Fire & Rescue NSW

File Ref. No: FRN16/3
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14 April 2016

Mr Darin Sullivan
Acting State Secretary
Fire Brigade Employees' Union of New South Wales
1 – 7 Belmore Street
SURRY HILLS NSW 2010

Dear Mr Sullivan,

Re: Firefighting Foam

I write in response to your letter of 19 November 2015 and 25 February 2016 regarding historic firefighting foams and recent information Fire & Rescue NSW (FRNSW) has provided to employees.

As you are aware, FRNSW is proactively working closely with the NSW Environment Protection Authority (EPA) as part of their investigation program to assess the historical legacy of perfluorinated compounds (PFCs) use across NSW. FRNSW withdrew the use of foams containing perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) by 2007 following evidence of their persistence in the environment.

FRNSW had recently been made aware that preliminary soil and water sample testing by the NSW Environment Protection Authority (EPA) found elevated readings of PFOS and PFOA in holding ponds at two training centres at Albion Park and Londonderry (Attachment A). The updated correspondence from the EPA regarding these sites supersedes any previous advice provided on the matter and details the information regarding the site inspection at Londonderry and Albion Park. The correspondence from the EPA advised further testing by specialists to ascertain the nature, extent, fate and transport of PFCs on and off site.

The EPA commissioned Environmental Risk Sciences Pty Ltd (enRiskS) to provide advice in relation to the recommended decisions and testing schedule for potentially affected sites, including the FRNSW training centres. The program will commence with an initial screening program to determine if these chemicals are present on site and prioritise sites for further investigation. As further testing and information becomes available, FRNSW will continue to work closely with the EPA regarding longer term management of these sites. A timeframe for testing and results will be provided as more information becomes available. FRNSW's existing policy relating to water use prevents exposure to these chemicals and will not affect the continued use of the training locations.

Guidance Statements on Perfluorinated Chemicals have been developed by the Environmental Health Standing Committee (enHealth) and endorsed by the Australian Health Protection Principal Committee on 15 March 2016 (attachment B). Accordingly, NSW Health wrote to FRNSW confirming that blood tests are not recommended. Therefore, the previous advice provided to employees on 19 February 2016 that voluntary testing would be made available to employees is superseded and withdrawn. The Employees Assistance Program (EAP) is available to assist employees in managing any anxiety they may be feeling and employees who believe they may have been exposed to such foam are encouraged to complete a NIIENM (Notification of Injury, Illness, Exposure or Near miss) form.

Updates will be provided to you as information is received from the EPA and other agencies. Should you wish to discuss, please contact Georgia Dawson, Assistant Industrial Relations Officer on (02) 9265 2639 or at Georgia.Dawson@fire.nsw.gov.au in the first instance.

Yours sincerely

Greg Mullins AFSM
Commissioner

Our reference: DOC16/107497

Mr Greg Mullins AFSM
Commissioner
Fire and Rescue NSW
PO Box A249
Sydney South NSW 1232

Dear Commissioner

RE: Fire & Rescue NSW Firefighting Training Site – Airport Road, Albion Park

As you are aware the Environment Protection Authority (EPA) is undertaking an investigation program to assess the historical legacy of perfluorinated compound (PFC) use across NSW. We are focussing on sites where these chemicals may have been used in large quantities in the past. This includes firefighting training facilities.

As a part of this program EPA officers Luke Formosa (Chemicals Regulation) and William Dove (Illawarra - Metro) undertook a site inspection at the Fire & Rescue NSW (FRNSW) firefighting training site at Airport Road, Albion Park on 13 January 2016 with NSW Fire and Rescue officer Superintendent Paul Johnstone. I write to inform you of the EPA's findings of the inspection. This letter takes into account advice provided to the EPA following our site inspection and supersedes any previous advice provided to you on this matter.

Inspection
The site is about 1 hectare in area, located adjacent to Wollongong airport and about 600m away from Lake Illawarra, a recreational fishing and water sports area. We understand that the site is owned by Shellharbour City Council. Aqueous film-forming foam (AFFF) and other firefighting foams potentially containing PFCs were used for training firefighters from the south coast regions at the training pad for a period in the 1990s. Due to the nature of the training conducted at the site there is the potential for significant amounts of PFCs to have been released to the environment.

One sample of collection pond water and one sample of soil were obtained by the EPA during the inspection and submitted for laboratory analysis for certain PFCs (see results in table below). The perfluorooctane sulfonate (PFOS) concentration detected in the onsite collection pond was **51 µg/L**. The soil sample recorded a PFOS concentration of **0.16 mg/kg**.

There are presently no guidelines established in Australia for assessing PFC contamination in the environment. Several national working groups are currently working towards finalisation of guidelines in mid 2016. In the interim the NSW EPA is developing screening criteria based on draft drinking water guidelines and draft guidelines for the protection of freshwater ecosystems. The screening criteria document will soon be provided to you under separate cover, following its finalisation.

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Results

Fire & Rescue NSW Training Site - Albion Park - 13.01.16				
Sample ID	PFOA	PFOS	6:2 FTS (C2H4-perfluorooctane sulfonate)	8:2 FTS (C2H4-perfluorodecane sulfonate)
Onsite collection pond water sample	**2.3 µg/L**	**51 µg/L**	**0.33 µg/L**	**0.25 µg/L**
Soil sample near collection pond	<0.002 mg/kg	**0.16 mg/kg**	<0.002 mg/kg	<0.002 mg/kg

Based on current scientific advice we have adopted the screening guideline of **0.1 µg/L** for PFOS in surface waters or groundwater leaving a site as the threshold above which further investigation is warranted. Concentrations of PFOS above **10 µg/L** in surface waters or groundwater at a site indicate elevated contamination that requires further investigation.

Similarly, based on evolving scientific advice we have not adopted a screening guideline for soil samples, due to the way that PFCs behave in soils. Instead, we recommend subjecting soil samples to the Australian Standard Leaching Procedure (ASLP) to assess the degree to which PFCs will leach from the soils into nearby surface water or groundwater. This was not undertaken in our inspection of Albion Park.

We understand that petroleum hydrocarbon contamination may be present in areas where firefighting foams were used in the past. Where PFC and hydrocarbon contamination is intermingled the risk profile can change. It is therefore important that any assessment also includes an investigation for hydrocarbons.

Recommendations

On the basis of the above we recommend further investigation into the nature, extent, fate and transport of PFCs on the site and off-site. This investigation should include consideration of the following matters:

a. Lateral and vertical soil sampling with ASLP analysis for PFCs and hydrocarbons with the objective of delineating the extent of soil contamination and assessing whether soil contamination may present an ongoing source of contamination to waters
b. Installation and sampling of groundwater wells with the objective of delineating the extent of PFC contamination in the unconfined aquifer
c. Sampling of any receiving waters including assessing background levels
d. Identification of any sensitive receptors and preferential pathways
e. Construction of a written and visual conceptual site model
f. Recommendations for further investigation

Thank you for your proactive and open approach to addressing this legacy contamination matter. The EPA will continue to work closely with FRNSW and other stakeholders to ensure an appropriate, scientific and risk-based resolution.

If you have any queries relating to this matter please contact me on 02 9995 5995.

Yours sincerely

26 February 2016

ANDREW MITCHELL
Manager Hazardous Incidents
Environment Protection Authority

Copy: Donna Flanagan – Manager Property & Recreation, Shellharbour City Council
Attachment: Sampling Locations

Aerial Photograph 1 with sample locations

Aerial photograph 2 with stormwater and drainage line overlays

Our reference: DOC16/107504

Mr Greg Mullins AFSM
Commissioner
Fire and Rescue NSW
PO Box A249
Sydney South NSW 1232

Dear Commissioner

RE: Fire & Rescue NSW Firefighting Training Site – 667 The Northern Road Londonderry

As you are aware the Environment Protection Authority (EPA) is undertaking an investigation program to assess the historical legacy of perfluorinated compound (PFC) use across NSW. We are focussing on sites where these chemicals may have been used in large quantities in the past. This includes firefighting training facilities.

As a part of this program EPA officers Luke Formosa (Chemicals Regulation) and Larissa Borysko (Metropolitan Region) undertook a site inspection at the Fire & Rescue NSW (FRNSW) firefighting training site at 667 The Northern Road, Londonderry on 13 January 2016 with NSW Fire and Rescue officers Superintendent Paul Johnstone, Mr Mark Davidson and Mr Andy Haag. I write to inform you of the EPA's findings of the inspection. This letter takes into account advice provided to the EPA following our site inspection and supersedes any previous advice provided to you on this matter.

Inspection

The site is part of a large facility of about 57 hectares in area owned by TestSafe Australia, a division of SafeWork NSW. Aqueous film-forming foam (AFFF) and other firefighting foams potentially containing PFCs were used at the training pads. The EPA understands that training with these foams was carried out in the 1990s to early 2000s and that significant quantities of PFC containing foams may have been used. The training pads are unsealed soft stand (no sealed concrete slabs) consisting of road base overlain with about 500mm of river sand.

One sample of soil from near a collection pond, one sample of water from the collection pond and two samples of water from a nearby culvert under the Northern Road were obtained by the EPA during the inspection and submitted for laboratory analysis for certain PFCs (see results in table below). The perfluorooctane sulfonate (PFOS) concentration detected in the onsite collection pond was **58 µg/L**. PFOS concentrations in the culvert surface water samples near the premises boundary and across the Northern Road were **0.054 µg/L** and **0.068 µg/L**, respectively. The culvert sample locations are about 300m down slope from the collection pond.

There are presently no guidelines established in Australia for assessing PFC contamination in the environment. Several national working groups are currently working towards finalisation of guidelines in mid 2016. In the interim the NSW EPA has developed screening criteria based on draft drinking water guidelines and draft guidelines for the protection of freshwater ecosystems.

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Results

Fire & Rescue NSW Training Site - Londonderry - 13.01.16				
Sample ID	PFOA	PFOS	6:2 FTS (C2H4-perfluorooctane sulfonate)	8:2 FTS (C2H4-perfluorodecane sulfonate)
Onsite collection pond water sample	**0.73 µg/L**	**58 µg/L**	**0.36 µg/L**	**0.35 µg/L**
Soil sample near collection pond	**0.0038 mg/kg**	**0.98 mg/kg**	<0.002 mg/kg	**0.0036 mg/kg**
Culvert 1 (surface water)	<0.01 µg/L	**0.054 µg/L**	<0.01 µg/L	<0.01 µg/L
Culvert 1 (opposite side of road)	<0.01 µg/L	**0.068 µg/L**	<0.01 µg/L	<0.01 µg/L

Based on current scientific advice we have adopted the screening guideline of **0.1 µg/L** for PFOS in surface waters or groundwater leaving a site as the threshold above which further investigation is warranted. Concentrations of PFOS above **10 µg/L** in surface waters or groundwater at a site indicate elevated contamination that requires further investigation.

Similarly, based on evolving scientific advice we have not adopted a screening guideline for soil samples, due to the way that PFCs behave in soils. Instead, we recommend subjecting soil samples to the Australian Standard Leaching Procedure (ALSP) to assess the degree to which PFCs will leach from the soils into nearby surface water or groundwater. This was not undertaken in our inspection of Londonderry.

Recommendations

On the basis of the above we recommend further investigation into the nature, extent, fate and transport of PFCs on the site and off-site. We understand that SafeWork NSW is currently undertaking such an investigation and we will provide them with advice on the investigation requirements.

Additionally, we understand that petroleum hydrocarbon contamination may be present in areas where firefighting foams were used in the past. Where PFC and hydrocarbon contamination is intermingled the risk profile can change. It is therefore important that any assessment also includes an investigation for hydrocarbons.

Thank you for your proactive and open approach to addressing this legacy contamination matter. The EPA will continue to work closely with FRNSW, SafeWork NSW and other stakeholders to ensure an appropriate, scientific and risk-based resolution.

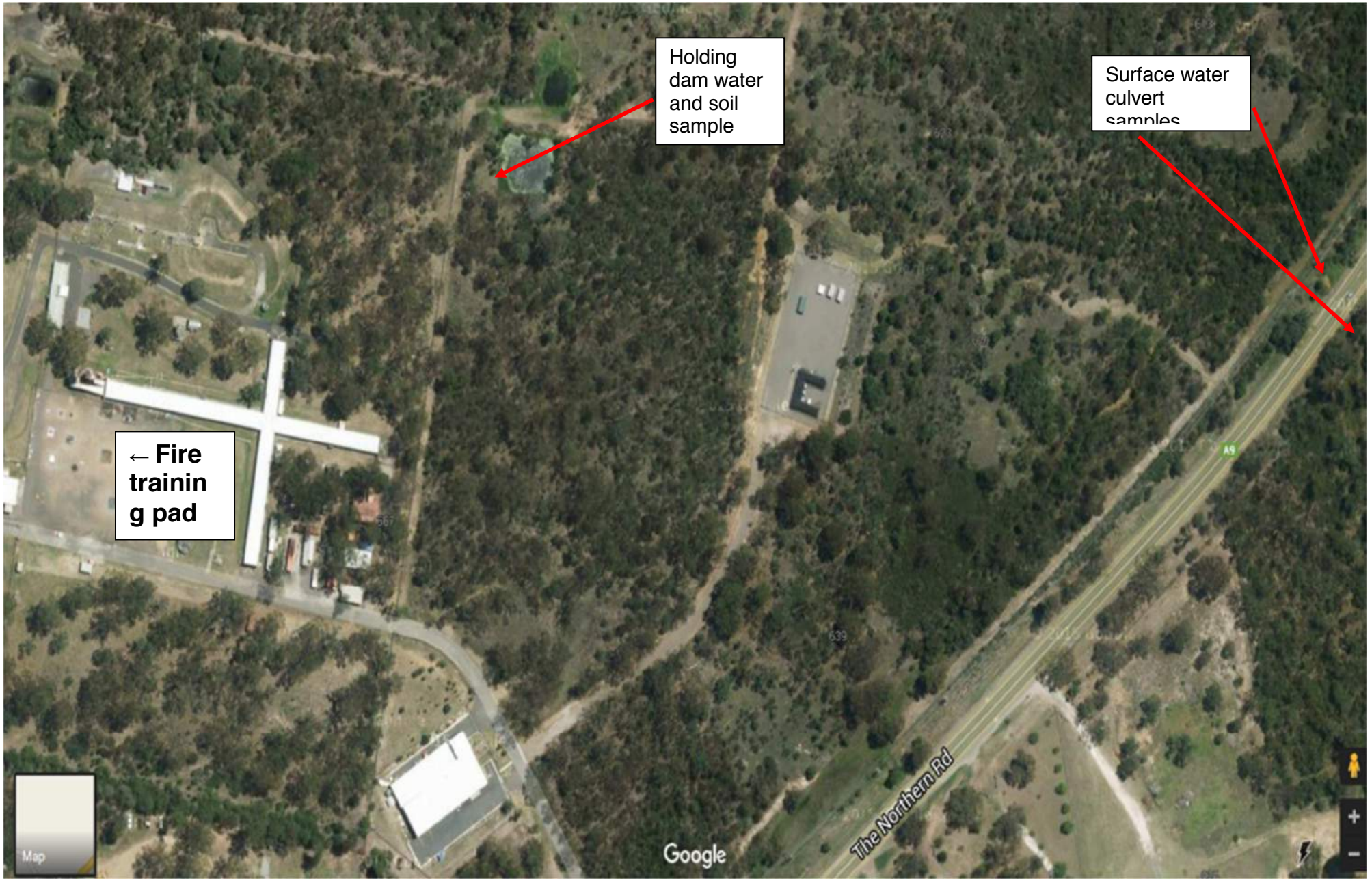
If you have any queries relating to this matter please contact me on 02 9995 5995.

Yours sincerely

26 February 2016

ANDREW MITCHELL
Manager Hazardous Incidents
Environment Protection Authority

Copy: Mr Ron Keelty, SafeWork NSW
Attachment: Figure of sampling locations


Holding dam water and soil sample
Surface water culvert samples
← Fire training pad
The Northern Rd
Google
Map

enHEALTH
Environmental Health Standing Committee (enHealth) of the
Australian Health Protection Principal Committee

enHealth Guidance Statements on Perfluorinated Chemicals

Background and context:

Perfluorinated chemicals (PFCs) are a class of manufactured chemicals that have been used since the 1950s to make products that resist heat, stains, grease and water. Products that may contain PFCs include furniture and carpets treated for stain resistance, foams used for firefighting, fast food or packaged food containers, make up and personal care products and cleaning products. Other chemicals used in these applications may be precursors to PFCs, and the PFCs are formed when these chemicals are released into the environment.

PFCs are of concern around the world because they are not broken down in the environment and so can persist for a long time. Their widespread use and persistence means that many PFCs are ubiquitous global contaminants.

The PFCs of most concern are perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). Many countries have phased out, or are in the process of phasing out the use of PFOS and PFOA due to concerns about their persistence, bioaccumulation and toxicity.

Because of their widespread use, most people in Australia will have some PFOS and PFOA in their body. PFOS and PFOA are readily absorbed through the gut, and once these chemicals are in a person's body it takes about two to nine years, depending on the study, before those levels go down by half, even if no more is taken in.

The Australian Government has been working since 2002 to reduce the importation of some PFCs. In Australia and internationally where the use of PFCs has become restricted a general trend towards lower PFCs levels in a person's body has been observed.

Outside of the occupational setting, exposure to PFCs can occur from the air, indoor dust, food, water and various consumer products. For most people food is expected to be the primary source of exposure to PFOS and PFOA. Human breast milk may contribute to exposure in infants since PFCs have been detected in human breast milk.

For some communities near facilities where PFOS and PFOA have been extensively used, higher levels may be found in the surrounding environment and exposure may occur through other means, including drinking water supplied from groundwater.

In chronic exposure studies on laboratory animals, research into PFOS and PFOA has shown adverse effects on the liver, gastrointestinal tract and thyroid hormones. However, the applicability of these studies to humans is not well established.

In humans, research has not conclusively demonstrated that PFCs are related to specific illnesses, even under conditions of occupational exposure. Recent studies have found possible associations to some health problems, although more research is required before definitive statements can be made on causality or risk.

Because the human body is slow to rid itself of PFOS and PFOA, continued exposure to these chemicals can result in accumulation in the body. Due to the potential for accumulation, and while uncertainty around their potential to cause human adverse health effects remains, it is prudent to reduce exposure to PFCs as far as is practicable. This means that action needs to be taken to address the exposure source or possible routes of exposure. Determination of exposure is best achieved through a full human health risk assessment that examines all routes of exposure.

It is understandable that communities living in PFC affected areas may want to know what their level of exposure to PFCs is and what this means for their health and the health of their families. The lack of certainty around the potential for health effects can compound concerns.

A blood test can measure the level of PFOS and PFOA in a person's blood and can tell a person concerned about exposure to PFCs how their blood PFOS and PFOA levels compare with the levels seen in the general Australian population. However, these tests are not routine and there is at present insufficient scientific evidence for a medical practitioner to be able to tell a person whether their blood level will make them sick now or later in life, or if any current health problems are related to the PFC levels found in their blood.

As such, blood tests have no diagnostic or prognostic value and are not recommended for the purpose of determining whether an individual's medical condition is attributable to exposure to PFOS or PFOA.

In the absence of any test, including a blood test, being definitive in informing individual risk and clinical management, exposure reduction is the key measure to reduce any possible risks posed by PFCs.

At a population level, blood tests can inform a community that they have been exposed to PFCs at a level above that of the general population. The monitoring of pooled community blood samples over time may help determine the success of exposure reduction measures.

Recognising the difficulty in assessing and communicating the risks posed by PFCs to the community, enHealth has developed these guidance statements on key health issues to support jurisdictional responses to incidents of environmental PFC contamination.

Guidance statements:

1. Health impacts from exposure to PFOS and PFOA

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.

2. Major human exposure pathways

For the general community, enHealth considers ingestion of food contaminated with PFOS and PFOA is the major human exposure pathway.

In sites contaminated by PFOS and PFOA, drinking water and specific foods may be important exposure pathways.

3. Reference values for PFOS and PFOA

In early 2016, enHealth will convene an expert group to provide advice to the Australian Health Protection Principal Committee on the development of an Australian interim health reference value for PFOS and PFOA for consistent use in the undertaking of human health risk assessments.

The interim health reference value will consider relevant international guidelines, as well as contemporary scientific and technical issues.

4. Breast feeding

The significant health benefits of breast feeding are well established and far outweigh any potential health risks to an infant from any PFOS or PFOA transferred through breast milk.

enHealth does not recommend that mothers living in or around sites contaminated with PFOS or PFOA cease breast feeding.

5. Pregnancy

There is currently no consistent evidence that exposure to PFOS or PFOA causes adverse human health outcomes in pregnant women or their babies.

Nonetheless, enHealth recommends that pregnant women should be considered a potentially sensitive population when investigating PFOS and PFOA contaminated sites, with a view to minimising their exposure to PFOS and PFOA.

6. Blood tests

There is currently no accepted clinical treatment to reduce levels of PFCs in the human body.

Given the uncertainty that PFCs are directly linked to adverse health outcomes, blood tests cannot determine if the PFC levels in a person's blood will make them sick now or later in life.

Therefore, blood tests are not recommended to determine whether any medical condition is attributable to exposure to PFOS or PFOA and have no current value in informing clinical management, including diagnosis, treatment or prognosis in terms of increased risk of particular conditions over time.

It is noted that various organisations around the world have collected blood samples from people as part of ongoing investigations into PFC contamination of soil and water. The purpose of these tests was either as part of a defined research program, or to determine how much of these chemicals may be entering a person's body. The value of blood testing is limited to assessing exposure, such as monitoring over time, which may help determine the success of exposure reduction measures. However, given the long biological half-life of PFCs, frequent blood monitoring is of no value.

enHealth recommends that:

- blood testing has no current value in informing clinical management; and
- the monitoring of pooled community blood samples over time may help determine the success of exposure reduction measures.