



RAAF Base East Sale - Human Health and Ecological Risk Assessment

PFAS Investigation and Management Program

About the Investigation

In May 2016, Defence commenced a detailed environmental investigation to identify the nature and extent of per- and poly-fluoroalkyl substances (PFAS) on, and in the vicinity of, RAAF Base East Sale as a result of the historical use of legacy firefighting foams at the Base.

The investigation will identify whether the use of these foams has resulted in risks to human health or ecosystems and will help develop strategies to minimise exposure, should these be required.

Preliminary Site Investigation

The first stage of the investigation, the Preliminary Site Investigation (PSI), was completed in October 2016. This stage involved the historical review of legacy firefighting foam use and storage to identify where and when legacy firefighting foam was used (sources), how PFAS moves in the environment (migration pathways), and whether people, animals and the environment may be exposed to PFAS (receptors).

Detailed Site Investigation

The second stage of the investigation, the Detailed Site Investigation (DSI), commenced in September 2016 and was finalised in June 2017. The DSI involved sampling of soil, sediment, surface water, ground water and grass to collect information to better understand how PFAS moves through the environment.

Summary of the Detailed Site Investigation findings

- Low PFAS concentrations were reported in soil samples across the base. Soil samples collected on private properties off-base recorded very low concentrations of PFAS that are many times lower than the adopted human health screening criteria for a residential setting.
- Elevated concentrations of PFAS were identified in on-base shallow groundwater and drainage line surface waters. Lower concentrations in groundwater and surface water were identified off-base.

- The main pathway for off-base migration of PFAS is via surface water drainage features, and to a lesser extent groundwater.
- The Detailed Site Investigation findings identified the need to complete a Human Health and Ecological Risk Assessment (HHERA).

The PSI and DSI reports are available on the RAAF Base East Sale investigation website.

Human Health and Ecological Risk Assessment

Based on the data collected in the DSI, Defence commenced a Human Health and Ecological Risk Assessment (HHERA) in October 2017. The aim of the HHERA is to better understand the risks posed by PFAS to people and the environment. The HHERA will be delivered in two stages. The first stage will provide interim guidance regarding risks associated with most pathways and activities to PFAS exposure. The second stage will deliver the final HHERA which will address data and information gaps outlined in the Interim HHERA.

To provide data for the HHERA, extensive additional sampling was undertaken as part of the investigation at the RAAF Base and in the surrounding area. This included further sampling of soil, water, grass and aquatic plants and animals (including fish and ducks from the Heart Morass) and analysis of these samples to see if they contained PFAS.

The following samples have been collected and analysed as part of the detailed environmental investigations:

East Sale Sampling		
Sample Type	On-Base Samples	Off-Base Samples
Soil	386	67
Groundwater	87	76
Drinking water	1	4
Surface water	49	69
Sediment	67	67
Grass	17	24
Aquatic plants and animals (Fish, eels, plants, invertebrates)	16	22
Ducks		10





HHERA Approach

The general approach for the HHERA included:

- **Separate assessment of on-site areas** as there are higher concentrations of PFAS on-site and the nature of potential exposures is different.
- **A broad assessment of off-site areas** to allow conclusions to be drawn for the whole investigation area.
- **A screening assessment** to exclude pathways with low and acceptable risk and include pathways or activities for which further and more detailed assessment was required in the HHERA.

Summary of the Interim HHERA

The Interim HHERA involved estimating the level of exposure from the different exposure pathways or activities and comparing this estimated exposure with the Health Based Guidance Values defined by Food Standards Australia and New Zealand (FSANZ). If the estimated exposure is below the acceptable level, it is concluded that the risks are low and acceptable. If the estimated exposure is above the acceptable level, it is concluded that the risks are potentially elevated. The findings of the HHERA are below.

Low and Acceptable Risks

Off-Base	On-Base
Consumption of milk, meat (excluding duck) or offal	Contact with groundwater or drain water
Livestock Health	Land ecosystems
Contact with drain water	Contact with soil by on-Base personnel
Water contact through recreational use of Heart Morass (people and pets)	Contact with soil by intrusive workers and construction workers on-Base
Consumption of chicken eggs	Drinking water
Contact with soil and water (e.g. gardening or non-potable domestic water use)	Contact with soil by sensitive Base users (e.g. kindergarten, child-care)
Consumption of home-grown fruit and vegetables	Contact with soil on Defence-owned land leased for grazing
Drinking water	
Land ecosystems	

Potentially Elevated Risks

Off-Base	On-Base
Consumption of recreationally hunted duck	Consumption of livestock raised on Defence owned grazing land
Consumption of recreationally or commercially caught fish/eels	
Aquatic ecosystems	

The detailed HHERA assessment found potentially elevated exposure risks associated with home consumption of ducks, fish or eels hunted recreationally from the Heart Morass.

According to the Environment Protection Authority (EPA) Victoria, people who have eaten fish, eels and ducks are not considered to be at risk of any adverse health effects. However, EPA Victoria recommends that recreational fish and game hunters do not consume fish, eels or ducks caught at the Heart Morass Wetlands until further notice. For further information, visit:

<http://www.epa.vic.gov.au/~media/Publications/1672%201.pdf>.

Based on results of the HHERA, further assessment is needed to better understand the potential risks associated with home consumption and public consumption of livestock raised on the Defence-owned grazing land.

Next steps

The Interim HHERA has provided Defence a greater understanding of the current human and ecological risks from exposure to PFAS at the RAAF Base and within the investigation area.

The Interim HHERA has been developed in consultation with the EPA Victoria, other Victorian Government agencies and the independent Environmental Site Auditor to assist in developing management measures.

Additional work will be undertaken to address data gaps and provide more certainty in the information delivered in the Interim HHERA. Defence will work with EPA Victoria and other Victorian Government agencies to complete this work and deliver the findings in early 2018.





Defence will also be developing a site-specific Strategic Management Plan in addition to the sampling, information gathering and analysis for the final HHERA. The Plan will identify and prioritise management activities to address the human health and ecological risks identified during the investigation.

Government Guidance

Advice about human health issues must come from appropriate authorities such as State and/or local health authorities and practitioners. Defence has provided the HHERA to the respective authorities.

Defence relies on health advice from the Australian Government's Environmental Health Standing Committee (enHealth). According to enHealth, there is currently no consistent evidence that exposure to PFAS causes adverse human health effects.

However, because these substances persist in humans and the environment, enHealth recommends that human exposure is minimised as a precaution.




Keeping the community informed

The measured concentrations of PFAS identified during the further investigations have been provided to neighboring residents and property owners.

Defence will continue to keep the community informed on the progress of the investigation and the implementation of the Strategic Management Plan. As well as community information sessions, updates will be provided through the project website, direct mail and information sheets as new information becomes available.

Contact Information

RAAF Base East Sale Investigation Hotline

-  Phone 1800 365 414
-  Email PFASDefenceCoordination@golder.com.au
-  Website <http://www.defence.gov.au/environment/pfas/EastSale/>
-  Post RAAF Base East Sale Environmental Investigation Project
PO Box 165 Collins Street West Post Shop Melbourne VIC 8007

Media enquiries should be directed to Defence Media on (02) 6127 1999 or media@defence.gov.au

Useful Links

Department of Health

-  Phone 1800 941 1800
-  Website www.health.gov.au/PFAS

Environment Protection Authority Victoria

-  Phone 1300 372 842
-  Website <http://www.epa.vic.gov.au/your-environment/land-and-groundwater/pfas-in-victoria>

Food Standards Australia and New Zealand (FSANZ)

-  Website <http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-pfas.htm>

