS?;
- PFAS as environmental contaminants;

¹⁷ NSW Legislative Council, [Minutes](#), 25 September 2024, item 36.

¹⁸ NSW Legislative Council, Select Committee on PFAS Contamination in Waterways and Drinking Water Supplies Throughout New South Wales, [Media release: Submissions now open for inquiry into PFAS contamination in water in NSW](#), 17 October 2024 (accessed 31 October 2024).

¹⁹ NSW Legislative Council, Select Committee on PFAS Contamination in Waterways and Drinking Water Supplies Throughout New South Wales, [Hearings and Transcripts](#) (accessed 14 March 2025).

- human exposure pathways of PFAS; and
 - regulation of PFAS in Australia.
- 1.32 **Chapter 3** discusses the impact of PFAS on human health. The chapter provides an overview of the current government advice relating to PFAS and human health and recounts evidence received from PFAS contaminated communities, including the Wreck Bay Aboriginal Community in the Jervis Bay Territory and affected communities in Richmond and the Blue Mountains, both in NSW. Chapter 3 also outlines evidence regarding the mental health impacts of living with high PFAS exposure.
- 1.33 **Chapter 4** considers PFAS in Australian drinking water. The chapter provides information on the current and updated draft Australian Drinking Water Guidelines (ADWG). The chapter details evidence from submitters and witnesses about the ADWG and compares Australia's guidelines with international jurisdictions. The chapter then details the status of PFAS testing amongst water suppliers in Australia, and outlines PFAS treatment technologies, including their current limitations. The chapter also includes two case studies of communities impacted by PFAS contamination in their water supply—the First Nations community of Wreck Bay and the Blue Mountains community.
- 1.34 **Chapter 5** describes active PFAS remediation programs currently directed by the Commonwealth, including:
- Defence PFAS Investigation and Management Program;
 - Airservices' National PFAS Management Program;
 - PFAS Airports investigation Program; and
 - state-level management and remediation programs.
- 1.35 Chapter 5 also provides an overview of remediation techniques and technologies, and presents a case study of remediation at Wreck Bay.
- 1.36 **Chapter 6** considers the social and cultural impacts of PFAS contamination, particularly for First Nations communities, with Wreck Bay as a case study. It looks at:
- cultural loss and disconnection;
 - views on the community's class action seeking compensation for cultural loss from the Commonwealth;
 - communication and consultation in relation to the investigation and remediation programs; and
 - the community's desire for self-determination and to play a meaningful role in addressing the impact of PFAS contamination on their lands and waters.
- 1.37 Noting the substantial program of work still to do, the committee is recommending it be reappointed in the 48th Parliament in order to facilitate further hearings and support consideration of these complex matters.

Recommendation 1

- 1.38 The committee recommends that the Senate reappoints the Select Committee on PFAS (per and polyfluoroalkyl substances) in the 48th Parliament, granting access to the evidence and documents collected during the 47th Parliament.**

Chapter 2

About PFAS

- 2.1 This chapter describes what are PFAS (per and polyfluoroalkyl substances), including the different types of PFAS and which ones are regulated in Australia. It then covers:
- PFAS as environmental contaminants;
 - human exposure pathways; and
 - regulation of PFAS in Australia.

What are PFAS

- 2.2 PFAS are a group of manufactured chemicals that have been used since the 1950s to make products 'that resist heat, stains, grease and water'.¹ PFAS have been used in a range of industrial and consumer products, including:
- stain resistant fabrics and carpets
 - non-stick cookware
 - food packaging
 - cosmetics
 - pharmaceuticals
 - waterproof clothing
 - dental products, and
 - firefighting foams.²
- 2.3 PFAS are chemicals of concern as they 'do not break down readily in the environment, can travel long distances through soil and water and can get into groundwater'. Evidence indicates that PFAS levels 'build up in animals and humans and remain for many years in the human body'.³
- 2.4 A key source of PFAS contamination in Australia, is the historic use of PFAS-containing aqueous film forming foams (AFFF), a type of water based firefighting foam. AFFF were used in Australia since the 1970s due to their effectiveness in fighting liquid fuel fires.⁴

¹ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 13.

² See, for example, Toxics Free Australia, *Submission 72*, [p. 3]; Friends of the Earth, *Submission 46*, p. 7; CSIRO, *Submission 22*, p. 7.

³ Department of Health and Aged Care, [Per- and Polyfluoroalkyl Substances \(PFAS\)](#), 30 October 2024, (accessed 13 February 2025); Department of Health and Aged Care, [Expert Health Panel for PFAS: Summary](#), April 2018, [p. 1].

⁴ Department of Defence, *Submission 66*, [p. 2].

- 2.5 While the use of PFAS-containing firefighting foams has dramatically decreased since the Australian Government began reducing the use of certain PFAS in firefighting foams in 2002⁵, PFAS-containing firefighting foams are still being used in operational and training scenarios in some jurisdictions across Australia.⁶
- 2.6 The historic use of PFAS in firefighting foams has led to increased levels being detected at 'airports, Defence bases, and other sites where fire-fighting training has been conducted, or where fire suppression systems are installed for extinguishing liquid-fuel fires'. Increased levels of PFAS may also be found in industrial areas, effluent outfalls and landfill sites.⁷

Types of PFAS

- 2.7 There are thousands of different PFAS, some of which have been more widely used and studied than others. The most prevalent PFAS found in the Australian environment and population to date have been perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorohexane sulfonate (PFHxS).⁸
- 2.8 PFOS, PFOA and PFHxS are also examples of 'long chain' PFAS.⁹ Long chain PFAS have been considered more harmful to the environment and human health compared to 'short chain' PFAS. As long-chain PFAS are becoming increasingly regulated, short-chain PFAS are being used as alternatives. However, while short-chain PFAS are assumed to have a lower bioaccumulation potential compared to long-chain PFAS, research has shown short-chain PFAS to have many of the same properties of concern. Like long-chain PFAS, short-chain PFAS are highly mobile in soil and water and can remain persistent in the environment.¹⁰ Recent studies have also shown the shorter-chain PFAS

⁵ Airservices Australia, *Submission 69*, p. 10.

⁶ United Firefighters Union of Australia, *Submission 104*, p. 4.

⁷ See, for example, Fire Rescue Victoria, *Submission 9*, [p. 4]; Department of Climate Change, Energy, the Environment and Water, *Submission 33*, p. 3; CSIRO, *Submission 22*, p. 7.

⁸ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 13.

⁹ Australian Industrial Chemicals Introduction Scheme, *Submission 65*, p. 6.

¹⁰ Stephan Brendel, Éva Fetter, Claudia Staude, Lena Vierke and Annegret Biegel-Engler, [*Short-chain perfluoroalkyl acids: environmental concerns and a regulatory strategy under REACH*](#), Environmental Sciences Europe, Volume 30, article 9, 2018, p. 1.

compounds to be more readily absorbed through the skin than longer-chain PFAS compounds.¹¹

- 2.9 Considering the logistical difficulties of monitoring thousands of different chemicals in the environment, PFOS, PFOA, and PFHxS have been used as 'primary indicators' of the presence of other PFAS compounds including other short and long chain perfluoroalkyl acids and precursors.¹²
- 2.10 PFAS have never been manufactured in Australia and the use and import of products containing PFOA, PFOS and PFHxS has reduced significantly in the last 20 years. Today, the importation of PFOA, PFOS and PFHxS has been almost entirely phased-out. As of 1 July 2025, the importation of PFOA, PFOS and PFHxS to Australia will be prohibited, with limited exceptions, such as for research or laboratory purposes. The ban will not apply if the chemicals are unintentionally present in products at low levels.¹³
- 2.11 There is concern that as PFOA, PFOS and PFHxS are phased out, equally or even more dangerous chemicals may replace them. The Minderoo Foundation submitted that chemical company, 3M, which first invented PFAS compounds:
- ... initiated a voluntary phase out of PFOA in 2000. However, ... immediately replaced PFOA with the PFAS known as 'GenX', which was also later shown to be toxic.¹⁴
- 2.12 The Department of Climate Change, Energy, the Environment and Water (Environment Department) raised similar concerns in its submission, stating:
- We do not yet fully understand the alternative chemicals that may replace the large numbers of PFAS. There is a risk of regrettable substitution, which occurs when a chemical of unknown or unforeseen (potentially greater) risk to the environment is used to replace a banned substance.¹⁵

PFAS as environmental contaminants

- 2.13 PFAS have many chemical characteristics which make them difficult environmental contaminants to manage and remediate. PFAS are soluble in water and highly bioavailable to aquatic organisms and plants. This allows

¹¹ Oddný Ragnarsdóttir, et al., 'Dermal bioavailability of perfluoroalkyl substances using *in vitro* 3D human skin equivalent models', *Environment International*, vol. 188, 108772, June 2024, p. 7, <https://doi.org/10.1016/j.envint.2024.108772>.

¹² Heads of Environmental Protection Agencies Australia and New Zealand (HEPA), *PFAS National Environmental Management Plan Version 2.0*, January 2020, p. 7.

¹³ Department of Climate Change, Energy, the Environment and Water, Industrial Chemicals Environmental Management Standard (IChEMS), 12 December 2024, *Perfluorohexanesulfonic acid (PFHxS) and related substances* (accessed 23 October 2024).

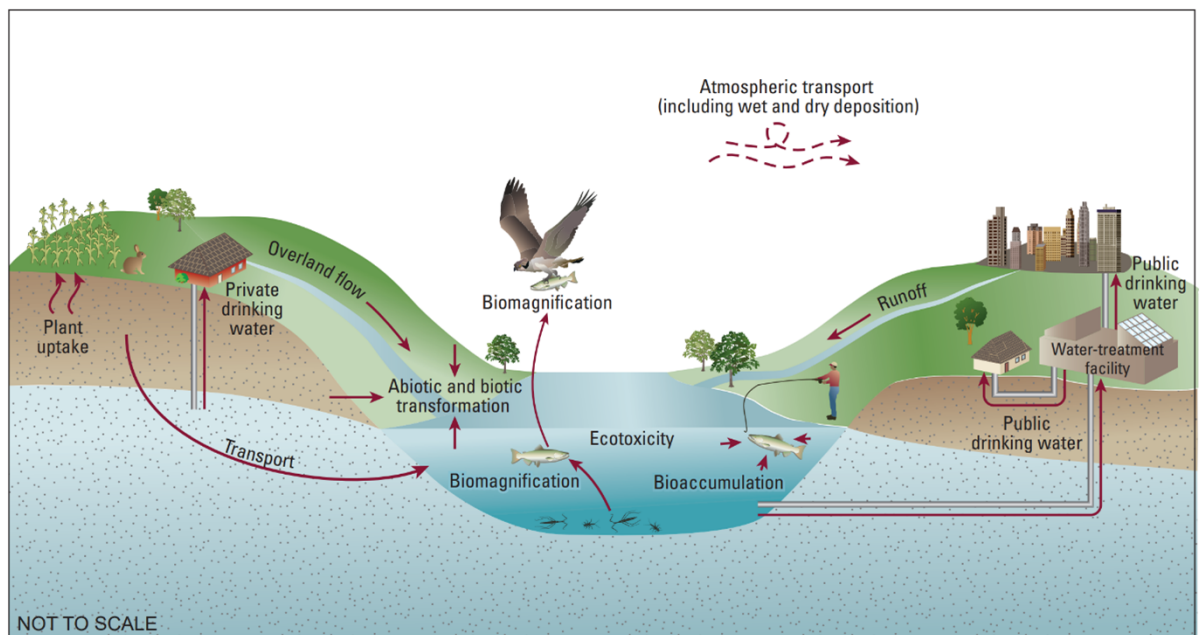
¹⁴ Minderoo Foundation, *Submission 115*, p. 5.

¹⁵ Department of Climate Change, Energy, the Environment and Water, *Submission 33*, p. 9.

PFAS to move long distances from the point of contamination in creeks, rivers and streams.¹⁶

- 2.14 PFAS are very stable chemicals which resist physical, chemical and biological degradation. This allows PFAS to degrade very slowly and persist for a long time in the environment and bioaccumulate in plants and animals.¹⁷

Figure 2.1 Conceptual diagram showing the major mechanisms of the fate, transport, and exposure pathways of PFAS



Source: United States Geological Survey, December 2021, www.usgs.gov/media/images/conceptual-diagram-showing-major-mechanisms-fate-transport-and-exposure-pathways-pfas (accessed 13 February 2025).

- 2.15 The Environment Department notes that PFAS in the environment is 'an emerging concern globally'. PFAS are 'highly persistent, bioaccumulate, can move long distances in the environment, and are linked to adverse impacts on some plants and animals'. PFAS accumulate in animals, including 'dolphins, whales, seals, sea birds, and polar bears', passing on higher concentrations to animals further up the food chain. Investigations indicate that PFAS from sites with high contamination 'have moved over time from the contaminated soil, and contaminated surface and ground water, and migrated into adjoining environments' and laboratory studies have identified negative effects on the reproductive, developmental and other systems of animals exposed to PFAS.¹⁸

¹⁶ HEPA, *PFAS National Environmental Management Plan Version 2.0*, January 2020, p. 8.

¹⁷ HEPA, *PFAS National Environmental Management Plan Version 2.0*, January 2020, p. 40.

¹⁸ Department of Climate Change, Energy, the Environment and Water, *Per- and poly-fluoroalkyl substances (PFASs) - Update: PFAS National Environmental Management Plan (PFAS NEMP)*, 3 January 2025, (accessed 13 February 2025).

Human exposure pathways

- 2.16 Due to the widespread historic use of PFAS and its persistence in the environment, it is likely that most people have detectable levels of PFAS in their blood. Population studies completed in the United States have shown 98 per cent of participants have detectable levels of PFAS in their blood.¹⁹ No equivalent studies have been undertaken in Australia.
- 2.17 PFAS can enter the blood stream through food, water, air or through contact with the skin. Eating and drinking contaminated food and water is expected to be the primary source of exposure for most people. Inhalation of contaminated dust, and skin contact with PFAS, including bathing in contaminated recreational water, are considered lower exposure pathways. Once in the human body, the time for the level of PFAS to reduce by half can take from two to eight years.²⁰

Firefighting foam

- 2.18 For most people living in Australia the level of exposure is likely to be relatively small. However, in locations where PFAS have been used as an active ingredient in firefighting foams, PFAS contamination in the environment and in the population are much higher. Research has found that firefighters who have administered these foams and communities living in these locations can have elevated blood concentrations above the general population.²¹

Drinking water

- 2.19 Contaminated drinking water is another source of exposure. Most tap water in Australia has PFAS levels well below both Australian and international standards.²² However, localised contamination can lead to a community's drinking water exceeding safe levels. Exposure to PFAS through drinking water

¹⁹ Antonia Calafat, et al., 'Polyfluoroalkyl chemicals in the U.S. population: data from the National Health and Nutrition Examination Survey (NHANES) 2003-2004 and comparisons with NHANES 1999-2000', *Environmental Health Perspectives*, vol. 115, no. 11, August 2007, pp. 1596-1602, <https://doi.org/10.1289/ehp.10598>.

²⁰ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 13.

²¹ See, for example, enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 13; Professor Martyn Kirk, Dr Kayla Smurthwaite and Ms Susan Trevenar, National Centre for Epidemiology and Population Health, Australian National University, *Submission 85*, p. 2.

²² Water Services Association of Australia, answers to written questions on notice by Senator Thorpe, 22 January 2025 (received 11 February 2025), p. 7. Note: International jurisdictions have significantly stricter drinking water guidelines compared to the Australian Drinking Water Guidelines (ADWG). For example, guideline levels for PFOA are 140 times higher in the ADWG compared to the United States Maximum Contaminant Level. The United States Environmental Protection Agency has also set a Maximum Contaminant Level Goal of zero.

can be heightened in areas where people are unknowingly drinking from contaminated bores.²³

- 2.20 The *Australian Drinking Water Guidelines* guideline values for PFAS assume that '10 per cent of an individual's daily intake of PFAS comes from the drinking water supply'.²⁴
- 2.21 Chapter 4 covers PFAS in drinking water in more detail, including more information on the current and proposed Australian Drinking Water Guidelines and the status of PFAS testing and treatment.

Food

- 2.22 Current evidence suggests PFAS levels in the general Australian food supply are low. Food Standards Australia New Zealand (FSANZ)'s 27th Australian Total Diet Study investigated the presence of 30 PFAS in 112 food types. Out of the 30 PFAS tested, PFOS was the only chemical detected. PFOS was found in less than two per cent of all the samples. The PFAS levels found in these samples were consistently lower than reported concentrations in overseas studies conducted in Europe, the United States, the United Kingdom and China. The study concluded that there are 'no public health and safety concerns for the general Australian population'.²⁵
- 2.23 However, there are areas of localised contamination where PFAS can be present at higher quantities. If they are aware of the contamination, local authorities may distribute advice. In its submission, the Department of Health and Aged Care (Health Department) described what this advice can include:

This local advice takes into consideration the Australian guidance values and specific local circumstances and may include encouraging people to consume produce from multiple sources, and in some cases, limiting consumption of home-grown produce, home-produced livestock, and locally harvested food such as fish, and PFAS contaminated water to reduce exposure.²⁶

²³ See, for example, Professor Martyn Kirk, Dr Kayla Smurthwaite and Ms Susan Trevenar, National Centre for Epidemiology and Population Health, Australian National University, *Submission 85*, p. 2; enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 14.

²⁴ National Health and Medical Research Council (NHMRC), [Australian Drinking Water Guidelines - Public Consultation on Draft Guidance for Per- and Polyfluoroalkyl Substances \(PFAS\)](#), October 2024, p. 13.

²⁵ Food Standards Australia and New Zealand, [27th Australian Total Diet Study: Per- and poly-fluoroalkyl substances](#), December 2021, p. 9.

²⁶ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 14.

Regulation of PFAS in Australia

2.24 Chemicals are regulated under both state and territory, and Commonwealth laws, in Australia.²⁷ At the national level, chemicals are regulated according to their use, through four regulatory authorities:

- **AICIS [Australian Industrial Chemicals Introduction Scheme]** regulates individual industrial chemicals in products such as paints, adhesives, inks, glues, solvents, soaps, cosmetics and cleaning products.
- **Australian Pesticides and Veterinary Medicines Authority** regulates agricultural and veterinary chemical products, such as pesticides, animal medicines, insect repellents, garden sprays and some pool chemicals
- **Therapeutic Goods Administration** regulates medicines, complementary medicines, medical devices, and biologicals such as vitamins, minerals, herbal material, aromatherapy and homeopathic preparations and blood products.
- **Food Standards Australia and New Zealand** regulates ingredients in food and food additives for human consumption, such as processing aids, colourings, vitamins and minerals and food packaging materials.²⁸

2.25 PFAS are also governed by two Commonwealth Acts, the *Industrial Chemicals Act 2019* and the *Industrial Chemicals Environmental Management (Register) Act 2021*. These Acts regulate the importation and manufacture of industrial chemicals in Australia.

Industrial Chemicals Act 2019

2.26 The *Industrial Chemicals Act 2019* (Cth) is the legal framework that regulates the importation and manufacture of industrial chemicals in Australia. It also establishes the AICIS and its Executive Director. All importers and manufacturers of industrial chemicals listed under this Act are required to register their business and the categories of their chemical importations or manufacture with AICIS before they introduce industrial chemicals into Australia.²⁹

2.27 AICIS enforces import and export controls on PFOS and specified PFOS precursors listed under an international agreement called the Rotterdam Convention.³⁰ Importers and manufacturers of PFAS must comply with legal obligations under the Act and are prohibited from importing or exporting PFAS

²⁷ Australian Industrial Chemicals Introduction Scheme, *Submission 65*, p. 8.

²⁸ Australian Industrial Chemicals Introduction Scheme, *Submission 65*, p. 8.

²⁹ Australian Industrial Chemicals Introduction Scheme, *Submission 65*, p. 13.

³⁰ Australian Industrial Chemicals Introduction Scheme, *Submission 65*, p. 5.

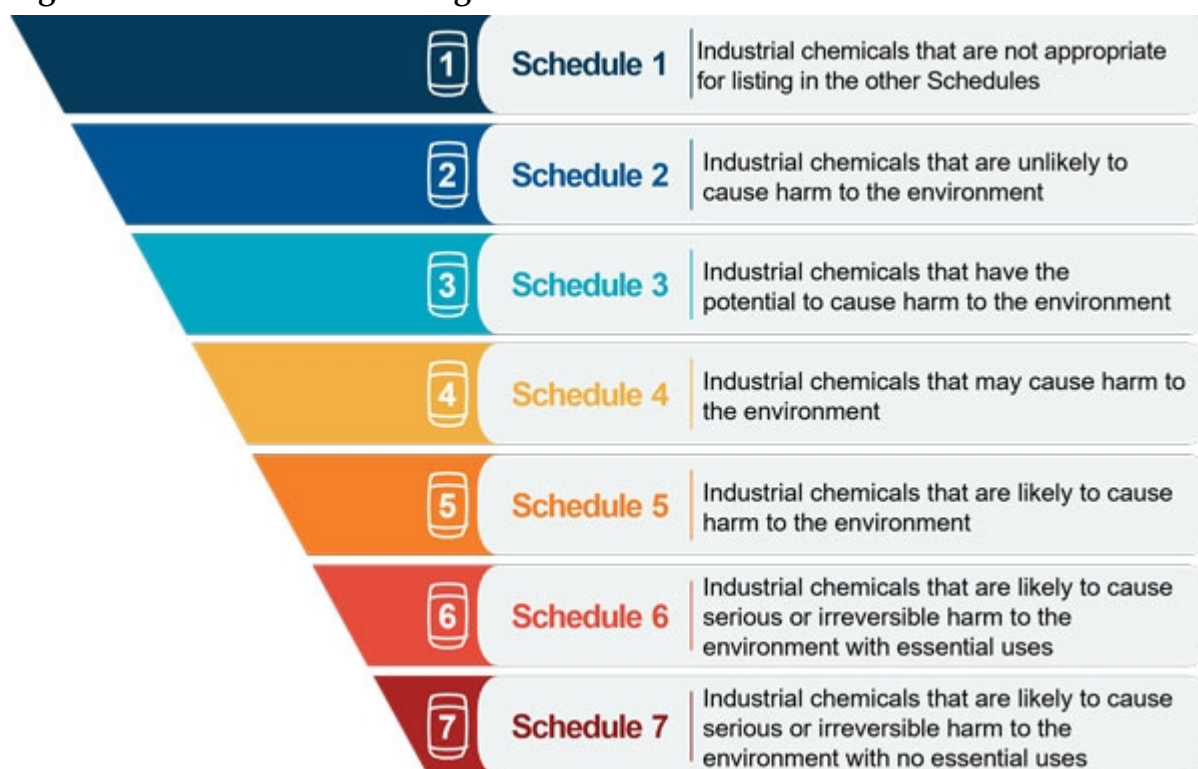
without approval from AICIS. However, the regulation of the 'use, release and disposal of PFAS in Australia is primarily a state and territory responsibility'.³¹

2.28 AICIS has recommended that industry should 'actively seek alternatives to and phase out PFAS and PFAS-related substances of concern'.³²

Industrial Chemicals Environmental Management (Register) Act 2021

2.29 The *Industrial Chemicals Environmental Management (Register) Act 2021* established the Industrial Chemicals Environmental Management Standard (IChEMS) Register. The IChEMS is a national approach to managing the import, use and disposal of industrial chemicals. Under the register chemicals can be classified under one of seven schedules, with Schedule 1 being of low concern, while Schedule 6 and 7 chemicals are considered 'likely to cause serious or irreversible harm to the environment':

Figure 2.2 IChEMS scheduling



Source: Department of Climate Change, Energy, the Environment and Water, [Setting standards under IChEMS](#), December 2024, (accessed 13 February 2025).

2.30 In December 2023, PFOS, PFOA and PFHxS were registered as Schedule 7 chemicals, which means the import, manufacture and export of these chemicals will be prohibited, with limited exceptions. The listing is due to come into effect on 1 July 2025. The delay enables states and territories to update their own

³¹ Australian Industrial Chemicals Introduction Scheme, [Per- and Polyfluoroalkyl Substances \(PFAS\)](#), 8 November 2024 (accessed 29 October 2024).

³² Australian Industrial Chemicals Introduction Scheme, *Submission 65*, p. 8.

regulatory regimes. Commonwealth legislation to implement the IChEMS 'at the border and on Commonwealth sites, is under development'.³³

Status of IChEMS implementation in state and territory jurisdictions

2.31 The state and territory governments have committed to several actions to implement IChEMS in their jurisdictions, including by adopting the IChEMS Register into their existing regulatory frameworks. The status of implementation in each jurisdiction at the time of writing is as follows:

- [Queensland](#)³⁴ and [NSW](#)³⁵ both passed legislation to implement the IChEMS Register requirements.
- [Victoria](#) indicated that its existing legislation is likely already consistent with IChEMS but also stated that it is 'conducting a case-by-case analysis of each chemical listed in the IChEMS register to determine whether further controls are required to manage their risks'.
- [Western Australia](#) released and consulted (between Dec 2023 and Feb 2024) on draft Regulations to implement IChEMS; however, the proposed Regulations do not appear to have been introduced into state law as yet.³⁶
- the [Tasmanian EPA states](#) that the Department of Natural Resources and Environment (NRE) is developing state legislation to implement IChEMS; however, the [NRE's webpage](#) provides no information on the progress of this legislation.
- the [South Australian EPA](#) gave notice in December 2023 that it intended to prepare a draft Industrial Chemicals Environment Protection Policy to implement IChEMS (p. 4179); however, the draft policy does not [appear to have been released](#) as yet.
- both the Northern Territory and the Australian Capital Territory (ACT) Governments do not appear to have indicated how they intend to implement IChEMS in their jurisdictions.³⁷

³³ Department of Climate Change, Energy, the Environment and Water, answers to written questions on notice from committee (received 29 October 2024), [p. 12].

³⁴ Queensland Government, [Meeting environment obligations and duties](#), June 2024 (accessed 13 February 2025).

³⁵ NSW Environmental Protection Agency, [Industrial Chemicals Environmental Management Standard](#), April 2024 (accessed 13 February 2025).

³⁶ The proposed *Environmental Protection (Industrial Chemicals) Regulations 2023* were to be established under the *Environmental Protection Act 1986* (see p. 2 of the [Regulations information paper](#)); however, they are not currently listed among the [in-force subsidiary legislation under the Act](#).

³⁷ See Appendix 1.

The Intergovernmental Agreement on a National Framework for Responding to PFAS Contamination

- 2.32 Management and regulation of chemicals and contamination is primarily the responsibility of state, territory and local governments.³⁸ The Intergovernmental Agreement on a National Framework for Responding to PFAS Contamination (the Intergovernmental Agreement) is an agreement between the Commonwealth and the states and territories to respond consistently to PFAS contamination.
- 2.33 The Intergovernmental Agreement came into effect in 2018. In 2019, the Intergovernmental Agreement was reviewed and updated. As part of the review, the National PFAS Position Statement was added to the Intergovernmental Agreement. The Position Statement lists nationally agreed objectives for phasing-out certain PFAS in Australia, including 'a goal to transition away from the use of short-chain PFASs where practical', but does not specify regulatory measures or timeframes for phasing out PFAS.³⁹
- 2.34 The Intergovernmental Agreement articulates the commitment of Australian governments to implement a range of national guidance documents, including:
- the PFAS National Environmental Management Plan;
 - Health Based Guidance Values for PFAS
 - Environmental Health Standing Committee Guidance Statements on PFAS;
 - a number of fact sheets and other guidance materials.⁴⁰
- 2.35 According to the Environment Department, since the release of the National PFAS Position Statement in May 2020, 'multiple industries are working with the Environment Department to phase out PFAS use', and national reforms to environmental management regulation are 'well progressed'. In addition, all Australian governments 'are sharing information on PFAS contamination with the aim of managing the potential impacts to environment and human health'.⁴¹

PFAS National Environmental Management Plan (PFAS NEMP)

- 2.36 The PFAS NEMP sets nationally agreed guidance and standards on the investigation, assessment and management of PFAS wastes and

³⁸ Department of Climate Change, Energy, the Environment and Water, *Submission 33*, p. iv.

³⁹ Department of Climate Change, Energy, the Environment and Water, answers to written questions on notice from committee (received 29 October 2024), [p. 11].

⁴⁰ Council of Australian Governments (now National Cabinet), [*Intergovernmental Agreement on a National Framework for Responding to PFAS Contamination*](#), 7 February 2020, (accessed 13 February 2025).

⁴¹ Department of Climate Change, Energy, the Environment and Water, answers to written questions on notice from committee (received 29 October 2024), [p. 11].

contamination.⁴² The PFAS NEMP was developed by the Heads of Environmental Protection Agencies in Australia and New Zealand (HEPA). The first iteration of the PFAS NEMP was developed in 2018. The PFAS NEMP is designed to be an iterative document, regularly updated to reflect emerging knowledge. The current version is Version 2.0, published in January 2020. PFAS NEMP 3.0 has been drafted, and a consultation process has been undertaken by the Nation Chemical Working Group, with NEMP 3.0 expected to be finalised in early 2025.⁴³

Stockholm Convention

2.37 PFOS, PFOA and PFHxS are listed on the [Stockholm Convention on Persistent Organic Pollutants](#). The Stockholm Convention is a global treaty to protect human health and the environment against persistent organic pollutants, such as PFAS. The Stockholm Convention entered into force on 17 May 2004. Australia ratified the Convention on 20 May 2004 but chose to be an 'opt-in' party. This means Australia undertakes a domestic treaty making process to determine whether to ratify any amendments to the Convention, including any new chemical listings. Australia is yet to ratify the listing of PFOS, PFOA or PFHxS under the Convention.⁴⁴

2.38 In its most recent report on compliance with the Stockholm Convention, Australia reported that, while it has not ratified the listing of PFOS in Annex B of the Convention, AICIS:

... issued a series of alerts in 2002, 2003, 2004, 2007 and 2008. These alerts were reviewed and updated in 2013. The alerts recommend that PFOS be restricted to only essential uses, for which no suitable and less hazardous alternatives are available.⁴⁵

2.39 The Environment Department shared that Australia 'strongly supports' the listing of PFAS and is working towards ratification:

... to ratify listings of chemicals on the Stockholm Convention Australia must be able to meet the specific obligations for managing those chemicals. This means ensuring there is an appropriate regulatory framework in place.

Once implemented, the IChEMS will provide the necessary regulatory framework to prohibit or severely restrict uses of PFOS, PFOA and PFHxS

⁴² Department of Climate Change, Energy, the Environment and Water, *Submission 33*, p. 17.

⁴³ Department of Climate Change, Energy, the Environment and Water, *Submission 33*, p. 17.

⁴⁴ Council of Australian Governments (now National Cabinet), 'Appendix D: National per- and polyfluoroalkyl substances (PFAS) Position Statement', [Intergovernmental Agreement on a National Framework for Responding to PFAS Contamination](#), 7 February 2020 (National PFAS Position Statement), p. 3.

⁴⁵ Stockholm Convention on Persistent Organic Pollutants, [Fifth Round Party Reports: Australia](#), 2 September 2022, [p. 26].

in Australia and enable Australia's ratification of their listings under the Stockholm Convention.⁴⁶

Packaging regulation

- 2.40 A potential source of PFAS exposure is food packaging. Since 1999, Australia has had national arrangements setting out that governments and businesses across Australia 'share the responsibility for managing the environmental impacts of packaging'. Under this arrangement, businesses with an annual turnover of \$5 million or more which produce or sell packaging and/or packaged products in Australia must become a signatory to the Australian Packaging Covenant. The Covenant is a voluntary, industry-led packaging product stewardship scheme administered by the Australian Packaging Covenant Organisation (APCO).⁴⁷
- 2.41 In 2022, APCO released an industry Action Plan to phase out PFAS in fibre-based food contact packaging by 31 December 2023. Packaging companies can report their compliance with the Action Plan.⁴⁸ However, the plan remains voluntary.
- 2.42 In September 2024, the Environment Department released a consultation paper on packaging regulation. The consultation paper 'identified PFAS as a chemical of concern targeted for elimination from packaging'.⁴⁹ The consultation outcomes are expected to be released in early 2025.⁵⁰
- 2.43 Australia's environment ministers have stated that 'removing PFAS in packaging is an urgent priority for all jurisdictions'.⁵¹

⁴⁶ Department of Climate Change, Energy, the Environment and Water, response to written questions on notice from committee (received 29 October 2024), [pp. 6–7].

⁴⁷ Department of Climate Change, Energy, the Environment and Water, [Reform of packaging regulation: Consultation paper](#), released 27 September 2024, pp. 2–3.

⁴⁸ Australian Packaging Covenant Organisation, [Action Plan to phase out PFAS in fibre-based food contact packaging](#), Version 3, November 2023.

⁴⁹ Department of Climate Change, Energy, the Environment and Water, *Submission 33*, p. 16.

⁵⁰ Department of Climate Change, Energy, the Environment and Water, *Submission 33*, p. 16.

⁵¹ Department of Climate Change, Energy, the Environment and Water, '[Environment Ministers Meeting Communique](#)', 21 June 2024, p. 2.

Chapter 3

Impact of PFAS on human health

- 3.1 Per and polyfluoroalkyl substances (PFAS) are pervasive and persistent in the environment and have been associated with certain health effects, including but not limited to: cancers, thyroid disease, kidney disease, high cholesterol, and impacts on the reproductive system and fetuses.¹
- 3.2 Australian government agencies have so far taken the view that levels of PFAS exposure within the general Australian population are low. Following more recent international research findings and changes in recommended safe drinking levels in the United States, consideration is now being given to tightening certain guideline recommendations regarding exposure to some PFAS chemicals in drinking water. Additionally, various authorities have issued warnings around the consumption of foods growing in contaminated lands and waters.
- 3.3 This chapter begins by outlining current health advice and health guidelines in Australia, then recounts evidence received from a community subjected to PFAS contamination, the Wreck Bay Aboriginal Community in Jervis Bay Territory. It also presents evidence from other PFAS affected communities in Richmond and in the Blue Mountains, both in NSW.
- 3.4 The chapter then outlines evidence regarding the mental health impacts of living with high PFAS exposure, and presents proposals made by inquiry participants on actions that can be taken now to prevent further potential harms, as well as proposals for long-term scientific studies that could produce more conclusive results.
- 3.5 The impact of PFAS on human health is a complicated and contested subject. The committee has received a significant amount of evidence already, and some of this is represented in this chapter. The committee intends to discuss the science around PFAS and human health in more detail, and present more of the evidence it has received, in a future report.

¹ See, for example, Department of Health and Aged Care, [Expert Health Panel on PFAS](#), Report Summary, May 2018, p. 1; Australian Academy of Health and Medical Sciences, *Submission 35*, p. 2; International Agency for Research on Cancer – World Health Organisation, '[IARC Monographs evaluate the carcinogenicity of perfluorooctanoic acid \(PFOA\) and perfluorooctanesulfonic acid \(PFOS\)](#)', *Media Release*, 1 December 2023 (accessed 17 February 2025).

Background

Government advice on PFAS and human health

- 3.6 The Environmental Health Standing Committee (enHealth) has members from Australian, state and territory health departments and research councils, and their New Zealand counterparts. enHealth advises the Australian Health Protection Committee (AHPC) on environmental health policy, including in relation to PFAS. The AHPC is the key decision-making committee for health emergencies, chaired by the Chief Medical Officer and including all state and territory Chief Health Officers.²
- 3.7 The most recent enHealth Guidance Statement on PFAS was included as part of the Department of Health and Aged Care (Health Department) submission to this inquiry. The enHealth Guidance Statement consolidated the Australian government's PFAS health guidance and included updates from the Australian National University (ANU) PFAS Health Study and the FSANZ 27th Australian Total Diet Study.³
- 3.8 The enHealth Guidance Statement covered several areas including the levels of PFAS in the food supply, the health effects associated with PFAS exposure, pregnancy, breast feeding, and the current utility of conducting blood tests.
- 3.9 enHealth noted that the Health Department has developed health-based guidance values in the form of a tolerable daily intake for PFOS, PFOA, and PFHxS for use in human health risk assessments, including site investigations across Australia.⁴
- 3.10 With respect to FSANZ's 27th Australian Total Diet Study, enHealth noted that FSANZ found:
- PFAS levels in the general food supply are well below Australian guidance values;
 - estimated dietary exposure to PFOS for the general Australian population is well below the tolerable daily intake; and

² Department of Health and Aged Care, *Environmental Health Standing Committee (enHealth)*, September 2024, <https://www.health.gov.au/committees-and-groups/enhealth> (accessed 19 February 2025); Department of Health and Aged Care, *Australian Health Protection Committee (AHPC)*, September 2024, <https://www.health.gov.au/committees-and-groups/australian-health-protection-committee-ahpc> (accessed 19 February 2025).

³ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 13.

⁴ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 14.

- no other PFAS were detected in the study.⁵
- 3.11 enHealth therefore stated that the FSANZ study 'indicates that there are no public health and safety concerns in relation to PFAS from overall dietary exposure for the general Australian population'.⁶ In relation to the general population, enHealth considered it 'extremely unlikely that specific foods consumed over a period would all be sourced from a contaminated site' and that 'occasionally eating produce with low levels of PFAS is not considered to be a public health concern'.⁷ In sum, the enHealth Guidance Statement advised that 'current evidence suggests PFAS levels in the general Australian food supply are very low and the regulation of PFAS chemical contaminants in the general food supply is therefore not required'.⁸
- 3.12 However, enHealth acknowledged some local variation to the general advice for PFAS contaminated areas:
- In some instances, advice is issued by local authorities in specific areas where PFAS contamination has been identified, as people within these areas may frequently consume food or water with some PFAS contamination. This local advice takes into consideration the Australian guidance values and specific local circumstances and may include encouraging people to consume produce from multiple sources, and in some cases, limiting consumption of home-grown produce, home-produced livestock, and locally harvested food such as fish, and PFAS contaminated water to reduce exposure.⁹
- 3.13 The enHealth Guidance Statement endorsed the findings regarding the health effects identified by the Expert Health Panel on PFAS, namely that the differences reported in the scientific studies between people who have the highest exposure to PFAS and those who have had low exposure, are generally small. enHealth stated that these small differences 'are unlikely to be important to health outcomes'.¹⁰

⁵ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 14.

⁶ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 14.

⁷ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 14.

⁸ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 14.

⁹ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 14.

¹⁰ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 15.

3.14 enHealth also discussed the 'potential associations between PFAS exposure and increased risk of two uncommon cancers, namely testicular and kidney cancer'. enHealth noted:

...much of this evidence relates specifically to PFOA, and not PFOS or PFHxS which are more common in Australia. However, studies on these cancers remain conflicting and associations have only been observed in high exposure groups such as workers in international factories where PFOA is produced.¹¹

3.15 Importantly, enHealth stated:

An association means that there is a relationship between PFAS exposure and the above health effects. This does not mean that the PFAS exposure caused the health effect. A causative relationship between the above health effects and PFAS exposure has not been established to date.¹²

3.16 Finally, noting that the science and understanding of these issues will continue to evolve, enHealth recommended 'exposure to PFAS be minimised wherever possible', particularly given 'the ability of these chemicals to persist in humans and in the environment'.¹³

3.17 The enHealth Guidance Statement observed:

Foetuses can be exposed to PFAS when their mother's blood crosses the placenta during pregnancy. However, the scientific research to date does not indicate that PFAS exposure during pregnancy is a major contributor to poor health outcomes in either pregnant women or their babies.¹⁴

3.18 Nonetheless, enHealth recommended pregnant women minimise their exposure to PFAS as a precaution.¹⁵

3.19 The enHealth Guidance Statement observed that the significant health benefits of breast feeding 'outweigh any potential health risks to an infant or child from the possibility of any PFAS being transferred through breast milk'.¹⁶

¹¹ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 15.

¹² enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 15.

¹³ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 15.

¹⁴ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 16.

¹⁵ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 16.

¹⁶ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 16.

3.20 Therefore, enHealth did 'not recommend that mothers living in or around sites contaminated with PFAS cease breast feeding'.¹⁷

3.21 enHealth also stated that blood tests are not recommended for PFAS exposure because there is insufficient scientific evidence to inform clinical management:

A blood test can measure the level of PFAS in a person's blood. If PFAS is detected, this tells a person that they have been exposed to PFAS. These results could then be compared with the levels seen in the general Australian population or in other countries using published biomonitoring data. However, there is at present insufficient scientific evidence for a medical practitioner to be able to tell a person whether their blood level will make them sick now or later in life, or if any current health problems are related to the PFAS levels found in their blood.

Therefore, individual blood tests are not recommended as they cannot determine whether any medical condition is attributable to exposure to PFAS and these tests have no current value in informing an individual's clinical management, including diagnosis, treatment, or prognosis in terms of increased risk of particular conditions over time.¹⁸

3.22 The Health Department noted that the Health Based Guidance Values developed by FSANZ and the enHealth Guidance Statement are referenced by all state and territory health departments and Commonwealth agencies.

3.23 For example, the NSW government submission stated that it is guided by the PFAS National Environmental Management Plan 2.0 (agreed by the Commonwealth and state heads of EPAs in October 2019) and enHealth's advice on PFAS. Further, while 'PFAS has not definitively been shown to be a cause of disease in humans...enHealth continues to recommend exposure to PFAS be minimised wherever possible. Accordingly, the NSW Government is taking a precautionary approach'.¹⁹

Case study: Wreck Bay Aboriginal community

3.24 The following section provides evidence from a community subjected to PFAS contamination in the Jervis Bay Territory on the southeast coast. On 20 January 2025, the committee visited the small Aboriginal community of Wreck Bay to see and hear first-hand the experiences of people living on land directly contaminated by PFAS used at the adjacent Defence Force base and held a public hearing in Nowra the following day. The contamination in Wreck Bay was caused by the historic use of PFAS-containing firefighting foam at two Defence sites on two hills above Wreck Bay that run into Summercloud Creek, Flat Rock

¹⁷ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 16.

¹⁸ enHealth Guidance Statement in Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 16.

¹⁹ NSW Premier's Department, *Submission 20*, p. 12.

Creek and Mary Creek. These three creeks lead down to the Wreck Bay Village and the beach where the community lived, bathed in its water, and gathered their food.

- 3.25 The contamination of the land, waterways, and traditional foods by PFAS, the loss of cultural heritage and ability to continue traditional cultural practices, as well as the status of remediation, are covered in other chapters. This chapter considers evidence from Wreck Bay community members and others about health impacts.

Evidence from members of the Wreck Bay Aboriginal Community

- 3.26 In Nowra, several members of the Wreck Bay Aboriginal Community spoke to the committee about their health challenges, and experiences of loss and death among family members and in the community.
- 3.27 The committee heard evidence of an abnormally large number of deaths among the Aboriginal population in Wreck Bay, including many fit young men in their 40s who had worked at the neighbouring Defence Force base, but also many women and other community members who did not work on the base.²⁰
- 3.28 Mr Clive Freeman told the committee that his father passed away from bowel cancer in his 40s. The genetic tests done before his death concluded that the bowel cancer was 'caused locally and not genetically'.²¹
- 3.29 Mr Keiran Assheton, from Wreck Bay, told the committee about several cancer deaths that he attributed unequivocally to the PFAS contamination from the Defence Force base:

Wreck Bay has a problem with PFAS—we know this as well. We know the Defence Force have admitted that their use of PFAS in operations such as firefighting training has contaminated the local area. Wreck Bay has horrific problems with cancer as a result of this, and we have horrific problems with other serious health conditions. We have the highest cancer rates in Australian history; this has impacted me and my family personally. Both of my grandparents were murdered by cancer. My mother's younger brother, my uncle, was also murdered by cancer. My own mother is currently being murdered by late-stage cancer. I'm speaking only of my own immediate family, but there are many, many people—of all ages—out at Wreck Bay that have been murdered or are being murdered by this contamination. I use the word 'murder' because these aren't natural deaths; they're caused by the actions of people. When a person's actions cause the death of another, we call that murder in any civilised society. This should be called murder as well, because that's exactly what it is.²²

²⁰ See, for example, Unidentified speaker, *Committee Hansard*, 21 January 2025, p. 6.

²¹ Mr Clive Freeman, Private capacity, *Committee Hansard*, 21 January 2025, p. 24.

²² Mr Keiran Assheton, Private capacity, *Committee Hansard*, 21 January 2025, p. 12.

- 3.30 Mr Keiron Brown, a traditional owner from Wreck Bay who now lives in Sydney, but was born and raised in the community, told the committee about his own tumours, the very rare eye cancer that killed his mother, and the death of his cultural mother:

As a young boy, I used to play out at back beach where Marys Creek is. We used to slide off the sand dunes and jump in the water, and there were all these white and yellow foam bubbles there. We used to just dive into them, thinking they were just there from the water, not knowing that they were actually contaminated. Now, as an adult, I have got a body full of benign tumours. I'm not sure if any of them are cancerous. I have quite a few of them on my back.

When I was seven years old, my mum passed away. She had a very rare form of cancer. It was in her eye. When she found out about that, she had a very quick time till death. It wasn't a long way away; it was very short. We weren't even allowed to go on a trip out of the area. I wanted to say that.

My other mother, my cultural mother, also became very sick recently—a year ago. She'd been sick for a while. It started off with dialysis and diabetes, and then it went to heart problems, until she finally passed away a year ago. She had all these things all in one. I believe that that is all from PFAS—everything that has happened in my family, with both of my mothers and myself.²³

Evidence from a former medical doctor at Wreck Bay Aboriginal Community

- 3.31 The committee heard evidence from Dr David Goldberg, a practising medical practitioner in general practice who was the Wreck Bay doctor from 2000 to 2008. Dr Goldberg noted that he was not an expert toxicologist, and that since leaving his position as the Wreck Bay GP in 2008, he has maintained an informal association with Wreck Bay.²⁴
- 3.32 In his eight years as the Wreck Bay doctor, Dr Goldberg had two people from the same family die under 50. One died of bowel cancer, the other of breast cancer. He noted that family cancer clusters can exist as well as community clusters, without necessarily implicating PFAS.²⁵
- 3.33 However, since he left his position in 2008, Dr Goldberg was aware of the number of people who have died in Wreck Bay and, in most cases, the cause of death. He told the committee that many people are dying, mostly from cancer, and most 'died at a younger age than we would expect from some of the cancers that they had, and that some died from heart disease'.²⁶

²³ Mr Keiron Brown, Private capacity, *Committee Hansard*, 21 January 2025, p. 17.

²⁴ Dr David Goldberg, Private capacity, *Committee Hansard*, 21 January 2025, p. 19.

²⁵ Dr David Goldberg, Private capacity, *Committee Hansard*, 21 January 2025, p. 19.

²⁶ Dr David Goldberg, Private capacity, *Committee Hansard*, 21 January 2025, p. 19.

- 3.34 Dr Goldberg pointed to statistics from the Australian Institute of Health and Welfare that found for the decade between 2010 and 2020, Wreck Bay was the No. 1 community in Australia for likelihood of dying under the age of 75.²⁷
- 3.35 Dr Goldberg noted the international evidence suggesting 'PFAS is a very likely carcinogen and certainly an immunosuppressant and is also associated with a modest increase in blood cholesterol'. He also noted that 'the Wreck Bay community has definitely been exposed to this family of chemicals'.²⁸
- 3.36 Accordingly, Dr Goldberg was convinced that there is a cancer cluster in Wreck Bay, very likely caused by PFAS:

The epidemiologists will tell you...that nobody can prove a cancer cluster. It's statistically not possible by the very definition of its small sample. But we know a cancer cluster when we see one, even though we can't statistically prove it.²⁹

I am convinced that Wreck Bay is being subjected to a cancer cluster and that the very likely cause is PFAS exposure. My feeling is that we've got a very likely carcinogen implicated in a cancer cluster – which can't be proven, but, as a doctor, the main reason that I'm here is to say that, on the basis of my medical intelligence over the last 50 years, this is a cancer cluster.³⁰

Screening and testing of members of the Wreck Bay Aboriginal Community

- 3.37 Community members and other witnesses argued for an urgent need for medical screening of all members of the Wreck Bay Aboriginal Community and criticised the reluctance of agencies involved to conduct blood testing for PFAS. The Australian Government previously funded a voluntary blood testing program which commenced in November 2016 and ran until April 2019. The blood testing program was only ever available to residents of Williamstown, Oakey and Katherine.³¹ A recommendation from a previous parliamentary inquiry, undertaken by the Joint Standing Committee on Foreign Affairs, Defence and Trade, was to 'extend the program to be available in additional areas'.³²
- 3.38 Given the possible impacts of PFAS on members of the Wreck Bay Aboriginal Community, Dr Goldberg recommended that:

²⁷ Dr David Goldberg, Private capacity, *Committee Hansard*, 21 January 2025, p. 19.

²⁸ Dr David Goldberg, Private capacity, *Committee Hansard*, 21 January 2025, p. 19.

²⁹ Dr David Goldberg, Private capacity, *Committee Hansard*, 21 January 2025, p. 19.

³⁰ Dr David Goldberg, Private capacity, *Committee Hansard*, 21 January 2025, p. 19.

³¹ JSCFADT, [Inquiry into the management of PFAS contamination in and around Defence bases](#), November 2018, p. 68.

³² JSCFADT, [Inquiry into the management of PFAS contamination in and around Defence bases](#), November 2018, p. 78.

- all community members be offered free standard medical screening including blood tests for dyslipidaemia, faecal occult blood tests, and mammograms for women; and
 - a preventative care clinic with a primary care doctor be established in Wreck Bay.³³
- 3.39 Mrs Tamara Mitchell, Chief Executive Officer (CEO) of Wreck Bay Aboriginal Community Council (WBACC), told the committee that the Commonwealth government has refused to undertake any blood testing for PFAS for community members living on land and waterways contaminated by PFAS from Commonwealth Defence facilities.³⁴
- 3.40 Similarly, Ms Annette Brown, Chairperson of WBACC, stated that no monitoring of any community members for PFAS exposure has occurred. Consequently, there is no data available for trying to determine causation and no scientific evidence that could definitively link the PFAS contamination to the high levels of deaths in the community.³⁵
- 3.41 Ms Celia Perkins, Acting Associate Secretary at the Department of Defence, was asked why Defence has not provided blood testing for residents of Wreck Bay, and replied:
- Defence has considered it, but at earlier points in the investigation program, at a number of sites, some limited blood testing was undertaken by the department of health. The Department of Defence isn't in a position to [provide blood testing at Wreck Bay]. Part of the reason it is not currently government policy to undertake blood testing is that there is insufficient consensus on what PFAS levels in blood might mean, and so, until there is a consensus around what the health indicators are—it has been a reasonable, informed view of the medical community that most of us will have PFAS in our blood; it is a very persistent chemical—we won't know what those levels mean. It is quite distressing, but there's no way to really understand what that blood test tells us about health effects.³⁶

Class action on behalf of the Wreck Bay Aboriginal Community

- 3.42 The committee heard evidence from Mr Craig Allsopp, Joint Head of Class Actions at Shine Lawyers, about why the class action settlement on behalf of the Wreck Bay community did not take the health effects of PFAS exposure into account despite the abnormally high cancer rates in the community.

³³ Dr David Goldberg, Private capacity, *Committee Hansard*, 21 January 2025, p. 23.

³⁴ Mrs Tamara Mitchell, Chief Executive Officer, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 1.

³⁵ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 11.

³⁶ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 46.

- 3.43 Mr Allsopp emphasised to the committee that the Wreck Bay class action related solely to economic and cultural loss and excluded personal injury and health issues because of a lack of provable scientific evidence on the causal health effects of PFAS:

Basically, the science wasn't there, from a legal perspective, and it still may not be there, despite what seems like overwhelming anecdotal evidence. If the science gets there, or if there's some further development, it's completely open to the community to seek further redress for the terrible, terrible stories about personal injuries, health issues, cancers and everything else the community has had to suffer.³⁷

Community recommendations for action on the health effects

- 3.44 The committee heard evidence from members of the Wreck Bay Aboriginal community about the complex governance of Wreck Bay and the consequent importance of the Commonwealth and its agencies cooperating positively with the community to monitor contamination, exposure, and the health effects of PFAS.
- 3.45 While other chapters of this report discuss the governance of Wreck Bay in terms of, for example, Commonwealth remediation of contaminated land and waterways in Wreck Bay, this section notes the impact of those governance arrangements on community health.
- 3.46 Ms Brown said WBACC recognises that the high level of PFAS contamination is here to stay. One of her key concerns was monitoring the health of the children in the community. In this regard, she noted that Wreck Bay itself is complicated because it is Commonwealth territory and, as a non-self-governing territory, it has no state government:

So the Commonwealth needs to play a strong role in how we manage the future for our community, not only for us now but for future generations— monitoring health, monitoring the environment and having a formal arrangement with the Commonwealth and all the Commonwealth agencies that have responsibilities for servicing the territory. I think education will play an important part in the future as we hand down knowledge through the schools and ensure that that is part of the curriculum.³⁸

- 3.47 Ms Brown also recognised that 'causation connected to PFAS may never come'. Therefore, she recommended that the Commonwealth establish a monitoring committee that involves relevant Commonwealth ministers, officials and Aboriginal people from Wreck Bay and that it reports to parliament. The committee would monitor the health effects of PFAS, particularly on children, establish a database, inform the community in a language they understand, and

³⁷ Mr Craig Allsopp, Joint Head of Class Actions, Shine Lawyers, *Committee Hansard*, 21 January 2025, p. 25.

³⁸ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 3.

develop strategies for how the community and the department deal with the health effects of PFAS contamination.³⁹ In this regard, Ms Brown noted that the Wreck Bay community currently relies solely on second-hand information.⁴⁰

- 3.48 In evidence to the committee Dr Goldberg highlighted a current shortage of primary health resources available to not only the Wreck Bay community, but the region.

There's a shortage of doctors, and it's hard to get continuity of care. So anybody in the Bay and Basin area, irrespective of their community, is probably getting suboptimal primary care.⁴¹

- 3.49 When asked what Wreck Bay needs in terms of health support, Dr Goldberg argued the need for improved medical screening and better access to primary health care:

I would make sure that they had free standard medical screening—the kinds of stuff we do for anybody—mammograms for women, faecal occult blood tests for everybody. But, instead of using the normal, over-50 range, I'd bring it down to 30 or offer it to the whole community. A lot of these screening tests are very cheap. And I'd make sure that they actually had access to a primary care doctor who was there so they wouldn't have to put petrol in the car and go and find one or drive off to one.⁴²

Evidence from Richmond and the Blue Mountains

- 3.50 The committee held a hearing in Penrith, NSW, where it received evidence from two nearby communities affected by PFAS contamination—Richmond and the Blue Mountains. Richmond is a known PFAS hotspot due to its proximity to a Royal Australian Air Force (RAAF) base where PFAS-containing firefighting foam was used. The Blue Mountains was not thought to be a PFAS hotspot until testing by Sydney Water in June 2024 revealed elevated levels of PFAS at the Cascade Filtration Plant in Katoomba.
- 3.51 While much of this evidence is covered in a later chapter on water, excerpts are provided in this section on the health effects, and in the subsequent section on the mental health impacts caused by concerns about PFAS contamination.
- 3.52 Mr Alastair McLaren, a farmer, told the committee that his family ran a small farmers market business called Paddock to Plate, selling predominantly grass-fed beef produced without chemicals. However, in 2018, he discovered that one

³⁹ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 14.

⁴⁰ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 3.

⁴¹ Dr David Goldberg, Private capacity, *Committee Hansard*, 21 January 2025, p. 23

⁴² Dr David Goldberg, Private capacity, *Committee Hansard*, 21 January 2025, p. 23

of his leased farms in Richmond was impacted by PFAS contamination from the firefighting foam used for training purposes on the Richmond RAAF base:

It had drained into the waterways, manmade drains, on the farm. This farm is directly across the road from the RAAF base and occupies the land between the base and the Hawkesbury River.⁴³

3.53 Mr McLaren wanted his family of six to have blood tests so they would know if they had elevated levels of PFAS from eating the beef they produced. When Mr McLaren's family were unable to access free blood tests, Channel Nine, an Australian television company, paid for their blood testing:

The results shocked us. Our entire family were over the 95th percentile for PFAS in our blood. Our kids have spent their formative years with a high-toxicity, endocrine-disrupting, likely carcinogenic chemical in their blood.⁴⁴

3.54 Mr McLaren also pointed out that the authorities refused to do blood tests of his cattle. When his family funded the testing of their cattle, he stated that the results were more than ten times higher than what the Health Department would recommend for eating just 200 grams of his beef a month. When Mr McLaren was alerted to these high levels, he shut down their family owned and operated market business, as they could not 'in good conscious', continue selling contaminated meat to their customers.⁴⁵ Mr McLaren never received any compensation from the government. The only advice Mr McLaren received from government authorities was 'not to eat the beef but it was okay to sell'.⁴⁶

3.55 Similarly, Ms Joanna Pickford told the committee that her property near the Richmond Airforce base was also contaminated by PFAS, that her chickens had high levels of PFAS, and that the authorities had refused her a blood test.⁴⁷

3.56 Mr John Dee from Stop PFAS stated that his community in the Blue Mountains was suffering from the health effects of PFAS contamination as a result of the crash of a petrol tanker that caught fire and spilled its load of fuel at Medlow Bath in 1992. The subsequent containment of the fire entailed the use of large amounts of firefighting foam that flowed into a creek and then into drinking water dams.⁴⁸

3.57 Mr Dee emphasised that NSW Health is refusing to do any blood tests in the community. This is despite testing of running water near the crash site done in October 2024 by Dr Ian Wright, Associate Professor in the School of Science at

⁴³ Mr Alastair McLaren, Private capacity, *Committee Hansard*, 22 January 2025, p. 6.

⁴⁴ Mr Alastair McLaren, Private capacity, *Committee Hansard*, 22 January 2025, p. 6.

⁴⁵ Mr Alastair McLaren, Private capacity, *Committee Hansard*, 22 January 2025, p. 7.

⁴⁶ Alastair and Kellie-Jo McLaren, *Submission 99*, [p. 3].

⁴⁷ Ms Joanna Pickford, Private capacity, *Committee Hansard*, 22 January 2025, p. 5.

⁴⁸ Mr Jon Dee, Stop PFAS, *Committee Hansard*, 22 January 2025, p. 4.

Western Sydney University, showing PFOS levels at 2200 nanograms a litre and PFHxS levels at 980 nanograms a litre, 32 years after the crash, causing concerns in the community that it has been consuming highly contaminated water for several decades.⁴⁹

- 3.58 Mr Dee told the committee that he has dangerously high levels of cholesterol and has to take medication:

But what concerns me is just how many people are coming up to me to say they've got a cholesterol level above seven. They're all taking medication.⁵⁰

Mental health impacts of living with high levels of PFAS exposure

- 3.59 Chapter 6 considers the cultural impacts that PFAS contamination has had on the Wreck Bay Aboriginal community. This section presents evidence the committee received from submitters and witnesses that the uncertainty and fear around the unknown effects of PFAS contamination and exposure causes considerable psychological distress.

- 3.60 As noted earlier, the ANU PFAS Health Study found major psychological distress in the three PFAS affected communities that their study looked at. Professor Kirk explained to the committee that the study attributed the major sources of this distress to an overall disruption to life, including declining property values, an inability to eat homegrown produce, and 'worries about their children's and their own health'.⁵¹ Professor Kirk and colleagues also acknowledged that 'people who live in PFAS-impacted areas want conclusive answers—to know the health effects caused by PFAS exposure'. However, the ANU study was not designed or able to provide that certainty.⁵²

- 3.61 Dr Ian Wright stated that he had 'never seen such a panicked group of people' as the community in the Blue Mountains:

There was a thirst for information from not only the general community but even technically literate people in different parts of the industry. This is a really difficult topic. We're dealing with tiny concentrations of very harmful chemicals. We don't know where they are. We don't know the hotspots. We don't necessarily know the impact, and we might not know for decades.⁵³

⁴⁹ Mr Jon Dee, Stop PFAS, *Committee Hansard*, 22 January 2025, p. 4.

⁵⁰ Mr Jon Dee, Stop PFAS, *Committee Hansard*, 22 January 2025, p. 7.

⁵¹ Professor Martyn Kirk, National Centre for Epidemiology and Population Health, Australian National University, *Committee Hansard*, 13 November 2024, p. 29; Professor Martyn Kirk, Dr Kayla Smurthwaite and Ms Susan Trevenar, *Submission 85*, p. 1.

⁵² Professor Martyn Kirk, Dr Kayla Smurthwaite and Ms Susan Trevenar, *Submission 85*, p. 4.

⁵³ Dr Ian Wright, Associate Professor, School of Science, Western Sydney University, *Committee Hansard*, 22 January 2025, p. 10.

3.62 Mr Dee, Mr McLaren, and Ms Pickford recounted similar stories about the psychological distress caused by not knowing the extent of PFAS contamination and the health effects, including the possibility of cancer and cancer clusters. This distress is caused by several factors including the refusal of the Commonwealth Defence Force and various state health departments and ministers to engage meaningfully with the community with respect to testing land, waterways, livestock, and the people themselves. Added to this are the loss of livelihoods for farmers, the inability to eat home-grown produce, and the unknown health effects on them, their families, and their communities.⁵⁴

3.63 For example, Mr McLaren told the committee of his devastation at discovering that he had been inadvertently selling PFAS contaminated beef to his customers:

It was shocking to us that nobody had informed us of the contamination. We had been farming that land for three years. We were directly across the road, and the stormwater from the base flows directly into the waterways on the farm. This is the water that the cattle drank. Can you imagine having a farmers market business selling directly to customers who over a period of years had become friends and finding out that the product that you had been selling them was possibly contaminated? I was gutted.⁵⁵

3.64 Consequently, Mr McLaren recommended that government departments and agencies treat communities affected by PFAS with respect by taking their fears and concerns seriously and providing information on PFAS contamination in a more accessible way. He also recommended ending food production on highly contaminated properties, and compensating farmers for their losses.⁵⁶

3.65 The committee received submissions from a workforce highly affected by PFAS contamination as part of their daily work, namely professional firefighters. The United Firefighters Union of Australia pointed to both the physical and psychological scars of work that entails repeated exposure to dangerous chemicals:

Professional firefighters go to work every day with the risk that they will be exposed to a cocktail of harmful chemicals; exposures that are shown to significantly impact their health and wellbeing. The impacts vary based on the type and extent of the exposure, but overall, the physical and psychological injuries that result are felt by thousands of firefighters in Australia.⁵⁷

⁵⁴ Mr Jon Dee, *Stop PFAS, Committee Hansard*, 22 January 2025, p. 8; Mr Alastair McLaren, Private capacity, *Committee Hansard*, 22 January 2025, p. 7; Ms Joanna Pickford, Private capacity, *Committee Hansard*, 22 January 2025, p. 5.

⁵⁵ Mr Alastair McLaren, Private capacity, *Committee Hansard*, 22 January 2025, p. 6.

⁵⁶ Mr Alastair McLaren, Private capacity, *Committee Hansard*, 22 January 2025, p. 6.

⁵⁷ United Firefighters Union of Australia, *Submission 104*, p. 3.

- 3.66 Similarly, the Aviation Branch of the United Firefighters Union of Australia, emphasised the absence of health monitoring by the government which compounds the uncertainty and stress endured by both serving and retired firefighters:

Aviation firefighters who have experienced serious PFAS exposure are largely left to their own devices to monitor effects on their own health. While there is academic research taking place into PFAS exposure and levels among aviation firefighters, there is no ongoing health monitoring and management program in place to support them. Additionally, they have to live with the anxiety of wondering what their exposure to PFAS chemicals is doing to their bodies and the effect it will have on their quality and duration of life. This anxiety is a real day-to-day concern for retired and serving UFUA members.⁵⁸

Immediate programs and further studies

- 3.67 Some inquiry participants have outlined programs that could be established to monitor and potentially reduce PFAS levels in the blood. Inquiry participants also advocated for more investment in monitoring and research that could provide data and evidence of the health effects of PFAS exposure.

- 3.68 Dr Nicholas Chartres, Senior Research Fellow, School of Pharmacy, Faculty of Medicine and Health, University of Sydney, recommended the committee look at a 2022 report by the National Academies of Sciences, Engineering and Medicine in the US:

They released a report in 2022 on clinical guidance for PFAS exposure, basically offering guidance for clinicians in PFAS affected communities on whether they should recommend testing, what markers are biologically relevant and what type of action their patients can take based on the information they get from that blood testing.⁵⁹

- 3.69 The Queensland Alliance of Environmental Health Sciences recommended easier access to programs that have a demonstrated ability to reduce PFAS concentrations in the human body such as blood and plasma donation:

Regarding the mitigation of PFAS in our body, research shows that there is a faster reduction in PFAS levels in those who donate blood or plasma. We propose that this information should be available to people so they can consider the option of donation if they have high levels of PFAS. Ideally, when a person is identified as having a high PFAS level (i.e., >95% of general Australian community) at some point in time, there should be a trigger for access to a Medicare rebate for venesection. This will enable people with higher levels and therefore the potential for a greater health risk to readily

⁵⁸ United Firefighters Union of Australia, Aviation Branch, *Submission 113*, p. 7.

⁵⁹ Dr Nicholas Chartres, Senior Research Fellow, School of Pharmacy, Faculty of Medicine and Health, University of Sydney, *Committee Hansard*, 22 January 2025, p. 14.

access a procedure that will reduce PFAS levels. This procedure can be repeated over time to continue to decrease PFAS body burden.⁶⁰

- 3.70 Dr Cameron Shearer noted that the studies which may provide robust evidence regarding the causal links between PFAS exposure and health effects take many years to conduct and are not typically funded by current grant funding pathways. He recommended that longitudinal studies greater than five years should be supported.⁶¹
- 3.71 The Queensland Alliance of Environmental Health Sciences at the University of Queensland recommended more research into the health effects of PFAS, including:
- which PFAS are currently in the environment, the levels, and the exposure pathways; and
 - longitudinal cohort studies to enable effective research into the health issues related to PFAS exposure.⁶²
- 3.72 The Australian Academy of Health and Medical Sciences emphasised:
- Longitudinal studies tracking PFAS exposure from pregnancy through early childhood are essential to understanding the potential risks to brain development and future health. Additionally, larger-scale research is needed to explore potential links between PFAS exposure and chronic conditions.⁶³
- 3.73 In order to address the shortcomings in the understanding of the adverse human health effects of PFAS, the Australian Academy of Health and Medical Sciences recommended several large-scale studies and programs, including:
- the immediate establishment of an interim program to monitor the levels of PFAS and other chemical contaminants in priority populations such as pregnant women; and
 - a national human biomonitoring program to track Australians' bioaccumulation of PFAS together with other chemical contaminants (similar to existing programs in the United States, South Korea, Japan, and several European countries).⁶⁴

⁶⁰ Queensland Alliance of Environmental Health Sciences at The University of Queensland, *Submission 112*, p. 1.

⁶¹ Dr Cameron Shearer, *Submission 49*, p. 1.

⁶² Queensland Alliance of Environmental Health Sciences at The University of Queensland, *Submission 112*, p. 2.

⁶³ Australian Academy of Health and Medical Sciences, *Submission 35*, p. 3.

⁶⁴ Australian Academy of Health and Medical Sciences, *Submission 35*, pp. 2 and 3; see also Cancer Council, *Submission 62*, p. 3.

Chapter 4

PFAS in drinking water

- 4.1 PFAS in Australia's drinking water supplies is an issue of concern to communities, governments and water service providers. Monitoring, testing and removal of PFAS from drinking water supplies presents a number of challenges for industry, science and governments.
- 4.2 PFAS have chemical characteristics that make them difficult environmental contaminants to manage and remediate. PFAS are soluble in water and highly bioavailable to aquatic organisms and plants.¹ These characteristics allow PFAS to move long distances from a point of contamination and can result in infiltration of surface and groundwater catchments.²
- 4.3 Elevated levels of PFAS are commonly found in water catchments near sewage treatment plants, landfills or places where PFAS-containing firefighting foams have been used, for example near military bases, commercial airports, mining operations or fuel refineries.³ While the extent and distribution of PFAS contamination varies greatly, they have become ubiquitous in the environment.⁴
- 4.4 This chapter considers PFAS in Australian drinking water, outlining the ubiquitous nature of PFAS in the environment, including in water catchments. The current regulatory guidelines governing drinking water in Australia are outlined, including the existing, and updated draft Australian Drinking Water Guidelines (ADWG).
- 4.5 The chapter details evidence from submitters and witnesses about the ADWG and compares Australia's guidelines with international jurisdictions. The chapter then details the status of PFAS testing amongst water suppliers in Australia, and outlines PFAS treatment technologies, including their current limitations.
- 4.6 Providing two case studies of communities impacted by PFAS contamination in their water supply—the First Nations community of Wreck Bay, Jervis Bay

¹ HEPA, *PFAS National Environmental Management Plan Version 2.0*, January 2020, p. 8.

² See, for example, Department of Climate Change, Energy and the Environment and Water, *Submission 33*, p. 3; Department of Health and Aged Care interim Australian Centre for Disease Control, *Submission 100*, p. 4.

³ Department of Health and Aged Care, [Per- and Polyfluoroalkyl Substances \(PFAS\)](#), 30 October 2024, (accessed 13 February 2025).

⁴ See, for example, Airservices Australia, *Submission 69*, p. 14; Dr Kate Hughes, *Submission 89*, p. 1; Water Services Association of Australia, *Submission 56*, p. 3.

Territory (JBT), and the Blue Mountains, NSW, community—the chapter concludes with the committee's views and areas for future inquiry.

Australian Drinking Water Guidelines

4.7 Water policy is primarily a responsibility of the states and territories, as such water management varies across different jurisdictions. For most states and territories, drinking water policy is set by the state health departments while water supplies are managed and provided by water utilities.⁵ Often these water utilities are state-owned corporations.⁶

4.8 The Commonwealth Government is responsible for national coordination of drinking water.⁷ One initiative of the federal government to this end is the development of the ADWG.⁸

Current Guidelines

4.9 The Australian Drinking Water Guidelines were designed by the National Health and Medical Research Council (NHMRC) and the Natural Resource Management Ministerial Council in 2011.⁹ Guideline values for PFAS were first added in August 2018.¹⁰ The current ADWG are maintained by NHMRC and are intended for use by all agencies involved in the supply of drinking water, including catchment and water resource managers, drinking water suppliers, water regulators, and health authorities. The ADWG are not mandatory or legally enforceable unless integrated into state and territory laws, which is at the discretion of individual states and territories.¹¹ All states and territories have a Water Act, Public Health Act or Drinking Water Act that references the Australian Drinking Water Guidelines 2011. However, some states are stricter than others in how the ADWG is enshrined into their legislation.¹²

4.10 Table 4.1, below, outlines the current ADWG for PFOA, PFOS and PFHxS.

⁵ Water Services Association of Australia, *Submission 56*, p. 5.

⁶ Mr Adam Lovell, Executive Director Water Services Association of Australia, *Committee Hansard*, 22 January 2025, p. 20.

⁷ Department of Climate Change, Energy, the Environment and Water, [National water policy](#), October 2023 (accessed 3 February 2025).

⁸ National Health and Medical Research Council, *Submission 57*, p. 1.

⁹ National Health and Medical Research Council, [Australian Drinking Water Guidelines](#) (accessed 3 February 2025).

¹⁰ National Health and Medical Research Council, *Submission 57*, p. 2.

¹¹ Professor Steve Wesselingh, CEO, National Health and Medical Research Council, [NHMRC update on the Australian Drinking Water Guidelines](#), 14 June 2024 (accessed 13 February 2025).

¹² Frontier economics, [Urban water regulation reform](#), December 2017, p. 27.

Draft revised Guidelines

- 4.11 In 2022, the Health Department requested that the NHMRC undertake an independent review of the Australian health-based guideline values for PFAS in the ADWG.¹³ In addition to reviewing the current guidance values for PFOA, PFOS and PFHxS, the review also considered perfluorobutane sulfonic acid (PFBS) and hexafluoropropopylene oxide (HFPO) dimer acid and its ammonium salt (referred to as "GenX chemicals").¹⁴
- 4.12 Updated draft ADWG were released for public consultation on 21 October 2024.¹⁵ The updated ADWG propose a significant decrease in what is considered safe levels of PFAS. It is expected that new ADWG will be published in 2025. Proposed changes are outlined below:

Table 4.1 Draft PFAS Guideline Recommendations for Public Consultation

PFAS	Current ADWG (2018)	Proposed ADWG for Public Consultation (2024)
PFOA	Based on human health considerations, the concentration of PFOA in drinking water should not exceed 560 ng/L.	Based on human health considerations, the concentration of PFOA in drinking water should not exceed 200 ng/L .
PFOS	Based on human health considerations, the sum of the concentrations of PFOS and PFHxS in drinking water should not exceed 70 ng/L.	Based on human health considerations, the concentration of PFOS in drinking water should not exceed 4 ng/L .
PFHxS		Based on human health considerations, the concentration of PFHxS in drinking water should not exceed 30 ng/L .
PFBS	No health-based guideline value in the current Guidelines.	Based on human health considerations, the concentration of PFBS in drinking water should not exceed 1000 ng/L .
GenX Chemicals	No health-based guideline value in the current Guidelines.	No health-based guideline value can be derived at this time.

Source: NHMRC, *Submission 57*, p. 3.

- 4.13 While the proposed draft guidelines are significantly stricter than the current Australian Drinking Water Guidelines, the guidance values are still weaker than those imposed in other international jurisdictions.¹⁶

¹³ National Health and Medical Research Council, *Submission 57*, p. 2.

¹⁴ National Health and Medical Research Council, *Submission 57*, p. 2–3.

¹⁵ National Health and Medical Research Council, *Submission 57*, p. 3.

¹⁶ United States Environmental Protection Agency, [Per- and Polyfluoroalkyl Substances \(PFAS\)—Final PFAS National Primary Drinking Water Regulation](#), January 2025 (accessed 3 February 2025).

International drinking water standards

4.14 In April 2024, the United States announced their National Primary Drinking Water Regulation for six PFAS.¹⁷ The United States regulation is significantly stricter than Australia's existing ADWG as well as the draft updated ADWG released in October 2024.

Table 4.2 Comparison of current Australian and United States drinking water guidelines

Chemical	Australia (current)	Australia (proposed)	United States
PFOS and PFHxS	70 ng/L		
PFOS	(see 'combined')	4 ng/L	4 ng/L
PFHxS	(see 'combined')	30 ng/L	10 ng/L
PFOA	560 ng/L	200 ng/L	4 ng/L
GenX chemicals	No health-based guideline value can be derived at this time.		10 ng/L

Source: NHMRC, *Submission 57*, p. 3; United States Environmental Protection Agency (US EPA), [Per- and Polyfluoroalkyl Substances \(PFAS\) - Final PFAS National Primary Drinking Water Regulation](#), January 2025, (accessed 3 February 2025).

4.15 The United States drinking water guidelines are also intended to become legally enforceable 'Maximum Contaminant Levels' (MCLs). Under the directive, public water systems have five years (until 2029) to implement solutions to reduce PFAS if monitoring shows drinking water levels exceed the MCLs. Public water systems will also have three years (until 2027) to show evidence of monitoring for PFAS.¹⁸

4.16 The European Union (EU) also has strict guidelines on safe levels of PFAS in drinking water. However, instead of having guidelines for individual PFAS compounds, the EU Drinking Water Directive 2020/2184 sets a combined limit of '0.1 µg/L [100ng/L] for the sum of 20 PFAS compounds and 0.5 µg/L [500ng/L] for PFAS Total (all PFAS) in drinking water'.¹⁹ European Union member states will be required to ensure compliance with these standards by 2026.²⁰

¹⁷ United States Environmental Protection Agency, *Per- and Polyfluoroalkyl Substances (PFAS)—Final PFAS National Primary Drinking Water Regulation*, January 2025.

¹⁸ United States Environmental Protection Agency, *Per- and Polyfluoroalkyl Substances (PFAS)—Final PFAS National Primary Drinking Water Regulation*, January 2025.

¹⁹ Water Europe, [Facing the PFAS Issue: Views from the European Water Sector](#), December 2024, p. 4.

²⁰ Water Europe, [Facing the PFAS Issue: Views from the European Water Sector](#), December 2024, p. 4.

Opinions on the updated NHMRC Australian Drinking Water Guidelines

4.17 Many submissions raised concerns about the proposed PFAS limits set out in the draft ADWG.²¹ Community group, STOP PFAS Blue Mountains, was concerned that the proposed new guidelines do not go far enough, and recommended Australia 'align its drinking water standards with the stricter PFAS drinking water limits established in the United States'.²² To highlight the importance of aligning the Australian drinking water guidelines to the updated American guidelines, Mr John Dee, founder and spokesperson for the STOP PFAS Blue Mountains group, asked if, when given the choice about drinking a glass of water:

Do you want the Australian one that's got 200 parts per trillion of PFOA or the American one with four parts per trillion? It's your choice. Which one are you going to have? If you ask that of every Australian, they'll want the four parts per trillion.²³

4.18 STOP PFAS Blue Mountains also recommended that the 'federal government should legally enforce the Australian Drinking Water Guidelines', which currently remains an advisory document.²⁴

4.19 Dr Ian Wright raised the importance of the Commonwealth Government providing strong leadership that goes beyond numerical guidelines:

The Commonwealth needs to provide strong leadership here, and I think there's a great opportunity with the current revision of the Australian drinking water guidelines. ... But along with that needs to come information to help explain things to people, to customers. For example: What if your water supply does have elevated PFAS? What are the alternatives? What if the filter works? Where can you get water? Can you get your blood tested?²⁵

4.20 The committee also heard evidence advocating for the updated ADWG to cover a broader range of PFAS. Professor Denis O'Carroll said:

At the moment, because utilities, for example, are only mandated to look for three or four PFAS, that's all they will report. We know there's much more PFAS out there. There would be a minimal incremental cost associated with quantifying more. ...the NHMRC should consider a wider range of PFAS for regulation.²⁶

²¹ See, for example: Toxics Free Australia, *Submission 72*, p. 5; Climate Action Merribek, *Submission 13*, p. 8; STOP PFAS Blue Mountains, *Submission 76*, p. 11.

²² STOP PFAS Blue Mountains, *Submission 76*, p. 11.

²³ Mr Jon Dee, Stop PFAS, *Committee Hansard*, 22 January 2025, p. 16.

²⁴ STOP PFAS Blue Mountains, *Submission 76*, p. 11.

²⁵ Dr Ian Wright, Associate Professor, School of Science, Western Sydney University, *Committee Hansard*, 22 January 2025, p. 2.

²⁶ Professor Denis Michael O'Carroll, Professor, University of New South Wales, *Committee Hansard*, 13 November 2024, p. 22.

4.21 In response to a question on notice, the Health Department stated that NHMRC's current PFAS review 'relates only to the specific chemical substances of PFOS, PFHxS, PFOA, PFBS and GenX chemicals'. These five PFAS were selected by NHMRC and the Health Department 'based on the health advisories proposed by the United States Environmental Protection Agency (US EPA) at the time (June 2022)'. The Health Department also stated:

- The most prevalent PFAS found in the Australian population to date have been PFOS, PFOA and PFHxS. There is limited evidence available for many PFAS chemicals.
- Additional PFAS may be reviewed in the future as part of the rolling revision of the Australian Drinking Water Guidelines. The Water Quality Advisory Committee will consider possible review topics and other high priority water quality issues as part of its next workplan commencing in early 2026.
- Based on the findings from the review (available in the NHMRC 2024 Addendum Report), NHMRC and the Water Quality Advisory Committee had concerns about the feasibility of implementing a guideline value for a PFAS sum/mixture with the current options available, given the limited health evidence available for other PFAS. Therefore, no single total/sum guideline value for a PFAS mixture has been proposed at this time but it may be reconsidered should further evidence and methods become available.²⁷

4.22 Evidence provided by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) highlighted that the technology is available to test for a wider variety of PFAS, describing:

Recent advancements in ultra-high resolution non-targeted PFAS analysis now provides a powerful tool to detect a larger number of PFAS (and other contaminants of concern) in complex mixtures occurring in samples... it can also provide a chemical profile (fingerprint) of samples for future examination of emerging contaminants, ensuring that assessments can account for the presence and extent of all PFAS found in samples, identification of sources, and effective remediation or management.²⁸

4.23 Not all submitters and witnesses advocated for stricter drinking water guidelines. Submissions from the water industry raised concerns that stricter drinking water guidelines could result in a substantial increase in costs for water distributors, which would then be passed on to consumers.²⁹ Water Services

²⁷ Department of Health and Aged Care, Response to written questions from Senator Thorpe (received 11 February 2025), [p. 3] and [p. 5].

²⁸ CSIRO, *Submission 22*, p. 7.

²⁹ See, for example: Water Services Association of Australia, *Submission 56*, p. 8; Queensland Water Directorate, *Submission 90*, p. 3; Riverina Water County Council, *Submission 64*, p. 4.

Association Australia, the peak body for the water services sector in Australia, stated in its submission:

PFAS monitoring, investigation, and treatment impose a financial burden on water utilities. For larger utilities, these costs are often manageable, but smaller utilities may face significant financial strain. Without direct government funding or access to alternative, non-customer funded capital investment avenues, these costs are likely to be passed on to customers through higher water bills.³⁰

4.24 The Queensland Water Directorate—the central advisory and advocacy body within Queensland's urban water and sewerage services sector—questioned whether the additional level of protection provided by the proposed limits 'may not justify the cost of implementation specifically for the Australian context'.³¹

4.25 At the public hearing in Penrith, Sydney Water explained that, as of the 6 January 2025, 'all of our systems will actually meet the US EPA guidelines' of 'four parts per trillion'—demonstrating that it is possible to meet the proposed limits.³²

4.26 However, when speaking about its recent \$3.4 million investment in a new PFAS treatment facility—recently installed at its Cascade Water Filtration Plant in Katoomba—Sydney Water explained:

We are lucky enough as an organisation the size of Sydney Water. It's a privilege that not everyone around the country has—to have the technical capability, the expertise and the resources to do something that we've just done.³³

Extent of PFAS in water supplies

4.27 This section outlines recent evidence on the prevalence and extent of PFAS contamination in drinking water supplies.

4.28 A recent study led by researchers at the University of NSW collated and assessed PFAS concentration data for over 45 000 surface and groundwater samples from around the world. The study found a substantial fraction of the samples exceeded both Australian and international drinking water guidelines, 'with the extent of exceedance depending on the jurisdiction and PFAS source'.³⁴

³⁰ Water Services Association of Australia, *Submission 56*, p. 8.

³¹ Queensland Water Directorate, *Submission 90*, p. 3.

³² Dr Kaye Power, Principal Water and Public Health Adviser, Sydney Water Corporation, *Committee Hansard*, 22 January 2025, p. 27.

³³ Mr Paul Plowman, Executive General Manager, Water and Environment Services, Sydney Water Corporation, *Committee Hansard*, 22 January 2025, p. 24.

³⁴ Professor Denis O'Carroll, *Submission 1*, attachment 1, p. 1.

4.29 Professor Denis O'Carroll, one of the authors on the University of NSW paper, explained the significance of their study to the way in which water testing has been conducted in Australia:

In Australia to date PFAS has typically only been quantified in drinking water when there is a suspected PFAS source to a drinking water source, however results from our study, and Sydney Water's recent discovery of PFAS in drinking water at the Cascade filtration plant in the Blue Mountains, suggest that PFAS is likely to be found in drinking water even when there is no suspected source.³⁵

4.30 Recent media reports suggest there are many more communities with contaminated drinking water, which have previously gone undetected. On 3 February 2025, ABC News reported on a recent 'regional testing blitz for PFAS' undertaken by NSW Health that identified three regional towns which had PFAS in their drinking water at levels higher than the proposed updated ADWG.³⁶ The sources of the PFAS contamination are still being investigated.

4.31 NSW Health confirmed on their website that as of 17 January 2025, that all 83 local water utilities in NSW have tested their supply systems. Three local water utilities had supplies that exceed the proposed ADWG, these included:

- Tarcutta, in Riverina Water County Council area and
- Narrabri, in Narrabri Shire Council area.
- Warialda, in the Gwydir Shire Council area.³⁷

4.32 Warialda, in the Gwydir Shire Council area, initially did not comply with the current drinking water guidelines. However, investigations identified two bores as the source of the PFAS contamination. These bores have now been cut off from the water supply. Subsequent tests have revealed PFAS levels to be below the current guidelines.³⁸

Testing of PFAS in water supplies

4.33 Currently, there is no national requirement to monitor levels of PFAS in drinking water in Australia. As outlined in NHMRC's ADWG draft fact sheet on PFAS:

... water quality data for PFAS have been collected to date on an *ad hoc* (as needed) basis in areas with contaminated PFAS sites. Some water utilities carry out regular monitoring due to the proximity of their raw water to PFAS contamination sites. Some other water utilities now include PFAS in

³⁵ Professor Denis O'Carroll, *Submission 1*, p. 2.

³⁶ Xanthe Gregory, "[PFAS contamination testing blitz in NSW sparks calls for further investigations](#)", *ABC News*, 3 February 2025 (accessed 3 February 2025).

³⁷ NSW Government, [Latest guidance on PFAS and drinking water](#) (accessed 13 February).

³⁸ NSW Government, [Latest guidance on PFAS and drinking water](#) (accessed 13 February).

monitoring programs, even when there is no identified source of contamination.³⁹

- 4.34 While there is no requirement for water services to test and report on PFAS levels, many water services do. When asked at the public hearing in Penrith how many water services were testing and publishing data on PFAS, the CEO of Water Services Association Australia, Mr Adam Lovell replied:

I would say most. I don't have an exact number for you, but the larger capital cities are certainly collecting that data and publishing it, mostly on their websites.⁴⁰

- 4.35 Cancer Council Australia shared in its submission that, at least to its knowledge, the water utilities:

... Melbourne Water, SA Water, WaterNSW, and SeqWater, regularly monitor PFAS levels in drinking water, and some make these results publicly available including Icon Water, Sydney Water.⁴¹

- 4.36 However, due to there being no requirement for water services to test or share PFAS contamination data, the distribution and extent of PFAS contamination across waterways in Australia is unclear.

- 4.37 The absence of consistent information around PFAS contamination in drinking water and across waterways was a common theme amongst submissions to the inquiry.⁴² The Concerned Waterways Alliance, a network of community organisations dedicated to protecting the health of waterways across southern Victoria, submitted:

Monitoring programs in Victoria are limited in scope and frequency and fail to provide comprehensive data on PFAS contamination in waterways. Public transparency is also limited, leaving affected communities with insufficient information on exposure risks.⁴³

- 4.38 Associate Professor Ian Wright highlighted that, currently, the most comprehensive map of PFAS hotspots in Australia is produced and managed by the volunteer-led environmental non-government organisation, Friends of the Earth.⁴⁴

- 4.39 Friends of the Earth confirmed the popularity of its PFAS Australia Map in its submission, saying that it 'had 41,000 active users visit the site in 2024'. Friends

³⁹ National Health and Medical Research Council, [Australian Drinking Water Guidelines - Public Consultation on Draft Guidance for Per- and Polyfluoroalkyl Substances \(PFAS\)](#), October 2024, p. 2.

⁴⁰ Mr Adam Lovell, Chief Executive Officer, Water Services Association of Australia, *Committee Hansard*, 22 January 2025, p. 22.

⁴¹ Cancer Council Australia, *Submission 62*, p. 4.

⁴² See, for example, crcCARE, *Submission 36*, p. 16; Name Withheld, *Submission 97*, p. 1.

⁴³ Concerned Waterways Alliance, *Submission 30*, p. 4.

⁴⁴ Dr Ian Wright, *Submission 102*, p. 2.

of the Earth also asked; 'Why is it left to a small handful of volunteers to attempt to monitor the multi-billion dollar PFAS problem across the country?'⁴⁵

4.40 The importance of having a centralised resource of known PFAS hotspots was echoed by the Environmental Defenders Office:

Communities also need greater transparency when it comes to possible PFAS contamination, and potential risks to human health. A central, accessible resource, such as a database or register, should provide this information on a national scale.⁴⁶

4.41 Similarly, the Australian Academy of Science recommended a 'nationally coordinated monitoring program to determine the extent of PFAS contamination levels across Australia'.⁴⁷

4.42 Professor Stuart Khan, Head of the School of Civil Engineering at the University of Sydney, echoed the need for the Commonwealth Government to take 'a much more active role in setting drinking water quality and risk management requirements'. In additional information provided to the committee, Professor Khan suggested that the Commonwealth Government should consider introducing an 'Australian Safe Drinking Water Act', which would 'enable the Commonwealth to mandate consistent application of best practices for managing drinking water'.⁴⁸ This request was echoed by STOP PFAS Blue Mountains.⁴⁹

Drinking water treatment options

4.43 PFAS treatment technologies can be categorised by either being destructive or non-destructive. As the names suggests, non-destructive technologies can only extract and contain PFAS from a particular source. Destructive technologies can breakdown PFAS into its original molecules.⁵⁰ At this point in time, destructive technologies are very expensive and not widely available.⁵¹

4.44 Common treatment options for removing PFAS from contaminated or potentially contaminated water include "membrane technology (nanofiltration

⁴⁵ Friends of the Earth, *Submission 46*, p. 1.

⁴⁶ Environmental Defenders Office, *Submission 55*, p. 4.

⁴⁷ Australian Academy of Science, *Submission 63*, p. 1.

⁴⁸ Professor Stuart Khan, Head of School of Civil Engineering, Sydney University, briefing material for public hearing 22 January 2025 (received 21 January 2025) p. 4.

⁴⁹ STOP PFAS Blue Mountains, *Submission 76*, p. 7.

⁵⁰ CSIRO, *Submission 22*, p. 4-5.

⁵¹ See, for example, CSIRO, *Submission 22*, p. 4-5; Professor Jochen Mueller, Queensland Alliance for Environmental Health Sciences, answer to question taken on notice, 13 November 2024 (received 4 December 2024). See Chapter 5 for further discussion on these technologies.

or reverse osmosis) or using sorption technology (typically specific activated carbon or ion exchange processes)⁵².

4.45 Neither of these treatment options work in the routine treatment of wastewater. As Professor Jochen Mueller explained, neither membrane nor sorption technologies are:

... applicable to (routine) treatment of wastewater since wastewater contains high levels of other chemicals and solids. These techniques can only act as a potential further treatment step following conventional wastewater treatment processes, as is done in the production of purified recycled water.⁵³

4.46 The absence of viable treatment options for wastewater has implications for the recycling of biosolids (solid by-product of the wastewater treatment process) and recycled water.

Case studies

Wreck Bay, Jervis Bay Territory

4.47 On 20 January 2025, the committee visited the First Nations community of Wreck Bay, JBT, where PFAS-containing firefighting foams were used on the neighbouring naval base, HMAS Creswell, and the Jervis Bay Range Facility for more than three decades since the 1970s.

4.48 During its visit to Wreck Bay, the committee heard about the serious impacts of PFAS contamination on the community, its lands and waters, and cultural practices. This section considers concerns around drinking water in Wreck Bay; the health impacts of the contamination are discussed in Chapter 3 of this report; remediation efforts are outlined in Chapter 5; and cultural impacts of the contamination are detailed in Chapter 6, of this report.

4.49 Drinking water at Wreck Bay and in other parts of JBT is sourced from nearby Lake Windermere. The Department of Infrastructure, Transport, Regional Development, Communications and the Arts (Infrastructure Department) is responsible for the Lake Windermere catchment. Shoalhaven Water undertakes routine monthly testing for PFAS in JBT's drinking water, on behalf of the Infrastructure Department.⁵⁴

4.50 JBT's drinking water results are released each month in the Jervis Bay community bulletins, published by the Infrastructure Department. Testing for

⁵² Professor Jochen Mueller, Queensland Alliance for Environmental Health Sciences, answer to question taken on notice, 13 November 2024 (received 4 December 2024), p. 1.

⁵³ Professor Jochen Mueller, Queensland Alliance for Environmental Health Sciences, answer to question taken on notice, 13 November 2024 (received 4 December 2024), p. 1.

⁵⁴ Department of Infrastructure, Transport, Regional Development, Communications and the Arts, [JBT drinking water – PFAS testing results](#), 20 January 2025, (accessed 13 February 2025).

January 2025 showed PFAS levels in JBT drinking water 'remain many times lower than levels recommended by the Australian Drinking Water Guidelines'.⁵⁵

Figure 4.1 Jervis Bay Territory drinking water—January 2025 PFAS testing results

	Sum of PFOS & PFHxS	PFOA
JBT drinking water January 2025 test results	0.0008 micrograms/litre	<0.0005 micrograms/litre
Australian Drinking Water Guidelines Health values for PFAS	0.07 micrograms/litre	0.56 micrograms/litre

*PFOS=Perfluorooctane Sulfonate, PFHxS=Perfluorohexane Sulfonate, PFOA=Perfluorooctanoic Acid

Source: Department of Infrastructure, Transport, Regional Development, Communications and the Arts, [JBT drinking water – PFAS testing results](#), 20 January 2025, (accessed 6 February 2025).

- 4.51 While drinking water in Wreck Bay is being tested and found to be below the current ADWG, community members remain concerned about the level of PFAS in their tap water. Wreck Bay community member, Mr Matt Simms shared his concerns at the public hearing in Nowra, saying; 'America says that there is no safe level of PFAS for consumption for anyone, for drinking... but it's still running through our taps'.⁵⁶
- 4.52 Another community member, Ms Donya Whaddy, noted that water that comes from taps in Wreck Bay Village is discoloured, saying: 'Our water out there—you run the bath and it's yellow. What is that? We haven't got an answer'.⁵⁷
- 4.53 While attending the site visit at Wreck Bay, and during the hearing in Nowra, senators heard that members of the community were concerned about drinking town water, so were instead paying for bottled water out of their aged-care packages.⁵⁸
- 4.54 When Senator Thorpe questioned the Department of Defence on whether they had costed the provision of alternative drinking water sources to the community, representatives of the department informed the committee that they had not:

CHAIR: Have you ever costed what connection to different mains would cost?

⁵⁵ DITRDCA, *JBT drinking water – PFAS testing results*, 20 January 2025.

⁵⁶ Mr Matt Simms, Private capacity, *Committee Hansard*, 21 January 2025, p. 11.

⁵⁷ Ms Donya Whaddy, Private capacity, *Committee Hansard*, 21 January 2025, p. 9.

⁵⁸ Appendix 2, Wreck Bay community visit, p. 17. Ms Donya Whaddy, Private capacity, *Committee Hansard*, 21 January 2025, p. 9.

Ms Perkins: I don't believe we've done that work at Wreck Bay. We have done mains connections in other communities, and, as I said, we'll continue to be guided with colleagues on access to other reticulated water networks.

CHAIR: Have you ever costed providing rainwater tanks to every household in the community?

Ms Perkins: I don't believe we have in Wreck Bay.⁵⁹

4.55 Mr Simms outlined the community's distrust regarding the current drinking water testing, saying:

Are they the same people that have poisoned the country? As a community member, I don't really trust their numbers and their stats. They could be manipulating that to suit their own agenda and to cover themselves up. Aunty Annette [Brown] spoke before about our people being trained up and upskilled in all this sort of stuff. Could funding be given to us so we can train our own people up? The only people that I trust when it comes to this poison are my people.⁶⁰

4.56 A recommendation made by Chairperson of the Wreck Bay Aboriginal Community Council, Ms Annette Brown, was that:

... the Commonwealth establish a monitoring committee that includes grassroots people—Aboriginal people—and that it answers to parliament. They don't answer to their own departments; they have to report back to parliament.⁶¹

Blue Mountains, New South Wales

4.57 In June 2024, elevated levels of PFAS were identified at Cascade Water Filtration Plant in Katoomba, NSW. Prior to June 2024, Sydney Water had not completed any testing at the Cascade Water Filtration Plant as the catchment area feeding into the plant was not a known 'PFAS hotspot'.

4.58 The elevated level of PFAS detected in the Blue Mountains was below the current ADWG, but above the United States Drinking Water Guidelines and the updated draft ADWG, released for consultation in October 2024.

Table 4.3 Water Samples taken at the Cascade Water Filtration Plant Katoomba 25 June 2024 compared to current and proposed safe drinking water guidelines

	25 June 2024, Katoomba	Current ADWG (2018)	Proposed ADWG (2024)
PFOA	< 0.1 ng/L	560 ng/L	200 ng/L

⁵⁹ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 48.

⁶⁰ Mr Matt Simms, Private capacity, *Committee Hansard*, 21 January 2025, p. 13.

⁶¹ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 14.

PFOS	16.4 ng/L	Combined 70 ng/L	4 ng/L
PFHxS	14.2 ng/L		30 ng/L

Source: Sydney Water, [PFAS monitoring results](#) (accessed 6 February 2025); NHMRC, *Submission 57*, p. 3.

- 4.59 In July 2024, WaterNSW started an investigation into the source of PFAS found at the Cascade Water Filtration Plant.⁶² In August 2024, WaterNSW announced that it had shut off Medlow Dam and Greaves Creek Dam from the drinking water supplies, following tests showing high levels of PFAS in these catchments.⁶³
- 4.60 WaterNSW investigations into the source of PFAS in the Blue Mountain catchment area are ongoing. WaterNSW anticipates that the investigation report will be available in mid-2025.⁶⁴
- 4.61 In September 2024, Professor Wright was asked by Fairfax journalists to sample PFAS testing in the Blue Mountains catchment area.⁶⁵ Results from this testing suggested that the elevated level of PFAS in Medlow Dam could have been connected to a 1992 petrol tanker crash fire.⁶⁶
- 4.62 Associate Professor Wright argued how the discovery of elevated levels of PFAS in the Blue Mountains:
- ... exposed the many inadequacies in management of Australian drinking water supplies. A major shortcoming is the lack of routine monitoring of drinking water supply systems, including their catchments, storages, water treatment facilities and reticulated water supply systems... It is unknown how long the Blue Mountains water has contained such elevated PFAS.⁶⁷
- 4.63 At the public hearing in Penrith, Mr Dee shared the community's fear that they 'have been drinking contaminated drinking water, potentially, for 32 years', and expressed concern at how the matter had been treated by the NSW government, saying:
- NSW Health is refusing to do any blood tests of our communities, even though I and many other people in our community have recently found through blood tests that we've got dangerously high levels of cholesterol in

⁶² WaterNSW, [Blue Mountains – PFAS investigation and raw water testing results](#) (accessed 15 January 2025).

⁶³ Ben Cubby and Carrie Fellner, "[White hot': Cancer-linked chemicals flowing into dam at 50 times safe level](#)", *Sydney Morning Herald*, 17 September 2024 (accessed 10 January 2025).

⁶⁴ WaterNSW, [PFAS Community Update – December 2024 – Blue Mountains catchment](#), December 2024 (accessed 10 January 2025).

⁶⁵ Dr Ian Wright, *Submission 102*, p. 5.

⁶⁶ Dr Ian Wright, *Submission 102*, p. 5.

⁶⁷ Dr Ian Wright, *Submission 102*, p. 6.

our bodies... I'm really concerned about the water industry and the health industry basically covering this up.⁶⁸

4.64 Since 3 October 2024, Sydney Water has conducted monthly testing of all its water treatment plants, and weekly testing of the Cascade and North Richmond treatment plants.⁶⁹

4.65 In December 2024, the NSW Government announced a new \$3.4 million filtration unit would be installed at the Cascade Water Filtration Plant in Katoomba.⁷⁰ The new filtration plant has been operational since 6 January 2025.⁷¹

⁶⁸ Mr Jon Dee, Stop PFAS, *Committee Hansard*, 22 January 2025, p. 4.

⁶⁹ Sydney Water, *PFAS monitoring results* (accessed 10 January 2025).

⁷⁰ The Hon. Rose Jackson MLC, NSW Minister for Water, '[Cascade Filtration Plant receives upgrade to improve drinking water quality](#)', *Media Release*, 3 December 2024.

⁷¹ Mr Paul Plowman, Executive General Manager, Water and Environment Services, Sydney Water Corporation, *Committee Hansard*, 22 January 2025, p. 21.

Chapter 5

Remediation of PFAS affected sites

- 5.1 Given the persistence of PFAS chemicals, and concerns about potential impacts on human health, active remediation is often pursued to reduce contamination where it occurs. Remediation is planned or underway across many PFAS-contaminated sites.
- 5.2 Remediation encompasses the removal of PFAS from contaminated sites, as well as the reduction of PFAS where removal is not currently possible. In addition to addressing the source of contamination, remediation aims to remove or mitigate contamination wherever it has spread, including soil, groundwater and surface water. Remediation also encompasses the storage or destruction of resultant waste.
- 5.3 A variety of monitoring and remediation programs are underway or planned across Australia, administered by a number of Commonwealth and state agencies. The Department of Defence (Defence) and Airservices Australia (Airservices) both administer programs for sites under their jurisdiction, while state-level environment protection authorities oversee state-level remediation works.
- 5.4 This chapter describes active remediation programs, examines the currently available technologies, presents a case study of remediation in Wreck Bay, and considers the broad approach to remediation in Australia.

Remediation programs

- 5.5 Commonwealth, state and territory agencies currently undertake a variety of remediation and monitoring programs and research. Given the prevalence of PFAS contamination on Defence sites and airports, the most active programs are administered by Defence, Airservices and the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (Infrastructure Department). State and territory remediation is generally managed by each state's environmental protection authority.

Defence PFAS Investigation and Management Program

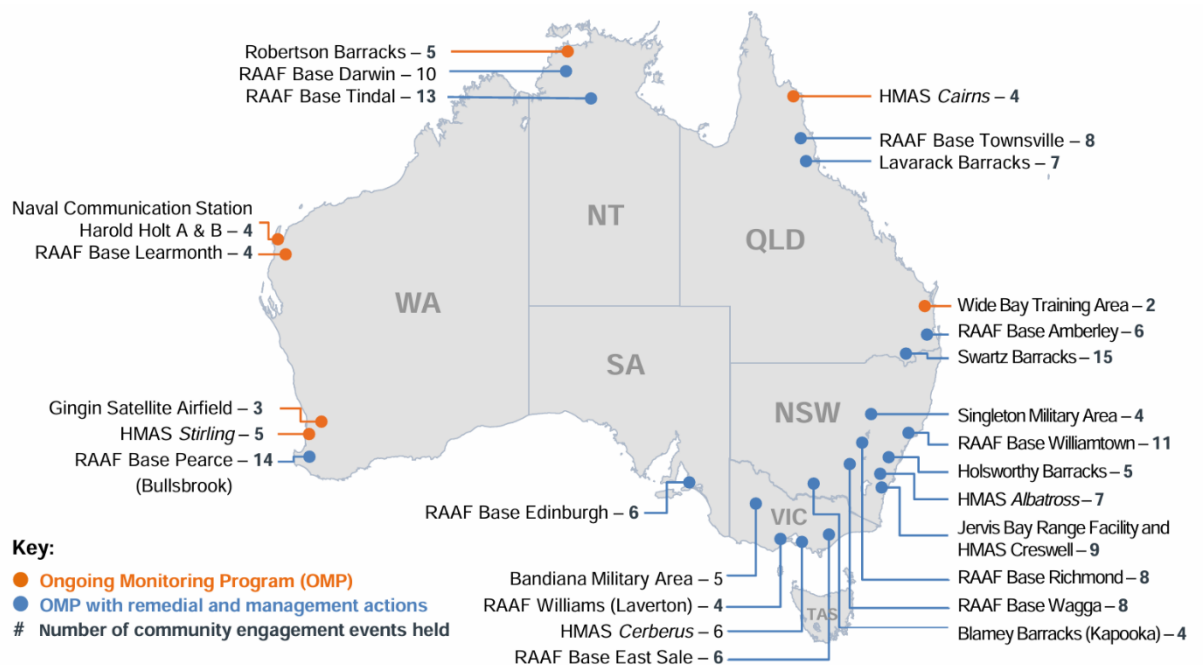
- 5.6 The historic use of firefighting foams containing PFAS at Defence facilities means that, despite phasing out PFAS-containing foams in 2004, high levels of PFAS remain present in the environment around many Defence sites. Defence works with Commonwealth, state and local authorities in managing PFAS contamination around Defence sites. Defence's national PFAS Investigation and Management Program works with industry partners and research groups to investigate and remediate PFAS contamination and support impacted

communities. The program has management teams located across Australia and publishes key reports and verified test results on its website.

5.7 As part of the program, Defence has invested \$807 million in managing and remediating PFAS contamination.¹ Outcomes include:

- 160 000 tonnes of contaminated soil have been removed;
- 11 water treatment plants have been installed;
- 11.5 billion litres of water have been treated;
- 378 properties have been connected to town water;
- 160 rainwater tanks have been provided to 117 properties;
- 869 properties are receiving water assistance (bottled water); and
- 183 community information sessions have been held.²

Figure 5.1 Defence PFAS Investigation and Management Program sites around Australia



Source: Defence, *PFAS Investigation and Management Program Snapshot—October 2024*.

5.8 Defence has identified 28 priority program sites for PFAS remediation, as shown in Figure 5.1, above. At these sites, Defence focuses on 'addressing PFAS sources on bases such as former fire training areas, and managing significant contamination flow pathways (such as groundwater or stormwater drains) where it is reasonably practicable to do so'.³

¹ Department of Defence, *Submission 66*, [p. 4].

² Department of Defence, *PFAS Investigation and Management Program Snapshot*, October 2024.

³ Department of Defence, *Submission 66*, [p. 6].

- 5.9 Remediation has commenced at eight of the sites, with more to follow in 2025 (as shown in Table 5.1), and international engagement is underway to accelerate the remediation and management process.⁴

Table 5.1 Defence PFAS Investigation and Management Program – Priority Program Sites

Remediation underway or complete	Remediation to commence in 2025	Remediation not commenced
Jervis Bay Range Facility*	Lavarack Barracks Swartz Barracks	Blamey Barracks HMAS <i>Albatross</i>
RAAF Base Richmond		Holsworthy Barracks
RAAF Base Wagga		Singleton Military Area
RAAF Base Williamtown*		Robertson Barracks HMAS <i>Cairns</i>
RAAF Base Tindal		Wide Bay Training Area
RAAF Base Darwin		Gin Gin Satellite Airfield
RAAF Base Amberley*		HMAS <i>Stirling</i>
RAAF Base Townsville		Naval Communication Station Harold E Holt A & B
RAAF Base Edinburgh		RAAF Base Learmonth
RAAF Base Pearce		Bandiana Military Area
RAAF Base East Sale		RAAF Base Williams – Laverton
HMAS <i>Cerberus</i>		RAAF Base Point Cook
* source remediation not commenced		

Source: Table created from information presented in Department of Defence, *Submission 66*, [pp. 8–14].

- 5.10 The specific remediation works undertaken or planned at each site vary according to 'the nature of the site, the historical PFAS use, [and] the geology and hydrology of the site', and might include 'water treatment...extensive treatment of contaminated soil on sites and either treatment of soil or removal of soil, [and] drainage diversion...'.⁵ Details on the specific remediation actions undertaken at each site are published on Defence's website.⁶

⁴ Department of Defence, *Submission 66*, [p. 6].

⁵ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 39.

⁶ See Department of Defence, [PFAS management sites](#) (accessed 23 January 2025).

- 5.11 Defence notes that completely eliminating PFAS and stopping its movement from a site of concern is not possible given current technology.⁷
- 5.12 Remediation works undertaken by this project are generally limited to Defence property or to boundaries established by Defence. The PFAS Independent Review identified 'unintended consequences' of this limitation, noting that 'the fact that a property is in a PFAS management area does not necessarily give any indication of whether the property is contaminated, or to what level'.⁸
- 5.13 Similarly, just because an area lies outside the Defence property boundary, it does not mean that it is not subject to PFAS contamination from Defence. Remediation of the sites adjacent to Defence boundaries would likely be beneficial to the wider environment.

Airservices National PFAS Management Program

- 5.14 Another source of significant PFAS contamination is the historical use of PFAS-containing firefighting foams at airports. Airservices provides aviation rescue and firefighting services at 27 of Australia's busiest airports and is implementing a National PFAS Management Program to manage and remediate these sites. The program includes site investigations, monitoring, management actions and, where appropriate, remediation.
- 5.15 Airservices started using PFAS-free foams in 2010. Out of the 27 airports where Airservices provides fire and rescue services, 18 locations are subject to investigation by Airservices, namely:
- Australian Capital Territory—Canberra
 - New South Wales—Sydney
 - Northern Territory—Alice Springs, Yulara
 - Queensland—Brisbane, Cairns, Gold Coast, Mackay, Rockhampton, Sunshine Coast
 - South Australia—Adelaide
 - Tasmania—Hobart, Launceston
 - Victoria—Avalon, Melbourne
 - Western Australia—Karratha, Perth, Port Hedland.
- 5.16 Most of Airservices' PFAS projects are still in their investigation phase. However, remediation has commenced at Launceston Airport, while action plans have been finalised for sites at Canberra Airport, with approvals to begin the work underway. Additional remediation action plans are under

⁷ Department of Defence, *Submission 66*, [p. 6].

⁸ Mr Jim Varghese AM, [Independent review of land uses around key Defence bases impacted by PFAS contamination](#), March 2024, p. 54.

development for Mackay, Rockhampton, Brisbane, Avalon, Karratha and Melbourne airports, expected to be finalised by mid-2025.⁹

- 5.17 Airservices provided a case study of its remediation activities at Launceston Airport. In addition to pre-existing management activities, including cleaning of stormwater drains and monitoring of surface and ground water, the works involve 'excavation and removal' of PFAS-affected soil and infrastructure, and their 'safe and lawful disposal'. This includes the removal of all existing infrastructure of the decommissioned firefighting training ground.¹⁰ Having commenced in October 2024, these works are expected to take approximately six months to complete.
- 5.18 Airservices' *2023–2024 Annual Report* states that \$88.3 million 'has been provided' to facilitate PFAS program work, as at 30 June 2024, with \$129 million provided in 2022–2023.¹¹
- 5.19 Airservices also noted its engagement with ongoing research into remediation technologies and best practice. In its submission, Airservices highlighted six of these trials, including studies into groundwater remediation, wastewater treatment, PFAS destruction and concrete treatment.¹²

PFAS Airports Investigation Program

- 5.20 The Australian Government has committed \$130.5 million for the PFAS Airports Investigation Program at civilian airports where the Commonwealth historically provided firefighting services using PFAS-containing foams. The program is administered by the Commonwealth Infrastructure Department and aims to 'determine the nature and extent of PFAS contamination at airports through independently audited whole-of-site testing, and to develop robust management plans to address any identified risks'.
- 5.21 A pilot program commenced in 2022 with testing at eight airports. The pilot supported development of a 'whole-of-site investigative approach' and a PFAS Investigation Framework. Participation in the program is voluntary, and sixteen airports are currently participating in the program.
- 5.22 Investigation is underway at Adelaide, Bankstown, Brisbane (including the former Eagle Farm airport site), Canberra, Hobart, Launceston, Melbourne and Parafield airports, which participated in the pilot program and are now

⁹ Airservices Australia, *Submission 69*, p. 7.

¹⁰ Airservices Australia, *Submission 69*, p. 8.

¹¹ Airservices Australia, [Annual Report 2023–24](#), p. 103.

¹² Airservices Australia, *Submission 69*, pp. 11–12.

considered Tranche 1. These are scheduled to be completed beginning in mid – 2026.¹³

- 5.23 In March 2024, investigations began at Archerfield, Camden, Gold Coast, Jandakot, Moorabbin, Mount Isa and Townsville airports, considered Tranche 2 and are expected to last between two and three years. Alice Springs, Darwin, Essendon Fields, Perth and Sydney airports have declined to participate in the program but remain eligible for future investigations.¹⁴ Planning activities are underway for future tranches, which may include the five non-participating airports as well as 16 non-federally leased airports and Avalon Airport, which is owned and leased by Defence.¹⁵
- 5.24 The wider program is expected to be completed by 30 June 2027. Although the program will be used for planning of future remediation activity, the Infrastructure Department noted that '[m]anagement and remediation activities are beyond the scope for the program'.¹⁶
- 5.25 Investigation has previously been carried out at Norfolk Island Airport, with investigation reports released in 2022, 2023 and 2024. The Infrastructure Department has invested \$1.946 million on investigation, remediation and monitoring at Norfolk Island.¹⁷ Remediation works appear to be primarily water filtration from the airport bore tank and the installation of 'do not drink' signs at public bathrooms, alongside ongoing monitoring.¹⁸

State-level management and remediation

- 5.26 A great deal of PFAS management and remediation falls under the authority of the states; generally their environment protection authorities (EPAs). In January 2018, the Heads of EPAs Australia and New Zealand agreed to a PFAS National Environmental Management Plan (PFAS NEMP). A second version of the PFAS NEMP was published in January 2020, with a third version currently available in draft form. Notably, the draft third version includes considerably more discussion of remediation methods and strategies than the second version, reflecting the fast-changing technological landscape in this area.¹⁹

¹³ Department of Infrastructure, Transport, Regional Development, Communications and the Arts, *Submission 2*, p. 4.

¹⁴ DITRDCA, *Submission 2*, p. 4.

¹⁵ DITRDCA, *Submission 2*, p. 4.

¹⁶ DITRDCA, *Submission 2*, p. 5.

¹⁷ DITRDCA, *Submission 2*, p. 5.

¹⁸ DITRDCA, *Submission 2*, p. 5.

¹⁹ National Chemicals Working Group of the Heads of EPAs Australia and New Zealand, [PFAS National Environmental Management Plan – Version 2.0](#), January 2020, pp. 67–69; National Chemicals

- 5.27 The draft third version sets out a clear hierarchy in terms of preferred remediation technologies. The preferred option is 'separation and treatment for destruction of the PFAS contaminated materials on site', followed by 'management approaches to on-site interventions on source-receptor pathways' and, lastly, 'off-site removal to a specific landfill cell'. The PFAS NEMP notes, however, that the preferred option may not be practical or possible in all circumstances.²⁰
- 5.28 In New South Wales, the EPA leads the PFAS Investigation Program, which has completed 1100 investigations to date.²¹ Fifty-one sites with significant levels of PFAS contamination have been identified,²² and the NSW Government possesses regulatory powers through the *Protection of the Environment Operations Act 1997* and the *Contaminated Land Management Act 1997* to direct remediation efforts.²³ The NSW EPA described a 'collaborative approach to the management of PFAS across [state] agencies', but noted that '[t]his has not always been our experience in working with federal agencies'.²⁴
- 5.29 The Victorian EPA manages 'the disposal, reuse and management of PFAS affected materials, like soil, in line with Victoria's environment protection regulations'.²⁵ In addition to Defence sites located in Victoria, the Victorian EPA has identified some contamination in the Maribyrnong River catchment due to runoff from the nearby Melbourne Airport. The Victorian EPA has engaged with Australia Pacific Airports (Melbourne) Pty Limited relating to PFAS remediation at the Melbourne Airport site and monitors these activities.²⁶
- 5.30 The Queensland government has established a PFAS Interdepartmental Committee from representatives of various departments to monitor and oversee the response to PFAS contamination in Queensland. In addition to previously identified investigations run by Defence and Airservices, the interdepartmental

Working Group of the Heads of EPAs Australia and New Zealand, [Draft PFAS National Environmental Management Plan – Version 3.0](#), 2022, pp. 85–91.

²⁰ National Chemicals Working Group of the Heads of EPAs Australia and New Zealand, [Draft PFAS National Environmental Management Plan – Version 3.0](#), 2022, pp. 89–90.

²¹ NSW Premier's Department, *Submission 20*, p. 9.

²² NSW Premier's Department, *Submission 20*, p. 10.

²³ NSW Premier's Department, *Submission 20*, p. 11.

²⁴ Mr Tony Chappel, Chief Executive Officer, Environmental Protection Authority, New South Wales, *Committee Hansard*, 22 January 2025, p. 30.

²⁵ Environment Protection Authority Victoria, [PFAS and EPA's role](#), 30 May 2023 (accessed 30 January 2025).

²⁶ Environment Protection Authority Victoria, [Maribyrnong River: Risk assessment with consumption of recreationally caught fish](#), 25 July 2024 (accessed 30 January 2025).

committee is monitoring investigations by CS Energy, the Queensland Fire Department and Queensland Ports at various sites around the state.²⁷

- 5.31 The Western Australian Department of Water and Environmental Regulation has conducted several investigations into PFAS contamination in key areas and otherwise engages with Defence and Airservices regarding affected sites in the state.²⁸
- 5.32 The South Australian EPA assesses site contamination and regulates the disposal of PFAS-contaminated waste.²⁹ It has developed guidelines for the disposal of PFAS-contaminated landfill and solid waste and has undertaken industry consultation on the management of PFAS-contaminated waste.³⁰
- 5.33 The Tasmanian Government endorsed its *PFAS Action Plan for Tasmania* in September 2018.³¹ The state EPA completed a monitoring program in 2020 that located PFAS contamination at low levels at 92 per cent of the 76 sites it surveyed and participates in the PFAS working groups for Tasmanian airports.³²
- 5.34 The Australian Capital Territory (ACT) government released its PFAS action plan in August 2019. The ACT EPA determines responsibility for the disposal of PFAS waste. The ACT Government is also a member of the Project Control Group for the Jervis Bay Range Facility and assists the Commonwealth Infrastructure Department in PFAS response activities as required.³³
- 5.35 The Northern Territory Department of Lands, Planning and Environment (the NT department) noted that, as a small jurisdiction, the Northern Territory (NT) is 'highly reliant on national policy and regulatory frameworks to provide guidance on where and how to prioritise' PFAS management and remediation efforts.³⁴ The NT department also noted that the lack of a thermal destruction facility in the NT means 'there is no cost-effective disposal option available',

²⁷ Queensland Government, [PFAS site investigations](#), 23 September 2024 (accessed 30 January 2025).

²⁸ Western Australian Government, [PFAS investigations in Western Australia](#), 16 August 2023 (accessed 30 January 2025).

²⁹ Environment Protection Authority South Australia, [Per- and poly-fluoroalkyl substances \(PFAS\)](#), 30 April 2024 (accessed 30 January 2025).

³⁰ Environment Protection Authority South Australia, [Guidance for managing PFAS in SA](#), 10 January 2025 (accessed 30 January 2025).

³¹ Tasmanian Government, *Submission 73*, [p. 1].

³² Tasmanian Government, *Submission 73*, [p. 2].

³³ ACT Government, [PFAS action plan: Australian Capital Territory](#), August 2019.

³⁴ Northern Territory Department of Lands, Planning and Environment, *Submission 68*, p. 2.

with the result that remediation requirements that may be imposed 'cannot practically be fulfilled by regulated entities, or only at prohibitive costs'.³⁵

Remediation techniques and technologies

- 5.36 There are two main technological approaches to the remediation of PFAS-contaminated sites, namely destructive and non-destructive technologies. Destructive technologies break down PFAS completely into naturally occurring molecules and negate the need for waste management, but are very expensive, and still in the early stages of development. Non-destructive technologies primarily focus on water and soil treatment and are widely available, but generate waste that needs to be managed.³⁶ Submitters who canvassed the different technological approaches agreed that a combination of the two approaches is required to effectively remediate PFAS contamination.³⁷
- 5.37 The CSIRO noted that '[o]ur understanding of PFAS treatment technologies and practices has significantly improved over the past 10 years', and it seems clear that this is an area of ongoing research and development and the potential for emerging technologies that may require flexible and responsive approaches to PFAS remediation.³⁸

Destructive technologies

- 5.38 Destructive technologies involve the complete removal of PFAS by breaking them down 'into small, naturally occurring molecules such as carbon dioxide, fluoride and water'. In practice, this takes the form of waste incineration, which the CSIRO noted was 'very expensive and not widely available'. The CSIRO further cautioned that, due to the emerging nature of this technology, best practices are still in development and international standards do not yet exist.³⁹
- 5.39 Professor and Head of School of Civil Engineering at the University of Sydney, Dr Stuart Khan, noted that, in addition to high cost and limited availability, '[h]igh-temperature incineration is going to produce fluorine and other by-products', and highlighted the importance of 'mak[ing] sure that we're not actually releasing further degraded or even undegraded PFAS into the atmosphere'.⁴⁰

³⁵ Northern Territory Department of Lands, Planning and Environment, *Submission 68*, p. 5.

³⁶ CSIRO, *Submission 22*, p. 13.

³⁷ CSIRO, *Submission 22*, p. 13; SciDev, *Submission 41*, p. 15; United Firefighters Union of Australia, *Submission 104*, p. 5.

³⁸ CSIRO, *Submission 22*, p. 12.

³⁹ CSIRO, *Submission 22*, p. 13.

⁴⁰ Dr Stuart Khan, Professor and Head of School, School of Civil Engineering, University of Sydney, *Committee Hansard*, 22 January 2025, pp. 13–14.

- 5.40 The CSIRO advised that technologies such as biodegradation and ultraviolet-light irradiation, which have been effective for other contaminants, 'have proven ineffective or highly inefficient' as tools for PFAS remediation.⁴¹
- 5.41 Water treatment company, SciDev identified granular activated carbon reactivation as a developing technology for PFAS destruction, noting its treatment as such by the United States Environmental Protection Agency in its 2024 guidance.⁴²
- 5.42 SciDev urged the prioritisation of PFAS destruction over disposal, noting that disposal in landfill 'merely relocates and concentrates the PFAS contaminant load in a new location'.⁴³ However, the company acknowledged that many existing hazardous waste combustion units do not currently operate at the conditions required for PFAS destruction, and that processes would need to be independently evaluated before authorisation.⁴⁴
- 5.43 Noting the expense, scarcity and developing nature of destructive technology, the CSIRO considered that a 'combination of non-destructive PFAS removal with subsequent PFAS destruction in the concentrated waste stream is often the most sustainable and cost-efficient approach to dealing with PFAS'.⁴⁵

Non-destructive technologies

- 5.44 The most well-established technologies for PFAS remediation are non-destructive. Although they do not destroy PFAS, they can 'reduce PFAS movement into the environment (for example, sealants, adsorbents) and remove PFAS to below regulatory levels (for example, water filters, resins)'.⁴⁶
- 5.45 Several submitters expressed concern about the waste that results from non-destructive technologies. The Australian & New Zealand Biosolids Partnership contended that '[t]here is no viable means of treating PFAS through wastewater treatment. PFAS in wastewater accumulates in biosolids...'⁴⁷ SciDev described 'a cyclic pattern wherein PFAS-containing wastes are deposited and subsequently leach PFAS, the PFAS-containing leachate is treated, and the

⁴¹ CSIRO, *Submission 22*, p. 12.

⁴² SciDev, *Submission 41*, pp. 16–17.

⁴³ SciDev, *Submission 41*, p. 16.

⁴⁴ SciDev, *Submission 41*, p. 17.

⁴⁵ CSIRO, *Submission 22*, p. 13.

⁴⁶ CSIRO, *Submission 22*, p. 12.

⁴⁷ Australian & New Zealand Biosolids Partnership, *Submission 53*, [p. 5].

PFAS-containing wastes from leachate treatment are placed back into the landfill'.⁴⁸

- 5.46 In addition to considering destructive waste incineration, the Sydney Water Corporation is investigating encapsulation technologies, where the waste is stored in a 'secured landfill' that prevents leaching.⁴⁹
- 5.47 The *Independent review of land uses around Defence bases impacted by PFAS contamination*, conducted by Mr Jim Varghese AM (the PFAS Independent Review) included a case study of soil remediation conducted at RAAF Base Richmond, using activated carbon-based amendments to reduce the leachability of PFAS in soils. The review described this technology as 'a sustainable alternative to excavation, transport and landfilling or incineration of large quantities of soil', and noted that studies have 'shown no significant degradation in effectiveness over time'.⁵⁰

Case study: Remediation at Wreck Bay

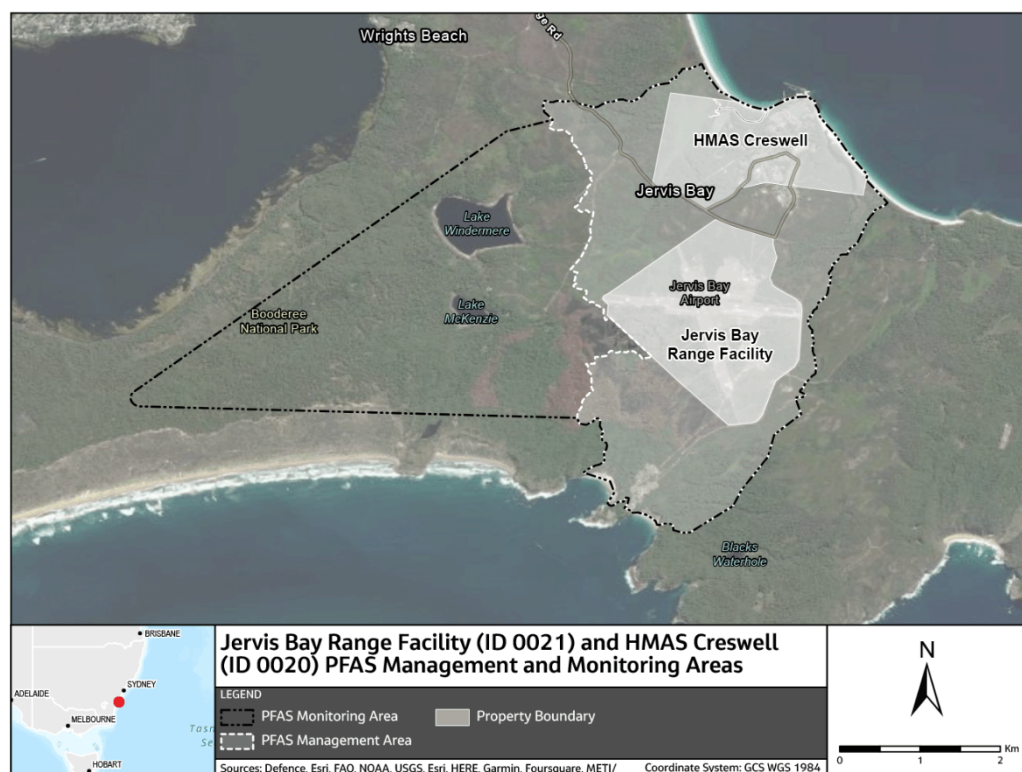
- 5.48 The committee visited Wreck Bay in the Jervis Bay Territory, and subsequently heard evidence from members of this small First Nations community regarding its experience with Defence's remediation efforts at the nearby Jervis Bay Range Facility and HMAS *Creswell*. The PFAS management and monitoring areas relating to these facilities extend to Wreck Bay village and through much of the community's traditional land, over which their ownership is recognised. The extent of Defence's management and monitoring areas are outlined in Figure 5.2, below.

⁴⁸ SciDev, *Submission 41*, p. 16.

⁴⁹ Mr Paul Plowman, Executive General Manager, Water and Environment Services, Sydney Water Corporation, *Committee Hansard*, 22 January 2025, p. 25.

⁵⁰ Mr Jim Varghese AM, [*Independent review of land uses around key Defence bases impacted by PFAS contamination*](#), March 2024, p. 47.

Figure 5.2 Jervis Bay and HMAS Creswell PFAS management and monitoring areas



Source: Department of Defence, [Jervis Bay Range Facility](#), 8 November 2024, accessed 7 February 2025.

- 5.49 At the Jervis Bay Range Facility, Defence remediation has been focused primarily on groundwater treatment. A temporary groundwater treatment plant was built in November 2022, treating water that flows into Mary Creek.⁵¹ This plant has treated over 21 million litres of water since construction.⁵²
- 5.50 The plant uses ion exchange technology to remove PFAS from surface water. Defence explained that the 'removed PFAS concentrate is sent to a licenced treatment facility in Victoria for thermal destruction'. A permanent water treatment plant is planned for construction beginning in early 2025.⁵³
- 5.51 Defence has prepared a remediation action plan for the Jervis Bay Range Facility, which includes surface water and groundwater treatment, removal of contaminated soil, and diverting water around contaminated sites.⁵⁴ In its

⁵¹ Department of Defence, [Jervis Bay Range Facility](#), 8 November 2024, accessed 3 February 2025.

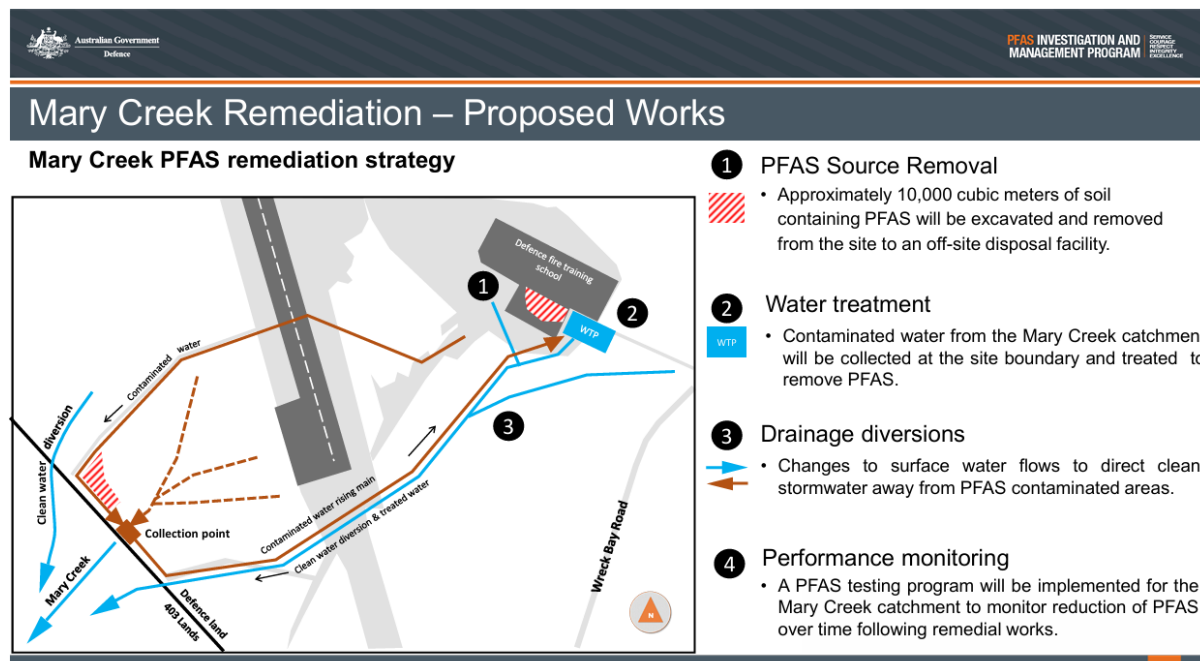
⁵² Department of Defence, *Submission 66*, [p. 8].

⁵³ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 39; Department of Defence, response to questions on notice, public hearing 21 January 2025 (received 11 February 2025), [p. 1].

⁵⁴ Department of Defence, [Jervis Bay Range Facility](#), 8 November 2024 (accessed 3 February 2025).

submission, Defence stated that it intends to commence these works in early 2025.⁵⁵ Figure 5.3 shows the planned remediation works as shared with the community in 2023.

Figure 5.3 Mary Creek remediation - Proposed works



Source: Department of Defence, [Jervis Bay Range Facility: Community information session](#), February 2023, [p. 5].

5.52 Defence has also conducted investigations into the Mary Creek catchment and has found:

... PFAS mainly moves off the base through surface water during wet weather events. Contaminated surface water and groundwater have also been found to be mixed in the swamps and wetlands located across the area.⁵⁶

5.53 In answers to questions on notice, Defence stated that Mary Creek continues to present PFAS contamination levels that are 'above drinking water guidelines and are often reported above recreational water guidelines'. However, the PFAS levels at the Mary Creek 'discharge points into both Mary Beach and Summercloud Bay are below the recreational use guideline'.⁵⁷

5.54 Since completing the investigations, Defence has spent \$11.7 million on remediation work at HMAS Creswell and the Jervis Bay Range Facility.⁵⁸

⁵⁵ Department of Defence, *Submission 66*, [p. 8].

⁵⁶ Department of Defence, [Jervis Bay Range Facility](#), 8 November 2024, accessed 3 February 2025.

⁵⁷ Department of Defence, response to written questions on notice from Senator Thorpe (received 17 February 2025), [pp. 3–4].

⁵⁸ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 46.

- 5.55 According to Defence, the forecast expenditure for future works at the Jervis Bay Range Facility and HMAS Creswell is approximately \$80 million, which 'includes currently contracted remediation works, ongoing monitoring and water treatment plant operating costs through to 2035'. Defence noted that the forecast cost is subject to change, 'based on ongoing investigations and external factors such as the cost of materials and labour'.⁵⁹
- 5.56 Defence operates dedicated phone lines for members of the public to make enquiries about PFAS contamination and remediation efforts at Defence sites. Defence reports that 17 phone calls have been made regarding the Jervis Bay Range Facility remediation project since 2017. Feedback provided through this phone line has included 'general dissatisfaction with Defence's PFAS management response', and complaints about 'communication approaches and methods of advertising engagement events'.⁶⁰
- 5.57 Ms Annette Brown, Chairperson of the Wreck Bay Aboriginal Community Council echoed this dissatisfaction with Defence's community engagement at the public hearing in Nowra:

The Commonwealth and its agencies sit silent and think that a one-page newsletter is satisfactory and that the ACT government can come down and test it every three months. No-one talks to the board. No-one comes in and tells the community, 'We've tested this, and these are the results.' They don't share that information. The agencies continue to be silent.⁶¹

- 5.58 Defence has held nine community engagement sessions with the community of Wreck Bay. The most recent engagement session was held in February 2023.⁶²
- 5.59 Community members feel that information about the remediation efforts is opaque, overly technical and difficult to understand. Evidence from Wreck Bay community members also indicated a desire for greater independence of remediation programs. Mr Freeman said:

... we need an independent space that investigates. I think the Commonwealth investigating itself is problematic and it compromises the data. I don't think that we can adequately create any type of remediation if the perpetrators are talking about how to fix their own problems and don't have an independent agency that is forced to come in without it being part

⁵⁹ Department of Defence, responses to questions taken on notice, public hearing 21 January 2025 (received 11 February 2025), [p. 59].

⁶⁰ Department of Defence, responses to questions taken on notice, public hearing 21 January 2025 (received 11 February 2025), [p. 6].

⁶¹ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 15.

⁶² Department of Defence, *Submission 66*, [p. 8].

of or purchased by the perpetrator. In this instance, the remediation plans have been sourced and paid for by the Commonwealth, and it's internal.⁶³

5.60 Mr Darryn Sturgeon commented on the fact that Defence has offered ad hoc soil testing for properties in Wreck Bay, saying that his mother took up this offer. When the test results came back indicating contamination, there was no capacity for remediation. Instead, remediation was undertaken by WBACC, who 'did drainage work in the backyard'.⁶⁴

5.61 Most other Wreck Bay community members appeared unaware that free ad hoc soil testing was available to them.⁶⁵

5.62 Defence confirmed that it has received 14 ad hoc sampling requests in the Shoalhaven area and actioned 12 of these requests. The other two requests were withdrawn by the stakeholder following initial enquiries.⁶⁶

5.63 Ms Brown argued that Defence 'needs to come out from behind their fences' and engage in a meaningful way with the community:

They contaminated in the early 1990s and failed to monitor that contamination. The remediation action plan that came out of the Coffey report said that it would fix itself. Defence needed to monitor it, but they chose not to continue the testing on Wreck Bay land. So, again, Defence is allowed to continually contaminate the region.⁶⁷

5.64 Noting the lack of remediation undertaken outside Defence property, Ms Annette Brown, Chairperson of WBACC, contended:

PFAS needs to be monitored outside the boundaries of the airfield, which is a naval base, but it's not done. The Commonwealth departments don't step outside their boundaries, so we don't know how big that level of contamination is and we can't continue to monitor it unless we're resourced for it.⁶⁸

5.65 Community members repeatedly criticised poor communication and a 'culture of secrecy' from Defence relating to remediation activities around Wreck Bay, both at the committee's site visit on 20 January 2025 and at its subsequent Nowra

⁶³ Mr Clive Freeman, Private capacity, *Committee Hansard*, 21 January 2025, p. 6.

⁶⁴ Mr Darryn Sturgeon, Private capacity, *Committee Hansard*, 21 January 2025, p. 13.

⁶⁵ *Committee Hansard*, 22 January 2025, p. 13.

⁶⁶ Department of Defence, responses to questions taken on notice, public hearing 21 January 2025 (received 11 February 2025), [p. 4].

⁶⁷ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 15.

⁶⁸ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 3. See also Mr Darryn Sturgeon, Private capacity, *Committee Hansard*, 21 January 2025, p. 10.

hearing on 21 January 2025.⁶⁹ Mr Sturgeon told the committee that, in order to work in remediation at the Jervis Bay Range Facility, workers were required to sign a non-disclosure agreement.⁷⁰

5.66 During its community visit, the committee observed the signage erected at Mary Creek, noting that the signage still indicates that the area is under investigation, rather than clearly stating that the area is contaminated, potentially misleading community members as to the extent of PFAS contamination and resulting necessary precautions.⁷¹

5.67 Despite this, Defence representatives argued that Australia is a world leader in remediation. Ms Celia Perkins stated:

My reflection would be that Australia, particularly the Australian Department of Defence, is leading the field in investigation and scientific inquiry about the nature of PFAS contamination and its remediation, and we haven't seen anything amongst NATO members. Most of our counterparts are still at the early investigation-and-monitoring phase, so I would say that—and I'm very proud of the work Defence has done here—we are leading the field in the investigation. The United States and the United States Department of Defence are important partners, and they probably lead the field in research. But Defence in Australia is ahead of our counterparts in remediation.⁷²

5.68 Community members expressed a desire for clearer messaging, and to take a more active role in monitoring and remediation processes. Ms Brown called for 'a committee that monitors Jervis Bay Territory and the levels of contamination that exist now and will exist in the future, and that comes up with strategies for how the community and the department deal with them'.⁷³

5.69 Defence, and other witnesses acknowledged that, with current technology, it is unlikely that contaminated bushland surrounding the Jervis Bay Range Facility can be completely remediated without irreparably damaging the local

⁶⁹ See, for example: Ms Maxine Brown, Private capacity, *Committee Hansard*, 21 January 2025, p. 2; Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, pp. 3, 11, 15; Mr Clive Freeman, Private capacity, *Committee Hansard*, 21 January 2025, pp. 6, 8; Ms Donya Whaddy, Private capacity, *Committee Hansard*, 21 January 2025, p. 5.

⁷⁰ Mr Darryn Sturgeon, Private capacity, *Committee Hansard*, 21 January 2025, p. 10.

⁷¹ See Appendix 2.

⁷² Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 40.

⁷³ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 14. See also Mr Clive Freeman, *Committee Hansard*, 21 January 2025, p. 13.

environment.⁷⁴ However, Defence also committed to improving communication with the community.⁷⁵

Committee view

5.70 The committee considers that the current level of engagement and communication with affected communities is insufficient. These communities understandably have limited trust towards government agencies, but are nonetheless eager to participate in and support remediation and monitoring activities. While communication must be improved, the committee urges responsible agencies to explore ways to involve communities in remediation and monitoring activities, wherever possible. This approach would also provide an opportunity to rebuild trust and goodwill where it has broken down.

Recommendation 2

5.71 The committee recommends that the Department of Defence and the Department of Infrastructure, Transport, Regional Development, Communications and the Arts work with the Wreck Bay Aboriginal Community Council, and other relevant stakeholders, to improve signage, messaging and information provided to the community.

Current approaches

5.72 Some submitters were critical of Australia's approach to remediation. At the same time government agencies indicated that this approach is evolving.

5.73 The United Firefighters Union of Australia criticised the 'current patchwork' of remediation projects across the nation, submitting that they '[do] not provide the community with the reassurance that remediation is providing holistic solutions across Australia'.⁷⁶ The union called for a Commonwealth grants program to fund remediation projects across Australia, and recommended that this be funded at least partially by pursuing 'litigation against manufacturers and suppliers of firefighting foams containing PFAS'.⁷⁷

5.74 Similarly, Professor Ravi Naidu from Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (crcCARE) submitted that:

... currently, Australian policies regarding PFAS management are fragmented and lack comprehensive national standards. This inconsistency

⁷⁴ Dr David Goldberg, Private capacity, *Committee Hansard*, 21 January 2025, p. 21.

⁷⁵ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 46.

⁷⁶ United Firefighters Union of Australia, *Submission 104*, p. 6.

⁷⁷ United Firefighters Union of Australia, *Submission 104*, p. 6.

creates gaps in addressing contamination, leading to delays in effective risk communication and mitigation strategies.⁷⁸

5.75 crcCARE maintained that different government agencies involved in PFAS 'have distinct priorities and funding streams, leading to fragmentation and duplication of efforts'. The organisation argued that the absence of a national PFAS research strategy or framework 'limits the ability to identify research gaps and prioritise studies', and limited funding has led to a 'focus on short-term projects, rather than long-term strategic investments'.⁷⁹

5.76 Submitters were concerned that investigation has taken many years and remediation efforts have been limited around the nation. Field & Game Australia, whose submission focused on PFAS contamination at The Heart Morass in East Gippsland, Victoria, recommended that governments prioritise and fund effective remediation efforts', including at The Heart Morass, 'ensuring contamination is controlled and reduced over time'. In addition, it recommended governments develop 'clear timelines and communication plans to keep stakeholders informed of progress'.⁸⁰

5.77 Fire Rescue Victoria (FRV) argued that environmental regulators need to better support organisations in dealing with PFAS contamination and 'allow the trial of new treatments and solutions':

Every PFAS mitigation strategy FRV have implemented has been not only measurable and successful, but prior to implementation, the 'experts' have said our goals were impossible to achieve. The fire appliance decontamination process, the PFAS blood reduction treatment, and the fire station remediation processes focussing on immobilisation, were all deemed impossible, until we did them.⁸¹

5.78 Mr Greg Peak recommended a 'centralised database that tracks PFAS contamination, remediation efforts, and health impacts' be established to allow communities to be 'informed about the risks they face, and the measures being taken to mitigate them'. Mr Peak also suggested improved regulatory oversight through strengthening the enforcement of environmental protection laws and 'imposing stricter penalties for non-compliance [to] serve as a deterrent against further contamination'.⁸²

Outcomes of the PFAS Independent review

5.79 In December 2024, the Government released the PFAS Independent Review, together with the government response to this report. The report considered

⁷⁸ crcCARE, *Submission 36*, p. 2.

⁷⁹ crcCARE, *Submission 36*, p. 9.

⁸⁰ Field & Game Australia, *Submission 52*, [p. 3].

⁸¹ Fire Rescue Victoria, *Submission 9*, [pp. 3–4].

⁸² Greg Peak, *Submission 5*, [p. 2].

RAAF Base Williamtown (NSW), Swartz Barracks (Qld) and RAAF Base Tindal (NT). Among 19 total recommendations, the review made four recommendations relating to remediation, which in some cases have wider implications for remediation, beyond Defence. The recommendations specifically concerned addressing unintended consequences of establishing PFAS management, the currency of health risk assessments, the publication advice on remediation prospects and feasibility, and a review of the objectives of the national policy.⁸³ The Government accepted all four of these recommendations.⁸⁴

- 5.80 A significant aspect of the Government's response was a commitment to establish a National Coordinating Body with Commonwealth and state ministerial oversight. The new entity will, among other things, 'engage with state/territory and local governments responsible for PFAS contamination management along with local affected communities and First Nations communities'.⁸⁵
- 5.81 At the committee's Nowra hearing, Defence indicated it was 'commissioning an interdepartmental committee ... to start the process of establishing a membership'.⁸⁶ A trial of community engagement at Williamtown would, depending on results, be followed by similar engagements at Katherine and Oakey.⁸⁷ There was not currently any plan to establish a community engagement mechanism for the Jervis Bay Territory.
- 5.82 In its response to the recommendation relating to a review of the national policy, the Government stated:

The Government acknowledges that the complete removal of PFAS from the environment is not possible. The fundamental goal of remediation should be to render a site acceptable and safe for long-term continuation of its existing use or proposed use. In instances where the contamination cannot be removed or eliminated, then measures should be taken to manage the exposure to land users.

⁸³ Mr Jim Varghese AM, [Independent review of land uses around key Defence bases impacted by PFAS contamination](#), March 2024, pp. 11–12, 42–49.

⁸⁴ Australian Government, [Government response to the Independent review of land uses around Defence bases impacted by PFAS contamination](#), December 2024, [pp. 7–9].

⁸⁵ Australian Government, [Government response to the Independent review of land uses around Defence bases impacted by PFAS contamination](#), December 2024, [p. 4].

⁸⁶ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 43.

⁸⁷ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 44.

The Government will work with states and territories to review approaches to the assessment of site contamination [...] with a view to streamlining standards and guidance for PFAS in the environment.

Any future reviews should explicitly address the ubiquitous nature of PFAS contamination and identify the best approaches to managing low level, widespread PFAS impacts, considering the limitations and practical applications of commercially available technologies.⁸⁸

⁸⁸ Australian Government, [Government response to the Independent review of land uses around Defence bases impacted by PFAS contamination](#), December 2024, [p. 9].

Chapter 6

Social and cultural impacts: Wreck Bay case study

- 6.1 Per- and poly-fluoroalkyl substances (PFAS) contamination affects every Australian to some degree, however, a small number of people and communities are heavily impacted. Communities located on or near Defence bases, airports, industrial complexes, landfill sites or firefighting training grounds may be exposed to significantly higher levels of PFAS from contamination in soil, flora and fauna, groundwater, and in some cases, drinking water.
- 6.2 First Nations communities are disproportionately affected by PFAS contamination as many are located on or near heavily contaminated land. In addition, traditional and cultural practices, such as hunting, gathering bushfoods, and fishing have historically led to higher exposure among First Nations people. For many communities, the impacts are compounded by socio-economic factors, including lower incomes, geographical isolation, poorer access to healthcare services, lower levels of education, and the impacts of racial discrimination.¹
- 6.3 A striking example is provided by the Aboriginal community of Wreck Bay, in Jervis Bay Territory, on the New South Wales (NSW) south coast. Jervis Bay is a significant site of historical use of PFAS-containing firefighting foams. The Department of Defence (Defence) commenced a detailed site investigation at HMAS Creswell and the Jervis Bay Range Facility (JBRF) in March 2017. Investigations found high levels of PFAS in surface and groundwater and PFAS contamination in soil, plants and animals. Because PFAS moves in surface water flowing through drains and creeks, or groundwater that flows underground through soil and rock, it has been found in high concentrations outside of the source areas, including at a number of sites in Wreck Bay.²
- 6.4 According to Defence, there are three source areas within the JBRF and HMAS Creswell. PFAS has moved from these source areas and accumulated in the:
- wetland at the head waters of Mary Creek;
 - former golf course at HMAS Creswell; and
 - HMAS Creswell Sewage Treatment Plant.³

¹ crcCARE, *Submission 36*, p. 10.

² New South Wales Environmental Protection Agency, [Jervis Bay Range Facility and HMAS Creswell: PFAS Investigations](#), December 2018 (accessed 19 February 2025).

³ Department of Defence, response to written questions on notice from Senator Thorpe (received 17 February 2025), [p. 2].

- 6.5 A list of impacted waterways, including precautionary advice issued by the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (Infrastructure Department), is set out in the table below:

Figure 6.1 Wreck Bay— impacted waterways and precautionary advice

Waterway	PFAS contamination levels	Precautionary advice
Mary Creek	Above drinking water guidelines and are often reported above recreational water guidelines.	Closed for all uses including fishing and swimming.
Summercloud Creek	Below both the drinking water guidelines and the recreational water guidelines.	Avoid collecting or eating seafood.
Captains Lagoon	Above both the drinking water guidelines and the recreational water guidelines.	Avoid collecting or eating seafood.
Flat Rock Creek	Above drinking water guidelines, but below recreational water guidelines.	Avoid collecting or eating seafood.
Clay Pools	Above drinking water guidelines, but below recreational water guidelines.	
Lake Windermere	Below both the drinking water guideline levels and the recreational water guideline levels.	
Lake McKenzie	Below both the drinking water guideline levels and the recreational water guideline levels.	
Telegraph Creek	Below both the drinking water guideline levels and the recreational water guideline levels.	

Source: Department of Defence, response to written questions on notice from Senator Thorpe (received 17 February 2025), [p. 2].

- 6.6 The committee visited Wreck Bay on 20 January 2025 and held a public hearing in nearby Nowra the following day. A summary of the committee's visit is provided in Appendix 2 of this report. The summary provides information on the location and administrative arrangements for Wreck Bay, the historical use of PFAS firefighting foams, and a summary of Defence's investigation and remediation efforts.
- 6.7 Defence has recognised that the PFAS contamination from the JBRF and HMAS Creswell is a significant issue for the Jervis Bay and Wreck Bay communities,⁴ and states that:
- In addition to health impacts, First Nations people have concerns about the impact of PFAS contamination on areas of cultural significance and cultural practices, for example use of ochre or plants for smoking ceremonies.⁵
- 6.8 This chapter outlines some of the social and cultural impacts of living in a community affected by PFAS contamination—in particular for First Nations

⁴ Department of Defence, [Jervis Bay Range Facility](#), November 2024 (accessed 19 February 2025).

⁵ Department of Defence, *Submission 66*, [p. 3].

communities—exploring these issues through an analysis of evidence from the community at Wreck Bay, and other interested parties.

- 6.9 The committee acknowledges that impacts on First Nations communities will vary, depending on each community's unique circumstances. As such, the committee intends to visit other First Nations communities as the inquiry progresses and will have more to say about these matters in a future report.
- 6.10 This chapter outlines evidence from and regarding Wreck Bay, including:
- evidence of cultural loss and disconnection;
 - views on the Wreck Bay class action for cultural loss;
 - views on communication and consultation with the community; and
 - the community's desire for self-determination in relation to the future of their lands and waters.
- 6.11 The health impacts of PFAS in Wreck Bay are discussed in Chapter 3, and evidence on Defence's investigation and remediation program for Wreck Bay is discussed in Chapter 5 of this report.

Cultural loss and disconnection

It's important to state that any of the chemicals added into country change the biodiversity of the place. We're so in tune with biodiversity as a part of it, not as a separate human sitting outside of nature but as blackfellas being a part of that whole ecosystem. When one of the things changes, we change. If it changes too quickly and we can't keep up, that's what constitutes the loss, because we can't keep up with the change—Mr Clive Freeman⁶

- 6.12 Community members from Wreck Bay described the impact of PFAS contamination on their cultural practices, the environment and sacred sites, their connection to the land and waters, and their ability to pass cultural knowledge on to future generations.
- 6.13 Mrs Coral Ardler Yuke described the strong sense of loss she feels that her grandchildren and great-grandchildren 'have to live on this land that's been poisoned'. Mrs Ardler Yuke grew up during the time of mission management at Wreck Bay, when mission managers tried to prevent the local people from practising their culture. Despite this, they grew up with 'pride' in the community, and continued to eat bushfoods and seafood from the area. She explained:

We grew up at a happy time. I see my little grannies and great-grannies growing up now and I'm thinking: what sort of future have they got with our land the way it is? How do we teach them that they can't go and do the things that we did? It's hard. It breaks your heart. We can't allow them to

⁶ Mr Clive Freeman, Private capacity, *Committee Hansard*, 21 January 2025, p. 8.

just go to the bush and grab the geebung and the four corners and different things. All the bush medicine that we grew up with—the ferns, the ribgrass—you can't use a lot of that stuff now because it's contaminated.⁷

6.14 Shoalhaven region Elder, Mr Henry (Sonny) Simms outlined his extensive experience working for the Shoalhaven City Council's water department. Mr Simms explained that the water in Jervis Bay Territory had previously been 'crystal clear', but is now 'so contaminated' that you would not want to wash your dog in it. Mr Simms explained that oysters no longer grow in the river, and said, 'parts of the river are dead'.⁸

6.15 Chairperson of the Wreck Bay Aboriginal Community Council (WBACC), Ms Annette Brown described how the PFAS contamination has impacted the people's cultural practice and complicated their connection to the land:

I think it's affected us because our cultural practices relate directly to land—hunting, gathering, fishing, swimming, activities. The only way that I see it continuing, from my point of view—and others may feel differently—is if those stories are told or taught in school now. The ability for families to take kids on country is limited. Basically, we've stopped taking them up near the airfield, where the water runs, and people are referring to falls where we hunted and gathered crayfish and geebung—that can't be done now. So, physically, we can't take our kids on country. We can drive them on country. We can show them plants, but to gather plants—medicines—from there is now impossible.⁹

6.16 Ms Maxine Brown highlighted the cultural importance of gathering seafood to Wreck Bay people, saying, 'It's limited now. It's in the abalone, it's in the blue gropers, it's in the pipis, and it's in the seagrass. We can't take what we were able to take at one time'. Ms Brown felt that 'closure' will not be possible, as long as Wreck Bay people keep dying young and 'the land and the water is sick'; the persistent nature of PFAS means the damage is 'forever'.¹⁰

6.17 Ms Annette Brown noted that the Shoalhaven River is contaminated and cannot be fished, and there are cultural impacts arising from the inability to collect foods from areas outside of the Wreck Bay land grant, such as Myola, Woollamia, and Currambene.¹¹

6.18 Traditional owner, Mr Darren Brown described PFAS contamination as 'this little evil lurking there', saying years ago, when it rained, there would be 'big,

⁷ Mrs Coral Ardler Yuke, Private capacity, *Committee Hansard*, 21 January 2025, p. 3.

⁸ Mr Henry (Sonny) Simms, Private capacity, *Committee Hansard*, 21 January 2025, p. 2.

⁹ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 7.

¹⁰ Ms Maxine Brown, Private capacity, *Committee Hansard*, 21 January 2025, p. 8.

¹¹ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 16.

high foam balls' on the side of the road—no one knew they were caused by PFAS. He was concerned that people continue to catch and eat the seafood and swim in the Bay, but that is their lifestyle.¹²

- 6.19 Mr Freeman pointed out that the cultural loss occurred as much because of the policies adopted by the government as the contamination itself:

... the chemical didn't need to be found for the damage to be done to the culture. Saying that the chemical was there was enough because, as soon as the Commonwealth said that there was the potential, the people panicked and it was within that panic that culture couldn't change or shift. It was from the very moment that they said it could have potentially been there—it didn't even need to have any of that qualitative data to be able to take away culture. All they needed to do was plant that seed of doubt that that could cause something, and, with all of the sickness in our community, one plus one was equalling two.¹³

- 6.20 This view was echoed by former general practitioner to Wreck Bay, Dr David Goldberg, who said the community 'is suffering because of the precautionary principle'. Dr Goldberg believes that PFAS 'very likely' causes cancer and believes there is a cancer cluster at Wreck Bay. He noted that governments currently have no choice but to apply the precautionary principle, 'which is: no swimming, no fishing, no bush tucker, no home veggies—a huge imposition on the community to try and reduce the chance of future harms'.¹⁴

- 6.21 There was a strong sense among community members that the government and the legal system had undervalued and misunderstood the significance of PFAS contamination on that land. Mr Darren Brown, said:

I think we talk a lot about the bush medicines, and we talk about the food supply and the water. In that falls area—and I think you saw yesterday—there are axe grinding grooves that are over a thousand years old. They're older than Jesus. When you go down to the bottom of that beach, into Marys, that's where a baby's skeleton was found; it exposed itself in the dunes. I don't know what the archaeological find was or how old that baby was. But we are talking about sacred sites here. We're not talking about the food, and we're not talking about what our land use is. We're talking about an area that is highly significant for this community as a sacred site.¹⁵

- 6.22 Many community members were focused on the future of their children and grandchildren living in Wreck Bay. Mrs Ardler Yuke said:

What's going to happen in the future? How are they going to sort out this problem that we have in our place for our kids? We want our kids to grow up and live the way we grew up: loving their place, enjoying our

¹² Mr Darren Brown, Private capacity, *Committee Hansard*, 21 January 2025, p. pp. 16–17.

¹³ Mr Clive Freeman, Private capacity, *Committee Hansard*, 21 January 2025, p. 8.

¹⁴ Dr David Goldberg, Private capacity, *Committee Hansard*, 21 January 2025, p. 19.

¹⁵ Mr Darren Brown, Private capacity, *Committee Hansard*, 21 January 2025, p. 7.

community, having pride in their place and being able to do the things that we did and that we can show them. But we're restricted in a lot of that stuff. We've got through a lot of sorry business in the last few years, more than any community should be carrying, but we carry that burden. Some people carry it in silence. We've got to get together and start pushing for things for our kids.¹⁶

6.23 Mr Gavin McLeod explained that his concern is also for future generations of Wreck Bay people, and said:

I think this story needs to be packaged up for the Commonwealth, and it's never to be forgotten—the damage. I understand the emotion. I feel the same way too, with the court case. Defence, or the government, should have gone straight down to the council, as a cultural authority representing the registered members, the voters, in there, and we could have nussed it out. To me, it wasn't about money, whether it was zero, minus, positive or whatever. You can't put a price on our culture. Like I say, we've been here for thousands and thousands of years. Land and water—it's all connected. It's who we are as a people; you know what I mean? That damage, all those stories—moving forward, it's on our kids.¹⁷

6.24 Mr Matt Simms highlighted the need for solutions, seeing the whole community is affected by the contamination:

We're the oldest continuous culture in the world. Our stories take us right back to the beginning when we were gifted all this water to take care of. Now it's poisoned. But we need to live in a solution. Things need to be put in place so we can move forward—for our generations, for our children, for our grandchildren, for everyone.¹⁸

Commonwealth settlement for cultural loss

For me, and from everything that's been said here today, the two biggest points are the contamination and the psychological damage that that contamination has done to this community ... The future, and the future of this place at Wreck Bay, is going to be a big thing for our community as a whole—to get together and work out how we're going to tackle the future. Don't ever sugarcoat the fact that the underlying issue here is that that land now is contaminated. That's it; it's done. We are told not to go up there. Don't worry about the signs; we're told not to go there. It's done; it's over. Don't even worry about the money now. That's done. But this contamination is the problem, and how we move forward—Mr Darren Brown.¹⁹

¹⁶ Mrs Coral Ardler Yuke, Private capacity, *Committee Hansard*, 21 January 2025, p. 3.

¹⁷ Mr Gavin McLeod, Private capacity, *Committee Hansard*, 21 January 2025, p. 7.

¹⁸ Mr Matt Simms, Private capacity, *Committee Hansard*, 21 January 2025, p. 11.

¹⁹ Mr Darren Brown, Private capacity, *Committee Hansard*, 21 January 2025, p. 17.

- 6.25 The discovery of PFAS contamination at Wreck Bay restricted the community's use and enjoyment of the land and waters, impacted their cultural practices, and altered their connection to the land forever.
- 6.26 A Class action was launched by WBACC against the Commonwealth for cultural loss in 2021. WBACC was represented by Shine Lawyers led by Joint Head of Class Actions, Mr Craig Allsopp. On 19 June 2023, the Federal Court of Australia approved a \$22 million dollar settlement of the Jervis Bay PFAS Contamination Class Action. On 8 September 2023, the Court approved the Settlement Distribution Scheme, which determined how compensation is distributed to members of the class action. The class action and the administration of the class action settlement concluded in 2023.²⁰
- 6.27 Mr Allsopp travelled to Nowra to give evidence at the committee's public hearing. In his opening statement, he explained that the class action 'excluded personal injury and health issues' because, 'the science wasn't there, from a legal perspective'. He noted that the settlement related to 'land value and, in particular, cultural loss'. Mr Allsopp said this aspect of the claim is unique to the Wreck Bay contamination. While Shine lawyers has brought nine class actions on behalf of PFAS-affected communities, the Wreck Bay action is the only case 'with the unique issue of the connection to land and the loss of culture'.²¹
- 6.28 Mr Allsopp maintained that he believes Wreck Bay is 'one of the worst impacted' communities when it comes to PFAS contamination. He argued that the small size and relative containment of the community provides 'an opportunity for government action', which cannot be achieved through the courts.²²
- 6.29 Discussing the distribution of the settlement, Mr Allsopp said a variety of different 'remedies' were considered, noting what he called the 'inadequacy of monetary compensation'. He noted that WBACC received 'a significant proportion of the settlement sum to direct how it saw fit towards community measures'. However, a direct distribution in the form of a 'pro rata allocation' of the remaining funds was considered appropriate. This was overseen by an independent referee.²³

²⁰ Federal Court of Australia, [Notice as to the Wreck Bay PFAS Land Contamination Class Action](#), 23 June 2023.

²¹ Mr Craig Allsopp, Joint Head of Class Actions, Shine Lawyers, *Committee Hansard*, 21 January 2025, p. 25.

²² Mr Craig Allsopp, Joint Head of Class Actions, Shine Lawyers, *Committee Hansard*, 21 January 2025, p. 25.

²³ Mr Craig Allsopp, Joint Head of Class Actions, Shine Lawyers, *Committee Hansard*, 21 January 2025, p. 26.

- 6.30 Originally seeking \$180 million in compensation for the community at Wreck Bay, Mr Allsopp was asked if the Commonwealth and Defence provided any explanation as to how they arrived at the settlement offer of \$22 million—Mr Allsopp replied, 'they did not'. Noting that Shine Lawyers did not expect to achieve the maximum set out in the claim, Mr Allsopp reported that, among the 'very limited precedents in Australia' where cases involved cultural loss, amounts have been significantly lower. As such, he considered that \$22 million represented 'advancing the state of recognition of cultural loss'.²⁴
- 6.31 Representatives from the Department of Defence were also unable to provide any information about how the sum offered was determined.²⁵
- 6.32 Mr Allsopp noted that Defence 'basically disputed every aspect of our claim' and that the settlement was made without an admission of liability. There was no scope within the settlement for the judge to make any directions around future funding for mitigation or adaptation measures.²⁶
- 6.33 Mr Allsopp also emphasised that the class action settlement did not cover personal injury claims:
- I think the most important point is that the class action only related to economic and cultural loss. It excluded personal injury and health issues, because of the reasons already given to this committee. Basically, the science wasn't there, from a legal perspective, and it still may not be there, despite what seems like overwhelming anecdotal evidence. If the science gets there, or if there's some further development, it's completely open to the community to seek further redress for the terrible, terrible stories about personal injuries, health issues, cancers and everything else the community has had to suffer.²⁷
- 6.34 Acknowledging the community's disappointment at the settlement figure, Mr Allsopp quoted Justice Lee's statement that 'there's a difference between what he can award under law and what is fair'. He said he tried to manage people's expectations as the case progressed, but was still not surprised that there was 'quite intense disappointment from some community members with the settlement that was achieved'.²⁸

²⁴ Mr Craig Allsopp, Joint Head of Class Actions, Shine Lawyers, *Committee Hansard*, 21 January 2025, p. 26.

²⁵ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 43.

²⁶ Mr Craig Allsopp, Joint Head of Class Actions, Shine Lawyers, *Committee Hansard*, 21 January 2025, p. 27.

²⁷ Mr Craig Allsopp, Joint Head of Class Actions, Shine Lawyers, *Committee Hansard*, 21 January 2025, p. 25.

²⁸ Mr Craig Allsopp, Joint Head of Class Actions, Shine Lawyers, *Committee Hansard*, 21 January 2025, p. 29.

- 6.35 Committee members noted that Shine Lawyers received \$5 million in legal fees which was taken out of the \$22 million. Asked about this figure, Mr Allsopp explained that Shine Lawyers is 'self-funded' and that the costs incurred by the firm 'were significantly higher' than the payment the firm received. Shine Lawyers had a team in Wreck Bay for about four years.²⁹
- 6.36 Since 2020, Defence has settled five class actions across 11 communities impacted by Defence's activities, totalling \$367.2 million (not including the Commonwealth's legal costs). In its submission, Defence noted that individuals and businesses who consider they have 'suffered loss or damage as a consequence of Defence's activities involving PFAS can make a legal claim directly to Defence'. The majority of these claims—which are assessed according to the *Attorney-General's Legal Services Directions 2017* (Cth)—have been in for 'property value diminution and inconvenience, distress and vexation'. It is unclear if any of these claims have been made by Wreck Bay community members.³⁰
- 6.37 There were a variety of views among community members about the settlement. While there was disagreement as to how the class action was conducted, and the decision to settle, there was broad agreement that the \$22 million settlement did not adequately account for the devastating loss the community has endured, and continues to endure.
- 6.38 Ms Donya Whaddy, who lives on the beach at Summercloud Bay, described the long connection of her family with the area and the intrinsic role that the water plays in their lives. Ms Whaddy outlined her feelings about the \$22 million settlement for cultural loss, saying:
- ... this is a really big cultural loss to our community, and I'm not really happy about how things went with the case. I was having chemo at that time, was in bed and couldn't talk to anyone. I lost my mum just a couple of years ago to breast cancer. I think we got overlooked.³¹
- 6.39 Mr Kieran Assheton explained that he received \$13, 000 as part of the settlement. Mr Assheton exclaimed, '\$13, 000 is how much this government and this court place as a price on genocide. Because that's what this is—cultural genocide'.³²
- 6.40 Ms Annette Brown explained that WBACC settled the case because, 'at the end of the day, the laws in Australia's judicial system are based on English law and there's no recognition in the legal system about Aboriginal culture'. Because of

²⁹ Mr Craig Allsopp, Joint Head of Class Actions, Shine Lawyers, *Committee Hansard*, 21 January 2025, p. 29.

³⁰ Department of Defence, *Submission 66*, [p. 4]; Department of Defence, response to questions on notice, public hearing 21 January 2025 (received 11 February 2025), [p. 7].

³¹ Ms Donya Whaddy, Private capacity, *Committee Hansard*, 21 January 2025, p. 4.

³² Mr Kieran Assheton, Private capacity, *Committee Hansard*, 21 January 2025, p. 12.

this, WBACC was encouraged to progress the case through mediation and settlement. It was Ms Brown's view that the settlement amount achieved was the best they could hope for under the circumstances. Previous offers had been significantly lower, and proceeding to court could have resulted in losing the case and burdening future generations with debt. Ms Brown said that she feels that what is difficult for community members is that the community's 'ability to hold other parties accountable is restricted because the law doesn't recognise cultural loss'.³³

6.41 Mr Allsopp noted that, from a legal perspective 'valuing cultural loss in a Western legal system' is highly challenging; Shine Lawyers 'had to assess what could be achieved'. He added:

I share as much frustration as everybody else, because in some ways you can't put a dollar value on it but in other ways it's such a profound impact. It is true that group members are getting \$13,000 or \$15,000. How is that compensation for this permanent impact on themselves, their children and their grandchildren?³⁴

6.42 Asked to comment on the prospects of future action in the form of health-related claims, Mr Allsopp said 'personal injury claims in relation to PFAS are still in their infancy and are still being developed'. He noted that the scientific understanding around PFAS and human health is continuing to increase; as such, there may be opportunities for future litigation. However, it was Mr Allsopp's view that government action to reduce health impacts is a better path than litigation.³⁵

6.43 During the committee's public hearing in Nowra, Ms Celia Perkins, Acting Associate Secretary, Department of Defence, was asked if Defence takes responsibility for the PFAS contamination in Wreck Bay. Ms Perkins replied, 'Yes. We have been and will continue to be transparent'. Ms Perkins noted that the Assistant Minister for Defence, Mr Matt Thistlethwaite MP, had apologised to the community in 2023. However, when asked if Defence takes responsibility for the health impacts on the Wreck Bay community caused by PFAS, Ms Perkins' response was noncommittal:

Ms Perkins: As I mentioned earlier, we rely on those parts of government who can provide both health advice and responses, and part of the government's response to the PFAS review released in December is an integrated Commonwealth engagement on these matters. The Department

³³ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 11.

³⁴ Mr Craig Allsopp, Joint Head of Class Actions, Shine Lawyers, *Committee Hansard*, 21 January 2025, p. 25.

³⁵ Mr Craig Allsopp, Joint Head of Class Actions, Shine Lawyers, *Committee Hansard*, 21 January 2025, p. 28.

of Defence will stay focused and committed on remediating the sources of contamination.

CHAIR: It's really a 'yes or no' answer. Does Defence take responsibility for the health impacts on the Wreck Bay community caused by PFAS? PFAS came from your Defence land—well, it's stolen land that you're on—where that Defence base is. The PFAS came from there and made the community sick. So does the defence department take on that responsibility also?

Ms Perkins: We'll continue to work across government—

CHAIR: Sorry, Ms Perkins—yes or no?

Ms Perkins: As I described earlier, the consistent evidence about health effects is evolving.³⁶

- 6.44 Asked to comment on the potential liability for the Commonwealth in relation to health claims, Ms Perkins said:

I think the best I can do there is to say that for many years the view has been that there is inconsistent evidence of human health effects, and that we need to apply the precautionary principle as understanding grows. We need to continue to rely on the work of the department of health and the work they do in other medical research, national and international, bodies, which is where the best advice comes to us from. So the Department of Defence has formed no views on health effects; rather, we rely on the expert positions and opinions of medical professionals.³⁷

Communication and consultation

- 6.45 A significant concern among community members and WBACC was the perceived inadequacy and inappropriateness of communication and consultation from Defence and other agencies.
- 6.46 During the committee's community visit, community members expressed their frustration at feeling as though no one is telling them anything, no one is taking responsibility for the health and environmental impacts, and that Wreck Bay is politically unrepresented. Committee members also noted that the signage at Mary Creek and Mary Bay still indicates that areas are being *tested* for PFAS, rather than clearly stating that these sites are contaminated.³⁸
- 6.47 Ms Annette Brown explained that scientists and government officers come and speak with the community, however, they do so in a way that community members cannot understand, and their statements are unclear. She said the multiple agencies that operate within Jervis Bay Territory have different operating procedures, different remits, policies, and approaches to consultation.

³⁶ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 45.

³⁷ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 43.

³⁸ See Appendix 2.

Ms Brown said that the Commonwealth 'needs all the agencies within the territory to speak the one language—a Commonwealth language and not their own language which is based around what their requirements are as an agency'.³⁹

6.48 Since 2016, Defence has conducted six community engagement sessions with the community of Wreck Bay. The most recent engagement session was held in February 2023.⁴⁰ 'Precautionary advice' has been provided to protect residents' health and Mary Creek 'remains closed for all use'. Defence also recommends against 'consumption of wild caught fish in other waterways'.⁴¹

6.49 Ms Perkins highlighted Defence's commitment to publishing the results of its investigations, along with management plans, and other material. She said Defence has committed to 'continued community engagement' to provide 'visibility and transparency over the ways in which [Defence is] dealing with PFAS removal':

... at HMAS *Creswell* and the Jervis Bay Range Facility—the two sites closest to Wreck Bay—our focus has been on groundwater treatment. We've had a temporary groundwater treatment plant that has treated over 21 million litres of water, and we expect to start construction early this year on a permanent water treatment plant. The remediation approach there is that we remove PFAS from the water, which is the way in which we will limit its capacity to continue moving off base and through both groundwater and surface water into communities.⁴²

6.50 However, evidence from community members at the public hearing suggested that information from Defence is not being relayed regularly or in accessible ways. When Senator Davey asked community members whether the Government communicates testing results to the community, Wreck Bay community member, Ms Donya Whaddy said, 'We don't get told anything. We don't get any letters about who's coming in the community or who's doing the testing'.⁴³

6.51 Defence submitted that it is now seeking to form 'a genuine partnership' with the Wreck Bay Aboriginal Community 'to manage PFAS exposure risks'. This process began in June 2024, when Defence met with community representatives. The Department is working on providing 'better access to plain English educational material and signage that can support community members to

³⁹ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 16.

⁴⁰ Department of Defence, *Submission 66*, [p. 8].

⁴¹ Department of Defence, *Submission 66*, [p. 4].

⁴² Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 39.

⁴³ Ms Whaddy, Private Capacity, *Committee Hansard*, 21 January 2025, p. 5.

mitigate their PFAS exposure risks', and plans to provide 'regular, tailored updates', and conduct 'additional biota sampling of species that have cultural importance to the community'. Defence plans to train local First Nations rangers to conduct ongoing sampling within Wreck Bay, and has supported the community in 'finding alternatives sources of sediment to be used in cultural ceremonies'.⁴⁴

6.52 Community members spoke of their distrust in government broadly, and in Defence specifically.⁴⁵ Community members' desire to play a greater role in managing their land and waters was informed, in part, by a pervasive sense of distrust in the government. Mr Freeman said that he believed Defence and the Commonwealth Government knew about the dangers of PFAS in the 1980s, but failed to act, exposing community members to the contamination for 30 years, unnecessarily.⁴⁶

6.53 Asked to comment on the suggestion that Defence knew the firefighting foam was hazardous in the 1990s, but did not inform the Wreck Bay community of the risks before 2016, Ms Perkins said that she could not 'speak to the decisions made in the 80s and 90s' and could not 'bring any knowledge' to respond to the question.⁴⁷

6.54 Then, on notice, Defence explained that the 1980s and 1990s had seen 'a growing focus of containment of discharges of any nature into waterways' and the implementation of 'stricter environmental laws, usually requiring a licensing system for discharges'. However, the department claimed that:

The potential risks of PFAS in firefighting foam to human health of PFAS in legacy firefighting foams were not understood in the 1980s and 1990s. On this basis, Defence would not have been in a position to provide warnings of the health impacts from exposure to firefighting foams.⁴⁸

6.55 Defence confirmed that the first Australian Government public alert about the potential health concerns for PFOS occurred in 2002 and PFOA in 2007 with Defence beginning to phase out PFAS-containing foams from 2004. PFAS-containing foams are still stored in a number of sites and still used in circumstances where 'lives and/or Defence assets are at risk. Defence anticipated that completely transitioning its fixed infrastructure to PFAS-free foams will take 'up to 10 years', and noted:

⁴⁴ Department of Defence, *Submission 66*, [p. 4].

⁴⁵ See Appendix 2.

⁴⁶ Mr Clive Freeman, Private capacity, *Committee Hansard*, 21 January 2025, p. 6.

⁴⁷ See page 45, *Committee Hansard*, 21 January 2025.

⁴⁸ Department of Defence, response to written questions on notice from Senator Thorpe (received 17 February 2025), [pp. 3–4].

Contact with fire-fighting agents is an inherent risk in firefighting. During the period when legacy firefighting foams containing PFAS were commonly used across the Defence Estate, the environmental and human health effects of these chemicals were not fully understood. The science and knowledge around the potential human health and environmental effects of PFAS continues to grow today.⁴⁹

6.56 When asked why the signage at Wreck Bay does not clearly state that the water is contaminated with PFAS, Ms Perkins took the question on notice, saying:

I know that we've worked very closely with technical experts and other parts of government to be clear with the messaging. I've got a copy of that messaging in front of me. I refer to my earlier comments about the precautionary principle. The signs are from the department of infrastructure. It has pictures that suggest not drinking, eating crabs or shellfish, swimming and so forth. It talks to the testing and, as a precaution, not using Mary Creek, for instance.⁵⁰

6.57 Defence confirmed that the signage had been installed in 2018 by the Infrastructure Department while investigations were ongoing, and stated that the Infrastructure Department is responsible for signage. However, Defence also stated that it will:

... work with the Wreck Bay Aboriginal Community Council, Jervis Bay Territory Administration and other relevant stakeholders, to improve signage and make the design more accessible.⁵¹

6.58 Ms Perkins undertook to consult with the community about what kind of signage community members believed would be appropriate as part of its planned engagements in 2025. She said that Defence intended to meet with the community that week (in the week commencing 20 January 2025) for Defence personnel to undertake cultural awareness training and to 'start working together on a plan' for better engaging the community on the PFAS management area plan and seeking its feedback.⁵²

Self-determination and the future

Our legislation has actually got by-law-making powers, but it's a toothless tiger. Our generation, currently—the younger ones who are working on country, like Rachele's crew, who were taking you around—haven't any powers until the legislation is changed, and that's where we're hamstrung.

⁴⁹ Department of Defence, response to written questions on notice from Senator Thorpe (received 17 February 2025), [pp. 4–6].

⁵⁰ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 45.

⁵¹ Department of Defence, response to written questions on notice from Senator Thorpe (received 17 February 2025), [p. 4].

⁵² Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, pp. 45–46.

Putting legislation and changes to our rules takes years and years. It's only if it impacts on a government that they'll rush it through. So I'm suggesting that the Commonwealth actually look at the legislation changes that allow our young wardens to have powers to actually work on country—Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council⁵³

- 6.59 Wreck Bay Village and surrounds is Aboriginal land, returned to the community through the *Aboriginal Land Grant (Jervis Bay Territory) Act 1986* (cth). The community, through WBACC, has decision-making powers in relation to the parts of the land that were included in the land grant. They have partial or shared decision-making around the National Park. They do not control Defence land, including the Jervis Bay Range Facility, which is the source of the PFAS contamination.
- 6.60 Wreck Bay traditional owner, Mr Clive Freeman spoke about water rights:
- ... our water supply in Wreck from Lake Windermere is something that has sustained Aboriginal people on the South Coast for tens of thousands of years. The contamination has not only taken that away from this generation but taken it away from future generations. Now that an arrangement has been negotiated between the Commonwealth and the states for us to purchase that water, I have a concern about how we care for something that we've cared for forever and who's stolen that away. How do we take that responsibility back? I think that there's been a theft of the water as well as a poisoning of the land. I think that—while we talk about water sovereignty in this country and we speak about people who are taking our water rights away from us—contamination is also stealing the water. So we need that to be addressed when we look at water reform at that Commonwealth level.⁵⁴
- 6.61 Mr Darren Brown described the situation as 'David vs Goliath', saying the community is 'up against the beast: the Department of Defence', and feels powerless. He described the community as damaged or diseased, asking, 'How do we cure this? I don't know how. How does the Commonwealth help this community cure this disease that we have to live with moving forward?'⁵⁵
- 6.62 Many Community members felt that, despite the contamination directly affecting land belonging to the community, they have little control or input into how that contamination is managed. Ms Annette Brown said that the community does not 'want to be fed second-hand information' and wants to be

⁵³ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 17.

⁵⁴ Mr Clive Freeman, Private capacity, *Committee Hansard*, 21 January 2025, p. 5.

⁵⁵ Mr Darren Brown, Private capacity, *Committee Hansard*, 21 January 2025, p. 8.

'at the table monitoring the level of contamination, monitoring the health of [its] kids and ensuring that [they] are a part of that'.⁵⁶

- 6.63 Ms Whaddy was asked if Defence is testing the local flora as part of its PFAS monitoring; she replied:

They're medicinal plants and we're all affected. How am I supposed to teach my grandchildren, when they grow up, about the things we used to do when we were little at the beach and used to go collecting. It's poison. What's going to happen? A lot of things could be happening at the moment, but I don't see anything happening.⁵⁷

- 6.64 Mr Clive Freeman provided evidence detailing the importance of regular testing during different seasons and after major disturbances, as fire or drought can change the amount of PFAS available in the soil:

I think it's important to understand that, as it's a bioaccumulative substance, the testing is very much dependent on the natural environment. If you get tests done during the drought, you're going to find a discrepancy as opposed to if you tested, say, after a cultural burn or a natural fire. What fire does is release the chemistry from the actual living organisms, and it'll burn it back to its original form, which makes it waterborne again to recontaminate another species.⁵⁸

- 6.65 Mr Matt Simms argued that Defence should provide funding for local people to be 'trained up and upskilled' to conduct monitoring and remediation activities. Mr Simms insisted that the only people he trusts to address the contamination are Wreck Bay people.⁵⁹

- 6.66 Ms Annette Brown outlined the community's frustration that they do not have a genuine say in how the contamination is managed, saying:

Human rights is an issue for the community that is affected as well as social justice issues. They call it Aboriginal land, we have ownership, but there are no laws that recognise that. We have legislation that has no strength when it comes to protecting land. So how we work with government, and the Commonwealth at a higher level, is going to be a very important step.⁶⁰

- 6.67 Ms Annette Brown recommended that the Commonwealth establishes a monitoring committee that includes 'grassroots' Aboriginal people and answers directly to Parliament. This committee should monitor the remediation as well as the health of the people. Ms Brown pointed to the unique governance and

⁵⁶ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 3.

⁵⁷ Ms Donya Whaddy, Private capacity, *Committee Hansard*, 21 January 2025, p. 5.

⁵⁸ Mr Clive Freeman, Private capacity, *Committee Hansard*, 21 January 2025, p. 13.

⁵⁹ Mr Matt Simms, Private capacity, *Committee Hansard*, 21 January 2025, p. 13.

⁶⁰ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 3.

administrative arrangements of the Jervis Bay Territory, and Wreck Bay, and suggested that a regional authority should be set up for Jervis Bay Territory, with proper representation of the Wreck Bay Aboriginal community. She also expressed that the Government should review the legislation governing the Wreck Bay land grant in order to give more formal power to Wreck Bay people to manage their land, including the Booderee National Park.⁶¹

6.68 Ms Annette Brown said WBACC understands that the contamination is here to stay, and the community must 'live with it and manage it, or our younger generation needs to make choices about whether they continue to reside in Wreck Bay'. Ms Brown explained that WBACC is working to address the contamination by looking at how the council can build houses to reduce residents' exposure, such as through the use of 'water tanks, solar systems or transgenerational-style houses'. She encouraged the Commonwealth to bring all the agencies with a 'commitment' to Jervis Bay Territory together at the table with Wreck Bay people to find solutions that genuinely work for the community.⁶²

6.69 Ms Brown also raised the possibility of reviewing the land claim arrangements at Wreck Bay, explaining that WBACC has previously made a land claim on Defence land in Jervis Bay Territory that was underutilised, on the grounds that it was 'vacant Crown land'. WBACC wanted to build houses for community members on that land. However, Defence resisted the claim and the Commonwealth let Defence retain the land. Ms Brown suggested that Defence and the Commonwealth should:

... change their minds, because, if they have a partnership with the community in Wreck Bay and their occupation of that land still continues, all that would be put in place is an agreement under a lease and what responsibilities we as two parties have. And it forms the basis of building a better relationship with Defence, and we need that, because the only other land that's available also has facilities there.⁶³

6.70 As discussed in other chapters of this report, the Government is now establishing a national coordination body to oversee PFAS investigation and remediation efforts. Ms Perkins indicated that Defence is commissioning an

⁶¹ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 14 and p. 17.

⁶² Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, p. 15.

⁶³ Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council, *Committee Hansard*, 21 January 2025, pp. 17–18.

interdepartmental committee to 'start the process of establishing a membership', in terms of reference, and that she expects she will be included.⁶⁴

- 6.71 With no plans currently in place for a community engagement mechanism to be implemented for Wreck Bay, Ms Perkins was asked how the Department will ensure that the community is part of the decision-making process. She replied that Defence has appointed an Indigenous engagement officer and will continue to engage with the Wreck Bay community.⁶⁵
- 6.72 The committee Chair noted that having conducted six engagement sessions since 2016, and latest in February 2023, Defence has engaged directly with the community on a less than annual basis. The Chair suggested Defence considers increasing representation from the Wreck Bay Aboriginal Community in decision-making forums.⁶⁶
- 6.73 On notice, Defence revealed that the department and WBACC 'have agreed on a training program for Wreck Bay Rangers enabling them to undertake independent environmental sampling in the Wreck Bay area'. This training commences in February 2025 and will involve training 10–15 rangers.⁶⁷
- 6.74 Noting that Defence will be the lead agency for the PFAS National Coordinating Body, Ms Perkins was asked if Defence will show leadership in seeking to close the 'knowledge gaps' around PFAS—particularly, health impacts. Ms Perkins replied, 'Yes, Senator, and we will provide the secretariat support to keep that group operating'.⁶⁸

Committee view

- 6.75 The complex administrative and governance arrangements of Jervis Bay Territory have increased the community's frustration and confusion. It is critical that the Commonwealth response to PFAS contamination in Jervis Bay Territory is well coordinated and that the Commonwealth speaks with one voice.
- 6.76 There may be scope for this issue to be further explored by the Joint Standing Committee on the National Capital and External Territories.

⁶⁴ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 44 and p. 47.

⁶⁵ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 44.

⁶⁶ Senator Lidia Thorpe, Chair, Senate Select Committee on PFAS, *Committee Hansard*, 21 January 2025, p. 44.

⁶⁷ Department of Defence, response to written questions on notice from Senator Thorpe (received 17 February 2025), [p. 7].

⁶⁸ Ms Celia Perkins, Acting Associate Secretary, Department of Defence, *Committee Hansard*, 21 January 2025, p. 47.

Recommendation 3

- 6.77 The committee recommends that Parliament considers referring an inquiry to the Joint Standing Committee on the National Capital and External Territories which examines governance, representation, and service provision in the Jervis Bay Territory (including the Wreck Bay Aboriginal community settlement).**
- 6.78 The committee intends to visit other First Nations communities affected by PFAS contamination, and collect further evidence, before making more recommendations.

Senator Lidia Thorpe
Chair

Appendix 1

State and territory governments and PFAS

- 1.1 The information in this appendix was provided by the Australian Parliamentary Library in November 2024.
- 1.2 This appendix provides an overview of recent reports concerning PFAS that have been released by the state and territory governments. It also provides a high-level overview of the restrictions on certain PFAS-containing firefighting foams that the state governments of [Queensland](#) (in 2016), [South Australia](#) (in 2018), and [New South Wales](#) (in 2021 and from September 2022) have introduced.

Victoria

- 1.3 The [Environment Protection Authority \(EPA\) Victoria](#) (VIC EPA) is responsible for regulating 'the disposal, reuse and management of PFAS affected materials, like soil, in line with Victoria's environment protection regulations'. The VICTORIANEPA also has an [Emerging Contaminants Program](#) 'dedicated to collecting and analysing the occurrence, concentration, and spatial distribution of emerging contaminants in the Victorian environment'. The VIC EPA has published several studies and reports concerning PFAS in the state, including:
 - Jul 2024—[Maribyrnong River: risk assessment with consumption of recreationally caught fish](#)
 - Nov 2023—[Classifying waste and waste soils containing PFAS: consultation paper](#), which resulted in the October 2024 update of the EPA's [Waste disposal categories: characteristics and thresholds](#) (Publication 1828.3)
 - see also the EPA's '[PFAS and waste: guidance for business](#)' webpage
 - Jun 2023—[Emerging contaminants in recycled water](#) (Publication 2054), which was undertaken as part of the EPA's Emerging Contaminants Program
 - other reports published under the program (between 2018 and 2020) [are listed here](#)
 - Oct 2022—[EPA science report: summary of PFAS concentrations detected in the environment](#) (Publication 2049).
- 1.4 Other reports and guidance information from the Victorian Government include:
 - Jul 2023—Inspector-General for Emergency Management [Implementation of government commitments in response to the Inquiry into the CFA Training College at Fiskville—Progress Report—2022](#)
 - the Victorian Department of Health's '[PFAS](#)' webpage (under the 'Environmental health' heading) lists three older reports on PFAS

(published between 2015 and 2016) that it commissioned from the Monash University.

- Agriculture Victoria's '[PFAS and livestock](#)' webpage provides information on issues relating to PFAS in livestock, and states that it undertook a recent literature review that 'indicated no evidence of negative impacts on livestock health from studies currently available worldwide'. The Library was unable to locate this review.

New South Wales

Restrictions on PFAS firefighting foams

- 1.5 The New South Wales (NSW) Government ([introduced a Regulation to restrict](#) the use of some fluorinated firefighting foams from 2021, with staggered timeframes for implementation. See the '[Key changes](#)' table on the NSW EPA website for a broad overview of the restrictions.
- 1.6 In specific situations, the [Regulation provides exemptions](#) to the restrictions for 'relevant authorities' (which includes 'Transport for NSW, fire brigades, rural fire brigades, community fire brigades and the Port Authority of NSW'), 'persons on watercraft' and stakeholders who have been granted an exemption by the NSW EPA.

Recent reports

- 1.7 The [NSW PFAS Expert Panel](#) is responsible for, among other things, providing '[informed advice to the EPA](#) to assist in developing the NSW Government's response to PFAS issues, including contamination to protect the community and the environment'. The panel has [previously undertaken reviews](#) of Commonwealth Department of Defence PFAS-related reports (in 2016 and 2017). The NSW EPA website states that it and the '[PFAS Expert Panel](#) will continue to review any reports released by the Department of Defence, to ensure they are scientifically sound'.
- 1.8 The NSW EPA also leads the [NSW Government's PFAS Investigation Program](#), which assesses 'the legacy of PFAS use across NSW' (see the NSW EPA's '[PFAS investigation process](#)' for more information on how the investigations are conducted). The 'List View' tab on the [PFAS Investigation Program webpage](#) provides links to site investigation reports and assessment documents for each of the 51 sites it is currently investigating.
- 1.9 The NSW EPA also [recently completed a study](#) of the composition of food organic and garden organic (FOGO) composts and other recovered organics in NSW to ensure the state's 'regulatory standards are appropriate and support safe and beneficial re-use of organic materials' (p. 1). To inform the study, the [NSW EPA commissioned several reports](#), including:

- Jan 2023—[Risk assessment of PFAS and \[polybrominated diphenyl ethers\] PBDEs in FOGO and \[garden organic\] GO composts \(2020–21\)](#) (and [its addendum](#))
 - Aug 2021—[Brief literature review of the potential sources of PFAS and PBDEs in food organics and garden organics composts.](#)
- 1.10 The Library notes that, on 25 September 2024, the NSW Legislative Council established a [Select Committee on PFAS Contamination in Waterways and Drinking Water Supplies Throughout NSW](#).

Tasmania

- 1.11 In [September 2018](#), the Tasmanian (Tas) Government endorsed the [PFAS Action plan for Tasmania](#). The Tas EPA has since released [two progress update reports](#) for the plan, one in [August 2019](#) and one in [July 2021](#).
- 1.12 Tas EPA's '[Ambient PFAS Monitoring](#)' webpage summarises the results of its [Tasmanian PFAS ambient monitoring program 2020](#) report and the [Preliminary targeted assessment of PFAS in eels downstream of source sites](#) (both released in October 2022).
- 1.13 Tas EPA's '[Tasmanian PFAS Investigations](#)' webpage provides information on investigations that have been undertaken at PFAS-contaminated sites in the state (including links to the state department's assessment reports for the sites). The Tas Department of Health's '[PFAS](#)' webpage links to the 2018 [Investigation of PFAS in Pitt Water summary report](#) and the 2019 [PFAS investigations in North Esk River fact sheet](#).
- 1.14 In February 2022, the Tasmanian Department of Natural Resources and Environment (NRE) released the [Tasmanian organics strategic framework](#), which 'provides a suggested structure and elements to consider when developing the Tasmanian Waste Strategy' (p. 1). One of the suggested policy initiatives was to 'ban persistent chemicals PFAS/PFOS, at source for contamination control' (p. 24). See also the [Tasmanian organics research report](#), commissioned to help develop the framework.
- 1.15 The [Tasmanian Waste and Resource Recovery Strategy 2023–2026](#), reportedly [released in December 2023](#), does not reference PFAS. However, they are mentioned in NRE's [discussion paper](#) for [Phasing out single-use plastics in Tasmania](#), released for consultation [from August 2024 to October 2024](#).

Queensland

Restrictions on PFAS firefighting foams

- 1.16 In 2016, the Queensland (Qld) Government [implemented a policy](#) to progressively phase out some PFAS-containing foams by 2019 ([several amendments to the policy](#) were made in October 2021). The Qld Government's [2019 PFAS Contamination Protocol](#) notes:

- Agencies most likely to have responsibilities under this protocol include those who manage high risk fire emergencies (QFES fire stations and training facilities), own property where explosive fire risks exist (Ports) or may acquire and develop/disturb land where the aforementioned activities have taken place (Transport and Main Roads). (p. 2)

Recent reports

- 1.17 The Queensland Government established the [PFAS Interdepartmental Committee](#) (PFAS IDC) to coordinate the jurisdiction's response to PFAS contamination incidents. The PFAS IDC is responsible for developing policy and providing 'advice and oversight of numerous PFAS investigations across Queensland'. There are currently several state-wide PFAS investigations being monitored by the PFAS IDC (listed on the Queensland Government's '[PFAS site investigations](#)' webpage).
- 1.18 The Queensland Government's '[PFAS management in Queensland](#)' webpage also outlines several reports and supporting documents it has released concerning PFAS.
- 1.19 The webpage notes that the Queensland has also been '[focused on managing](#) the potential impacts of PFAS on transitioning to a safe circular economy', including 'by setting [PFAS limits on finished compost products](#) across the state, as well as [PFAS trigger levels for the use of biosolids](#)'. For further information, see:
- Aug 2024—Queensland Department of Environment, Science and Innovation [Consultation paper: review of the regulated waste PFAS values in the Environmental Protection Regulation 2019](#)
 - Mar 2024—Queensland Department of Environment, Science and Innovation [Regulatory position statement: PFAS in organic waste \(composting\)](#).

Western Australia

- 1.20 Much of the information provided by the Western Australia (WA) Government [concerning PFAS](#) refers to the Commonwealth Government's guidance documents and those provided under the Intergovernmental Agreement on a National Framework for Responding to PFAS Contamination. The Library has identified the following recent PFAS site investigations reports that have been released by the WA Government:
- Nov 2022—WA Department of Water and Environmental Regulation [PFAS in the Perth metropolitan area](#)
 - Sep 2022—WA Department of Biodiversity, Conservation and Attractions [Assessment of PFAS in the surface water and biota of the Swan Canning Estuary and its catchment](#).
- 1.21 The WA Government's December 2017 [Statement on PFAS](#) provides information on 15 identified PFAS-contaminated sites within the state's jurisdiction and

regulated under the WA *Contaminated Sites Act 2003* (as of November 2017, pp. 4–6). Pages 5–6 of the statement outline some of the investigations undertaken into the PFAS contamination at these sites.

South Australia

Restrictions on PFAS firefighting foams

- 1.22 In 2018, the South Australian (SA) Government [implemented a ban](#) on all fluorinated firefighting foams, including short-chain PFAS foams (see under 'Transitioning to fluorine-free fire-fighting foam'). The ban included a two-year transitional period and came into full effect on 30 January 2020.
- 1.23 SA EPA can issue exemptions to the ban for certain sites. There are currently seven sites with exemptions, which can be viewed on the [public register](#) by selecting 'Record Type: Exemption' and 'Record Status: Issued'.

Recent reports

- 1.24 In SA, several recent reports and guidelines have been released concerning the disposal of PFAS-contaminated waste:
- Aug 2023—SA Environment, Resources and Development Committee [Briefing report on the disposal of PFAS contaminated waste in SA](#)¹
 - Jul 2023—SA EPA [PFAS in waste soils interim guideline](#)
 - Jul 2023—SA EPA draft [PFAS-contaminated waste disposal site suitability guideline](#).
- 1.25 See also SA EPA's '[PFAS](#)' and '[Guidance for managing PFAS in SA](#)' webpages. The SA Department of Health's '[PFAS](#)' webpage also links to information on two PFAS-contaminated sites in the state.

Northern Territory

- 1.26 In the Northern Territory (NT), the [PFAS Interagency Working Group](#) is responsible for developing, coordinating and implementing the NT's [PFAS Legacy site investigation strategy](#) (dated June 2016).
- 1.27 The NT Department of Health has released some [fact sheets on PFAS](#) in wild-caught fish species and bushfoods in some regions of the Top End (see also NT EPA's '[PFAS](#)' webpage).
- 1.28 Power and Water Corporation (PWC), the [NT Government-owned power and water service provider](#) for the territory, [monitors for PFAS in its drinking water sources](#) and has also undertaken testing for PFAS at wastewater treatment

¹ See also the Committee's 2022 interim inquiry report into the disposal of PFAS contaminated waste, which can be downloaded from the [Committee's webpage](#) by selecting 'Environment, Resources and Development Committee' > '03 PFAS inquiry' (under 'Committee Files'), and downloading the file titled '03 Interim Report 4 February 2022.pdf'.

facilities. The results of these tests are available on PWC's '[PFAS monitoring](#)' webpage.

Australian Capital Territory

- 1.29 The Australian Capital Territory (ACT) Government released a [PFAS Action plan](#) in August 2019, outlining the ACT Government's actions and areas of responsibility regarding PFAS contamination.
- 1.30 Icon Water, the [ACT Government-owned](#) water service provider, undertakes [testing for PFAS](#) in its final drinking water (as of 2024) and catchment source water (as of 2016) (see the under '[Does Icon Water Test for PFAS](#)' and '[What is the difference between Source Water, Raw Water and Final treated water?](#)').

Appendix 2

Wreck Bay community visit

- 1.1 On 20 January 2025, the Senate Select Committee on PFAS (per and polyfluoroalkyl substances) was privileged to visit the community of Wreck Bay, a Community Council-managed Aboriginal village in Jervis Bay Territory, on the New South Wales (NSW) South Coast.
- 1.2 Four committee members attended the visit—the Chair, Senator Lidia Thorpe, Deputy Chair, Senator Varun Ghosh, Senator Perin Davey and Senator Peter Whish-Wilson.
- 1.3 The visit provided valuable firsthand evidence on the impacts of PFAS contamination on the land, the waters, and the community to assist the committee to better understand the issues.
- 1.4 This appendix provides a summary of the committee's visit, outlining what the committee observed, and reporting some of what committee members heard from the people of Wreck Bay. It begins by providing a brief description of the unique history and governance arrangements of Jervis Bay Territory and Wreck Bay, and describing the background of PFAS contamination in the area.

Background

Jervis Bay Territory and HMAS Creswell

- 1.5 Jervis Bay Territory, 180 kilometres south of Sydney, was surrendered to the Commonwealth by NSW in 1915 and the laws of the Australian Capital Territory (ACT) apply insofar as they are not inconsistent with Jervis Bay Territory Ordinances. Municipal services in Jervis Bay Territory are provided by the Commonwealth. Jervis Bay Territory Ordinances are made by the Governor-General and administered by the Commonwealth minister with responsibility for Territories—currently the Hon Kristy McBain MP, Minister for Regional Development, Local Government and Territories.
- 1.6 The Department of Defence (Defence) first established a presence in Jervis Bay territory in 1912. The Royal Australian Navy base, HMAS Creswell, was established in January 1958 and is located on the south-western shores of Jervis Bay. As part of a large national park and in recognition of its historical significance, HMAS Creswell is listed on the National Register as a significant heritage site.
- 1.7 HMAS Creswell consists of the Royal Australian Naval College and four other departments. The School of Survivability and Ship Safety teaches firefighting, damage control and nuclear, biological and chemical defence. The Becroft Weapons Range across the peninsula offers targets for Naval Gunfire Support

practice. The fourth department provides administrative support for all sections operating out of Creswell. HMAS Creswell is surrounded by Booderee National Park and sits on the shore of Jervis Bay Marine Park. This coastal region is popular for fishing, swimming, water skiing, horse riding, trail bike riding, canoeing, sky diving, and gliding.¹

Wreck Bay is Aboriginal land

1.8 The Wreck Bay Community settlement consists of 403 hectares on the southern shores of Bherwerre Peninsula, around 40 km south of Nowra:

Figure 2.1 Wreck Bay location



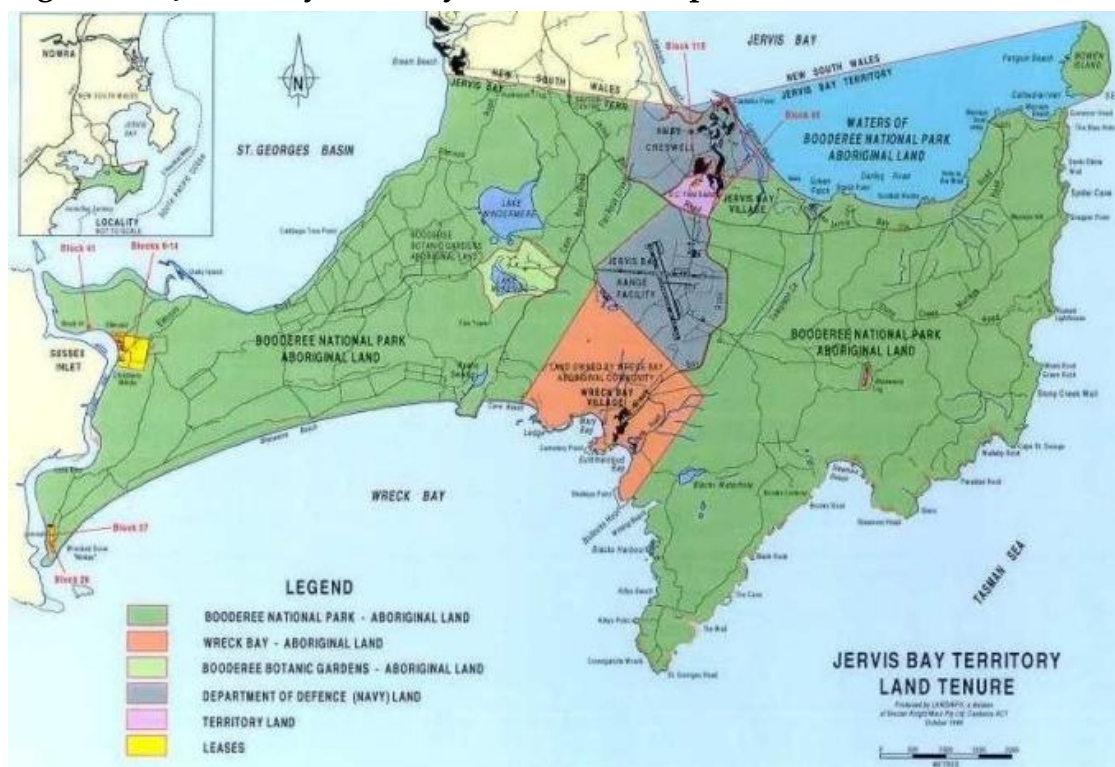
Source: Grace Crivellaro, [“They should have to see what they’ve done”: the scars of Wreck Bay](#), *Illawarra Mercury*, 30 June 2023 (accessed 24 February 2025).

1.9 In the late 1980s legislation was enacted which enabled the return of lands and waters at Wreck Bay to Aboriginal ownership. The [Aboriginal Land Grant \(Jervis Bay Territory\) Act 1986](#) allowed for an initial grant of 403 hectares of Jervis Bay Territory, including Wreck Bay Village, to the local Aboriginal people. In 1995 the existing Jervis Bay National Park and the Jervis Bay Botanic Gardens (now known as Booderee National Park and Booderee Botanic Gardens) were granted to the Wreck Bay Aboriginal Community.²

¹ Royal Australian Navy, [HMAS Creswell](#) (accessed 24 February 2025).

² Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA), [Jervis Bay Territory governance and administration](#) (accessed 4 February 2025).

Figure 2.2 Jervis Bay Territory land tenure map



Source: Wreck Bay Aboriginal Community Council, [Annual report 2021-22](#), p. 8.

- 1.10 The settlement is made up of a village and surrounding bushland and beaches. The village consists of several streets with around 50 houses, a Council Administration office, an early learning centre, a medical centre, a community hall, multi-functional centre, playing fields, a fire shed and cemetery. The village has a population which 'fluctuates between 215 and 230 people' and the area is regarded as a private area that is for Community members and their invited guests.³
- 1.11 A history and timeline of Aboriginal community management at Wreck Bay is available in the Wreck Bay Aboriginal Community Council (WBACC) *Annual Report 2020-21* and the [Four-Year Cultural Heritage Strategy for Booderee National Park](#) (2020).⁴ WBACC describes the connection of Wreck Bay people to the land and waters:

The cultural heritage of the Wreck Bay Community is deeply embedded in the surrounding land and waters of Bhewerre Peninsula. The natural and social histories are intertwined and reflects on relationship between Wreck Bay people and the natural environment, from traditional times until the present day.

³ Wreck Bay Aboriginal Community Council (WBACC), [Where we are](#), 2020 (accessed 4 February 2025); WBACC, [Four-year Cultural Heritage Strategy for Booderee National Park](#), 2020.

⁴ WBACC, [Annual report 2020-21](#) (accessed 5 February 2025).

The lands belonging to the Wreck Bay Community form part of the broader Jervis Bay landscape. The culture, history and heritage of Wreck Bay and its people is closely associated with the culture, history and heritage of the whole Jervis Bay region.

Wreck Bay culture and history did not develop in isolation from the rest of Australia and it has many features in common with other Aboriginal cultures, such as a shared belief system that emphasises family relationships and connections with the land.

Anthropologist Debbie Bird Rose describes the relationship between Aboriginal people and their country as being:

Intense, intimate, full of responsibilities and when all is well, friendly. It is a kinship Relationship, and like relations among kin, there are obligations of nurturance. People and country take care of each other (Rose 1996:49).

These shared beliefs are reflected in creation stories such as Biame, which are familiar to all Aboriginal Australians of south-eastern Australia.⁵

PFAS contamination in Jervis Bay

- 1.12 Defence identified Jervis Bay as a significant site of historical use of per- and poly-fluoroalkyl substances (PFAS)-containing firefighting foams and commenced a detailed site investigation at HMAS Creswell and Jervis Bay Range Facility (JBRF) in March 2017. The investigation aimed to determine the extent of the impact of PFAS contamination, and the potential risks to the community. PFAS foams were used at JBRF and HMAS Creswell in fire-fighting training and operations prior to the foams being phased out of routine use. Investigations found high levels of PFAS in surface and groundwater and PFAS contamination in soil, plants and animals.⁶
- 1.13 In December 2019, Defence completed its initial investigation and commenced planning for remediation works. Defence has recognised that the PFAS contamination from the JBRF and HMAS Creswell is a significant issue for the Jervis Bay and Wreck Bay communities. The investigation found that PFAS is mostly concentrated in the soil and water in areas where firefighting foams were previously used, stored or disposed—known as 'source areas'. However, because PFAS moves in surface water flowing through drains and creeks, or groundwater that flows underground through soil and rock, it was also found outside of the source areas, including at a number of sites in Wreck Bay.⁷
- 1.14 The JBRF is situated on a flat-topped hill and is surrounded by several creeks. Investigations found that water draining north flows into either the Flat Rock Creek catchment, or Captains Lagoon catchment. Water draining south mostly

⁵ WBACC, [Who we are](#), 2020 (accessed 4 February 2025).

⁶ NSW Environmental Protection Agency, [Jervis Bay Range Facility and HMAS Creswell: PFAS investigations](#), December 2018 (accessed 24 February 2025).

⁷ Department of Defence, [Jervis Bay Range Facility](#), November 2024 (accessed 24 February 2025).

flows into the Mary Creek catchment, with some also flowing into the Summercloud Creek catchment.⁸ These catchments and creeks are on Aboriginal land at Wreck Bay and lead to the two coves that incorporate the Aboriginal community's beaches.

- 1.15 The discovery of PFAS at Wreck Bay led to significant changes in how the community was able to use and connect with its land (outlined below and discussed further in Chapter 6 of this report). A class action was launched by WBACC against the Commonwealth for cultural loss in 2021.⁹ On 19 June 2023, the Federal Court of Australia approved a \$22 million dollar settlement of the Jervis Bay PFAS Contamination Class Action. On 8 September 2023, the Court approved the Settlement Distribution Scheme, which determined how compensation is distributed to members of the class action.
- 1.16 The class action and the administration of the class action settlement have now concluded,¹⁰ but the issue of PFAS contamination remains a significant concern for the community, particularly as the class action was limited to cultural loss and did not address any of the health challenges experienced in the community. During its visit, and at the public hearing, the committee heard that many community members were unsatisfied with the settlement amount, which raises questions for them around how much their culture is worth. The distribution of the settlement has also created tensions in the community, with some members receiving larger settlement amounts than others and some receiving none at all.

The committee's visit

- 1.17 The committee's visit was facilitated by WBACC, which is chaired by Annette Brown. Beverly Ardler is the Deputy Chair, and the Chief Executive Officer is Tamara Mitchell. Community Liaison Officer, Joanna Ardler also assisted with arranging the visit. The committee thanks the Board for supporting the visit, and Tamara and Joanna for making the arrangements.

Welcome to Country

- 1.18 As part of its visit, the committee received a Welcome to Country and Smoking Ceremony, provided by Matt Simms, a Wandj Wandj man who belongs to the Dhurga Language group from the Yuin Nation.¹¹

⁸ Department of Defence, [Jervis Bay Range Facility](#), November 2024 (accessed 24 February 2025).

⁹ The class action was limited to consideration of impacts of PFAS contamination on cultural practices and did not address the issue of health impacts or compensation for personal injury.

¹⁰ Federal Court of Australia, [Notice as to the Wreck Bay PFAS Land Contamination Class Action](#), 23 June 2023.

¹¹ Djiriba Waagura, [Matthew Simms](#), 2021 (accessed 4 February 2025).

Figure 2.3 Matt Simms—smoking ceremony



Source: Chair's photograph.

Figure 2.4 Smoking ceremony



Source: Chair's photograph.

- 1.19 Matt Simms explained that he welcomed the committee to Wreck Bay *as family*. He invited committee members and staff to walk through the smoke in order to be properly welcomed to Country. Matt explained that the smoke reminds him that he is connected to his mother and the land, who is also his mother. He encouraged committee members to let the smoke soothe them and take away their worries and burdens.
- 1.20 The committee thanked Matt Simms, and Djiriba Waagura, for providing a warm and informative welcome.

Tour of PFAS-affected locations

- 1.21 Wreck Bay people have been caring for their lands and waters for thousands of years and continue to do so, despite the impacts of PFAS contamination. The committee was met by representatives of the Bherwerre Rangers. The Ranger program was established in July 2020 and works to 'develop and implement management plans and programs to educate the wider community' about the history of Wreck Bay people's culture in the region. The Rangers implement invasive species management, fire control, maintain tracks and signage, and work with children from local schools, in collaboration with Booderee National Park, providing 'walks on country and dreamtime story talks and artworks'.¹² The committee was inspired to hear about the work of the Ranger team who are dedicated, highly skilled, and knowledgeable in caring for their Country.
- 1.22 A group of Rangers, led by Senior Ranger Rachelle McLeod, took the committee on a tour of significant locations impacted by PFAS contamination.

Royal Australian Navy School of Survivability and Ship Safety

- 1.23 The tour started at the gates to the Royal Australian Navy School of Survivability and Ship Safety (RAN SSSS), which Rachelle described as 'ground zero' for the PFAS contamination impacting Wreck Bay.
- 1.24 The RAN SSSS provides training to equip sea-going personnel with combat survivability skills, including firefighting skills. According to GHD—Defence's lead consultant for the testing and remediation program—firefighting activities undertaken in the 1960s and 1970s 'were conducted at unsealed areas', with training fires 'established in open pits or within shallow metal trays'. At the RAN SSSS, training fire pits were constructed on concrete slabs and run-off of fuels and firefighting foam 'was uncontrolled'. Fire training practices and infrastructure were upgraded in 1994–95 and again in 2009–10. However, Defence did not begin phasing out the use of PFAS-containing foams until 2004.¹³

¹² WBACC, [Ranger Program](#), 2020 (accessed 24 February 2025)

¹³ GHD, Department of Defence, [Jervis Bay Range Facility and HMAS Creswell Supplementary Detailed Site Investigation Report](#), December 2020, p. 9 (accessed 4 February 2025).

- 1.25 GHD describes the RAN SSSS as 'the most significant source area identified in [the detailed site investigation of the JBRF]', saying 'PFAS was observed in soil, concrete, groundwater, sediment and surface water associated with this area'. Further, that the 'majority of surface water that flows to the south from JBRF is expected to form the headwaters of Mary Creek, which flow south into Mary Bay and Wreck Bay'.¹⁴
- 1.26 The Rangers explained that Mary Creek, Mary Bay and Wreck Bay continue to be affected by run-off from the RAN SSSS, especially when it rains. Discussing historical fire training practices, Rachelle told the committee that her father had been employed at that location in a role that exposed him to PFAS, and that he had died prematurely at the age of 42.

Mary Creek

- 1.27 The next location in the tour was Mary Creek. Like a number of areas surrounding Wreck Bay Village, Mary Creek holds cultural and spiritual significance for Wreck Bay people. Parks Australia reports that:

More than 100 ancient Aboriginal sites have been recorded on the Bherwerre Peninsula, some probably dating back to the stabilisation of the sea level about 6000 years ago. Most sites are shell middens, but there are also rock shelters, burial sites, ceremonial grounds, stone-flaking sites and axe-sharpening grooves.

The distribution of these recorded sites emphasises the importance of the eastern end of Wreck Bay. The high density of midden sites on the Bherwerre Peninsula mirrors the preferred fishing zones of the present community.

Ceremonial bunan or bora grounds are known only from the immediate hinterland of this section of Wreck Bay, and nearly all known axe grinding groove sites are in the catchments of Mary and Summercloud bays.¹⁵

¹⁴ GHD, Department of Defence, *Jervis Bay Range Facility and HMAS Creswell Supplementary Detailed Site Investigation Report*, December 2020, p. 10 and p. 17.

¹⁵ Booderee National Park, [Our history](#), (accessed 24 February 2025).

Figure 2.5 Senior Ranger Rachelle McLeod at Mary Creek



Source: Chair's photograph.

- 1.28 The committee was privileged to be shown an axe-grinding groove site in Mary Creek which is thousands of years old and holds particular cultural and historical significance to the people of Wreck Bay.
- 1.29 The committee heard that local people and their children have always swum in the waters of Mary Creek, played in the rock pools, collected bush tucker in the area, and eaten yabbies from the creek. Senior Ranger Rachelle McLeod told the committee that, when she was a child, the area was their 'playground'—it was 'pristine', but they did not know about the contamination they were eating and drinking.
- 1.30 In October 2016, based on initial testing undertaken by the ACT Government, the ACT Chief Health Officer recommended that WBACC close Mary Creek to human use. Mary Creek has remained closed ever since. Defence's formal investigation process began in 2017. Now in 2025, signage at Mary Creek still advises that the area is being 'tested' for PFAS, and does not confirm its presence. The sign (pictured below) includes graphics suggesting that swimming, drinking the water and collecting and eating seafood are prohibited.¹⁶

¹⁶ Parks Australia, [Jervis Bay Range Facility and HMAS Creswell: Department of Defence PFAS Investigations](#), November 2020 (accessed 24 February 2025).

Figure 2.6 Signage at Mary Creek










Source: Chair's photograph.

The signage was provided by the Department of Infrastructure.

- 1.31 As part of its investigation, Defence's contractor, GHD, spoke with local people and conducted a survey to determine how they will use the land, with the aim of assessing possible exposure pathways. GHD's investigation confirmed the importance of bush foods as both medicinal and food sources for the community, noting that community members traditionally collected berries, leaves, tubers, flowers, seeds, nectars and roots. Members of the Wreck Bay community also traditionally ate animals such as kangaroos, possums and echidnas, and foraged for crustaceans such as oysters, muttonfish, conches, pipis and mussels, collected at low tide. Yabbies from the creek were a common source of food, as was fishing. Residents of Wreck Bay caught mullet, whiting, bream, salmon and tailor using net-fishing methods and this formed a significant proportion of some people's diets.¹⁷
- 1.32 Information collected from community members about their cultural practices contributed to the formulation of Defence's human health risk assessment, and the advice provided to the community, summarised in Defence's [Human Health Risk Assessment factsheet](#). The advice relating to Mary Creek is reproduced below:








¹⁷ GHD, Department of Defence, [Jervis Bay Range Facility and HMAS Creswell Detailed Site Investigation Report](#), July 2019, p. 42.

Figure 2.7 Exposure-Risk Scenarios for Adults

Wreck Bay Community		
Using sediments on skin for sunscreen or ceremonial use		No elevated exposure risk.
Eating sediments from the Clay Pools or Summercloud Creek	Not assessed	Eating sediments from the Clay Pools is only known to occur by adult women during pregnancy.
Using mosses for medicinal purposes		No elevated exposure risk.
Drinking surface water from Mary Creek		Elevated exposure risk for children who frequently drink water direct from Mary Creek (up to 6 cups of water each week). Lower consumption (up to 2 cups per week) did not identify an elevated exposure risk. This advice ¹ is also relevant for using surface water from Mary Creek to cook food.
Recreational use (i.e. swimming, playing in creek or fishing) in Mary Creek		Elevated exposure risk for children who frequently use Mary Creek for recreation (up to 4 days each week). Lower use (up to 2 days per week) did not identify an elevated exposure risk. Because Mary Creek has the highest concentrations of PFAS in surface water on 403 lands, this scenario is protective of recreational use of other waterways (e.g. Summercloud Creek), which can be used with no elevated exposure risk.
Eating mammal (i.e. rabbit) meat		The risk assessment did not identify an elevated risk for mammal meat, even if eaten fortnightly . This assessment did not consider consumption of mammal offal by children, as this is not known to occur. This assessment was based on PFAS concentrations in rabbits collected near source areas on-base, which had higher PFAS concentrations than would be expected for rabbits or other mammals collected elsewhere.
Eating mammal (i.e. rabbit) offal	Not assessed	
Eating seafood from Mary Creek		The risk assessment identified elevated exposure risk even at low levels of consumption (one serve per week). Defence recommends that all existing precautionary advice¹ for eating seafood from Mary Creek is observed.
Eating seafood from Summercloud Creek and Wreck Bay marine environment.		The risk assessment did not identify elevated exposure risk, based on up to 7 serves of fish each week from Summercloud Creek or Wreck Bay.

Source: Department of Defence, [Human Health Risk Assessment Findings–fact sheet](#), 2018.

Figure 2.8 Exposure-Risk Scenarios for Children

Wreck Bay Community		
Using sediments on skin for sunscreen or ceremonial use		No elevated exposure risk.
Eating sediments from the Clay Pools or Summercloud Creek	Not assessed	Eating sediments from the Clay Pools is only known to occur by adult women during pregnancy.
Using mosses for medicinal purposes		No elevated exposure risk.
Drinking surface water from Mary Creek		Elevated exposure risk for children who frequently drink water direct from Mary Creek (up to 6 cups of water each week). Lower consumption (up to 2 cups per week) did not identify an elevated exposure risk. This advice ¹ is also relevant for using surface water from Mary Creek to cook food.
Recreational use (i.e. swimming, playing in creek or fishing) in Mary Creek		Elevated exposure risk for children who frequently use Mary Creek for recreation (up to 4 days each week). Lower use (up to 2 days per week) did not identify an elevated exposure risk. Because Mary Creek has the highest concentrations of PFAS in surface water on 403 lands, this scenario is protective of recreational use of other waterways (e.g. Summercloud Creek), which can be used with no elevated exposure risk.
Eating mammal (i.e. rabbit) meat		The risk assessment did not identify an elevated risk for mammal meat, even if eaten fortnightly . This assessment did not consider consumption of mammal offal by children, as this is not known to occur. This assessment was based on PFAS concentrations in rabbits collected near source areas on-base, which had higher PFAS concentrations than would be expected for rabbits or other mammals collected elsewhere.
Eating mammal (i.e. rabbit) offal	Not assessed	
Eating seafood from Mary Creek		The risk assessment identified elevated exposure risk even at low levels of consumption (one serve per week). Defence recommends that all existing precautionary advice¹ for eating seafood from Mary Creek is observed.
Eating seafood from Summercloud Creek and Wreck Bay marine environment.		The risk assessment did not identify elevated exposure risk, based on up to 7 serves of fish each week from Summercloud Creek or Wreck Bay.

Source: Department of Defence, [Human Health Risk Assessment Findings–fact sheet](#), 2018.

- 1.33 Because PFAS persist in the environment for an unknown amount of time (potentially thousands of years),¹⁸ the Rangers explained that it is likely that young people from the community will never have an opportunity to engage in these traditional practices or experience the lifestyle valued by their parents and grandparents, impacting their ability to pass down cultural knowledge and practices.
- 1.34 At Mary Creek, the committee was also told about traditional birthing practices involving the water from the creek. While the majority of women no longer practice traditional birth, the committee was told that contamination of Mary Creek means this practice is almost certainly lost forever.
- 1.35 The community has worked with the National Archives and Australian Institute of Aboriginal and Torres Strait Islander Studies to ensure the community has access to oral histories, photographs, and records of these cultural practices. WBACC has developed a [Cultural Heritage Strategy](#) and [Cultural Heritage Action Framework](#), and Rangers conduct education sessions for local children to raise awareness of the dangers of PFAS and to teach local children about their history.
- 1.36 As part of this education, children are told not to drink the water, eat crustaceans or bush food, or swim in Mary Creek. Community members described feeling a sense of 'tragedy' that the people cannot practice their culture and today's young people will never have those experiences.

Beach at Mary Bay

- 1.37 The committee was invited to walk down a steep hill to the beach at Mary Bay. This beautiful white sand beach is only accessed by the Wreck Bay Aboriginal Community and is not open to the public. Rangers explained that the Bay was once an important site for swimming, gathering food and feasting.
- 1.38 On the beach committee members could see the site where Mary Creek drains into the bay. Signage for the creek at this location was the same as the signage observed at Mary Creek. However, no such signage has been placed on Mary Bay Beach itself, and it is unclear to the committee whether the ocean water is regularly tested for PFAS contamination originating from the creek.

¹⁸ The John Hopkins Bloomberg School of Public Health, [The Omnipresence of PFAS – and What We Can Do About Them](#), 28 March 2024 (accessed 24 February 2025).

Figure 2.9 Signage at the Bay



Source: Chair's photograph.

- 1.39 The beach and surrounding coastline at Mary Bay contain highly significant middens which provide insight into traditional culinary and cooking practices, information about past flora and fauna, and evidence of patterns of settlement and culture. The committee heard that all coastal erosion is exposing previously unseen artefacts, including the bones of a whale and an ancient dingo and a baby.

Figure 2.10 Middens on the shoreline



Source: Chair's photograph.

- 1.40 Rangers told the committee that the community is now advised not to swim at the Bay, not to eat abalone, and to limit the consumption of fish from the area. Fish and seafood are a significant food source for many members of the community, and the committee was told that some community members continue to fish and swim and consume the seafood at Mary Bay.
- 1.41 Some Wreck Bay families also made their living selling seafood from the Bay. The committee was told that the last fishing family at Wreck Bay, the Ardler family, ceased operations a number of years ago as a result of the health advice provided by Defence.
- 1.42 On the beach, committee members observed a large python struggling in water. The python was covered in parasites and appeared to be dying. Rangers reported their concerns about the impacts of PFAS contamination on the plants and animals of Wreck Bay. These impacts have been researched and documented in GHD's *Ecological Risk Assessment*, published December 2020.¹⁹

Barbecue and sit down

- 1.43 Following the tour, committee members attended a barbecue where they met with a number of community members, including Elders. Committee members then sat down with community members to hear their concerns.

Figure 2.11 Senators at the visit



Source: Chair's photograph. From left to right: unnamed Ranger, Senator Whish-Wilson, Senator Thorpe, Senator Davey, Senator Ghosh and Ranger, Senior Ranger Rachelle McLeod.

¹⁹ GHD, Department of Defence, [Jervis Bay Range Facility and HMAS Creswell – Ecological Risk Assessment](#), December 2020 (accessed 24 February 2025).

- 1.44 After being welcomed by community leaders, Senator Thorpe gave a short speech introducing the committee and explaining the purpose of the committee's inquiry. The Chair thanked WBACC, the community, and the Bherwerre Rangers for the warm welcome and informative tour on Country. Senator Thorpe encouraged community members to attend the committee's public hearing, taking place in the nearby town of Nowra the following day, and provided information about giving evidence to Senate committees.

Figure 2.12 Chair speaking with community members



Source: Chair's photograph.

- 1.45 The Chair then introduced her fellow committee members. Senator Ghosh spoke, thanking the community and the Rangers. Senator Ghosh stated that it was an honour for the committee to have been taken out on Country and shown a number of culturally significant sites. Senator Davey echoed the gratitude of other committee members and spoke about the benefits of working together to address the very real concerns of community members. Senator Whish-Wilson described the tour as enlightening and special. Encouraging community members to give evidence at the hearing, Senator Whish-Wilson said that testimony from community members is powerful and has the capacity to help other people.

Figure 2.13 Deputy Chair speaking



Source: Chair's photograph.

- 1.46 Committee members explained the role and functions of a Senate committee along with the limitations. Community members heard that the committee will collect evidence, reflect that evidence in its report, and make recommendations to the Government. It was also noted that the Government is expected to respond to the committee's report within three months, and to directly address the recommendations.
- 1.47 A number of community members then spoke. One told the committee of her heartbreak at the loss of the carefree life she experienced as a child; and that the children of Wreck Bay will never know this freedom. A significant concern among those gathered was the uncertainty they face regarding the future. Community members told the committee, 'we want to know what's coming out of this inquiry; we want to know what will be done for the kids'.
- 1.48 Some spoke of the confusion and difficulties encountered when trying to engage with government about the contamination. In particular, the involvement of a number of different agencies, and the inconsistency of messaging. A number of people felt that 'no one is taking responsibility' for the potential health impacts of the contamination, and that the community is not being provided with sufficient information.
- 1.49 Community members gathered spoke about the class action and compensation for cultural loss. One community member talked about compensation amount, asking, is \$22 million 'all our culture is worth'? WBACC Board members explained the limitations of Australia's legal system in relation to claiming for

cultural loss and maintained that the outcome achieved was believed to be the best possible under the circumstances.

- 1.50 Some of the participants in the discussion felt that the settlement had been agreed too quickly, limiting opportunities for the people's stories to be told. Some felt that the community was not yet healed.
- 1.51 One community member was concerned that Commonwealth and state environmental agencies are not more actively involved in dealing with the PFAS contamination and remediation efforts.
- 1.52 Community members spoke about the adequacy of information provided about testing and remediation. Community members reported being concerned about drinking the tap water and explained that many residents, including Elders, currently buy bottled water, at significant personal expense, or from their Aged Care packages due to concerns that the water is contaminated with PFAS.
- 1.53 The issue of water rights was of concern to a number of people, who explained that, despite Aboriginal ownership of Wreck Bay, the community has to buy its water supplies from the NSW Government. Community members were also frustrated with the impacts of the administrative arrangements for Jarvis Bay Territory, with some suggesting that Wreck Bay is 'falling through the cracks', as it does not have access to a dedicated governmental authority. Community members felt that the unique governance arrangements in Jarvis Bay Territory can lead to a situation in which Commonwealth, state and territory authorities all refer to each other, with no one wanting to take responsibility for service provision, and addressing of concerns in the community.
- 1.54 One community member also clarified that Wreck Bay is the only area in the whole country which does not have a Senator as a representative in the Australian Senate.
- 1.55 There was a lack of trust in Defence and the Commonwealth among many of those gathered. Community members were concerned that the agency responsible for the contamination is also the agency responsible for resolving the problem, constituting a conflict of interest. It was also noted that Defence's remediation program only involves remediating soil and water within the boundaries of Defence land, and does not include remediation on Wreck Bay community land.
- 1.56 Participants outlined other impacts of the contamination. One participant explained that the community is unable to undertake cultural burning because this releases PFAS into the environment, and that residents are afraid to grow vegetables in their backyards due to contamination in the soil.
- 1.57 The committee was told that the community has lost a lot of people, who have died young, mostly from cancers. It was felt that the PFAS contamination is breaking the people's connection to their culture and the continuity of

connection to the land. This is a challenge the community is actively working to address every day.

- 1.58 A number of community members advocated for an independent authority to manage the contamination and remediation, and encouraged the committee to make recommendations that would improve the way in which PFAS contamination in Wreck Bay is addressed. Community members highlighted the need for greater involvement of Wreck Bay people in making decisions that affect them, their children, and their land and waters.

Public hearing

- 1.59 The following day the committee held a public hearing in Nowra to provide an opportunity for community members, and other witnesses, to give evidence in a more formal setting. Community members were invited to come along and speak with the committee as part of a community session in the morning. Thirteen community members gave evidence at the hearing, and many others gathered as observers of the hearing or to ask questions during the community roundtable.

Figure 2.14 Public hearing in Nowra



Source: Chair's photograph.

- 1.60 Committee members appreciate that speaking about these issues is difficult. The committee is grateful for the courage and generosity of individuals who provided evidence to inform the committee and assist it in conducting its inquiry.
- 1.61 Evidence from the public hearing is presented throughout this report.

Appendix 3

Submissions and additional documents

- 1 Professor Denis O'Carroll
 - Attachment 1
- 2 Department of Infrastructure, Transport, Regional Development,
Communications and the Arts
- 3 Dr Mariann Lloyd-Smith
- 4 Council for the Human Future
- 5 Mr Greg Peak
- 6 Mr Norvan Vogt
- 7 Hemp Farms Australia
- 8 Name Withheld
- 9 Fire Rescue Victoria
- 10 No Incinerator for Western Sydney (NIWS)
- 11 Professor Miriam K. Forbes, Dr Robin Gasiorowski, Professor Mark Patrick
Taylor
- 12 Dr Cheng Zhang
- 13 Climate Action Merri-Bek
- 14 Mr George Bury
- 15 Mr Simon Wood
- 16 Mr Robert Heron
- 17 Laundry Association Australia
- 18 Australian Academy of Technological Sciences and Engineering (ATSE)
- 19 Environmental Risk Sciences Pty Ltd (enRiskS)
- 20 NSW Premier's Department
- 21 Professor Deborah Glass
- 22 CSIRO
- 23 Westmark Pty Ltd
- 24 Australian Landfill Owners Association
 - Attachment 1
 - Attachment 2
 - Attachment 3
- 25 The Australian Furniture Association and the Australian Furnishing Industry
Stewardship Council
- 26 Name Withheld
- 27 Organisation for Economic Cooperation and Development (OECD)
- 28 Ms Joanna Pickford
- 29 North Queensland Airports Group
- 30 Concerned Waterways Alliance
- 31 Mr Russell Jennings

- 32 Ms Lynda Newnam
- 33 Department of Climate Change, Energy, the Environment and Water
- 34 Local Government NSW
- 35 Australian Academy of Health and Medical Sciences
- 36 crcCARE
- 37 Oakey Creek Groundwater Management Association
- 38 National Asthma Council Australia (NAC)
 - Attachment 1
- 39 Australian Airports Association
- 40 Waste Management and Resource Recovery Association
- 41 SciDev Limited
- 42 Australian Organics Recycling Association
- 43 Capital Airport Group
- 44 Clean Ocean Foundation
- 45 Australian Bedding Stewardship Council
- 46 Friends of the Earth Australia
- 47 Refrigerants Australia and AREMA
- 48 Ms Carole Stanford
- 49 Dr Cameron Shearer
- 50 Ms Amelie Bachir
- 51 Dr. Philippe Grandjean
- 52 Field & Game Australia
- 53 Australia & New Zealand Biosolids Partnership (ANZBP)
- 54 WWF-Australia
- 55 Environmental Defenders Office
- 56 Water Services Association of Australia
- 57 National Health and Medical Research Council
- 58 Veolia Australia and New Zealand
- 59 JJ's Waste & Recycling
- 60 Dr Matthew Askeland and Mr Andrew Mitchell
- 61 Loop Organics
- 62 Cancer Council Australia
- 63 Australian Academy of Science
- 64 Riverina Water County Council
- 65 Australian Industrial Chemicals Introduction Scheme (AICIS)
- 66 Department of Defence
- 67 APCO
 - Attachment 1
- 68 Northern Territory Department of Lands, Planning and Environment (DLPE)
- 69 Airservices Australia
- 70 Food Standards Australia New Zealand (FSANZ)
- 71 3M Corporate
- 72 Toxics Free Australia

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- 72.1 Supplementary to submission 72
 - Attachment 1
- 73 Tasmanian Government
- 74 Dr Daniel Deere
- 75 Professor Bernard Stewart
- 76 STOP PFAS Blue Mountains
- 77 Mr David Arthur
- 78 Lotsearch Pty Ltd
- 79 Natural Turf Alliance
- 80 Australian Pesticides and Veterinary Medicines Authority
- 81 Ms Heidi Fagan
- 82 Ms Erin Levee
- 83 Tellus
- Attachment 1
- 84 Professor Susan Wilson
- 84.1 Supplementary to submission 84
- 85 Professor Martyn Kirk, Dr Kayla Smurthwaite and Ms Susan Trevenar,
National Centre for Epidemiology and Population Health, Australian National
University
- 86 Ms Dianne Priddle and Mr William Jefferis
- 87 3M Australia
- 88 CropLife
- 89 Dr Kate Hughes
- 90 Queensland Water Directorate
- 91 Mr Christopher Howe
- 92 Ms Jayne Newgreen
- 93 Pacific Biotechnologies
- 94 Organic Operators Australia
- 95 Name Withheld
- 96 Mr Geoff Warham
- 97 Name Withheld
- 98 Name Withheld
- 99 Mr Alastair and Mrs Kellie-Jo McLaren
- 100 Department of Health and Aged Care interim Australian Centre for Disease
Control
- 101 Chemistry Australia
- 102 Dr Ian Wright
- 103 Name Withheld
- 104 United Firefighters Union of Australia
- 105 Dr Anne Smith
- 106 Mr Ian McDonald
- 107 Joint submission from Fytolutions, Earth+, and C-Biotech

- 108 Catholic Women's League Australia Inc.
- 109 Ms Louise Keats
- 110 Name Withheld
- 111 Soil Science Australia (SSA)
- 112 Queensland Alliance for Environmental Health Sciences
- 113 United Firefighters Union of Australia Aviation Branch
- 114 Mr Bob King
- 115 Minderoo Foundation
- 116 Confidential
- 117 Confidential
- 118 Australian Advocacy Group (AAG)
- 119 Mr Steven Daicos
- 120 Icon Water
- 121 Peak Oil Company
- 122 Pesticide Action Australia
- 123 Mr Lance Quintal
- 124 Mr Paul Adam
- 125 Ms Caroline Masters
- 126 Fire and Test Australasia
- 127 Launceston Airport

Additional Information

- 1 Dr Mariann Lloyd-Smith, IPEN, preliminary briefing submission (received 4 November 2024)
- 2 Department of Climate Change, Energy, the Environment and Water, preliminary briefing submission (received 4 November 2024)
- 3 Briefing material for Professor Martyn Kirk and Dr Kayla Smurthwaite, the National Centre for Epidemiology and Population Health (received 4 November 2024)
- 4 Professor Susan C Wilson, preliminary briefing submission (received 4 November 2024)
- 5 Professor Jochen Mueller, Queensland Alliance for Environmental Health Sciences, preliminary briefing submission (received 4 November 2024)
- 6 Australian Industrial Chemicals Introduction Scheme, preliminary submission (received 7 November 2024)
- 7 Society of Environmental Toxicology and Chemistry, Selection of academic journal articles on the environmental and human health impacts of PFAS (received 21 October 2024)
- 8 Department of Defence, clarification of evidence, public hearing 13 November 2024 (received 2 December 2024)
- 9 Professor Stuart Khan, Head of School of Civil Engineering, Sydney University, briefing material for public hearing 22 January 2025 (received 21 January 2025)

- 10 Chart detailing the relative concentrations of PFAS in consumer products, drinking water guidelines and biosolids, provided by the Water Services Association of Australia as briefing material for public hearing on the 22 January 2025 (received 21 January 2025)
- 11 Waste Dive media article, published November 2024, provided by Colin J Bosworth (received 26 November 2024)
- 12 Dr Matt Landos, Selection of academic journal articles on the environmental impacts of PFAS (received 26 February 2025)

Answer to Question on Notice

- 1 Department of Climate Change, Energy, the Environment and Water, response to written questions on notice from committee (received 29 October 2024)
- 2 Professor Denis O'Carroll, response to written question from Senator Thorpe (received 14 November 2024)
- 3 Professor Deborah Glass, response to written questions from Senator Thorpe (received 28 November 2024)
- 4 CSIRO, response to written questions from Senator Thorpe (received 2 December 2024)
- 5 Australian Pesticides and Veterinary Medicines Authority (APVMA), response to written questions on notice from Senator Thorpe (received 3 December 2024)
- 6 Professor Jochen Mueller, response to written question on notice from Senator Thorpe (received 4 December 2024)
- 7 Professor Jochen Mueller, answer to question taken on notice at a public hearing on 13 November 2024 (received 4 December 2024)
- 8 Department of Climate Change, Energy, the Environment and Water, response to written questions on notice from Senator Thorpe (received 4 December 2024)
- 9 Department of Climate Change, Energy, the Environment and Water, answers to questions taken on notice at a public hearing on 13 November 2024 (received 4 December 2024)
- 10 National Centre for Epidemiology & Population Health, Australian National University, responses to written questions on notice from Senator Thorpe (received 4 December)
- 11 National Health and Medical Research Council, response to written questions from Senator Thorpe (received 6 December 2024)
- 12 National Health and Medical Research Council, response to written question from Senator Thorpe (received 9 December 2024)
- 13 Australian Industrial Chemicals Introduction Scheme, responses to written questions from Senator Thorpe (received 9 December 2024)
- 14 Department of Defence, response to written questions from Senator Thorpe (firefighting foams and bottled water) (received 12 December 2024)

- 15 Department of Defence, response to written questions from Senator Thorpe (update on Defence actions) (received 12 December 2024)
- 16 National Health and Medical Research Council, response to written question from Senator Thorpe (received 13 December 2024)
- 17 Australian Industrial Chemicals Introduction Scheme, response to written question from Senator Thorpe (received 12 December 2024)
- 18 Professor Martyn Kirk, Dr Kayla Smurthwaite and Ms Susan Trevenar, National Centre for Epidemiology and Population Health, Australian National University, answer to question taken on notice at public hearing on 13 November 2024 (received 19 December 2024)
- 19 NSW EPA, response to written questions from Senator Thorpe (received 5 February 2025)
- 20 NSW EPA, answer to question taken on notice at public hearing on 22 January 2025 (received 5 February 2025)
- 21 Sydney Water, response to written questions from Senator Thorpe (received 7 February 2025)
- 22 Sydney Water, answer to question taken on notice at public hearing on 22 January 2025 (received 7 February 2025)
- 23 Water Services Association of Australia, response to written questions from Senator Thorpe (received 11 February 2025)
- 24 Dr Nicholas Chartres, response to written questions from Senator Thorpe (received 11 February 2025)
- 25 Craig Allsopp and Shine Lawyers, response to written questions on notice from Senator Thorpe (received 7 February 2025)
- 26 Shine Lawyers, response to questions taken on notice, public hearing 21 January 2025 (received 7 February 2025)
- 27 Department of Defence, response to questions on notice, public hearing 21 January 2025 (received 11 February 2025)
- 28 Department of Health and Aged Care, response to questions on notice, public hearing 22 January 2025 (received 11 February 2025)
- 29 Department of Defence, response to written questions on notice from Senator Thorpe (received 17 February 2025)
- 30 Professor Stuart Khan, Head of School of Civil Engineering at the University of Sydney, responses to written questions on notice from Senator Thorpe (received 26 February 2025)

Appendix 4

Public hearings and witnesses

Wednesday 13 November 2024

2S1 Parliament House, Canberra

CSIRO

- Dr Peter Mayfield, Executive Director, Environment Energy and Resources
- Dr Jason Kirby, Group Leader, Environment Business Unit
- Dr Jens Blotevogel, Team Leader, Environment Research Unit
- Dr Liam Hall, Team Leader, Quantum Biotechnology, Manufacturing
- Dr David Beale, Senior Research Scientist, Environment Research Unit

Department of Climate Change, Energy, the Environment and Water

- Ms Kate Lynch, Division Head, Circular Economy Division
- Ms Rachel Burgess, Branch Head, Chemicals and Atmosphere Branch, Circular Economy Division
- Ms Kate Elliot, Branch Head, Wildlife, Waste and Environmental Permits Branch

Department of Defence (PFAS Investigation and Management Program)

- Ms Celia Perkins, Deputy Secretary, Security and Estate
- Ms Kathleen Leane, Assistant Secretary, PFAS Investigations and Management

Department of Infrastructure, Transport, Regional Development, Communication and the Arts (PFAS Airports Investigation Program)

- Ms Marisa Purvis-Smith, Deputy Secretary, Transport Group
- Ms Sarah Nattey, Acting First Assistant Secretary, Domestic Aviation and Reform Division
- Ms Tori Wright, Assistant Secretary, Airport Environment Branch

Australian Industrial Chemicals Introduction Scheme

- Mr Graeme Barden, Executive Director

Panel of PFAS contamination and remediation experts

- Professor Denis Michael O'Carroll, University of New South Wales
- Professor Susan C Wilson, Professor in Environmental Pollution, University of New England

Panel of PFAS human health experts

- Professor Martyn Kirk, National Centre for Epidemiology and Population Health, Australian National University

- Dr Kayla Smurthwaite, Research Fellow, The National Centre for Epidemiology and Population Health, Australian National University
- Professor Deborah Glass, Private capacity
- Professor Jochen Mueller, Theme Leader, Emerging Environmental Health Risks, Queensland Alliance for Environmental Health Sciences, University of Queensland

Tuesday 21 January 2025

Nowra School of Arts

11 Berry Street, Nowra

Wreck Bay Community members and representatives

- Ms Annette Brown, Chairperson, Wreck Bay Aboriginal Community Council
- Mrs Tamara Mitchell, Chief Executive Officer, Wreck Bay Aboriginal Community Council
- Mrs Coral Ardler Yuke, Private capacity
- Mr Keiran Assheton, Private capacity
- Mr Darren Brown, Private capacity
- Mr Keiron Brown, Private capacity
- Ms Maxine Brown, Private capacity
- Mr Clive Freeman, Private capacity
- Mr Gavin McLeod, Private capacity
- Mr Henry (Sonny) Simms, Private capacity
- Mr Matt Simms, Private capacity
- Mr Darryn Sturgeon, Private capacity
- Ms Donya Whaddy, Private capacity

Dr David Goldberg, Private capacity

Shine Lawyers

- Mr Craig Allsopp, Joint Head of Class Actions

Associate Professor Nicholas Osborne, Private capacity

Department of Defence

- Ms Celia Perkins, Acting Associate Secretary
- Mr Pat Sowry, Acting Deputy Secretary Security and Estate Group

Wednesday 22 January 2025

Hornseywood Hall

Penrith RSL

8 Tindale Street, Penrith

Roundtable discussion

- Mr Jon Dee, Stop PFAS
- Ms Joanna Pickford, Private capacity
- Mr Alastair McLaren, Private capacity
- Dr Stuart Khan, Professor and Head of School Civil Engineering, University of Sydney
- Dr Ian Wright, Associate Professor, School of Science, Western Sydney University
- Dr Nicholas Chartres, Senior Research Fellow, School of Pharmacy, Faculty of Medicine and Health, University of Sydney

Water Services Association of Australia

- Mr Adam Lovell, Executive Director

WaterNSW

- Mrs Fiona Smith, Executive Manager—Strategy and Performance
- Mr Ronan Magaharan, Executive Manager—Operations

Sydney Water Corporation

- Mr Paul Plowman, Executive General Manager, Water and Environment Services
- Dr Kaye Power, Principal Water and Public Health Advisor

NSW Environmental Protection Authority

- Mr Tony Chappel, Chief Executive Officer
- Mr Stephen Beaman, Executive Director, Regulatory Practice and Services

National Health and Medical Research Council

- Mr Alan Singh, Executive Director, Research Quality Branch
- Dr Kristal Jackson, Director, Environmental Health Section

Wednesday 12 March 2025

Cataract Suite, Sebel Hotel Launceston

12-14 St John Street, Launceston

Dr Matt Landos, Director, Future Fisheries Veterinary Services

Ms Jane Bremmer, Chair, Toxics Free Australia

Australia Pacific Airports (Launceston) (APAL)

- Mr Shane O'Hare, Chief Executive Officer
- Mr Ilya Brucksch, Head of Planning, Development and Customer
- Mr Ben Moore, Senior Environment Advisor, Melbourne and Launceston Airports

TasWater

- Mr Graham Hawke, Chief Scientist

Department of Natural Resources and Environment Tasmania

- Ms Holly Mackey, Acting CEO, Tasmanian Waste and Resource Recovery Board

Minderoo Foundation

- Professor (Emeritus) Sarah Dunlop, Head, Plastics and Human Health

Airservices Australia

- Mr Paul Stoddart, Chief Customer & External Relations Officer
- Ms Michelle Peterson, Chief Aerodromes Officer
- Mr James Comley, PFAS Technical Lead

Department of Infrastructure, Transport, Regional Development, Communications and the Arts

- Ms Jennifer Stace, Acting First Assistant Secretary, Domestic Aviation and Reform
- Ms Tori Wright, Assistant Secretary, Airport Environment