

## Human Intake of PFAS from Locally-Sourced Foods in Environments Impacted by 3M Lightwater™

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**Background/Objectives.** The Australian Department of Defence is undertaking a nationwide PFAS Investigation and Management Program to assess the nature, extent and impact of PFAS contamination from legacy AFFF use on Defence sites. Where the abiotic data indicated a plausible pathway or elevated exposure risk to human health or ecology, sampling and testing of biota were also conducted. Human health risk assessments were undertaken to comply with the Australian National Environment Protection (Assessment of Site Contamination) Measure (NEPM), and to assess and inform the surrounding communities of the potential effect of the contamination. The main AFFF product used by the Australian Department of Defence between 1987 and 2004 was 3M Lightwater™, and therefore the impact is dominated by PFOS and PFHxS. In several of the investigations the conceptual site model identified multiple pathways for people in the area to potentially be exposed to PFAS, including through consumption of homegrown produce, recreationally caught foods or bush tucker.

**Approach/Activities.** Direct measurement was conducted of over 300 homegrown produce samples, 500 fish samples and 50 bush foods. Specimens were selected for collection and testing based on a combination of community requests and offers, and by targeting areas that represent high exposure conditions or frequent food sources. Commercially produced foods were not identified as a high exposure potential, due to distribution of food sources through the broader community, and the specific food types having low PFAS accumulation. Samples of edible portions of fruits, vegetables, eggs, fish, crustaceans, reptiles, poultry and mammals were collected. The samples were analyzed for 28 PFAS compounds. Results were used to develop exposure point concentrations in human health risk assessments, which were undertaken in accordance with the NEPM, specific procedures of which are based on the USEPA Risk Assessment Guidance.

**Results/Lessons Learned.** Homegrown produce presented some potential for intake approaching the tolerable daily intake in areas of the highest concentrations in irrigation water. The results of the analyses identified that certain fruits and vegetables represented very low PFAS exposure regardless of related water concentrations. Leafy greens, potatoes and pumpkin presented some potential for PFAS intake, but concentrations and volumes consumed did not result in significant intake of PFAS. Consumption of eggs from poultry watered with contaminated water presented the highest exposure potential from homegrown produce. Recreationally caught foods also presented a potentially significant source of PFAS intake, depending on the frequency of consumption. PFOS concentrations in fish varied with species generally consistent with diet. Herbivorous fish exhibited higher concentrations than carnivorous fish in the same environment. Results indicated a half-life of PFOS in fish was short enough that significant fluctuations were observed over a year where river water concentrations varied between the wet and dry seasons.