



26 October 2017

Anne Sibbel  
22 Turner Road  
Bullsbrook WA 6084

Dear Ms Sibbel

**Re: RAAF Base Pearce Environmental Investigation – Bore test results**

I am writing to you on behalf of the Department of Defence (Defence) to provide you with the test results from the sample collected on 5 September from your property, 22 Turner Road Bullsbrook WA 6084 (Property).

The sample collected from your Property was analysed for per- and poly-fluoroalkyl substances (PFAS). The results for the sample collected from your Property are in the enclosed Certificate of Analysis.

**Test results**

The test results of the sample collected from your Property are presented Table 1 of this letter with comparison against the relevant screening guidelines where available. Please note: Table 1 only lists the results for perfluorooctane sulfonate (PFOS), perfluorohexane sulfonate (PFHxS) and perfluorooctanoic acid (PFOA), as they are the PFAS for which there are Australian health based guidance values. The enclosed Certificate of Analysis also presents the test results for the other types of PFAS included in the analytical suite completed by the laboratory.

**Screening guidelines**

On 3 April 2017, the Commonwealth Department of Health released final health based guidance values for PFOS, PFHxS and PFOA for drinking water and water for recreational use. Further environmental screening guidelines are being developed by the Commonwealth Department of the Environment and Energy which includes soil and sediment. Defence will adopt these guidelines once finalised.

The following table details the health based guidance values.

Health based guidance values	PFOS + PFHxS	PFOA
Drinking water quality value	0.07 (µg/L)	0.56 (µg/L)
Recreational water quality value	0.7 (µg/L)	5.6 (µg/L)

Additional information about the health based guidance values is provided in the enclosed Fact sheet – Health Based Guidance Values for PFAS.

### Limit of reporting

The limit of reporting (LOR) is the threshold, or lowest concentration, that the laboratory is able to measure for a compound with a reasonable degree of certainty. The LOR varies according to the method of analysis, the type of compound, and other factors in the sample tested. If the results are below the LOR, the result will be listed as <LOR. A result listed as <LOR means that while the compound may be present, the concentration is so low that it cannot be accurately measured.

The limits of reporting for your samples are:

Type of PFAS	Water (LOR)
PFOA	0.01 µg/L
PFHXS	0.02 µg/L
PFOA	0.01 µg/L

Table 1: Water results from your Property

Sample description	PFOA + PFHXS	PFOA	Comparison against screening guidelines
BORE 5	<LOR	<LOR	Less than the Limit of reporting and below screening criteria for drinking water and recreational water use
Bore			

### Management of information collected from your Property

Defence is working cooperatively with a range of government agencies, including relevant Commonwealth, State, Territory and local governments. As outlined in your Property access letter, details of the sampling location and results of testing may be shared with Defence's environmental experts, relevant government agencies and business entities directly involved in any action linked to the investigation.

### Use of information in environmental investigation reports

The data collected from your Property will be managed in accordance with the option you selected on the 'Landowner Authority to Access Property and Acknowledgement Form'. A copy of the complete signed form is enclosed for your records and shows the data management option you selected before this sampling was completed.

Investigation reports will be made publicly available and published on the project website (<http://www.defence.gov.au/id/pearce>).

### Additional information

Additional information about the environmental investigation is available on the project website <http://www.defence.gov.au/id/pearce>.

If you have any questions about your test results or the ongoing environmental investigation, please contact the project team on 1800 987 614 or by email to [bullsbrook.defence@ghd.com](mailto:bullsbrook.defence@ghd.com).

Yours sincerely



*Graham Williams*

WGCDR

A/Senior Australian Defence Force Officer RAAF Pearce

**Enclosures:**

1. Certificate of Analysis – BORE 5 – 22 Turner Road Bullsbrook WA 6084 – 14 September 2017
2. Landowner Authority to Access Property and Acknowledgement Form – 5 September 2017
3. Fact sheet – *Health Based Guidance Values for PFAS* – Department of Health





CERTIFICATE OF ANALYSIS

Work Order	: EP1709665	Page	: 1 of 5
Client	: GHD PTY LTD	Laboratory	: Environmental Division Perth
Contact	: RAAF Pearce Lab Reports	Contact	: Marne Thomsell
Address	: 999 HAY STREET PERTH WA, AUSTRALIA 6000	Address	: 10 Hod Way Malaga WA Australia 6090
Telephone	: +61 08 6222 8222	Telephone	: +61 8-9209 7655
Project	: 6133334	Date Samples Received	: 08-Sep-2017 09:20
Order number	: —	Date Analysis Commenced	: 11-Sep-2017
C-Q-C number	: —	Issue Date	: 14-Sep-2017 07:44
Sample	: OLIVER SAARE		
Site	: RAAF Pearce		
Quote number	: EP/671/17 V5		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.**

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories

Alex Rosei	Organic Chemist	Sydney Organics, Smithfield, NSW
	Position	Accreditation Category



Accreditation No. 825  
Accredited for compliance with  
ISO/IEC 17025 - Testing



### General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM, in house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/organate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

#### Key:

CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

\* = This result is computed from individual analyte detections at or above the level of reporting

# = ALS is not NATA accredited for these tests.

- = Indicates an estimated value.

- PFAS analysis conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.

**Analytical Results**

Substrate: WATER  
 (Matrix: WATER)

Client sample ID

Client sampling date / time

05-Sep-2017 12:00

EP1709685-001

Result

BORE 5

**EP231A: Perfluorinated Sulfonic Acids**

Compound	CAS Number	LOR	Unit	Result	Result	Result	Result	Result	Result
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	---	---	---	---	---
Perfluoropentane sulfonic acid (PFPeS)	2708-91-4	0.02	µg/L	<0.02	---	---	---	---	---
Perfluorohexane sulfonic acid (PFHxS)	355-48-4	0.02	µg/L	<0.02	---	---	---	---	---
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	---	---	---	---	---
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	---	---	---	---	---
Perfluorodecane sulfonic acid (PFDS)	339-77-3	0.02	µg/L	<0.02	---	---	---	---	---

**EP231B: Perfluorinated Carboxylic Acids**

Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	---	---	---	---	---
Perfluoropentanoic acid (PFPeA)	2708-90-3	0.02	µg/L	<0.02	---	---	---	---	---
Perfluorohexanoic acid (PFHxA)	307-34-4	0.02	µg/L	<0.02	---	---	---	---	---
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	---	---	---	---	---
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	---	---	---	---	---
Perfluorononanoic acid (PFNA)	375-85-1	0.02	µg/L	<0.02	---	---	---	---	---
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	---	---	---	---	---
Perfluoroundecanoic acid (PFUdA)	2058-94-6	0.02	µg/L	<0.02	---	---	---	---	---
Perfluorododecanoic acid (PFDDA)	307-55-1	0.02	µg/L	<0.02	---	---	---	---	---
Perfluorotridecanoic acid (PFTDA)	72829-94-8	0.02	µg/L	<0.02	---	---	---	---	---
Perfluorotetradecanoic acid (PFTeDA)	378-08-7	0.05	µg/L	<0.05	---	---	---	---	---

**EP231C: Perfluorinated Sulfonamides**

Perfluorooctane sulfonamide (FOSA)	754-91-8	0.02	µg/L	<0.02	---	---	---	---	---
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31508-32-8	0.05	µg/L	<0.05	---	---	---	---	---
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	---	---	---	---	---





**Analytical Results**

Substrate: WATER  
 (Matrix: WATER)

Client sample ID

BORE 5

Client sampling date / time

05-Sep-2017 12:00

Compound CAS Number LOF Unit

EP1709665-001  
Result

Compound	CAS Number	LOF	Unit	Result						
<b>EP231C: Perfluoroalkyl Sulfonamides - Continue</b>										
N-Methyl perfluorooctane sulfonamideethanol (MeFOSE)	2448-09-7	0.05	µg/L	<0.05	---	---	---	---	---	---
N-Ethyl perfluorooctane sulfonamideethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	---	---	---	---	---	---
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	---	---	---	---	---	---
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	---	---	---	---	---	---
<b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>										
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	---	---	---	---	---	---
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	---	---	---	---	---	---
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	---	---	---	---	---	---
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-80-0	0.05	µg/L	<0.05	---	---	---	---	---	---
<b>EP231P: PFAS Sums</b>										
Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---	---	---
Sum of PFHS and PFOs	355-45-4/1785-23-1	0.01	µg/L	<0.01	---	---	---	---	---	---
Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---	---	---
<b>EP231S: PFAS Surrogate</b>										
13C4-PFOs	---	0.02	%	101	---	---	---	---	---	---



**Surrogate Control Limits**

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP231S: PFAS Surrogate			
13C4-PFOs	—	60	130





**Landowner Authority to Access Property and Acknowledgment**

In signing this letter, you:

- authorise Defence, through its contractor GHD, to enter your Property to collect a bore sample;
- understand that the sample is being collected for Defence in accordance with the details outlined above; and
- acknowledge that you have read and understood this letter.

Please choose one option only to indicate how information collected from your Property is to be used in the environmental investigation report:

Option 1 YES / NO



Option 2 YES / NO

Option 3 YES / NO

Signed: Alice Gibbel  
Full name (printed): Alice Gibbel  
Date: 5 Sept 2017

# Health Based Guidance Values for PFAS FOR USE IN SITE INVESTIGATIONS IN AUSTRALIA

## Final health based guidance values for use in site investigations in Australia

FSANZ has recommended final health based guidance values for PFOS and PFOA in the form of a tolerable daily intake. A tolerable daily intake is a level of daily oral exposure over a lifetime that is considered to be without significant health risk for humans.

Based on FSANZ's recommended tolerable daily intake, the Department of Health has calculated revised drinking water quality and recreational water quality values for use in site investigations in Australia.

To determine the drinking and recreational water quality values for site investigations across Australia, the Department of Health used the final tolerable daily intakes for PFOS and PFOA and the methodology described in Chapter 6.3.3 of the National Health and Medical Research Council's *Australian Drinking Water Guidelines*. This approach is consistent with the one used by eHealth in developing the interim values in 2016. The health based guidance values for use in site investigations in Australia are:

Toxicity reference value	ng	µg	ng	µg
	PFOS/PFHXS		PFOA	
Tolerable daily intake (ng or µg / kg bw/day)	20	0.02	160	0.16
Drinking water quality value (ng or µg /L)	70	0.07	560	0.56
Recreational water quality value (ng or µg /L)	700	0.7	5,600	5.6

Note: bw = body weight, ng = nanogram, µg = micrograms

In June 2016, the Department of Health commissioned Food Standards Australia New Zealand (FSANZ) to develop final health based guidance values for perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHXS), which belong to a group of chemicals known as per- and poly-fluoroalkyl substances (PFAS).

The Department of Health has received FSANZ's *Hazard Assessment Report—PFOS, PFOA and PFHXS* with its recommendations for Australia's final health based guidance values.

The final health based guidance values will be used consistently in undertaking human health risk assessments across Australia. The recommended health based guidance values have replaced the Environmental Health Standing Committee's (eHealth) interim human health reference values.

The final health based guidance values are protective of human health; are a precautionary measure for use when conducting site investigations; and are to assist in providing advice to affected communities on how to minimise exposure to PFAS.

## What is a health based guidance value?

Health based guidance values indicate the amount of a chemical in food or drinking water that a person can consume on a regular basis over a lifetime without any significant risk to health. Health based guidance values can be expressed as a tolerable monthly intake (TMI), a tolerable weekly intake (TWI) or a tolerable daily intake (TDI). The choice of whether a TMI, TWI or TDI is set depends on the nature of the chemical.

Health based guidance values are used by organisations and government agencies to investigate and assess potential human health risks.



## How did FSANZ determine the health based guidance values?

The tolerable daily intake for PFOS and PFOA are derived from the results of toxicity studies in laboratory animals. FSANZ concluded that the current available epidemiological data on human health is not suitable to support the derivation of tolerable daily intake levels for PFOS and PFOA.

A pharmacokinetic modelling approach was used to extrapolate data for humans, noting that animal physiology is not the same as human.

For PFHxS, FSANZ concluded that there was not enough toxicological and epidemiological information to justify establishing a tolerable daily intake. However, as a precaution, and for the purposes of site investigations, the PFOS tolerable daily intake should apply to PFHxS. In practice, this means that the level of PFHxS exposure should be added to the level of PFOS exposure; and this combined level be compared to the tolerable daily intake for PFOS.

The tolerable daily intakes include conservative assumptions to ensure the protection of public health. FSANZ's report and recommended health based guidance values have been nationally and internationally peer reviewed.

## How will the final health based guidance values impact communities affected by PFAS contamination?

Commonwealth agencies and other organisations that conduct site investigations for PFAS contamination can use the health based guidance values to assist in assessing human health risk. Agencies or organisations that have recently conducted human health risk assessments for PFAS contamination may review their assessments and advice based on the final health based guidance values.

Advice on reducing exposure to PFAS will vary with each location so you should follow the most current advice provided by your state or territory government, and if available, the human health risk assessment for your area conducted by the investigating agency.

## Further information

For further information regarding health based guidance values and the Department of Health's response to PFAS contamination, please visit the Department of Health website ([health.gov.au/pfas](http://health.gov.au/pfas))

Alternatively you can contact the Department of Health by phone on 1800 941 180 or by email: [health.pfas@health.gov.au](mailto:health.pfas@health.gov.au)