



Fact Sheet Norfolk Island PFAS Preliminary Site Investigation

Background

Per- and polyfluoroalkyl substances (PFAS) were detected at three test sites on Norfolk Island in late 2019, when CSIRO was conducting water studies on the Island. The Department of Infrastructure, Transport, Regional Development and Communications (the department) hired environmental consultants, Senversa, to conduct a detailed environmental investigation.

In early–mid 2020, environmental consultants Senversa undertook a PFAS Preliminary Site Investigation (PSI) on Norfolk Island. The objectives of the PSI included investigation of potential PFAS source areas, identification of PFAS migration pathways and sensitive receptors, and the targeted assessment of drinking water sources across the island.

Historical PFAS use at Norfolk Island International Airport

PFAS-containing aqueous fire-fighting foam (AFFF) (commonly known as legacy AFFF) was reportedly introduced at the airport in the early 1980s and was used (predominately on-airport) until 2015. When compared with many similar mainland airports, AFFF with PFAS as active ingredients appears to have been used on Norfolk Island for a shorter time (and likely in smaller volumes). The remaining stocks of legacy AFFF are currently held at the fire station and are proposed to be taken off-Island in the near future.

Key PFAS source areas

Through review of historical land use and activities that used legacy AFFF, potential PFAS source areas were identified on and off the airport. Six on-airport areas (shown in **Figure 1** below) have been identified as the most significant potential source areas, as heavier application occurred for several years in these areas.

Other potential source areas, including some off-airport areas, have been identified but these are all considered to be less significant due to the lower volume of AFFF likely applied over time. Off-airport areas include the off-site training area at St Barnabas Chapel, the council works depot where historical fire truck maintenance took place and other



Figure 1: Significant PFAS Source Areas




areas where foam was applied as a single event (e.g. in response to incidents).

Testing results

Targeted soil, sediment, surface water and ground water sampling was undertaken over a two-week period in January 2020. 172 samples consisting of 25 groundwater samples, 17 surface water samples, 41 sediment samples and 89 soil samples both on the airport and across the broader island were collected and analysed for PFAS. Key results are summarised below:

- **Private drinking water supplies:** All privately-owned drinking water sources sampled were found to have PFAS levels **below** the health based guidance values (HBGVs) for PFAS in drinking water. The privately-owned drinking water sources assessed included three water carters and tanks / groundwater bores within the Mission Creek catchment. Based on these results, continued use of the tested water supplies used for drinking water is acceptable.
- **Water supplies at public facilities:** At three public facilities (hospital, works depot and fire station) PFAS levels in water sampled from internal water taps and groundwater tanks were **above** the HBGV for PFAS in drinking water. The PFAS levels at all three facilities was linked to supply of water from the Airport Bore that was identified by CSIRO in December 2019 as having elevated concentrations of PFAS. Senversa re-sampled the Airport Bore and also identified elevated PFAS levels. Upon confirmation of the analytical results, alternative drinking water supplies have been provided at these locations and other potentially affected public facilities (including the airport, which is understood to have previously used water from the Airport Bore).
- **Public toilets:** Airport Bore water is also used in public toilets across the island but the potential for exposure during hand-washing and toilet-flushing is likely to be relatively low given the frequency and duration of exposure, the limited potential for PFAS adsorption through the skin, and the non-volatile nature of PFAS. Signage is in place at toilet facilities across the island to indicate the water should not be drunk. This will manage potential exposures to PFAS within public toilets.
- **Use of water for cattle and produce:** PFAS was identified in three water sources used for the watering of stock, chickens and vegetables within the Mission Creek catchment. Exposure to the measured levels of PFAS is unlikely to affect the health or condition of cattle. However, where PFAS is present in water used for stock watering and/or irrigation, it can be taken up into meat, eggs and produce and people who consume such produce can be subsequently exposed. Further assessment of these pathways is required. When cattle source their water from a variety of sources (that is, not all of the water they drink is from a PFAS-affected source), this will reduce the potential exposures via this pathway.
- **Groundwater:** Concentrations of PFAS above the HBGVs in groundwater was restricted to the Mission Creek surface water catchment. The 11 groundwater samples obtained in five other surface water catchments on the island were all below laboratory detection limits with the exception of one groundwater sample obtained adjacent Headstone Creek, which was above laboratory detection limits but below the HBGV.
- **Creek water:** Elevated concentrations of PFAS above the HBGVs were identified within the surface waters of Mission Creek and Watermill Creek. Concentrations above laboratory detection limits but below the HBGVs was identified in Headstone Creek, with the one surface water sample obtained from Broken Bridge Creek below detection limits.
- **Soil and sediment (on-airport):** PFAS concentrations in all soil samples were below the adopted commercial land use human health screening value assessment criteria. Sediment samples from drains on and around the airport (collecting run-off from the airport) were generally below the adopted human



health screening values HHSV with the exception of two samples, which were samples collected off-site adjacent to the maintenance facility. The results indicate risks to airport workers contacting the soil and sediment are low and acceptable as there is likely to be limited exposure to sediment in drains.

- **Soil (off-airport):** PFAS concentrations in all off-airport samples were below the adopted human health screening values (HHSV) for residential land use, indicating risks to people contacting the soil are low and acceptable.
- **Sediment (off-airport):** PFAS concentrations at a number of locations exceeded the residential HHSV. The residential HHSV assumes that fruit and vegetables could be grown in soil for home consumption, as well as offering protection for people coming into daily contact with soil, so exceedances of this screening level do not necessarily mean there are potential risks to people who contact the sediment less frequently. PFAS concentrations in the sampled sediment are below the HHSV for all other land uses, including for public open space. The public open space guidance values are derived on the basis that daily contact with soils could occur (but they assume that no produce is grown in the soils). The open space guidance values are considered conservative to assess the potential risks associated with incidental contact with these sediments (which is likely to occur infrequently).

What are the next steps?

The PSI identified eight 'data gaps' where further information is required to understand potential risks to human health and/or the environment, and identify appropriate management controls. A detailed site investigation (DSI) will be undertaken to address the data gaps identified in the PSI. As part of the DSI, additional data will be collected to further investigate PFAS in groundwater, surface water, soil, sediment and biota on Norfolk Island.

Senversa are returning to Norfolk Island in March 2021 for two weeks to collect additional samples.

Is the water safe to drink?


All privately-owned drinking water sampled by Senversa were found to have concentrations of PFAS below adopted health based guidance values.

Three public facilities were found to have concentrations of PFAS above adopted health based guide values. These facilities now have alternative drinking water supplies.

The supply of alternative drinking water will continue until the Detailed Site Investigation results become available.

Is it safe to swim in the Mission Creek and Watermill Creek areas?

The advice not to drink water from Mission Creek or Watermill Creek remains current and will be refined during the Detailed Site Investigation. People may be exposed to PFAS-affected water while swimming, however PFAS have very low/negligible absorption rates through the skin.



Should people be concerned about using the water for livestock or food production? Or consuming local animal products and fresh produce?

Further assessment of other potential exposure pathways – including agriculture and food production – will be undertaken as part of the ongoing investigations. We will then be able to provide the community with more specific information on this issue.

PFAS accumulates in humans over long periods of exposure to PFAS-affected sources, such as food or water. Given this, while further testing and analysis is undertaken, continuing with current practices would not have a significant impact on exposure.

Where can I get more information?

If you have questions or would like further information, we encourage you to contact NIPFAS@infrastructure.gov.au. Community members can also contact the Department on 23315.

For general information on PFAS, please go to www.pfas.gov.au. For health information, go to <http://www.health.gov.au/pfas>.

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