



Australian Government  
Department of Defence  
Estate and Infrastructure Group

# Community Information Session

## PFAS Investigation & Management Program

RAAF Base Wagga  
Human Health and Ecological Risk Assessment

12 November 2018



## Acknowledgment of Country

We would like to respectfully acknowledge the Wiradjuri people, the traditional custodians of the land on which this meeting takes place, and also pay respect to Elders both past and present.

We would also like to pay our respects to the Indigenous men and women who have contributed to the defence of Australia in times of peace and war.

# Welcome

## Session outline:

- What are PFAS?
- About Defence's PFAS Investigation and Management Program
- HHERA RAAF Base Wagga key findings
- Next Steps
- Further information and questions

## Speakers:

- Chris Birrer, First Assistant Secretary Infrastructure, Defence
- Derek Langgons, Environmental Investigation Lead, Jacobs

# PFAS Investigation and Management Program

From  
1950s

From  
1970s

2003

From  
2004

2010

2015 -  
Present

Widely used around the world to make products that resist heat, stains, grease and water.

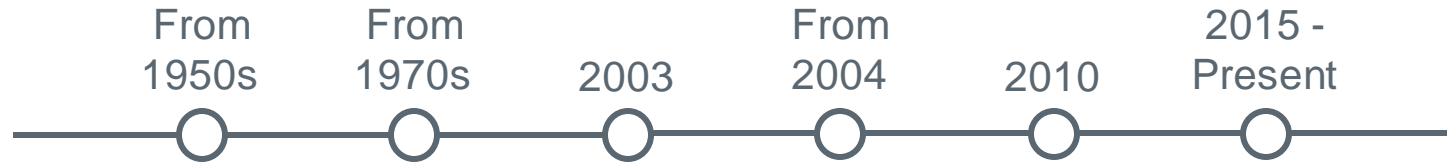
Used in legacy firefighting foam to extinguish liquid fuel fires by both civilian and military authorities.

Most people in developed countries are likely to have levels of PFAS in their blood.



- Perfluorooctane sulfonate (PFOS)
- Perfluorooctanoic acid (PFOA)
- Perfluorohexane sulfonate (PFHxS)

# PFAS Investigation and Management Program



From  
1970s

PFAS was used in legacy firefighting foam to extinguish liquid fuel fires by both civilian and military authorities.

2003

Defence and other users became aware that PFOS/PFOA was an emerging persistent organic pollutant.

From  
2004

Defence introduced a new foam and commenced phasing out use of the old foams for both training and emergencies.



## Health Guidance

*“ There is currently no consistent evidence that exposure to PFOS and PFOA causes adverse human health effects. Because these chemicals persist in humans and the environment, enHealth recommends that human exposure to these chemicals is minimised as a precaution. ”*

**The Environmental Health Standing Committee (enHealth)**

- Defence relies on the advice of Australian health authorities.
- In May 2018, enHealth’s advice was reaffirmed by an independent Expert Health Panel which was established by the Department of Health.

## What has the investigation involved?

Defence has engaged a lead environmental consultant (Jacobs) to undertake the investigation at RAAF Base Wagga.

A separate consultant (Environmental Resources Management (ERM)) has been engaged to conduct a peer-review/ auditing function on the environmental investigation.

The detailed environmental investigations were undertaken in accordance with the National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM).

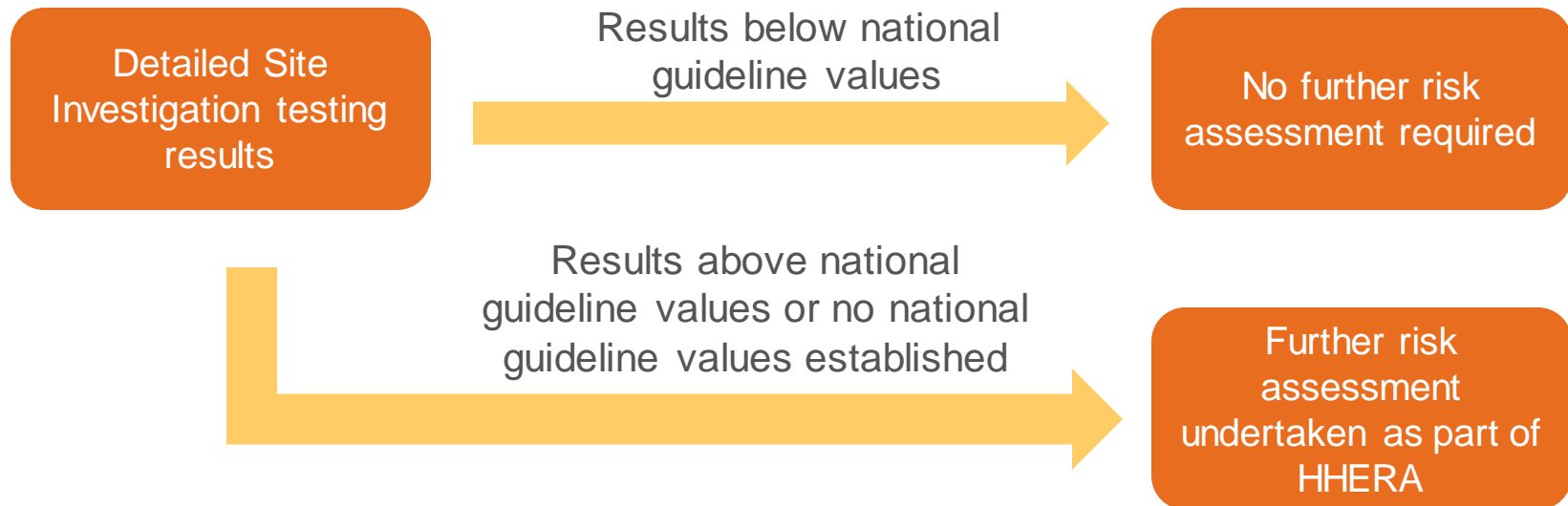
There are three main stages to the investigations:





# Human Health and Ecological Risk Assessment

The HHERA was undertaken in accordance with guidelines and protocols endorsed by Australian regulators, including PFAS specific guidance. It comprised a detailed (quantitative) HHRA and a screening level (qualitative) ERA.



## Human Health and Ecological Risk Assessment

### ✓ What it can tell us

- Activities to avoid to minimise PFAS exposure (as per NSW state agency advice).
- Potential for ecosystems (plants and animals) to be exposed to PFAS above conservative screening levels.
- Inform future management actions.

### ✗ What it can't tell us

- Potential future health effects for individuals.
- Whether existing health effects for individuals are associated with past exposure.
- Medical advice.
- Predict adverse effects in ecosystems (plants and animals).











## Findings from the Detailed Site Investigation

Issue	Current potential risk?	Future potential risk?
<i>Base personnel (excluding construction and maintenance workers)</i>	No	No
<i>Contact with soil off-Base</i>	No	No
<i>Contact with water off-Base</i>	Yes	Yes
<i>Consumption of fish and yabbies</i>	Yes	Yes
<i>Consumption of home grown produce</i>	No	Yes
<i>Drinking water supplies</i>	No	Yes
<i>Aquatic Ecosystems</i>	Yes	Yes
<i>Terrestrial Ecosystems</i>	No	No
<i>Risks to higher order predators consuming aquatic plants and animals</i>	Yes	Yes

Potential risks identified in the DSI have now been assessed in the HHERA

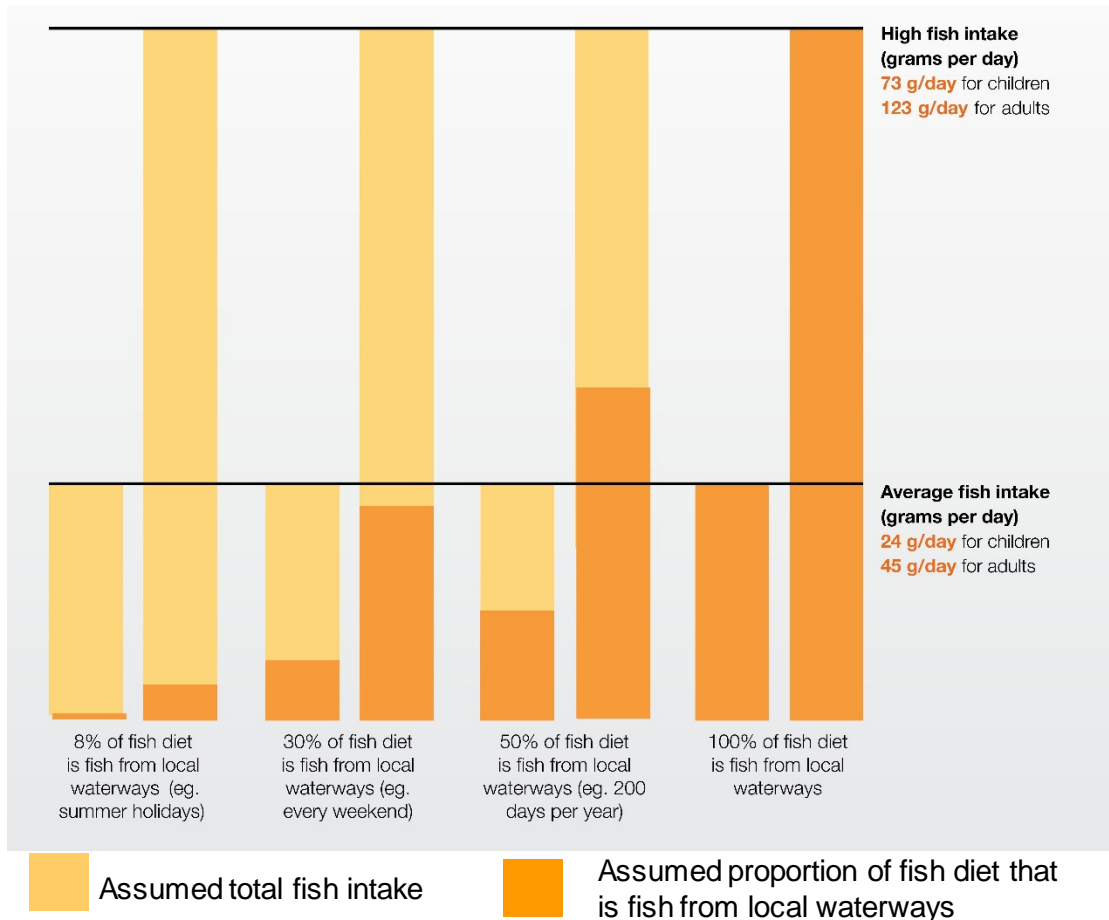
# Sampling undertaken for HHERA

- Fish and yabbies in the Murrumbidgee River, Marshalls Creek, Murray Cod Hatchery and Farm dams around the Base
- Additional surface water sampling in local waterways
- Groundwater sampling at various locations
- Pump test program on the Riverina Water East Wagga bores

Number of fish and yabbies collected for PFAS analysis as part of the HHERA				
Species	Murrumbidgee River	Marshalls Creek	Farm dams	Total caught
 Murray Cod	12			12
 Golden Perch	43			42
 Carp	125	7		132
 Goldfish		5		5
 Shrimp	>10	2		>12
 Smelt	>10			>10
 Gudgeon	3			3
 Yabby		5	25	30
 Carp Gudgeon			14	14
 Mosquito fish		60	>5	>60

# How are human health exposure risks assessed for fish and yabby consumption?

- Concentrations of PFAS in fish and yabbies from sampling
- Average and high fish intakes for children and adults based on information from Food Standards Australia & New Zealand
- Proportion of fish diet that is fish from local waterways



## Results of human health risk assessment for fish and yabby consumption

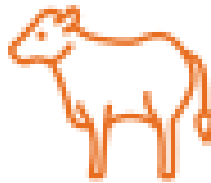
Overall, health risks from consuming fish and yabbies from local waterways were estimated to be low and acceptable

- Potential unacceptable risk identified for Children that are **high** fish consumers and:
  - 50% or more of their fish diet is Carp or Smelt or 100% of their fish diet is Murray Cod from the Murrumbidgee River
  - 30% or more of their fish diet is Carp or 50% is Gudgeon or 100% is yabbies from Marshalls Creek
  - 100% of their fish diet is yabbies from farm dams
- Potential unacceptable risk identified for Adults that are **high** fish consumers and:
  - 100% of their fish diet is Smelt from the Murrumbidgee River
  - 100% of their fish diet is Carp from Marshalls Creek

## Consumption of home grown produce



Fruit and Vegetables



Livestock



Eggs

- Investigations to date have not identified any properties where livestock, fruit, vegetables or eggs are being grown in PFAS impacted soil or using PFAS impacted water for home consumption
- Modelling undertaken for the HHERA has identified potential unacceptable exposure risks if produce is grown in PFAS impacted soil or using PFAS impacted water for home consumption in the future. This includes the following areas:
  - Gumly Gumly Wetland and surrounding properties
  - Marshalls Creek

## Contact with surface water

- No unacceptable health risks associated with contact with or incidental ingestion of PFAS impacted surface water.
- A child would need to swim in the Gumly Gumly Wetland farm dams or Marshalls Creek for 1.5 hours each time, 90 days a year and ingest 1 cup of water each time before there was the potential for unacceptable health risks.





## Ecological risks

- No unacceptable risk to terrestrial animals (including livestock) coming in to contact with soil in PFAS affected areas was identified.
- Potential risk of exposure from bioaccumulation in mammals that eat insects which live in PFAS impacted soil and sediment was identified in some areas including Gumly Gumly Wetland and Marshalls Creek.
- Potential risk of exposure to aquatic animals from direct contact with impacted surface water was identified in some waterways including Gumly Gumly Wetland and Marshalls Creek.
- Potential risk of exposure was identified for birds and mammals that consume aquatic animals from local waterways in the Study Area.

## Future movement of PFAS in groundwater

- A groundwater model is being developed to help us refine our understanding of the extent of groundwater contamination and potential risks to drinking water supplies in the future
- The groundwater model findings will be reported as part of the PFAS Management Area Plan
- An Ongoing Monitoring Plan will be implemented to validate the model and monitor PFAS movement in the future

## Next Steps



Further investigation of PFAS in sewer and stormwater on Base



Completion of groundwater model



Development of PMAP



Ongoing monitoring

# Stakeholder and Community Engagement



Website



Information  
Line



Factsheets &  
Newsletters



Advertisements  
& Flyers



Individual  
Correspondence



Community  
Information Sessions






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# Questions

# Thank you

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## Contact us

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