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Details of Filing

Document Lodged:	Statement of Claim - Form 17 - Rule 8.06(1)(a)
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Registry:	NEW SOUTH WALES REGISTRY - FEDERAL COURT OF AUSTRALIA



A handwritten signature in blue ink that reads "Sia Lagos".

Dated: 16/04/2020 12:46:48 PM AEST

Registrar

Important Information

As required by the Court's Rules, this Notice has been inserted as the first page of the document which has been accepted for electronic filing. It is now taken to be part of that document for the purposes of the proceeding in the Court and contains important information for all parties to that proceeding. It must be included in the document served on each of those parties.

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Form 17
Rule 8.05(1)(a)

Statement of claim

No. NSD of 2020

Federal Court of Australia

District Registry: New South Wales

Division: General

REANNAN LAURA HASWELL and another

Applicants

COMMONWEALTH OF AUSTRALIA

Respondent

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PRELIMINARY

The Applicant and the Group Members

1. This proceeding is commenced as a representative proceeding pursuant to Part IVA of the *Federal Court of Australia Act 1976* (Cth) by the Applicants on their own behalf and on behalf of all persons who or which:
 - (a) were persons who:
 - (i) as at 23 June 2016, owned land located in whole or in part within the area delineated by the dashed yellow line on the map which is Annexure 1A to Schedule 1 to this Statement of Claim (the **Pearce Relevant Area**) (**Pearce Group Members**); or
 - (ii) as at 24 November 2016, owned land and/or was the lessee of a crown lease in perpetuity located in whole or in part within the area delineated by the solid purple line on the map which is Annexure 2A to Schedule 2 to this Statement of Claim (the **Darwin Relevant Area**) (**Darwin Group Members**); or
 - (iii) as at 12 December 2016, owned land located in whole or in part within the area delineated by the green shading on the map which is Annexure 3A to Schedule 3 to this Statement of Claim (the **Richmond Relevant Area**) (**Richmond Group Members**); or
 - (iv) as at 1 October 2016, owned land located in whole or in part within the area delineated by the solid purple line on the map which is Annexure 4A to Schedule 4 to this Statement of Claim (the **Wagga Relevant Area**) (**Wagga Group Members**); or
 - (v) as at 1 October 2016, owned land located in whole or in part within the area delineated by the dashed black line on the map which is Annexure 5A to Schedule 5 to this Statement of Claim (the **Edinburgh Relevant Area**) (**Edinburgh Group Members**); or
 - (vi) as at 1 October 2016, owned land located in whole or in part within the area delineated by the dashed black line on the map which is Annexure

6A to Schedule 6 to this Statement of Claim (the **Bandiana Relevant Area**) (**Bandiana Group Members**); or

- (vii) as at 29 November 2016, owned land located in whole or in part within the area delineated by the dashed black line on the map which is Annexure 7A to Schedule 7 to this Statement of Claim (the **Townsville Relevant Area**) (**Townsville Group Members**),

the areas identified in the foregoing sub-paragraphs being **Relevant Areas**;
and

- (b) have suffered loss or damage by or resulting from the conduct of the Respondent pleaded in this Statement of Claim,

(**Group Members**).

2. At all material times since 27 February 2010, the Applicants have owned land in a Relevant Area (being the Pearce Relevant Area).

PARTICULARS

- (i) *The Applicants are the owners as joint tenants of the land known as 1166 Almeria Parade, Bullsbrook in Western Australia (being lot 401 on Diagram 71626).*

3. As at the commencement of this proceeding, there were more than seven Group Members.

The Respondent

4. The Respondent (**Commonwealth**) is and at all material times was:

- (a) a body politic constituted by the *Constitution of the Commonwealth of Australia*;
and
(b) capable of being sued by reason of s 56 of the *Judiciary Act 1903* (Cth).

A THE BASES AND THEIR SURROUNDS

A.1 The Bases

5. The Commonwealth has continuously owned and occupied the following bases (together, **Bases**):

- (a) the Pearce Base in Western Australia, as pleaded in Schedule 1, Section A1;
- (b) the Darwin Base in the Northern Territory, as pleaded in Schedule 2, Section A1
- (c) the Richmond Base in New South Wales, as pleaded in Schedule 3, Section A1;
- (d) the Wagga Base in New South Wales, as pleaded in Schedule 4, Section A1;
- (e) the Edinburgh Base in South Australia, as pleaded in Section 5, Section A1;
- (f) the Bandiana Base in Victoria, as pleaded in Schedule 6, Section A1;
- (g) the Townsville Base in Queensland, as pleaded in Schedule 7, Section A1.

A.2 The natural features of the Bases

6. The natural features the Bases and the Relevant Areas were:

- (a) in respect of the Pearce Base and Pearce Relevant Area, as pleaded in Schedule 1, Section A2;
- (b) in respect of the Darwin Base and Darwin Relevant Area, as pleaded in Schedule 2, Section A2;
- (c) in respect of the Richmond Base and Richmond Relevant Area, as pleaded in Schedule 3, Section A2;
- (d) in respect of the Wagga Base and Wagga Relevant Area, as pleaded in Schedule 4, Section A2;
- (e) in respect of the Edinburgh Base and Edinburgh Relevant Area, as pleaded in Section 5, Section A2;
- (f) in respect of the Bandiana Base and Bandiana Relevant Area, as pleaded in Schedule 6, Section A2;
- (g) in respect of the Townsville Base and Townsville Relevant Area, as pleaded in Schedule 7, Section A2.

A.3 The artificial water-related features of the Bases

7. The artificial water-related features of the Bases and the Relevant Areas were:

- (a) in respect of the Pearce Base and Pearce Relevant Area, as pleaded in Schedule 1, Section A3;
- (b) in respect of the Darwin Base and Darwin Relevant Area, as pleaded in Schedule 2, Section A3;
- (c) in respect of the Richmond Base and Richmond Relevant Area, as pleaded in Schedule 3, Section A3;
- (d) in respect of the Wagga Base and Wagga Relevant Area, as pleaded in Schedule 4, Section A3;
- (e) in respect of the Edinburgh Base and Edinburgh Relevant Area, as pleaded in Section 5, Section A3;
- (f) in respect of the Bandiana Base and Bandiana Relevant Area, as pleaded in Schedule 6, Section A3;
- (g) in respect of the Townsville Base and Townsville Relevant Area, as pleaded in Schedule 7, Section A3.

A.4 The foreseeable flow of water from the Bases

8. The foreseeable flow of water, liquids and soluble materials discharged from the Bases was:
- (a) in respect of the Pearce Base and Pearce Relevant Area, as pleaded in Schedule 1, Section A4;
 - (b) in respect of the Darwin Base and Darwin Relevant Area, as pleaded in Schedule 2, Section A4;
 - (c) in respect of the Richmond Base and Richmond Relevant Area, as pleaded in Schedule 3, Section A4;
 - (d) in respect of the Wagga Base and Wagga Relevant Area, as pleaded in Schedule 4, Section A4;
 - (e) in respect of the Edinburgh Base and Edinburgh Relevant Area, as pleaded in Section 5, Section A4;

- (f) in respect of the Bandiana Base and Bandiana Relevant Area, as pleaded in Schedule 6, Section A4;
- (g) in respect of the Townsville Base and Townsville Relevant Area, as pleaded in Schedule 7, Section A4.

B WATER USE IN THE AREAS SURROUNDING THE BASES

B.1 Rivers, creeks, etc

9. The usage of surface water sources proximate to the Bases and the Relevant Areas were:

- (a) in respect of the Pearce Base and Pearce Relevant Area, as pleaded in Schedule 1, Section B1;
- (b) in respect of the Darwin Base and Darwin Relevant Area, as pleaded in Schedule 2, Section B1;
- (c) in respect of the Richmond Base and Richmond Relevant Area, as pleaded in Schedule 3, Section B1;
- (d) in respect of the Wagga Base and Wagga Relevant Area, as pleaded in Schedule 4, Section B1;
- (e) in respect of the Edinburgh Base and Edinburgh Relevant Area, as pleaded in Section 5, Section B1;
- (f) in respect of the Bandiana Base and Bandiana Relevant Area, as pleaded in Schedule 6, Section B1;
- (g) in respect of the Townsville Base and Townsville Relevant Area, as pleaded in Schedule 7, Section B1.

B.2 Groundwater

10. The usage of groundwater sources proximate to the Bases and the Relevant Areas were:

- (a) in respect of the Pearce Base and Pearce Relevant Area, as pleaded in Schedule 1, Section B2;

- (b) in respect of the Darwin Base and Darwin Relevant Area, as pleaded in Schedule 2, Section B2;
- (c) in respect of the Richmond Base and Richmond Relevant Area, as pleaded in Schedule 3, Section B2;
- (d) in respect of the Wagga Base and Wagga Relevant Area, as pleaded in Schedule 4, Section B2;
- (e) in respect of the Edinburgh Base and Edinburgh Relevant Area, as pleaded in Section 5, Section B2;
- (f) in respect of the Bandiana Base and Bandiana Relevant Area, as pleaded in Schedule 6, Section B2;
- (g) in respect of the Townsville Base and Townsville Relevant Area, as pleaded in Schedule 7, Section B2.

B.3 Foreseeable water usages

11. The foreseeable water usages of residents of the Relevant Areas were:

- (a) in respect of the Pearce Base and Pearce Relevant Area, as pleaded in Schedule 1, Section B3;
- (b) in respect of the Darwin Base and Darwin Relevant Area, as pleaded in Schedule 2, Section B3;
- (c) in respect of the Richmond Base and Richmond Relevant Area, as pleaded in Schedule 3, Section B3;
- (d) in respect of the Wagga Base and Wagga Relevant Area, as pleaded in Schedule 4, Section B3;
- (e) in respect of the Edinburgh Base and Edinburgh Relevant Area, as pleaded in Section 5, Section B3;
- (f) in respect of the Bandiana Base and Bandiana Relevant Area, as pleaded in Schedule 6, Section B3;
- (g) in respect of the Townsville Base and Townsville Relevant Area, as pleaded in Schedule 7, Section B3.

C THE COMMONWEALTH'S USE OF AFFF AT THE BASES

C.1 Introduction

12. At all material times, the Commonwealth has been responsible for conducting all of the activities conducted at each of the Bases:
- (a) in respect of the Pearce Base, as pleaded in Schedule 1, Section C1;
 - (b) in respect of the Darwin Base, as pleaded in Schedule 2, Section C1;
 - (c) in respect of the Richmond Base, as pleaded in Schedule 3, Section C1;
 - (d) in respect of the Wagga Base, as pleaded in Schedule 4, Section C1;
 - (e) in respect of the Edinburgh Base, as pleaded in Section 5, Section C1;
 - (f) in respect of the Bandiana Base, as pleaded in Schedule 6, Section C1;
 - (g) in respect of the Townsville Base, as pleaded in Schedule 7, Section C1.

C.2 The Commonwealth's use of AFFF

13. As pleaded:
- (a) in respect of the Pearce Base, in Schedule 1, Section C2;
 - (b) in respect of the Darwin Base, in Schedule 2, Section C2;
 - (c) in respect of the Richmond Base, as pleaded in Schedule 3, Section C2;
 - (d) in respect of the Wagga Base, as pleaded in Schedule 4, Section C2;
 - (e) in respect of the Edinburgh Base, as pleaded in Section 5, Section C2;
 - (f) in respect of the Bandiana Base, as pleaded in Schedule 6, Section C2;
 - (g) in respect of the Townsville Base, as pleaded in Schedule 7, Section C2;

the following occurred:

- (i) the Commonwealth regularly conducted **Training and Operation Activities**, in which the Commonwealth:

- (A) used an aqueous film forming foam fire-fighting product in a liquid form (**AFFF Concentrate**);
 - (B) mixed the AFFF Concentrate with water to create a working solution (at a concentration rate of 3% or 6%) (**AFFF Working Solution**); and
 - (C) aspirated the AFFF Working Solution into a foam via nozzles on firefighting trucks and other mechanisms (the aspirated foam being known as **AFFF**, and the discharged AFFF and its residues being **Spent AFFF**); and
- (ii) the Training and Operation Activities (and ancillary storage, containment and disposal practices) resulted in:
- (A) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground; and/or
 - (B) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with combustion by-products created during firefighting and fire-suppression (**Fire Run-Off**), being discharged, or allowed to escape, to bare ground.

PARTICULARS

- (i) *The AFFF Concentrate used by the Commonwealth at each of the Bases was principally a product known as "Light WaterTM" (being manufactured by the Minnesota Mining and Manufacturing Company (now known as 3M Company) and/or its subsidiary 3M Australia Pty Ltd.*
- (ii) *Further details of the Training and Operation Activities at each of the Bases is pleaded in the sections identified in subparagraphs (a)-(g).*

C.3 The Commonwealth's methods of disposal of AFFF

14. The Commonwealth's methods of disposal of AFFF at each of the Bases was:

- (a) in respect of the Pearce Base, as pleaded in Schedule 1, Section C3;
- (b) in respect of the Darwin Base, as pleaded in Schedule 2, Section C3;
- (c) in respect of the Richmond Base, as pleaded in Schedule 3, Section C3;

- (d) in respect of the Wagga Base, as pleaded in Schedule 4, Section C3;
- (e) in respect of the Edinburgh Base, as pleaded in Section 5, Section C3;
- (f) in respect of the Bandiana Base, as pleaded in Schedule 6, Section C3;
- (g) in respect of the Townsville Base, as pleaded in Schedule 7, Section C3.

C.4 Physical properties of AFFF and Spent AFFF

- 15. At all material times, AFFF Concentrate was soluble in water.

PARTICULARS

- (i) *AFFF Concentrate was a manufactured product and the particulars to paragraph 13 are repeated.*
 - (ii) *The fact that AFFF Concentrate was soluble was at all times intrinsic to its property as a concentrate.*
- 16. At all material times AFFF Working Solution, AFFF, and Spent AFFF had the same properties as AFFF Concentrate (as pleaded in paragraph 15 above).

C.5 The foreseeable flow of Spent AFFF from the Pearce Base

- 17. The foreseeable flow of Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF was as follows:
 - (a) in respect of the Pearce Base and Pearce Relevant Area, as pleaded in Schedule 1, Section C5;
 - (b) in respect of the Darwin Base and Darwin Relevant Area, as pleaded in Schedule 2, Section C5;
 - (c) in respect of the Richmond Base and Richmond Relevant Area, as pleaded in Schedule 3, Section C5;
 - (d) in respect of the Wagga Base and Wagga Relevant Area, as pleaded in Schedule 4, Section C5;
 - (e) in respect of the Edinburgh Base and Edinburgh Relevant Area, as pleaded in Section 5, Section C5;
 - (f) in respect of the Bandiana Base and Bandiana Relevant Area, as pleaded in Schedule 6, Section C5;

- (g) in respect of the Townsville Base and Townsville Relevant Area, as pleaded in Schedule 7, Section C5.

D THE TOXIC PROPERTIES OF SPENT AFFF

D.1 The potential for AFFF to harm humans and the environment

18. At all material times, AFFF Concentrate was a non-naturally occurring (unnatural) substance.
19. The AFFF Concentrate used by the Commonwealth at each of the Bases contained, among other constituent ingredients, synthetic per- and poly-fluorinated compound chemical surfactants (**PFCs**), including:
- (a) perfluoro-octane sulfonate (**PFOS**);
 - (b) perfluoro-octanoic acid (**PFOA**); and
 - (c) other PFCs, such as perfluoro-hexane sulfonate.

PARTICULARS

- (i) *the MSDS sheets for “Light WaterTM” disclosed that AFFF Concentrate contained various fluoroalkyl substances.*
 - (ii) *It was only in about 2004, that the Commonwealth implemented a policy to restrict use of AFFF containing PFOS/PFOA and introduce a training foam called “Ansul” (which the Commonwealth considered to contain no PFOS/PFOA) and a foam for operational purposes called “Ansulite” (which the Commonwealth considered to contain only trace levels of PFOS/PFOA).*
20. PFCs, and in particular each of PFOS and PFOA (together **PFC Contaminants**), have the following properties:
- (a) they are persistent in soil and water;
 - (b) they are mobile, and can migrate significant distances with little attenuation;
 - (c) they are bio-accumulative and persistent in the human body and in animals;
 - (d) they are bio-accumulative in plants;
 - (e) they bio-magnify in the food chain;
 - (f) they are readily absorbed by humans and animals, including by:

- (i) drinking water containing the compounds;
 - (ii) consuming produce from land and/or water containing the compounds;
 - (iii) consuming meat from animals that have grazed on land and/or consumed water or produce grown therewith and/or thereon containing the compounds; and
 - (iv) inhalation, including inhalation of dust generated from surface soils containing the compounds and dermal contact, including dermal contact with impacted soil and groundwater containing the compounds; and
- (g) they are toxic.

PARTICULARS

- (i) *Coleville & McCarron (Environmental, Heritage and Risk Branch), "Environmental Issues Associated with Defence Use of Aqueous Film Forming Foam (AFFF)" (May 2003) at pp.3-4.*
 - (ii) *Australian Government, Foreign Affairs and Trade Committee, Submission by the Department of the Environment in relation to Part B: Inquiry into PFOS and PFOA contamination on other Commonwealth, state and territory sites in Australia where firefighting foams containing PFOS and PFOA were used (2016).*
21. By reason of the matters pleaded in paragraphs 18 and/or 19 to 20, AFFF Concentrate was:
- (a) potentially damaging to the environment; and/or
 - (b) potentially causative of adverse health effects in humans.
22. At all material times AFFF Working Solution, AFFF, and Spent AFFF had the same properties as AFFF Concentrate (as pleaded in paragraphs 18 and/or 19 to 20 and/or 21 above).

D.2 The foreseeable flow and transmission of a toxic substance

23. The foreseeable flow and transmission of an unnatural soluble substance containing synthetic chemicals from each of the Bases was:
- (a) in respect of the Pearce Base, as pleaded in Schedule 1, Section D2;
 - (b) in respect of the Darwin Base, as pleaded in Schedule 2, Section D2;
 - (c) in respect of the Richmond Base, as pleaded in Schedule 3, Section D2;

- (d) in respect of the Wagga Base, as pleaded in Schedule 4, Section D2;
- (e) in respect of the Edinburgh Base, as pleaded in Section 5, Section D2;
- (f) in respect of the Bandiana Base, as pleaded in Schedule 6, Section D2;
- (g) in respect of the Townsville Base, as pleaded in Schedule 7, Section D2.

E THE CONTAMINATION OF THE AREAS SURROUNDING THE BASES

E.1 The contamination of surface water

24. Rivers, creeks and other surface waters proximate to the Bases and the Relevant Areas have been contaminated:

- (a) in respect of the Pearce Base and Pearce Relevant Area, as pleaded in Schedule 1, Section E1 – namely the Pearce Surface Water Contamination;
- (b) in respect of the Darwin Base and Darwin Relevant Area, as pleaded in Schedule 2, Section E1 – namely the Darwin Surface Water Contamination;
- (c) in respect of the Richmond Base and Richmond Relevant Area, as pleaded in Schedule 3, Section E1 – namely the Richmond Surface Water Contamination;
- (d) in respect of the Wagga Base and Wagga Relevant Area, as pleaded in Schedule 4, Section E1 – namely the Wagga Surface Water Contamination;
- (e) in respect of the Edinburgh Base and Edinburgh Relevant Area, as pleaded in Section 5, Section E1 – namely the Edinburgh Surface Water Contamination;
- (f) in respect of the Bandiana Base and Bandiana Relevant Area, as pleaded in Schedule 6, Section E1 – namely the Bandiana Surface Water Contamination;
- (g) in respect of the Townsville Base and Townsville Relevant Area, as pleaded in Schedule 7, Section E1 – namely the Townsville Surface Water Contamination,

(together, **Surfacewater Contamination**), and there is no practical or cost-effective way of remediating the Surfacewater Contamination.

E.2 The contamination of groundwater

25. PFCs and PFC Contaminants have been identified in aquifers underlying the Relevant Areas:

- (a) in respect of the Pearce Relevant Area, as pleaded in Schedule 1, Section E2 – namely the Pearce Toxic Plume and Pearce Groundwater Contamination;
- (b) in respect of the Darwin Relevant Area, as pleaded in Schedule 2, Section E2 – namely the Darwin Toxic Plume and Darwin Groundwater Contamination;
- (c) in respect of the Richmond Relevant Area, as pleaded in Schedule 3, Section E2 – namely the Richmond Toxic Plume and Richmond Groundwater Contamination;
- (d) in respect of the Wagga Relevant Area, as pleaded in Schedule 4, Section E2 – namely the Wagga Toxic Plume and Wagga Groundwater Contamination;
- (e) in respect of the Edinburgh Relevant Area, as pleaded in Section 5, Section E2 – namely the Edinburgh Toxic Plume and Edinburgh Groundwater Contamination;
- (f) in respect of the Bandiana Relevant Area, as pleaded in Schedule 6, Section E2 – namely the Bandiana Toxic Plume and Bandiana Groundwater Contamination;
- (g) in respect of the Townsville Relevant Area, as pleaded in Schedule 7, Section E2 – namely the Townsville Toxic Plume and Townsville Groundwater Contamination,

(together, **Toxic Plumes** and **Groundwater Contamination**), and there is no practical or cost-effective way of remediating the Toxic Plumes, or the Groundwater Contamination.

E.3 The contamination of soil

26. Soil on the land in the Relevant Areas has become, and is likely to continue to become and remain, contaminated by PFC Contaminants emanating from the Bases:

- (a) in respect of the Pearce Relevant Area, as pleaded in Schedule 1, Section E3 – namely the Pearce Soil Contamination;

- (b) in respect of the Darwin Relevant Area, as pleaded in Schedule 2, Section E3 – namely the Darwin Soil Contamination;
- (c) in respect of the Richmond Relevant Area, as pleaded in Schedule 3, Section E3 – namely the Richmond Soil Contamination;
- (d) in respect of the Wagga Relevant Area, as pleaded in Schedule 4, Section E3 – namely the Wagga Soil Contamination;
- (e) in respect of the Edinburgh Relevant Area, as pleaded in Section 5, Section E3 – namely the Edinburgh Soil Contamination;
- (f) in respect of the Bandiana Relevant Area, as pleaded in Schedule 6, Section E3 – namely the Bandiana Soil Contamination;
- (g) in respect of the Townsville Relevant Area, as pleaded in Schedule 7, Section E3 – namely the Townsville Soil Contamination,

(together, **Soil Contamination**), and there is no practical or cost-effective way of remediating the Soil Contamination.

E.4 The Broader Biota Contamination

27. Extensive other aspects of the biotic and abiotic matrices within the Relevant Areas (including on land owned by Group Members) have become and are likely to continue to remain, contaminated by PFC Contaminants, and be recirculated indefinitely within the Relevant Areas:

- (a) in respect of the Pearce Relevant Area, as pleaded in Schedule 1, Section E4 – namely the Pearce Biota Contamination;
- (b) in respect of the Darwin Relevant Area, as pleaded in Schedule 2, Section E4 – namely the Darwin Biota Contamination;
- (c) in respect of the Richmond Relevant Area, as pleaded in Schedule 3, Section E4 – namely the Richmond Biota Contamination;
- (d) in respect of the Wagga Relevant Area, as pleaded in Schedule 4, Section E4 – namely the Wagga Biota Contamination;

- (e) in respect of the Edinburgh Relevant Area, as pleaded in Section 5, Section E4 – namely the Edinburgh Biota Contamination;
- (f) in respect of the Bandiana Relevant Area, as pleaded in Schedule 6, Section E4 – namely the Bandiana Biota Contamination;
- (g) in respect of the Townsville Relevant Area, as pleaded in Schedule 7, Section E4 – namely the Townsville Biota Contamination,

(together, **Biota Contamination**), and there is no practical or cost-effective way of remediating the Biota Contamination.

E.5 The announcement of the contamination of the Relevant Areas

28. The contamination of the Relevant Areas was publicly announced:

- (a) in respect of the Pearce Relevant Area, as pleaded in Schedule 1, Section E5;
- (b) in respect of the Darwin Relevant Area, as pleaded in Schedule 2, Section E5;
- (c) in respect of the Richmond Relevant Area, as pleaded in Schedule 3, Section E5;
- (d) in respect of the Wagga Relevant Area, as pleaded in Schedule 4, Section E5;
- (e) in respect of the Edinburgh Relevant Area, as pleaded in Section 5, Section E5;
- (f) in respect of the Bandiana Relevant Area, as pleaded in Schedule 6, Section E5;
- (g) in respect of the Townsville Relevant Area, as pleaded in Schedule 7, Section E5.

E.6 The adverse affectation to land in the Relevant Areas

29. Land in the Relevant Areas (including the land of the Applicant and Group Members) has become adversely affected in its value:

- (a) in respect of the Pearce Relevant Area, as pleaded in Schedule 1, Section E6;
- (b) in respect of the Darwin Relevant Area, as pleaded in Schedule 2, Section E6;

- (c) in respect of the Richmond Relevant Area, as pleaded in Schedule 3, Section E6;
- (d) in respect of the Wagga Relevant Area, as pleaded in Schedule 4, Section E6;
- (e) in respect of the Edinburgh Relevant Area, as pleaded in Section 5, Section E6;
- (f) in respect of the Bandiana Relevant Area, as pleaded in Schedule 6, Section E6;
- (g) in respect of the Townsville Relevant Area, as pleaded in Schedule 7, Section E6.

E.7 The reasonable foreseeability of the adverse affectation to the value of land in the Relevant Areas

30. The adverse affectation of land in the Relevant Areas was foreseeable:

- (a) in respect of the Pearce Relevant Area, as pleaded in Schedule 1, Section E7;
- (b) in respect of the Darwin Relevant Area, as pleaded in Schedule 2, Section E7;
- (c) in respect of the Richmond Relevant Area, as pleaded in Schedule 3, Section E7;
- (d) in respect of the Wagga Relevant Area, as pleaded in Schedule 4, Section E7;
- (e) in respect of the Edinburgh Relevant Area, as pleaded in Section 5, Section E7;
- (f) in respect of the Bandiana Relevant Area, as pleaded in Schedule 6, Section E7;
- (g) in respect of the Townsville Relevant Area, as pleaded in Schedule 7, Section E7.

F THE COMMONWEALTH'S ACTS AND OMISSIONS

F.1 The Commonwealth's knowledge

F.1.1 The Commonwealth's knowledge of the Bases and their surrounds

31. At all material times, the Commonwealth knew, or ought reasonably to have known of the features of the Bases and their surrounds:

- (a) in respect of the Pearce Base and Pearce Relevant Area, as pleaded in Schedule 1, Section F1.1;
- (b) in respect of the Darwin Base and Darwin Relevant Area, as pleaded in Schedule 2, Section F1.1;
- (c) in respect of the Richmond Base and Richmond Relevant Area, as pleaded in Schedule 3, Section F1.1;
- (d) in respect of the Wagga Base and Wagga Relevant Area, as pleaded in Schedule 4, Section F1.1;
- (e) in respect of the Edinburgh Base and Edinburgh Relevant Area, as pleaded in Section 5, Section F1.1
- (f) in respect of the Bandiana Base and Bandiana Relevant Area, as pleaded in Schedule 6, Section F1.1;
- (g) in respect of the Townsville Base and Townsville Relevant Area, as pleaded in Schedule 7, Section F1.1.

F.1.2 The Commonwealth's knowledge of water use in the Relevant Areas

32. At all material times, the Commonwealth knew, or ought reasonably to have known of the water usages in the Relevant Areas:

- (a) in respect of the Pearce Relevant Area, as pleaded in Schedule 1, Section F1.2;
- (b) in respect of the Darwin Relevant Area, as pleaded in Schedule 2, Section F1.2;
- (c) in respect of the Richmond Relevant Area, as pleaded in Schedule 3, Section F1.2;
- (d) in respect of the Wagga Relevant Area, as pleaded in Schedule 4, Section F1.2;
- (e) in respect of the Edinburgh Relevant Area, as pleaded in Section 5, Section F1.2;
- (f) in respect of the Bandiana Relevant Area, as pleaded in Schedule 6, Section F1.2;
- (g) in respect of the Townsville Relevant Area, as pleaded in Schedule 7, Section F1.2.

F.1.3 The Commonwealth's knowledge of the toxic properties of Spent AFFF and Fire Run-Off

33. At all material times, the Commonwealth ought reasonably to have known that AFFF Concentrate, AFFF Working Solution, AFFF, Spent AFFF and/or Fire Run Off were:
- (a) potentially damaging to the environment; and/or
 - (b) potentially causative of adverse health effects in humans.

PARTICULARS

(i) As to sub-paragraph (a):

- A. Prior to 1987, the Commonwealth knew or ought to have known of the following publications:
 - (a) US Natural Fire Protection Association (1974). *Synthetic Foam and Combined Agent Systems 1974*, NFPA No. 11B.
 - (b) Air Force Weapons Laboratory. (1974). *Treatability of Aqueous Film-Forming Foams Used for Firefighting*. New Mexico: Air Force Weapons Laboratory;
 - (c) Krasner, L. Breen, D. and Fitzgerald, P. (1975). *Fire Protection of Large Airforce Hangars*. Norwood: Air Force Weapons Laboratory;
 - (d) British Home Office (Fire Department) (1976). *Manual of Firemanship: Hand Pumps, Extinguishers and Foam Equipment Book 3. Survey of the Science of Fire-fighting*.
 - (e) Naval Facilities Engineering Command. (1980). *Aircraft Fire and Rescue Training Facilities*. Alexandria: Naval Facilities Engineering Command;
 - (f) Saam, R., Rakowski, P. and Aydlett, G. (1980). *Treatability of Fire Fighting School Wastewaters: US Navy Compliance with POTW Pretreatment Requirements*. Virginia: US Navy;
 - (g) US Navy, Air Force and Army. (1980). *Membrane Treatment of Aqueous Film Forming Foam (AFFF) Wastes for Recovery of Its Active Ingredients*. Port Hueneme: Georgia Institute of Technology;
 - (h) Alger, R. and Johnson, W. (1981). *Evaluation of the North Island A/C Crash/Rescue Training Facility*. Alexandria: Naval Facilities Engineering Command;
 - (i) Booz, Allen & Hamilton Inc. (1981). *Fire Fighter Trainer Environmental Considerations Phase II*. Bethesda: Advanced Technology Systems;

- (j) The Parliament of the Commonwealth of Australia (1984). Report relating to the Development of R.A.A.F. Base, Tindal, Northern Territory (Twelfth Report of 1984). *Parliamentary Standing Committee on Public Works*.
 - (k) Salazar, S. (1985). *Toxicity of Aqueous Film Forming Foams to Marine Organisms: Literature Review and Biological Assessment*. San Diego: Naval Ocean Systems Center;
 - (l) Thurman, E., Barber, L. and LeBlanc, D. (1986). Movement and fate of detergents in groundwater: a field study. *Journal of Contaminant Hydrology*, 1(1-2);
 - (m) Binovi, R., Tetla, R., Slavich, F. (1987). *Wastewater Characterization and Hazardous Waste Survey*. Texas: USAF Occupational and Environmental Health Laboratory;
 - (n) Binovi, R., Tetla, R., Slavich, F. (1987). *Wastewater Characterization and Hazardous Waste Survey at George AFB CA*. Texas: USAF Occupational and Environmental Health Laboratory; and
 - (o) Department of Defence. (1987). *RAAF Base Tindal Environmental Management Plan and Environmental Contingency Plan*. Kinhill Engineers.
- B. Prior to 1999, the Commonwealth knew or ought to have known of the following publications (in addition to the publications referred to in D1 above):
- (a) Dharmavaram, S., Knowlton, D., Heflin, C. and Donahue, B. (1988). *Hazardous Waste Minimization Assessment*. Champaign: US Army Construction Engineering Research Laboratory;
 - (b) Slavich, F. and Atterbery, C. (1988). *Wastewater and Hazardous Waste Survey, England AFB, LA*. Texas: US Air Force Occupational Health Laboratory;
 - (c) Brittain, J. (1991). *Foams: The Environmental Challenge*. Reims: Second International Oil and Petrochemical Forum;
 - (d) Holemann, H. (1994). *Environmental Problems Caused by Firefighting Agents*.
 - (e) Darwin, R., Ottman, R., Norman, E., Gott, J. and Hanauska, C. (1995). Foam and the Environment: a Delicate Balance. *NFPA Journal*, (67);
 - (f) Stern, J., Routley, J. (1996). *Class A Foam for Structural Fire Fighting*. Emmitsburg: National Fire Data Center;
 - (g) US Army Corps of Engineers. (1997). *Containment and*

Disposal of Aqueous Film Forming Foam Solution.

Washington: US Army Corps of Engineers;

- (h) Moody, C. and Field, J. (1999). Determination of Perfluorocarboxylates in Groundwater Impacted by Firefighting Activity. *Environmental Science and Technology*, 33(16).
- C. By no later than 16 May 2000, the Commonwealth knew of the following publications (in addition to the publications of which it knew which it knew or ought to have known referred to in D1 and D2 above):
 - (a) Environmental Protection Agency (2000). *EPA and 3M Announce Phase Out of PFOS*;
 - (b) Email received by employees of the Commonwealth of Australia (mark.hyman@ea.gov.au and vickersc@worksafe.gov.au) from Charles Auer of United States Environmental Protection on 16 May 2000 at 11.1AM] regarding Phaseout of PFOS; and
 - (c) 3M News (2000). *3M Phasing Out Some of its Specialty Materials*.
- D. Between 16 May 2000 and 2008, the Commonwealth knew or ought to have known of the following publications (in addition to the publications of which it knew or ought to have known referred to in D1, D2 and D3 above):
 - (a) The Federal Register. (2000). *Perfluorooctyl Sulfonates; Proposed Significant New Use Rules*. Washington: The Daily Journal of the United States Government;
 - (b) "Joint Meeting of the Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology. (2002). *Hazard Assessment of Perfluorooctane Sulfonate and its Salts*. Crystal City: Organisation for Economic Co-Operation and Development;
 - (c) National Industrial Chemicals Notification and Assessment Scheme. (2003). *NICNAS Alert No.2 – Existing Chemicals – Perfluorooctane sulfonate (PFOS)*. Brisbane: NICNAS;
 - (d) Defence Corporate Services Infrastructure Centre. (2003). *Environmental Issues Associated with Defence use of Aqueous Film Forming Foam (AFFF)*. Environmental Stewardship, Environment, Heritage and Risk Branch.

- (ii) *As to sub-paragraph (b), the matters referred to in particular (i) involved knowledge of the contamination of groundwater, and it may be inferred that a person who ought reasonably to have known that groundwater may be contaminated also ought reasonably to have known that there existed a potential for adverse health effects in humans who may consume groundwater, or produce (including livestock) watered with groundwater.*

34. Further, or alternatively, at all material times from no later than 16 May 2000, the Commonwealth knew that AFFF Working Solution, AFFF and Spent AFFF was:

- (a) potentially damaging to the environment; and/or
- (b) potentially causative of adverse health effects in humans,

because it contained PFCs, namely PFOS.

PARTICULARS

- (i) *Particular (i)(D) to paragraph 33 is repeated.*

35. Further, or alternatively, at all material times from no later than 2003 (**Actual Knowledge Date**), the Commonwealth knew that:

- (a) it had been conducting Training and Operation Activities at each of the Bases for a substantial period of time; and
- (b) AFFF Working Solution, AFFF and/or Spent AFFF:

- (i) had contaminated:

- (A) the groundwater underlying the Bases and the Relevant Areas;
- (B) the surface water sources proximate to the Bases and the Relevant Areas;

- (ii) alternatively, was likely to have contaminated:

- (A) the groundwater underlying the Bases and the Relevant Areas;
- (B) the surface water sources proximate to the Bases and the Relevant Areas.

PARTICULARS

- (i) *As to sub-paragraph (a):*

- A. *Paragraph 13 is repeated;*
 - B. *The Commonwealth had commenced conducting such Training and Operation Activities at each of the Bases since about the 1970s at the earliest and about 1983 at the latest.*
- (ii) *As to sub-paragraph (b):*
- A. *the following paragraphs are repeated:*
 - I. *Paragraph 1.97 of Schedule 1 and the particulars thereto (Pearce), which pleads that the Commonwealth knew, or ought reasonably to have known that AFFF Working Solution, AFFF, and Spent AFFF had contaminated groundwater under the Pearce Base by 2005;*
 - II. *Paragraph 2.138 of Schedule 2 and the particulars thereto (Darwin), which pleads that the Commonwealth knew, or ought reasonably to have known that AFFF Working Solution, AFFF, and Spent AFFF had contaminated groundwater under the Darwin Base by 2004;*
 - III. *Paragraph 3.96 of Schedule 3 and the particulars thereto (Richmond), which pleads that the Commonwealth knew or ought reasonably to have known that AFFF Working Solution, AFFF, and Spent AFFF had contaminated groundwater under the Richmond Base by 2005;*
 - IV. *Paragraph 4.89 of Schedule 4 and the particulars thereto (Wagga), which pleads that the Commonwealth knew or ought reasonably to have known that AFFF Working Solution, AFFF, and Spent AFFF had contaminated groundwater under the Wagga Base by 2004;*
 - V. *Paragraph 5.94 of Schedule 5 and the particulars thereto (Edinburgh), which pleads that the Commonwealth knew or ought reasonably to have known that AFFF Working Solution, AFFF, and Spent AFFF had contaminated groundwater under the Edinburgh Base by 2008;*
 - VI. *Paragraph 6.113 of Schedule 6 and the particulars thereto (Bandiana), which pleads that the Commonwealth knew or ought reasonably to have known that AFFF Working Solution, AFFF, and Spent AFFF had contaminated groundwater under the Bandiana Base by 2005;*
 - VII. *Paragraph 7.118 of Schedule 7 and the particulars thereto (Townsville), which pleads that the Commonwealth knew or ought reasonably to have known that AFFF Working Solution, AFFF, and Spent AFFF had contaminated groundwater under the Townsville Base by 2003.*
- (iii) *Given that the earliest of the dates referred to in (I)-(VII) above is 2003, and that the Commonwealth's use of AFFF was not*

materially different at each of the Bases, it may be inferred that the Commonwealth knew that AFFF Working Solution, AFFF and/or Spent AFFF had contaminated, or was likely to have contaminated, groundwater underlying all of the Bases, and surface water proximate to all of the Bases.

F.2 The Commonwealth's conduct

36. The Commonwealth's conduct in respect of:

- (a) the Applicant and Pearce Group Members, is as pleaded in Schedule 1, Section F2;
- (b) Darwin Group Members, is as pleaded in Schedule 2, Section F2;
- (c) Richmond Group Members, is as pleaded in Schedule 3, Section F2;
- (d) Wagga Group Members, is as pleaded in Schedule 4, Section F2;
- (e) Edinburgh Group Members, is as pleaded in Schedule 5, Section F2;
- (f) Bandiana Group Members, is as pleaded in Schedule 6, Section F2;
- (g) Townsville Group Members, is as pleaded in Schedule 7, Section F2.

G THE COMMONWEALTH'S LIABILITY

G.1 Nuisance

37. The Commonwealth is liable in nuisance to:

- (a) the Applicant and Pearce Group Members, as pleaded in Schedule 1, Section G1;
- (b) Darwin Group Members, as pleaded in Schedule 2, Section G1;
- (c) Richmond Group Members, as pleaded in Schedule 3, Section G1;
- (d) Wagga Group Members, as pleaded in Schedule 4, Section G1;
- (e) Edinburgh Group Members, as pleaded in Schedule 5, Section G1;
- (f) Bandiana Group Members, as pleaded in Schedule 6, Section G1;
- (g) Townsville Group Members, as pleaded in Schedule 7, Section G1.

G.2 Negligence

38. The Commonwealth is liable in negligence to:

- (a) the Applicant and Pearce Group Members, as pleaded in Schedule 1, Section G2;
- (b) Darwin Group Members, as pleaded in Schedule 2, Section G2;
- (c) Richmond Group Members, as pleaded in Schedule 3, Section G2;
- (d) Wagga Group Members, as pleaded in Schedule 4, Section G2;
- (e) Edinburgh Group Members, as pleaded in Schedule 5, Section G2;
- (f) Bandiana Group Members, as pleaded in Schedule 6, Section G2;
- (g) Townsville Group Members, as pleaded in Schedule 7, Section G2.

G.3 Breach of statutory duty

39. The Commonwealth is liable for contravention of s 28 of the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) to:

- (a) the Applicant and Pearce Group Members, as pleaded in Schedule 1, Section G3;
- (b) Darwin Group Members, as pleaded in Schedule 2, Section G3;
- (c) Richmond Group Members, as pleaded in Schedule 3, Section G3;
- (d) Wagga Group Members, as pleaded in Schedule 4, Section G3;
- (e) Edinburgh Group Members, as pleaded in Schedule 5, Section G3;
- (f) Bandiana Group Members, as pleaded in Schedule 6, Section G3;
- (g) Townsville Group Members, as pleaded in Schedule 7, Section G3.

H CLAIM FOR RELIEF

AND the Applicant claims on his/her own behalf, and on behalf of Group Members the relief set out in the Originating Application under Part IVA of the *Federal Court of Australia Act 1976* (Cth):

1. Damages (including aggravated and exemplary damages);
2. Further, or alternatively:
 - (a) a declaration that by its use of each of the Bases, the Commonwealth contravened s 28(1) of the EPBC Act on and from 16 July 1999;
 - (b) statutory compensation pursuant to s 500(1) of the EPBC Act;
3. Interest;
4. Costs; and
5. Such further or other relief as the Court thinks fit.

Date: 15 April 2020



Signed by Joshua Aylward
Lawyer for the Applicants

This pleading was prepared by Shine Lawyers, and settled by W A D Edwards, R J May and T Bateman of counsel.

Certificate of lawyer

I Joshua Aylward certify to the Court that, in relation to the statement of claim filed on behalf of the Applicant, the factual and legal material available to me at present provides a proper basis for each allegation in the pleading.

Date: 15 April 2020

A handwritten signature in cursive script, reading "Joshua Aylward".

Signed by Joshua Aylward
Lawyer for the Applicants

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A THE PEARCE BASE AND SURROUNDS

A.1 The Pearce Base

- 1.1. Since about 1934, the Commonwealth has continuously owned and occupied an area of land, which now consists of approximately 9.63 kilometres square in size and is approximately 35 kilometres north-east of Perth in Western Australia, known as RAAF Base Pearce (the **Pearce Base**).

PARTICULARS

- (i) *GHD Pty Ltd, Department of Defence: RAAF Base Pearce PFAS Investigation – Consolidated Detailed Site Investigation Report (18 July 2018) (GHD DSI Report) at paragraphs 2.2 and 3.1.*
 - (ii) *From time to time the Commonwealth has acquired neighbouring properties which have become incorporated into the land occupied by the Pearce Base.*
- 1.2. At all material times, neighbouring land use in the region surrounding the Pearce Base was and is:
- (a) in the north quarter, vacant Commonwealth land, the Pearce Base landfill and a golf course;
 - (b) in the east quarter, vacant Commonwealth land and land leased to the Water Corporation for use as a Waste Water Treatment Plan, the Bullsbrook town centre, residential rural properties and commercial/industrial properties;
 - (c) in the south quarter, rural residential including paddocks; and
 - (d) in the west quarter, residential properties, rural residential including paddocks and Commonwealth land currently leased as pastoral land (known as lot 200).

PARTICULARS

- (i) *GHD DSI Report at paragraph 2.3.*

A.2 The natural features of the Pearce Base and surrounding area

A.2.1 Climate

- 1.3. At all material times, the Pearce Base and the Pearce Relevant Area were situated in a Mediterranean climate with distinct hot and dry summers and cool and wet winters.

PARTICULARS

- (i) *GHD DSI Report at paragraph 4.1.*

A.2.2 Topography

- 1.4. At all material times, the Pearce Base and the Pearce Relevant Area was relatively flat, sloping gently in westerly direction towards Ellen Brook.

PARTICULARS

(i) *GHD Consolidated Report at paragraph 4.2.*

- 1.5. At all material times, the Pearce Relevant Area contained two streams being:
- (a) Ellen Brook, which is located along the western boundary of the Pearce Relevant Area; and
 - (b) Ki-it Monger Brook, which is located along the southern portion of the eastern boundary of the Pearce Relevant Area,

(together, the **Pearce Brooks**).

PARTICULARS

(i) *GHD Consolidated Report at paragraph 4.2.*

- 1.6. At all material times, the Pearce Relevant Area contained a number of sensitive ecological receptors including several conservation reserves and wetlands including the Twin Swamps Nature Reserve and the Ellen Brook Nature Reserve (**Ecological Receptors**).
- 1.7. At all material times, the Ecological Receptors were hydraulically connected to groundwater and surface water, with:
- (a) the surface water in the Twin Swamps Nature Reserve being supplemented by groundwater from bores located within the northern portion of the reserve; and
 - (b) the surface water in Ellen Brook Nature Reserve being fed directly by Ellen Brook.

PARTICULARS

(i) *GHD DSI Report at paragraph 4.6.1.*

- 1.8. At all material times, due to high clay content of near-surface soils across the Pearce Base, surface water would pool or pond, particularly:
- (a) within bushland along the western boundary of the Pearce Base near Ellen Brook;

- (b) within bushland in the southern portion of the former fire training areas;
- (c) within the eastern portion of Lot 200, immediately west of Ellen Brook, which was likely as a result of overflow from Ellen Brook during or following heavy rainfall events.

PARTICULARS

(i) GHD DSI Report at paragraph 4.2.

- 1.9. At all material times, by reason of the matters pleaded in paragraphs 1.4 to 1.8, surface water on and around the Pearce Base (including rainwater, floodwaters, or overland flow):
- (a) generally tended to pool, pond and percolate or permeate into the soil after wet weather or inundation for lengthy periods; and
 - (b) naturally moves into the Pearce Brooks.

A.2.3 Soils

- 1.10. At all material times, the Pearce Base and the Pearce Relevant Area was generally dominated by a succession of brown silty clays which formed a unit, over a sandier basal unit.
- 1.11. At all material times:
- (a) the upper clay-rich unit contained various lenses of gravelly clay and silty sand, which were variously distributed across the Pearce Relevant Area; and
 - (b) the sandier basal unit, contained silty to clayey sands, of a grey to molten brown colour,
- each of which permitted the passage of rainwater (and surface water) to the subsoil and groundwater below the Pearce Relevant Area.

PARTICULARS

(i) GHD DSI Report at paragraph 8.1

A.2.4 Hydrology

- 1.12. At all material times, Ellen Brook flowed generally in a southerly direction along the western boundary of the Pearce Base.

PARTICULARS

- (i) GHD DSI Report paragraph 4.2.

1.13. At all material times, Ki-it Monger Brook flowed generally south along the southern portion of the eastern boundary of the Pearce Base.

PARTICULARS

- (i) GHD DSI Report paragraph 4.2.

1.14. At all material times, Ellen Brook and Ki-it Monger Brook merged at approximately 200 metres south of the Pearce Base.

PARTICULARS

- (i) GHD DSI Report at paragraph 4.2.

1.15. At all material times, surface water on and around the Pearce Base (including rainwater or overland flow), is and was generally directed towards three principal drainage catchments, which direct surface water to open drainage channels, that discharge into the Pearce Brooks.

1.16. The three principal drainage catchments are located:

- (a) in the northern portion of the Pearce Base, which flows in a north-westerly direction towards an open drain and discharges into Ellen Brook;
- (b) in the eastern portion of the Pearce Base, which flows towards open drains extending in a general south-easterly direction and discharge into Ki-it Monger Brook; and
- (c) in the western portion of the Pearce Base, which flows to open drains that mostly extend in south-westerly direction and discharge into Ellen Brook, with one drain extending in a south south-easterly direction and discharges into Ki-it Monger Brook.

PARTICULARS

- (i) GHD DSI Report at paragraph 4.2.

A.2.5 Hydrogeology

1.17. At all material times, the Pearce Base and the Pearce Relevant Area were underlain by two aquifers, being:

- (a) a discontinuous, seasonal, perched aquifer located within the upper clay rich layer; and
- (b) a superficial regional aquifer that is present throughout the whole of the Pearce Base and the Pearce Relevant Area, is generally unconfined and occurs within the sand-rich layer underlying the clay-rich upper unit (**Pearce Regional Aquifer**).

PARTICULARS

- (i) GHD DSI Report at paragraphs 4.4 and 8.2.1.

A.2.6 Flooding

- 1.18. At all material times, the Pearce Base and the Pearce Relevant Area were prone to flooding, associated overland flow, and the discharge of surface water to groundwater and groundwater to surface water during the wet season, and post-winter conditions.

PARTICULARS

- (i) GHD DSI Report at paragraphs 12.2.1 and 12.2.2.

A.3 The artificial water-related features of the Pearce Base

- 1.19. At all material times, the Pearce Base contained a number of open drains that traversed the Pearce Base and diverted the bulk of surface water run-off to the Pearce Brooks (**Pearce Drainage System**).

PARTICULARS

- (i) GHD DSI Report at paragraph 12.2.1.
 - (i) Further particulars of the Pearce Drainage System and other drainage systems on the Pearce Base may be provided after discovery and inspection.
- 1.20. At all material times, there were ground water bores located within a 5 km radius of the centre of the Pearce Base, the majority of which abstracted ground water from the Pearce Regional Aquifer.

PARTICULARS

- (i) *GHD DSI Report at paragraph 4.5.*
- (ii) *Based on information available through the Western Australia Department of Water and Environment*

Regulation (DWER) water information database, there are in excess of 100 registered groundwater bores located within a 5 kilometre radius of the centre of the Pearce Base. Domestic groundwater abstraction (with a yield of less than 1500 kL/annum) does not require licensing and thus there is likely to be a significant number of bores present within the Pearce Relevant Area which are not shown on the DWER (2017b) database.

- (iii) *The best particulars the Applicants can provide of the bores which exist on the Pearce Base are contained in the GHD DSI Report at paragraph 4.5 and Figure 9 Registered groundwater bores.*

A.4 The foreseeable flow of water from the Pearce Base

1.21. At all material times, by reason of the matters pleaded in paragraphs 1.4 to 1.20, it was reasonably foreseeable that waters, liquids, and soluble materials discharged on Pearce Base would:

- (a) permeate, percolate or leach into the soil at the Pearce Base;
- (b) be transmitted to the groundwater beneath the Pearce Base, including into the Regional Aquifer and mingle and flow with that groundwater;
- (c) mingle with other surface water on the Pearce Base (especially after periods of rain), and flow overland in a generally westerly direction, towards Ellen Brook and:
 - (i) permeate or percolate into the soil over which the surface water overland flows occurred; and
 - (ii) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including into the Regional Aquifer; and
- (d) be transmitted to the Pearce Brooks.

PARTICULARS

- (i) *GHD DSI Report at paragraphs 12.2.2 and 14.5.*

B WATER USE AT THE PEARCE RELEVANT AREA

B.1 Ellen Brook and Ki-it Monger Brook

- 1.22. At all material times, the Pearce Brooks have been used by residents of the Pearce Relevant Area for fishing (including crustaceans (yabbies and gilgies) for food) (particularly from the portion of Ellen Brook directly south of the Pearce Base and the tributary that crosses Lot 200 and connects with Ellen Brook), swimming and recreational purposes (the **Brooks Usages**).

PARTICULARS

- (i) *GHD DSI Report at paragraphs 3.3, 4.5 and 12.4.1.*
- (ii) *GHD Department of Defence RAAF Base Pearce PFAS Investigation Human Health Risk Assessment Consolidated Report (July 2018) (GHD HHRA Report) at paragraph 7.3.6.*

B.2 Groundwater

- 1.23. At all material times, the use of groundwater from the Pearce Regional Aquifer by the residents of the Pearce Relevant Area has been for:

- (a) drinking, particularly the residents of the properties located to the west of the Pearce Base within West Bullsbrook who do not have a scheme water connection;
- (b) swimming (including in municipal, residential, and rural swimming pools filled using water from bores);
- (c) domestic purposes (including cooking, bathing, showering, washing, and cleaning);
- (d) gardening and irrigation purposes (including by both township and rural properties); and
- (e) watering of livestock,

(together, the **Pearce Groundwater Usage**).

PARTICULARS

- (i) *GHD DSI Report at paragraph 4.5.*
- (ii) *The Applicants repeat the particulars to paragraph 1.20 above.*

- (iii) *Forty-five respondents to a water use survey conducted in 2016 indicated they had groundwater bores on their properties, all of which were using at the time, or previously used, bore water on their properties, including forty four respondents who used bore water in their homes: GHD DSI Report at paragraph 4.5.*

1.24. At all material times, some Pearce Group Members in the Pearce Relevant Area had private bores on their land which drew water from the Pearce Regional Aquifer and engaged in the Pearce Groundwater Usage.

PARTICULARS

- (i) *GHD Consolidated Report at paragraph 4.5.*
- (ii) *GHD HHRA Report at paragraph 4.7.*
- (iii) *The Applicants repeat the particulars to paragraphs 1.20 and 1.23 above.*
- (iv) *The best particulars the Applicants can provide of the private bores in the Pearce Relevant Area are contained in the GHD HHRA Report at paragraph 4.7 and Figure 37 and the GHD DSI Report at paragraphs 4.5 and 14.5 and Figure 9 and in Table 67 (which is a map and list of 65 registered bores, which does not take into account unregistered bores or bores of residents who do not wish for their bores to be identified.*
- (v) *Some Group Members have private bores on their land. The identity of all those Group Members who have private bores will be particularised following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Group Members.*

B.3 The foreseeable usage of water emanating from the Pearce Base

1.25. At all material times, by reason of the matters pleaded in paragraphs 1.21 to 1.24 above, it was reasonably foreseeable that waters, liquids, and soluble materials discharged and/or allowed to escape the Pearce Base which were transmitted to the Pearce Brooks, and the Pearce Regional Aquifer would be used by residents of the Pearce Relevant Area.

C THE COMMONWEALTH'S USE OF AFFF AT THE PEARCE BASE

C.1 Introduction

- 1.26. Since the establishment of the Pearce Base, the Commonwealth has been primarily responsible for conducting all of the activities conducted at the Pearce Base.

PARTICULARS

- (i) *GHD DSI Report at paragraphs 2.2 and 3.1.*

C.2 The Commonwealth's use of AFFF

- 1.27. As part of the operation of the Pearce Base, and since about the 1970s, the Commonwealth has regularly conducted fire drills, firefighting training, fire tests, mock emergency aircraft landing and accident drills, foam training, equipment testing (including the testing of nozzles, firefighting trucks, and fire suppression systems), firefighting, fire suppression, and like operations (both on and near Pearce Base) **(Pearce Training and Operations Activities)**.

PARTICULARS

- (i) *GHD DSI Report at paragraphs 3.2, 12.1.1, 12.1.2.*
(ii) *Further particulars may be provided after discovery and inspection.*

- 1.28. At all material times in the period from in or about the 1970s until a time unknown to the Applicants after about 2004, in the use and occupation of the Pearce Base for the purpose of the Pearce Training and Operations Activities, the Commonwealth:

- (a) used AFFF Concentrate;
- (b) mixed the AFFF Concentrate with water to create AFFF Working Solution; and
- (c) aspirated the AFFF Working Solution into a foam via nozzles on firefighting trucks and other mechanisms (the aspirated foam being known as AFFF).

PARTICULARS

- (i) *GHD DSI Report at paragraphs 3.1 and 12.1.1.*
(ii) *Particular (i) to paragraph 13 of the Statement of Claim is repeated: the AFFF Concentrate used was principally a product known as "Light WaterTM" (being manufactured by the Minnesota Mining and Manufacturing Company (now known as 3M Company) and/or its subsidiary 3M Australia Pty Ltd).*

- (iii) *At a time unknown to the Applicants in about 2004, the Commonwealth transitioned to using “Ansulite” at Pearce Base.*

1.29. The Pearce Training and Operations Activities included those in and around:

- (a) the fire training area, located in the centre of the airfield, east of the fire station (**Pearce Fire Training Area**);
- (b) the two former fire training areas located within bushland to the north and south of the aircraft washdown area (**Pearce Former Fire Training Areas**);
- (c) Hanger 93 and a foam disposal pit (**Pearce Hanger 93 and the Foam Disposal Pit**);
- (d) a grounds maintenance area, located in the central eastern portion of the Pearce Base (**Pearce Grounds Maintenance Area**).

PARTICULARS

- (i) *GHD DSI Report at paragraph 3.2.*
- (ii) *GHD PSI Report at paragraphs 7.2.1 and 7.2.2 and Appendix A.*
- (iii) *Further particulars may be provided after discovery and inspection.*

Pearce Fire Training Area

1.30. The Pearce Fire Training Area:

- (a) was established in the mid to late 1980s and operated continuously for fire training with AFFF until about 2003;
- (b) was located at the centre of the Pearce Base and is generally flat, consisting of an unpaved surface with a reasonable covering of mown grass;
- (c) was generally surrounded at the perimeter by a series of surface water drainage channels;
- (d) contained a small, unsealed area immediately adjacent to the fire station that was used as an area for foam discharge.

1.31. The Pearce Training and Operation Activities in and around the Pearce Fire Training Area:

- (a) was conducted on a regular (weekly) basis;
- (b) involved large combustible items, such as vehicle bodies and aircraft fuel stores, being set alight and extinguished;
- (c) involved the extensive use of AFFF to extinguish fires;
- (d) resulted in all discharged liquids flowing from the pad to the surrounding area and infiltrating into the soil;
- (e) resulted in some surface runoff being captured in an open drain located west of the pad which drained thorough the centre of the airfield and connects with Ellen Book to the south of the Pearce Base;
- (f) included intensive testing of the stickiness of foam on the tress located to the north of the first station.

PARTICULARS

- (i) *GHD DSI paragraphs 3.2 and 12.1.1.*
- (ii) *GHD PSI Report at paragraph 7.2.2 and Appendix A.*

Pearce Former Fire Training Areas

1.32. The Pearce Former Fire Training Areas consisted of two fire training areas, being:

- (a) a fire training area located to the south of the aircraft washdown area which:
 - (i) since the 1970s until about a time not presently known to the Applicants in or about the 1980s involved the use of water and fire retarding chemicals including AFFF to extinguish fires;
 - (ii) resulted in any water and chemicals used being infiltrated directly into the underlying soils or runoff towards the open drain located to the west; and
- (b) a fire training area located to the north of the aircraft washdown area which:
 - (i) was used during the 1980s, during which AFFF was used to extinguish fires;
 - (ii) consisted of a number of shallow pits dug into the soils, where flammable and combustible fuels were used to ignite wood, scrap metal and car bodies on a monthly basis;

- (iii) resulted in any water and fire retarding chemicals including AFFF used being infiltrated directly into the underlying soils or runoff towards the open drain located to the west.

1.33. The Pearce Training and Operations Activities in and around the Pearce Former Fire Training Areas:

- (a) involved the use of AFFF at both the north and south locations;
- (b) resulted in the discharge of AFFF directly onto unsealed ground which infiltrated into the soil or run-off into the nearby open surface water drains and subsequently into Ki-it Monger Brook

PARTICULARS

- (i) *GHD DSI Report at paragraphs 3.2 and 12.1.2.*
- (ii) *GHD, Department of Defence RAAF Base Pearce PFAS Investigation, Preliminary Site Investigation (September 2016) (**GHD PSI Report**) at paragraph 7.2.2 and Appendix A.*

Pearce Hangar 93 and the Foam Disposal Pit

1.34. The Pearce Hangar 93 and the Foam Disposal Pit consisted of:

- (a) Hangar 93, which:
 - (i) in 2000 had installed an AFFF deluge system which was accidentally activated on a number of occasions due to system malfunctions or power surges;
 - (ii) contained only standard grated drains and had sufficient room under the doors of the hangar for foam to escape;
 - (iii) was located adjacent to a pump room, which contained stores of AFFF including a 4,000 litre AFFF tank that fed the AFFF deluge system in Hangar 93 and multiple 200 litre drums of various AFFF concentrate;
- (b) a foam disposal pit, which:
 - (i) was located near Hangar 93;
 - (ii) in 2000 was purpose built and used to test AFFF;

- (iii) following the testing of AFFF, pumped the contents from the pit and flushed the pit;
- (iv) was decommissioned on a date unknown to the Applicants due to concerns about the pit's integrity.

PARTICULARS

- (i) *GHD DSI Report at paragraphs 3.2 and 12.1.4.*
- (ii) *GHD PSI Report at paragraph 7.2.1 and Appendix A.*

Pearce Grounds Maintenance Area

- 1.35. At all material times, the Pearce Grounds Maintenance Area was used for the storage of grounds maintenance plant and equipment which included various fuels, oils, lubricants and chemicals.
- 1.36. The Pearce Training and Operations Activities in and around the Pearce Grounds Maintenance Area resulted in the uncontrolled release of AFFF which discharged to a surface water drain located outside the north-west corner of the maintenance area.

PARTICULARS

- (i) *GHD DSI Report at paragraphs 3.2 and 12.1.4.*
- (ii) *GHD PSI Report at paragraph 7.2.1.*

Pearce Additional Areas

- 1.37. The Pearce Training and Operations Activities also occurred in and around:
- (a) the main runway strip, where in emergency events AFFF was applied to the surface of the main runway strip creating 'foam paths' following which the resultant foam path was pushed to adjacent unsealed ground;
 - (b) the workshop (known as Filter's workshop) where fire trucks were serviced and which involved the handling of AFFF, resulting in AFFF spills;
 - (c) a former fire training area where fire training exercises were conducted involving the setting alight of foam mattresses, which were extinguished using AFFF, and subsequently buried 2.5 to 4.5 metres below ground level;

- (d) a former fuel farm where four cabinets located at the former fuel farm which had been found to contain drums of AFFF and a deluge foam protection system, associated with two aviation fuel tanks, existed in the northern portion of the fuel farm;
- (e) an area referred to as the BroadSpectrum compound where a 1,000 litre container of AFFF was stored on unsealed ground;
- (f) Lot 1990 Neaves Road where fire training involved the use of AFFF;
- (g) a wastewater treatment plant that discharged treated water containing concentrations of PFOS and PFOA:
 - (i) prior to 2002, into Ellen Brook via open drains at the northern end of the airfield; and
 - (ii) from around 2002, by irrigation onto the grassed open space to the east of the wastewater treatment plant;
- (h) the Pearce Base landfill, located approximately 500 metres north of the Pearce Base boundary where construction and demolition material and empty or old drums of AFFF were disposed of; and
- (i) a police dog training site where waste material including construction and demolition waste treated with AFFF was buried.

PARTICULARS

- (i) *GHD DSI Report at paragraphs 3.2, 12.1.3, 12.1.5 and 12.1.6 and Table 3.*
- (ii) *GHD PSI Report at paragraphs 7.2.1 and 7.2.2.*
- (iii) *Further particulars may be provided after discovery and inspection.*

1.38. By reason of the matters pleaded in paragraphs 1.27 to 1.37 above, the Pearce Training and Operations Activities at Pearce Base resulted in:

- (a) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground at the Pearce Base; and/or

- (b) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with Fire Run-Off, being discharged, or allowed to escape, to bare ground at the Pearce Base.

C.3 The Commonwealth's methods for disposal of Spent AFFF

1.39. At all material times:

- (a) Spent AFFF; and/or
- (b) Fire Run-Off co-mingled with Spent AFFF,

was generally directed by the Commonwealth towards bare ground or the Pearce Drainage System.

PARTICULARS

- (i) *Paragraphs 1.27 to 1.38 are repeated.*
- (ii) *The Applicants do not, with their present state of knowledge, know the quantities of Spent AFFF and/or Fire Run-Off directed to bare ground and the earthen drains comprising the Pearce Drainage System.*
- (iii) *Further particulars may be provided after discovery and inspection.*

1.40. At all material times, to the extent that:

- (a) AFFF discharged in the course of the Pearce Training and Operations Activities; and/or
- (b) Fire Run-Off co-mingled with Spent AFFF,

was directed by the Commonwealth to the Pearce Drainage System they were ineffective to ensure that liquids contained in them did not leak into the soil below and around them.

C.4 Physical properties of AFFF and Spent AFFF

1.41. Paragraph 15 is repeated.

1.42. Paragraph 16 is repeated.

C.5 The foreseeable flow of Spent AFFF from the Pearce Base

1.43. At all material times, by reason of the matters pleaded in paragraphs 1.3 to 1.25 and 1.41 to 1.42 above, it was reasonably foreseeable that use of AFFF Working Solution and AFFF on the Pearce Base as pleaded in paragraphs 1.27 to 1.38 and/or 1.39 to

1.40 above would result in Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF:

- (a) being transmitted to the groundwater beneath the Pearce Base, including the Pearce Regional Aquifer and mingle and flow with that groundwater (including in a general direction towards the Pearce Brooks), and being utilised by persons engaged in the Pearce Groundwater Usages;
- (b) mingling with other surface water on the Pearce Base (especially after periods of rain), and flowing overland in a generally westerly direction, towards and into the surrounding water catchment areas outside the Pearce Base (including the Pearce Brooks) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Pearce Regional Aquifer;

and being extracted and utilised by persons engaged in the Pearce Groundwater Usages; and

- (c) mingling with other surface water on the Pearce Base (especially after periods of rain), and flowing overland in a generally westerly direction, towards and into the surrounding water catchment areas outside the Pearce Base (including the Pearce Brooks) and then being utilised by persons engaged in the Pearce Brooks Usages.

D THE TOXIC PROPERTIES OF SPENT AFFF

D.1 The potential for AFFF to harm humans and the environment

1.44. Paragraph 18 is repeated.

1.45. Paragraph 19 is repeated.

1.46. Paragraph 20 is repeated.

1.47. Paragraph 21 is repeated.

1.48. Paragraph 22 is repeated .

D.2 The foreseeable flow and transmission of a toxic substance

1.49. At all material times, by reason of the matters pleaded in paragraphs 1.3 to 1.25 and 1.41 to 1.42 and 1.44 to 1.48 above, it was reasonably foreseeable that the use of AFFF on the Pearce Base as pleaded in paragraphs 1.27 to 1.38 and/or 1.39 to 1.40 above would result in an unnatural soluble substance containing synthetic chemicals:

- (a) permeating or percolating into the soil at the Pearce Base;
- (b) being transmitted to the groundwater beneath the Pearce Base, including the Pearce Regional Aquifer and mingling and flowing with that groundwater (including in a general direction towards the Pearce Brooks);
- (c) mingling with other surface water on the Pearce Base (especially after periods of rain), and flowing overland in a generally westerly direction, towards and into the surrounding water catchment areas outside the Pearce Base (including the Pearce Brooks) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Pearce Regional Aquifer; and
- (d) being transmitted to the Pearce Brooks.

E THE CONTAMINATION OF THE PEARCE RELEVANT AREA

E.1 The contamination of the Pearce Brooks

1.50. PFCs and PFC Contaminants have been detected in the Ellen Brook and Ki-it Monger Brook.

PARTICULARS

- (i) *GHD DSI Report at paragraphs 9.3.4 and 14.3*

1.51. The contamination of Ellen Brook and Ki-it Monger Brook with PFCs and PFC Contaminants is the result of discharged AFFF Working Solution and AFFF on the Pearce Base resulting in Spent AFFF:

- (a) permeating or percolating into the soil at the Pearce Base;
- (b) being transmitted to the groundwater beneath the Pearce Base, including the Pearce Regional Aquifer and mingling and flowing with that groundwater (including in a general direction towards the Pearce Brooks);
- (c) mingling with other surface water on the Pearce Base (especially after periods of rain), and flowing overland in a generally westerly direction, towards and into the surrounding water catchment areas outside the Pearce Base (including the Pearce Brooks) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Pearce Regional Aquifer; and
- (d) being transmitted to the Pearce Brooks.

PARTICULARS

- (i) *GHD DSI Report at paragraphs 9.3.4, 12.2.1 and 14.3.*

1.52. By reason of the matters pleaded in paragraph 1.50 and 1.51 above, the water in Ellen Brook and Ki-it Monger Brook has become, and is likely to continue to remain, contaminated by, and a receptor of, PFC Contaminants originally emanating from the Pearce Base.

PARTICULARS

- (i) *GHD DSI Report at paragraphs 9.3.4, 12.2.1 and 14.3.*

1.53. By reason of the matters pleaded in paragraphs 1.50 to 1.52 above, water in Ellen Brook and Ki-it Monger Brook have become, and will continue and remain, potentially hazardous and unfit for the Brooks Usages (the **Pearce Surface Water Contamination**).

PARTICULARS

(i) GHD DSI Report at paragraphs 9.3.4, 12.2.1 and 14.3.

1.54. There is no practical or cost-effective way of remediating the Pearce Surface Water Contamination.

E.2 The contamination of Pearce Relevant Area's Groundwater

1.55. PFCs and PFC Contaminants emanating from the Pearce Base have been identified in the Pearce Regional Aquifers and under the Pearce Relevant Area (or part thereof) (the **Pearce Toxic Plume**).

PARTICULARS

(i) *GSH DSI Report at paragraphs 9.4.4, 12.2.2, 12.5 and 14.5.*

1.56. The Pearce Toxic Plume is the result of discharged AFFF Working Solution and AFFF on the Pearce Base resulting in Spent AFFF:

- (a) permeating or percolating into the soil at the Pearce Base;
- (b) being transmitted to the groundwater beneath the Pearce Base, including the Pearce Regional Aquifer and mingling and flowing with that groundwater (including in a general direction towards the Pearce Brooks);
- (c) mingling with other surface water on the Pearce Base (especially after periods of rain), and flowing overland in a generally westerly direction, towards and into the surrounding water catchment areas outside the Pearce Base (including the Pearce Brooks) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Pearce Regional Aquifer; and
- (d) being transmitted to the Pearce Brooks.

PARTICULARS

(i) *GSH DSI Report at paragraph 9.4.4, 12.2.2, 14.4*

- 1.57. By reason of the matter pleaded in paragraphs 1.55 and 1.56, groundwater in the Pearce Regional Aquifer and beneath the Pearce Relevant Area (including under land owned by the Applicants and many Group Members) has become, and is likely to continue to remain, contaminated by, and a receptor of, PFC Contaminants originally emanating from the Pearce Base.

PARTICULARS

- (i) *At the groundwater beneath the Pearce Base, contaminant concentrations of PFOS and PFHxS were below the adopted health based assessment levels for the Pearce Base (FSANZ non-potable and recreational) though were above the FSANZ drinking water assessment level: GSH DSI Report at paragraph 14.4.*
- (ii) *At the groundwater beneath the Pearce Relevant Area, contaminant concentrations of PFOS and PFHxS was detected in 16 off-Base private bores and exceeded the drinking water assessment level in six of these private bores. The majority of contaminant concentration detections occurred in the West Bullsbrook area and one in each of the south and south east of the Pearce Base: GSH DSI Report at paragraph 14.4.*
- (iii) *GSH DSI Report at paragraph 9.4.*
- (iv) *GSH HHRA Report at paragraphs 7.3.5, 8.3.4, 9.1 and 9.2*
- (v) *Particulars of the contamination of the groundwater under the land of Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Group Members.*

- 1.58. By reason of the matters pleaded in paragraph 1.57, groundwater in the Pearce Regional Aquifer and beneath the Pearce Relevant Area has become, and is likely to continue to remain, potentially hazardous and unfit for Pearce Groundwater Usages (the **Pearce Groundwater Contamination**).

PARTICULARS

- (i) *The groundwater in the Pearce Regional Aquifers under the Applicants' Land is potentially hazardous and unfit for drinking: Parts D.1 above and E.5 below are repeated.*
- (ii) *The groundwater in the Pearce Regional Aquifer is potentially hazardous and unfit for:*
 - a. *irrigation purposes because such usages result in the further spreading of PFC Contaminants to soils and uptake by plants, vegetables and fruits, and the exposure of people to PFC Contaminants: Parts D.1 above and E.5 below are repeated.*

- b. *watering of livestock (including chickens) because such usages may result in the further spreading of PFC Contaminants to soils, uptake of PFC Contaminants by the livestock and the exposure of people to PFC Contaminants (particularly by consumption of livestock and eggs): Parts D.1 above and E.5 below are repeated.*
- c. *swimming, domestic purposes, and water supply because such usages may result in the further exposure of people to PFC Contaminants: Parts D.1 above and E.5 below are repeated.*

(iii) *Further particulars of the contamination of the groundwater in the Pearce Regional Aquifers under the Pearce Group Members' land will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Pearce Group Members.*

- 1.59. There is no practical or cost-effective way of remediating the Pearce Toxic Plume, or the Pearce Groundwater Contamination.
- 1.60. Further, there is no practical, cost-effective or reliable alternative water supply to the Pearce Regional Aquifer for irrigation, watering of livestock and use by Pearce Group Members who do not have and/or have never had a mains water supply.

PARTICULARS

- (i) *GHD DSI Report at paragraph 13 and Table 76.*
- (ii) *GHD HHRA Report at paragraphs 7.3.5, 8.3.4, 9.1 and 9.2.*

E.3 The contamination of soil in the Pearce Relevant Area

- 1.61. Soil on the land within the Pearce Relevant Area has become, and is likely to continue to become and remain, contaminated by PFC Contaminants emanating from the Pearce Base (the **Pearce Soil Contamination**) by:
- (a) overland flows of surface water commingled with Spent AFFF (containing PFC Contaminants) from the Pearce Base; and
 - (b) discharge or application of groundwater containing PFC Contaminants extracted from the Pearce Regional Aquifer by persons engaged in Pearce Groundwater Usages to the soils (by, in particular, irrigation).

PARTICULARS

- (i) *GHD DSI Report at paragraphs 9.1.2, 9.1.17 and 9.1.19.*
- (ii) *Particulars of the contamination of the soils on lands of Pearce Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Pearce Group Members.*

1.62. There is no practical or cost-effective way of remediating the Pearce Soil Contamination.

E.4 The Broader Biota Contamination

1.63. Extensive other aspects of the biotic and abiotic matrices within the Pearce Relevant Area (including on the Applicants' land and land owned by the Pearce Group Members) have become and are likely to continue to remain, contaminated by PFC Contaminants, and be recirculated indefinitely within the Pearce Relevant Area (the **Pearce Biota Contamination**).

PARTICULARS

- (i) *GHD DSI Report at paragraphs 9.5.1, 9.5.2 and 9.5.3.*
- (ii) *Fruit and vegetables from residential gardens in the Pearce Relevant Area, eggs from locally raised poultry, livestock raised within the Pearce Relevant Area, and fish and crustaceans from the Pearce Brooks have been found to contain PFCs and PFC Contaminants to varying degrees*
- (iii) *Ingestion of produce (including livestock, fruit, vegetables and eggs) irrigated with impacted groundwater (or impacted surface water) and/or fish and crustaceans from the Pearce Brooks are secondary sources of PFC contamination: GHD HHRA Report at paragraphs 5.4, 7.3.6, 8.2.5, 8.3.4, 8.4.1, 8.4.4, 8.4.5 and 9.1.*
- (iv) *Secondary sources of PFC contamination, leading to further redistribution of contamination and creation of additional exposure pathways for ongoing contamination of the biota generally (including humans): Braunig J, Baudel C, Heffernan A et al, Fate and redistribution of perfluoroalkyl acids through AFFF-impacted groundwater (2017).*

1.64. There is no practical, cost-effective way of remediating the Pearce Biota Contamination.

E.5 The announcement of the contamination of Pearce

1.65. On a date shortly before 23 June 2016 the Commonwealth published a fact sheet titled “Department of Defence, RAAF Base Pearce – Environmental Investigation Project” (the **Pearce Contamination Announcement**) which stated:

- (a) AFFF containing PFOS and PFOA were once used extensively worldwide and within Australia due to its effectiveness in fighting liquid fuel fires;
- (b) PFOS and PFOA were an emerging concern around the world because they are persistent in the environment;
- (c) the Commonwealth is undertaking an environmental investigation, consistent with the National Environment Protection Measure (**NEPM**) Guidelines, at the Pearce Base to investigate the extent and levels of PFOS and PFOA;
- (d) preliminary sampling started in May 2016 which has included a review of the site history for AFFF, collection of on and off-Base groundwater samples, reporting of resulting and developing a plan for detailed site investigation;
- (e) that the detailed site investigation (known as a **DSI**) would include:
 - (i) comprehensive sampling on and off-site of soil, groundwater and drainage lines;
 - (ii) modelling of PFC sources and the way they move through the environment;
 - (iii) if required, preparing a human health and ecological assessment.

PARTICULARS

- (i) *The Pearce Contamination Announcement is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Factsheets/FactSheet18June2016.pdf>

1.66. On or around 23 June 2016, the Commonwealth held a community information session to outline the recently commenced environmental investigation at the Pearce Base (the **Pearce June 2016 Community Information Session**) at which its representatives made the following statements:

- (a) the Pearce Base had a legacy of using AFFF for emergency firefighting situations and fire fighter training;

- (b) PFOS and PFOA belong to a group of chemicals known as per- and poly-fluoroalkyl substances (**PFAS**) and until recently, PFAS were known as 'perfluorinated chemicals' or 'PFCs';
- (c) PFAS were a class of manufactured chemicals that had been used to make products that resist heat, stains, grease, and water;
- (d) PFAS were an emerging concern around the world because they are persistent in the environment;
- (e) that because PFAS persist in humans and the environment, it was recommended that human exposure be minimised;
- (f) in 2003 the Commonwealth became aware that PFOS/PFOA was an emerging persistent organic pollutant and from 2004 the Commonwealth commenced phasing out use of the old foams for both training and emergencies;
- (g) PFCs can potentially enter the body in a number of ways, primarily through drinking water, and also by eating food that has taken up the chemicals or inhalation in industrial settings;
- (h) a detailed environmental investigation project into the Pearce Base has commenced;
- (i) the detailed environmental investigation would be consistent with NEPM and WA EPA requirements and include:
 - (i) sampling soil, sediment, surface water, and groundwater on and off Pearce Base to identify PFAS exposure in the vicinity;
 - (ii) identifying pathways and receptors for the potential migration of PFAS;
 - (iii) community and stakeholder engagement, including a water-use survey;
 - (iv) a human health and ecological risk assessment (if required) to evaluate potential risks to the human population and ecology, and inform future action to mitigate risks;
- (j) when detailed environmental investigation reports were finalised and publicly released, residents, businesses, and local stakeholders would be consulted;

- (k) that a community briefing and information activity would be conducted prior to the commencement of the detailed environmental investigation at the Pearce Base; and
- (l) alternative sources of drinking water were being provided to eligible residents located within 3 kilometres of the Pearce Base who did not have a town water connection and relied on the use of a bore for drinking water.

PARTICULARS

- (i) *The Pearce June 2016 Community Information Session was held on 23 June 2016 at which a slideshow presentation entitled 'Perfluorinated Compounds (PFC) Environmental Management Program: Community Information Session – RAAF Base Pearce Environmental Investigation' was made (**Pearce June 2016 Presentation**). The Pearce June 2016 Presentation is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Presentations/Presentation23June2016.pdf>
- (ii) *Each of the statements in subparagraphs (a) to (j) was made in writing in the Pearce June 2016 Presentation, or spoken to orally at the meeting by representatives of the Commonwealth.*

1.67. In September 2016, the Commonwealth published a fact sheet titled 'Department of Defence, RAAF Base Pearce Environmental Investigation Project – Preliminary Site Investigation – key findings and next steps' (the **Pearce September 2016 Factsheet**) which stated:

- (a) the Commonwealth has engaged an independent environmental consultant to undertake an environmental investigation into the presence of PFAS on and in the vicinity of the Pearce Base;
- (b) PFAS are a class of manufactured chemicals that were used extensively worldwide from about the 1970s by both military and civilian authorities due to its effectiveness in extinguishing liquid fuel fires;
- (c) the environmental investigation is being undertaken in accordance with the NEPM and includes a preliminary site investigation (known as a **PSI**) and a DSI (which may include a human health and ecological risk assessment (known as a **HHERA**) if required);

- (d) the PSI in relation to the Pearce Base (**Pearce PSI**) commenced in May 2016 and was completed in August 2016;
- (e) the key findings of the Pearce PSI included:
 - (i) preliminary offsite sampling was undertaken on 22 private bores between May and July 2016, of which there were 3 detections of PFAS being less than the applicable guideline values;
 - (ii) four key areas were identified as primary potential sources of PFAS including a fire training area, former fire training areas, maintenance hangar and foam disposal pit and grounds maintenance area;
- (f) the primary migration pathways of PFAS are surface water and groundwater;
- (g) the surface water drainage system at the Pearce Base comprises a series of shallow depressions which capture surface water on the site and directs it to a series of discharge points that release water to Ellen and Ki-it Monger Brooks;
- (h) the main exposure pathway to people is through consuming groundwater and as an interim measure the Commonwealth will continue to provide drinking water for people who live within 3 kilometres of the Pearce Base and who do not have access to town water;
- (i) a DSI commenced in September 2016 and will include comprehensive on- and off-base sampling;
- (j) a HHERA to better understand the risk to people and the environment would be undertaken if required;
- (k) that because PFAS persist in humans and the environment, it was recommended that human exposure be minimised.

PARTICULARS

- (i) *The Pearce September 2016 Factsheet is published on:
<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Factsheets/160920-FactSheet-PEARCECommunityInfoSession22Sep16.pdf>*

- 1.68. On 22 September 2016, the Commonwealth held a community information session to present the findings on the Pearce PSI (the **Pearce September 2016 Community Information Session**), at which its representatives made the following statements:
- (a) PFAS are a class of manufactured chemicals that have been used since the 1950s to make products that resist heat, stains, grease and water;
 - (b) legacy firefighting foam used extensively within Australia from the 1970s contained PFAS which are a concern around the world because they persist in the environment;
 - (c) the Commonwealth commenced using AFFF containing PFOS/PFOA in the 1970s;
 - (d) in 2003 the Commonwealth became aware that PFOS/PFOA was an emerging persistent organic pollutant and from 2004 the Commonwealth commenced phasing out use of the old foams for both training and emergencies;
 - (e) in May 2016, the Commonwealth commenced investigations at the Pearce Base;
 - (f) GHD Pty Ltd has been engaged as specialist environmental consultants to undertake the investigation with Senversa Pty Ltd engaged to conduct a peer review / audit function;
 - (g) the key findings of the Pearce PSI included:
 - (i) of 22 residential bores sampled, 3 detections of PFAS occurred but were all less than the applicable guideline values;
 - (ii) four key areas were identified as primary potential sources of PFAS including a fire training area, former fire training areas, maintenance hangar and foam disposal pit and grounds maintenance area;
 - (iii) the pathways of PFAS was via surface water and drainage lines with a general grade north east to south west and discharge to Ellen Brook and Ki-it Monger Brook;
 - (h) a DSI into the Pearce Base has commenced which will include sampling of soil, surface water and sediment, groundwater and biota;

- (i) a HHERA will commence if results during the investigation exceed guidelines values and will provide a more detailed assessment to better understand the risk to people and the environment;
- (j) the Commonwealth will continue to provide drinking water to eligible residents as required.

PARTICULARS

- (i) *The Pearce September 2016 Community Information Session was held on 22 September 2016 at which a slideshow presentation entitled 'PFAS Environmental Management Program: Community Information Session – RAAF Base Pearce Environmental Investigation' was made (**Pearce September 2016 Presentation**). The Pearce September 2016 Presentation is published on:*

https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Presentations/PearceCommunityInfoSession2_22Sep16-PresentationFinal.pdf

- (ii) *Each of the statements in subparagraphs (a) to (j) was made in writing in the Pearce September 2016 Presentation, or spoken to orally at the meeting by representatives of the Commonwealth.*

1.69. In December 2016, the Commonwealth published a fact sheet titled 'RAAF Base Pearce Environmental Investigation Project – Detailed Site Investigation – update and next steps' (the **Pearce December 2016 Factsheet**) which stated:

- (a) the Commonwealth has engaged an independent environmental consultant to undertake an environmental investigation into the presence of PFAS on and in the vicinity of the Pearce Base;
- (b) PFAS are a class of manufactured chemicals that were used extensively worldwide from about the 1970s by both military and civilian authorities due to its effectiveness in extinguishing liquid fuel fires;
- (c) the Pearce PSI commenced in May 2016 and completed in August 2016 and indicated that 3 detections of PFAS were found in private bores, but were less than the applicable guideline values;
- (d) early findings of the detailed site investigation in relation to the Pearce Base (**Pearce DSI**) indicate that PFAS is present in and around source areas and along surface water drainage lines moving south and west off the Pearce Base;

- (e) based on the early findings of the Pearce DSI, a HHERA process has been commenced in relation to the Pearce Base (**Pearce HHERA**);
- (f) as part of the Pearce HHERA, selected flora and fauna will be tested, including undertaking biota sampling (small fish) from fresh water brooks and resident crops and chicken eggs on bore-watered properties.

PARTICULARS

- (i) *The Pearce December 2016 Factsheet is published on:
<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Factsheets/RAAFPearcePFASInvestigationCommunityEngagement05Dec2016FactSheet.pdf>*

1.70. On 5 December 2016, the Commonwealth held a community information session to provide an update on the detailed investigation works at the Pearce Base (the **Pearce December 2016 Community Information Session**), at which its representatives made the following statements:

- (a) PFAS are a class of manufactured chemicals that have been used since the 1950s to make products that resist heat, stains, grease and water;
- (b) legacy firefighting foam contained PFAS which are a concern around the world because they persist in the environment;
- (c) the environmental investigation being conducted at the Pearce Base is being undertaken in accordance with NEPM;
- (d) GHD Pty Ltd has been engaged as specialist environmental consultants to undertake the investigation with Senversa Pty Ltd engaged to conduct a peer review / audit function;
- (e) the key findings of the Pearce PSI included that of 22 residential bores sampled, 3 detections of PFAS were found but were all less than the applicable guideline values;
- (f) an update of the Pearce DSI includes:
 - (i) soil concentrations were generally below those reported at other Commonwealth bases with one result exceeding the DER interim guidelines value for industrial sites;

- (ii) no sediments concentrations exceeded the DER interim guidelines value for industrial sites;
 - (iii) off-site surface water samples were generally less than the adopted recreational screening criterion
 - (iv) on-site surface water along the main draining line (north-south) were above recreational screening criterion;
 - (v) groundwater concentrations exceeded adopted recreational screening criterion and drinking water criterion in four groundwater samples;
- (g) the Pearce HHERA will provide a more detailed assessment to better understand the risk to people and the environment and field work and analysis will commence in December 2016, with the reporting of results in July 2017.

PARTICULARS

- (i) *The Pearce December 2016 Community Information Session was held on 5 December 2016 at which a slideshow presentation entitled 'PFAS Investigation and Management Program: Community Information Session – RAAF Base Pearce Environmental Investigation' was made (**Pearce December 2016 Presentation**). The Pearce December 2016 Presentation is published on:*
https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Presentations/161205_RAAFPearcePFASInvestigationCommunityInfoSession_Presentation.pdf
- (ii) *Each of the statements in subparagraphs (a) to (g) was made in writing in the Pearce September 2016 Presentation, or spoken to orally at the meeting by representatives of the Commonwealth.*

1.71. In May 2017, the Commonwealth published a fact sheet titled 'RAAF Base Pearce Community Update Flyer May 2017 – PFAS Investigation and Management Program' (the **Pearce May 2017 Factsheet**) which stated:

- (a) in early 2016, the Commonwealth has engaged an independent environmental consultant to undertake an environmental investigation into the presence of PFAS on and in the vicinity of the Pearce Base;
- (b) the Commonwealth has a history of using legacy AFFF for emergency firefighting situations and for fire fighter training and in 2004 commenced phasing out its use of AFFF that contained PFOS and PFOA as active ingredients;

- (c) PFAS are a class of manufactured chemicals that were once used extensively worldwide and within Australia due to its effectiveness in fighting liquid fuel fires;
- (d) PFAS are emerging as a concern around the world because they are persistent in the environment;
- (e) the Pearce PSI was conducted between May 2016 and July 2016 and included the preliminary sampling of 22 off-base bores in close proximity to the Pearce Base and a water use survey of local residents;
- (f) the Pearce DSI:
 - (i) commenced in September 2016 and is expected to be completed in late 2017;
 - (ii) has involved the on and off-base sampling in soil, groundwater, surface water and drainage lines and included the following numbers of sampling: 73 groundwater, 45 surface water, 46 sediment, 171 soil and 48 biota;
 - (iii) sampling has focused around Bullsbrook and downstream outside the investigation area due to concerns raised by the community about PFAS impacts in the Swan River;
 - (iv) has been extended through to the remainder of 2017 to conduct further investigations as recommended to better understand complex PFAS pathways and to incorporate current guidance
- (g) the Pearce HHERA will continue through the remainder of 2017 and is expected to be reported in earlier 2018;
- (h) the Commonwealth Department of Health released final Health Based Guidance Values (**HBGVs**) for PFAS on 3 April 2017, at the request of the Department of Health, which will be adopted by the Commonwealth in its investigations at the Pearce Base.

PARTICULARS

- (i) *The Pearce May 2017 Factsheet is published on:*
https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Factsheets/CommunityUpdateFactSheet_May2017.pdf

1.72. On 18 May 2017, the Commonwealth held a community walk-in session to outline the results of the Pearce DSI and provide an update on the Pearce HHERA (the **Pearce May 2017 Community Information Session**), at which its representatives made the following statements:

- (a) PFAS are a group of man-made compounds and were widely used around the world since the 1950s, and since the 1970s by both civilian and military authorities in AFFF to extinguish liquid fuel fires;
- (b) the detailed environmental investigation at the Pearce Base is being undertaken in accordance with the NEPM;
- (c) a summary of the Pearce PSI included that 4 main source areas were identified on the Pearce Base and the pathways were understood, being surface water and groundwater flow;
- (d) the Pearce DSI:
 - (i) commenced in September 2016 and is expected to be completed in late 2017;
 - (ii) has involved the on and off-base sampling in soil, groundwater, surface water and drainage lines and included the following numbers of sampling: 73 groundwater, 45 surface water, 46 sediment, 171 soil and 48 biota samples (including home grown produce);
 - (iii) further sampling has been conducted downstream outside the investigation area due to concerns raised by the community about PFAS impacts in the Swan River;
 - (iv) has been extended through to the remainder of 2017;
- (e) the Pearce HHERA will continue through the remainder of 2017 and is expected to be reported in earlier 2018;
- (f) the Commonwealth Department of Health released final HBGVs for PFAS on 3 April 2017, at the request of the Department of Health, which will be adopted by the Commonwealth in its investigations at the Pearce Base, and are a precautionary measure to assist people, investigating agencies and affected communities in assessing the risk of exposure;

- (g) the Commonwealth is providing alternate sources of drinking water to eligible residents who are located in close proximity to the Pearce Base, and do not have a town water connection and rely on the use of a bore for drinking water, and/or source drinking water from a rainwater tank that contains, or has in the past contained bore water;
- (h) as of 12 May 2017, the Commonwealth is providing 92 properties with alternative water.

PARTICULARS

- (i) *The Pearce May 2017 Community Information Session was held on 18 May 2017 at which a slideshow presentation entitled 'PFAS Investigation and Management: Community Information Session – RAAF Base Pearce, WA' was made (**Pearce May 2017 Presentation**). The Pearce May 2017 Presentation is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Presentations/DepartmentOfDefencePresentation18May20171-9MBPDF.pdf>
- (ii) *Each of the statements in subparagraphs (a) to (h) was made in writing in the Pearce May 2017 Presentation, or spoken to orally at the meeting by representatives of the Commonwealth.*

1.73. In November 2017, the Commonwealth published two factsheets titled 'RAAF Base Pearce PFAS Investigation Background – PFAS Investigation and Management Program' and 'RAAF Base Pearce Investigation Update – November 2017 – PFAS Investigation and Management Program' (together, the **Pearce November 2017 Factsheets**), advising as follows:

- (a) the Pearce PSI was completed in June 2016;
- (b) the Pearce DSI commenced in July 2016 and its activities included:
 - (i) assessment of 17 potential PFAS source areas by sampling of soil, sediment, surface water and groundwater;
 - (ii) assessment of how PFAS migrates from the Pearce Base by sampling surface water and groundwater;
 - (iii) assessment of impacts to flora and fauna within conservation areas on the base by sampling plants, invertebrates and animal scats (faeces);

- (iv) off-base, assessment of who PFAS is affecting by sampling soil, surface water, groundwater, fruit, vegetables and eggs at various off-base properties;
- (v) off-base, assessment of impacts to aquatic flora and fauna by sampling sediment, surface water and fish and crustaceans;
- (c) the Pearce HHRA was expected to be finalised and released to the public in first half of 2018;
- (d) the HHRA will provide a better understanding of the risk of PFAS and recommendations for ongoing management of exposure pathways to PFAS;
- (e) the initial findings from the investigation indicated that:
 - (i) there were five main sources of PFAS including former fire training areas, facilities with PFAS spray systems and a landfill site at the Pearce Base;
 - (ii) excessive levels of PFAS were detected at the Pearce Base with concentrations in groundwater, surface water and soil;
 - (iii) excessive levels of PFAS were detected at the Pearce Base drainage channels at Ellen Brook and Ki-it Monger Brook;
 - (iv) the most significant PFAS migration pathway from the Pearce Base was surface water migration;
 - (v) PFAS were detected in groundwater at seven off-base properties and excessive PFAS were detected in drinking water at four off-base properties;
 - (vi) low concentrations of PFAS were detected in fish and crustaceans in Ellen Brook and Ki-it Monger Brook and assessments were being made as to the risks of exposure from these sources;
 - (vii) PFAS was detected in residential chicken eggs, though concentrations were below relevant guidance values, and no PFAS was detected in fruit and vegetable samples;

- (f) as a result of the PFAS levels detected in the groundwater and drinking water at the off-base properties, alternate drinking water had been offered to the affected properties;
- (g) the Commonwealth had little understanding of the impacts of PFAS at the time of using legacy firefighting foam.

PARTICULARS

- (i) *The Pearce November 2017 Factsheets are published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Factsheets/20171128DSIInvestigationUpdateFactsheetNovember2017.pdf>;

<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Factsheets/20171128BackgroundFactsheetNovember2017.pdf>

- (ii) *The release of the Pearce November 2017 Factsheets were accompanied with a community information session held on 28 November 2017 at which a slideshow presentation entitled “PFAS Investigation and Management: Program Community Information Session – RAAF Pearce WA” dated 28 November 2017, was made (**Pearce November 2017 Presentation**). The Pearce November 2017 Presentation is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Presentations/20171128RAAFBasePearceCWISPresentation.pdf>

1.74. On 28 November 2017, the Commonwealth held a community walk-in session to provide an update on the second phase of sampling for the Pearce DSI and outline the preliminary findings of the Pearce HHERA (the **Pearce November 2017 Community Information Session**), at which its representatives made the following statements:

- (a) the Commonwealth commenced using legacy firefighting foam containing PFOS/PFOA as active ingredients from the 1970s;
- (b) in 2003, the Commonwealth and other users became aware that PFOS was an emerging persistent organic pollutant and in 2004 commenced phasing out the use of the old foams for both training and emergencies;
- (c) in late 2005, the Commonwealth established a National PFAS Investigation and Management Program to identify the nature and extent of PFAS on or around the Department of Defence properties and to research and implement

remediation and management activities to reduce the impact of PFAS contamination

- (d) a summary of the Pearce PSI included that 4 main source areas were identified on the Pearce Base and the pathways were understood, being surface water and groundwater flow;
- (e) the Pearce DSI:
 - (i) commenced in September 2016, its fieldwork was completed in November 2017 and is expected to be completed in mid-2018;
 - (ii) involved the on and off-base sampling in soil, sediment, groundwater, surface water and biota (plants and animals) sampling;
 - (iii) findings in relation to sources included:
 - (A) six areas were identified as the most significant PFAS sources including two former fire training grounds, two facilities with legacy firefighting foam deluge systems, a former firefighting foam storage area and the off-site Pearce landfill;
 - (B) soil and groundwater at these six source areas contained PFAS above the relevant health based guidance values;
 - (iv) findings in relation to pathways included that surface water migration from the Pearce Base is the most significant PFAS migration pathway and that PFAS above the relevant HBGVs in on-base drainage channels Ellen Brook and Ki-it Monger Brook were detected and PFAS below the relevant HBGV were detected in surface water in West Bullsbrook drainage channels.
 - (v) findings in relation to receptors included:
 - (A) PFAS was detected above the relevant HBGVs in four private groundwater bores outside of the Pearce Base;
 - (B) fish in Ellen Brook and Ki-it Monger Brook contain PFAS exceeding the HBGVs though crustaceans do not;
 - (C) flora and fauna on the Pearce Base contain detectable PFAS;

- (D) eggs, vegetables and fruit do not have PFAS above HBGVs;
- (f) groundwater and surface water modelling is currently underway and was expected to be completed by January 2018;
- (g) the Pearce HHERA is expected to be completed by mid-2018;
- (h) the Commonwealth is providing alternate sources of drinking water to eligible residents who are located in close proximity to the Pearce Base, and do not have a town water connection and rely on the use of a bore for drinking water, and/or source drinking water from a rainwater tank that contains, or has in the past contained bore water;
- (i) as of 28 November 2017, the Commonwealth is providing 107 properties with alternative water.

PARTICULARS

- (i) *The Pearce November 2017 Community Information Session was held on 28 November 2017 at which a slideshow presentation entitled 'PFAS Investigation and Management: Community Information Session – RAAF Base Pearce, WA' was made (**Pearce November 2017 Presentation**). The Pearce November 2017 Presentation is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Presentations/20171128RAAFBasePearceCWISPresentation.pdf>
- (ii) *Each of the statements in subparagraphs (a) to (i) was made in writing in the Pearce November 2017 Presentation, or spoken to orally at the meeting by representatives of the Commonwealth.*

1.75. In February 2018, the Commonwealth released a factsheet titled 'RAAF Base Pearce PFAS Investigation – Community Update – PFAS Investigation and Management Program' (the **Pearce February 2018 Factsheet**) which advised as follows:

- (a) the Pearce PSI was completed and outcomes provided to the local community in June 2016;
- (b) the Pearce DSI commenced in July 2016 and is close to being completed;
- (c) the Pearce HHERA commenced in late 2016 and is made up of four components: hazard identification, exposure assessment, toxicity assessment; and risk assessment.

- (d) the Commonwealth is supplying alternative drinking water (bottled water) to a number of properties that use bore water for drinking purposes and do not have access to town water;
- (e) the Commonwealth would be conducting additional private bore sampling in the month.

PARTICULARS

- (i) *The Pearce February 2018 Factsheet is published on:
<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Factsheets/20180205PearceInvestigationCommunityNewsletterFebruary2018.pdf>*
- (ii) *The release of the Pearce February 2018 Factsheet was accompanied with two Community Shopfronts held on 23 and 24 February 2018 at Bullsbrook.*

1.76. In July 2018, the Commonwealth released a factsheet titled 'RAAF Base Pearce – Detailed Site Investigation and Human Health Risk Assessment – PFAS Investigation and Management Program' (the **Pearce July 2018 Factsheet**) which provided a summary of the results of the Pearce DSI and the HHERA and advised as follows:

- (a) the Pearce DSI has now been completed;
- (b) of the Pearce HHERA, the human health risk assessment (**Pearce HHRA**) has now been completed, and the ecological risk assessment (**Pearce ERA**) was expected to be completed in late 2018;
- (c) the results of the Pearce DSI included PFAS being detected:
 - (i) in the soil and groundwater at the Pearce Base above relevant guidance values;
 - (ii) in Ellen Brook and Ki-it Monger Brook downstream from the Pearce Base;
 - (iii) in groundwater at the Pearce Base, up to around 14 metres below ground level, in excess of relevant guidance values;
 - (iv) in groundwater samples, collected from six residential bores off-site from the Pearce Base, in excess of drinking water guidance values;
- (d) the results of the Pearce DSI indicated that PFAS was not detected:

- (i) above the relevant guidance values in soil samples collected on residential properties;
 - (ii) within the surface water or sediments of Twin Swamps Nature Reserve;
 - (iii) in groundwater beneath the Pearce Base 30 metres below ground level;
 - (iv) in any produce (fruit and vegetables) sampled from private properties, with the exception of two egg samples which contained PFAS below the HBGVs
- (e) PFAS has been identified in six main source areas in soil or groundwater above the relevant guidance values, being:
- (i) Source Area A - Fire training area;
 - (ii) Source Area B - Former fire training areas;
 - (iii) Source Area C - A hanger with a foam deluge system;
 - (iv) Source Area D - A former foam storage area;
 - (v) Source Area J - Pearce Former Fuel Farm with a foam deluge system; and
 - (vi) Source Area R - The RAAF Pearce landfill;
- (f) the key findings of the Pearce HHRA include the estimation that the following scenarios may pose an elevated risk of exposure to PFAS:
- (i) if contact with soil and water at some areas of the Pearce Base;
 - (ii) by drinking bore water at some properties within the Pearce Relevant Area;
- (g) the outcomes of the detailed environmental investigation will be used to develop a plan with options for the future management of PFAS contamination, which will be known as a PFAS Management Area Plan (known as a **PMAP**) and is expected to be completed in late 2018.

PARTICULARS

- (i) *The Pearce July 2018 Factsheet is published on:*

- 1.77. On 24 July 2018, the Commonwealth held a community information session to discuss the results of the Pearce DSI and the Pearce HHRA (the **Pearce July 2018 Community Information Session**), at which its representatives made the following statements:
- (a) the Commonwealth commenced using legacy firefighting foam containing PFOS/PFOA as active ingredients from the 1970s;
 - (b) in 2003, the Commonwealth and other users became aware that PFOS was an emerging persistent organic pollutant and in 2004 commenced phasing out the use of the old foams for both training and emergencies;
 - (c) in 2010 the first PFAS investigation commenced at Army Aviation Centre Oakey;
 - (d) in 2015 the PFAS Investigation and Management Program commenced;
 - (e) the Pearce DSI key findings included:
 - (i) the identification of six key source areas (fire training area, former fire training areas, a hangar with a foam deluge system, a former foam storage area, former fuel farm with a foam deluge system and the RAAF Pearce landfill) as the most significant contributors of PFAS impact;
 - (ii) the identification of two migration pathways being surface water drains on-base which discharge into Ellen Brook and groundwater moving from the Pearce Base;
 - (iii) six of the 138 off-site private groundwater bores sampled contained PFAS above drinking water guidelines levels;
 - (f) the Pearce HHRA indicated that there was an elevated exposure risk and management is recommended for contact with soil and water at the Pearce Base and drinking bore water off the Pearce Base;
 - (g) the Commonwealth is assessing the supply of alternative water with arrangements to be developed to transition residents to a more sustainable water supply where required.

PARTICULARS

- (i) *The release of the Pearce July 2018 Factsheet was accompanied with a community information session held on 24 July 2018 and a community kiosk on 28 July 2018, at which a slideshow presentation entitled “Community Information Session PFAS Investigation & Management Program – RAAF Base Pearce, WA Detailed Site Investigation Update and Human Health Risk Assessment” dated 24 July 2018, was made (**Pearce July 2018 Presentation**). The Pearce July 2018 Presentation is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Presentations/201807PearceCWISPresentation.pdf>

- (ii) *Each of the statements in subparagraphs (a) to (g) was made in writing in the Pearce July 2018 Presentation, or spoken to orally at the meeting by representatives of the Commonwealth.*

1.78. In November 2018, the Commonwealth released a factsheet titled ‘RAAF Base Pearce – Ecological Risk Assessment Findings – PFAS Investigation and Management Program’ (the **Pearce November 2018 ERA Factsheet**) which provided a summary of the Pearce ERA findings and advised as follows:

- (a) the aim of the Pearce ERA was to better understand the potential PFAS exposure risks to plants and animals within the investigation area;
- (b) the Pearce ERA assessed sensitive ecological receptors (such as birds, reptiles and mammals) located within three assessment areas where PFAS concentrations had exceeded the ecology based assessment guidelines in soil and/or water and lower order animals (fish, crustaceans and invertebrates), being the fire training area, the former fire training area and within Ki-it Monger and Ellen Brooks;
- (c) the Pearce ERA findings indicated that a number of birds, reptiles and mammals within the three assessment areas may have some or an elevated exposure risk to PFAS and management actions may be required to reduce exposure.

PARTICULARS

- (i) *The Pearce November 2018 ERA Factsheet is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Factsheets/201811ERAFactsheet.pdf>

- (ii) *The release of the Pearce November 2018 ERA Factsheet was accompanied by a community information*

kiosk held on 15 November 2018 at the West Bullsbrook Museum (Community Hall).

- 1.79. In November 2018, the Commonwealth released a factsheet titled 'RAAF Base Pearce – PFAS Management Area Plan Update – PFAS Investigation and Management Program'(the **Pearce November 2018 PMAP Factsheet**) which summarised the management actions recommended in the draft PFAS Management Area Plan (**Pearce PMAP**), which included:
- (a) managing the three main sources of PFAS contamination, being the former fire training areas and grounds maintenance area to reduce the ongoing release of PFAS into the environment from these sources;
 - (b) managing the drainage channels at the Pearce Base to minimise the amount of PFAS leaving the Pearce Base through surface water run-off which is the main off-Base migration pathway;
 - (c) managing the properties that have PFAS concentrations in groundwater in excess of the drinking water guideline level, through the provision of alternative water supply; and
 - (d) conducting further investigations at some source areas;
 - (e) advising that the specific management measures that will be implemented to address the recommended management actions will be included in the final Pearce PMAP;
 - (f) as part of the Pearce PMAP, an Ongoing Monitoring Plan (known as an **OMP**) is being prepared and will provide an evidence base for the ongoing management of the PFAS contamination.

PARTICULARS

- (iii) *The Pearce November 2018 PMAP Factsheet is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Factsheets/201811PMAPFactsheet.pdf>

- (iv) *The release of the Pearce November 2018 PMAP Factsheets was accompanied by a community information kiosk held on 15 November 2018 at the West Bullsbrook Museum (Community Hall)..*

1.80. In March 2019, the Commonwealth published a community newsletter titled 'RAAF Base Pearce – Community Newsletter – PFAS Investigation and Management Program' (**Pearce March 2019 Factsheet**) which advised:

- (a) since the completion of the detailed environmental investigation into the nature and extent of PFAS at the Pearce Base, which was completed in November 2018, the Commonwealth has been:
 - (i) sampling residential bores to assess the need for ongoing supply of alternative drinking water;
 - (ii) reviewing potential long-term water supply options for affected residents in the investigation area;
 - (iii) developing the Pearce PMAP, including an OMP in relation to the Pearce Base (**Pearce OMP**);
- (b) as part of the Pearce OMP, sampling of selected bores (including those that have recorded PFAS concentrations above assessment levels) commenced in early March and will be undertaken for an initial two year period.

PARTICULARS

- (i) *The Pearce March 2019 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Factsheets/201903.%20Pearce%20Community%20Newsletter.pdf>

1.81. In July 2019, the Commonwealth released a further factsheet titled 'RAAF Base Pearce – PFAS Management Update – PFAS Investigation and Management Program' (the **Pearce July 2019 Factsheet**) which advised:

- (a) the Pearce OMP will provide an evidence base for the ongoing management of PFAS contamination and include sampling of groundwater, surface water and sediment at locations on and off the Pearce Base;
- (b) the Pearce PMAP has been finalised and implementation of actions outlined in the Pearce PMAP is expected to commence this year;
- (c) the Pearce PMAP focuses on the elevated exposure risks identified in the Pearce HHRA and the Pearce ERA and examines potential management options available to reduce these risks.

- (d) the summary of the recommendations contained in the Pearce PMAP include:
 - (i) managing the three main sources of PFAS contamination on the Pearce Base, which involved removing contaminated soil from the former fire training areas and the Grounds Maintenance Area to reduce the ongoing release of PFAS to the local environment;
 - (ii) removing contaminated sediment and modifying main drainage channels on the Pearce Base to minimise the amount of PFAS leaving the Pearce Base through surface water run-off, which is the main off-base migration pathway;
 - (iii) providing long term solutions to properties which use groundwater bores as their primary drinking water source and have PFAS concentrations above the limit of reporting;
 - (iv) conducting further investigation at a number of source areas to better understand the extent of PFAS impact and whether or not these sources are contributing to off-base impacts.
- (e) the Commonwealth will continue to provide alternative water to properties that have recorded a PFAS detect above the limit of reporting;
- (f) the Pearce PMAP will be reviewed annually or more frequently if new information or technology arises.

PARTICULARS

- (i) *The Pearce July 2019 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Factsheets/201907.Pearce.Factsheet.PMAP.pdf>

1.82. On 10 July 2019, the Commonwealth held a community information session to discuss the Pearce PMAP and the Pearce OMP (the **Pearce July 2019 Community Information Session**), at which its representatives made the following statements:

- (a) in 2003, NICNAS recommended the use of PFOS and related PFAS based chemicals be restricted to essential use only and PFOS-based firefighting foam not be used for fire training purposes;
- (b) in 2010, the Commonwealth commenced the first PFAS investigation in Oakey and in 2015 the PFAS Investigation and Management Program commenced;

- (c) the key findings of the Pearce DSI included that there were six key sources of contamination and two key migration pathways, being surface water drains on base, discharging into Ellen Brook and groundwater moving from the Pearce Base;
- (d) the key findings of the Pearce HHRA include the estimation that the following scenarios may pose an elevated risk of exposure to PFAS:
 - (i) if contact with soil and water at some areas of the Pearce Base;
 - (ii) by drinking bore water at some properties within the Pearce Relevant Area;
- (e) the Pearce PMAP focuses on the elevated exposure risks identified in the Pearce HHRA and the Pearce ERA which included drinking groundwater from bores with PFAS concentrations above guidelines, incidental ingestion of shallow groundwater by sub-surface maintenance workers, incidental ingestion of surface water by personnel working in the on-base drainage channels, and base workers and sub-surface maintenance workers exposure to soil within the grounds maintenance area;
- (f) the proposed actions contained in the Pearce PMAP included:
 - (i) the excavation of contaminated soils at the current and former fire training areas and surface capping to mitigate leaching and run-off at the grounds maintenance area;
 - (ii) draining improvement (for example, the excavation of sediments lining of unlined channels) and surface water capture and treatment at the Pearce Base drainage channels;
 - (iii) the provision of a long-term alternative water solution to properties which use groundwater bores as their primary drinking water source and have PFAS concentrations above the limit of reporting;
- (g) the Pearce OMP included the assessment of potential changes to the nature and extent of PFAS impacts and/or risks on and off-base including by monitoring groundwater, surface water and sediment, at the Pearce Base, neighbouring properties, and surrounding and downstream waterways;

- (h) since the beginning of the investigation, the Commonwealth has provided alternative drinking water to eligible residents and will continue to do so for properties that have recorded a PFAS detect above the limit of reporting;
- (i) the Commonwealth has considered potential long term drinking water options for residents whose private bores had registered excessive levels of PFAS, including Point of Entry Treatment systems which were emerging as the preferred long term supply option.

PARTICULARS

- (i) *The Pearce July 2019 Community Information Session was held on 10 July 2019 at which a slideshow presentation entitled “PFAS Investigation & Management Program PMAP, Ongoing Monitoring and Alternative Water Supply – RAAF Base Pearce” dated 10 July 2019, was made (**Pearce July 2019 Presentation**). The Pearce July 2019 Presentation is published on:

<https://www.defence.gov.au/Environment/PFAS/docs/Pearce/Presentations/201907.Pearce.CWISPresentation.pdf>*
- (ii) *Each of the statements in subparagraphs (a) to (i) was made in writing in the Pearce July 2018 Presentation, or spoken to orally at the meeting by representatives of the Commonwealth.*

E.6 The injurious affectation to land in the Pearce Relevant Area

1.83. Land in the Pearce Relevant Area (including the land of the Applicants and Pearce Group Members) has become, and is likely to remain:

- (a) affected by the Pearce Surface Water Contamination; and/or
- (b) affected by the Pearce Groundwater Contamination; and/or
- (c) affected by the Pearce Soil Contamination; and/or
- (d) affected by the Pearce Biota Contamination.

PARTICULARS

- (i) *As to subparagraph (a), paragraphs 1.50 to 1.54 are repeated.*
- (ii) *As to subparagraph (b), paragraphs 1.55 to 1.60 are repeated.*
- (iii) *As to subparagraph (c), paragraphs 1.61 to 1.62 are repeated.*

- (iv) *As to subparagraph (d), paragraphs 1.63 to 1.64 are repeated.*

1.84. Further, or alternatively, by reason of:

- (a) the Pearce Surface Water Contamination; and/or
- (b) the Pearce Groundwater Contamination; and/or
- (c) the Pearce Soil Contamination; and/or
- (d) the Pearce Biota Contamination,

land in the Pearce Relevant Area (including the land of the Applicant and Pearce Group Members) has become, and is likely to remain land, of which occupiers and produce, livestock and biota from which, have ongoing and largely unavoidable exposure to PFC Contaminants through multiple potential pathways (**Pearce Ongoing Contaminant Exposure**).

PARTICULARS

- (i) *Paragraphs 1.50 to 1.64 are repeated.*
- (ii) *GHD HHRA at paragraphs 7.1 to 9.2*
- (iii) *Braunig J, Baudel C, Heffernan A et al, Fate and redistribution of perfluoroalkyl acids through AFFF-impacted groundwater (2017).*

1.85. Further, or alternatively, there exists a material risk that:

- (a) land in the Pearce Relevant Area (including land owned by the Applicants and Pearce Group Members) may be subject to an environmental protection notice issued and registered against land in the Pearce Relevant Area (including land owned by the Applicants and Group Members) pursuant to s 66 of the *Environmental Protection Act 1986* (WA) (**EPA**); and
- (b) owners of land in the Pearce Relevant Area (including land owned by the Applicants and Pearce Group Members) will be obligated to disclose to prospective purchasers that land is and/or that there is a risk that land may be contaminated by PFC Contaminants (with any contract of sale subject to rescission if disclosure is not made) or will be obliged to disclose to prospective purchasers or occupiers the content of an environmental protection notice and of the fact that it is binding on the prospective purchasers or occupiers.

PARTICULARS

- (i) *As to subparagraph (a):*
 - a. *An “environmental protection notice” may be issued to the owner or occupier of land that is polluted: s 66 of the EPA. An environmental protection notice may be registered against the title of the land.*
 - b. *Pollution means the direct or indirect alteration of the environment to its detriment or degradation or to the detriment of an environmental value that involves an emission (which includes a discharge of waste): s3A(1) of the EPA.*
 - c. *PFC Contaminants are a contaminant or waste as defined under s3A(1) of the EPA and paragraph 1.46 is repeated.*
- (ii) *The obligations in subparagraph (b) arise under s 67 of the EPA if the owner or occupier of land is issued with a “environmental protection notice” and/or at common law in respect of the risk of contamination to land.*

1.86. Further, or alternatively, by reason of the matters pleaded in paragraphs 1.50 to 1.85, there exists a material risk that by reason of the Pearce Surface Water Contamination and/or Pearce Groundwater Contamination and/or the Pearce Soil Contamination and/or the Pearce Biota Contamination that persons may be unable to conduct activities growing crops, feedstock, fruits and vegetables intended for human consumption on land in the Pearce Relevant Area.

PARTICULARS

- (i) *Parts D.1 above and E.5 below are repeated.*
- (ii) *GHD HHRA Report at paragraphs 8.4.5 and 9.1.*
- (iii) *There is a material risk that persons who supply stock feeds that are grown within the Pearce Relevant Area and required to provide a commodity vendor declaration under the LPA may be unable to state that the stock feeds are free of chemical residue and may be obliged to disclose the possible presence of PFOS/PFOA.*

1.87. By reason of the matters pleaded in paragraphs 1.50 to 1.85, land in the Pearce Relevant Area has become, and is likely to remain:

- (a) land which is, or may be perceived by prospective purchasers of land to be, unfit for residential purposes or human occupancy because occupiers and visitors have ongoing and largely unavoidable exposure to PFC Contaminants through multiple potential pathways;

- (b) land which is, or may be perceived by prospective purchasers of land to be unfit for agricultural purposes, including use for growing crops for human consumption, growing feedstock for livestock intended for human consumption, pasture for livestock intended for human consumption and fruits and vegetables intended for human consumption.

PARTICULARS

- (i) *The particulars to paragraphs 1.50 to 1.85 are repeated.*

1.88. By reason of the matters pleaded in paragraph 1.86 and/or 1.87, land in the Pearce Relevant Area has become, and is likely to remain, injuriously affected in its value (**Pearce Contamination Land Value Affection**).

PARTICULARS

- (i) *The Valuer General in Western Australia has confirmed that 137 properties in the Pearce Relevant Area have been reviewed and, on average, unimproved values have fallen by 50 percent: article published by Echo Newspaper titled 'PFAS taint hits West Bullsbrook properties' published on 9 May 2019 at <https://echonewspaper.com.au/pfas-taint-hits-west-bullsbrook-properties>.*
- (ii) *The unimproved value of the Applicants' Land as valued by the Valuer General in Western Australia (Landgate) decreased from \$199,000 in the 2015/2016 financial year to \$89,000 in 2019.*
- (iii) *Further particulars regarding the quantum of the adverse affection on the value of the Applicants' Land will be particularised following service of the Applicants' opinion evidence in chief.*
- (iv) *Further particulars regarding the Pearce Contamination Land Value Affection in the Pearce Relevant Area including of land owned by Pearce Group Members may be given following discovery and inspection.*

E.7 The reasonable foreseeability of the injurious affection to the value of land in the Pearce Relevant Area

1.89. At all material times, by reason of the matters pleaded in paragraphs 1.3 to 1.25 and 1.41 to 1.49 above, it was reasonably foreseeable that use of AFFF Working Solution and/or AFFF on the Pearce Base as pleaded in paragraphs 1.27 to 1.40 would result in:

- (a) the Pearce Surface Water Contamination;

- (b) the Pearce Groundwater Contamination;
- (c) the Pearce Soil Contamination;
- (d) the Pearce Biota Contamination; and/or
- (e) the Pearce Contamination Land Value Affection.

F THE COMMONWEALTH'S ACTS AND OMISSIONS

F.1 The Commonwealth's knowledge

F.1.1 The Commonwealth's knowledge of the Pearce Base and its surrounds

1.90. At all material times, the Commonwealth knew, or ought reasonably to have known:

- (a) the matters pleaded in Section A.1 above;
- (b) the matters pleaded in Section A.2 above;
- (c) the matters pleaded in Section A.3 above;
- (d) that waters, liquids, and soluble materials discharged on Pearce Base would:
 - (i) permeate, percolate or leach into the soil at the Pearce Base;
 - (ii) be transmitted to the groundwater beneath the Pearce Base, including into the Pearce Regional Aquifer and mingle and flow with that groundwater (including in a general direction towards the Pearce Brooks);
 - (iii) mingle with other surface water on the Pearce Base (especially after periods of rain), and flow overland in a generally westerly direction, towards Ellen Brook and:
 - (A) permeate or percolate into the soil over which the surface water overland flows occurred; and
 - (B) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including into the Pearce Regional Aquifer; and
 - (iv) be transmitted to the Pearce Brooks.

PARTICULARS

- (i) *As to sub-paragraph (a), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Pearce Base.*
- (ii) *As to sub-paragraph (b), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Pearce Base or artificial features which the Commonwealth developed, constructed, upgraded and utilised.*
- (iii) *As to sub-paragraph (c), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Pearce Base or artificial features which the Commonwealth developed, constructed, upgraded and utilised.*
- (iv) *As to sub-paragraph (d), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) to (c) above.*

F.1.2 The Commonwealth's knowledge of water use at the Pearce Relevant Area

1.91. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) the matters pleaded in Section B.1 above;
- (b) the matters pleaded in Section B.2 above; and
- (c) that waters, liquids, and soluble materials discharged and/or allowed to escape the Pearce Base which were transmitted to the Pearce Brooks, and the Pearce Regional Aquifer would be used by residents of the Pearce Relevant Area.

PARTICULARS

- (i) *As to sub-paragraph (a), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person occupying the land comprising the Pearce Base, having regard to its proximity to the Pearce Relevant Area, Ellen Brook, and Ki-it Monger Brook.*
- (ii) *As to sub-paragraph (b), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person occupying the land comprising the Pearce Base, having regard to its proximity to the Pearce Relevant Area.*

- (iii) *As to sub-paragraph (c), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) and (b) above.*

F.1.3 The Commonwealth's knowledge of the potential flow of Spent AFFF and Fire Run-Off from the Pearce Base

1.92. At all material times, the Commonwealth knew, or ought reasonably to have known:

- (a) that the Pearce Training and Operation Activities (and ancillary storage, containment and disposal practices) resulted in:
 - (i) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground; and/or
 - (ii) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with Fire Run-Off, being discharged, or allowed to escape, to bare ground
- (b) the matters pleaded in Section C.4 above; and
- (c) that use of AFFF Working Solution and AFFF on the Pearce Base would result in Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF:
 - (i) being transmitted to the groundwater beneath the Pearce Base, including the Pearce Regional Aquifer and mingle and flow with that groundwater (including in a general direction towards the Pearce Brooks), and being utilised by persons engaged in the Pearce Groundwater Usage;
 - (ii) mingling with other surface water on the Pearce Base (especially after periods of rain), and flowing overland in a generally westerly direction, towards and into the surrounding water catchment areas outside the Pearce Base (including the Pearce Brooks) and:
 - (A) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (B) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Pearce Regional Aquifer;

and being extracted and utilised by persons engaged in the Pearce Groundwater Usages; and

- (iii) mingling with other surface water on the Pearce Base (especially after periods of rain), and flowing overland in a generally westerly direction, towards and into the surrounding water catchment areas outside the Pearce Base (including the Pearce Brooks) and then being utilised by persons engaged in the Pearce Brooks Usages.

PARTICULARS

- (i) *As to sub-paragraph (a), these were matters known to the Commonwealth as the entity responsible for conducting the Pearce Training and Operation Activities, and using AFFF Concentrate, AFFF Working Solution and AFFF, and disposing of the same.*
- (ii) *As to sub-paragraph (b), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person using AFFF Concentrate, AFFF Working Solution and AFFF.*
- (iii) *As to sub-paragraph (c), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) and (b) above, together with the matters pleaded in sub-paragraph 1.90(d).*

F.1.4 The Commonwealth's knowledge of the toxic properties of Spent AFFF and Fire Run-Off

1.93. Paragraph 33 is repeated.

1.94. Paragraph 34 is repeated.

1.95. Further, or alternatively, at all material times from 16 May 2000, alternatively 2005, the Commonwealth knew that its Pearce Training and Operations Activities at the Pearce Base using AFFF were:

- (d) potentially damaging to the environment; and/or
- (e) potentially causative of adverse health effects in humans.

PARTICULARS

- (i) *As to sub-paragraph (a) see Schedule 9.*

- (ii) *As to sub-paragraph (b), the matters referred to in particular (i) involved knowledge of the contamination of groundwater, and it may be inferred that a person who knew that groundwater was contaminated also knew that there existed a potential for adverse health effects in humans who may consume groundwater, or produce (including livestock and eggs) watered with groundwater.*
- (iii) *See the documents listed in GHD DSI Report at paragraph 15.*

1.96. Paragraph 35 is repeated.

1.97. Further, or alternatively, at all material times from no later than 2005 (**Pearce Contamination Knowledge Date**), the Commonwealth knew or ought reasonably to have known that AFFF Working Solution, AFFF, and Spent AFFF had contaminated groundwater under the Pearce Base.

PARTICULARS

- (i) *GHD DSI Report at paragraph 3.1.*
- (ii) *See the documents listed in GHD DSI Report at paragraph 15.*

F.2 The Commonwealth's conduct

F.2.1 The Commonwealth's deliberate conduct

1.98. At all material times, the Commonwealth's:

- (a) use of AFFF in the Pearce Training and Operations Activities, as pleaded in paragraphs 1.27 to 1.38; and/or
 - (b) method of disposal of AFFF and Spent AFFF, as pleaded in paragraph 1.39,
- was deliberate.

F.2.2 The Commonwealth's careless conduct

1.99. Further, or alternatively, by reason of the matters pleaded in paragraphs 1.27 to 1.40 at all material times on and after each of the times identified in paragraphs 1.93 to 1.97 the Commonwealth carelessly:

- (a) did the following acts:
 - (i) it allowed large quantities of AFFF to be discharged to bare ground;

- (ii) it allowed Spent AFFF and Fire Run-Off to flow directly onto bare ground in large quantities;
 - (iii) it allowed Spent AFFF and Fire Run-Off to permeate or percolate into the soil at the Pearce Base;
 - (iv) it allowed Spent AFFF and Fire Run-Off to be transmitted to the groundwater beneath the Pearce Base, including the Pearce Regional Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Pearce Relevant Area);
 - (v) it allowed Spent AFFF and Fire Run-Off to drain into the surrounding water catchment areas (including via the Pearce Drainage System), including into the Pearce Brooks; and/or
 - (vi) it allowed Spent AFFF and Fire Run-Off to be transmitted to the Pearce Brooks; and/or
 - (vii) to the extent it stored store wastewater from the use of AFFF Working Solution and AFFF, it did so in such a way that it failed to avoid leakage to the surrounding environment;
- (b) made the following omissions:
- (i) it failed to investigate and assess, or to do so adequately, the risks associated with the use of AFFF before using, or continuing to use AFFF;
 - (ii) it failed to restrict, or to do so adequately, the use of AFFF Working Solution and AFFF only to emergencies;
 - (iii) it failed to take any or any adequate steps to contain or limit the use of AFFF Working Solution and AFFF in Pearce Training and Operations Activities;
 - (iv) it failed to take any or any adequate steps to contain, capture, clean up and securely dispose of Spent AFFF and Fire Run-Off, such that it did not:
 - (A) flow directly onto bare ground;
 - (B) permeate or percolate into the soil at the Pearce Base;

- (C) become transmitted to the groundwater beneath the Pearce Base, including the Pearce Regional Aquifer (where it was likely to mingle with groundwater underlying areas off-base in the Pearce Relevant Area);
 - (D) drain into the surrounding water catchment areas (including via the Pearce Drainage System), including into the Pearce Brooks; and
 - (E) transmit to the Pearce Brooks;
- (v) it failed to store wastewater from the use of AFFF Working Solution and AFFF in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
 - (vi) it failed to take any or any adequate steps to remediate the contamination of the groundwater under the Pearce Base at any time after the time when it knew or ought reasonably to have known that groundwater was contaminated, as pleaded in paragraphs 1.93 to 1.97 (to the extent, which is unknown to the Applicants, that the contamination may at one time have been remediable); and/or
 - (vii) it failed to take any or any adequate steps to remediate the contamination of the soil on Pearce Base at any time after the time when it knew or ought reasonably to have known that soil was contaminated (including to prevent Spent AFFF and Fire Run Off leaching, or further leaching into the groundwater or surface water, (to the extent, which is unknown to the Applicants, that the contamination may at one time have been remediable)).

PARTICULARS

- (i) *As to subparagraph (a)(i), paragraphs 1.27 to 1.40 are repeated.*
- (ii) *As to subparagraph (a)(ii), paragraphs 1.27 to 1.40 are repeated.*
- (iii) *As to subparagraph (a)(iii), paragraphs 1.27 to 1.40 and 1.61 to 1.62 are repeated.*
- (iv) *As to subparagraph (a)(iv), paragraphs 1.27 to 1.40 and 1.55 to 1.60 are repeated.*
- (v) *As to subparagraph (a)(v), paragraphs 1.27 to 1.40 and 1.50 to 1.54 is repeated.*

- (vi) *As to subparagraph (a)(vi), paragraph 1.27 to 1.40 and 1.50 to 1.54 is repeated.*
- (vii) *As to subparagraph (a)(vii), paragraph 1.27 to 1.40 and 1.50 to 1.64 is repeated.*
- (viii) *As to subparagraph (b)(i), paragraphs 1.27 to 1.40 and 1.93 to 1.97 are repeated.*
- (ix) *As to subparagraph (b)(ii), paragraphs 1.27 to 1.40 are repeated.*
- (x) *As to subparagraph (b)(iii), paragraphs 1.27 to 1.40 are repeated.*
- (xi) *As to subparagraph (b)(iv), paragraphs 1.27 to 1.40 and 1.50 to 1.64 are repeated.*
- (xii) *As to subparagraph (b)(v), paragraph 1.27 to 1.40 is repeated.*
- (xiii) *As to subparagraph (b)(vi), paragraphs 1.27 to 1.40 and 1.93 to 1.97 are repeated.*
- (xiv) *As to subparagraph (b)(vii), paragraphs 1.27 to 1.40 and 1.93 to 1.97 are repeated.*

1.100. Further, or alternatively, the Commonwealth:

- (a) failed, at all material times after the Pearce Contamination Knowledge Date, to warn persons resident in the Pearce Relevant Area that:
 - (i) it had been using AFFF Working Solution and AFFF at the Pearce Base since or about the 1970s;
 - (ii) Spent AFFF had permeated and percolated into the soil at the Pearce Base and entered and/or contaminated, the Pearce Regional Aquifer, Ellen Brook, and Ki-it Monger Brook; and/or
 - (iii) Spent AFFF was:
 - (A) potentially damaging to the environment; and/or
 - (B) potentially causative of adverse health effects in humans; and/or

1.101. Further, or alternatively, the Commonwealth failed, at all material times after the inception of the *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, Volume 1, Ch6(6), to comply with that measure by providing all relevant information on site contamination for persons resident in the Pearce Relevant Area.

G THE COMMONWEALTH'S LIABILITY

G.1 Pearce Nuisance

G.1.1 Liability in Pearce Nuisance

1.102. By its use of the Pearce Base as pleaded in paragraphs 1.27 to 1.40 and 1.98 to 1.99, the Commonwealth has created, and continued, an interference with the use and enjoyment of the land owned by the Applicants and Pearce Group Members (the **Pearce Nuisance**), in that:

- (a) their land is affected by the Pearce Surface Water Contamination and such contamination is irreducible (and paragraphs 1.50 to 1.54 are repeated);
- (b) they are no longer able safely to use private bores on their land to access the Pearce Regional Aquifer as a water supply for Pearce Groundwater Usages, given the Pearce Regional Aquifer is irreducibly contaminated (and paragraphs 1.55 to 1.60 are repeated);
- (c) their soil has sustained Pearce Soil Contamination, and such contamination is irreducible (and paragraphs 1.61 to 1.62 are repeated);
- (d) their land is affected by the Pearce Biota Contamination, and such contamination is irreducible (and paragraphs 1.63 to 1.64 are repeated); and
- (e) those occupying their land are subject to the Pearce Ongoing Contaminant Exposure.

PARTICULARS

- (i) *The Applicants' use and enjoyment of the Applicants' Land has been interfered with by reason of the Pearce Groundwater Contamination, the Pearce Soil Contamination and/or the Pearce Biota Contamination.*
- (ii) *The interference with the land of Pearce Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Pearce Group Members.*

1.103. Further, by reason of the matters pleaded in paragraphs 1.21, 1.25, 1.43, 1.49, 1.89 and/or 1.90 to 1.97, at all material times it was reasonably foreseeable to a reasonable person in the Commonwealth's position that persons owning land in the Pearce Relevant Area (including the Applicants and Pearce Group Members) would suffer loss

by the Commonwealth's use of the Pearce Base as pleaded in paragraphs 1.27 to 1.40, being pure economic loss, in the form of diminution in the value of land in the Pearce Relevant Area.

PARTICULARS

- (i) *Paragraphs 1.21, 1.25, 1.43, 1.49, 1.89 and/or 1.90 to 1.97 are repeated.*

1.104. By reason of the matters pleaded in paragraphs 1.102 and 1.103, the Pearce Nuisance constitutes a substantial and unreasonable interference with the use and enjoyment of the land owned by the Applicants and Pearce Group Members.

G.1.2 Causation, loss and damage

1.105. The Pearce Nuisance directly caused:

- (a) the Pearce Surface Water Contamination (as pleaded in paragraph 1.53);
- (b) the Pearce Groundwater Contamination (as pleaded in paragraph 1.58);
- (c) the Pearce Soil Contamination (as pleaded in paragraph 1.61);
- (d) the Pearce Biota Contamination (as pleaded in paragraph 1.63); and/or
- (e) the Pearce Contamination Land Value Affection (as pleaded in paragraph 1.88); and/or

the Applicants and Pearce Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *The First and Second Applicants have suffered loss being:
 - A) *Diminution in the value of the Applicants' land;*
 - B) *Loss of opportunity to acquire land in a different area;*
 - C) *Distress, annoyance and inconvenience;**
- (ii) *The particulars of the losses of Pearce Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Pearce Group Members.*

G.1.3 Aggravated and exemplary damages

1.106. Further, on and from the Actual Knowledge Date, by continuing the Pearce Nuisance by:

- (a) continuing to do the acts as pleaded in paragraph 1.98 and/or sub-paragraph 1.99(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 1.99(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 1.90 to 1.97, the Commonwealth engaged in aggravating conduct, and the Applicants and Pearce Group Members claim aggravated damages.

1.107. Further, or alternatively, on and from each of the Actual Knowledge Date, by continuing the Pearce Nuisance by:

- (a) continuing to do the acts as pleaded in paragraph 1.98 and/or sub-paragraph 1.99(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 1.99(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 1.90 to 1.97, the Commonwealth engaged in conduct in contumelious disregard for the rights of the Applicants and Pearce Group Members, and the Applicants and Pearce Group Members claim exemplary damages.

G.2 Pearce Negligence

G.2.1 Duty of care

1.108. At all material times, persons other than the Commonwealth (including the Applicant and Pearce Group Members) had no capacity to control the activities of the Commonwealth on the Pearce Base, and in particular the use of AFFF Working Solution and AFFF on the Pearce Base.

1.109. At all material times, the land in the Pearce Relevant Area (including the Applicants' Land, the land owned by Pearce Group Members) was physically proximate to the Pearce Base.

- 1.110. At all material times, by reason of the matters pleaded in paragraphs 1.108 to 1.109 persons owning, or considering purchasing land in the Pearce Relevant Area (including the Applicants and Pearce Group Members) were in a position of vulnerability.
- 1.111. By reason of the matters pleaded in paragraphs 1.21, 1.25, 1.43, 1.49, 1.89 and/or 1.90 to 1.97 a reasonable person in the Commonwealth's position would have foreseen a reasonably foreseeable and not insignificant risk of harm to persons owning in the Pearce Relevant Area (including the Applicants and Pearce Group Members) by the Commonwealth's use of AFFF Working Solution and AFFF on the Pearce Base as pleaded in paragraphs 1.27 to 1.40, being pure economic loss, in the form of diminution in the value of their land (the **Pearce Risk of Harm**).

PARTICULARS

- (i) *Paragraphs 1.21, 1.25, 1.43, 1.49, 1.89 and/or 1.90 to 1.97 are repeated.*

- 1.112. By reason of the matters pleaded in paragraphs 1.108 to 1.111, the Commonwealth owed a duty to each and all of the Applicants and Pearce Group Members to exercise reasonable care, in the use of AFFF Working Solution and AFFF on the Pearce Base not to cause pure economic loss, in the form of diminution in the value of land in the Pearce Relevant Area (**Pearce Duty of Care**).
- 1.113. By reason of the matters pleaded in paragraphs 1.108 to 1.111, on and after the Pearce Contamination Knowledge Date, alternatively the Actual Knowledge Date, the Commonwealth owed a duty to each and all of the Applicants and Pearce Group Members to exercise reasonable care to warn them that:
- (a) it had been using AFFF at the Pearce Base since or about the 1970s;
 - (b) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Pearce Base and entered and/or contaminated the Pearce Regional Aquifer and/or contaminated the Pearce Brooks; and
 - (c) Spent AFFF was:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans.
- (**Pearce Duty to Warn**).

G.2.2 Scope of Duty of Care

1.114. On and from 26 November 1974, the *Rights in Water and Irrigation Act 1914-1973* (WA) (**RWIA**) as amended by the *Rights in Water and Irrigation Act Amendment Act 1974* (WA) up to the commencement of the *Environmental Protection Act 1986* (WA) **EPA WA**):

- (a) made it an offence to cause or knowingly permit any poisonous, noxious or polluting matter to be discharged or deposited on or in any land or water which a person knows or ought reasonably to know will lead, or be likely to lead, to the impairment of the physical, chemical or biological condition of the waters in any watercourse, lake, lagoon, swamp, marsh or subterranean water source, or will tend (either directly or in combination with other matter which he or another person causes or permits to enter those waters) to impede the proper flow of those waters in a manner leading or likely to lead to a substantial aggravation of pollution due to other causes or the consequences of such pollution;
- (b) provided that the provisions of Part IIIA (including the provision referred to in the previous sub-paragraph) applied in relation to every river, stream, watercourse, lagoon, lake, swamp, marsh or subterranean water throughout Western Australia, except if the Governor declared otherwise.

PARTICULARS

(ii) *RWIA, ss 27A and 27G.*

1.115. On and from 20 February 1987, the EPA WA:

- (a) prohibited persons from:
 - (i) causing pollution, or allowing it to be caused;
 - (ii) allowing waste to be emitted from any premises which unreasonably interferes with the health, welfare, convenience, comfort or amenity of any person;
 - (iii) causing or allowing waste to be placed in any position from which the waste could reasonably be expected to gain access to any portion of the environment and in so gaining access be likely to result in pollution;

- (b) defined “pollution” to mean the direct or indirect alteration of the environment (a) to its detriment or degradation; (b) to the detriment of any beneficial use, or (c) of a prescribed kind;
- (c) defined “environment” to mean living things, their physical, biological and social surroundings, and interactions between all these (including in the case of humans, the aesthetic, cultural, economic and social surroundings to the extent that they directly affect or are affected by physical or biological surroundings);
- (d) defined “waste” to include matter, whether liquid, solid, gaseous or radioactive and whether useful or useless, which is discharged (that is, deposited, allowed to escape, or permitted to be or failed to prevent from being discharged, deposited or allowed to escape) into the environment.

PARTICULARS

- (i) *As to sub paragraph (a), EPA ss 49, 50, 51.*

1.116. At all material times:

- (a) from 26 November 1974 to 20 February 1987, the content of the RWIA (as pleaded in paragraph 1.114);
- (b) from 20 February 1987 the content of the EPA WA (as pleaded in paragraph 1.115),

bound the Commonwealth by reason of the *Commonwealth Places (Application of Laws) Act 1970* (Cth), and/or informed the scope of what a reasonably person ought do in relation to conduct which it was reasonably foreseeable might result in environmental harm (including the Pearce Risk of Harm pleaded in paragraph 1.111).

1.117. The Commonwealth had the capacity to exercise control of the Pearce Training and Operations Activities and the use of AFFF Working Solution and AFFF on the Pearce Base so as to take the precautions which a reasonable person in its position would have taken against the Pearce Risk of Harm, by:

- (a) not doing the following acts at all, or alternatively any time after the Actual Knowledge Date:
 - (i) allowing large quantities of AFFF Working Solution and AFFF to be discharged to bare ground;

- (ii) allowing Spent AFFF and Fire Run-Off to flow directly onto bare ground in large quantities;
 - (iii) allowing Spent AFFF and Fire Run-Off to permeate or percolate into the soil at the Pearce Base;
 - (iv) allowing Spent AFFF and Fire Run-Off to be transmitted to the groundwater beneath the Pearce Base, including the Pearce Regional Aquifer (where it was likely to mingle with groundwater underlying areas off-base in the Pearce Relevant Area);
 - (v) allowing Spent AFFF and Fire Run-Off to drain into the surrounding water catchment areas (including via the Pearce Drainage System), including into the Pearce Brooks;
 - (vi) allowing Spent AFFF and Fire Run-Off to be transmitted to the Pearce Brooks; and/or
 - (vii) to the extent it stored wastewater from the use of AFFF, doing so in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment) failed to avoid leakage to the surrounding environment;
- (b) doing the following things, at any time, or alternatively any time after the Actual Knowledge Date:
- (i) investigating and assessing the risks associated with the use of AFFF Working Solution and AFFF before using, or continuing to use, AFFF Working Solution and AFFF (and not using them at all);
 - (ii) restricting the use of AFFF Working Solution and AFFF only for emergency activities;
 - (iii) taking steps to contain or limit the use of AFFF Working Solution and AFFF in the Pearce Training and Operations Activities;
 - (iv) taking steps to contain, capture, clean up and securely dispose of Spent AFFF and Fire Run-Off, such that it did not:
 - (A) flow directly onto bare ground;

- (B) permeate or percolate into the soil at the Pearce Base;
 - (C) become transmitted to the groundwater beneath the Pearce Base, including the Pearce Regional Aquifer (where it was likely to mingle with groundwater underlying areas off-base in the Pearce Relevant Area);
 - (D) drain into the surrounding water catchment areas (including via the Pearce Drainage System), including into the Pearce Brooks; and
 - (E) transmit to the Pearce Brooks;
- (v) storing wastewater from the use of AFFF in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
 - (vi) taking steps to remediate the contamination of the groundwater under the Pearce Base promptly after the time when it knew or ought reasonably to have known that groundwater was, or was likely to have been, contaminated as pleaded in paragraphs 33 to 35 (to the extent, which is unknown to the Applicants, that the contamination may at one time have been remediable); and/or
 - (vii) taking steps to remediate contaminated soil on Pearce Base at any time promptly after the time when it knew or ought reasonably to have known that soil was contaminated (including by removing that soil and disposing of it at an off-site disposal area so as to prevent Spent AFFF and Fire Run Off leaching, or further leaching into the groundwater or surface water, (to the extent, which is unknown to the Applicants, that the contamination may at one time have been remediable).

G.2.3 Scope of Duty to Warn

1.118. At all material times the Pearce Contamination Knowledge Date, alternatively the Actual Knowledge Date, the Commonwealth had capacity to warn the general public, alternatively owners and residents of the Pearce Relevant Area, alternatively the market of potential purchasers of land in the Pearce Relevant Area (including the Applicants and Pearce Group Members) that:

- (c) it had been using AFFF Working Solution and AFFF at the Pearce Base since or about the 1970s;
- (d) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Pearce Base and entered and/or contaminated the Pearce Regional Aquifers and/or contaminated the Pearce Brooks; and
- (e) Spent AFFF was:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans.

G.2.4 Breach of duty

1.119. By reason of the matters pleaded in paragraphs 1.27 to 1.40, 1.99 and 1.117, the Commonwealth breached the Pearce Duty of Care (the **Pearce Negligence**).

1.120. By reason of the matters pleaded in paragraphs 1.27 to 1.40, 1.100 and 1.118, the Commonwealth breached the Pearce Duty to Warn (the **Pearce Negligent Failure to Warn**).

G.2.5 Causation, loss and damage

1.121. The Commonwealth's Pearce Negligence caused:

- (a) the Pearce Surface Water Contamination (as pleaded in paragraph 1.53);
- (b) the Pearce Groundwater Contamination (as pleaded in paragraph 1.58);
- (c) the Pearce Soil Contamination (as pleaded in paragraph 1.61);
- (d) the Pearce Biota Contamination (as pleaded in paragraph 1.63); and/or
- (e) the Pearce Contamination Land Value Affectation (as pleaded in paragraph 1.88);

the Applicants and Pearce Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *The particulars to paragraph 1.105 are repeated.*

1.122. Further, or alternatively, the Commonwealth's Pearce Negligent Failure to Warn caused or materially contributed to the Applicants and some Pearce Group Members acquiring

land in the Pearce Relevant Area, and the Applicants and Pearce Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *The Applicants would not have acquired the Applicants' Land were it not for the Commonwealth's Pearce Negligent Failure to Warn, and have thereby suffered loss, and particulars (i) and (ii) to paragraph 1.105 is repeated.*
- (ii) *Particulars of the identity of those Pearce Group Members who would not have acquired land were it not for the Commonwealth's Pearce Negligent Failure to Warn will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Pearce Group Members, and particular (iii) to paragraph 1.105 is repeated.*

G.2.6 Aggravated and exemplary damages

1.123. Further, on and from the Actual Knowledge Date by:

- (a) continuing to do the acts as pleaded in paragraph 1.98 and/or sub-paragraph 1.99(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 1.99(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 1.90 to 1.97, the Commonwealth engaged in aggravating conduct, and the Applicants and Pearce Group Members claim aggravated damages.

1.124. Further, or alternatively, on and from the Actual Knowledge Date by:

- (a) continuing to do the acts as pleaded in paragraph 1.98 and/or sub-paragraph 1.99(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 1.99(b) (and each of them),

in circumstances where it where it had the knowledge as pleaded in paragraphs 1.90 to 1.97, the Commonwealth engaged in conduct in contumelious disregard for the rights

of the Applicants and Pearce Group Members, and the Applicants and Pearce Group Members claim exemplary damages.

G.3 Breach of statutory duty

G.3.1 Liability

1.125. The Pearce Base is situated on Commonwealth land as defined in ss 27 and 525 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**)

1.126. Pursuant to s 28 of the EPBC Act, the Commonwealth or a Commonwealth agency must not take an action that has, will have, or is likely to have a significant impact on the environment, defined by s 528 non-exhaustively to include:

- (c) ecosystems and their constituent parts, including people and communities;
- (d) natural and physical resources;
- (e) the qualities and characteristics of locations, places and areas;
- (f) heritage values of places; and
- (g) the social, economic and cultural aspects of a thing mentioned in paragraph (a), (b), (c) or (d).

1.127. By its use of the Pearce Base on and from 16 July 1999, as pleaded in paragraphs 1.27 to 1.40 and 1.98 and/or 1.99, the Commonwealth took an action or actions that has or is likely to have a significant impact on the environment.

PARTICULARS

- (i) *These actions have had such an impact by reason of the matters pleaded in paragraphs 1.50 to 1.64, namely the Pearce Surface Water Contamination, Pearce Toxic Plume, the Pearce Groundwater Contamination, the Pearce Soil Contamination, and the Pearce Biota Contamination*
- (ii) *These actions were likely to have such an impact by reason that they were reasonably foreseeable, by reason of the matters pleaded in paragraphs 1.21, 1.25, 1.43, 1.49 and 1.89.*

1.128. By reason of the matters pleaded in paragraph 1.127, the Commonwealth has contravened s 28 of the EPBC Act (**Pearce EPBC Act Breach**).

G.3.2 Causation, loss and damage

1.129. The Pearce EPBC Act Breach caused:

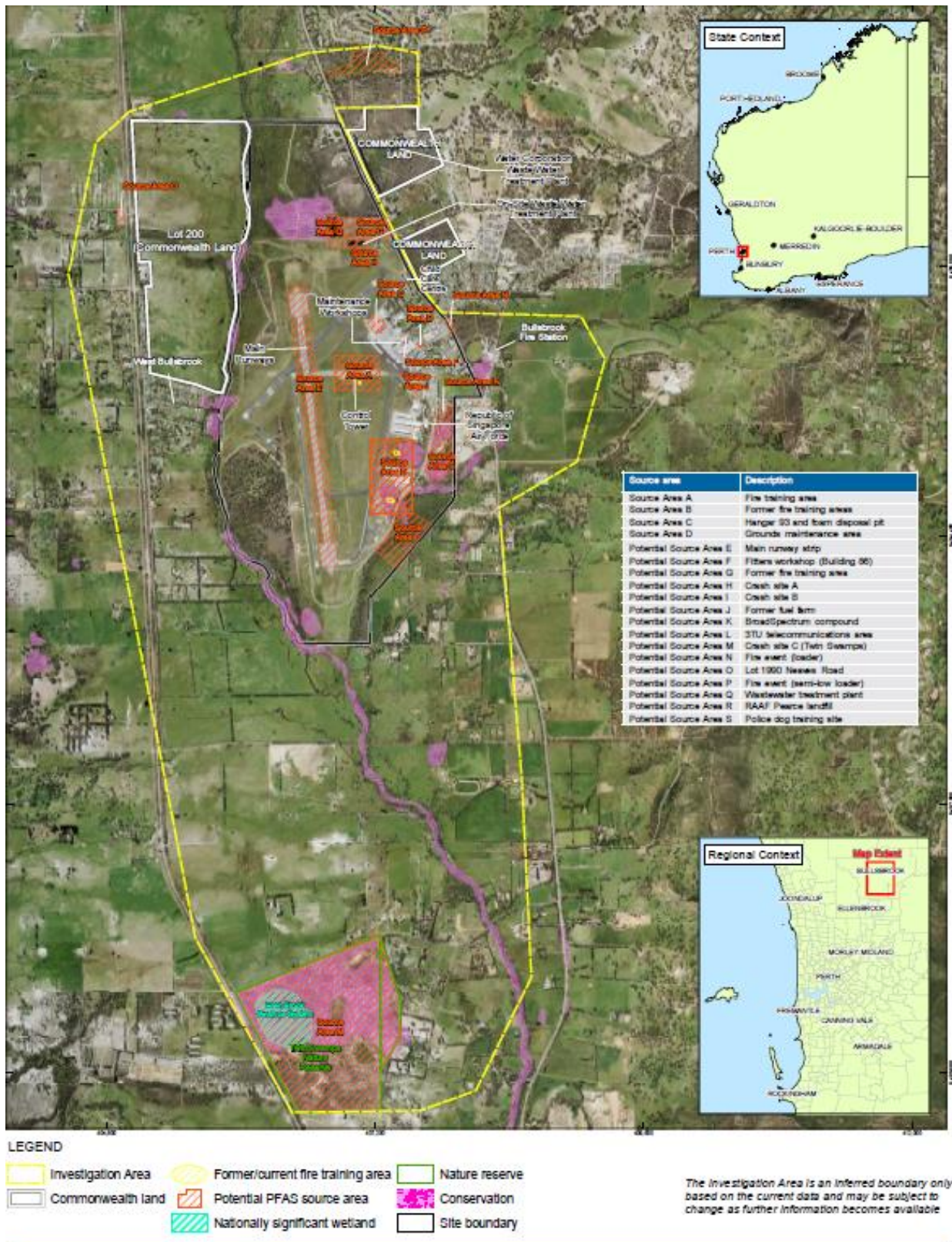
- (a) the Pearce Surface Water Contamination (as pleaded in paragraph 1.53);
- (b) the Pearce Groundwater Contamination (as pleaded in paragraph 1.58);
- (c) the Pearce Soil Contamination (as pleaded in paragraph 1.61);
- (d) the Pearce Biota Contamination (as pleaded in paragraph 1.63); and/or
- (e) the Pearce Contamination Land Value Affectation (as pleaded in paragraph 1.88);

the Applicants and Pearce Group Members have thereby suffered loss and damage arising from the Pearce EPBC Act Breach.

PARTICULARS

- (i) *The particulars to paragraph 1.105 are repeated.*

ANNEXURE 1A: PEARCE RELEVANT AREA



SCHEDULE 2 – DARWIN BASE

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A THE DARWIN BASE AND SURROUNDS

A.1 The Darwin Base

- 2.1. Since about February 1940, the Commonwealth has continuously owned and occupied an area of land approximately 12.78 square kilometres in size and approximately seven kilometres from the business centre of Darwin in the Northern Territory known as RAAF Base Darwin (the **Darwin Base**).

PARTICULARS

- (i) *Coffey Environments Australia Pty Ltd, Department of Defence: RAAF Base Darwin – Supplementary Detailed Site Investigation Report – Per and Poly-fluoroalkyl Substances (PFAS) (5 February 2018) (**Coffey DSI Report**) at paragraphs 2.1, 3 and 4.1.1.*
- (ii) *Coffey Services Australia Pty Ltd, Department of Defence: RAAF Base Darwin – Human Health Risk Assessment for PFAS (19 June 2018) (**Coffey HHRA Report**) at paragraphs 2.1 and 3.2.*
- (iii) *Coffey Environments Australia Pty Ltd, Department of Defence: RAAF Base Darwin – Ecological Risk Assessment (23 October 2018) (**Coffey ERA Report**) at paragraph 2.2.*
- (iv) *Coffey Environments Australia Pty Ltd, Department of Defence: RAAF Base Darwin – Supplementary Detailed Site Investigation Report – Per and Poly-fluoroalkyl Substances (PFAS) (2 November 2018) (**Coffey Supplementary DSI Report**) at paragraphs 2.1.1 and 3.1.1 .*
- (v) *PFAS Management Area Plan (July 2019) (**PMA**) at paragraph 2.1.*

- 2.2. Since about 1983, neighbouring land use in the region surrounding the Darwin Base has at times included:

- (a) in the north, the Darwin International Airport, residential housing and a sporting complex;
- (b) in the east, grass and shrub land, some light industry and a power station;
- (c) in the south, Berrimah and Winnellie industrial estates, and further south Charles Darwin National Park; and
- (d) in the west, Ludmilla primary school, RAAF Golf Course and residential and community housing.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 2.3 and 3.4.*

- (ii) *Coffey HHRA at paragraphs 2.2 and 4.3.*
- (iii) *Coffey ERA at paragraph 2.2.1.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 2.1.3.*
- (v) *PMAP at paragraphs 2.1 and 2.2.*

A.2 The natural features of the Darwin Base and surrounding area

A.2.1 Climate

- 2.3. At all material times, the Darwin Base and the Darwin Relevant Area were situated in a tropical climate with distinct monsoonal wet and dry seasons.
- 2.4. At all material times, the wet season, typically lasting between November to April, is characterised by warmer temperatures, heavy rainfall and higher humidity while the dry season, typically lasting between May to October, is characterised by relatively cool temperatures and low humidity.

PARTICULARS

- (i) *Coffey DSI Report at paragraph 4.1.2.*
- (ii) *Coffey HHRA Report at paragraph 2.3.*
- (iii) *Coffey ERA Report at paragraph 3.1.*
- (iv) *Coffey Supplementary DSI Report at paragraph 3.1.2.*
- (v) *PMAP at paragraph 2.2.*

A.2.2 Topography

- 2.5. At all material times, the Darwin Base was relatively flat and low lying, sloping gently across a distance of several kilometres along the northern and western boundaries.

PARTICULARS

- (i) *Coffey DSI Report at paragraph 4.1.3.*
 - (ii) *Coffey HHRA Report at paragraph 2.1.2.*
 - (iii) *Coffey ERA Report at paragraph 2.2.2.*
 - (iv) *Coffey Supplementary DSI at paragraph 3.1.3.*
 - (v) *PMAP at paragraph 2.2.*
- 2.6. At all material times, the Darwin Base and Darwin Relevant Area were surrounded by four Darwin Creeks, being:
 - (a) Rapid Creek, located to the north of the Darwin Base;
 - (b) Ludmilla Creek, located to the west of the Darwin Base;

- (c) Sadgroves Creek, located to the south-west of the Darwin Base; and
- (d) Reichardt Creek, located to the south-east of the Darwin Base.

(together, the **Darwin Creeks**).

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.2.1 and 4.2.3.*
- (ii) *Coffey HHRA at paragraphs 2.4.1 and 2.4.2.*
- (iii) *Coffey ERA at paragraph 2.2.2.*
- (iv) *Coffey Supplementary DSI at paragraphs 3.2.1 and 3.2.3.*
- (v) *PMAP at paragraph 2.2.*

2.7. At all material times, Rapid Creek:

- (a) is and was the closest surface water body to the Darwin Base;
- (b) is and was approximately 9.8km in length and drains a catchment of approximately 30 km²;
- (c) flowed in a north-westerly direction towards and into the Beagle Gulf;
- (d) receives both groundwater and surface water.

PARTICULARS

- (i) *Coffey DSI Report at paragraph 4.2.3.*
- (ii) *Coffey HHRA Report at paragraph 2.4.2.*
- (iii) *Coffey ERA Report at paragraph 2.2.2.*
- (iv) *Coffey DSI Supplementary Report at paragraphs 3.2.3 and 7.2.1.*
- (v) *PMAP at paragraph 2.2.*

2.8. Ludmilla Creek:

- (a) at all material times, is and was an extensive salt and freshwater wetland system located to the west of the Darwin Base;
- (b) was widened in 1969 to compensate for runoff from the residential developments and the Darwin Base;

- (c) in about 2015, had 420m reinstated to the trunk drain to return it back to 1974 levels;
- (d) at a time not presently known, but after 2015, had works conducted to extend the drain to the tidal reaches at Dick Ward Drive; and
- (e) at all material times received both groundwater and surface water.

PARTICULARS

- (i) *Coffey DSI Report at paragraph 4.2.3.*
- (ii) *Coffey HHRA Report at paragraph 2.4.2.*
- (iii) *Coffey ERA Report at paragraph 2.2.2.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 3.2.3 and 7.2.2.*
- (v) *PMAP at paragraph 2.2.*

2.9. At all material times, Sadgroves Creek and Reichardt Creek:

- (a) were and are located to the south of the Darwin Base and discharge into Darwin Harbour;
- (b) receive groundwater and surface water.

PARTICULARS

- (i) *Coffey DSI Report at paragraph 4.2.3.*
- (ii) *Coffey HHRA Report at paragraph 2.4.2.*
- (iii) *Coffey ERA Report at paragraph 2.2.2.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 3.2.3 and 7.2.3.*
- (v) *PMAP at paragraph 2.2.*

A.2.3 Soils

2.10. At all material times, the Darwin Base was and is located on a gently undulating plateau formed by siltstone and fine grained sandstones which permitted the passage of rainwater (and surface water) to the groundwater below the Darwin Base, including through the dissipation of fractures in the siltstone and sandy layers.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.3 and 7.1.1.*

- (ii) *Coffey HHRA Report at paragraph 2.5.1.*
- (iii) *Coffey Supplementary DSI Report at paragraph 3.3.*

2.11. At all material times, the soil on the Darwin Base has predominantly comprised:

- (a) red massive earths; and
- (b) sandy loam surface soils.

PARTICULARS

- (i) *Coffey DSI Report at paragraph 4.3.*
- (ii) *Coffey HHRA Report at paragraph 2.5.1.*
- (iii) *Coffey Supplementary DSI at paragraph 3.3.*
- (iv) *PMAP at paragraph 2.2.*

A.2.4 Hydrology

The Catchments

2.12. At all material times, surface water on or around the Darwin Base and Darwin Relevant Area (including rainwater, floodwater or overland flow) was discharged to four catchment areas, being:

- (a) Rapid Creek Catchment;
- (b) Ludmilla Creek Catchment;
- (c) Sadgroves Creek Catchment; and
- (d) Reichardt Creek Catchment.

Rapid Creek Catchment

2.13. At all material times, the Rapid Creek Catchment:

- (a) extended across approximately 70% of the Darwin Base at the northern and eastern sections of the Darwin Base; and
- (b) was prone to significant flooding over the wet seasons;
- (c) has at times consisted of a series of mostly unsealed open drains that fed surface water runoff towards Rapid Creek.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.2.1, 4.2.3 and 4.2.4.*
- (ii) *Coffey HHRA at paragraphs 2.4.1, 2.4.2 and 2.4.3.*
- (iii) *Coffey ERA at paragraph 2.2.2.*
- (iv) *Coffey Supplementary DSI at paragraphs 3.2.1, 3.2.3 and 7.2.1.*
- (v) *PMAP at paragraph 2.2.*

2.14. From about 1983, the features of the drainage network feeding surface water to the Rapid Creek Catchment has at times included:

- (a) an unlined drain network at Darwin International Airport which captures runoff into a major drain on the western side of the main terminal area, discharges to Rapid Creek;
- (b) at the north-west of the Rapid Creek Catchment, (and including the majority of the runway), surface water flowed to the north towards Darwin International Airport where they enter drains that flow north and discharge into Rapid Creek;
- (c) at the south eastern portion of the Darwin Base, an unlined drain discharging water from the northwest to the southeast where stormwater would collect during heavy rain;
- (d) a primary open spoon drain which captured surface waters at the north of the catchment area, (as well as surface water runoff from the eastern end of the runway), and flowed in a northerly direction towards the Rapid Creek;
- (e) in the Darwin Relevant Area, five main constructed drainage points to Rapid Creek, being:
 - (i) an ephemeral unlined drain at the eastern end of the main runway;
 - (ii) an ephemeral stormwater discharge which is fed from the Darwin International Airport;
 - (iii) a stormwater discharge which discharges to Rapid Creek and is fed by runoff from DIA;
 - (iv) a stormwater discharge which is fed from runoff north of the runway; and

- (v) a large earthen drain which discharges to Rapid Creek and is fed by runoff from northwest of the runway.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.2.1, 4.2.3 and 4.2.4.*
- (ii) *Coffey HHRA Report at paragraphs 2.4.1, 2.4.2 and 2.4.3.*
- (iii) *Coffey ERA Report at paragraph 2.2.2.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 3.2.1, 3.2.3 and 7.2.1.*
- (v) *PMAP at paragraph 2.2.*

The Ludmilla Creek Catchment

2.15. At all material times, the Ludmilla Creek Catchment:

- (a) included the western section of the Darwin Base;
- (b) was prone to flooding over the wet season.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.2.1, 4.2.3 and 4.2.4.*
- (ii) *Coffey HHRA at paragraphs 2.4.1, 2.4.2 and 2.4.3.*
- (iii) *Coffey ERA at paragraph 2.2.2.*
- (iv) *Coffey Supplementary DSI at paragraphs 3.2.1, 3.2.3 and 7.2.2.*
- (v) *PMAP at paragraph 2.2.*

2.16. From about 1983, features of the drainage network that fed surface water to the Ludmilla Creek Catchment have at times included:

- (a) drainage occurring mainly as sheet flow that collects in small, unlined drains before discharging into several drainage systems;
- (b) a swale being designed and constructed to capture overland flow from within the Darwin Base;
- (c) surface flow:

- (i) at the north west of the Darwin Base, in a westerly direction along open spoon drains into a closed underground stormwater network which discharges to Ludmilla Creek;
 - (ii) in the northern portion of the Ludmilla Catchment, predominantly westward towards the Darwin Base perimeter drainage, which subsequently flows to the south before migrating westward and discharge to Ludmilla Creek;
 - (iii) from the western end of runway 11/29 and near Hangar 31, generally westward via surface drains and discharge to subsurface drains, which in turn discharge to a mixture of open and closed drains that discharge to Ludmilla Creek;
 - (iv) in the southern portion of the Darwin Base surface drainage flows are also westerly towards subsurface drains with the majority of drains resurfacing as open and generally unlined drains which ultimately discharge to Ludmilla Creek;
- (d) two constructed stormwater detention basins have been constructed to the west of Hangar 31 and collect stormwater during heavy rainfall events and discharge the stormwater into drains running into Ludmilla Creek.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.2.1, 4.2.3 and 4.2.4.*
- (ii) *Coffey HHRA at paragraphs 2.4.1, 2.4.2 and 2.4.3.*
- (iii) *Coffey ERA at paragraph 2.2.2.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 3.2.1, 3.2.3 and 7.2.2.*

The Sadgroves Creek Catchment

- 2.17. At all material times, the Sadgroves Creek Catchment was a small, highly modified system of approximately 2.5 kilometres square, and included a small portion of the south west of the Darwin Base.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.2.1 and 4.2.3.*
- (ii) *Coffey HHRA Report at paragraphs 2.4.1 and 2.4.2.*

(iii) *Coffey Supplementary DSI at paragraphs 3.2.1 and 3.2.3.*

2.18. Since about 1983 the features of the drainage network that fed surface water to the Sadgroves Creek Catchment have at times included:

- (a) in the south-west of the Darwin Base, several piped stormwater drains emerge on the southern boundary of the Darwin Base and flow into drains which subsequently emerge into open surface drains, and discharge into Sadgroves Creek;
- (b) open surface drains on either side of the southern portion of runway 18/36 collect surface water from the runway and discharge into a sub-surface drain and travel south via sub-surface drains and discharge into Sadgroves Creek;
- (c) in the eastern section of the catchment, on-Base drainage channels connect to Sadgroves Creek via concrete lined drains and pipelines;
- (d) at the top of Sadgroves Creek, several stormwater drains that discharge into the top of the western arm of Reichardt Creek;
- (e) a holding basin in Dwyer Park with drainage to Sadgroves Creek;
- (f) Sadgroves Creek which ultimately discharges to Darwin Harbour.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.2.1 and 4.2.3.*
- (ii) *Coffey HHRA Report at paragraph 2.4.1.*
- (iii) *Coffey ERA Report at paragraph 2.2.2.*
- (iv) *Coffey Supplementary Report at paragraphs 3.2.1, 3.2.3 and 7.2.3.*

The Reichardt Creek Catchment

2.19. At all material times, the Reichardt Creek Catchment was a small, highly modified system of approximately 1.8 kilometres square, and included a small portion of the south east of the Darwin Base.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.2.1 and 4.2.3.*
- (ii) *Coffey HHRA Report at paragraphs 2.4.1 and 2.4.2.*
- (iii) *Coffey Supplementary DSI at paragraphs 3.2.1 and 3.2.3.*

2.20. Since about 1983 the features of the drainage network that fed surface water to the Reichardt Creek Catchment have at times included:

- (a) drainage occurring mainly as sheet flow that collects in small, unlined drains that direct flow southwards where the water is further directed to sub-surface drains;
- (b) drainage is mostly subsurface drainage (with the exception of a large open drain to the east of the area which passes under the railway line) with several subsurface drains resurface and discharge water into Reichardt Creek to the east;
- (c) small unlined drainage channels on-Base in the western end of the catchment that discharge to Reichardt Creek;
- (d) at the top of Sadgroves Creek, several constructed stormwater drains that discharge into the top of the western arm of Reichardt Creek;
- (e) Reichardt Creek that ultimately discharges to Darwin Harbour.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.2.1 and 4.2.3.*
- (ii) *Coffey HHRA at paragraphs 2.4.1 and 2.4.3.*
- (iii) *Coffey ERA at paragraph 2.2.2.*
- (iv) *Coffey Supplementary Report at paragraphs 3.2.1, 3.2.3 and 7.2.3.*

2.21. By reason of the matters pleaded in paragraphs 2.5 to 2.20, surface water on and around the Darwin Base (including rain water, floodwaters, or overland flow) generally tends to drain into the surrounding catchments, however during the wet season, in particular, surface water within the Darwin Base would:

- (a) percolate or permeate into the soil;
- (b) be transmitted to the groundwater beneath the Darwin Base and mingle and flow with that groundwater (including in a general direction towards the Darwin Creeks);

- (c) mingle with other surface water on the Darwin Base (especially after periods of rain), and flow overland towards and into the surrounding water catchment areas outside the Darwin Base (including Rapid Creek) and:
 - (i) permeate or percolate into the soil over which the surface water overland flows occurred; and
 - (ii) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred; and
- (d) be transmitted to the Darwin Creeks.

PARTICULARS

- (i) *Coffey Supplementary DSI Report at paragraphs 7.3.1, 7.3.2, 7.3.3, 7.3.4, 7.3.5, 7.3.6, 7.3.7 and 7.3.8.*

A.2.5 Hydrogeology

- 2.22. At all material times, the Darwin Base and the Darwin Relevant Area were underlain by two aquifer systems, being the Bathurst Formation (**Bathurst Aquifer**) and the Burrell Creek Formation (**Burrell Aquifer**) (together, the **Darwin Aquifers**).

PARTICULARS

- (i) *Coffey DSI Report at paragraph 4.4.1.*
- (ii) *Coffey HHRA Report at paragraph 2.5.2.*
- (iii) *Coffey Supplementary DSI at paragraph 3.4.*
- (iv) *PMAP at paragraph 2.2.*

- 2.23. At all material times, the Bathurst Aquifer:

- (a) was an upper and unconfined aquifer;
- (b) had water levels that were subject to significant seasonal variation;
- (c) during the wet season, rose to ground surface levels due to the recharge from surface water infiltration;
- (d) was not commonly accessed, and had limited use for irrigation;
- (e) included groundwater flow generally following in the direction of surface topography, including:

- (i) at the location of the Rapid Creek Catchment, to the north-west following the flow direction of Rapid Creek;
- (ii) at the location of the Ludmilla Creek Catchment, to the west and southwest flowing into drains and Ludmilla Creek;
- (iii) on the southern edge of the Darwin Base, to the south to Sadgroves and Reichardt Creek.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.4.1, 7.2.4 and 7.2.8.*
- (ii) *Coffey HHRA Report at paragraph 2.5.2.*
- (iii) *Coffey Supplementary DSI Report at paragraphs 3.4 and 6.2.3.*
- (iv) *PMAP at paragraph 2.2.*

2.24. At all material times, the Burrell Aquifer:

- (a) was a lower confined aquifer located approximately 35 metres to 80 metres below ground level;
- (b) was accessed for irrigation uses;
- (c) groundwater flow was in a generally westerly or south-westerly direction.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.4.1 and 7.2.4.*
- (ii) *Coffey HHRA Report at paragraph 2.5.2.*
- (iii) *Coffey Supplementary DSI Report at paragraphs 3.4 and 6.2.3.*
- (iv) *PMAP at paragraph 2.2.*

Groundwater flow in relation to the Catchments

2.25. At all material times, the nature of groundwater in relation to the Rapid Creek Catchment was as follows:

- (a) groundwater levels were very responsive to rainfall, consistent with groundwater travelling through fractures in the siltstone;

- (b) groundwater flowed from the northern portion of the Darwin Base toward Rapid Creek all year round;
 - (c) along the north eastern site boundary, which runs adjacent to Rapid Creek, there was some discharge of groundwater to surface water all year.
- 2.26. At all material times, the nature of the groundwater in relation to the Ludmilla Creek Catchment was that groundwater flow was very similar at all times of the year, with land contours indicating a flow directly west, with a southerly flow close to Ludmilla Creek.
- 2.27. At all material times, the nature of groundwater in relation to the Sadgroves Creek Catchment and the Reichardt Creek Catchment was as follows:
- (a) groundwater generally flowed south based on groundwater elevation contours;
 - (b) a groundwater divide at the eastern end of the southern boundary strongly influenced groundwater flow;
 - (c) groundwater flow in the vicinity of the southern boundary was toward Sadgroves Creek or Reichardt Creek, although the precise direction and hydraulic gradient vary with seasons.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.4.1, 7.2.4 and 7.2.8.*
- (ii) *Coffey HHRA Report at paragraph 2.5.2.*
- (iii) *Coffey Supplementary DSI Report at paragraphs 3.4, 6.2.3, 6.2.6 and 7.3.10.*
- (iv) *PMAP at paragraph 2.2.*

A.2.6 Flooding

- 2.28. At all material times, during the wet season (November – April) Darwin is subject to tropical low pressure systems and cyclones which release a large amount of rain, and results in Darwin being subject to flooding events over the wet season.
- 2.29. At all material times, there was significant flooding potential of:
- (a) the Rapid Creek Catchment and the Ludmilla Creek Catchment;
 - (b) Rapid Creek;

(c) Ludmilla Creek, following major rainfall events, by way of catchment runoff.

2.30. At all material times, by reason of the matters pleaded in paragraphs 2.5 to 2.29, the Darwin Base and the Darwin Relevant Area were prone to flooding and associated overland flow during the wet season.

PARTICULARS

- (i) *Coffey DSI Report at paragraph 4.2.4.*
- (ii) *Coffey HHRA Report at paragraph 2.4.3.*

A.3 The artificial water-related features of the Darwin Base

2.31. At all material times, the Darwin Base has been drained by large, open, unlined drains, municipal drains, and underground piping, which included two drainage lines that ran parallel to the major runway and fed run-off into the smaller drainage network of the Darwin Base (**Darwin Drainage System**).

2.32. The Darwin Drainage System are predominantly unlined, with a mixture of organic cover and exposed laterite and sandy gravel.

2.33. The Darwin Drainage System includes a stormwater network concentrated on the western and southern regions of the Darwin Base which are unlined and run into a series of closed underground drains which form a network to move the water from the Darwin Base to the Darwin Creeks.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.2.1 and 4.2.2.*
- (ii) *Coffey HHRA Report at paragraph 2.4.1.*
- (iii) *Coffey ERA Report at paragraph 2.2.2.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 3.2.1 and 7.2.4.*
- (v) *PMAP at paragraph 2.2.*

2.34. At all material times, the Darwin Drainage System has at times discharged surface waters (including rainwater, floodwater or overland flow) into:

- (a) Rapid Creek, on the north and east side of the Darwin Base;
- (b) Ludmilla Creek, on the west side of the Darwin Base;
- (c) Sadgroves Creek, on the south side of the Darwin Base;

- (d) Reichardt Creek, on a small central portion of the southern boundary of the Darwin Base.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.2.1.*
- (ii) *Coffey HHRA Report at paragraph 2.4.1.*
- (iii) *Coffey ERA Report at paragraph 2.2.2.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 3.2.1 and 7.2.4.*
- (v) *PMAP at paragraph 2.2.*

- 2.35. In the course of its occupation and use of the Darwin Base, the Commonwealth constructed several water retention ponds as part of the Darwin Drainage System to prevent flooding of the runway and external roads.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 4.2.1.*
- (ii) *Coffey HHRA Report at paragraph 2.4.1.*
- (iii) *Coffey ERA Report at paragraph 2.2.2.*
- (iv) *Coffey Supplementary DSI Report at paragraph 3.2.1.*

- 2.36. The Darwin Drainage System includes several key drains that facilitate the rapid dispersion of stormwater during heavy rain events in the wet season, which include:

- (a) a drain running to the south of the main runway that discharges to Rapid Creek, and is likely to intercept groundwater during the wet season near the end of the main runway;
- (b) a newly installed drain that discharges into two large stormwater retarding basins and discharges into Ludmilla Creek; and
- (c) the Darwin International Airport drainage network which includes three main drains that discharge into Rapid Creek.

- 2.37. There are various bores in the Darwin Relevant Area (including bores drilled by the Commonwealth, or its predecessors in title on the Darwin Base) to draw groundwater from the Darwin Aquifers.

PARTICULARS

- (i) *Coffey DSI Report at paragraph 4.4.2.*
- (ii) *Within the Darwin Relevant Area, there were 298 registered bores, with 87 listed as production bores (which includes those listed for farming and irrigation) and 74 with no listed purpose.*
- (iii) *Unregistered groundwater bores are also likely to be located with the Darwin Relevant Area, being used for irrigation purposes.*
- (iv) *Coffey HHRA Report at paragraph 2.5.3.*
- (v) *Coffey Supplementary DSI Report at paragraph 7.2.4.*
- (vi) *PMAP at paragraph 2.5.*

A.4 The foreseeable flow of water from the Darwin Base

2.38. At all material times, by reason of the matters pleaded in paragraphs 2.5 to 2.37, it was reasonably foreseeable that waters, liquids, and soluble materials discharged on Darwin Base would:

- (a) permeate or percolate into the soil at the Darwin Base;
- (b) be transmitted to the groundwater beneath the Darwin Base, including the Burrell Aquifer and mingle and flow with that groundwater (including in a general direction towards the Darwin Creeks);
- (c) mingle with other surface water on the Darwin Base (especially after periods of rain), and flow overland towards and into the surrounding water catchment areas outside the Darwin Base (including Rapid Creek) and:
 - (i) permeate or percolate into the soil over which the surface water overland flows occurred; and
 - (ii) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Burrell Aquifer; and
- (d) be transmitted to the Darwin Creeks.

B WATER USE AT THE RELEVANT AREA

B.1 The Darwin Creeks

2.39. At all material times, the Darwin Creeks have been used by the residents of the Darwin Relevant Area for:

- (a) fishing (including for bait and for food); and
- (b) swimming,

(**Darwin Creeks Usages**).

PARTICULARS

- (i) *Coffey HHRA Report at paragraph 8.3.1.*

B.2 Groundwater

2.40. At all material times, the use of groundwater from the Burrell Aquifer by the residents of the Darwin Relevant Area has been mainly for irrigation and farming purposes and for use on gardens and at sporting fields (the **Darwin Groundwater Usages**).

PARTICULARS

- (i) *Coffey DSI Report at paragraph 4.4.2.*
- (ii) *Coffey HHRA Report at paragraph 2.5.3.*
- (iii) *PMAP at paragraph 2.5.*

B.3 The foreseeable usage of water emanating from the Darwin Base

2.41. At all material times, by reason of the matters pleaded in paragraphs 2.38 to 2.40 above, it was reasonably foreseeable that waters, liquids, and soluble materials discharged and/or allowed to escape the Darwin Base which were transmitted to the Darwin Creeks, and the Burrell Aquifer would be used by persons in the Darwin Relevant Area.

C THE COMMONWEALTH'S USE OF AFFF AT THE DARWIN BASE

C.1 Introduction

2.42. At all material times since the establishment of the Darwin Base, the Commonwealth has been responsible for conducting all of the activities conducted at the Darwin Base.

C.2 The Commonwealth's use of AFFF

Introduction

2.43. As part of the operation of the Darwin Base, and since about 1983, the Commonwealth has regularly conducted fire drills, firefighting training, fire tests,

mock emergency aircraft landing and accident drills, foam training, equipment testing (including the testing of nozzles, firefighting trucks, and fire suppression systems), firefighting, fire suppression, and like operations both on and near the Darwin Base (**Darwin Training and Operation Activities**).

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 3.1, 3.2, 3.3, 5.1.1, 5.1.2, 5.1.3, 5.1.5, 5.1.9, 5.1.11, 5.1.12, 5.1.13, 5.1.14, 5.1.15 and 8.1.2.*
- (ii) *Coffey HHRA Report at paragraphs 3.3 and 3.3.1.*
- (iii) *Coffey ERA Report at paragraph 2.5 and 2.5.1.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 2.2.1, 2.2.2, 7.3.1, 7.3.2, 7.3.3, 7.3.5, 7.3.6, 7.3.7 and, 7.3.8.*

2.44. As part of the operation of the Darwin Base, and since about 1983, the Commonwealth has, from time to time, been responsible for activities or events that were ancillary to, or associated with, the Darwin Training and Operation Activities (**Darwin Discharge Events**).

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 5.1.4, 5.1.6, 5.1.7, 5.1.8, 5.1.10.*
- (ii) *Coffey HHRA Report at paragraph 3.3.*
- (iii) *Coffey ERA Report at paragraphs 2.5 and 2.5.1.*
- (iv) *Coffey Supplementary DSI at paragraphs 2.2.2 and 7.3.4.*

2.45. At all material times in the period since about 1983 until a time unknown to the Applicants but after about 2009, in the use and occupation of the Darwin Base for the purpose of the Darwin Training and Operation Activities and the Darwin Discharge Events, the Commonwealth:

- (a) used AFFF Concentrate;
- (b) mixed the AFFF Concentrate with water to create AFFF Working Solution; and
- (c) aspirated the AFFF Working Solution into a foam via nozzles on firefighting trucks and other mechanisms (the aspirated foam being known as AFFF).

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 1.4, 3.1 and 3.3.*
- (ii) *Coffey HHRA Report at paragraph 3.2.*
- (iii) *Coffey Supplementary DSI Report at paragraph 2.2.1.*

- (iv) *Department of Defence, RAAF Base Tindal: Environmental Management Plan, Environmental Contingency Plan (October 1987) at pp 3-8 to 3-9, and Appendix F.*
- (v) *Particular (i) to paragraph 13 of the Statement of Claim is repeated: the AFFF Concentrate used was principally a product known as “Light WaterTM” (being manufactured by the Minnesota Mining and Manufacturing Company (now known as 3M Company) and/or its subsidiary 3M Australia Pty Ltd).*
- (vi) *At a time unknown to the Applicants in about the early 2000s, the Commonwealth transitioned to using “Ansulite” at the Darwin Base and was completely removed from the Darwin Base in 2009: Coffey DSI Report at paragraph 3.1.*

2.46. The Darwin Training and Operation Activities included those in and around:

- (a) the former fire training ground, which covered an area approximately 18,300 metres squared and was located at the south eastern end of the main runway (**Darwin Former Fire Training Ground 1**);
- (b) the former fuel farm 5 located on the southern side of the main runway at the south eastern end (**Darwin Former Fuel Farm 5**);
- (c) the former fuel farm 4 located on the southern side of the main runway (**Former Fuel Farm 4**);
- (d) the former fuel farm 6 located on the southern side of the main runway (**Darwin Former Fuel Farm 6**);
- (e) the former ARFF fire station located on the south side of the runway (**Darwin Former ARFF Fire Station**);
- (f) the former RAAF fire station located at building 558 (**Darwin Former RAAF Fire Station**);
- (g) the vehicle maintenance workshop, (also known as the ground equipment maintenance facility) (**Darwin Vehicle Maintenance Workshop**);
- (h) the former tarmac skid pan located in the north western portion of the Darwin Base (**Darwin Former Tarmac**);
- (i) the former fire training ground 2 (**Darwin Former Fire Training Ground 2**);
- (j) the current fire training ground located on the boundary of the Darwin International Airport (**Darwin Current Fire Training Ground**).

Darwin Former Fire Training Ground 1

- 2.47. At all material times until the late 1990s the Darwin Former Fire Training Ground 1 operated and surface water flowed as sheet flow towards the north and entered an unlined surface spoon drain to the north which then flowed to the east, ultimately joining the Marrara Swamp and the head of Rapid Creek.
- 2.48. The Darwin Training and Operation Activities at the Darwin Former Fire Training Ground 1:
- (a) included the use of AFFF Working Solution and AFFF;
 - (b) included the dumping of fuels and propellants on the ground, lighting and then extinguishing the fire;
 - (c) included the testing of equipment and foam every week which involved the production of foam to test valves, pumps and foam suitability;
 - (d) resulted in fluids containing AFFF Working Solution and AFFF being discharged into the surface drains and groundwater towards Rapid Creek.
- 2.49. At some time in late 2002, 0.2 metres of soil from Darwin Former Fire Training Ground 1 was scraped and stockpiled, in an area the size of approximately 100m x 100m.
- 2.50. The method for storing the stockpile at Darwin Former Fire Training Ground 1 was ineffective to ensure that AFFF did not leach into the soil in and around the stockpile.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 5.1.1 and 8.1.2.*
- (ii) *Coffey HHRA Report at paragraph 3.3.1.*
- (iii) *Coffey ERA Report at paragraph 2.5.1.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 2.2.2. and 7.3.1.*
- (v) *PMAP at paragraph 7.2.*
- (vi) *Further particulars may be provided after discovery and inspection.*

Darwin Former Fuel Farm 5

2.51. From about 1983 to 2012 (when the site was decommissioned and all infrastructure (excluding the control room) were removed), features of the Darwin Former Fuel Farm 5 have at times included:

- (a) site specific hydrant systems with overhead sprays to deliver AFFF to the bunded areas;
- (b) a stormwater drain immediately south of the former fuel farm, which flowed east and ultimately discharged to Rapid Creek;
- (c) the discharge of surface water, by manual operation of a drain valve, which flowed north in surface drains towards Rapid Creek;
- (d) surface water flow as sheet flow towards the south which entered a large unlined surface spoon drain that flowed to the east and ultimately joined the Marrara Swamp and the head of Rapid Creek;
- (e) discharged groundwater, which flowed north towards Rapid Creek (although groundwater may have flowed periodically to the south).

2.52. The Darwin Training and Operation Activities at Darwin Former Fuel Farm 5:

- (a) included the use of AFFF Working Solution and AFFF;
- (b) included servicing the fighter replenishment area immediately to the north, where fighters were refuelled;
- (c) resulted in fluids containing AFFF Working Solution and AFFF being discharged into the stormwater drains towards Rapid Creek.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 5.1.2 and 8.1.2.*
- (ii) *Coffey HHRA Report at paragraph 3.3.1.*
- (iii) *Coffey ERA Report at paragraph 2.5.1.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 2.2.2 and 7.3.2.*
- (v) *Further particulars may be provided after discovery and inspection.*

Darwin Former Fuel Farm 4

2.53. At all material times until October 2012 (when the site was decommissioned), the Darwin Former Fuel Farm 4:

- (a) contained built in AFFF fire suppression systems;
- (b) contained AFFF storage and fire pumps, located on the north eastern corner of the farm;
- (c) discharged surface water, by manual operation of a drain valve, which flowed north in surface drains towards Rapid Creek;
- (d) discharged surface water to the north, into site drains, which further flowed to the north and east into Marrara Swamp and Rapid Creek;
- (e) discharged groundwater flow is inferred to be to the north northeast, towards Rapid Creek (during and at the end of the wet season) and east to north east (at the end of the dry season).

2.54. The Darwin Training and Operations Activities at Darwin Former Fuel Farm 4:

- (a) included the use of AFFF Working Solution and AFFF;
- (b) included supplying Darwin Former Fuel Farm 5 and Darwin Former Fuel Farm 6;
- (c) involved a small spill of AFFF in an unsealed bund in 2009;
- (d) resulted in fluids containing AFFF Working Solution and AFFF being discharged or released into the site drains towards Rapid Creek, absorbed into shallow soils, migrating with water or sediment in stormwater and/or infiltrating to groundwater.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 5.1.3 and 8.1.2.*
- (ii) *Coffey HHRA Report at paragraph 3.3.1.*
- (iii) *Coffey ERA Report at paragraphs 2.5 and 2.5.1.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 2.2.2 and 7.3.3.*
- (v) *Further particulars may be provided after discovery and inspection.*

Darwin Former Fuel Farm 6

2.55. At all material times until October 2012 (when the site was decommissioned), Darwin Former Fuel Farm 6:

- (a) contained built in AFFF fire suppression systems;
- (b) contained AFFF storage and fire pumps, located on the north eastern corner of the farm;
- (c) discharged surface water, by manual operation of a drain valve, which flowed north in surface drains towards Rapid Creek;
- (d) discharged surface water to the north, into site drains, which further flowed to the north and east into Marrara Swamp and Rapid Creek;
- (e) discharged groundwater to the north northeast, towards Rapid Creek (during and at the end of the wet season) and east to north east (at the end of the dry season).

2.56. The Darwin Training and Operations Activities at Darwin Former Fuel Farm 6:

- (a) included the use of AFFF Working Solution and AFFF;
- (b) included supplying fuel to the bomber replenishment / refuelling areas;
- (c) from about 1983, resulted in fluids containing AFFF Working Solution and AFFF being discharged into the site drains towards Rapid Creek, absorbed into shallow soils, migrating with water or sediment in stormwater and/or infiltrating to groundwater.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 5.1.3 and 8.1.2.*
- (ii) *Coffey HHRA Report at paragraph 3.3.1.*
- (iii) *Coffey ERA Report at paragraphs 2.5 and 2.5.1.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 2.2.2 and 7.3.3.*
- (v) *Further particulars may be provided after discovery and inspection.*

Darwin Former ARFF Fire Station

2.57. The Darwin Former ARFF Fire Station:

- (a) operated at all material times until about 1999;
- (b) contained 200 litre drums within the building containing AFFF;
- (c) had surface water flows as sheet flow to the north and collected in a large open earthen drain running to the east, which joined up with the drains running past Darwin Former Fuel Farm 4 and Darwin Former Fuel Farm 6 and ultimately discharged to Rapid Creek;
- (d) was located on a groundwater high and impact from the area may potentially be migrating in multiple directions including to the north at the end of the wet season, and in multiple directions at the end of the dry season.

2.58. The Darwin Training and Operation Activities at Darwin Former ARFF Fire Station:

- (a) included the use of AFFF Working Solution and AFFF;
- (b) involved fire vehicles parking, fire equipment storage and storage of AFFF;
- (c) included testing and wash-down activities;
- (d) has resulted in fluids containing AFFF Working Solution and AFFF being discharged into the main surface water drain towards Rapid Creek, absorbed into shallow soils and migrated with water or sediment in stormwater.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 5.1.5 and 8.1.2.*
- (ii) *Coffey HHRA Report at paragraph 3.3.1.*
- (iii) *Coffey ERA Report at paragraphs 2.5 and 2.5.1.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 2.2.2 and 7.3.8.*
- (v) *Further particulars may be provided after discovery and inspection.*

Darwin Former RAAF Fire Station

2.59. The Darwin Former RAAF Fire Station:

- (a) operated at all material times until about 1990;

- (b) contained fire alarm system monitoring, vehicle parking, equipment storage and AFFF storage;
- (c) did not contain a seal between the building walls and the building slab, meaning any spills or leaks would have drained to the soils on the western side of the building;
- (d) discharged surface water towards the south and collected into stormwater drains, and into Ludmilla Creek;
- (e) discharged groundwater flow is anticipated to be to the west southwest towards Ludmilla Creek.

2.60. The Darwin Training and Operation Activities at Darwin Former RAAF Fire Station:

- (a) included the use of AFFF Working Solution and AFFF;
- (b) included the testing of truck mounted (and other) AFFF systems;
- (c) included small extinguisher training conducted on a weekly basis in the open grassed area directly north east of the Darwin Former RAAF Fire Station;
- (d) resulted in fluids containing AFFF Working Solution and AFFF being discharged into the soil and towards Ludmilla Creek.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 5.1.11 and 8.1.2.*
- (ii) *Coffey HHRA Report at paragraph 3.3.1.*
- (iii) *Coffey ERA Report at paragraphs 2.5 and 2.5.1.*
- (iv) *Coffey Supplementary DSI Report at paragraph 7.3.5.*
- (v) *Further particulars may be provided after discovery and inspection.*

Darwin Vehicle Maintenance Workshop

2.61. The Darwin Vehicle Maintenance Workshop:

- (a) contained a wash down area on the eastern side of the facility, including oil/water separator and bunded above ground waste oil tank;
- (b) contained an asphalted hardstand used for vehicle parking which included a bunded hazardous storage shed;

- (c) contained a fuel equipment maintenance area, used to store vehicles, fuel drums and chemicals;
- (d) contained a triple interceptor pit;
- (e) contained various drainage pits that drained to interceptors in the southwest corner and eastern portion of the site;
- (f) contained a large earthen stormwater drain that ran south from the site
- (g) stored AFFF;
- (h) was located near a power station that is indicated to have had a fire suppression system utilising AFFF;
- (i) discharged surface water to the south, joining the Darwin Base stormwater systems and ultimately discharging into Ludmilla Creek;
- (j) discharged groundwater flow direction is anticipated to be to the east, towards Ludmilla Creek;

2.62. At all material times, the Darwin Training and Operation Activities at the Darwin Vehicle Maintenance Workshop:

- (a) included the use of AFFF Working Solution and AFFF;
- (b) included fire fighting vehicle maintenance;
- (c) included fire fighting vehicle wash downs;
- (d) included draining of AFFF from firefighting equipment that was being serviced or repaired;
- (e) resulted in fluids containing AFFF Working Solution and AFFF being discharged into the stormwater drainage system towards Ludmilla Creek.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 5.1.12 and 8.1.2.*
- (ii) *Coffey HHRA Report at paragraph 3.3.*
- (iii) *Coffey ERA Report at paragraph 2.5.*
- (iv) *Coffey Supplementary DSI Report at paragraph 2.2.2.*

- (v) *Further particulars may be provided after discovery and inspection.*

Darwin Former Tarmac

2.63. The Darwin Former Tarmac:

- (a) comprised a broadly flat, sealed surface area of approximately 40 metres by 120 metres, that slopped slightly towards the west;
- (b) was surrounded by mostly grassed surfaces;
- (c) discharged surface water and groundwater to the west, southwest towards Ludmilla Creek.

2.64. At all material times, the Darwin Training and Operation Activities at the Darwin Former Tarmac:

- (a) included the use of AFFF Working Solution and AFFF;
- (b) included police driver training which involved the spraying of AFFF on the surface of the Darwin Former Tarmac to produce a slippery driving surface;
- (c) resulted in fluids containing AFFF Working Solution and AFFF being discharged into the soils and ultimately towards Ludmilla Creek.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 5.1.13 and 8.1.2.*
- (ii) *Coffey HHRA Report at paragraph 3.3.*
- (iii) *Coffey ERA Report at paragraph 2.5.*
- (iv) *Coffey Supplementary DSI at paragraph 2.2.2.*
- (v) *Further particulars may be provided after discovery and inspection.*

Darwin Former Fire Training Ground 2

2.65. The Darwin Former Fire Training Ground 2:

- (a) operated regularly as a training ground from between 1970 to 1990 and more occasionally after that time until it was decommissioned in 1998;

- (b) comprised an earthen ground which was approximately 80 metres by 80 metres;
- (c) comprised no concrete pads or bunding or liquid collection areas for containing the fires or any waste fluids;
- (d) contained three ground water wells including a well located in the centre of the facility
- (e) discharged surface water flow predominantly as sheet flow towards the north east and entered a small unlined surface spoon drain which flowed to the east and ultimately discharged to a large grassed area at the northern end of the secondary (18/36) runway, and towards Rapid Creek;
- (f) was located at a groundwater high and the flow direction is seasonally affected with the direction anticipated to be east northeast (at the end of the wet season) and to the north (at the end of the dry season) towards Rapid Creek.

2.66. At some time after 1998, remediation works were conducted at the Darwin Former Fire Training Ground 2, and hydrocarbon contaminated soils were scrapped and stockpiled.

2.67. The Darwin Training and Operation Activities at the Darwin Former Fire Training Ground 2:

- (a) included the use of AFFF Working Solution and AFFF on average, twice a week conducting fire training activities including lighting and extinguishing fuel fires;
- (b) included the destruction of off-spec fuel;
- (c) resulted in fluids containing AFFF Working Solution and AFFF being discharged into the site drains towards Rapid Creek.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 5.1.14 and 8.1.2.*
- (ii) *Coffey HHRA Report at paragraph 3.3.*
- (iii) *Coffey ERA Report at paragraphs 2.5 and 2.5.1.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 2.2.2 and 7.3.6.*
- (v) *Further particulars may be provided after discovery and inspection.*

Darwin Current Fire Training Ground

2.68. The Darwin Current Fire Training Ground:

- (a) commenced operation in 2002;
- (b) contained a large concrete bunded area with a plane mock-up, surrounded by a large gravel apron;
- (c) contained an underground holding tank located to the north east of the large concrete bunded area with a plane mock-up;
- (d) utilised a water pumping system to treat wastewater located on the large concrete bunded area with a plane mock-up, whereby water collected would be pumped to a separator to remove fuel/oil contaminants, which was then pumped to the underground holding tank;
- (e) discharged surface water flow to the north and collected in an open drain the water that ran to the north that ultimately discharged to Rapid Creek;
- (f) discharged groundwater flow is most likely to the northwest, ultimately discharging to Rapid Creek.

2.69. Between 2008 and early 2010, water from the underground holding tank was used on trees at the border of the road of the Darwin Current Fire Training Ground.

2.70. The Darwin Training and Operation Activities at the Darwin Current Fire Training Ground:

- (a) included the use of AFFF Working Solution and AFFF for testing and training for fire services;
- (b) resulted in fluids containing AFFF Working Solution and AFFF being discharged onto the trees and into the soil around the area.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 5.1.15 and 8.1.2.*
- (ii) *Coffey HHRA Report at paragraph 3.3.*
- (iii) *Coffey ERA Report at paragraphs 2.5 and 2.5.1.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 2.2.2 and 7.3.7.*
- (v) *Further particulars may be provided after discovery and inspection.*

Darwin Discharge Events

2.71. The Darwin Discharge Events included those in and around:

- (a) a large steel framed and clad aircraft hangar known as Hangar 31 (**Hangar 31**);
- (b) the former fuel farm 1 located south of Hangar 31 (**Darwin Former Fuel Farm 1**); and
- (c) at the main sports field at the Darwin Base including the Fred Smith Sports field (**Sports Fields**).

Hangar 31

2.72. Hangar 31:

- (a) contained an automated foam system which was designed to provide afterhours suppression of any fuel fires;
- (b) at times contained four 1,200 litre AFFF concentrate tanks at each corner of the hangar;
- (c) was generally flat with a slight slope towards perimeter drainage systems which included a large earthen drain constructed in 2015 to the west of the hangar (prior to this there were two main swales adjacent to the site which ran north to south to the south east of the hangar, and east to west across the northern side);
- (d) stormwater flowed via a stormwater collection pit into an unlined spoon drain that flowed into a large stormwater channel, ultimately being discharged into Ludmilla Creek;
- (e) groundwater flowed to the west, towards Ludmilla Creek.

2.73. The Darwin Discharge Events at Hangar 31 included three separate bulk discharges of AFFF concentrate between 1985 and 2008, that in at least one instance involved the emptying of the four 1,200 litre AFFF concentrate tanks, and the subsequent release of the discharge from the hangar onto the soil and grassed areas outside to the north and south of the hangar.

2.74. In around 2010 the surface soils and sediments around Hangar 31 were excavated to remove and contain the soils with the highest residual concentrations (which were stockpiled) and clean cover soils were reinstated, with the stockpiled soil removed from around Hangar 31 initially being stored at an area to the immediate south west

of Hangar 31 and then later being moved in June 2015 to an area at the south border of the Darwin Base where it was left exposed to the weather, and to covered in vegetation.

- 2.75. Surface water at the relocated Hangar 31 stockpile areas flows to the south east at the end of the dry season towards Reichardt Creek and to the south west at the end of the wet season towards Sadgroves Creek and Reichardt Creek, respectively.

PARTICULARS OF 2.72 TO 2.75

- (i) *Coffey DSI Report at paragraphs 5.1.4, 5.1.8 and 8.1.2*
- (ii) *Coffey HHRA Report at paragraph 3.3.*
- (iii) *Coffey ERA Report at paragraphs 2.5 and 2.5.1.*
- (iv) *Coffey Supplementary DSI at paragraphs 2.2.2 and 7.3.4.*
- (v) *Further particulars may be provided after discovery and inspection.*

Darwin Former Fuel Farm 1

- 2.76. The Darwin Former Fuel Farm 1:

- (a) was located south of Hangar 31 and constructed in the 1940s;
- (b) at all material times contained a fire pump, water tank and a mobile 1 kilolitre tank of AFFF located outside of an unlined earthen bunded area;
- (c) at all material times discharged surface water via an interceptor trap to the west, but subsequently flowed via sheet flow to the west and joined constructed stormwater channels eventually discharging to Ludmilla Creek;
- (d) groundwater flow direction is to the west, towards Ludmilla Creek;
- (e) was decommissioned prior to 2011.

- 2.77. At a time prior to 2006 there was a release of a 1,000 litre tank holding AFFF at Darwin Former Fuel Farm 1 when the tank was accidentally flushed with water.

PARTICULARS

- (i) *Coffey DSI Report at paragraph 5.1.9.*
- (ii) *Coffey HHRA Report at paragraph 3.3.*
- (iii) *Coffey ERA at paragraphs 2.5 and 2.5.1.*

- (iv) *Coffey Supplementary DSI at paragraphs 2.2.2 and 7.3.4.*
- (v) *Further particulars may be provided after discovery and inspection.*

Sports Fields

2.78. At times not known to the Applicants, the Darwin Discharge Events at the Sports Fields included the direct application of AFFF Working Solution, during the dry season, to the Sports Fields to keep them green.

PARTICULARS

- (i) *Coffey DSI Report at paragraph 5.1.7.*
- (ii) *Coffey Supplementary DSI at paragraph 2.2.2.*
- (iii) *Further particulars may be provided after discovery and inspection.*

2.79. Each of the Darwin Discharge Events resulted in fluids containing AFFF Working Solution and AFFF being discharged into the soils and the Darwin Creeks.

Conclusion

2.80. By reason of the matters pleaded in paragraphs 2.45 to 2.79 above, the Darwin Training and Operation Activities and the Darwin Discharge Events resulted in:

- (a) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground at the Darwin Base; and/or
- (b) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with Fire Run-Off, being discharged, or allowed to escape, to bare ground at the Darwin Base.

C.3 The Commonwealth's methods for disposal of Spent AFFF

2.81. At all material times:

- (a) Spent AFFF; and/or
- (b) Fire Run-Off co-mingled with Spent AFFF,

was generally directed by the Commonwealth towards bare ground, and the Darwin Drainage System.

PARTICULARS

- (i) *Paragraphs 2.43 to 2.79 are repeated.*
- (ii) *The Applicants do not, with their present state of knowledge, know the quantities of Spent AFFF and/or Fire Run-Off directed to bare ground and the earthen drains comprising the Darwin Drainage System.*
- (iii) *Further particulars may be provided after discovery and inspection.*

2.82. At all material times, to the extent that:

- (a) AFFF discharged in the course of the Darwin Training and Operations Activities and Darwin Discharge Events; and/or
- (b) Fire Run-Off co-mingled with Spent AFFF,

was directed by the Commonwealth to the Darwin Drainage System they were ineffective to ensure that liquids contained in them did not leak into the soil below and around them.

C.4 Physical properties of AFFF and Spent AFFF

2.83. Paragraph 15 is repeated.

2.84. Paragraph 16 is repeated.

C.5 The foreseeable flow of Spent AFFF from the Darwin Base

2.85. At all material times, by reason of the matters pleaded in paragraphs 2.3 to 2.41 and 2.83 to 2.84 above, it was reasonably foreseeable that use of AFFF Working Solution and AFFF on the Darwin Base as pleaded in paragraphs 2.43 to 2.80 and/or 2.81 to 2.82 above would result in Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF:

- (a) being transmitted to the groundwater beneath the Darwin Base, including the Burrell Aquifer and mingle and flow with that groundwater (including in a general direction towards the Darwin Creeks), and being utilised by persons engaged in the Darwin Groundwater Usages;
- (b) mingling with other surface water on the Darwin Base (especially after periods of rain), and flowing overland generally towards and into the surrounding water catchment areas outside the Darwin Base (including to the Darwin Creeks) and:

- (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Burrell Aquifer,
- and being extracted and utilised by persons engaged in the Darwin Groundwater Usages;
- (c) mingling with other surface water on the Darwin Base (especially after periods of rain), and flowing overland generally towards and into the surrounding water catchment areas outside the Darwin Base (including the Darwin Creeks) and then being utilised by persons engaged in the Darwin Creeks Usages.

D THE TOXIC PROPERTIES OF SPENT AFFF

D.1 The potential for AFFF to harm humans and the environment

2.86. Paragraph 18 is repeated.

2.87. Paragraph 19 is repeated.

2.88. Paragraph 20 is repeated.

2.89. Paragraph 21 is repeated.

2.90. Paragraph 22 is repeated.

D.2 The foreseeable flow and transmission of a toxic substance

2.91. At all material times, by reason of the matters pleaded in paragraphs 2.3 to 2.41 and 2.83 to 2.84 and 2.86 to 2.90 above, it was reasonably foreseeable that the use of AFFF on the Darwin Base as pleaded in paragraphs 2.43 to 2.80 and/or 2.81 to 2.82 above would result in an unnatural soluble substance containing synthetic chemicals:

- (a) permeating or percolating into the soil at the Darwin Base;
- (b) being transmitted to the groundwater beneath the Darwin Base, including the Burrell Aquifer and mingling and flowing with that groundwater (including in a general direction towards the Darwin Creeks);

- (c) mingling with other surface water on the Darwin Base (especially after periods of rain), and flowing overland generally towards and into the surrounding water catchment areas outside the Darwin Base (including the Darwin Creeks) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Burrell Aquifer; and
- (d) being transmitted to the Darwin Creeks.

E THE CONTAMINATION OF THE DARWIN CREEKS

E.1 The contamination of the Darwin Creeks

2.92. PFCs and PFC Contaminants have been detected in the Darwin Creeks.

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 7.3.3 and 8.1.3.*
- (ii) *Coffey HHRA Report at paragraphs 5.5.1, 5.5.2 and 11.1.*
- (iii) *Coffey ERA Report at paragraphs 3.5.3, 4.1.2 and 4.2.*
- (iv) *Coffey Supplementary DSI Report at paragraphs 6.3.3, 7.2.1, 7.2.2, 7.2.3, 7.4.4 and 8.*
- (v) *PMAP at Appendix F at paragraph 1.1.*

2.93. The contamination of the Darwin Creeks with PFCs and PFC Contaminants is the result of discharged AFFF Working Solution and AFFF on the Darwin Base resulting in Spent AFFF:

- (a) permeating or percolating into the soil at the Darwin Base;
- (b) being transmitted to the groundwater beneath the Darwin Base, including the Burrell Aquifer and mingling and flowing with that groundwater (including in a general direction towards the Darwin Creeks);
- (c) mingling with other surface water on the Darwin Base (especially after periods of rain), and flowing overland in a generally south-west direction, towards and into the surrounding water catchment areas outside the Darwin Base (including the Darwin Creeks) and:

- (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Burrell Aquifer; and
- (d) being transmitted to the Darwin Creeks.

PARTICULARS

- (i) *Coffey HHRA Report at paragraphs 4.1.2 and 4.2.*
- (ii) *Coffey ERA Report at paragraphs 1.2, 2.5 and 2.5.2.*
- (iii) *PMAP at paragraph 4.1 and Appendix C.*

2.94. By reason of the matters pleaded in paragraph 2.92 and 2.93 above, the water in the Darwin Creeks has become, and is likely to continue to remain, contaminated by, and a receptor of, PFC Contaminants originally emanating from the Darwin Base.

PARTICULARS

- (i) *Coffey DSI Report at paragraph 8.1.3.*
- (ii) *Coffey HHRA Report at paragraphs 4.1.1, 4.1.2, 4.2 and 5.5.1.*
- (iii) *Coffey ERA Report at paragraphs 1.2, 2.5, 2.5.2 and 5.1.1.*
- (iv) *Coffey Supplementary DSI at paragraphs 7.3.1, 7.3.2, 7.3.3, 7.3.4, 7.3.5, 7.3.6, 7.3.7, 7.3.8 and 8.*
- (v) *PMAP at paragraph 2.4.2, 4.1, 6.1.1 and Appendix C.*

2.95. By reason of the matters pleaded in paragraphs 2.92 to 2.94 above, water in the Darwin Creeks have become, and will continue and remain, potentially hazardous and unfit for the Darwin Creeks Usages (the **Darwin Surface Water Contamination**).

PARTICULARS

- (i) *Coffey DSI Report at paragraph 8.1.3.*
- (ii) *Coffey HHRA Report at paragraph 5.5.1.*

2.96. There is no practical or cost-effective way of remediating the Darwin Surface Water Contamination.

E.2 The contamination of Groundwater

2.97. PFCs and PFC Contaminants emanating from the Darwin Base have been identified in the Darwin Aquifers and under the Darwin Relevant Area (or part thereof) (the **Darwin Toxic Plume**).

PARTICULARS

- (i) *Coffey DSI Report at paragraphs 7.5 and 7.5.1, 7.5.2, 8.1.2*
- (ii) *Coffey HHRA Report at paragraphs 5.4.1 and 11.1.*
- (iii) *Coffey Supplementary DSI at paragraph 6.2.7, 7.1.3, 7.3.1, 7.3.2, 7.3.3, 7.3.4, 7.3.5, 7.3.6, 7.3.7, 7.3.8 and 8.*
- (iv) *PMAP at 2.4.2 and Appendix F.*

2.98. The Darwin Toxic Plume is the result of discharged AFFF Working Solution and AFFF on the Darwin Base resulting in Spent AFFF:

- (a) permeating or percolating into the soil at the Darwin Base;
- (b) being transmitted to the groundwater beneath the Darwin Base, including the Burrell Aquifer and mingling and flowing with that groundwater;
- (c) mingling with other surface water on the Darwin Base (especially after periods of rain), and flowing overland in a generally south-west direction, towards and into the surrounding water catchment areas outside the Darwin Base (including the Darwin Creeks) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Burrell Aquifer; and
- (d) being transmitted to the Darwin Creeks.

PARTICULARS

- (i) *Coffey HHRA Report at paragraphs 4.1.2 and 4.2.*
- (ii) *Coffey ERA Report at paragraphs 1.2, 2.5 and 2.5.2.*
- (iii) *PMAP at paragraph 4.1 and Appendix C.*

2.99. By reason of the matters pleaded in paragraphs 2.97 and 2.98, groundwater in the Burrell Aquifer and beneath the Darwin Relevant Area has become, and is likely to

continue to remain, contaminated by, and a receptor of, PFC Contaminants originally emanating from the Darwin Base.

PARTICULARS

- (i) *The PFC Contaminant concentrations measured in groundwater (predominantly PFOS and PFHxS) in the Darwin Relevant Area exceed the adopted screening criteria for the protection of all beneficial uses of groundwater (including irrigation, potable non-domestic water use and maintenance of ecosystems). However, concentrations of PFOS (and PFHxS and PFOA) decreased along the groundwater flow paths to be largely delineated to concentrations below the laboratory reporting limit prior to groundwater discharging to surface water bodies with the exception of Rapid Creek and two narrow pathways towards Ludmilla Creek and Reichardt Creek. Concentrations of PFOS (and PFHxS) in groundwater wells immediately up-gradient of Rapid Creek were above the adopted screening criteria for the protection of aquatic ecosystems and recreational uses. Concentrations in groundwater were observed to increase over the dry season: Coffey DSI Report at paragraph 9.*
- (ii) *Particulars of the contamination of the groundwater under the land of Darwin Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Darwin Group Members.*

2.100. By reason of the matters pleaded in paragraphs 2.97 to 2.99, groundwater in the Burrell Aquifer and beneath the Darwin Relevant Area has become, and is likely to continue to remain, potentially hazardous and unfit for Darwin Groundwater Usages (the **Darwin Groundwater Contamination**).

PARTICULARS

- (i) *The groundwater in the Darwin Aquifers is potentially hazardous and unfit for drinking: Parts D.1 above and E.5 below are repeated.*
- (ii) *The groundwater in the Darwin Aquifer is potentially hazardous and unfit for:*
 - a. *irrigation purposes because such usages result in the further spreading of PFC Contaminants to soils and uptake by plants, vegetables and fruits, and the exposure of people to PFC Contaminants: Parts D.1 above and E.5 below are repeated.*
 - b. *watering of livestock (including chickens) because such usages may result in the further spreading of PFC Contaminants to soils, uptake of PFC Contaminants by the livestock and the exposure of people to PFC Contaminants (particularly by*

consumption of livestock and eggs): Parts D.1 above and E.5 below are repeated.

c. swimming, domestic purposes because such usages may result in the further exposure of people to PFC Contaminants: Parts D.1 above and E.5 below are repeated.

- (iii) Coffey DSI Report at paragraphs 7.5.2 and 9.*
- (iv) Coffey HHRA Report at paragraphs 5.6.1, 5.6.3, 8.4, 9.2.4, 11.1 and 11.2.*
- (v) Coffey Supplementary DSI at paragraphs 6.5.1 and 8.*
- (vi) Further particulars of the contamination of the groundwater in the Burrell Aquifer under the Darwin Group Members' land will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Darwin Group Members.*

2.101. There is no practical or cost-effective way of remediating the Darwin Toxic Plume, or the Darwin Groundwater Contamination.

E.3 The contamination of soil in Darwin

2.102. Soil on the land within the Darwin Relevant Area (including soil on land owned by Darwin Group Members) has become, and is likely to continue to become and remain, contaminated by PFC Contaminants emanating from the Darwin Base (the **Darwin Soil Contamination**) by:

- (a) overland flows of surface water commingled with Spent AFFF (containing PFC Contaminants) from the Darwin Base; and
- (b) discharge or application of groundwater containing PFC Contaminants extracted from the Burrell Aquifer by persons engaged in Darwin Groundwater Usages to the soils (by, in particular, irrigation).

PARTICULARS

- (i) Particulars of the contamination of the soils on lands of Darwin Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Darwin Group Members.*

2.103. There is no practical or cost-effective way of remediating the Darwin Soil Contamination.

E.4 The Broader Biota Contamination

2.104. Extensive other aspects of the biotic and abiotic matrices within the Darwin Relevant Area (including on land owned by Darwin Group Members) have become and are likely to continue to remain, contaminated by PFC Contaminants, and be recirculated indefinitely within the Darwin Relevant Area (the **Darwin Biota Contamination**).

PARTICULARS

- (i) *Coffey HHRA Report at paragraphs 5.6.1, 5.6.2, 5.6.3, 5.7, 8, 8.1, 8.2, 8.2.1, 8.2.2, 8.2.3, 8.3, 8.3.1, 8.3.2, 8.3.3, 8.3.4, 8.4, 9, 9.1.1, 9.1.2, 9.1.3, 9.1.4, 9.2.1, 9.2.2, 9.2.3, 9.2.4, 9.2.5, 9.2.6, 9.3, 10, 10.1, 10.2, 11, 11.1, 11.2 and 11.3.,*
- (ii) *Fruit and vegetables from residential gardens in the Municipality of Darwin, eggs from locally raised poultry, native edible flora in the Municipality of Darwin and fish and crustaceans from the Darwin Creeks have been found to contain PFCs and PFC Contaminants to varying degrees: (Coffey HHRA Report at paragraphs 5.6.1, 5.6.2, 5.6.3 and 11.1.*
- (iii) *Ingestion of produce (including, fruit, vegetables and eggs) irrigated with impacted groundwater (or impacted surface water) and/or fish and crustaceans from the Darwin Creeks or Darwin River are secondary sources of PFC contamination: Coffey HHRA Report at paragraphs 4.4, 4.5.2, 5.8, 8, 8.1, 9.2.4, 9.2.6, 9.3, 11.2 and 11.3.*
- (iv) *Secondary sources of PFC contamination, leading to further redistribution of contamination and creation of additional exposure pathways for ongoing contamination of the biota generally (including humans): Braunig J, Baudel C, Heffernan A et al, Fate and redistribution of perfluoroalkyl acids through AFFF-impacted groundwater (2017).*
- (v) *Coffey ERA Report at paragraphs 3.3, 3.4, 3.5, 3.5.1, 3.5.2, 3.5.3, 4, 4.1, 4.1.1, 4.1.2, 4.2, 5, 5.1, 5.1.1, 5.1.2, 5.1.3, 5.2, 5.3, 6, 6.1, 6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.1.5, 6.1.6, 6.2, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 7, 7.1, 7.2 and 8.*
- (vi) *Coffey Supplementary Report at paragraphs 4.4, 4.5, 6.5, 6.5.1, 6.5.2, 7.4, 7.4.1, 7.4.2, 7.4.3, 7.4.4 and 8.*
- (vii) *PMAP at paragraphs 1.5, 4.1 and, 4.2 and, Appendix C.*

2.105. There is no practical, cost-effective way of remediating the Darwin Biota Contamination.

E.5 The announcement of the contamination

2.106. On a date shortly before 24 November 2016 the Commonwealth published a document titled 'Department of Defence, RAAF Base Darwin (October 2016)' (the **Darwin Contamination Announcement**) which stated:

- (a) the Darwin Base had a legacy of using AFFF for emergency firefighting situations and fire fighter training;
- (b) in 2004, the Commonwealth commenced phasing out its use of AFFF containing PFOS and PFOA as active ingredients;
- (c) PFOS and PFOA belong to a group of chemicals known as per- and poly-fluoroalkyl substances (**PFAS**) and until recently, PFAS were known as 'perfluorinated chemicals' or 'PFCs';
- (d) PFAS were an emerging concern around the world because they are persistent in the environment;
- (e) that because PFAS persist in humans and the environment, it was recommended that human exposure be minimised;
- (f) based on the outcome of preliminary sampling, it had been determined that RAAF Base Darwin would be subject to a detailed environmental investigation;
- (g) that the detailed environmental investigation would include:
 - (i) reviewing the historical use, storage and management of AFFF to identify potential sources of PFAS;
 - (ii) sampling soil, sediment, surface water, and groundwater on and off Darwin Base to identify PFAS exposure in the vicinity;
 - (iii) identifying pathways and receptors for the potential migration of PFAS;
 - (iv) community and stakeholder engagement, including a water-use survey;
 - (v) a human health and ecological risk assessment (if required) to evaluate potential risks to the human population and ecology, and inform future action to mitigate risks;

- (h) when detailed environmental investigation reports were finalised and publicly released, residents, businesses, and local stakeholders would be consulted;
- (i) that a community briefing and information activity would be conducted prior to the commencement of the detailed environmental investigation at the Darwin Base; and
- (j) alternative sources of drinking water were being provided to eligible residents located in close proximity to the Darwin Base who did not have a town water connection, and relied on the use of a bore for drinking water, as well as to residents whose drinking water was sourced from a rainwater tank which contained or did contain bore water, and to residents in other exceptional circumstances.

PARTICULARS

- (i) *The Darwin Contamination Announcement is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/FactSheets/201610PSPFactSheetDarwinFinal.pdf>

2.107. On or around 24 November 2016, the Commonwealth convened a community briefing as publicised in the Darwin Contamination Announcement (the **Darwin November 2016 Community Information Session**) at which its representatives made the following statements:

- (a) there was a history of AFFF being used at the Darwin Base in emergency firefighting situations and for fire fighter training;
- (b) the AFFF that had been used at the Darwin Base contained PFAS—namely including perfluorooctane and perfluorooctanoic acid;
- (c) PFAS were a class of manufactured chemical that had been used to make products that resist heat, stains, grease, and water;
- (d) PFAS were a concern around the world because they persist in the environment;
- (e) the Commonwealth commenced using AFFF containing PFOS/PFOA from the 1970s;
- (f) the Commonwealth was aware that PFOS/PFOA was an emerging persistent organic pollutant

- (g) PFAS had been detected in groundwater and surface water samples collected from locations off-base in the vicinity of the Darwin Base;
- (h) alternative sources of drinking water were being provided to eligible residents;
- (i) the Commonwealth delivered the findings of its preliminary sampling which revealed:
 - (i) three surface water samples were taken from off-base locations in the vicinity of the Darwin Base;
 - (ii) no groundwater samples were taken at that time;
 - (iii) PFAS was detected in all three of the surface water samples;
- (j) a detailed environmental investigation would be undertaken to determine the nature and extent of PFAS on and in the vicinity of the Darwin Base; and
- (k) a human health and ecological risk assessment would be undertaken (if required) to evaluate risks to human health and ecology, and to inform future action to mitigate risks.

PARTICULARS

- (i) *The Darwin November 2016 Community Information Session was held on 24 November 2016, at which a slideshow presentation entitled 'PFAS Investigation and Management: Community Information Session – RAAF Base Darwin Environmental Investigation' dated 24 November 2016, was made (**Darwin November 2016 Presentation**). The Darwin November 2016 Presentation is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/Presentations/PresentationCommunityWalkinSession24November.pdf>
- (ii) *Each of the statements in subparagraphs (a) to (k) was made in writing in the Darwin November 2016 Presentation, and/or spoken to orally at the meeting by representatives of the Commonwealth.*

2.108. On or around 22 March 2017, the Commonwealth held a community walk-in session to announce the commencement of the detailed environmental investigation (the **Darwin March 2017 Community Information Session**) at which its representatives made the following statements:

- (a) the Commonwealth has engaged Coffey Environments Australia Pty Ltd (**Coffey**) as the lead environmental consultant to undertake the investigation;
- (b) WSP Parsons Brinckerhoff Pty Ltd, has been engaged by the Commonwealth as a separate consultant to conduct a peer-review / auditing function on the environmental investigation;
- (c) the detailed site investigation (known as a **DSI**) Detailed Site Investigation is likely to comprise:
 - (i) soil investigation involving on-site soil samples;
 - (ii) surface water investigation involving on-site samples of surface water and sediment/soil within drainage channels and off-site samples downstream at drainage channel and dams;
 - (iii) groundwater investigation involving the installation of additional shallow and multi-level monitoring bores and gauge all bores, sample and assess all new locations; and
 - (iv) a report on the works being consistent with the National Environmental Protection (Assessment of Site Contamination) Measure 1999 (**NEPM**);
- (d) in the event a Human Health and Ecological Risk Assessment (known as a **HHERA**) is required it will involve:
 - (i) consultation and input from agencies, experts and community;
 - (ii) the methodology will be prepared using NEPM and Heath guidance; and
 - (iii) upon completion will evaluate the risks to the human health and ecology and inform future action to mitigate risks;
- (e) the detailed environmental investigation has commenced.

PARTICULARS

- (i) *The Darwin March 2017 Community Information Session was held on 22 March 2017 at which a slideshow presentation entitled “PFAS Investigation and Management: Community Information Session – RAAF Base Darwin & Robertson Barracks, NT” dated March 2017, was made (**Darwin March 2017 Presentation**). The Darwin March 2017 Presentation is published on:*

https://www.defence.gov.au/environment/pfas/docs/Darwin/Presentations/170322_Presentation-Darwin&Robertson_CommunityWalkInSession.pdf

- (ii) *Each of the statements in subparagraphs (a) to (e) was made in writing in the Darwin March 2017 Presentation, and/or spoken to orally at the meeting by representatives of the Commonwealth.*

https://www.defence.gov.au/environment/pfas/docs/Darwin/Presentations/170322_Presentation-Darwin&Robertson_CommunityWalkInSession.pdf

2.109. In April 2017, the Commonwealth published a factsheet titled 'RAAF Base Darwin PFAS Investigation & Management Program' (**Darwin April 2017 Factsheet**) which advised as follows:

- (a) a detailed environmental investigation will be conducted which will include:
- (i) reviewing the historical use, storage and management of AFFF to identify potential sources;
 - (ii) sampling soil, sediment, surface water and groundwater on and off the base to identify PFAS exposure in the vicinity;
 - (iii) identifying pathways and receptors for the potential migration of PFAS;
 - (iv) community and stakeholder engagement, including a water-use survey; and
 - (v) an HEREA (if required), which will evaluate potential risks to the human population and ecology, and inform future action to mitigate risks;
- (b) when detailed environmental investigation reports are finalised and publicly released, residents, businesses and local stakeholders will be consulted.

PARTICULARS

- (i) *The Darwin April 2017 Factsheet is published on:*

https://www.defence.gov.au/Environment/PFAS/docs/Darwin/Factsheets/170515-RAAFBaseDarwin_Factsheet.pdf

2.110. In June 2017, the Commonwealth published a factsheet titled 'PFAS Investigation & Management Program' (**Darwin June 2017 Factsheet**) which advised as follows:

- (a) a detailed environmental investigation was being conducted;
- (b) the preliminary site investigation (known as a **PSI**) was being completed which involved a historical review of AFFF use and storage to identify on-base sources, develop an understanding of migration pathways of PFAS from the source and identify potential receptors;
- (c) a DSI would commence and involve on and off-base sampling of soil, sediments, groundwater, surface water, plants and animals to build on the PSI information and characterise the nature and extent of contamination;
- (d) the Commonwealth Department of Health released final Health Based Guidance Values (**HBGVs**) for PFAS on 3 April 2017 and will be adopted in all of the environmental investigations across all sites including at the Darwin Base.

2.111. On 27 June 2017, the Commonwealth held a Community Walk-in Session in Darwin outlining the results of the Preliminary Site Investigation (the **Darwin June 2017 Community Information Session**) at which its representatives made the following statements:

- (a) the aim of the PSI was to understand the source-pathway-receptor linkages and prioritise works for the DSI;
- (b) the aim of the DSI was to conduct on and off-base sampling to further assess the nature and extent of PFAS on and in the vicinity of the Darwin Base including of soil, surface water, groundwater and biota;
- (c) the aim of the HHERA (if required) was to conduct a detailed assessment to better understand the risk of PFAS to people and the environment and would evaluate all pathways where screening levels were exceeded in order to assess risks to human health and ecology and inform future action to mitigate risks;
- (d) the Commonwealth Department of Health released final HBGVs for PFAS on 3 April 2017 and will be adopted in all of the environmental investigations across all sites including at the Darwin Base;
- (e) the Commonwealth had commenced a NEPM compliant detailed environmental investigation at the Darwin Base in March 2017;

- (f) the PSI has identified approximately 17 source areas on the Darwin Base and incidental pathways via groundwater and surface water to potential receptors;
- (g) the DSI will provide information on sources of PFAS, how PFAS may be moving through the environment and the current extent of the PFAS near the Darwin Base;
- (h) that findings from the investigation will help inform remediation and management options.

PARTICULARS

- (i) *The Darwin June 2017 Community Information Session was held on 27 June 2017, at which a slideshow presentation entitled 'PFAS Investigation and Management: Community Walk-in Session – RAAF Base Darwin NT' dated 27 June 2017, was made (**Darwin June 2017 Presentation**). The Darwin June 2017 Presentation is published on:

<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/Presentations/20170912RAAFBaseDarwinCWISPresentation.pdf>*
- (ii) *Each of the statements in subparagraphs (a) to (h) was made in writing in the Darwin November 2016 Presentation, and/or spoken to orally at the meeting by representatives of the Commonwealth.*

2.112. In September 2017, the Commonwealth published a community update titled 'RAAF Base Darwin Community Update PFAS Investigation and Management Program' (**Darwin Community Update Issue 01**) which advised as follows:

- (a) the Commonwealth has appointed Coffey to manage the detailed environmental investigation for the Darwin Base;
- (b) the investigation test area includes the Darwin Base, the area immediately surrounding the Darwin Base, Ludmilla Creek, Rapid Creek and Sadgroves Creek;
- (c) Coffey staff are testing existing bores, surface water and installing groundwater monitoring bores in the area around the Darwin Base.

PARTICULARS

- (i) *The Darwin Community Update Issue 01 is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/Factsheets/170904DarwinCommunityUpdateFactsheet.pdf>

2.113. In November 2017, the Commonwealth released a further community update titled 'RAAF Base Darwin – PFAS Investigation and Management Program Darwin Community Update' (**Darwin Community Update Issue 02**) which advised as follows:

- (a) the drilling of monitoring bores on and off the Darwin Base has been completed;
- (b) the collection of samples for the DSI is well established and sampling for the HHERA has commenced;
- (c) as at the date of the Darwin Community Update Issue 02 update approximately 1,000 samples have been taken across more than 370 locations including six residential properties with an estimated further 300 samples expected to be collected;
- (d) an Human Health Risk Assessment (known as an HHRA) will be conducted to determine possible risks associated with human exposure to PFAS;
- (e) an Ecological Risk Assessment (known as an ERA) will be conducted to investigate the potential effects on plants and animals as a result of exposure to PFAS;
- (f) the HHRA and ERA are expected to be completed mid-2018.

PARTICULARS

- (i) *The Community Update Issue 02 is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/Factsheets/20171127DarwinCommunityUpdateNewsletter.pdf>

2.114. In December 2017, the Commonwealth released a factsheet (the **Darwin December 2017 Factsheet**), advising as follows:

- (a) the investigation area for the detailed environmental investigation was determined and refined as a result of the initial investigation findings and has been determined by understanding the soil, water flow and aquifer boundaries as well as where testing has confirmed no detectable concentrations of PFAS;

- (b) PFAS moves around and off the Darwin Base through groundwater and surface water and moves away from the source areas on-base through leaching of the soil into surface water and groundwater;
- (c) drains leading to Ludmilla Creek have shown readings from 0.05 and 4.4 µg/L for PFAS concentration;
- (d) Ludmilla Creek itself has shown readings of up to 0.22 µg/L for PFAS concentration;
- (e) Rapid Creek has shown readings of up to 2.2 µg/L;
- (f) extensive soil sampling was conducted on-base to understand the source areas of PFAS contamination and help guide remediation efforts;
- (g) PFAS concentrations within the soil in the investigation area could potentially present a risk through PFAS uptake into home-grown foods;
- (h) PFAS compounds have been detected in fish, molluscs and crustaceans that live in the Darwin Creeks;
- (i) recreational water activities in the Darwin Creeks should be limited due to the presence of PFAS above the recreational screen value in areas adjacent to the Darwin Base and drains leading to the Darwin Creeks.

PARTICULARS

- (i) *The Darwin December 2017 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/Factsheets/20171206DarwinInvestigationArea.pdf>

2.115. On 6 December 2017, the Commonwealth held a community walk-in session outlining the results of the Detailed Site Investigation (the **Darwin December 2017 Community Information Session**) at which its representatives made the following statements:

- (a) the Commonwealth established a national PFAS investigation and management program in late 2015 to identify the nature and extent of PFAS;
- (b) the Commonwealth commenced using legacy firefighting foam containing PFOS/PFOA as active ingredients from the 1970s;

- (c) the Commonwealth became aware that PFOS/PFOA was an emerging persistent organic pollutant in 2003;
- (d) the PSI was undertaken between March to June 2017 and identified 17 areas on the Darwin Base where legacy firefighting foam was potentially used and may have caused contamination;
- (e) the results of the DSI, which commenced in June 2017 but was yet to be finalised, included:
 - (i) eleven source areas were confirmed and the soil and groundwater concentrations characterised;
 - (ii) PFAS is leaching from soils to groundwater and surface drains;
 - (iii) PFAS has migrated off-Base to the north and into Rapid Creek; to the west and into Ludmilla Creek; and to the south into the upper reaches of Sadgroves and Reichardt Creeks;
 - (iv) concentrations in Rapid Creek, particularly in dry season, were above recreational guidance values;
 - (v) elevated concentrations of PFOS have been reported in fish and crustaceans in Rapid and Ludmilla Creeks
- (f) an HHRA was warranted based on the DSI findings including that:
 - (i) some soil results were above screening levels for direct contact;
 - (ii) concentrations in Rapid Creek and potentially Ludmilla Creek suggested viable pathways for exposure during recreational activities like swimming or consumption of fish;
- (g) an ERA was warranted based on the DSI findings including that:
 - (i) some soil concentrations being above ecological screening levels for plants and invertebrates;
 - (ii) concentrations in creeks are above aquatic ecosystem guidelines.

- (h) soil, groundwater and surface water sampling has confirmed PFAS source areas on base and shown that contamination is migrating off base in groundwater and surface water
- (i) an HHRA and ERA, which commenced during the DSI, are being conducted to calculate the risk that PFAS presents to people and ecology

PARTICULARS

- (i) *At the Community Walk-in Session held on 6 December 2017 at Charles Darwin University, Casuarina, a slideshow presentation entitled “PFAS Investigation and Management: Community Information Session – RAAF Base Darwin NT’NT” dated Wednesday 6 December 2017, was made (**Darwin December 2017 Presentation**). The Darwin December 2017 Presentation is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/Presentations/20171206DarwinCommunityWalkinSessionPresentation.pdf>
- (ii) *Each of the statements in subparagraphs (a) to (i) was made in writing in the Darwin December 2017 Presentation, and/or spoken to orally at the meeting by representatives of the Commonwealth.*

2.116. In February 2018, the Commonwealth released a factsheet titled ‘RAAF Base Darwin PFAS Investigation – Detailed Site Investigation Findings and Next Steps PFAS Investigation and Management Program’ (the **Darwin February 2018 Factsheet**), advising as follows:

- (a) the Commonwealth has completed the DSI in relation to the Darwin Base (**Darwin DSI**);
- (b) the Darwin DSI has involved:
 - (i) a review of relevant historical reports and documents;
 - (ii) the determination of an Investigation Area by understanding the soil, water flow and aquifer boundaries, as well as those areas where testing confirmed no detectable amounts of PFAS;
 - (iii) an analysis of fish and crustaceans at the end of the 2017 wet season, from seven freshwater locations adjacent to the Darwin Base which were

paired with surface water and sediment contamination assessments at these locations;

- (iv) an analysis of 85 surface water samples from 11 locations on Rapid Creek, three locations on Ludmilla Creek, four locations on Sadgroves Creek and three locations on Reichardt Creek;
 - (v) a groundwater assessment of the water level and PFAS concentrations in 159 monitoring wells, including 104 newly installed monitoring wells, 45 existing monitoring wells and six private off-base bores;
 - (vi) an analysis of approximately 403 soil and 180 sediment samples; and
 - (vii) the monitoring of fluctuations in groundwater levels.
- (c) sampling and analysis has confirmed eleven PFAS source areas at the Darwin Base;
- (d) as a result of the Darwin DSI findings, the following potential pathways for PFAS to move through the environment have been identified:
- (i) from soil in the source areas to groundwater or surface water;
 - (ii) with groundwater into the Darwin Creeks and ultimately the ocean (Darwin Harbour or the Beagle Gulf); and
 - (iii) from surface water runoff into drains and the Darwin Creeks;
- (e) as a result of the Darwin DSI findings, the following scenarios have been identified as potential risk to PFAS exposure:
- (i) the ingestion of water from Rapid Creek during recreational activities;
 - (ii) the ingestion of contaminated drain water or groundwater during maintenance and construction works, and irrigation;
 - (iii) the direct contact with contaminated soils in the main source areas on-Darwin Base; and
 - (iv) consuming fish or crustaceans from drains and Darwin Creeks in the vicinity of the Base,

- (f) additional water, soil, plant and animal sampling will be occur during the first quarter of 2018 given the tropical climate of Darwin and the potential significant variation between the wet and dry seasons, the results of which will be reported in a Supplementary DSI;
- (g) a HHRA has commenced and is expected to be finalised and reported in mid-2018, and an ERA to evaluate the potential risks PFAS poses to the natural environment has also commenced.

PARTICULARS

- (i) *The Darwin February 2018 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/factsheets/20180214DetailedSiteInvestigationFindingsFactsheet.pdf>

2.117. In June 2018, the Commonwealth released a further factsheet titled “RAAF Base Darwin – Human Health Risk Assessment Factsheet PFAS Investigation and Management Program” (the **Darwin June 2018 Factsheet**) providing a summary of the results of the HHRA in relation to the Darwin Base (**Darwin HHRA**) and advising as follows:

- (a) the Darwin DSI confirmed that:
 - (i) there were 11 areas on the Darwin Base that had elevated concentrations of PFAS contamination in soil or groundwater that may be contributing contamination to the surrounding surface water or groundwater;
 - (ii) residual contamination in soil is leaching to surface water during the wet season, and groundwater throughout the year, which then migrates in drains or through groundwater flows, ultimately discharging to Rapid Creek to the north, and Ludmilla Creek to the west, and leading to the PFAS levels in creek water; and
 - (iii) contaminated surface water and groundwater flows to the south into Reichardt Creek and Sadgrove Creek are relatively minor;
- (b) there is potentially an elevated risk of PFAS exposure from consuming fish, crustaceans or molluscs from Rapid Creek and Ludmilla Creek;
- (c) the risk varied with circumstances in relation to:

- (i) consumption of homegrown eggs; and
- (ii) recreational water use.

PARTICULARS

- (i) *The June 2018 Factsheet is published on:
<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/factsheets/201806HHRAFindingsFactsheet.pdf>*

2.118. On 19 June 2018, the Commonwealth held a Community Walk-in Session which included a presentation on the findings of the Darwin HHERA and the findings of the Darwin DSI, advising as follows:

- (a) some of the soil results from the Darwin DSI were above screening levels for direct contact on the Darwin Base;
- (b) the Darwin DSI revealed that concentrations in Rapid Creek and Ludmilla Creek suggested viable pathways for exposure during recreational activities like swimming or consumption of fish;
- (c) an elevated risk scenario included eating fish from freshwater section of Rapid Creek;
- (d) an elevated risk scenario, in upper estimates, included:
 - (i) residential activities west of the Darwin Base (including use of bore water);
 - (ii) frequent swimming in Ludmilla Creek east of Dick Ward Drive;
 - (iii) eating high volumes of fish, crabs or mussels in Rapid Creek;
 - (iv) eating high volumes of fish, crabs or mussels from Ludmilla Creek;
- (e) ways to control exposure.

PARTICULARS

- (i) *At the Community Walk-in Session held on 19 June 2018 a slideshow presentation entitled 'PFAS Investigation and Management Program: Community Information Session – Robertson Barracks Detailed Site Investigation RAAF Base Darwin Human Health Risk Assessment' dated 19 June 2018,*

was made (**Darwin June 2018 Presentation**). The Darwin June 2018 Presentation is published on:

<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/presentations/201806DarwinAndRobertsonCWISPresentation.pdf>

2.119. In October 2018, the Commonwealth released a community update titled “RAAF Base Darwin – Investigation Community Newsletter PFAS Investigation and Management Program” (**Darwin Community Update Issue 03**) which announced:

- (a) the ERA is in progress;
- (b) the outcomes of the investigation are being used to develop a PFAS Management Area Plan.

PARTICULARS

(i) *The Darwin Community Update Issue 03 is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/Factsheets/201810DarwinCommunityUpdateNewsletter.pdf>

2.120. In November 2018, the Commonwealth released three fact sheets titled:

- (a) ‘RAAF Base Darwin – Supplementary Detailed Site Investigation’ which summarised the findings of a Supplementary Detailed Site Investigation which was conducted to monitor the impact of seasonal variation on the movement of PFAS (**Darwin Supplementary DSI Factsheet**);
- (b) ‘RAAF Base Darwin Ecological Risk Assessment factsheet’ which summarised the key findings of the Ecological Risk Assessment (**Darwin Ecological Risk Assessment Factsheet**);
- (c) ‘RAAF Base Darwin PFAS Management Area Plan’ (**Darwin PMAP Factsheet**).

2.121. The Darwin Supplementary DSI Factsheet advised that:

- (a) The results of the Supplementary Detailed Site Investigation sampling supported the initial Detailed Site Investigation Report and did not identify any additional PFAS sources or pathways.
- (b) The mass estimates for groundwater and soil indicate that approximately 70% of the total reported PFAS is spread beyond the immediate source areas.

PARTICULARS

- (i) *The Darwin Supplementary DSI Factsheet was published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/factsheets/201811DarwinSupplementaryDSIFactsheet.pdf>

2.122. The Darwin Ecological Risk Factsheet:

- (a) ranked the risks to species located in certain zones of the Darwin Relevant Area;
- (b) advised the findings of the Ecological Risk Assessment do not change the outcomes of the Darwin HHERA.

PARTICULARS

- (i) *The Darwin Ecological Risk Factsheet was published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/factsheets/201811DarwinERAFactsheet.pdf>

2.123. The Darwin PMAP Factsheet advised that:

- (a) the outcomes from the investigation are being used to develop a PFAS Management Area Plan in relation to the Darwin Base (**Darwin PMAP**);
- (b) the Darwin PMAP will inform the activities the Commonwealth will undertake to manage and reduce the risks of PFAS exposure on, and around, the Darwin Base;
- (c) the Darwin PMAP prioritises the implementation of practical solutions to prevent or minimise PFAS migrating from the Darwin Base;
- (d) migration estimates identified that the removal of any single PFAS source area would not have a great impact on reducing the amount PFAS ending up in nearby creeks and waterways because PFAS is moving through the environment in a number of different directions from numerous source areas, and the mass of PFAS that has already left the source areas is now spread across the broader area;
- (e) as part of the Darwin PMAP, an Ongoing Monitoring Plan has been developed, outlining the sampling program that will be undertaken by the Commonwealth to monitor and track the PFAS contamination over the coming years.

PARTICULARS

(i) *The PMAP Factsheet was published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/factsheets/201811PMAPFactsheet.pdf>

2.124. In July 2019, the Commonwealth released a community update titled 'RAAF Base Darwin PFAS Management Area Plan Update PFAS Investigation and Management Program' (**Darwin Community Update Issue 04**) which advised:

- (a) the following actions recommended in the Darwin PMAP have already commenced:
 - (i) continued support to the NT EPA and NT Department of Health to assist them in providing dietary advice related to regular consumption of fish and crustaceans in Rapid Creek and Ludmilla Creek;
 - (ii) implementation of controls for construction excavation and waste water management, to reduce direct contact exposure in specific source areas on-base;
 - (iii) implementation of administrative controls to ensure disturbance of PFAS or results in additional exposure pathways;
 - (iv) routine inspections of the existing soil stockpile on-base to ensure the cover remains intact;
- (b) ongoing sampling as part of the Darwin PMAP has occurred with results as follows:
 - (i) concentrations of PFAS compounds in the Darwin Creeks of samples taken in December 2018 being generally lower than the similar sampling from December 2017, however this is considered due to the lessor rainfall;
 - (ii) concentrations of PFAS compounds in the Darwin Creeks reported in March 2019 were consistent with previous end of wet season results;
 - (iii) concentrations of PFAS compounds in fish, long bums, giant mangrove whelks and redclaw crayfish were generally consistent with previous rounds of monitoring;

- (c) the additional sampling results do not alter the findings and recommendations of the Darwin HHER and Darwin ERA.

PARTICULARS

- (i) The Darwin Community Update Issue 04 is published on:
<https://www.defence.gov.au/Environment/PFAS/docs/Darwin/Factsheets/201907DarwinCommunityUpdateNewsletter.pdf>

E.6 The injurious affectation to land in the Darwin Relevant Area

2.125. Land in the Darwin Relevant Area (including the land of Darwin Group Members) has become, and is likely to remain:

- (a) affected by the Darwin Surface Water Contamination; and/or
- (b) affected by the Darwin Groundwater Contamination; and/or
- (c) affected by the Darwin Soil Contamination; and/or
- (d) affected by the Darwin Biota Contamination.

PARTICULARS

- (i) *As to subparagraph (a), paragraphs 2.92 to 2.96 are repeated.*
- (ii) *As to subparagraph (b), paragraphs 2.97 to 2.101 are repeated.*
- (iii) *As to subparagraph (c), paragraphs 2.102 to 2.103 are repeated.*
- (iv) *As to subparagraph (d), paragraphs 2.104 to 2.105 are repeated.*

2.126. Further, or alternatively, by reason of:

- (a) the Darwin Surface Water Contamination; and/or
- (b) the Darwin Groundwater Contamination; and/or
- (c) the Darwin Soil Contamination; and/or
- (d) the Darwin Biota Contamination,

land in the Darwin Relevant Area (including the land of Darwin Group Members) has become, and is likely to remain land, of which occupiers, produce and biota which, have

ongoing and largely unavoidable exposure to PFC Contaminants through multiple potential pathways (**Darwin Ongoing Contaminant Exposure**).

PARTICULARS

- (i) *Paragraphs 2.92 to 2.105 are repeated.*
- (ii) *Coffey HHRA Report at paragraphs 5.6.1, 5.6.2, 5.6.3, 5.7, 8, 8.1, 8.2, 8.2.1, 8.2.2, 8.2.3, 8.3, 8.3.1, 8.3.2, 8.3.3, 8.3.4, 8.4, 9, 9.1.1, 9.1.2, 9.1.3, 9.1.4, 9.2.1, 9.2.2, 9.2.3, 9.2.4, 9.2.5, 9.2.6, 9.3, 10, 10.1, 10.2, 11, 11.1, 11.2 and 11.3. ,*
- (iii) *Braunig J, Baudel C, Heffernan A et al, Fate and redistribution of perfluoroalkyl acids through AFFF-impacted groundwater (2017).*

2.127. Further, or alternatively, there exists a material risk that:

- (a) land in the Darwin Relevant Area (including land owned by Darwin Group Members) may be recorded on a register established pursuant to s 9 of the *Waste Management and Pollution Control Act 1998* (NT) (**WMPCA**), pursuant to s 77 of the WMPCA; and
- (b) owners of land in the Darwin Relevant Area (including land owned by Darwin Group Members) may be obligated to disclose to prospective purchasers that land is and/or that there is a risk that land may be contaminated by PFC Contaminants (with any contract of sale subject to rescission if disclosure is not made).

PARTICULARS

- (i) *As to subparagraph (a):*
 - a. *Land may be placed on a register if the owner or occupier of that land is issued a “pollution abatement notice”.*
 - b. *A “pollution abatement notice” may be issued to the owner or occupier of land that is polluted: s 77 of the WMPCA.*
 - c. *Pollution means the presence of a contaminant or waste in the environment as a consequence of an emission, discharge, deposition, escape or disturbance of a contaminant or waste: s4(1) of the WMPCA.*
 - d. *PFC Contaminants are a contaminant or waste as defined under s 4(1) of the WMPCA and paragraph 2.88 is repeated.*
- (ii) *The obligations in subparagraph (b) arise under s 112(2) of the WMPCA if the owner or occupier of land is issued with a*

“pollution abatement notice” and/or at common law in respect of the risk of contamination to land.

2.128. By reason of the matters pleaded in paragraphs 2.92 to 2.127, land in the Darwin Relevant Area has become, and is likely to remain land which is, or may be perceived by prospective purchasers of land to be, unfit for residential purposes or human occupancy because occupiers and visitors have ongoing and largely unavoidable exposure to PFC Contaminants through multiple potential pathways.

PARTICULARS

(i) *The particulars to paragraphs 2.92 to 2.127 are repeated.*

2.129. By reason of the matters pleaded in paragraph 2.128 land in the Darwin Relevant Area has become, and is likely to remain, injuriously affected in its value (**Darwin Contamination Land Value Affection**).

PARTICULARS

(i) *The quantum of the adverse affection on the value of the land of Darwin Group Members will be given following opt out, the determination of the Applicants’ claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Darwin Group Members.*

E.7 The reasonable foreseeability of the injurious affection to the value of land

2.130. At all material times, by reason of the matters pleaded in paragraphs 2.3 to 2.41 and 2.83 to 2.91 above, it was reasonably foreseeable that use of AFFF Working Solution and/or AFFF on the Darwin Base as pleaded in paragraphs 2.43 to 2.82 would result in:

- (a) the Darwin Surface Water Contamination;
- (b) the Darwin Groundwater Contamination;
- (c) the Darwin Soil Contamination;
- (d) the Darwin Biota Contamination; and/or
- (e) the Darwin Contamination Land Value Affection.

F THE COMMONWEALTH'S ACTS AND OMISSIONS

F.1 The Commonwealth's knowledge

F.1.1 The Commonwealth's knowledge of the Darwin Base and its surrounds

2.131. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) the matters pleaded in Section A1 above;
- (b) the matters pleaded in Section A2 above;
- (c) the matters pleaded in Section A3 above;
- (d) that waters, liquids, and soluble materials discharged on Darwin Base would:
 - (i) permeate or percolate into the soil at the Darwin Base;
 - (ii) be transmitted to the groundwater beneath the Darwin Base, including the Burrell Aquifer and mingle and flow with that groundwater (including in a general direction towards the Darwin Creeks);
 - (iii) mingle with other surface water on the Darwin Base (especially after periods of rain), and flow overland towards and into the surrounding water catchment areas outside the Darwin Base (including Rapid Creek) and:
 - (A) permeate or percolate into the soil over which the surface water overland flows occurred; and
 - (B) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Burrell Aquifer; and
 - (iv) be transmitted to the Darwin Creeks.

PARTICULARS

- (i) *As to sub-paragraph (a), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Darwin Base.*
- (ii) *As to sub-paragraph (b), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Darwin Base or artificial features which the Commonwealth developed, constructed, upgraded and utilised.*

- (iii) *As to sub-paragraph (c), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Darwin Base or artificial features which the Commonwealth developed, constructed, upgraded and utilised.*
- (iv) *As to sub-paragraph (d), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) to (c) above.*

F.1.2 The Commonwealth's knowledge of water use at Darwin Base

2.132. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) the matters pleaded in Section B1 above;
- (b) the matters pleaded in Section B2 above; and
- (c) that waters, liquids, and soluble materials discharged and/or allowed to escape the Darwin Base which were transmitted to the Darwin Creeks, and the Burrell Aquifer would be used by residents of the Darwin Relevant Area.

PARTICULARS

- (i) *As to sub-paragraph (a), these were matters which were readily observable to, and ought reasonably to have been known by, a reasonable person occupying the land comprising the Darwin Base.*
- (ii) *As to sub-paragraph (b), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person occupying the land comprising the Darwin Base.*
- (iii) *As to sub-paragraph (c), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) and (b) above.*

F.1.3 The Commonwealth's knowledge of the potential flow of Spent AFFF and Fire Run-Off from the Darwin Base

2.133. At all material times, the Commonwealth knew, or ought reasonably to have known:

- (a) that the Darwin Training and Operation Activities (and ancillary storage, containment and disposal practices) and Darwin Discharge Events resulted in:

- (i) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground; and/or
 - (ii) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with Fire Run-Off, being discharged, or allowed to escape, to bare ground;
- (b) the matters pleaded in Section C4 above; and
- (c) that the use of AFFF Working Solution and AFFF on the Darwin Base would result in Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF:
 - (i) being transmitted to the groundwater beneath the Darwin Base, including the Burrell Aquifer and mingle and flow with that groundwater (including in a general direction towards the Darwin Creeks), and being utilised by persons engaged in the Darwin Groundwater Usages;
 - (ii) mingling with other surface water on the Darwin Base (especially after periods of rain), and flowing overland generally towards and into the surrounding water catchment areas outside the Darwin Base (including to the Darwin Creeks) and:
 - (A) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (B) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Burrell Aquifer;

and being extracted and utilised by persons engaged in the Darwin Groundwater Usages;
 - (iii) mingling with other surface water on the Darwin Base (especially after periods of rain), and flowing overland generally towards and into the surrounding water catchment areas outside the Darwin Base (including the Darwin Creeks) and then being utilised by persons engaged in the Darwin Creeks Usages.

PARTICULARS

- (i) *As to sub-paragraph (a), these were matters known to the Commonwealth as the entity responsible for conducting the Darwin Training and Operation Activities, and using AFFF Concentrate, AFFF Working Solution and AFFF, and disposing of the same.*
- (ii) *As to sub-paragraph (b), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person using AFFF Concentrate, AFFF Working Solution and AFFF.*
- (iii) *As to sub-paragraph (c), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) and (b) above, together with the matters pleaded in sub-paragraph 2.131(d).*

F.1.4 The Commonwealth's knowledge of the toxic properties of Spent AFFF and Fire Run-Off

2.134. Paragraph 33 is repeated.

2.135. Paragraph 34 is repeated.

2.136. Further, or alternatively, at all material times from 16 May 2000, alternatively 2004, the Commonwealth knew that its Darwin Training and Operations Activities at the Darwin Base using AFFF Working Solution and AFFF were:

- (a) potentially damaging to the environment; and/or
- (b) potentially causative of adverse health effects in humans.

PARTICULARS

- (i) *As to sub-paragraph (a), the particulars to paragraph 34 are repeated*
- (ii) *As to sub-paragraph (b), the matters referred to in particular (i) involved knowledge of the contamination of groundwater, and it may be inferred that a person who knew that groundwater was contaminated also knew that there existed a potential for adverse health effects in humans who may consume groundwater, or produce (including livestock and eggs) watered with groundwater.*
- (iii) *See the documents listed in Coffey DSI Report at Appendix B.*

2.137. Paragraph 35 is repeated.

2.138. Further, or alternatively, at all material times from no later than 2004 (**Darwin Contamination Knowledge Date**), the Commonwealth knew or ought reasonably to have known that AFFF Working Solution, AFFF, and Spent AFFF had contaminated groundwater under the Darwin Base.

PARTICULARS

(i) *Coffey DSI Report at Appendix B.*

F.2 The Commonwealth's conduct

F.2.1 The Commonwealth's deliberate conduct

2.139. At all material times, the Commonwealth's:

- (a) use of AFFF in the Darwin Training and Operations Activities, as pleaded in paragraphs 2.432.42 to 2.80; and/or
 - (b) method of disposal of AFFF and Spent AFFF, as pleaded in paragraph 2.81,
- was deliberate.

F.2.2 The Commonwealth's careless conduct

2.140. Further, or alternatively, by reason of the matters pleaded in paragraphs 2.43 to 2.82 at all material times on and after each of the times identified in paragraphs 2.134 to 2.137 the Commonwealth carelessly:

- (a) did the following acts:
 - (i) it allowed large quantities of AFFF to be discharged to bare ground;
 - (ii) it allowed Spent AFFF and Fire Run-Off to flow directly onto bare ground in large quantities;
 - (iii) it allowed Spent AFFF and Fire Run-Off to permeate or percolate into the soil at the Darwin Base;
 - (iv) it allowed Spent AFFF and Fire Run-Off to be transmitted to the groundwater beneath the Darwin Base, including the Burrell Aquifer (where it was likely to mingle with groundwater underlying areas off-base in the Darwin Relevant Area);

- (v) it allowed Spent AFFF and Fire Run-Off to drain into the surrounding water catchment areas (including via the Darwin Drainage System), including into the Darwin Creeks; and/or
 - (vi) it allowed Spent AFFF and Fire Run-Off to be transmitted to Darwin Creeks; and/or
 - (vii) to the extent it stored store wastewater from the use of AFFF Working Solution and AFFF, it did so in such a way that it failed to avoid leakage to the surrounding environment;
- (b) made the following omissions:
- (i) it failed to investigate and assess, or to do so adequately, the risks associated with the use of AFFF before using, or continuing to use AFFF;
 - (ii) it failed to restrict, or to do so adequately, the use of AFFF Working Solution and AFFF only to emergencies;
 - (iii) it failed to take any or any adequate steps to contain or limit the use of AFFF Working Solution and AFFF in Darwin Training and Operations Activities;
 - (iv) it failed to take any or any adequate steps to contain, capture, clean up and securely dispose of Spent AFFF and Fire Run-Off, such that it did not:
 - (A) flow directly onto bare ground;
 - (B) permeate or percolate into the soil at the Darwin Base;
 - (C) become transmitted to the groundwater beneath the Darwin Base, including the Burrell Aquifer (where it was likely to mingle with groundwater underlying areas off-base in the Darwin Relevant Area);
 - (D) drain into the surrounding water catchment areas (including via the Darwin Drainage System), including into the Darwin Creeks; and
 - (E) transmit to the Darwin Creeks;

- (v) it failed to store wastewater from the use of AFFF Working Solution and AFFF in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment); and/or
- (vi) it failed to take any or any adequate steps to remediate the contamination of the groundwater under the Darwin Base at any time after the time when it knew or ought reasonably to have known that groundwater was contaminated, as pleaded in paragraphs 2.134 to 2.138 (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable);
- (vii) it failed to take any or any adequate steps to remediate the contamination of the soil on Darwin Base at any time after the time when it knew or ought reasonably to have known that soil was contaminated (including to prevent Spent AFFF and Fire Run Off leaching, or further leaching into the groundwater or surface water, (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable).

PARTICULARS

- (i) *As to subparagraph (a)(i), paragraphs 2.43 to 2.82 are repeated.*
- (ii) *As to subparagraph (a)(ii), paragraphs 2.43 to 2.82 are repeated.*
- (iii) *As to subparagraph (a)(iii), paragraphs 2.43 to 2.82 and 2.102 to 2.103 are repeated.*
- (iv) *As to subparagraph (a)(iv), paragraphs 2.43 to 2.82 and 2.97 to 2.101 are repeated.*
- (v) *As to subparagraph (a)(v), paragraphs 2.43 to 2.82 and 2.92 to 2.96 are repeated.*
- (vi) *As to subparagraph (a)(vi), paragraphs 2.43 to 2.82 and 2.92 to 2.96 are repeated.*
- (vii) *As to subparagraph (a)(vii), paragraphs 2.43 to 2.82 and 2.92 to 2.105 are repeated.*
- (viii) *As to subparagraph (b)(i), paragraphs 2.43 to 2.82 and 2.134 to 2.138 are repeated.*
- (ix) *As to subparagraph (b)(ii), paragraphs 2.43 to 2.82 are repeated.*
- (x) *As to subparagraph (b)(iii), paragraphs 2.43 to 2.82 are repeated.*
- (xi) *As to subparagraph (b)(iv), paragraphs 2.43 to 2.82 and 2.92 to 2.105 are repeated.*

- (xii) *As to subparagraph (b)(v), paragraphs 2.43 to 2.82 are repeated.*
- (xiii) *As to subparagraph (b)(vi), paragraphs 2.43 to 2.82 and 2.134 to 2.138 are repeated.*
- (xiv) *As to sub-paragraph (b)(vii), paragraphs 2.43 to 2.82 and 2.134 to 2.138 are repeated*

2.141. Further, or alternatively, the Commonwealth:

- (a) failed, at all material times after the Darwin Contamination Knowledge Date to warn persons resident in the Darwin Relevant Area that:
 - (i) it had been using AFFF Working Solution and AFFF at the Darwin Base since or about 1987;
 - (ii) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Darwin Base and entered and/or contaminated, the Darwin Aquifers and/or the Darwin Creeks; and/or
 - (iii) Spent AFFF was:
 - (A) potentially damaging to the environment; and/or
 - (B) potentially causative of adverse health effects in humans; and/or

2.142. Further, or alternatively, the Commonwealth failed, at all material times after the inception of the *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, Volume 1, Ch6(6), to comply with that measure by providing all relevant information on site contamination for persons resident in the Darwin Relevant Area.

G THE COMMONWEALTH'S LIABILITY

G.1 Nuisance

G.1.1 Liability in nuisance

2.143. By its use of the Darwin Base as pleaded in paragraphs 2.43 to 2.82 and 2.139 to 2.140, the Commonwealth has created, and continued, an interference with the use and enjoyment of the land owned by Darwin Group Members (the **Darwin Nuisance**), in that:

- (a) their land is affected by the Darwin Surface Water Contamination and such contamination is irreparable (and paragraphs 2.92 to 2.96 are repeated);
- (b) they are no longer able safely to access the Burrell Aquifer as a water supply for the Darwin Groundwater Usages, given the Darwin Aquifers are irreparably contaminated (and paragraphs 2.97 to 2.101 are repeated);
- (c) their soil has sustained Darwin Soil Contamination, and such contamination is irreparable (and paragraphs 2.102 to 2.103 are repeated);
- (d) their land is affected by the Darwin Biota Contamination, and such contamination is irreparable (and paragraphs 2.104 to 2.105 are repeated); and
- (e) those occupying their land are subject to the Darwin Ongoing Contaminant Exposure.

PARTICULARS

- (i) *The particulars of the interference with the land of Darwin Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Darwin Group Members.*

2.144. Further, by reason of the matters pleaded in paragraphs 2.38, 2.41, 2.85, 2.91, 2.130 and/or 2.131 to 2.138, at all material times it was reasonably foreseeable to a reasonable person in the Commonwealth's position that persons owning land in the Darwin Relevant Area (including Darwin Group Members) would suffer loss by the Commonwealth's use of the Darwin Base as pleaded in paragraphs 2.43 to 2.82, being pure economic loss, in the form of diminution in the value of land in the Darwin Relevant Area.

PARTICULARS

- (i) *Paragraphs 2.38, 2.41, 2.85, 2.91, 2.130 and/or 2.131 to 2.138 are repeated.*

2.145. By reason of the matters pleaded in paragraphs 2.143 and 2.144, the Darwin Nuisance constitutes a substantial and unreasonable interference with the use and enjoyment of the land owned by Darwin Group Members.

G.1.2 Causation, loss and damage

2.146. The Darwin Nuisance directly caused:

- (a) the Darwin Surface Water Contamination (as pleaded in paragraph 2.95);
- (b) the Darwin Groundwater Contamination (as pleaded in paragraph 2.100);
- (c) the Darwin Soil Contamination (as pleaded in paragraph 2.102);
- (d) the Darwin Biota Contamination (as pleaded in paragraph 2.104); and/or
- (e) the Darwin Contamination Land Value Affectation (as pleaded in paragraph 2.129);

and Darwin Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *The particulars of the losses of Darwin Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Darwin Group Members.*

G.1.3 Aggravated and exemplary damages

2.147. Further, on and from the Darwin Actual Knowledge Date, by continuing the Darwin Nuisance by:

- (a) continuing to do the acts as pleaded in paragraph 2.139 and/or sub-paragraph 2.140(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 2.140(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 2.131 to 2.138, the Commonwealth engaged in aggravating conduct, and Darwin Group Members claim aggravated damages.

2.148. Further, or alternatively, on and from each of the Darwin Actual Knowledge Date, by continuing the Darwin Nuisance by:

- (a) continuing to do the acts as pleaded in paragraph 2.139 and/or sub-paragraph 2.140(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 2.140(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 2.131 to 2.138, the Commonwealth engaged in conduct in contumelious disregard for the rights of Darwin Group Members, and Darwin Group Members claim exemplary damages.

G.2 Darwin Negligence

G.2.1 Duty of care

2.149. At all material times, persons other than the Commonwealth (including Darwin Group Members) had no capacity to control the activities of the Commonwealth on the Darwin Base, and in particular the use of AFFF Working Solution and AFFF on the Darwin Base.

2.150. At all material times, the land in the Darwin Relevant Area (including the land owned by Darwin Group Members) was physically proximate to the Darwin Base.

2.151. At all material times, by reason of the matters pleaded in paragraphs 2.149 to 2.150 persons owning, or considering purchasing land in the Darwin Relevant Area (including Darwin Group Members) were in a position of vulnerability.

2.152. By reason of the matters pleaded in paragraphs 2.38, 2.41, 2.85, 2.91, 2.130 and/or 2.131 to 2.138 a reasonable person in the Commonwealth's position would have foreseen a reasonably foreseeable and not insignificant risk of harm to persons owning, or acquiring land in the Darwin Relevant Area (including Darwin Group Members) by the Commonwealth's use of AFFF Working Solution and AFFF on the Darwin Base as pleaded in paragraphs 2.43 to 2.82, being pure economic loss, in the form of diminution in the value of their land (the **Darwin Risk of Harm**).

PARTICULARS

(i) *Paragraphs 2.38, 2.41, 2.85, 2.91, 2.130 and/or 2.131 to 2.138 are repeated.*

2.153. By reason of the matters pleaded in paragraphs 2.149 to 2.152, the Commonwealth owed a duty to each and all of Darwin Group Members to exercise reasonable care, in the use of AFFF Working Solution and AFFF on the Darwin Base not to cause pure economic loss, in the form of diminution in the value of land in the Darwin Relevant Area (**Darwin Duty of Care**).

2.154. By reason of the matters pleaded in paragraphs 2.149 to 2.152, on and after the Darwin Contamination Knowledge Date, alternatively the Actual Knowledge Date the

Commonwealth owed a duty to each and all of Darwin Group Members to exercise reasonable care to warn them that:

- (a) it had been using AFFF at the Darwin Base since or about 1983;
- (b) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Darwin Base and entered and/or contaminated the Darwin Aquifers and/or contaminated the Darwin Creeks; and
- (c) Spent AFFF was:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans.

(Darwin Duty to Warn).

G.2.2 Scope of Duty of Care

2.155. On and from 26 January 1979, the *Control of Waters Ordinance 1938-1959 (CWO)*, as amended by the *Control of Waters Act 1978 (NT) (CWA)*:

- (a) made it an offence to:
 - (i) convey, or cause or permit to be conveyed, any rubbish, dirt, filth or other noisome thing into any watercourse or aquifer; or
 - (ii) cause the water of any sink, sewer or drain or any other filthy water belonging to him or under his control, to run or be brought into any watercourse or aquifer;
- (b) defined a "watercourse" to mean a river, stream, creek or natural channel along the bed of which water flows permanently, intermittently or occasionally; and
- (c) defined an "aquifer" to mean a geological formation which is capable of accepting, storing or transmitting water.

PARTICULARS

- (i) *As to subparagraph (a), CWO s 10 and CWA s 5(b).*
- (ii) *As to subparagraph (b), CWA s 10A.*
- (iii) *As to subparagraph (c), CWO s 2.*
- (iv) *As to subparagraph (d), CWA s 3(a).*

2.156. On and from 1 July 1992, the *Water Act 1992* (NT) (**WA NT**):

- (a) made it an offence for a person to cause, suffer or permit:
 - (i) waste (being a matter or thing, whether wholly or partly in a solid, liquid or gaseous state, which, if added to water, may pollute the water) to come into contact with water; or
 - (ii) water to be polluted.
- (b) defined “water” to mean water flowing or contained in a waterway and/or ground water or tidal water; and
- (c) defined “pollute” to mean directly or indirectly altering the physical, thermal, chemical, biological or radioactive properties of the water so as to render it less fit for a prescribed beneficial use for which it is or may reasonably be used, or to cause a condition which is hazardous or potentially hazardous to –
 - (i) public health, safety or welfare;
 - (ii) animals, birds, fish or aquatic life or other organisms; or
 - (iii) plants.

PARTICULARS

- (i) *As to sub paragraphs (a) and (b), WA NT s 16.*
- (ii) *As to sub paragraph (c), WA NT s 4(1).*

2.157. On and from 1 February 1999, the WMPCA:

- (a) obliged persons not to cause pollution that results in “environmental harm”, being any harm to or adverse effect, or potential harm to or potential adverse effect, on the environment (being land, air, water, organisms and ecosystem and including the well-being of humans, amenity values of an area and social, cultural and economic conditions), or that generates or is likely to generate waste (being a solid, liquid or gas, or mixture of such substances, that is or are left over, surplus or an unwanted by product from any activity), unless that person takes all measures that are reasonable and practicable to prevent or minimise the pollution or environmental harm and reduce the amount of waste;

- (b) defined “pollution” to mean:
 - (i) a contaminant or waste that is emitted, discharged, deposited or disturbed or that escapes; or
 - (ii) a contaminant or waste, effect or phenomenon, that is present in the environment as a consequence of an emission, discharge, deposition, escape or disturbance of a contaminant or waste;
- (c) made it an offence to pollute or intentionally pollute the environment, where:
 - (i) serious environmental harm results and the person knows, or ought reasonably be expected to know, that serious environmental or material environmental harm will or might result from the pollution;
 - (ii) material environmental harm results and the person knows, or ought reasonably be expected to know, that serious environmental or material environmental harm will or might result from the pollution;
- (d) defined “pollute” to mean:
 - (i) emit, discharge, deposit, or disturb, directly or indirectly, a contaminant or waste; or
 - (ii) cause, permit, or fail to prevent, directly or indirectly, the emission, discharge, deposition, disturbance or escape of a contaminant or waste;
- (e) defined “serious environmental harm” to mean harm that is more serious than material environmental harm and includes environmental harm that:
 - (i) is irreversible or otherwise of a high impact or on a wide scale;
 - (ii) damages an aspect of the environment that is of a high conservation value, high cultural value or high community value or is of special significance;
 - (iii) results or is likely to result in more than \$50,000 or the prescribed amount (whichever is greater) being spent in taking appropriate action to prevent or minimise the environmental harm or rehabilitate the environment; or
 - (iv) results in actual or potential loss or damage to the value of more than \$50,000 or the prescribed amount (whichever is greater);

- (f) defined “material environmental harm” to mean environmental harm that —
 - (i) is not trivial or negligible in nature;
 - (ii) consists of an environmental nuisance of a high impact or on a wide scale;
 - (iii) results, or is likely to result, in not more than \$50,000 or the prescribed amount (whichever is greater) being spent in taking appropriate action to prevent or minimise the environmental harm or rehabilitate the environment; or
 - (iv) results in actual or potential loss or damage to the value of not more than \$50,000 or the prescribed amount (whichever is greater); and
- (g) made it an offence to cause an environmental nuisance (being unreasonable interference with or likely unreasonable interference with the enjoyment of the area by persons who occupy a place within the area or are otherwise lawfully in the area).

PARTICULARS

- (i) *As to sub paragraph (a), WMPCA ss 4 and 12(1).*
- (ii) *As to sub paragraphs (b), (d), (e) and (f), WMPCA s 4.*
- (iii) *As to sub paragraph (c), WMPCA s 83.*
- (iv) *As to sub paragraph (g), WMPCA ss 4 and 83.*

2.158. At all material times:

- (a) from 26 January 1979 to 1 July 1992, the content of the CWO and CWA (as pleaded in paragraph 2.155);
- (b) from 1 July 1992, the content of the WA NT (as pleaded in paragraph 2.156); and
- (c) from 1 February 1999, the content of the WMPCA (as pleaded in paragraph 2.157),

bound the Commonwealth by reason of the *Commonwealth Places (Application of Laws) Act 1970* (Cth), and/or informed the scope of what a reasonably person ought do

in relation to conduct which it was reasonably foreseeable might result in environmental harm (including the Darwin Risk of Harm pleaded in paragraph 2.152).

2.159. The Commonwealth had the capacity to exercise control of the Darwin Training and Operations Activities and the use of AFFF Working Solution and AFFF on the Darwin Base so as to take the precautions which a reasonable person in its position would have taken against the Darwin Risk of Harm, by:

- (a) not doing the following acts at all, or alternatively any time after the date pleaded in paragraph each of Actual Knowledge Dates:
 - (i) allowing large quantities of AFFF Working Solution and AFFF to be discharged to bare ground;
 - (ii) allowing Spent AFFF and Fire Run-Off to flow directly onto bare ground in large quantities;
 - (iii) allowing Spent AFFF and Fire Run-Off to permeate or percolate into the soil at the Darwin Base;
 - (iv) allowing Spent AFFF and Fire Run-Off to be transmitted to the groundwater beneath the Darwin Base, including the Burrell Aquifer (where it was likely to mingle with groundwater underlying areas off-base in the Darwin Relevant Area);
 - (v) allowing Spent AFFF and Fire Run-Off to drain into the surrounding water catchment areas (including via the Darwin Drainage System), including into the Darwin Creeks;
 - (vi) allowing Spent AFFF and Fire Run-Off to be transmitted to the Darwin Creeks; and/or
 - (vii) to the extent it stored wastewater from the use of AFFF, doing so in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
- (b) doing the following things, at any time, or alternatively any time after each of the Actual Knowledge Dates:

- (i) investigating and assessing the risks associated with the use of AFFF Working Solution and AFFF before using, or continuing to use, AFFF Working Solution and AFFF (and not using them at all);
- (ii) restricting the use of AFFF Working Solution and AFFF only for emergency activities;
- (iii) taking steps to contain or limit the use of AFFF Working Solution and AFFF in the Darwin Training and Operations Activities;
- (iv) taking steps to contain, capture, clean up and securely dispose of Spent AFFF and Fire Run-Off, such that it did not:
 - (A) flow directly onto bare ground;
 - (B) permeate or percolate into the soil at the Darwin Base;
 - (C) become transmitted to the groundwater beneath the Darwin Base, including the Darwin Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Darwin Relevant Area);
 - (D) drain into the surrounding water catchment areas (including via the Darwin Drainage System), including into the Darwin Creeks; and transmit to the Darwin Harbour;
- (v) storing wastewater from the use of AFFF in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
- (vi) taking steps to remediate the contamination of the groundwater under the Darwin Base promptly after the time when it knew or ought reasonably to have known that groundwater was, or was likely to have been, contaminated, as pleaded in paragraphs 33 to 35 (to the extent, which is unknown to the Applicants, that the contamination may at one time have been remediable); and/or
- (vii) taking steps to remediate contaminated soil on Darwin Base at any time promptly after the time when it knew or ought reasonably to have known that soil was contaminated (including by removing that soil and disposing

of it at an off-site disposal area so as to prevent Spent AFFF and Fire Run Off leaching, or further leaching into the groundwater or surface water, (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable).

G.2.3 Scope of Duty to Warn

2.160. At all material times after the Darwin Contamination Knowledge Date, alternatively the Actual Knowledge Date, the Commonwealth had capacity to warn the general public, alternatively owners and residents of the Darwin Relevant Area, alternatively the market of potential purchasers of land in the Darwin Relevant Area (including Darwin Group Members) that:

- (a) it had been using AFFF Working Solution and AFFF at the Darwin Base since or about 1987;
- (b) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Darwin Base and entered and/or contaminated the Darwin Aquifers and/or contaminated the Darwin Creeks; and
- (c) Spent AFFF was:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans.

G.2.4 Breach of duty

2.161. By reason of the matters pleaded in paragraphs 2.43 to 2.82, 2.140 and 2.159, the Commonwealth breached the Darwin Duty of Care (the **Darwin Negligence**).

2.162. By reason of the matters pleaded in paragraphs 2.43 to 2.82, 2.141 and 2.160, the Commonwealth breached the Darwin Duty to Warn (the **Darwin Negligent Failure to Warn**).

G.2.5 Causation, loss and damage

2.163. The Commonwealth's Darwin Negligence caused:

- (a) the Darwin Surface Water Contamination (as pleaded in paragraph 2.95));
- (b) the Darwin Groundwater Contamination (as pleaded in paragraph 2.100);

- (c) the Darwin Soil Contamination (as pleaded in paragraph 2.102);
- (d) the Darwin Biota Contamination (as pleaded in paragraph 2.104); and/or
- (e) the Darwin Contamination Land Value Affectation (as pleaded in paragraph 2.129),

and Darwin Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *The particulars to paragraph 2.146 are repeated.*

2.164. Further, or alternatively, the Commonwealth's Darwin Negligent Failure to Warn caused or materially contributed to some Darwin Group Members acquiring land in the Darwin Relevant Area, and Darwin Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *Particulars of the identity of those Darwin Group Members who would not have acquired land were it not for the Commonwealth's Darwin Negligent Failure to Warn will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Darwin Group Members, and the particulars to paragraph 2.146 is repeated.*

G.2.6 Aggravated and exemplary damages

2.165. Further, on and from each of the Actual Knowledge Date by:

- (a) continuing to do the acts as pleaded in paragraph 2.139 and/or sub-paragraph 2.140(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 2.140(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 2.131 to 2.138, the Commonwealth engaged in aggravating conduct, and Darwin Group Members claim aggravated damages.

2.166. Further, or alternatively, on and from each of the Actual Knowledge Date by:

- (a) continuing to do the acts as pleaded in paragraph 2.139 and/or sub-paragraph 2.140(a) (and each of them); and/or

- (b) continuing to fail to do the things as pleaded in sub-paragraph 2.140(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 2.131 to 2.138, the Commonwealth engaged in conduct in contumelious disregard for the rights of Darwin Group Members, and Darwin Group Members claim exemplary damages.

G.3 Breach of statutory duty

G.3.1 Liability

2.167. The Darwin Base is situated on Commonwealth land as defined in ss 27 and 525 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**).

2.168. Pursuant to s 28 of the EPBC Act, the Commonwealth or a Commonwealth agency must not take an action that has, will have, or is likely to have a significant impact on the environment, defined by s 528 non-exhaustively to include:

- (a) ecosystems and their constituent parts, including people and communities;
- (b) natural and physical resources;
- (c) the qualities and characteristics of locations, places and areas;
- (d) heritage values of places; and
- (e) the social, economic and cultural aspects of a thing mentioned in paragraph (a), (b), (c) or (d).

2.169. By its use of the Darwin Base on and from 16 July 1999, as pleaded in paragraphs 2.43 to 2.82 and 2.139 and/or 2.140, the Commonwealth took an action or actions that has or is likely to have a significant impact on the environment.

PARTICULARS

- (i) *These actions have had such an impact by reason of the matters pleaded in paragraphs 2.92 to 2.1052.104, namely the Darwin Surface Water Contamination, Darwin Toxic Plume, the Darwin Groundwater Contamination, the Darwin Soil Contamination, and the Darwin Biota Contamination.*
- (ii) *These actions were likely to have such an impact by reason that they were reasonably foreseeable, by reason of the matters pleaded in paragraphs 2.38, 2.41, 2.85, 2.91 and 2.130.*

2.170. By reason of the matters pleaded in paragraph 2.169, the Commonwealth has contravened s 28 of the EPBC Act (**Darwin EPBC Act Breach**).

G.3.2 Causation, loss and damage

2.171. The Darwin EPBC Act Breach caused:

- (a) the Darwin Surface Water Contamination (as pleaded in paragraph 2.95);
- (b) the Darwin Groundwater Contamination (as pleaded in paragraph 2.100);
- (c) the Darwin Soil Contamination (as pleaded in paragraph 2.102);
- (d) the Darwin Biota Contamination (as pleaded in paragraph 2.104); and/or
- (e) the Darwin Contamination Land Value Affection (as pleaded in paragraph 2.129),

and Darwin Group Members have thereby suffered loss and damage arising from the Darwin EPBC Act Breach.

PARTICULARS

- (i) *The particulars to paragraph 2.146 are repeated.*

ANNEXURE 2A: DARWIN RELEVANT AREA



SCHEDULE 3 – RICHMOND BASE

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A THE RICHMOND BASE AND SURROUNDS

A.1 The Richmond Base

- 3.1. Since about 1925, the Commonwealth has continuously owned and occupied an area of land approximately 4.14 kilometres square in size, located in the Hawkesbury City Council local area, approximately 55 kilometres north west of the Sydney central business district, known as RAAF Base Richmond (the **Richmond Base**).

PARTICULARS

- (i) *AECOM Australia Pty Ltd, Detailed Site Investigation RAAF Base Richmond – PFAS Investigation (13 June 2018) (**AECOM DSI Report**) at paragraphs 1.2 and 2.1.*
- 3.2. Since about 1976, the Richmond Relevant Area was at times comprised of three distinct areas:
- (a) the Richmond Base including residential and commercial properties to the west;
 - (b) the Sewage Treatment Plant (**Richmond STP**) and Trade Waste Plant, located to the north of the Richmond Base; and
 - (c) Rickbys Creek Drop Zone, being a floodplain area, owned by the Commonwealth.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 2.1.*
- 3.3. Since about 1976, neighbouring land use in the region surrounding the Richmond Base has at times included:
- (a) in the north, semi-rural land and Bakers Lagoon;
 - (b) in the east, semi-rural land;
 - (c) in the south, agricultural land, residential, a racecourse and a golf club; and
 - (d) in the west, residential, a small industrial area and a primary school.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 2.2.*
- (ii) *AECOM Australia Pty Ltd Ecological Risk Assessment, November 2018 – RAAF Base Richmond PFAS Investigation (7 November 2018) (**AECOM ERA Report**) at paragraph 4.1.*

A.2 The natural features of the Richmond Base and surrounding area

A.2.1 Climate

- 3.4. At all material times, the Richmond Base and the Richmond Relevant Area were situated in a climate which had its highest rainfall levels between November and March each year.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 2.3.2.*

A.2.2 Topography

- 3.5. At all material times, the Richmond Base was situated on a series of wide, flat alluvial terraces occurring at varying elevations above the Hawkesbury River, which included:
- (a) an elevated formation, where the majority of the Richmond Base was situated (**Clarendon Formation**); and
 - (b) to the north and east of the Richmond Relevant Area, and located sharply beneath the Clarendon Formation, a flood plain terrace of the Hawkesbury River (**Lowlands Formation**).
- 3.6. At all material times, the Richmond Base sloped slightly towards the edge of the Clarendon Formation, to the north west, north and north east, and dropped sharply at the Lowlands Formation.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.3.1 and 5.5.1.*

A.2.3 Soils

- 3.7. At all material times, the Clarendon Formation was generally comprised of red-fawn coloured fine-grained clayey silt with increasing clay towards the base of the formation, and consisted of two broad units, being:
- (a) an upper unit, made up of firm-to-stiff clays, clayey silts and silts with low permeability; and
 - (b) a lower unit of fine sands, which was generally saturated and represented the main aquifer of the Clarendon Formation.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.3.3, 4.3 and 5.1.2, Table 7 and Figure 4.*

3.8. At all material times, the Lowlands Formation generally comprised an upper unit of orange-grey clay, silt and fine sand which was underlain by a gravel and coarse sand sub-unit.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.3.3, 4.3 and 5.1.1, Table 7 and Figure 4.*

A.2.4 Hydrology

3.9. At all material times, the Richmond Base was located within the Hawkesbury Nepean River catchment and was surrounded by a network of interconnected rural drains, lagoons, rivers and creeks, including:

- (a) Pughs Lagoon, located approximately 3 kilometres west of the Richmond Base;
- (b) Bakers Lagoon, located approximately 1 kilometre north of the Richmond Base;
- (c) Rickabys Creek, located to the south and east of the Richmond Base;
- (d) Cooleys Creek, located to the north of the Richmond Base; and
- (e) Hawkesbury River, located to the west, north and east of the Richmond Base (together, the **Richmond Surface Water Bodies**).

PARTICULARS

- (i) *AECOM DSI Report at paragraph 2.3.5.1.*

Surface water drainage

3.10. At all material times, surface water from the Richmond Base, was discharged to:

- (a) an interconnected network of rural drains located to the north, which were located adjacent to the Richmond STP, and which would subsequently discharge to Bakers Lagoon; and
- (b) from the south and east, directly into Rickabys Creek.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.1, 2.3.5.3, 2.8 and 4.5.1 and Table 11.*

3.11. At all material times, all surface water from the Richmond Base and Richmond Relevant Area ultimately discharged into the Hawkesbury River.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 2.8 and Table 11.*

3.12. At all material times, the features of the unnamed rural drains located to the north of the Richmond Base, included:

- (a) that it formed a network of tributaries that flowed through the Richmond Lowlands; and
- (b) its surface water flowed generally in an easterly direction and intersected Rickabys Creek and the Hawkesbury River.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 2.3.5.3.*

3.13. At all material times, the features of Rickabys Creek included:

- (a) its surface water flowing generally in a northerly direction; and
- (b) at the eastern boundary of the Rickabys Drop Zone, it combined with the network of rural drains in the north, which combined and flowed generally in a north eastern direction towards the Hawkesbury River.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 2.3.5.3.*

3.14. At all material times, the features of Cooleys Creek included:

- (a) a series of ephemeral, unnamed rural drains to the west and north west of the Richmond Lowlands forming a surface water network that drained into Bakers Lagoon;
- (b) transferring treated effluent from the Richmond STP through an underground pipe and discharging into Bakers Lagoon; and
- (c) at the southern boundary of Bakers Lagoon, surface water flowing in an easterly direction through rural properties before joining the Hawkesbury River.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.3.5.3 and 4.5.1 and Table 29.*

3.15. At all material times, the features of Hawkesbury River included:

- (a) forming at approximately 7 kilometres from the southwest of the Richmond Base;
- (b) receiving surface water from Cooleys Creek and Rickabys Creek; and
- (c) flowing in a north easterly direction and being tidally influenced.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.3.5.3 and 4.5.1 and Table 29.*

A.2.5 Hydrogeology

3.16. At all material times, the hydrogeology of the Richmond Base and Richmond Relevant Area comprised fractured rock aquifers and younger tertiary unconsolidated aquifers, which included:

- (a) a fractured rock aquifer, the Hawkesbury Sandstone Aquifer which was historically the most reliable water source in the region with uses for irrigation, stock water and domestic purposes; and
- (b) two unconsolidated aquifers, being:
 - (i) the Clarendon Formation Aquifer (**Clarendon Formation Aquifer**); and
 - (ii) the Lowlands Formation Aquifer (**Lowlands Formation Aquifer**),

(together, the **Richmond Aquifers**).

3.17. At all material times, the Clarendon Formation Aquifer:

- (a) was a semi-confined aquifer;
- (b) was highly permeable;
- (c) provided an accessible groundwater supply to the Richmond Base and the Richmond Relevant Area which bore water in a lithology consisting of silty sand, coarse sand and coarse gravel; and
- (d) had a groundwater flow:

- (i) to the north east towards the northwest tributaries of Rickabys Creek, Bakers Lagoon and the Hawkesbury River; and
- (ii) into the Lowlands Formation Aquifer.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.3.4, 2.3.4.1, 2.3.4.2, 2.8 and 5.3.1 and Table 11.*

3.18. At all material times, the Lowlands Formation Aquifer:

- (a) was predominately an unconfined aquifer;
- (b) provided an accessible groundwater supply to the Richmond Base and the Richmond Relevant Area, which bore water in a lithology consisting of silty fine sands and minor gravelly sands;
- (c) had an inferred groundwater flow to the north east towards the northwest tributaries of Rickabys Creek, Bakers Lagoon and the Hawkesbury River; and
- (d) contained notable lateral and vertical lithology variation, which resulted in a range of hydraulic connectivity including with the Lowlands Formation Aquifer.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.3.4, 2.3.4.1, 2.3.4.2, 2.8, 5.3.1 and 5.3.6 and Table 11.*

3.19. At all material times, the Lowlands Formation Aquifer and the Clarendon Formation Aquifer were interconnected at the boundary of the upper terrace and lower floodplain terrace, where the permeable, silty sand and fine sand of the Lowlands Formation Aquifer was adjacent to the saturated sand of the lower unit in the Clarendon Formation.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 5.3.1.*

Groundwater flow

3.20. At all material times, the groundwater of the Richmond Base and Richmond Relevant Area flowed:

- (a) to the north east towards the Hawkesbury River; and

- (b) adjacent to the north western boundary of the Richmond Base, in a north westerly direction towards the unnamed drain.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 4.4.3 and 5.3.*

The interaction of surface water and groundwater

3.21. At all material times, the groundwater and surface water at the Richmond Base and Richmond Relevant Area interacted with each other, including at:

- (a) Cooleys Creek, which was a losing creek, that is, discharges to groundwater;
- (b) Rickabys Creek, which was both a losing creek and gaining creek, that is both discharges to, and receives from, groundwater; and
- (c) the unnamed drain, which was a losing creek.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 5.3.2 and Table 48.*

3.22. At all material times, the groundwater in the Richmond Relevant Area was predominately recharged by surface water through rainwater infiltration and surface water run-off.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 5.3.2.*

3.23. At all material times, the level of interaction and discharge between the groundwater and surface water at the Richmond Base and Richmond Relevant Area, was influenced by:

- (a) the varying levels of permeability at different depths of the Clarendon Formation Aquifer and the Lowlands Formation Aquifer;
- (b) the variability of the presence of silts, clays and gravels;
- (c) the interaction with man-made drains and Richmond Surface Water Bodies;
- (d) the significance of rainfall events and flooding; and
- (e) the levels of irrigation.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 2.8 and Table 11.*

A.2.6 Flooding

- 3.24. At all material times, the Richmond Base and Richmond Relevant Area was located on a flood plain and subject to flooding events including at times of heavy rainfall.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 4.1 and 5.5.5.*

- 3.25. At all material times, flood waters would collect and pool on the Richmond Relevant Area, and inundate the Richmond Relevant Area.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 4.1.*

- 3.26. At all material times, flooding of the Richmond Base and Richmond Relevant Area, would:

- (a) transport surface water from the Richmond Base;
 - (i) via the tributaries of Rickaby Creek to the north of the Richmond Base or onto the Richmond Lowlands; and
 - (ii) via Rickaby Creek to the east of the Richmond Base, which might cause localised flooding to the creek; and
- (b) as a result of flooding to the Hawkesbury River, disperse surface water to Bakers Lagoon, the tributaries of Rickaby Creek and Rickaby Creek throughout the Richmond Lowlands.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 5.5.5.*

- 3.27. At all material times, by reason of the matters pleaded in paragraphs 3.5 to 3.26, the Richmond Base and the Richmond Relevant Area were prone to flooding, associated overland flow, which resulted in the discharge of surface water to groundwater and groundwater to surface water.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.1, 2.3.1, 2.3.3, Table 7, Figure 4, paragraphs 2.3.4, 2.3.4.1, 2.3.4.2, 2.3.5.1, 2.3.5.3, 2.8, Table 11, paragraphs 4.1, 4.3, 4.4.3, 4.5.1, Table 29, paragraphs 5.1.1, 5.1.2, 5.3, 5.3.1, 5.3.2, Table 48, paragraphs 5.3.6, 5.5.5 and Tables 7, 11, 29 and 48 and Figure 4.*

A.3 The artificial water-related features of the Richmond Base

3.28. At all material times, the features of the drainage systems at the Richmond Base included:

- (a) several formed surface water drainage networks, constructed wetland systems and settlement ponds;
- (b) an airside surface water swale drain system which was upgraded in 2016 to address surface water ponding in localised topographic depressions and stormwater erosion; and
- (c) a network of engineered open swale drains, underground stormwater pipes, pits, culverts and detention storage, designed to define surface water catchments on the Richmond Base,

(together, the **Richmond Drainage System**).

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.3.5.2 and 4.5.1.*
- (ii) *Further particulars of the Richmond Drainage System and other drainage systems on the Richmond Base may be provided after discovery and inspection.*

3.29. At all material times, the catchments of the Richmond Base included:

- (a) Catchment A, which was located to the north east, discharged to the constructed wetlands system on Rickabys Drop Zone, and ultimately was received by Rickabys Creek and the Hawkesbury River;
- (b) Catchment B, which was located to the east, comprised mostly open grassed areas, discharged to a drainage channel off-site, and ultimately was received by Rickabys Creek and the Hawkesbury River;

- (c) Catchment C, which was the predominant catchment of the Richmond Base, discharged to the settlement pond on Rickabys Drop Zone, and ultimately discharged to Rickabys Creek and the Hawkesbury River;
 - (d) Catchment D, which was located to the north west, grass covered, discharged to an open drain to the west of the Richmond STP Settlement Ponds before discharging off-site to a rural drain, and ultimately discharged to the north western tributary of Rickabys Creek, Rickabys Creek and the Hawkesbury River;
 - (e) Catchment E, which was located to the north, discharged to a stormwater system before discharging off-site to the north of the Richmond STP into a rural drain, and ultimately discharged to the north western tributary of Rickabys Creek, Rickabys Creek and the Hawkesbury River;
 - (f) Catchment F, which was located to the north, discharged to a stormwater system before discharging off-site to the north of the Richmond STP into a rural drain, and ultimately discharged to the north western tributary of Rickabys Creek, Rickabys Creek and the Hawkesbury River; and
 - (g) Catchment G, which was located to the north east, discharged to a constructed wetland system on Rickabys Drop Zone, and ultimately discharged to the north western tributary of Rickabys Creek, Rickabys Creek and the Hawkesbury River,
- (together, the **Richmond Base Catchments**).

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.3.5.2 and 4.5.1 and Table 9.*

3.30. From about 1976, Since about 1976 the Richmond Relevant Area had registered bores which at times has included:

- (a) located north west of the Richmond Base:
 - (i) 13 groundwater bores identified as irrigation bores;
 - (ii) 1 groundwater bore identified as a recreational bore; and
 - (iii) 1 groundwater bore identified as a stock watering bore;

- (b) located south west of the Richmond Base, 1 groundwater bore identified as having intended purpose as a stock and domestic bore; and
- (c) located west of the Richmond Base, 2 groundwater bores identified as a stock and domestic bore.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 4.4.1.*
- (ii) *The best particulars the Applicants can provide of the bores which exist on the Richmond Base are contained in the AECOM DSI Report at paragraph 4.4.1 and Figure 29 Registered groundwater bores.*

A.4 The foreseeable flow of water from the Richmond Base

3.31. At all material times, by reason of the matters pleaded in paragraphs 3.5 to 3.30 it was reasonably foreseeable that waters, liquids, and soluble materials discharged on Richmond Base would:

- (a) permeate, percolate or leach into the soil at the Richmond Base;
- (b) be transmitted to the groundwater beneath the Richmond Base, including into the Richmond Aquifers and mingle and flow with that groundwater (including in a general direction towards the Hawkesbury River);
- (c) mingle with other surface water on the Richmond Base (especially after periods of rain), and flow overland towards the Richmond Surface Water Bodies and:
 - (i) permeate or percolate into the soil over which the surface water overland flows occurred; and
 - (ii) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including into the Richmond Aquifers; and
- (d) be transmitted to the Richmond Surface Water Bodies.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.3.5.2 and 4.5.1 and Table 9.*

B WATER USE AT THE RELEVANT AREA

B.1 Richmond Surface Water Bodies

3.32. At all material times, the Richmond Surface Water Bodies, including the Hawkesbury River have been used by residents of the Richmond Relevant Area for:

- (a) fishing (including for bait and food), swimming, boating or other recreational purposes;
- (b) irrigation; and
- (c) stock water,

(together, the **Richmond Surface Water Usages**).

PARTICULARS

- (i) *AECOM DSI Report at paragraph 4.1 and Table 21.*

B.2 Groundwater

3.33. At all material times, groundwater from the Richmond Aquifers has been used by Richmond Group Members for:

- (a) drinking;
- (b) swimming, boating, fishing or other recreational purposes;
- (c) domestic purposes (including cooking, bathing, showering, washing, and cleaning);
- (d) irrigation purposes; and
- (e) watering of livestock.

(together, the **Richmond Groundwater Usages**).

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.5 and 4.1.*
- (ii) *AECOM Australia Pty Ltd, Human Health Risk Assessment, November 2018 - RAAF Base Richmond PFAS Investigation (7 November 2018 (**AECOM HHRA Report**) at paragraphs 3.1 and 5.1.2.1.*

- 3.34. At all material times, some Richmond Group Members in the Richmond Relevant Area had private bores on their land which drew water from the Richmond Aquifers (**Private Richmond Bores**) and engaged in the Richmond Groundwater Usages.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 4.1 and Table 22.*
- (ii) *The best particulars the Applicants can provide of the private bores in the Richmond Relevant Area are contained in the AECOM DSI Report at paragraph 4.4.1 and Figure 29 of Appendix A (which is a map of 18 registered bores, but which does not take into account unregistered bores).*
- (iii) *Some private bores are registered while some are unregistered. The identity of all those Richmond Group Members who have private bores will be particularised following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Richmond Group Members.*
- (iv) *AECOM HHRA Report at paragraph 3.1.*

B.3 The foreseeable usage of water emanating from the Richmond Base

- 3.35. At all material times, by reason of the matters pleaded in paragraphs 3.31 to 3.34 above, it was reasonably foreseeable that waters, liquids, and soluble materials discharged and/or allowed to escape the Richmond Base which were transmitted to the Richmond Surface Water Bodies and/or the Richmond Aquifers would be used by residents of the Richmond Relevant Area.

C THE COMMONWEALTH'S USE OF AFFF AT THE RICHMOND BASE

C.1 Introduction

- 3.36. At all material times since the establishment of the Richmond Base, the Commonwealth has been responsible for conducting all of the activities conducted at the Richmond Base.

C.2 The Commonwealth's use of AFFF

- 3.37. As part of the operation of the Richmond Base, and since at least in or around 1976 the Commonwealth has regularly conducted fire drills, firefighting training, fire tests, mock emergency aircraft landing and accident drills, foam training, equipment testing (including the testing of nozzles, firefighting trucks, and fire suppression systems), firefighting, fire suppression, and like operations (both on and near the Richmond Base)

including responding to operational and emergency needs (**Richmond Training and Operations Activities**).

PARTICULARS

- (i) *AECOM DSI Report at paragraph 8.1.*
- (ii) *Further particulars may be provided after discovery and inspection.*

3.38. At all material times in the period since in or about the date referred to in paragraph 3.37 until a time unknown to the Applicants after about 2004, in the use and occupation of the Richmond Base for the purpose of the Richmond Training and Operations Activities, the Commonwealth:

- (a) used AFFF Concentrate;
- (b) mixed the AFFF Concentrate with water to create AFFF Working Solution; and
- (c) aspirated the AFFF Working Solution into a foam via nozzles on firefighting trucks and other mechanisms (the aspirated foam being known as AFFF).

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 1.2 and 2.4.1.*
- (ii) *Particular (i) to paragraph 13 of the Statement of Claim is repeated: the AFFF Concentrate used was principally a product known as “Light WaterTM” (being manufactured by the Minnesota Mining and Manufacturing Company (now known as 3M Company) and/or its subsidiary 3M Australia Pty Ltd) .*
- (iii) *At a time unknown to the Applicants in about 2003 or 2004, the Commonwealth transitioned to using “Ansulite”.*

3.39. The Richmond Training and Operations Activities included those in and around:

- (a) the location known as the former fire training ground (**Richmond Former Fire Training Ground**);
- (b) the location known as Hangar 54 (**Richmond Hangar 54**);
- (c) the location known as former fuel farm 1 (**Richmond Former Fuel Farm 1**);
- (d) the Richmond STP;
- (e) the various locations of airfield foam cannon testing, including the Airfield Foam Cannon Testing Area (**Richmond Testing Areas**); and

- (f) the various locations of vehicle maintenance operations.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.4.2 and 2.6.1.*
- (ii) *Further particulars may be provided after discovery and inspection.*

Richmond Former Fire Training Grounds

3.40. At all material times, the Richmond Former Fire Training Grounds:

- (a) was located in the west of the Richmond Base, and was the principal location of Richmond Training and Operations Activities that involved the use of AFFF;
- (b) contained an adjacent disused underground storage tank which was installed during World War II and was used for the storage of AFFF;
- (c) was decommissioned at some time prior to 1988, but the Richmond Training and Operations Activities continued there beyond this time, as alternate training grounds were not constructed by that time; and
- (d) discharged groundwater interpolated to flow in a northerly and north easterly direction within the Clarendon Formation Aquifer.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.4.2, 5.4.1.1 and 6.2.1.1.*

Richmond Hangar 54

3.41. The Richmond Hangar 54:

- (a) at all material times from about 1982, contained a foam deluge system that was used to test vehicles;
- (b) at all material times contained four storage tanks that held 2,000 to 3,000 litres of AFFF Concentrate; and
- (c) had groundwater beneath it which was interpolated to flow in a north easterly direction within the Clarendon Formation Aquifer.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.4.4, 2.4.5, 5.4.1.4 and 6.2.1.1.*

Richmond Former Fuel Farm 1

3.42. The Richmond Training and Operations Activities at Richmond Former Fuel Farm 1 included:

- (a) in the 1980s and 1990s, the discharge of AFFF from the foam deluge system;
- (b) at all material times the discard onto grassed areas of up to 900 litres at a time of AFFF Concentrate that did not meet specifications; and

3.43. Groundwater at the Richmond Former Fuel Farm 1 was interpolated to flow in an easterly direction within the Clarendon Formation Aquifer.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.4.3, 2.4.4, 2.4.7, 5.4.1.2 and 6.2.1.1.*

Richmond Testing Areas

3.44. The Richmond Training and Operations Activities at the Richmond Testing Areas included the application of 40 to 60 litres per serviceable vehicle, for testing purposes:

- (a) between 1976 and 1988, on a weekly basis, anywhere on the airfield;
- (b) from 1992 to 1995, on a weekly basis, in the vicinity of the flying club; and
- (c) between 2001 and 2017, on a monthly basis, at the Richmond Airfield Foam Cannon Testing Area.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.4.4 and 6.2.1.1.*

Richmond Additional Areas

3.45. Since about 1976, the additional locations around the Richmond Base that the Richmond Training and Operations Activities occurred at times included:

- (a) the Richmond STP, where groundwater was interpolated to flow in a north easterly direction within the Lowlands Formation Aquifer;

- (b) the locations where combatant personnel training was conducted, which occurred every week between 1980 and 2002, and involved the use of two 10 litre hand-held extinguishers that contained AFFF;
- (c) the storage location of 400 fire extinguishers that contained AFFF, and foam generators holding 10 litre AFFF Concentrate;
- (d) the grassed areas of the airfield, where AFFF was regularly discarded; and
- (e) the location of vehicle maintenance works,

(together, the **Richmond Additional Areas**)

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.4.2, 2.4.3, 2.4.5, 2.4.6, 2.4.7, 5.4.1.5, 5.5.3.1.5 and 6.2.1.1.*
- (ii) Further particulars may be provided after discovery and inspection.

3.46. By reason of the matters pleaded in paragraphs 3.37 to 3.45 above, the Richmond Training and Operations Activities resulted in:

- (a) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground at the Richmond Base; and/or
- (b) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with Fire Run-Off, being discharged, or allowed to escape, to bare ground at the Richmond Base.

C.3 The Commonwealth's methods for disposal of Spent AFFF

3.47. At all material times:

- (a) Spent AFFF; and/or
- (b) Fire Run-Off co-mingled with Spent AFFF,

was generally directed by the Commonwealth towards bare ground or the Richmond Drainage System.

PARTICULARS

- (i) *Paragraphs 3.37 to 3.46 are repeated.*

- (ii) *The Applicants do not, with their present state of knowledge, know the quantities of Spent AFFF and/or Fire Run-Off directed to bare ground and the Richmond Drainage System.*
- (iii) *Further particulars may be provided after discovery and inspection.*

3.48. At all material times, to the extent that:

- (a) AFFF discharged in the course of the Richmond Training and Operations Activities; and/or
- (b) Fire Run-Off co-mingled with Spent AFFF,

was directed by the Commonwealth to the Richmond Drainage System they were ineffective to ensure that liquids contained in them did not leak into the soil below and around them.

C.4 Physical properties of AFFF and Spent AFFF

3.49. Paragraph 15 is repeated.

3.50. Paragraph 16 is repeated.

C.5 The foreseeable flow of Spent AFFF from the Richmond Base

3.51. At all material times, by reason of the matters pleaded in paragraphs 3.4 to 3.35 and 3.49 to 3.50 above, it was reasonably foreseeable that use of AFFF Working Solution and AFFF on the Richmond Base as pleaded in paragraphs 3.37 to 3.46 and/or 3.47 to 3.48 above would result in Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF:

- (a) being transmitted to the groundwater beneath the Richmond Base, including the Richmond Aquifers and mingle and flow with that groundwater (including in a general direction towards the Hawkesbury River), and being utilised by persons engaged in the Richmond Groundwater Usages;
- (b) mingling with other surface water on the Richmond Base (especially after periods of rain), and flowing overland towards and into the surrounding Richmond Surface Water Bodies outside the Richmond Base (including the Hawkesbury River) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and

- (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Richmond Aquifers;

and being extracted and utilised by persons engaged in the Richmond Groundwater Usages; and
- (c) mingling with other surface water on the Richmond Base (especially after periods of rain), and flowing overland towards and into the surrounding Richmond Surface Water Bodies outside the Richmond Base (including the Hawkesbury River and then being utilised by persons engaged in the Richmond Surface Water Usages.

D THE TOXIC PROPERTIES OF SPENT AFFF

D.1 The potential for AFFF to harm humans and the environment

- 3.52. Paragraph 18 is repeated.
- 3.53. Paragraph 19 is repeated.
- 3.54. Paragraph 20 is repeated.
- 3.55. Paragraph 21 is repeated.
- 3.56. Paragraph 22 is repeated.

D.2 The foreseeable flow and transmission of a toxic substance

- 3.57. At all material times, by reason of the matters pleaded in paragraphs 3.4 to 3.35 and 3.49 to 3.50 and 3.52 to 3.56 above, it was reasonably foreseeable that the use of AFFF on the Richmond Base as pleaded in paragraphs 3.37 to 3.46 and/or 3.47 to 3.48 above would result in an unnatural soluble substance containing synthetic chemicals:
 - (a) permeating or percolating into the soil at the Richmond Base;
 - (b) being transmitted to the groundwater beneath the Richmond Base, including the Richmond Aquifers and mingling and flowing with that groundwater (including in a general direction towards the Hawkesbury River);
 - (c) mingling with other surface water on the Richmond Base (especially after periods of rain), and flowing overland towards and into the surrounding

Richmond Surface Water Bodies outside the Richmond Base (including the Hawkesbury River) and:

- (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Richmond Aquifers; and
- (d) being transmitted to the Richmond Surface Water Bodies.

E THE CONTAMINATION OF THE RELEVANT AREA

E.1 The contamination of the Richmond Surface Water Bodies

3.58. PFCs and PFC Contaminants have been detected in the Richmond Surface Water Bodies.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 8.1, 13.1 and 14.2.2.*
- 3.59. The contamination of the Richmond Surface Water Bodies with PFCs and PFC Contaminants is the result of discharged AFFF Working Solution and AFFF on the Richmond Base resulting in Spent AFFF:
- (a) permeating or percolating into the soil at the Richmond Base;
 - (b) being transmitted to the groundwater beneath the Richmond Base, including the Richmond Aquifers and mingling and flowing with that groundwater (including in a general direction towards the Hawkesbury River);
 - (c) mingling with other surface water on the Richmond Base (especially after periods of rain), and flowing overland towards and into the surrounding Richmond Surface Water Bodies outside the Richmond Base (including the Hawkesbury River) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and

- (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Richmond Aquifers; and
- (d) being transmitted to the Richmond Surface Water Bodies.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.8, 2.9.1, 4.5, 5.5.2 and 6.3.*
 - (ii) *AECOM ERA Report at paragraph 4.4.*
- 3.60. By reason of the matters pleaded in paragraph 3.58 and 3.59 above, the water in the Richmond Surface Water Bodies has become, and is likely to continue to remain, contaminated by, and a receptor of, PFC Contaminants originally emanating from the Richmond Base.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 4.10 and 4.10.1.*
- 3.61. By reason of the matters pleaded in paragraphs 3.58 to 3.60 above, water in the Richmond Surface Water Bodies have become, and will continue and remain, potentially hazardous and unfit for the Richmond Surface Water Usages (the **Richmond Surface Water Contamination**).

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.8, 2.9.1, 4.5, 5.5.2 and 6.3.*
- 3.62. There is no practical or cost-effective way of remediating the Richmond Surface Water Contamination.

E.2 The contamination of the Groundwater

- 3.63. PFCs and PFC Contaminants emanating from the Richmond Base have been identified in the Richmond Aquifers and under the Richmond Relevant Area (or part thereof) extending across 2 kilometres (from the southern extent to the northern extent) and 5 kilometres wide (across the axis of migration) (the **Richmond Toxic Plume**).

PARTICULARS

- (i) *AECOM DSI Report at paragraph 7.0.*
- 3.64. The Richmond Toxic Plume is the result of discharged AFFF Working Solution and AFFF on the Richmond Base resulting in Spent AFFF:

- (a) permeating or percolating into the soil at the Richmond Base;
- (b) being transmitted to the groundwater beneath the Richmond Base, including the Richmond Aquifers and mingling and flowing with that groundwater (including in a general direction towards the Hawkesbury River);
- (c) mingling with other surface water on the Richmond Base (especially after periods of rain), and flowing overland towards and into the surrounding water catchment areas outside the Richmond Base (including the Hawkesbury River) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Richmond Aquifers; and
- (d) being transmitted to the Richmond Surface Water Bodies.

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 2.8, 2.9.1, 4.5, 5.4.2 and 6.3.*

3.65. By reason of the matters pleaded in paragraphs 3.63 and 3.64, groundwater in the Richmond Aquifers and beneath the Richmond Relevant Area (including under land owned by many Richmond Group Members) has become, and is likely to continue to remain, contaminated by, and a receptor of, PFC Contaminants originally emanating from the Richmond Base.

PARTICULARS

- (i) *The PFC Contaminant concentrations measured in groundwater (predominately PFOS and PFHxS) in the Richmond Relevant Area exceed the adopted screening criteria for drinking water usages and is subject to certain specific health precautions issued by the Commonwealth in respect of drinking water and, if used for such purposes, eating meat from livestock or eggs from poultry watered with the groundwater.*
- (ii) *The groundwater in the Richmond Aquifers has been contaminated with high levels of PFC Contaminants: AECOM HHRA Report at paragraphs 4.8, 7.3.4, 7.5, Table 32 and Table T2 of Appendix B.*

- (iii) *Particulars of the contamination of the groundwater under the land of Richmond Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Richmond Group Members.*

3.66. By reason of the matters pleaded in paragraph 3.65, groundwater in the Richmond Aquifers and beneath the Richmond Relevant Area (including land owned by Richmond Group Members) has become, and is likely to continue to remain, potentially hazardous and unfit for the Richmond Groundwater Usages (the **Richmond Groundwater Contamination**).

PARTICULARS

- (i) *The groundwater in the Richmond Aquifers is potentially hazardous and unfit for drinking: Parts D.1 above and E.5 below are repeated.*
- (ii) *The groundwater in the Richmond Aquifers is potentially hazardous and unfit for:*
 - (A) *irrigation purposes because such usages result in the further spreading of PFC Contaminants to soils and uptake by plants, vegetables and fruits, and the exposure of people to PFC Contaminants: Parts D.1 above and E.5 below are repeated.*
 - (B) *watering of livestock (including chickens) because such usages may result in the further spreading of PFC Contaminants to soils, uptake of PFC Contaminants by the livestock and the exposure of people to PFC Contaminants (particularly by consumption of livestock and eggs): Parts D.1 above and E.5 below are repeated.*
 - (C) *swimming, domestic purposes, and water supply because such usages may result in the further exposure of people to PFC Contaminants: Parts D.1 above and E.5 below are repeated.*
- (iii) *AECOM HHRA Report at paragraphs 4.8, 7.3.4 and 7.5.*
- (iv) *Further particulars of the contamination of the groundwater in the Richmond Aquifers under the Richmond Group Members' land will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Richmond Group Members.*

3.67. There is no practical or cost-effective way of remediating the Richmond Toxic Plume, or the Richmond Groundwater Contamination.

3.68. Further, there is no practical, cost-effective or reliable alternative water supply to the Richmond Aquifers for:

- (a) irrigation;
- (b) watering of livestock; and
- (c) use by some Richmond Group Members who do not have and/or have never had a mains water supply.

PARTICULARS

- (i) *AECOM HHRA Report at paragraphs 4.8, 7.3.4 and 7.5.*

E.3 The contamination of soil in the Richmond Relevant Area

3.69. Soil on the land within the Richmond Relevant Area (including soil on land owned by Richmond Group Members) has become, and is likely to continue to become and remain, contaminated by PFC Contaminants emanating from the Richmond Base (the **Richmond Soil Contamination**) by:

- (a) overland flows of surface water commingled with Spent AFFF (containing PFC Contaminants) from the Richmond Base; and
- (b) discharge or application of groundwater containing PFC Contaminants extracted from the Richmond Aquifers by persons engaged in Richmond Groundwater Usage to the soils (by, in particular, irrigation).

PARTICULARS

- (i) *Particulars of the contamination of the soils on lands of Richmond Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Richmond Group Members.*

3.70. There is no practical or cost-effective way of remediating the Richmond Soil Contamination.

E.4 The Richmond Biota Contamination

3.71. Extensive other aspects of the biotic and abiotic matrices within the Richmond Relevant Area (including on land owned by Richmond Group Members) have become and are likely to continue to remain, contaminated by PFC Contaminants, and be recirculated indefinitely within the Richmond Relevant Area (the **Richmond Biota Contamination**).

PARTICULARS

- (i) *AECOM DSI Report at paragraphs 9.5.1, 9.5.2 and 9.5.3.*
- (ii) *Ingestion of produce (including livestock and eggs) irrigated with impacted groundwater (or impacted surface water) and/or fish from the Richmond Surface Water Bodies are secondary sources of PFC contamination: AECOM HHRA at paragraph 7.3.4.*
- (iii) *Secondary sources of PFC contamination, leading to further redistribution of contamination and creation of additional exposure pathways for ongoing contamination of the biota generally (including humans): Braunig J, Baudel C, Heffernan A et al, Fate and redistribution of perfluoroalkyl acids through AFFF-impacted groundwater (2017).*

3.72. There is no practical, cost-effective way of remediating the Richmond Biota Contamination.

E.5 The announcement of the contamination

3.73. On a date shortly before 12 December 2016, the Commonwealth published a document titled 'Department of Defence, RAAF Base Richmond (October 2016)' (the **Richmond Contamination Announcement**) which stated:

- (a) the Richmond Base had a legacy of using AFFF for emergency firefighting situations and fire fighter training;
- (b) in 2004, the Commonwealth commenced phasing out its use of AFFF containing PFOS and PFOA as active ingredients;
- (c) PFOS and PFOA belong to a group of chemicals known as per- and poly-fluoroalkyl substances (**PFAS**) and until recently, PFAS were known as 'perfluorinated chemicals' or 'PFCs';
- (d) PFAS were an emerging concern around the world because they are persistent in the environment;
- (e) that because PFAS persist in humans and the environment, it was recommended that human exposure be minimised;
- (f) based on the outcome of preliminary sampling, it had been determined that RAAF Base Richmond would be subject to a detailed environmental investigation;
- (g) that the detailed environmental investigation would include:

- (i) reviewing the historical use, storage and management of AFFF to identify potential sources of PFAS;
 - (ii) sampling soil, sediment, surface water, and groundwater on and off the Richmond Base to identify PFAS exposure in the vicinity;
 - (iii) identifying pathways and receptors for the potential migration of PFAS;
 - (iv) community and stakeholder engagement, including a water-use survey;
 - (v) a human health and ecological risk assessment (if required) to evaluate potential risks to the human population and ecology, and inform future action to mitigate risks;
- (h) when detailed environmental investigation reports were finalised and publicly released, residents, businesses, and local stakeholders would be consulted;
- (i) that a community briefing and information activity would be conducted prior to the commencement of the detailed environmental investigation at the Richmond Base; and
- (j) alternative sources of drinking water were being provided to eligible residents located in close proximity to the Richmond Base who did not have a town water connection, and relied on the use of a bore for drinking water, as well as to residents whose drinking water was sourced from a rainwater tank which contained or did contain bore water, and to residents in other exceptional circumstances.

PARTICULARS

- (i) *The Richmond Contamination Announcement is published on:*
<https://www.defence.gov.au/Environment/PFAS/Docs/General/PSPFactSheets/PSPFactSheetRichmondFinal.pdf>

3.74. On or around 12 December 2016, the Commonwealth convened a community briefing (the **Richmond December 2016 Community Information Session**) at which its representatives made the following statements:

- (a) there was a history of AFFF being used at the Richmond Base in emergency firefighting situations and for fire fighter training;

- (b) the AFFF that had been used at the Richmond Base contained PFAS—namely including perfluorooctane and perfluorooctanoic acid;
- (c) PFAS were a class of manufactured chemical that had been used to make products that resist heat, stains, grease, and water;
- (d) PFAS were a concern around the world because they persist in the environment;
- (e) the Commonwealth commenced using AFFF containing PFOS/PFOA from the 1970s;
- (f) the Commonwealth was aware that PFOS/PFOA was an emerging persistent organic pollutant;
- (g) PFAS had been detected in surface water samples collected from locations on the Richmond Base;
- (h) alternative sources of drinking water were being provided to eligible residents;
- (i) a detailed environmental investigation would be undertaken to determine the nature and extent of PFAS on and in the vicinity of the Richmond Base; and
- (j) a human health and ecological risk assessment would be undertaken (if required) to evaluate risks to human health and ecology, and to inform future action to mitigate risks.

PARTICULARS

- (i) *The Richmond December 2016 Community Information Session was held on 12 December 2016 at which a slideshow presentation entitled “PFAS Investigation and Management: Community Information Session – RAAF Base Richmond Environmental Investigation” dated 12 December 2016, was made (**Richmond December 2016 Presentation**). The Richmond December 2016 Presentation is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Richmond/Presentations/PresentationCommunityWalkinSession12December.pdf>
- (ii) *Each of the statements in subparagraphs (a) to (j) was made in writing in the Richmond December 2016 Presentation, and/or spoken to orally at the Richmond December 2016 Community Information Session by representatives of the Commonwealth.*

3.75. In August 2017, the Commonwealth published a factsheet titled 'Community Update Factsheet: PFAS Investigation & Management Program' (**Richmond August 2017 Factsheet**) which advised as follows:

- (a) a detailed environmental investigation was being conducted into the presence of PFAS on and in the vicinity of the Richmond Base;
- (b) stage one of the investigation, being the preliminary site investigation (known as a **PSI**) has been completed which involved a historical review of AFFF use and storage to identify on-base sources, develop an understanding of migration pathways of PFAS from the source and identify potential receptors; and
- (c) a detailed site investigation (known as a **DSI**) commenced in August 2017 and will involve on and off-base sampling.

PARTICULARS

- (i) *The Richmond August 2017 Factsheet is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Richmond/Factsheets/20170907RAAFBaseRichmondFactsheetSeptemberCWIS.pdf>

3.76. In June 2018, the Commonwealth published a factsheet titled 'RAAF Base Richmond – Detailed Site Investigation Findings: PFAS Investigation and Management Program' (the **Richmond June 2018 Factsheet**), advising as follows:

- (a) the DSI in relation to the Richmond Base (**Richmond DSI**) has been completed;
- (b) the Richmond DSI involved the sampling of soil, sediment, surface water and groundwater to collect information to better understand how PFAS moves through the environment;
- (c) a summary of the Richmond DSI findings included:
 - (i) there is no evidence that groundwater is used for drinking water supply and there is limited use of groundwater for watering stock and irrigation within the Richmond Relevant Area;
 - (ii) there are five areas, on-base, that have been identified as the sources for PFAS contamination, where old formulations of firefighting foam have been historically used, handled and stored;

- (iii) the main migration pathway for PFAS is surface water runoff from the Richmond Base, to Rickabys Creek and its tributaries and Bakers Lagoon;
- (iv) samples of surface water from two off-site locations detected PFAS above the Health Based Guidance Values for recreational water use, including a tributary of Rickabys Creek and Bakers Lagoon;
- (v) surface water samples from the Hawkesbury River had PFAS concentrations below the Health Based Guidance Values for recreational water use; and
- (vi) PFAS concentrations in a farm dam, and drains close to the Richmond Base and Rickabys Creek, were below the Health Based Guidance Values for recreational water use.

PARTICULARS

- (i) *The Richmond June 2018 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Richmond/Factsheets/201806RAAFBaseRichmondDetailedSiteInvestigationFactsheet.pdf>

3.77. On or around 14 June 2018, the Commonwealth held a community walk-in session (the **Richmond June 2018 Community Information Session**) at which its representatives confirmed the outcomes of the Richmond DSI as per the Richmond June 2018 Factsheet and advised that the Commonwealth will:

- (a) undertake to complete a HHRA (known as a **HHRA**) and an Ecological Risk Assessment (known as an **ERA**) which will identify any risks of exposure to humans and the environment that require management; and
- (b) develop a PFAS Management Area Plan (known as a **PMAP**).

PARTICULARS

- (i) *The Richmond June 2018 Community Information Session was held on 14 June 2018 at which a slideshow presentation entitled "PFAS Investigation and Management Program: RAAF Base Richmond, Detailed Site Investigation Findings" dated June 2018 (**Richmond June 2018 Presentation**). The Richmond June 2018 Presentation is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Richmond/Presentations/201806PresentationCommunityWalkinSession.pdf>

- (ii) *Each of the statements in subparagraphs (a) to (b) was made in writing in the Richmond June 2018 Presentation, and/or spoken to orally at the Richmond June 2018 Community Information Session by representatives of the Commonwealth.*

3.78. In November 2018, the Commonwealth published a further factsheet titled 'RAAF Base Richmond – Human Health Risk Assessment Findings: PFAS Investigation and Management Program' (the **Richmond HHRA Factsheet**) providing a summary of the results of the HHRA in relation to the Richmond Base (**Richmond HHRA**) which included that:

- (a) there was an elevated exposure risk for people who live in the Richmond Relevant Area and:
 - (i) eat large quantities of finfish caught from local waterways and, either home-grown eggs or home-grown red meat;
 - (ii) eat a large proportion of home-grown from poultry, which eat soil or drink water containing detectable PFAS;
 - (iii) eat a large proportion of home-grown red meat from cattle, which drink water containing detectable PFAS from Bakers Lagoon and surrounding surface water networks; and
- (b) a PMAP in relation to the Richmond Base (**Richmond PMAP**) would be developed to manage and reduce the risks of PFAS exposure.

PARTICULARS

- (i) *The Richmond HHRA Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Richmond/Factsheets/201811.Richmond.HHRA.Factsheet.pdf>

3.79. In November 2018, the Commonwealth published a further factsheet titled 'RAAF Base Richmond – Ecological Risk Assessment Findings: PFAS Investigation and Management Program' (the **Richmond ERA Factsheet**) providing a summary of the results of the ERA in relation to the Richmond Base (**Richmond ERA**) which included that:

- (a) there was the potential for elevated risks to plants and animals with the Richmond Relevant Area, because of:

- (i) discharge of PFAS impacted surface water from the Richmond Base's airfield foam cannon testing area and Richmond STP;
 - (ii) discharge of PFAS impacted surface water from the Richmond Base and Rickabys Drop Zone to Rickabys Creek;
 - (iii) discharge of PFAS impacted surface water from the Richmond STP on the Richmond Base and Rickabys Drop Zone, through an underground pipe to Bakers Lagoon; and
 - (iv) the bioaccumulation of PFAS in water and land-based animals; and
- (b) the Richmond PMAP would be developed to manage and reduce the risks of PFAS exposure.

PARTICULARS

- (i) *The Richmond ERA Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Richmond/Factsheets/201811RAAFBaseRichmondERAFactsheet.pdf>

3.80. On 7 November 2018, the Commonwealth held a Community Information Session (**Richmond November 2018 Community Information Session**) at which its representatives advised the outcomes of the Richmond HHRA and the Richmond ERA including:

- (a) confirming the exposure risk activities as outlined in the Richmond HHRA Factsheet;
- (b) confirming the exposure risk to plants and animals and the reasons for that exposure as outlined in the Richmond ERA Factsheet; and
- (c) the Richmond PMAP was due to be released in early 2019.

PARTICULARS

- (i) *At the Richmond November 2018 Community Information Session a slideshow presentation entitled "Community Information Session PFAS Investigation and Management Program: Human Health and Ecological Risk Assessment Findings" dated 7 November 2018, was made (**Richmond November 2018 Presentation**). The Richmond November 2018 Presentation is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Richmond/Presentations/201811PresentationCommunityInformationSession.pdf>

3.81. In August 2019, the Commonwealth released a further factsheet titled 'RAAF Base Richmond PFAS Management Area Plan & Ongoing Monitoring: PFAS Investigation and Management Program' (the **Richmond August 2019 Factsheet**) which included a summary of the management actions recommended in the Richmond PMAP, in order to reduce the spread of PFAS from the Richmond Base and reduce exposure risks to the community, including to:

- (a) remediating soil at key on-base source areas, such as the former fire training area to reduce the amount of PFAS in the environment and leaving the Richmond Base;
- (b) reviewing the on-base stormwater drainage system to investigate diverting contaminated water from the stormwater network, and to identify the suitability of treating contaminated water;
- (c) investigating options to stop contaminated water being discharged from the on-base sewage treatment plant to Bakers Lagoon;
- (d) continue to promote NSW Government precautionary advice about PFAS exposure;
- (e) implementing an Ongoing Monitoring Plan to verify groundwater model results and track PFAS movement and concentrations.

PARTICULARS

- (i) *The Richmond August 2019 Factsheet is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Richmond/Factsheets/20190813RichmondPMAPFactsheet.pdf>

E.6 The injurious affectation to land in the Richmond Relevant Area

3.82. Land in the Richmond Relevant Area (including the land of Richmond Group Members) has become, and is likely to remain:

- (a) affected by the Richmond Surface Water Contamination; and/or
- (b) affected by the Richmond Groundwater Contamination; and/or

- (c) affected by the Richmond Soil Contamination; and/or
- (d) affected by the Richmond Biota Contamination.

PARTICULARS

- (i) *As to subparagraph (a), paragraphs 3.58 to 3.62 are repeated.*
- (ii) *As to subparagraph (b), paragraphs 3.63 to 3.68 are repeated.*
- (iii) *As to subparagraph (c), paragraphs 3.69 to 3.70 are repeated.*
- (iv) *As to subparagraph (d), paragraphs 3.71 to 3.72 are repeated.*

3.83. Further, or alternatively, by reason of:

- (a) the Richmond Surface Water Contamination; and/or
- (b) the Richmond Groundwater Contamination; and/or
- (c) the Richmond Soil Contamination; and/or
- (d) the Richmond Biota Contamination,

land in the Richmond Relevant Area (including the land of Richmond Group Members) has become, and is likely to remain land, of which occupiers and produce, livestock and biota from which, have ongoing and largely unavoidable exposure to PFC Contaminants through multiple potential pathways (**Richmond Ongoing Contaminant Exposure**).

PARTICULARS

- (i) *Paragraphs 3.58 to 3.72 are repeated.*
- (ii) *Braunig J, Baudel C, Heffernan A et al, Fate and redistribution of perfluoroalkyl acids through AFFF-impacted groundwater (2017).*

3.84. Further, or alternatively, there exists a material risk that:

- (a) land in the Richmond Relevant Area (including land owned by Richmond Group Members) may be recorded on a register established pursuant to s 58 of the *Contaminated Land Management Act 1997* (NSW) (**CLMA NSW**); and
- (b) owners of land in the Richmond Relevant Area (including land owned by Richmond Group Members) will be obligated to disclose to prospective purchasers that land is and/or that there is a risk that land may be contaminated by PFC Contaminants (with any contract of sale subject to rescission if disclosure is not made).

PARTICULARS

- (i) *As to subparagraph (a):*
 - (A) *Land may be declared significantly contaminated land if the EPA have reason to believe that the land is contaminated and that the contamination is significant enough to warrant regulation: s11 of the CLMA NSW.*
 - (B) *Contamination of land means the presence in, on or under the land of a substance at a concentration above the concentration at which the substance is normally present in, on or under land in the same locality, being a presence that presents a risk of harm to human health or any other aspect of the environment: s 5 of the CLMA NSW.*
 - (C) *A record of notices issued pursuant to s 11 of the CLMA NSW are maintained by the EPA and are publicly available: s 58 CLMA NSW.*
- (ii) *The obligations in subparagraph (b) arise under s 52A(2)(b) of the Conveyancing Act 1919 (NSW) and/or at common law in respect of the risk of contamination to land.*

3.85. Further, or alternatively, by reason of the matters pleaded in paragraphs 3.58 to 3.84, there exists a material risk that by reason of the Richmond Surface Water Contamination and/or Richmond Groundwater Contamination and/or the Richmond Soil Contamination and/or the Richmond Biota Contamination that persons may be unable to conduct agricultural activities growing crops, feedstock, fruits and vegetables for consumption on land in the Richmond Relevant Area.

PARTICULARS

- (i) *Parts D.1 above and E.5 below are repeated.*

3.86. By reason of the matters pleaded in paragraphs 3.58 to 3.84, land in the Richmond Relevant Area has become, and is likely to remain:

- (a) land which is, or may be perceived by prospective purchasers of land to be, unfit for residential purposes or human occupancy because occupiers and visitors have ongoing and largely unavoidable exposure to PFC Contaminants through multiple potential pathways; and
- (b) which is, or may be perceived by prospective purchasers of land to be unfit for agricultural purposes, including use for growing crops for sale for human consumption, growing feedstock for sale for livestock intended for sale for human consumption, pasture for livestock intended for sale for human

consumption and fruits and vegetables intended for sale for human consumption.

PARTICULARS

(i) *The particulars to paragraphs 3.58 to 3.84 are repeated.*

3.87. By reason of the matters pleaded in paragraph 3.82 to 3.86, land in the Richmond Relevant Area has become, and is likely to remain, injuriously affected in its value (**Richmond Contamination Land Value Affection**).

PARTICULARS

(i) *The quantum of the adverse affection on the value of the land of Richmond Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Richmond Group Members.*

E.7 The reasonable foreseeability of the injurious affection to the value of land in the Richmond Relevant Area

3.88. At all material times, by reason of the matters pleaded in paragraphs 3.4 to 3.35 and 3.49 to 3.57 above, it was reasonably foreseeable that use of AFFF Working Solution and/or AFFF on the Richmond Base as pleaded in paragraphs 3.37 to 3.48 would result in:

- (a) the Richmond Surface Water Contamination;
- (b) the Richmond Groundwater Contamination;
- (c) the Richmond Soil Contamination;
- (d) the Richmond Biota Contamination; and/or
- (e) the Richmond Contamination Land Value Affection.

F THE COMMONWEALTH'S ACTS AND OMISSIONS

F.1 The Commonwealth's knowledge

F.1.1 The Commonwealth's knowledge of the Richmond Base and its surrounds

3.89. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) the matters pleaded in Section A1 above;
- (b) the matters pleaded in Section A2 above;
- (c) the matters pleaded in Section A3 above; and
- (d) that waters, liquids, and soluble materials discharged on Richmond Base would:
 - (i) permeate, percolate or leach into the soil at the Richmond Base;
 - (ii) be transmitted to the groundwater beneath the Richmond Base, including into the Richmond Aquifers and mingle and flow with that groundwater (including in a general direction towards the Hawkesbury River);
 - (iii) mingle with other surface water on the Richmond Base (especially after periods of rain), and flow overland towards the Richmond Surface Water Bodies and:
 - (A) permeate or percolate into the soil over which the surface water overland flows occurred; and
 - (B) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including into the Richmond Aquifers; and
 - (iv) be transmitted to the Richmond Surface Water Bodies.

PARTICULARS

- (i) *As to sub-paragraph (a), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Richmond Base.*
- (ii) *As to sub-paragraph (b), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Richmond Base or artificial features which the Commonwealth developed, constructed, upgraded and utilised.*
- (iii) *As to sub-paragraph (c), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Richmond Base or artificial features which the Commonwealth developed, constructed, upgraded and utilised.*
- (iv) *As to sub-paragraph (d), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) to (c) above.*

F.1.2 The Commonwealth's knowledge of water use at the Richmond Relevant Area

3.90. The Commonwealth knew, or ought reasonably to have known each of:

- (a) the matters pleaded in Section B1 above;
- (b) the matters pleaded in Section B2 above; and
- (c) waters, liquids, and soluble materials discharged and/or allowed to escape the Richmond Base which were transmitted to the Richmond Surface Water Bodies, and the Richmond Aquifers would be used by residents of the Richmond Relevant Area.

PARTICULARS

- (i) *As to sub-paragraph (a), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person occupying the land comprising the Richmond Base.*
- (ii) *As to sub-paragraph (b), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person occupying the land comprising the Richmond Base.*
- (iii) *As to sub-paragraph (c), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) and (b) above.*

F.1.3 The Commonwealth's knowledge of the potential flow of Spent AFFF and Fire Run-Off from the Richmond Base

3.91. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) that the Richmond Training and Operation Activities (and ancillary storage, containment and disposal practices) resulted in:
 - (i) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground; and/or
 - (ii) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with Fire Run-Off, being discharged, or allowed to escape, to bare ground;
- (b) the matters pleaded in Section C4 above; and

- (c) that use of AFFF Working Solution and AFFF on the Richmond Base would result in Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF:
- (i) being transmitted to the groundwater beneath the Richmond Base, including the Richmond Aquifers and mingle and flow with that groundwater (including in a general direction towards the Hawkesbury River), and being utilised by persons engaged in the Richmond Groundwater Usages;
 - (ii) mingling with other surface water on the Richmond Base (especially after periods of rain), and flowing overland towards and into the surrounding Richmond Surface Water Bodies outside the Richmond Base (including the Hawkesbury River) and:
 - (A) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (B) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Richmond Aquifers;

and being extracted and utilised by persons engaged in the Richmond Groundwater Usages; and
 - (iii) mingling with other surface water on the Richmond Base (especially after periods of rain), and flowing overland towards and into the surrounding Richmond Surface Water Bodies outside the Richmond Base (including the Hawkesbury River) and then being utilised by persons engaged in the Richmond Surface Water Usages.

PARTICULARS

- (i) *As to sub-paragraph (a), these were matters known to the Commonwealth as the entity responsible for conducting the Richmond Training and Operation Activities, and using AFFF Concentrate, AFFF Working Solution and AFFF, and disposing of the same.*
- (ii) *As to sub-paragraph (b), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person using AFFF Concentrate, AFFF Working Solution and AFFF.*
- (iii) *As to sub-paragraph (c), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to*

have known of the matters referred to in sub-paragraphs (a) and (b) above, together with the matters pleaded in sub-paragraph 3.89(d).

F.1.4 The Commonwealth's knowledge of the toxic properties of Spent AFFF and Fire Run-Off

3.92. Paragraph 33 is repeated.

3.93. Paragraph 34 is repeated.

3.94. Further, or alternatively, at all material times from 16 May 2000, alternatively from 2005, the Commonwealth knew that its Richmond Training and Operations Activities at the Richmond Base using AFFF were:

- (a) potentially damaging to the environment; and/or
- (b) potentially causative of adverse health effects in humans.

PARTICULARS

- (i) *As to sub-paragraph (a), the particulars to paragraph 34 are repeated.*
- (ii) *As to sub-paragraph (b), the matters referred to in particular (i) involved knowledge of the contamination of groundwater, and it may be inferred that a person who knew that groundwater was contaminated also knew that there existed a potential for adverse health effects in humans who may consume groundwater, or produce (including livestock and eggs) watered with groundwater.*
- (iii) *See the documents listed in AECOM DSI Report at paragraph 8.0.*

3.95. Paragraph 35 is repeated.

3.96. Further, or alternatively, at all material times from no later than 2005 (**Richmond Contamination Knowledge Date**), the Commonwealth knew or ought reasonably to have known that AFFF Working Solution, AFFF, and Spent AFFF had contaminated groundwater under the Richmond Base.

PARTICULARS

- (i) *AECOM DSI Report at paragraph 8.0.*

F.2 The Commonwealth's conduct

F.2.1 The Commonwealth's deliberate conduct

3.97. From about 1976, the Commonwealth's:

- (a) use of AFFF in the Richmond Training and Operations Activities, as pleaded in paragraphs 3.37 to 3.46; and/or
 - (b) method of disposal of AFFF and Spent AFFF, as pleaded in paragraph 3.47,
- was deliberate.

F.2.2 The Commonwealth's careless conduct

3.98. Further, or alternatively, by reason of the matters pleaded in paragraphs 3.37 to 3.48 at all material times on and after each of the times identified in paragraphs 3.92 to 3.96 the Commonwealth carelessly:

- (a) did the following acts:
 - (i) it allowed large quantities of AFFF to be discharged to bare ground;
 - (ii) it allowed Spent AFFF and Fire Run-Off to flow directly onto bare ground in large quantities;
 - (iii) it allowed Spent AFFF and Fire Run-Off to permeate or percolate into the soil at the Richmond Base;
 - (iv) it allowed Spent AFFF and Fire Run-Off to be transmitted to the groundwater beneath the Richmond Base, including the Richmond Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Richmond Relevant Area);
 - (v) it allowed Spent AFFF and Fire Run-Off to drain into the surrounding water catchment areas (including via the Richmond Drainage System), including into the Richmond Surface Water Bodies; and/or
 - (vi) it allowed Spent AFFF and Fire Run-Off to be transmitted to the Richmond Surface Water Bodies; and/or
 - (vii) to the extent it stored wastewater from the use of AFFF, doing so in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
- (b) made the following omissions:

- (i) it failed to investigate and assess, or to do so adequately, the risks associated with the use of AFFF before using, or continuing to use AFFF;
- (ii) it failed to restrict, or to do so adequately, the use of AFFF Working Solution and AFFF only to emergencies;
- (iii) it failed to take any or any adequate steps to contain or limit the use of AFFF Working Solution and AFFF in the Richmond Training and Operations Activities;
- (iv) it failed to take any or any adequate steps to contain, capture, clean up and securely dispose of Spent AFFF and Fire Run-Off, such that it did not:
 - (A) flow directly onto bare ground;
 - (B) permeate or percolate into the soil at the Richmond Base;
 - (C) become transmitted to the groundwater beneath the Richmond Base, including the Richmond Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Richmond Relevant Area);
 - (D) drain into the surrounding water catchment areas (including via the Richmond Drainage System), including into the Richmond Surface Water Bodies; and
 - (E) transmit to the Richmond Surface Water Bodies;
- (v) it failed to store wastewater from the use of AFFF Working Solution and AFFF in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
- (vi) it failed to take any or any adequate steps to remediate the contamination of the groundwater under the Richmond Base at any time after the time when it knew or ought reasonably to have known that groundwater was contaminated, as pleaded in paragraphs 3.923.92 to 3.963.96 (to the extent, which is unknown to the Applicants, that the contamination may at one time have been remediable); and/or

- (vii) it failed to take any or any adequate steps to remediate the contamination of the soil on the Richmond Base at any time after the time when it knew or ought reasonably to have known that soil was contaminated (including to prevent Spent AFFF and Fire Run Off leaching, or further leaching into the groundwater or surface water, (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable).

PARTICULARS

- (i) *As to subparagraph (a)(i), paragraphs 3.37 to 3.48 are repeated.*
- (ii) *As to subparagraph (a)(ii), paragraphs 3.37 to 3.48 are repeated.*
- (iii) *As to subparagraph (a)(iii), paragraphs 3.37 to 3.48 and 3.69 to 3.70 are repeated.*
- (iv) *As to subparagraph (a)(iv), paragraphs 3.37 to 3.48 and 3.63 to 3.68 are repeated.*
- (v) *As to subparagraph (a)(v), paragraphs 3.37 to 3.48 and 3.58 to 3.62 is repeated.*
- (vi) *As to subparagraph (a)(vi), paragraph 3.37 to 3.48 and 3.58 to 3.62 is repeated.*
- (vii) *As to subparagraph (a)(vii), paragraph 3.37 to 3.48 and 3.58 to 3.72 is repeated.*
- (viii) *As to subparagraph (b)(i), paragraphs 3.37 to 3.48 and 3.92 to 3.96 are repeated.*
- (ix) *As to subparagraph (b)(ii), paragraphs 3.37 to 3.48 are repeated.*
- (x) *As to subparagraph (b)(iii), paragraphs 3.37 to 3.48 are repeated.*
- (xi) *As to subparagraph (b)(iv), paragraphs 3.37 to 3.48 and 3.58 to 3.72 are repeated.*
- (xii) *As to subparagraph (b)(v), paragraphs 3.37 to 3.48 are repeated.*
- (xiii) *As to subparagraph (b)(vi), paragraphs 3.37 to 3.48 and 3.92 to 3.96 are repeated.*
- (xiv) *As to sub-paragraph (b)(vii), paragraphs 3.37 to 3.48 and 3.92 to 3.96 are repeated.*

3.99. Further, or alternatively, the Commonwealth:

- (a) failed, at all material times after the Richmond Contamination Knowledge Date, alternatively the Actual Knowledge Date, to warn persons resident in the Richmond Relevant Area that:
 - (i) it had been using AFFF Working Solution and AFFF at the Richmond Base since or about 1976;

- (ii) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Richmond Base and entered and/or contaminated, the Richmond Aquifers and/or Richmond Surface Water Bodies; and/or
- (iii) Spent AFFF was:
 - (A) potentially damaging to the environment; and/or
 - (B) potentially causative of adverse health effects in humans.

3.100. Further, or alternatively, the Commonwealth failed, at all material times after the inception of the *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, Volume 1, Ch6(6), to comply with that measure by providing all relevant information on site contamination for persons resident in the Richmond Relevant Area.

G THE COMMONWEALTH'S LIABILITY

G.1 Nuisance

G.1.1 Liability in nuisance

3.101. By its use of the Richmond Base as pleaded in paragraphs 3.37 to 3.48 and 3.97 to 3.98, the Commonwealth has created, and continued, an interference with the use and enjoyment of the land owned by Richmond Group Members (the **Richmond Nuisance**), in that:

- (a) their land is affected by the Richmond Surface Water Contamination and such contamination is irreparable (and paragraphs 3.58 to 3.62 are repeated);
- (b) they are no longer able safely to use private bores on their land to access the Richmond Aquifers as a water supply for Richmond Groundwater Usages, given the Richmond Aquifers are irreparably contaminated (and paragraphs 3.63 to 3.68 are repeated);
- (c) their soil has sustained the Richmond Soil Contamination, and such contamination is irreparable (and paragraphs 3.69 to 3.70 are repeated);
- (d) their land is affected by the Richmond Biota Contamination, and such contamination is irreparable (and paragraphs 3.71 to 3.72 are repeated); and

- (e) those occupying their land are subject to the Richmond Ongoing Contaminant Exposure.

PARTICULARS

- (i) *The interference with the land of Richmond Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Richmond Group Members.*

3.102. Further, by reason of the matters pleaded in paragraphs 3.31, 3.35, 3.51, 3.57, 3.88 and/or 3.89 to 3.96, it was reasonably foreseeable to a reasonable person in the Commonwealth's position that persons owning land in the Richmond Relevant Area (including Richmond Group Members) would suffer loss by the Commonwealth's use of the Richmond Base as pleaded in paragraphs 3.37 to 3.48, being pure economic loss, in the form of diminution in the value of land in the Richmond Relevant Area.

PARTICULARS

- (i) *Paragraphs 3.31, 3.35, 3.51, 3.57, 3.88 and/or 3.89 to 3.96 are repeated.*
- (ii) *Paragraphs 3.31, 3.35, 3.51, 3.57, 3.88 and/or 3.89 to 3.96 are repeated.*

3.103. By reason of the matters pleaded in paragraphs 3.101 and 3.102, the Richmond Nuisance constitutes a substantial and unreasonable interference with the use and enjoyment of the land owned by Richmond Group Members.

G.1.2 Causation, loss and damage

3.104. The Richmond Nuisance directly caused:

- (a) the Richmond Surface Water Contamination (as pleaded in paragraph 3.61);
- (b) the Richmond Groundwater Contamination (as pleaded in paragraph 3.66);
- (c) the Richmond Soil Contamination (as pleaded in paragraph 3.69);
- (d) the Richmond Biota Contamination (as pleaded in paragraph 3.71); and/or
- (e) the Richmond Contamination Land Value Affectation (as pleaded in paragraph 3.87), and

Richmond Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *Particulars of the losses of Richmond Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Richmond Group Members.*

G.1.3 Aggravated and exemplary damages

3.105. Further, on and from the Actual Knowledge Date, by continuing the Richmond Nuisance by:

- (a) continuing to do the acts as pleaded in paragraph 3.97 and/or sub-paragraph 3.98(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 3.98(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 3.89 to 3.96, the Commonwealth engaged in aggravating conduct, and Richmond Group Members claim aggravated damages.

3.106. Further, or alternatively, on and from the Actual Knowledge Date, by continuing the Richmond Nuisance by:

- (a) continuing to do the acts as pleaded in paragraph 3.97 and/or sub-paragraph 3.98(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 3.98(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 3.89 to 3.96, the Commonwealth engaged in conduct in contumelious disregard for the rights of Richmond Group Members, and Richmond Group Members claim exemplary damages.

G.2 Negligence

G.2.1 Duty of care

3.107. At all material times, persons other than the Commonwealth (including Richmond Group Members) had no capacity to control the activities of the Commonwealth on the Richmond Base, and in particular the use of AFFF Working Solution and AFFF on the Richmond Base.

- 3.108. At all material times, the land in the Richmond Relevant Area (including the land owned by Richmond Group Members, was physically proximate to the Richmond Base.
- 3.109. At all material times, by reason of the matters pleaded in paragraphs 3.107 to 3.108 persons owning or considering purchasing land in the Richmond Relevant Area (including Richmond Group Members) were in a position of vulnerability.
- 3.110. By reason of the matters pleaded in paragraphs 3.31, 3.35, 3.51, 3.57, 3.88 and/or 3.89 to 3.96 a reasonable person in the Commonwealth's position would have foreseen a reasonably foreseeable and not insignificant risk of harm to persons owning or acquiring land in the Richmond Relevant Area (including Richmond Group Members) by the Commonwealth's use of AFFF Working Solution and AFFF on the Richmond Base as pleaded in paragraphs 3.37 to 3.48, being pure economic loss, in the form of diminution in the value of their land (the **Richmond Risk of Harm**).

PARTICULARS

- (i) *Paragraphs 3.31, 3.35, 3.51, 3.57, 3.88 and/or 3.89 to 3.96 are repeated.*
- 3.111. By reason of the matters pleaded in paragraphs 3.107 to 3.110, the Commonwealth owed a duty to each and all of Richmond Group Members to exercise reasonable care, in the use of AFFF Working Solution and AFFF on the Richmond Base not to cause pure economic loss, in the form of diminution in the value of land in the Richmond Relevant Area (**Richmond Duty of Care**).
- 3.112. By reason of the matters pleaded in paragraphs 3.107 to 3.110, on and after the Richmond Contamination Knowledge Date, alternatively the Actual Knowledge Date, the Commonwealth owed a duty to each and all of Richmond Group Members to exercise reasonable care to warn them that:
- (a) it had been using AFFF at the Richmond Base since or about 1976;
 - (b) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Richmond Base and entered and/or contaminated the Richmond Aquifers and/or contaminated the Richmond Surface Water Bodies; and
 - (c) Spent AFFF was:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans,

(Duty to Warn).

G.2.2 Scope of Richmond Duty of Care

3.113. On and from 3 November 1972, the *Clean Waters Act 1970* (NSW) (**CWA NSW**):

- (a) prohibited persons in NSW from polluting any waters (meaning any river, stream, lake, lagoon, natural or artificial watercourse, dam or tidal waters (including the sea), and includes any underground or artesian water) or causing or permitting any waters to be polluted;
- (b) defined “pollute” to mean to place in or on waters any matter whether solid, liquid or gaseous, so that the physical, chemical or biological condition of the waters is changed, or to place in or on the waters any refuse, litter, debris or other matter, whether solid or liquid or gaseous, so that the change in the condition of the waters or the refuse, litter debris or other matter is likely to make the waters unclean, noxious, poisonous or impure, detrimental to the health, safety, welfare or property of persons, undrinkable for farm animals, poisonous or harmful to aquatic life, animals, birds or fish in or around waters or unsuitable for use in irrigation;

PARTICULARS

- (i) *CWA NSW, ss 5 and 16.*

3.114. On and from 1 July 1999, the *Protection of the Environment Operations Act 1997* (NSW) (**POEO NSW**):

- (a) prohibited persons in NSW from polluting any waters (meaning any river, stream, lake, lagoon, swamp, wetlands, unconfined surface water, natural or artificial watercourse, dam or tidal waters (including the sea), and any water stored in artificial works, any waste in water mains, water pipes, or water channels or any underground or artesian water) or causing or permitting any waters to be polluted;
- (b) defined “pollution of waters” to mean placing in or on, or otherwise introducing into or onto, waters (whether through an act or omission) any matter, whether solid, liquid or gaseous so that the physical, chemical or biological condition of the waters is changed, or to place in or on the waters any refuse, litter, debris or other matter, whether solid or liquid or gaseous, so that the change in the condition of the waters or the refuse, litter debris or other matter is likely to make

the waters unclean, noxious, poisonous or impure, detrimental to the health, safety, welfare or property of persons, undrinkable for farm animals, poisonous or harmful to aquatic life, animals, birds or fish in or around waters or unsuitable for use in irrigation;

- (c) prohibited wilfully or negligently disposing (including to cause or permit disposal) of waste in a manner that harms or is likely to harm the environment; and
- (d) defined “waste” to include any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration on the environment, or any discarded, rejected, unwanted, surplus or abandoned substance.

PARTICULARS

- (i) *POEO NSW, ss 115 and 120.*

3.115. At all material times:

- (a) from 3 November 1972 to 1 July 1999, the content of the CWA NSW (as pleaded in paragraph 3.113);
- (b) from 1 July 1999, the content of the POEA NSW (as pleaded in paragraph 3.114),

bound the Commonwealth by reason of the *Commonwealth Places (Application of Laws) Act 1970* (Cth), and/or informed the scope of what a reasonably person ought do in relation to conduct which it was reasonably foreseeable might result in environmental harm (including the Richmond Risk of Harm pleaded in paragraph 3.110).

3.116. The Commonwealth had the capacity to exercise control of the Richmond Training and Operations Activities and the use of AFFF Working Solution and AFFF on the Richmond Base so as to take the precautions which a reasonable person in its position would have taken against the Richmond Risk of Harm, by:

- (a) not doing the following acts at all, or alternatively any time after the Actual Knowledge Date:
 - (i) allowing large quantities of AFFF Working Solution and AFFF to be discharged to bare ground;
 - (ii) allowing Spent AFFF and Fire Run-Off to flow directly onto bare ground in large quantities;

- (iii) allowing Spent AFFF and Fire Run-Off to permeate or percolate into the soil at the Richmond Base;
 - (iv) allowing Spent AFFF and Fire Run-Off to be transmitted to the groundwater beneath the Richmond Base, including the Richmond Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Richmond Relevant Area);
 - (v) allowing Spent AFFF and Fire Run-Off to drain into the surrounding water catchment areas (including via the Richmond Drainage System), including into the Richmond Surface Water Bodies;
 - (vi) allowing Spent AFFF and Fire Run-Off to be transmitted to the Richmond Surface Water Bodies; and/or
 - (vii) to the extent it stored store wastewater from the use of AFFF Working Solution and AFFF, it did so in such a way that it failed to avoid leakage to the surrounding environment;
- (b) doing the following things, at any time, or alternatively any time after each of the Actual Knowledge Dates:
- (i) investigating and assessing the risks associated with the use of AFFF Working Solution and AFFF before using, or continuing to use, AFFF Working Solution and AFFF (and not using them at all);
 - (ii) restricting the use of AFFF Working Solution and AFFF only for emergency activities;
 - (iii) taking steps to contain or limit the use of AFFF Working Solution and AFFF in the Richmond Training and Operations Activities;
 - (iv) taking steps to contain, capture, clean up and securely dispose of Spent AFFF and Fire Run-Off, such that it did not:
 - (A) flow directly onto bare ground;
 - (B) permeate or percolate into the soil at the Richmond Base;
 - (C) become transmitted to the groundwater beneath the Richmond Base, including the Richmond Aquifers (where it was likely to

mingle with groundwater underlying areas off-base in the Richmond Relevant Area);

(D) drain into the surrounding water catchment areas (including via the Richmond Drainage System), including into the Richmond Surface Water Bodies; and

(E) transmit to the Richmond Surface Water Bodies;

(v) storing wastewater from the use of AFFF in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);

(vi) taking steps to remediate the contamination of the groundwater under the Richmond Base promptly after the time when it knew or ought reasonably to have known that groundwater was, or was likely to have been, contaminated, as pleaded in paragraphs 33 to 35 (to the extent, which is unknown to the Applicants, that the contamination may at one time have been remediable); and/or

(vii) taking steps to remediate contaminated soil on the Richmond Base at any time promptly after the time when it knew or ought reasonably to have known that soil was contaminated (including by removing that soil and disposing of it at an off-site disposal area so as to prevent Spent AFFF and Fire Run Off leaching, or further leaching into the groundwater or surface water, (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable).

G.2.3 Scope of Duty to Warn

3.117. At all material times after the Richmond Contamination Knowledge Date, alternatively the Actual Knowledge Date, the Commonwealth had capacity to warn the general public, alternatively owners and residents of the Richmond Relevant Area, alternatively the market of potential purchasers of land in the Richmond Relevant Area (including Richmond Group Members) that:

(a) it had been using AFFF Working Solution and AFFF at the Richmond Base since or about 1976;

- (b) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Richmond Base and entered and/or contaminated the Richmond Aquifers and/or contaminated the Richmond Surface Water Bodies; and
- (c) Spent AFFF was:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans.

G.2.4 Breach of duty

3.118. By reason of the matters pleaded in paragraphs 3.37 to 3.48, 3.98 and 3.116, the Commonwealth breached the Richmond Duty of Care (the **Richmond Negligence**).

3.119. By reason of the matters pleaded in paragraphs 3.37 to 3.48, 3.99 and 3.117, the Commonwealth breached the Duty to Warn (the **Richmond Negligent Failure to Warn**).

G.2.5 Causation, loss and damage

3.120. The Commonwealth's Richmond Negligence caused:

- (a) the Richmond Surface Water Contamination (as pleaded in paragraph 3.61);
- (b) the Richmond Groundwater Contamination (as pleaded in paragraph 3.66);
- (c) the Richmond Soil Contamination (as pleaded in paragraph 3.69);
- (d) the Richmond Biota Contamination (as pleaded in paragraph 3.71); and/or
- (e) the Richmond Contamination Land Value Affectation (as pleaded in paragraph 3.87),

and Richmond Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *The particulars to paragraph 3.104 are repeated.*

3.121. Further, or alternatively, the Commonwealth's Richmond Negligent Failure to Warn caused or materially contributed to some Richmond Group Members acquiring land in the Richmond Relevant Area, and Richmond Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *Particulars of the identity of those Richmond Group Members who would not have acquired land were it not for the Commonwealth's Richmond Negligent Failure to Warn will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Richmond Group Members, and the particulars to paragraph 3.104 are repeated.*

G.2.6 Aggravated and exemplary damages

3.122. Further, on and from the Actual Knowledge Date by:

- (a) continuing to do the acts as pleaded in paragraph 3.97 and/or sub-paragraph 3.98(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 3.98(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 3.89 to 3.96, the Commonwealth engaged in aggravating conduct, and Richmond Group Members claim aggravated damages.

3.123. Further, or alternatively, on and from the Actual Knowledge Date by:

- (a) continuing to do the acts as pleaded in paragraph 3.97 and/or sub-paragraph 3.98(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 3.98(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 3.89 to 3.96, the Commonwealth engaged in conduct in contumelious disregard for the rights of Richmond Group Members, and Richmond Group Members claim exemplary damages.

G.3 Breach of statutory duty

G.3.1 Liability

3.124. The Richmond Base is situated on Commonwealth land as defined in ss 27 and 525 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**)

3.125. Pursuant to s 28 of the EPBC Act, the Commonwealth or a Commonwealth agency must not take an action that has, will have, or is likely to have a significant impact on the environment, defined by s 528 non-exhaustively to include:

- (a) ecosystems and their constituent parts, including people and communities;
- (b) natural and physical resources;
- (c) the qualities and characteristics of locations, places and areas;
- (d) heritage values of places; and
- (e) the social, economic and cultural aspects of a thing mentioned in paragraph (a), (b), (c) or (d).

3.126. By its use of the Richmond Base on and from 16 July 1999, as pleaded in paragraphs 3.37 to 3.48 and 3.97 and/or 3.98, the Commonwealth took an action or actions that has or is likely to have a significant impact on the environment.

PARTICULARS

- (i) *These actions have had such an impact by reason of the matters pleaded in paragraphs 3.58 to 3.723.71 , namely the Richmond Surface Water Contamination, Richmond Toxic Plume, the Richmond Groundwater Contamination, the Richmond Soil Contamination, and the Richmond Biota Contamination.*
- (ii) *These actions were likely to have such an impact by reason that they were reasonably foreseeable, by reason of the matters pleaded in paragraphs 3.31, 3.35, 3.51, 3.57 and 3.88.*

3.127. By reason of the matters pleaded in paragraph 3.126, the Commonwealth has contravened s 28 of the EPBC Act (**Richmond EPBC Act Breach**).

G.3.2 Causation, loss and damage

3.128. The Richmond EPBC Act Breach caused:

- (a) the Richmond Surface Water Contamination (as pleaded in paragraph 3.61);
- (b) the Richmond Groundwater Contamination (as pleaded in paragraph 3.66);
- (c) the Richmond Soil Contamination (as pleaded in paragraph 3.69);
- (d) the Richmond Biota Contamination (as pleaded in paragraph 3.71); and/or

- (e) the Richmond Contamination Land Value Affectation (as pleaded in paragraph 3.87); and

Richmond Group Members have thereby suffered loss and damage arising from the Richmond EPBC Act Breach.

PARTICULARS

- (i) *The particulars to paragraph 3.104 are repeated.*

ANNEXURE 3A: RICHMOND RELEVANT AREA



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SITE LAYOUT AND STUDY AREA
Detailed Site Investigation
RAAF Richmond, Richmond, New South Wales
13 June 2018

SCHEDULE 4 – WAGGA BASE

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A THE WAGGA BASE AND SURROUNDS

A.1 The Wagga Base

- 4.1. Since about 1939, the Commonwealth has continuously owned and occupied an area of land approximately 3.1 kilometres square in size, located in Forrest Hill approximately 10 kilometres east of Wagga in New South Wales, known as RAAF Base Wagga (the **Wagga Base**).

PARTICULARS

- (i) *Jacobs Group (Australia) Pty Ltd, Department of Defence: Comprehensive Investigation of Per- and PolyFluoroalkyl Substances (PFAS) at RAAF Base Wagga – Detailed Site Investigation (5 June 2018) (**Jacobs DSI Report**) at paragraphs 2.1 and 3.1.*
 - (ii) *Environmental Risk Sciences Pty Ltd, ‘Human Health and Ecological Risk Assessment for the RAAF Base Wagga PFAS Investigation’ (6 November 2018) (**EnRiskS HHERA**) at paragraph 2.2.*
 - (iii) *Department of Defence, RAAF Base Wagga PFAS Management Area Plan (September 2019) (**PMAP**) at paragraph 2.1.*
 - (iv) *PFAS Ongoing Monitoring Plan – RAAF Base Wagga (September 2019) (**OMP**) at paragraph 2.1.*
- 4.2. Since at least 1995, the Wagga Base has also contained an operational airfield, the Wagga City Domestic Airport (**Wagga Domestic Airport**), which is located in the central and southern portion of the Wagga Base and is operated by the City of Wagga Council, on a 30 lease agreement that commenced on 1 July 1995.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 2.1 and 2.2.3.*
 - (ii) *PMAP at paragraph 2.1.*
 - (iii) *OMP at paragraph 2.1.*
- 4.3. From about 1970, neighbouring land use in the region surrounding the Wagga Base has at times included:
- (a) in the north, a primary school, shopping centre and agricultural land;
 - (b) in the east, residential, a caravan park and agricultural land (including a former dairy farm);
 - (c) in the south, agricultural land; and

- (d) in the west, residential, council recreational fields and agricultural land.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 2.4, 2.4.1 and 2.4.2.*
- (ii) *EnRiskS HHERA at paragraph 2.2.*
- (iii) *PMP at paragraph 2.2.9.*
- (iv) *OMP at paragraph 2.2.9.*

A.2 The natural features of the Wagga Base and surrounding area

A.2.1 Climate

- 4.4. At all material times, the Wagga Base and Wagga Relevant Area rainfall levels were generally consistent throughout the year, with slight increases in May to October.

PARTICULARS

- (i) *Jacobs DSI Report at paragraph 5.2.*
- (ii) *PMP at paragraph 2.2.1.*
- (iii) *OMP at paragraph 2.2.1.*

A.2.2 Topography

- 4.5. At all material times, the Wagga Base was situated within the Murrumbidgee Valley and was generally flat, acting as a floodplain for the Murrumbidgee River.

PARTICULARS

- (i) *Jacobs DSI Report at paragraph 5.1.*
- (ii) *EnRiskS HHERA at paragraph 2.2.*
- (iii) *PMP at paragraph 2.2.2.*
- (iv) *OMP at paragraph 2.2.2.*

A.2.3 Soils

- 4.6. At all material times, the geology underlying the Wagga Base and Wagga Relevant Area comprised two layers of alluvial deposits, being:

- (a) an upper layer consisting of dense clays and silts (the **Cowra Formation**); and
- (b) an underlying layer consisting of coarse grain, gravel and sand (the **Lachlan Formation**),
(together, the **Alluvium Layer**).

- 4.7. At all material times, the Alluvium Layer permitted the passage of rainwater (and surface water) to the groundwater below the Wagga Base and Wagga Relevant Area.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 5.4, 5.5.1.1 and 8.1.*
- (ii) *EnRiskS HHERA at paragraphs 2.4 and 2.7.1.*
- (iii) *PMP at paragraph 2.2.3.*
- (iv) *OMP at paragraph 2.2.3.*

A.2.4 Hydrology

- 4.8. At all material times, the Wagga Base was located within the Murrumbidgee Catchment and was connected to number of local rivers and creeks, including:

- (a) the Murrumbidgee River, which:
 - (i) was the largest watercourse in the region;
 - (ii) was located 4 kilometres north of the Wagga Base;
 - (iii) flowed from east to west and provided water for irrigators and for environmental flows; and
 - (iv) contained higher water levels during the summer months of peak irrigation;
- (b) Kyeamba Creek, which:
 - (i) was a tributary of the Murrumbidgee River;
 - (ii) was located 2.5 kilometres to the east of the Wagga Base;
 - (iii) flowed northwards to the east of the Wagga Base;
 - (iv) flowed intermittently and generally not between February and May each year; and
 - (v) during periods of high rainfall and flooding, received water from farm dams located to the east of the Wagga Base which were fed by surface water only;

- (c) Marshalls Creek, which was a tributary of the Murrumbidgee River and located to the west of the Wagga Base;
- (d) Gregadoo Creek, which:
 - (i) was located approximately 1.2 kilometres west of the Wagga Base; and
 - (ii) was an ephemeral creek that flowed in the direction of Marshalls Creek, or Gumly Gumly Wetland during periods of high rainfall;
- (e) Gumly Gumly Wetland, which:
 - (i) was located 1 kilometre north west of the Wagga Base;
 - (ii) appeared to be ephemerally connected to Gregadoo Creek;
 - (iii) was ephemeral with several farm dams located within the wetland area; and
 - (iv) was used for grazing of beef livestock,

(together, the **Wagga Surface Water Bodies**).

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 5.1, 5.7.1 and 8.1.*
- (ii) *EnRiskS HHERA at paragraph 2.3.*
- (iii) *PMP at paragraph 2.2.6.*
- (iv) *OMP at paragraph 2.2.6.*

A.2.5 Hydrogeology

- 4.9. At all material times, the groundwater under the Wagga Relevant Area was principally found in the Alluvium Layer (**Wagga Alluvium Aquifer**).

PARTICULARS

- (i) *The hydrostratigraphy comprised the Wagga Alluvium Aquifer (comprising the Cowra Formation and the Lachlan Formation) and an underlying Wantabadgery granite layer (**Granite Layer**) which comprised interbedded siltstone, shale, phyllite, schist and quartzite, which had negligible or very low primary porosity, with groundwater storage and movement being governed by geological structures such as fractures, faults and dykes (secondary porosity). There was limited hydraulic connectivity between the two, albeit there was some degree of connectivity by*

reason of the secondary porosity of the Granite Layer and local variations in the hydraulic gradient of the Granite Layer and Alluvium Layer driving water movement between the two layers.

- (ii) *Jacobs DSI Report at paragraphs 5.4.1, 5.4.2, 5.5.1.1, 5.5.1.2, 5.5.2.1 and 5.5.2.2.*
- (iii) *EnRiskS HHERA at paragraphs 2.4 and 2.7.1.*
- (iv) *PMAP at paragraphs 2.2.4 and 7.1.*
- (v) *OMP at paragraphs 2.2.4 and 3.4.2.*

4.10. At all material times, the Wagga Alluvium Aquifer was the main source of groundwater supply to residents of the Wagga Relevant Area.

PARTICULARS

- (i) *The Cowra Formation was not generally water bearing, but the Lachlan Formation was water bearing.*
- (ii) *Jacobs DSI Report at the Executive Summary and paragraphs 5.4.1, 5.5.1.1, 5.5.2.1, 5.5.3.1, 5.5.3.2, 12.1.1, 13.2.2 and 15.*
- (iii) *EnRiskS HHERA at paragraphs 2.4 and 2.7.1.*
- (iv) *PMAP at paragraphs 2.4.2 and 3.4.2.*

4.11. At all material times, the Wagga Alluvium Aquifer was recharged by surface water as a result of rainfall, flooding, or run-off, including:

- (a) as a direct result of the flooding of the Murrumbidgee River; and
- (b) in areas where the Wagga Alluvium Aquifer was more permeable.

PARTICULARS

- (i) *This occurred in areas such as the north west of the Wagga Relevant Area, including the Murrumbidgee River and the Murray Cod Hatchery.*
- (ii) *This did not occur in areas where the Cowra Formation and the surficial clay layer was thick, such as in the immediate vicinity of the Wagga Base, and the south east of the Wagga Relevant Area.*
- (iii) *Jacobs DSI Report at paragraphs 5.5.2.1, 8.1, 13.2.2 and 13.2.3.*

4.12. At all material times, the Wagga Alluvium Aquifer would discharge water to the base flow of the Murrumbidgee River and its tributaries (gaining watercourse).

PARTICULARS

- (i) *This occurred in those areas where there is groundwater/surface water connectivity, and where the river bed was in contact with higher permeability sediments.*
- (ii) *Jacobs DSI Report at paragraph 5.5.2.1.*

A.2.6 Flooding

- 4.13. At all material times, the Wagga Base and Wagga Relevant Area was located on a flood plain and subject to flooding at times of heavy rainfall, and associated overland flow, which resulted in the discharge of surface water to groundwater and groundwater to surface water.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 5.1, 5.2, 5.5.2.1. and 13.2.2.*
- (ii) *PMP at paragraph 2.2.1.*
- (iii) *OMP at paragraph 2.2.1.*

A.3 The artificial water-related features of the Wagga Base

- 4.14. At all material times, the majority of stormwater (including overland flow) from the Wagga Base was discharged towards the Gumly Gumly Wetland.
- 4.15. At all material times, the features of the drainage system of the Wagga Base and Wagga Relevant Area included:
- (a) at the northern area of the Wagga Base, a system of stormwater drains, that discharged water from the north west into the Gumly Gumly Wetlands;
 - (b) at the southern area of the Wagga Base, surface water being discharged to farm dams, which, during periods of high rainfall, would discharge into Gregadoo Creek (in the west) or Kyeamba Creek (in the east); and
 - (c) further ditches or formalised channels discharging surface water to Marshalls Creek which ultimately discharged to the Murrumbidgee River, approximately 8 kilometres north west of the Wagga Base.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 2.3.3, 5.1, 8.1, 9.1.4 and 15.*
- (ii) *EnRiskS HHERA at paragraph 2.3.*
- (iii) *PMP at paragraph 2.2.7.*
- (iv) *OMP at paragraph 2.2.7.*

4.16. At all material times, the features of the drainage systems at the Wagga Base included:

- (a) a pit and pipe network (containing open grass-lined swales) that discharges water from the majority of the Wagga Base into the council drainage network before ultimately discharging water to the Gumly Gumly Wetland;
- (b) at the north east of the Wagga Base, the discharge by overland flow to off-Base farm dams which, during extended periods of rainfall, would flow to Kyeamba Creek; and
- (c) at the Wagga Domestic Airport, a pit and pipe network around the paved areas, airport buildings and apron areas which connected to the pit and pipe network that discharged into the Gumly Gumly Wetland, and additional discharge to farm dams in the southern and western areas of the airfield,

(together, including with the matters pleaded at paragraph 4.15, the **Wagga Drainage System**).

PARTICULARS

- (i) *Jacobs DSI Report at paragraph 2.3.3.*
- (ii) *PMP at paragraph 2.2.7.*
- (iii) *OMP at paragraph 2.2.7.*
- (iv) *Further particulars of the Wagga Drainage System and other drainage systems on the Wagga Base may be provided after discovery and inspection.*

4.17. In the course of its occupation and use of the Wagga Base, the Commonwealth installed five groundwater bores in the Wagga Relevant Area (**Wagga Off Base Bores**).

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 2.3.1.1, 5.6.2 and 8.1.*
- (ii) *PMP at paragraph 2.5.*
- (iii) *OMP at paragraph 2.4.*
- (iv) *Further particulars of the Wagga Off Base Bores and other bores in the Wagga Relevant Area may be provided after discovery and inspection.*

4.18. At all material times prior to 2007, groundwater from the Wagga Off Base Bores was used:

- (a) to service all irrigation areas on and around the Wagga Base, including general grassed areas, a former golf course and recreational fields;
- (b) for potable drinking water; and
- (c) by users other than the Commonwealth including the Forest Hill Sewage Treatment Plant, Suez liquid waste plant, CSIRO and the Metrology Station.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 2.3.1.2, 5.6.2 and 8.1.*
- (ii) *PMP at paragraph 2.5.*
- (iii) *OMP at paragraph 2.4.*

4.19. Since about 2007, one of the Wagga Off Base Bores continued to be accessible and in use whereby water is pumped and stored in the two reserve fire tanks located in the Tower 5 storage tank on the Wagga Base.

PARTICULARS

- (i) *Jacobs DSI Report at paragraph 5.6.2 and 8.1.*
- (ii) *PMP at paragraph 2.5.*
- (iii) *OMP at paragraph 2.4.*

4.20. At all material times, there were also a large number of registered and unregistered bores in the Wagga Relevant Area which:

- (a) were used to supply residents in the Wagga Relevant Area with access to water;
- (b) access groundwater from the Lachlan Formation; and
- (c) acted as migration pathways for groundwater within the Wagga Alluvium Aquifer.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 5.5.1.1, 5.6.1, 5.6.2, 5.6.3, 5.6.4, 5.6.5 and 8.1.*
- (ii) *EnRiskS HHERA at paragraphs 2.7.1, 2.8.1 and 2.8.2.*
- (iii) *PMP at paragraph 2.5.*

- (iv) *OMP at paragraph 2.4.*
- (v) *Further particulars of the registered and unregistered bores in the Wagga Relevant Area may be provided after discovery and inspection.*

A.4 The foreseeable flow of water from the Wagga Base

4.21. At all material times, by reason of the matters pleaded in paragraphs 4.5 to 4.20, it was reasonably foreseeable that waters, liquids, and soluble materials discharged on Wagga Base would:

- (a) permeate, percolate or leach into the soil at the Wagga Base;
- (b) be transmitted to the groundwater beneath the Wagga Base, including into the Wagga Alluvium Aquifer and mingle and flow with that groundwater (including in a general direction towards the Murrumbidgee River);
- (c) mingle with other surface water on the Wagga Base (especially after periods of rain), and flow overland towards the Wagga Surface Water Bodies and:
 - (i) permeate or percolate into the soil over which the surface water overland flows occurred; and
 - (ii) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including into the Wagga Alluvium Aquifer; and
- (d) be transmitted to the Wagga Surface Water Bodies.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 8.3, 12.3.5.2.1, 12.3.5.2.1.1, 12.3.5.2.2, 12.3.5.2.3, 12.3.5.2.4, 12.3.7, 13.2.1, 13.2.2, 13.2.3 and 13.2.4.*
- (ii) *EnRiskS HHERA at paragraphs 2.6, 2.7.1, 2.7.2 and 2.7.4.*
- (iii) *PMAP at paragraphs 2.4.1, 4.1 and 7.1.*
- (iv) *OMP at paragraphs 2.3.1 and 2.3.2.*

B WATER USE AT THE RELEVANT AREA

B.1 Wagga Surface Water Bodies

4.22. At all material times, the Wagga Surface Water Bodies, including the Murrumbidgee River and farm dams have been used by the residents of the Wagga Relevant Area for:

- (a) fishing (including for bait and food);
- (b) irrigation purposes;
- (c) agricultural uses (including for grazing beef stock);
- (d) recreational uses; and
- (e) the supply of approximately 20% of the total water to the Riverina Water County Council which is the primary water source (both for potable and non-potable uses):
 - (i) to the Wagga Base; and
 - (ii) throughout the Municipality of Wagga Wagga, including Forest Hill and the surrounding areas,

(together, the **Wagga Surface Water Usages**).

PARTICULARS

- (iii) *Jacobs DSI Report at paragraphs 2.4.5, 5.6.3, 5.8, 8.1 and 8.5.*
- (iv) *EnRiskS HHERA at paragraphs 2.3, 2.8.1, 2.8.2 and 5.3.*
- (v) *PMAP at paragraphs 2.2.6 and 2.4.2.*

B.2 Wagga Groundwater

4.23. At all material times, groundwater from the Wagga Alluvium Aquifer has been used by Wagga Group Members for:

- (a) drinking;
- (b) swimming (including in municipal, residential, and rural swimming pools filled using water from bores);
- (c) domestic purposes (including cooking, bathing, showering, washing, and cleaning);

- (d) irrigation purposes (including by both township and rural properties);
- (e) aquaculture purposes; and
- (f) watering of livestock,

(together, the **Wagga Groundwater Usages**).

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 2.4.5, 5.6.1, 5.6.2, 5.6.3, 5.6.4, 5.6.5 and 9.1.1.*
- (ii) *EnRiskS HHERA at paragraphs 2.4, 2.8.1 and 2.8.2.*
- (iii) *PMP at paragraph 2.5.*
- (iv) *OMP at paragraph 2.4.*

4.24. At all material times, some Wagga Group Members in the Wagga Relevant Area have had private bores on their land which drew water from the Lachlan Formation and engaged in the Wagga Groundwater Usages.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 5.6.1 and 5.6.5.*
- (ii) *EnRiskS HHERA at paragraph 2.8.2.*
- (iii) *PMP at paragraph 2.5.*
- (iv) *Some private bores are registered, while some are unregistered.*
- (v) *Some Wagga Group Members have private bores on their land. The identity of all those Wagga Group Members who have private bores will be particularised following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Wagga Group Members.*

B.3 The foreseeable usage of water emanating from the Wagga Base

4.25. At all material times, by reason of the matters pleaded in paragraphs 4.21 to 4.24 above, it was reasonably foreseeable that waters, liquids, and soluble materials discharged and/or allowed to escape the Wagga Base which were transmitted to the Wagga Surface Water Bodies, and the Wagga Alluvium Aquifer would be used by residents of the Wagga Relevant Area.

C THE COMMONWEALTH'S USE OF AFFF AT THE WAGGA BASE

C.1 Introduction

- 4.26. At all material times since the establishment of the Wagga Base, the Commonwealth has been responsible for conducting all of the activities conducted at the Wagga Base.

C.2 The Commonwealth's use of AFFF

- 4.27. As part of the operation of the Wagga Base, and since at least 1970, the Commonwealth has regularly conducted fire drills, firefighting training, fire tests, mock emergency aircraft landing and accident drills, foam training, equipment testing (including the testing of nozzles, firefighting trucks, and fire suppression systems), firefighting, fire suppression, and like operations (both on and near Wagga Base) **(Wagga Training and Operation Activities)**.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 1.1.1, 4.2 and 8.1.*
 - (ii) *Further particulars may be provided after discovery and inspection.*
- 4.28. At all material times in the period from about 1970 until a time unknown to the Applicants but after about 2004, the Commonwealth in its use and occupation of the Wagga Base for the purpose of the Wagga Training and Operation Activities:
- (a) used AFFF Concentrate;
 - (b) mixed the AFFF Concentrate with water to create AFFF Working Solution; and
 - (c) aspirated the AFFF Working Solution into a foam via nozzles on firefighting trucks and other mechanisms (the aspirated foam being known as AFFF).

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 1.1.1, 4.2, 8.1 and 9.1.1.*
 - (ii) *PMP at paragraph 2.4.1.*
 - (iii) *OMP at paragraphs 1.1 and 2.3.1.*
 - (iv) *Particular (i) to paragraph 13 of the Statement of Claim is repeated: the AFFF Concentrate used was principally a product known as "Light Water™" (being manufactured by the Minnesota Mining and Manufacturing Company (now known as 3M Company) and/or its subsidiary 3M Australia Pty Ltd).*
 - (v) *At a time unknown to the Applicants in about 2005, the Commonwealth transitioned to using "Ansulite".*
- 4.29. The Wagga Training and Operation Activities included those in and around:

- (a) the current fire station (RMV0097) located on the southern side of Barker Street which includes a designated storage area for AFFF (**Wagga Fire Station**);
- (b) a former fire training area (RMV0093) located adjacent to the eastern end of the runway (**Wagga Former Fire Training Area**); and
- (c) a former fire station located on the northern side of the Baker Street that extended eastward toward Newton Road (**Wagga Former Fire Station**) and a fire extinguisher concrete pad (RMV0098) that now occupies part of the area where the Wagga Former Fire Station was located (**Wagga Fire Extinguisher Concrete Pad**).

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 4.1.1, 4.1.2, 4.2 and 8.2.1.*
- (ii) *PMP at paragraphs 2.4.1 and 4.1.*
- (iii) *OMP at paragraph 2.3.1.*
- (iv) *Further particulars may be provided after discovery and inspection.*

Wagga Fire Station (RMV0097)

4.30. At all material times from about 1993 when the Wagga Fire Station was constructed and commenced operation, the Wagga Fire Station:

- (a) contained a designated storage area for AFFF, which included 200 litre drums stored on bunded pallets in a covered shed, and 20 litre containers of AFFF used with fire hose reels in hangars;
- (b) garaged two fire vehicles fitted with AFFF tanks;
- (c) was used as an area to wash down fire engines with water and some occasional equipment testing; and
- (d) discharged stormwater from a concrete drive to a sump.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 4.1.1 and 6.3.*
- (ii) *PMP at paragraph 4.1.*

Wagga Former Fire Training Area (RMV0093)

4.31. The Wagga Former Fire Training Area:

- (a) was located adjacent to the eastern end of the runway;
- (b) consisted of a grassed area adjacent to a concrete pad which was used to simulate incident response and test fire equipment; and
- (c) at all material times until about 2004 when training at the Wagga Former Fire Training Area ceased, involved the testing of AFFF equipment, which occurred approximately once a month, during which AFFF was sprayed onto the grassed area surrounding the concrete pad, followed by the washing of the equipment with water, which also drained onto the grassed area.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 4.2 and 6.3.*
- (ii) *PMP at paragraph 4.1.*

Wagga Fire Extinguisher Concrete Pad (RMV0098)

4.32. At all material times from about 2004, when the Wagga Fire Extinguisher Concrete Pad was constructed and commenced operation, the Wagga Fire Extinguisher Concrete Pad:

- (a) was located on the opposite side of Baker Street from the Wagga Fire Station;
- (b) contained:
 - (i) a concrete pad with a 4 metre high wall on three sides of the pad;
 - (ii) a floor drain in the concrete pad which drained wastewater collected in the pad to an underground waste water storage tanks;
 - (iii) an asphalt apron that leads from the fire pit to where the fire vehicles pulled up for training, which had numerous cracks in the pavement and was in poor condition. As a result, fire vehicles were required to avoid standing next to the pit forcing the operation of the water cannons from a distance and resulting in some leakage from the truck when spraying water; and

- (c) was used to conduct training in the use of AFFF from the fire vehicles which included the use of diesel to ignite fires in the training area and the spray of water jets towards the 4 metre high wall.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 4.1.2 and 6.3.*
- (ii) *PMAP at paragraph 4.1.*

4.33. At all material times from about 2004, the features of the drainage network of the Wagga Fire Extinguisher Concrete Pad included:

- (a) water would pass through the 4 metre high wall onto the other sides of the concrete pad;
- (b) water would pool at the bottom of the pit;
- (c) capacity issues with the drain would occur causing it to become blocked easily and/or overflow during training exercises, causing localised contamination; and
- (d) stormwater draining to the pit and pipe network on the Wagga Base, and ultimately discharging to the Murrumbidgee River.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 2.3.3, 4.1.2 and 6.3.*
- (ii) *PMAP at paragraph 4.1.*

Wagga Former Fire Station

4.34. The Wagga Former Fire Station:

- (a) was a feature of the Wagga Base from at least 1971;
- (b) was located in the area that is now occupied by the Wagga Fire Extinguisher Concrete Pad (but extended further east toward Newton Road); and
- (c) was demolished at some time between 1990 and 1995.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 4.2.*
- (ii) *PMAP at paragraph 4.1.*

4.35. By reason of the matters pleaded in paragraphs 4.27 to 4.34 above, the Wagga Training and Operations Activities resulted in:

- (a) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground at the Wagga Base; and/or
- (b) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with Fire Run-Off, being discharged, or allowed to escape, to bare ground at the Wagga Base.

C.3 The Commonwealth's methods for disposal of Spent AFFF

4.36. At all material times:

- (a) Spent AFFF; and/or
- (b) Fire Run-Off co-mingled with Spent AFFF,

was generally directed by the Commonwealth towards bare ground or the Wagga Drainage System.

PARTICULARS

- (i) *Paragraphs 4.27 to 4.35 are repeated.*
- (ii) *The Applicants do not, with their present state of knowledge, know the quantities of Spent AFFF and/or Fire Run-Off directed to bare ground and the earthen drains comprising the Wagga Drainage System.*
- (iii) *Further particulars may be provided after discovery and inspection.*

4.37. At all material times, to the extent that:

- (a) AFFF discharged in the course of the Wagga Training and Operations Activities; and/or
- (b) Fire Run-Off co-mingled with Spent AFFF,

was directed by the Commonwealth to the Wagga Drainage System they were ineffective to ensure that liquids contained in them did not leak into the soil below and around them.

C.4 Physical properties of AFFF and Spent AFFF

4.38. Paragraph 15 is repeated.

4.39. Paragraph 16 is repeated.

C.5 The foreseeable flow of Spent AFFF from the Wagga Base

4.40. At all material times, by reason of the matters pleaded in paragraphs 4.4 to 4.25 and 4.38 to 4.39 above, it was reasonably foreseeable that use of AFFF Working Solution and AFFF on the Wagga Base as pleaded in paragraphs 4.27 to 4.35 and/or 4.36 to 4.37 above would result in Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF:

- (a) being transmitted to the groundwater beneath the Wagga Base, including the Wagga Alluvium Aquifer and mingle and flow with that groundwater (including in a general direction towards the Murrumbidgee River), and being utilised by persons engaged in the Wagga Groundwater Usages;
- (b) mingling with other surface water on the Wagga Base (especially after periods of rain), and flowing overland towards and into the surrounding Wagga Surface Water Bodies outside the Wagga Base (including the Gumly Gumly Wetland) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Wagga Alluvium Aquifer,

and being extracted and utilised by persons engaged in the Wagga Groundwater Usages; and

- (c) mingling with other surface water on the Wagga Base (especially after periods of rain), and flowing overland towards and into the surrounding Wagga Surface Water Bodies outside the Wagga Base (including the Gumly Gumly Wetland and then being utilised by persons engaged in the Wagga Surface Water Usages.

D THE TOXIC PROPERTIES OF SPENT AFFF

D.1 The potential for AFFF to harm humans and the environment

4.41. Paragraph 18 is repeated.

- 4.42. Paragraph 19 is repeated.
- 4.43. Paragraph 20 is repeated.
- 4.44. Paragraph 21 is repeated.
- 4.45. Paragraph 22 is repeated.

D.2 The foreseeable flow and transmission of a toxic substance

- 4.46. By reason of the matters pleaded in 4.4 to 4.25 and 4.38 to 4.39 and 4.41 to 4.45 above, it was reasonably foreseeable that the use of AFFF on the Wagga Base as pleaded in paragraphs 4.27 to 4.35 and/or 4.36 to 4.37 above would result in an unnatural soluble substance containing synthetic chemicals:
- (a) permeating or percolating into the soil at the Wagga Base;
 - (b) being transmitted to the groundwater beneath the Wagga Base, including the Wagga Alluvium Aquifer and mingling and flowing with that groundwater (including in a general direction towards the Murrumbidgee River);
 - (c) mingling with other surface water on the Wagga Base (especially after periods of rain), and flowing overland towards and into the surrounding Wagga Surface Water Bodies outside the Wagga Base (including the Gumly Gumly Wetland) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Wagga Alluvium Aquifer; and
 - (d) being transmitted to the Wagga Surface Water Bodies.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 8.3, 12.3.5.2.1, 12.3.5.2.1.1, 12.3.5.2.2, 12.3.5.2.3, 12.3.5.2.4, 12.3.7, 13.2.1, 13.2.2, 13.2.3 and 13.2.4.*
- (ii) *EnRiskS HHERA at paragraphs 2.6, 2.7.1, 2.7.2 and 2.7.4.*
- (iii) *PMap at paragraphs 2.4.1, 4.1 and 7.1.*
- (iv) *OMP at paragraphs 2.3.1 and 2.3.2.*

E THE CONTAMINATION OF THE RELEVANT AREA

E.1 The contamination of the Wagga Surface Water Bodies

4.47. PFCs and PFC Contaminants have been detected in the Wagga Surface Water Bodies.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 8.1, 12.3.5.2.1.2, 12.3.5.2.2, 12.3.5.2.3, 12.3.5.2.4, 12.3.5.2.5, 13.1 and 14.2.2.*
- (ii) *EnRiskS HHERA at paragraphs 3.2, 3.4.2, 3.4.3, 6.4 and 8.*
- (iii) *PMAP at paragraphs 2.4.2, 4.1, 6.2.5 and 7.1.*
- (iv) *OMP at paragraph 2.3.2.*

4.48. The contamination of the Wagga Surface Water Bodies with PFCs and PFC Contaminants is the result of discharged AFFF Working Solution and AFFF on the Wagga Base resulting in Spent AFFF:

- (a) permeating or percolating into the soil at the Wagga Base;
- (b) being transmitted to the groundwater beneath the Wagga Base, including the Wagga Alluvium Aquifer and mingling and flowing with that groundwater (including in a general direction towards the Murrumbidgee River);
- (c) mingling with other surface water on the Wagga Base (especially after periods of rain), and flowing overland towards and into the surrounding Wagga Surface Water Bodies outside the Wagga Base (including the Gumly Gumly Wetland) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred;
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Wagga Alluvium Aquifer; and
- (d) being transmitted to the Wagga Surface Water Bodies.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 8.3, 12.3.5.2.1, 12.3.5.2.1.1, 12.3.5.2.2, 12.3.5.2.3, 12.3.5.2.4, 12.3.7, 13.2.1, 13.2.2, 13.2.3 and 13.2.4.*
- (ii) *EnRiskS HHERA at paragraphs 2.6, 2.7.1, 2.7.2 and 2.7.4.*
- (iii) *PMAP at paragraphs 2.4.1, 4.1 and 7.1.*

(iv) *OMP at paragraphs 2.3.1 and 2.3.2.*

4.49. By reason of the matters pleaded in paragraph 4.47 and 4.48 above, the water in the Wagga Surface Water Bodies has become, and is likely to continue to remain, contaminated by, and a receptor of, PFC Contaminants originally emanating from the Wagga Base.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 13.1, 13.2.1, 13.2.2, 13.2.3 and 13.2.4.*
- (ii) *PMAP at paragraphs 6.2.3 and 7.1.*
- (iii) *OMP at paragraph 2.3.2.*

4.50. By reason of the matters pleaded in paragraphs 4.47 to 4.49 above, water in the Wagga Surface Water Bodies have become, and will continue and remain, potentially hazardous and unfit for the Wagga Surface Water Usages (the **Wagga Surface Water Contamination**).

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 13.1, 13.2.1, 13.2.2, 13.2.3, 13.2.4 and 13.3.*
- (ii) *Department of Defence, PFAS Management Area Plan RAAF Base Wagga Executive Summary (September 2019) (**PMAP Summary**) at p.5.*
- (iii) *PMAP at paragraphs 7.1 and A.2.2.*
- (iv) *OMP at paragraph 2.3.2.*

4.51. There is no practical or cost-effective way of remediating the Wagga Surface Water Contamination.

PARTICULARS

- (i) *PMAP at paragraphs 6.2.4, 6.2.6, and Appendix E.*

E.2 The contamination of the Wagga Groundwater

4.52. PFCs and PFC Contaminants emanating from the Wagga Base have been identified in the Wagga Alluvium Aquifer and under the Wagga Relevant Area (or part thereof) (the **Wagga Toxic Plume**).

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 12.3.4, 12.3.6.1, 12.3.6.2.1, 12.3.6.2.2.3 and 12.3.6.2.4*
- (ii) *EnRiskS HHERA at paragraphs 2.7.4 and 8.*
- (iii) *PMP Summary at p.3.*
- (iv) *PMP at paragraphs 2.4.1, 4.1 and 7.1.*
- (v) *OMP at paragraph 2.3.2.*

4.53. The Wagga Toxic Plume is the result of discharged AFFF Working Solution and AFFF on the Wagga Base resulting in Spent AFFF:

- (a) permeating or percolating into the soil at the Wagga Base;
- (b) being transmitted to the groundwater beneath the Wagga Base, including the Wagga Alluvium Aquifer and mingling and flowing with that groundwater (including in a general direction towards the Murrumbidgee River);
- (c) mingling with other surface water on the Wagga Base (especially after periods of rain), and flowing overland in a generally westerly direction, towards and into the surrounding water catchment areas outside the Wagga Base (including the Gumly Gumly Wetland) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Wagga Alluvium Aquifer; and
- (d) being transmitted to the Wagga Surface Water Bodies.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 8.3, 12.3.5.2.1, 12.3.5.2.1.1, 12.3.5.2.2, 12.3.5.2.3, 12.3.5.2.4, 12.3.7, 13.2.1, 13.2.2, 13.2.3 and 13.2.4.*
- (ii) *EnRiskS HHERA at paragraphs 2.6, 2.7.1, 2.7.2 and 2.7.4.*
- (iii) *PMP at paragraphs 2.4.1, 4.1 and 7.1.*
- (iv) *OMP at paragraphs 2.3.1 and 2.3.2.*

4.54. By reason of the matters pleaded in paragraphs 4.52 and 4.53, groundwater in the Wagga Alluvium Aquifer and beneath the Wagga Relevant Area has become, and is

likely to continue to remain, contaminated by, and a receptor of, PFC Contaminants originally emanating from the Wagga Base.

PARTICULARS

- (i) *The PFC Contaminants concentrations measured in groundwater (predominantly PFOS and PFHxS) in some samples taken within the Wagga Relevant Area exceed the adopted screening criteria for the protection of beneficial use of groundwater for irrigation, potable and non-domestic water use and maintenance of ecosystems: PMAP at paragraph 2.4.2 (pp 25 and 26).*
- (ii) *Current groundwater flow modelling indicates that PFAS at the Gumly Gumly Wetland could reach the Riverina Water County Council East Wagga bore field and/or the GGPID supply bore in approximately 55 years: PMAP at paragraph 2.4.2 (p 26).*
- (iii) *Although there are no formal institutional controls in place on the use of groundwater, the NSW EPA has provided precautionary advice for two properties not to use groundwater for drinking water or irrigation of home consumed produce: PMAP at paragraph 2.5 (p 27).*
- (iv) *The groundwater in the Wagga Alluvium Aquifer has been contaminated with high levels of PFC Contaminants: Jacobs DSI Report at paragraphs 12.3.4, 12.3.6.1, 12.3.6.2.1, 12.3.6.2.2.3 and 12.3.6.2.4.*
- (v) *PMAP at paragraphs 1.5, 2.1, 2.4.2, 2.5, 4.2, 6.2.1 6.2.3, 6.2.5, 7.1 and A.2.2 and pp 37 and 38.*
- (vi) *OMP at paragraph 2.3.2.*
- (vii) *Particulars of the contamination of the groundwater under the land of Wagga Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Wagga Group Members.*

4.55. By reason of the matters pleaded in paragraph 4.54, groundwater in the Wagga Alluvium Aquifer and beneath the Wagga Relevant Area has become, and is likely to continue to remain, potentially hazardous and unfit for Wagga Groundwater Usages (the **Wagga Groundwater Contamination**).

PARTICULARS

- (i) *The groundwater in the Wagga Alluvium Aquifer is potentially hazardous and unfit for drinking: Parts D.1 above and E.5 below are repeated.*
- (ii) *The groundwater in the Wagga Alluvium Aquifer is potentially hazardous and unfit for:*
 - (A) *irrigation purposes because such usages result in the further spreading of PFC Contaminants to soils and uptake*

by plants, vegetables and fruits, and the exposure of people to PFC Contaminants: Parts D.1 above and E.5 below are repeated;

(B) watering of livestock (including chickens) because such usages may result in the further spreading of PFC Contaminants to soils, uptake of PFC Contaminants by the livestock and the exposure of people to PFC Contaminants (particularly by consumption of livestock and eggs): Parts D.1 above and E.5 below are repeated; and

(C) swimming, domestic purposes, and water supply because such usages may result in the further exposure of people to PFC Contaminants: Parts D.1 above and E.5 below are repeated.

(iii) PMAP at paragraphs 1.5, 2.4.2, 2.5, 4.2, 6.2.1, 6.2.4, 7.1 and A.2.2.

(iv) Further particulars of the contamination of the groundwater in the Wagga Alluvium Aquifer under the Wagga Group Members' land will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Wagga Group Members.

4.56. There is no practical or cost-effective way of remediating the Wagga Toxic Plume, or the Wagga Groundwater Contamination.

PARTICULARS

(i) PMAP at paragraphs 6.2.4 and 6.2.6 and Appendix E.

E.3 The contamination of soil in the Wagga Relevant Area

4.57. Soil on the land within the Wagga Relevant Area has become, and is likely to continue to become and remain, contaminated by PFC Contaminants emanating from the Wagga Base (the **Wagga Soil Contamination**) by:

(a) overland flows of surface water commingled with Spent AFFF (containing PFC Contaminants) from the Wagga Base; and

(b) discharge or application of groundwater containing PFC Contaminants extracted from the Wagga Alluvium Aquifer by persons engaged in Wagga Groundwater Usage to the soils (by, in particular, irrigation).

PARTICULARS

- (i) *Particulars of the contamination of the soils on lands of Wagga Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Wagga Group Members.*
- (ii) *Jacobs DSI Report at paragraphs 7.1, 8.1, 8.3, 12.3.1.1, 12.3.2, 12.3.3.1, 12.3.3.2, 12.3.5.2.1-12.3.5.2.4, 12.3.6.2.2.1, 12.3.6.2.3 12.3.7 and 13.2.1-13.2.4.*
- (iii) *EnRiskS HHERA at paragraphs 2.6, 2.7.1, 2.7.2, 2.7.4, 3.2, 3.3.1-3.3.3, 5.5.2 and 6.3.*
- (iv) *PMAP at paragraphs 1.5, 1.8, 2.4.1, 2.4.2, 4.1, 6.2.4, 6.2.5 and 7.1.*

4.58. There is no practical or cost-effective way of remediating the Wagga Soil Contamination.

PARTICULARS

- (i) *PMAP at paragraphs 6.2.3, 6.2.4 and 6.2.6 and Appendix E.*

E.4 The Wagga Biota Contamination

4.59. Extensive other aspects of the biotic and abiotic matrices within the Wagga Relevant Area have become and are likely to continue to remain, contaminated by PFC Contaminants, and be recirculated indefinitely within the Wagga Relevant Area (the **Wagga Biota Contamination**).

PARTICULARS

- (i) *EnRiskS HHERA at paragraphs 3.2, 3.4.3, 3.5, 3.6, 5.4.2, 5.4.3, 5.4.4, 5.4.5, 5.4.6, 5.5.3, 5.5.4, 5.5.5, 5.7.2, 6.4 and 8.*
- (ii) *Fish and crustaceans from the Wagga Surface Water Bodies have been found to contain PFCs and PFC Contaminants to varying degrees: EnRiskS HHERA at paragraphs 5.4.2, 5.4.3, 5.4.5, 5.4.6 and 6.4.*
- (iii) *Ingestion of produce (including livestock, fruit, vegetables and eggs) produced with impacted soil and/or irrigated with impacted groundwater (or impacted surface water) and/or fish and crustaceans from the Wagga Surface Water Bodies are and could become secondary sources of PFC contamination: EnRiskS HHERA at paragraphs 3.2, 3.3.1, 3.5, 3.6, 5.2, 5.4.2, 5.4.3, 5.4.4, 5.4.5, 5.4.6, 5.5.3, 5.5.4, 5.5.5, 5.7.2, 7 and 8 and PMAP at paragraphs 1.5, 1.8 and 4.2.*
- (iv) *Jacobs DSI Report at paragraphs 13.3 and 15.*

- (v) *PFAS concentrations identified in soil and surface water samples exceed the PFAS NEMP ecological guideline values for indirect exposure: PMAP at paragraph 4.2.*
- (vi) *PMAP at paragraphs 1.5, 1.8, 2.1, 4.2 and 7.1.*
- (vii) *OMP at paragraphs 2.3.2 and 2.5.*
- (viii) *Secondary sources of PFC contamination, leading to further redistribution of contamination and creation of additional exposure pathways for ongoing contamination of the biota generally (including humans): Braunig J, Baudel C, Heffernan A et al, Fate and redistribution of perfluoroalkyl acids through AFFF-impacted groundwater (2017).*

4.60. There is no practical, cost-effective way of remediating the Wagga Biota Contamination.

E.5 The announcement of the contamination

4.61. In October 2016, the Commonwealth published a document titled 'Department of Defence, RAAF Base Wagga (October 2016)' (the **Wagga Contamination Announcement**) which stated:

- (a) the Wagga Base had a legacy of using AFFF for emergency firefighting situations and fire fighter training;
- (b) in 2004, the Commonwealth commenced phasing out its use of AFFF containing PFOS and PFOA as active ingredients;
- (c) PFOS and PFOA belong to a group of chemicals known as per- and poly-fluoroalkyl substances (**PFAS**) and until recently, PFAS were known as 'perfluorinated chemicals' or 'PFCs';
- (d) PFAS were an emerging concern around the world because they are persistent in the environment;
- (e) that because PFAS persist in humans and the environment, it was recommended that human exposure be minimised;
- (f) based on the outcome of preliminary sampling, it had been determined that the Wagga Base would be subject to a detailed environmental investigation;
- (g) that the detailed environmental investigation would include:
 - (i) reviewing the historical use, storage and management of AFFF to identify potential sources of PFAS;

- (ii) sampling soil, sediment, surface water, and groundwater on and off Wagga Base to identify PFAS exposure in the vicinity;
 - (iii) identifying pathways and receptors for the potential migration of PFAS;
 - (iv) community and stakeholder engagement, including a water-use survey;
 - (v) a human health and ecological risk assessment (if required) to evaluate potential risks to the human population and ecology, and inform future action to mitigate risks;
- (h) when detailed environmental investigation reports were finalised and publicly released, residents, businesses, and local stakeholders would be consulted;
- (i) that a community briefing and information activity would be conducted prior to the commencement of the detailed environmental investigation at the Wagga Base; and
- (j) alternative sources of drinking water were being provided to eligible residents located in close proximity to the Wagga Base who did not have a town water connection, and relied on the use of a bore for drinking water, as well as to residents whose drinking water was sourced from a rainwater tank which contained or did contain bore water, and to residents in other exceptional circumstances.

PARTICULARS

- (i) *The Wagga Contamination Announcement is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/General/PSPFactsheets/PSPFactsheetWaggaFinal.pdf>

4.62. On or around 7 December 2016, the Commonwealth convened a community briefing (the **Wagga December 2016 Community Information Session**) at which its representatives made the following statements:

- (a) there was a history of AFFF being used at the Wagga Base in emergency firefighting situations and for fire fighter training;
- (b) the AFFF that had been used at the Wagga Base contained PFAS—namely including perfluorooctane and perfluorooctanoic acid;

- (c) PFAS were a class of manufactured chemical that had been used to make products that resist heat, stains, grease, and water;
- (d) PFAS were a concern around the world because they persist in the environment;
- (e) the Commonwealth commenced using AFFF containing PFOS/PFOA from the 1970s;
- (f) the Commonwealth was aware that PFOS/PFOA was an emerging persistent organic pollutant;
- (g) PFAS had been detected in groundwater and surface water samples collected from locations on the Wagga Base;
- (h) alternative sources of drinking water were being provided to eligible residents;
- (i) a detailed environmental investigation would be undertaken to determine the nature and extent of PFAS on and in the vicinity of the Wagga Base; and
- (j) a human health and ecological risk assessment would be undertaken (if required) to evaluate risks to human health and ecology, and to inform future action to mitigate risks.

PARTICULARS

- (i) *The Wagga December 2016 Community Information Session was held on 7 December 2016 at Wagga Wagga, at which a slideshow presentation entitled “PFAS Investigation and Management: Community Information Session – RAAF Base Wagga Environmental Investigation” dated 7 December 2016, was made (**Wagga December 2016 Presentation**). The Wagga December 2016 Presentation is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Wagga/Presentations/PresentationCommunityWalkinSession7December2016.pdf>
- (ii) *Each of the statements in subparagraphs (a) to (j) was made in writing in the Wagga December 2016 Presentation, and/or spoken to orally at the Wagga December 2016 Presentation by representatives of the Commonwealth.*

4.63. On 27 March 2017, the Commonwealth convened a community briefing (the **March 2017 Community Information Session**) at which its representatives made the following statements:

- (a) there was a history of AFFF being used at the Wagga Base in emergency firefighting situations and for fire fighter training;
- (b) the AFFF that had been used at the Wagga Base contained PFAS—namely including perfluorooctane and perfluorooctanoic acid;
- (c) PFAS were a class of manufactured chemical that had been used to make products that resist heat, stains, grease, and water;
- (d) PFAS were a concern around the world because they persist in the environment;
- (e) the Commonwealth commenced using AFFF containing PFOS/PFOA from the 1970s;
- (f) the Commonwealth was aware that PFOS/PFOA was an emerging persistent organic pollutant;
- (g) alternative sources of drinking water were being provided to eligible residents;
- (h) PFAS had been detected in groundwater and surface water samples collected from locations on the Wagga Base; and
- (i) a detailed environmental investigation will be commenced in April 2017.

PARTICULARS

- (i) *The Wagga March 2017 Community Information Session was held on 27 March 2017 at Wagga Wagga, at which a slideshow presentation entitled “PFAS Investigation and Management: Community Information Session – RAAF Base Wagga Environmental Investigation” dated March 2017, was made (**Wagga March 2017 Presentation**). The Wagga March 2017 Presentation is published on:*

https://www.defence.gov.au/Environment/PFAS/docs/Wagga/Presentations/170327_Presentation_CommunityWalkInSession.pdf
- (ii) *Each of the statements in subparagraphs (a) to (i) was made in writing in the Wagga December 2016 Presentation, and/or spoken to orally at the Wagga March 2017 Presentation by representatives of the Commonwealth.*

4.64. In March 2017, the Commonwealth published a factsheet titled ‘Community Update Factsheet: PFAS Investigation & Management Program’ (**Wagga March 2017 Factsheet**) which advised as follows:

- (a) there was a history of AFFF being used at the Wagga Base in emergency firefighting situations and for fire fighter training;
- (b) PFAS were a class of manufactured chemical that had been used to make products that resist heat, stains, grease, and water;
- (c) PFAS were a concern around the world because they persist in the environment;
- (d) the Commonwealth commenced using AFFF containing PFOS/PFOA from the 1970s;
- (e) a detailed environmental investigation was being conducted into the presence of PFAS on and in the vicinity of Wagga Base;
- (f) that the detailed environmental investigation would include:
 - (i) reviewing the historical use, storage and management of AFFF to identify potential sources of PFAS;
 - (ii) sampling soil, sediment, surface water, and groundwater on and off Wagga Base to identify PFAS exposure in the vicinity;
 - (iii) identifying pathways and receptors for the potential migration of PFAS;
 - (iv) community and stakeholder engagement, including a water-use survey;
 - (v) a human health and ecological risk assessment (if required) to evaluate potential risks to the human population and ecology, and inform future action to mitigate risks;
- (g) when detailed environmental investigation reports were finalised and publicly released, residents, businesses, and local stakeholders would be consulted;
- (h) that a community briefing and information activity would be conducted prior to the commencement of the detailed environmental investigation at the Wagga Base; and
- (i) alternative sources of drinking water were being provided to eligible residents located in close proximity to the Wagga Base who did not have a town water connection, and relied on the use of a bore for drinking water, as well as to residents whose drinking water was sourced from a rainwater tank which

contained or did contain bore water, and to residents in other exceptional circumstances.

PARTICULARS

- (i) *The Wagga March 2017 Factsheet is published on:*
https://www.defence.gov.au/Environment/PFAS/docs/Wagga/Factsheets/170327_FactSheet_RAAFBaseWagga.pdf

4.65. In August 2017, the Commonwealth published a factsheet titled 'Community Update Factsheet: PFAS Investigation & Management Program' (**Wagga August 2017 Factsheet**) which advised as follows:

- (a) a detailed environmental investigation was due to start in September 2017 into the presence of PFAS on and in the vicinity of Wagga Base;
- (b) stage one of the investigation, being the preliminary site investigation (known as a **PSI**) has been completed which involved a historical review of AFFF use and storage to identify on-base sources, develop an understanding of migration pathways of PFAS from the source and identify potential receptors; and
- (c) a detailed site investigation (known as a **DSI**) would commence and involve on and off-base sampling of soil, sediments, groundwater, surface water, with the possibility of plants and animals on and off the Wagga Base to build on the PSI information and characterise the nature and extent of contamination.

PARTICULARS

- (i) *The Wagga August 2017 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Wagga/Factsheets/170824FactsheetRAAFBaseWagga.pdf>
- (ii) *The release of the Wagga August 2017 Factsheet was accompanied with a community information session held on 24 August 2017 at Wagga Wagga to discuss the investigation at the Wagga Base.*

4.66. In December 2017, the Commonwealth published a document titled, 'RAAF Base Wagga Investigation Update Newsletter (Issue 01)' (the **Wagga December 2017 Newsletter**) which advised as follows:

- (a) the Commonwealth is undertaking a detailed environmental investigation to understand the nature and extend of PFAS on, and surrounding, the Wagga Base;
- (b) PFAS can travel in the environment in surface water, drainage or groundwater and takes a long time to break down in the environment;
- (c) higher levels of PFAS have been found in soil, surface water and groundwater as a result of legacy fire-fighting foams being used in the past; and
- (d) the DSI in relation to the Wagga Base (Wagga DSI) was in expected to complete in January 2018.

PARTICULARS

- (i) *The Wagga December 2017 Newsletter is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Wagga/Factsheets/20171215RAAFBaseWaggaNewsletterDecember2017.pdf>

4.67. In May 2018, the Commonwealth published a community update titled, 'RAAF Base Wagga Investigation Community Newsletter' (the **Wagga May 2018 Newsletter**) which advised as follows:

- (a) the Wagga DSI was in progress and involved the testing at over 350 locations;
- (b) a Human Health and Ecological Risk Assessment in relation to the Wagga Base (**Wagga HHERA**) was being conducted to understand any potential exposure to people and the environment; and
- (c) additional targeted sampling was now being conducted to support the HHERA.

PARTICULARS

- (i) *The Wagga May 2018 Newsletter is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Wagga/Factsheets/201805RAAFBaseWaggaNewsletterMay2018.pdf>

4.68. In June 2018, the Commonwealth published a factsheet titled 'RAAF Base Wagga – Detailed Site Investigation Findings: PFAS Investigation and Management Program' (the **Wagga June 2018 Factsheet**), advising as follows:

- (a) the Wagga DSI has been completed;

- (b) the Wagga DSI involved the sampling of soil, sediment, surface water and groundwater to collect information to better understand how PFAS moves through the environment; and
- (c) a summary of the Wagga DSI findings included:
 - (i) the former firefighting training area, current fire extinguisher training area and the current fire station, on the Wagga Base, were identified as the main PFAS source areas;
 - (ii) the main surface water pathway for PFAS is the runoff from the Wagga Base to Gumly Gumly Wetland, and on to Marshalls Creek;
 - (iii) samples of surface water from farm dams in the Gumly Gumly Wetland and along Marshalls Creek, detected PFAS concentrations above the investigation criteria for recreational water use and ecological protection;
 - (iv) surface water samples from the Murrumbidgee River had PFAS concentrations below the laboratory limits of reporting;
 - (v) PFAS concentrations in farm dams close to the Wagga Base, along the Gregadoo and Kyeamba Creek pathways, were below investigation criteria;
 - (vi) PFAS concentrations in groundwater bores, used for drinking water supply, were below the guideline values for drinking water;
 - (vii) groundwater samples from the Riverina Water County City bores and the Gumly Gumly Private Irrigation District bore did not identify PFAS concentrations above the drinking water guideline values; and
 - (viii) PFAS detects in the groundwater used to supply the aquaculture ponds at the Murray Cod Hatchery, as well as PFAS concentrations in surface water collected from the ponds, indicate the potential for uptake of PFAS in the hatchery produce.

PARTICULARS

- (i) *The Wagga June 2018 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Wagga/Factsheets/201806DetailedSiteInvestigationResultsFactsheet.pdf>

4.69. On or around 7 June 2018, the Commonwealth held a community walk-in session (the **Wagga June 2018 Community Information Session**) at which its representatives advised the outcomes of the Wagga DSI, which included that:

- (a) surface water run-off was the main pathway for PFAS from the Wagga Base to Gumly Gumly Wetland, and on to Marshalls Creek;
- (b) PFAS was detected in samples from Gumly Gumly Wetland and Marshalls Creek above the recreational water-use guidance values;
- (c) PFAS detected in samples from around the Gumly Gumly Wetland, the Forest Hill Sewage Treatment Plant and the Forest Hill Council Landfill;
- (d) natural geology generally restricts PFAS movement to deeper groundwater on-base;
- (e) samples from the Murrumbidgee River had PFAS concentrations below the laboratory limits of reporting (not detectable); and
- (f) the Commonwealth will:
 - (i) undertake to complete the Wagga HHERA and an Ecological Risk Assessment in relation to the Wagga Base (**Wagga ERA**) which will identify any risks of exposure to humans and the environment that require management; and
 - (ii) develop a PFAS Management Area Plan in relation to the Wagga Base (**Wagga PMAP**).

PARTICULARS

- (i) *The Wagga June 2018 Community Information Session was held on 7 June 2018 at Wagga Wagga, at which a slideshow presentation entitled “PFAS Investigation and Management Program: RAAF Base Wagga, Detailed Site Investigation Findings” dated June 2018 (**Wagga June 2018 Presentation**). The Wagga June 2018 Presentation is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Wagga/Presentations/201806DetailedSiteInvestigationPresentation.pdf>
- (ii) *Each of the statements in subparagraphs (a) to (f) was made in writing in the Wagga June 2018 Presentation, and/or spoken to orally at the Wagga June 2018 Community Information Session by representatives of the Commonwealth.*

4.70. In August 2018, the Commonwealth published a further newsletter titled 'RAAF Base Wagga Investigation Community Newsletter (Issue 03) (the **Wagga August 2018 Newsletter**) providing an update on the environmental investigation which included:

- (a) the Wagga HHERA is currently in progress;
- (b) the Wagga HHERA will consider potential future risks of exposure via groundwater;
- (c) the following targeted sampling is underway to assess potential PFAS exposure risks:
 - (i) testing effluent at the Forest Hill Sewage Treatment Plant;
 - (ii) sampling of yabbies in the farm dams surrounding the Wagga Base;
 - (iii) sampling fish at the Murray Cod Hatchery;
 - (iv) sampling aquatic biota (including fish and yabbies) in the Murrumbidgee River;
 - (v) sampling aquatic biota in Marshalls Creek and Kyeamba Creek to assess potential ecological risks; and
- (d) the Wagga PMAP will be developed setting out actions for the risks identified from the environmental investigation that require management.

PARTICULARS

- (i) *The Wagga August 2018 Newsletter is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Wagga/Factsheets/201808RAAFBaseWaggaNewsletterIssue03.pdf>

4.71. In November 2018, the Commonwealth published a further factsheet titled 'RAAF Base Wagga – Human Health and Ecological Risk Assessment: PFAS Investigation and Management Program' (the **Wagga November 2018 Factsheet**) providing a summary of the results of the Wagga HHERA which included that:

- (a) there was an elevated exposure risk by certain amounts of certain species of fish from Murrumbidgee River, Marshalls Creek and farm dams;

- (b) there was a potential exposure risk in the areas of Gumly Gumly Wetland and Marshalls Creeks of consuming home-grown produce including home-slaughtered livestock, home-grown eggs from chickens and home-grown fruit and vegetables;
- (c) further assessment of recreational use of Gumly Gumly Wetland and Marshalls Creek was being undertaken after PFAS was detected in the surface water;
- (d) PFAS concentrations were found in effluent from the Forest Hill stormwater treatment plant as a result of sewage flows received from the Wagga Base, which had historically been used to irrigate private agricultural land next to Kyeamba Creek and an area next to the Murrumbidgee River, so as a precaution to prevent further contribution of PFAS to the environment, the recommendation that effluent no longer used for irrigation;
- (e) 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;
- (f) 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; and
- (g) potential risk of exposure was identified for birds and mammals that consume aquatic animals from local waterways in the Wagga Relevant Area.

PARTICULARS

- (i) *The Wagga November 2018 Factsheet is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Wagga/Factsheets/201811FactsheetRAAFBaseWaggaHHERA.pdf>

4.72. On 12 November 2018, the Commonwealth held a Community Information Session (**Wagga November 2018 Community Information Session**) at which its representatives advised the outcomes of the HHERA including:

- (a) the findings from the Wagga DSI including that the:

- (i) current potential risks included contact with water off-Base and consumption of fish and yabbies and to aquatic ecosystems and higher order predators consuming aquatic plants and animals;
 - (ii) future potential risks included the current potential risks, and consumption of home grown produce and drinking water supplies;
- (b) that a groundwater model was being developed to help understand the extent of groundwater contamination and potential risks to drinking water supplies in the future;
- (c) health risks from consuming fish and yabbies from local waterways were estimated to be low and acceptable however there was potential unacceptable risk for adult and children that are high fish consumers and source an indicated percentage of fish from the indicated waterways;
- (d) modelling undertaking 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 including the Gumly Gumly Wetland and surrounding properties and Marshalls Creek; and
- (e) potential risks of exposure were identified:
 - (i) from bioaccumulation in mammals that eat insects which live in PFAS impacted soil and sediment, in some areas including Gumly Gumly Wetland and Marshalls Creek;
 - (ii) to aquatic animals from direct contact with impacted surface water, in some water ways including Gumly Gumly Wetland and Marshalls Creek; and
 - (iii) for birds and mammals that consume aquatic animals in local waterways in the Relevant Area.

PARTICULARS

- (i) *At the Wagga November 2018 Community Information Session a slideshow presentation entitled “Community Information Session PFAS Investigation and Management Program: Human Health Risk Assessment” dated 12 November 2018, was made (**Wagga November 2018 Presentation**). The Wagga November 2018 Presentation is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Wagga/Presentations/201811PresentationCommunityWalkinSession.pdf>

- (ii) *Each of the statements in subparagraphs (a) to (e) was made in writing in the Wagga November 2018 Presentation, and/or spoken to orally at the Wagga November 2018 Community Information Session by representatives of the Commonwealth.*

4.73. In July 2019, the Commonwealth released a further newsletter (the **Wagga July 2019 Newsletter**) which provided an update on the progress of the environmental investigation and advised:

- (a) the detailed environmental investigation is complete;
- (b) the Wagga PMAP was being developed which will outline activities that Defence will undertake to manage and reduce the risks of PFAS exposure on, and around, the Wagga Base;
- (c) the Wagga PMAP will give guidance to the Commonwealth to:
 - (i) manage the key sources of contamination, such as the former and current fire station;
 - (ii) reduce the amount of PFAS in the environment;
 - (iii) reduce PFAS movement from the Wagga Base; and
 - (iv) manage the exposure risks for the community;
- (d) the Wagga PMAP will contain an Ongoing Monitoring Plan (known as a **OMP**) which will describe how the Commonwealth will continue to monitor and track PFAS concentrations in groundwater and surface water over time;
- (e) the Wagga PMAP will be reviewed annually; and
- (f) further assessments on the stormwater and wastewater network are in progress.

PARTICULARS

- (i) *The Wagga July 2019 Newsletter is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Wagga/Factsheets/201907.WaggaNewsletter.pdf>

4.74. In September 2019, the Commonwealth released a further factsheet (the **Wagga September 2019 Factsheet**) which included a summary of the management actions recommended in the Wagga PMAP, and advised:

- (a) the elevated exposure scenarios identified in the Wagga HHERA were:
 - (i) very high consumers of certain fish species from Murrumbidgee River;
 - (ii) use of water from farm dams around the Wagga Base to grow home consumed food; and
 - (iii) use of groundwater from Gumly Gumly Wetland and the surrounding area for drinking water or irrigation of home consumed food;
- (b) the Wagga PMAP recommendations included:
 - (i) reducing PFAS entering the sewer and stormwater network on the Wagga Base;
 - (ii) conducting additional investigations of groundwater east of the Wagga Base;
 - (iii) continuing to support and promote State and Local government precautionary advice about PFAS exposure;
 - (iv) continuing to work with Council to resolve issues associated with PFAS at the Forest Hill Wastewater Treatment Plant; and
 - (v) implementing an OMP to verify groundwater model results and track PFAS movement and concentrations.

PARTICULARS

- (i) *The Wagga September 2019 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Wagga/Factsheets/201909RAAFBaseWaggaPMAP.pdf>
- (ii) *The release of the Wagga September 2019 Factsheet was accompanied with a community information session held on 17 September 2019 at Wagga Wagga.*

E.6 The injurious affectation to land in the Wagga Relevant Area

4.75. Land in the Wagga Relevant Area (including the land of Wagga Group Members) has become, and is likely to remain:

- (a) affected by the Wagga Surface Water Contamination; and/or
- (b) affected by the Wagga Groundwater Contamination; and/or
- (c) affected by the Wagga Soil Contamination; and/or
- (d) affected by the Wagga Biota Contamination.

PARTICULARS

- (i) *As to subparagraph (a), paragraphs 4.47 to 4.51 are repeated.*
- (ii) *As to subparagraph (b), paragraphs 4.52 to 4.56 are repeated.*
- (iii) *As to subparagraph (c), paragraphs 4.57 to 4.58 are repeated.*
- (iv) *As to subparagraph (d), paragraphs 4.59 to 4.60 are repeated.*

4.76. Further, or alternatively, by reason of:

- (a) the Wagga Surface Water Contamination; and/or
- (b) the Wagga Groundwater Contamination; and/or
- (c) the Wagga Soil Contamination; and/or
- (d) the Wagga Biota Contamination,

land in the Wagga Relevant Area (including the land of Wagga Group Members) has become, and is likely to remain land, of which occupiers and produce, livestock and biota from which, have ongoing and largely unavoidable exposure to PFC Contaminants through multiple potential pathways (**Wagga Ongoing Contaminant Exposure**).

PARTICULARS

- (i) *Paragraphs 4.47 to 4.60 are repeated.*
- (ii) *Braunig J, Baudel C, Heffernan A et al, Fate and redistribution of perfluoroalkyl acids through AFFF-impacted groundwater (2017).*

4.77. Further, or alternatively, there exists a material risk that:

- (a) land in the Wagga Relevant Area (including land owned by Wagga Group Members) may be recorded on a register established pursuant to s 58 of the *Contaminated Land Management Act 1997* (NSW) (**CLMA NSW**); and
- (b) owners of land in the Wagga Relevant Area (including land owned by Wagga Group Members) will be obligated to disclose to prospective purchasers that land is and/or that there is a risk that land may be contaminated by PFC Contaminants (with any contract of sale subject to rescission if disclosure is not made).

PARTICULARS

- (i) *As to subparagraph (a):*
 - (A) *Land may be declared significantly contaminated land if the EPA have reason to believe that the land is contaminated and that the contamination is significant enough to warrant regulation: s11 of the CLMA NSW.*
 - (B) *Contamination of land means the presence in, on or under the land of a substance at a concentration above the concentration at which the substance is normally present in, on or under land in the same locality, being a presence that presents a risk of harm to human health or any other aspect of the environment: s 5 of the CLMA NSW.*
 - (C) *A record of notices issued pursuant to s 11 of the CLMA NSW are maintained by the EPA and are publicly available: s 58 CLMA NSW.*
- (ii) *The obligations in subparagraph (b) arise under s 52A(2)(b) of the Conveyancing Act 1919 (NSW) and/or at common law in respect of the risk of contamination to land.*

4.78. Further, or alternatively, by reason of the matters pleaded in paragraphs 4.47 to 4.77, there exists a material risk that by reason of the Wagga Surface Water Contamination and/or Wagga Groundwater Contamination and/or the Wagga Soil Contamination and/or the Wagga Biota Contamination that persons may be unable to conduct agricultural activities or activities growing crops, feedstock, fruits and vegetables intended for human consumption, on land in the Wagga Relevant Area.

PARTICULARS

- (i) *Parts D.1 above and E.5 below are repeated.*

4.79. By reason of the matters pleaded in paragraphs 4.47 to 4.77, land in the Wagga Relevant Area has become, and is likely to remain:

- (a) land which is, or may be perceived by prospective purchasers of land to be, unfit for residential purposes or human occupancy because occupiers and visitors

have ongoing and largely unavoidable exposure to PFC Contaminants through multiple potential pathways; and

- (b) land which is, or may be perceived by prospective purchasers of land to be unfit for agricultural purposes, including use for growing crops for sale for human consumption, growing feedstock for sale for livestock intended for sale for human consumption, pasture for livestock intended for sale for human consumption and fruits and vegetables intended for sale for human consumption.

PARTICULARS

- (i) *The particulars to paragraphs 4.47 to 4.77 are repeated.*

- 4.80. By reason of the matters pleaded in paragraph 4.79, land in the Wagga Relevant Area has become, and is likely to remain, injuriously affected in its value (**Wagga Contamination Land Value Affection**).

PARTICULARS

- (i) *The quantum of the adverse affection on the value of the land of Wagga Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Wagga Group Members.*

E.7 The reasonable foreseeability of the injurious affection to the value of land

- 4.81. At all material times, by reason of the matters pleaded in paragraphs 4.4 to 4.25 and 4.38 to 4.46 above, it was reasonably foreseeable that use of AFFF Working Solution and/or AFFF on the Wagga Base as pleaded in paragraphs 4.27 to 4.37 would result in:

- (a) the Wagga Surface Water Contamination;
- (b) the Wagga Groundwater Contamination;
- (c) the Wagga Soil Contamination;
- (d) the Wagga Biota Contamination; and/or
- (e) the Wagga Contamination Land Value Affection.

F THE COMMONWEALTH'S ACTS AND OMISSIONS

F.1 The Commonwealth's knowledge

F.1.1 The Commonwealth's knowledge of the Wagga Base and its surrounds

4.82. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) the matters pleaded in Section A1 above;
- (b) the matters pleaded in Section A2 above;
- (c) the matters pleaded in Section A3 above;
- (d) that waters, liquids, and soluble materials discharged on Wagga Base would:
 - (i) permeate, percolate or leach into the soil at the Wagga Base;
 - (ii) be transmitted to the groundwater beneath the Wagga Base, including into the Wagga Alluvium Aquifer and mingle and flow with that groundwater (including in a general direction towards the Murrumbidgee River);
 - (iii) mingle with other surface water on the Wagga Base (especially after periods of rain), and flow overland towards the Wagga Surface Water Bodies and:
 - (A) permeate or percolate into the soil over which the surface water overland flows occurred; and
 - (B) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including into the Wagga Alluvium Aquifer; and
 - (iv) be transmitted to the Wagga Surface Water Bodies.

PARTICULARS

- (i) *As to sub-paragraph (a), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Wagga Base.*
- (ii) *As to sub-paragraph (b), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Wagga Base or artificial*

features which the Commonwealth developed, constructed, upgraded and utilised.

- (iii) *As to sub-paragraph (c), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Wagga Base or artificial features which the Commonwealth developed, constructed, upgraded and utilised.*
- (iv) *As to sub-paragraph (d), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) to (c) above.*

F.1.2 The Commonwealth's knowledge of water use at the Wagga Relevant Area

4.83. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) the matters pleaded in Section B1 above;
- (b) the matters pleaded in Section B2 above; and
- (c) that waters, liquids, and soluble materials discharged and/or allowed to escape the Wagga Base which were transmitted to the Wagga Surface Water Bodies, and the Wagga Alluvium Aquifer would be used by residents of the Wagga Relevant Area.

PARTICULARS

- (i) *As to sub-paragraph (a), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person occupying the land comprising the Wagga Base.*
- (ii) *As to sub-paragraph (b), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person occupying the land comprising the Wagga Base.*
- (iii) *As to sub-paragraph (c), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) and (b) above.*

F.1.3 The Commonwealth's knowledge of the potential flow of Spent AFFF and Fire Run-Off from the Wagga Base

4.84. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) that from about 1970 the Wagga Training and Operation Activities (and ancillary storage, containment and disposal practices) resulted in:
 - (i) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground; and/or
 - (ii) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with Fire Run-Off, being discharged, or allowed to escape, to bare ground;
- (b) the matters pleaded in Section C4 above; and
- (c) that from about 1970 the use of AFFF Working Solution and AFFF on the Wagga Base would result in Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF:
 - (i) being transmitted to the groundwater beneath the Wagga Base, including the Wagga Alluvium Aquifer and mingle and flow with that groundwater (including in a general direction towards the Murrumbidgee River), and being utilised by persons engaged in the Wagga Groundwater Usages;
 - (ii) mingling with other surface water on the Wagga Base (especially after periods of rain), and flowing overland towards and into the surrounding Wagga Surface Water Bodies outside the Wagga Base (including the Gumly Gumly Wetland) and:
 - (A) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (B) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Wagga Alluvium Aquifer;

and being extracted and utilised by persons engaged in the Wagga Groundwater Usages; and
 - (iii) mingling with other surface water on the Wagga Base (especially after periods of rain), and flowing overland towards and into the surrounding Wagga Surface Water Bodies outside the Wagga Base (including the

Gumly Gumly Wetland and then being utilised by persons engaged in the Wagga Surface Water Usages.

PARTICULARS

- (i) *As to sub-paragraph (a), these were matters known to the Commonwealth as the entity responsible for conducting the Wagga Training and Operation Activities, and using AFFF Concentrate, AFFF Working Solution and AFFF, and disposing of the same.*
- (ii) *As to sub-paragraph (b), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person using AFFF Concentrate, AFFF Working Solution and AFFF.*
- (iii) *As to sub-paragraph (c), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) and (b) above, together with the matters pleaded in sub-paragraph 4.82(d).*

F.1.4 The Commonwealth's knowledge of the toxic properties of Spent AFFF and Fire Run-Off

4.85. Paragraph 33 is repeated.

4.86. Paragraph 34 is repeated.

4.87. Further, or alternatively, at all material times from 16 May 2000, alternatively 2004, the Commonwealth knew that its Wagga Training and Operations Activities at the Wagga Base using AFFF were:

- (a) potentially damaging to the environment; and/or
- (b) potentially causative of adverse health effects in humans.

PARTICULARS

- (i) *As to sub-paragraph (a), the particulars to paragraph 34 are repeated.*
- (ii) *As to sub-paragraph (b), the matters referred to in particular (i) involved knowledge of the contamination of groundwater, and it may be inferred that a person who knew that groundwater was contaminated also knew that there existed a potential for adverse health effects in humans who may consume groundwater, or produce (including livestock and eggs) watered with groundwater.*
- (iii) *See the documents listed in Jacobs DSI Report at paragraph 16.*

4.88. Paragraph 35 is repeated.

- 4.89. Further, or alternatively, at all material times from about 2004 (**Wagga Contamination Knowledge Date**), the Commonwealth knew or ought reasonably to have known that AFFF Working Solution, AFFF, and Spent AFFF had contaminated groundwater under the Wagga Base.

PARTICULARS

- (i) *Jacobs DSI Report at paragraphs 6.1-6.8.*

F.2 The Commonwealth's conduct

F.2.1 The Commonwealth's deliberate conduct

- 4.90. At all material times, the Commonwealth's:

- (a) use of AFFF in the Wagga Training and Operations Activities, as pleaded in paragraphs 4.27 to 4.35; and/or
 - (b) method of disposal of AFFF and Spent AFFF, as pleaded in paragraph 4.36,
- was deliberate.

F.2.2 The Commonwealth's careless conduct

- 4.91. Further, or alternatively, by reason of the matters pleaded in paragraphs 4.27 to 4.37 at all material times on and after each of the times identified in paragraphs 4.85 to 4.89 the Commonwealth carelessly:

- (a) did the following acts:
 - (i) it allowed large quantities of AFFF to be discharged to bare ground;
 - (ii) it allowed Spent AFFF and Fire Run-Off to flow directly onto bare ground in large quantities;
 - (iii) it allowed Spent AFFF and Fire Run-Off to permeate or percolate into the soil at the Wagga Base;
 - (iv) it allowed Spent AFFF and Fire Run-Off to be transmitted to the groundwater beneath the Wagga Base, including the Wagga Alluvium Aquifer (where it was likely to mingle with groundwater underlying areas off-base in the Wagga Relevant Area);

- (v) it allowed Spent AFFF and Fire Run-Off to drain into the surrounding water catchment areas (including via the Wagga Drainage System), including into the Wagga Surface Water Bodies; and/or
 - (vi) it allowed Spent AFFF and Fire Run-Off to be transmitted to the Wagga Surface Water Bodies; and/or
 - (vii) to the extent it stored wastewater from the use of AFFF, doing so in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
- (b) made the following omissions:
- (i) it failed to investigate and assess, or to do so adequately, the risks associated with the use of AFFF before using, or continuing to use AFFF;
 - (ii) it failed to restrict, or to do so adequately, the use of AFFF Working Solution and AFFF only to emergencies;
 - (iii) it failed to take any or any adequate steps to contain or limit the use of AFFF Working Solution and AFFF in Wagga Training and Operations Activities;
 - (iv) it failed to take any or any adequate steps to contain, capture, clean up and securely dispose of Spent AFFF and Fire Run-Off, such that it did not:
 - (A) flow directly onto bare ground;
 - (B) permeate or percolate into the soil at the Wagga Base;
 - (C) become transmitted to the groundwater beneath the Wagga Base, including the Wagga Alluvium Aquifer (where it was likely to mingle with groundwater underlying areas off-base in the Wagga Relevant Area);
 - (D) drain into the surrounding water catchment areas (including via the Wagga Drainage System), including into the Wagga Surface Water Bodies; and
 - (E) transmit to the Wagga Surface Water Bodies;

- (v) it failed to store wastewater from the use of AFFF Working Solution and AFFF in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
- (vi) it failed to take any or any adequate steps to remediate the contamination of the groundwater under the Wagga Base at any time after the time when it knew or ought reasonably to have known that groundwater was contaminated, as pleaded in paragraphs 4.85 to 4.89 (to the extent, which is unknown to the Applicants, that the contamination may at one time have been remediable); and/or
- (vii) it failed to take any or any adequate steps to remediate the contamination of the soil on Wagga Base at any time after the time when it knew or ought reasonably to have known that soil was contaminated (including to prevent Spent AFFF and Fire Run Off leaching, or further leaching into the groundwater or surface water, (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable).

PARTICULARS

- (i) *As to subparagraph (a)(i), paragraphs 4.27 to 4.37 are repeated.*
- (ii) *As to subparagraph (a)(ii), paragraphs 4.27 to 4.37 are repeated.*
- (iii) *As to subparagraph (a)(iii), paragraphs 4.27 to 4.37 and 4.57 to 4.58 are repeated.*
- (iv) *As to subparagraph (a)(iv), paragraphs 4.27 to 4.37 and 4.52 to 4.56 are repeated.*
- (v) *As to subparagraph (a)(v), paragraphs 4.27 to 4.37 and 4.47 to 4.51 is repeated.*
- (vi) *As to subparagraph (a)(vi), paragraphs 4.27 to 4.37 and 4.47 to 4.51 is repeated.*
- (vii) *As to subparagraph (a)(vii), paragraphs 4.27 to 4.37 and 4.47 to 4.60 is repeated.*
- (viii) *As to subparagraph (b)(i), paragraphs 4.27 to 4.37 and 4.82 to 4.89 are repeated.*
- (ix) *As to subparagraph (b)(ii), paragraphs 4.27 to 4.37 are repeated.*
- (x) *As to subparagraph (b)(iii), paragraphs 4.27 to 4.37 are repeated.*
- (xi) *As to subparagraph (b)(iv), paragraphs 4.27 to 4.37 and 4.47 to 4.60 are repeated.*
- (xii) *As to subparagraph (b)(v), paragraphs 4.27 to 4.37 is repeated.*
- (xiii) *As to subparagraph (b)(vi), paragraphs 4.27 to 4.37 and 4.82 to 4.89 are repeated.*

- (xiv) *As to subparagraph (b)(vii), paragraphs 4.27 to 4.37 and 4.82 to 4.89 are repeated.*

4.92. Further, or alternatively, the Commonwealth:

- (a) failed, at all material times after the Wagga Contamination Knowledge Date, to warn persons resident in the Wagga Relevant Area that:
 - (i) it had been using AFFF Working Solution and AFFF at the Wagga Base since or about 1970;
 - (ii) Spent AFFF had permeated and percolated into the soil at the Wagga Base and entered and/or contaminated, the Wagga Alluvium Aquifer, Wagga Surface Water Bodies; and/or
 - (iii) Spent AFFF was:
 - (A) potentially damaging to the environment; and/or
 - (B) potentially causative of adverse health effects in humans; and/or

4.93. Further, or alternatively, the Commonwealth failed, at all material times after the inception of the *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, Volume 1, Ch6(6), to comply with that measure by providing all relevant information on site contamination for persons resident in the Wagga Relevant Area.

G THE COMMONWEALTH'S LIABILITY

G.1 Nuisance

G.1.1 Liability in nuisance

4.94. By its use of the Wagga Base as pleaded in paragraphs 4.27 to 4.37 and 4.90 to 4.91, the Commonwealth has created, and continued, an interference with the use and enjoyment of the land owned by Wagga Group Members (the **Wagga Nuisance**), in that:

- (a) their land is affected by the Wagga Surface Water Contamination and such contamination is irreducible (and paragraphs 4.47 to 4.51 are repeated);
- (b) they are no longer able safely to use any private bores on their land to access the Wagga Alluvium Aquifer as a water supply for Wagga Groundwater Usages,

given the Wagga Alluvium Aquifer are irretrievably contaminated (and paragraphs 4.52 to 4.56 are repeated);

- (c) their soil has sustained Wagga Soil Contamination, and such contamination is irretrievable (and paragraphs 4.57 to 4.58 are repeated);
- (d) their land is affected by the Wagga Biota Contamination, and such contamination is irretrievable (and paragraphs 4.59 to 4.60 are repeated); and
- (e) those occupying their land are subject to the Wagga Ongoing Contaminant Exposure.

PARTICULARS

- (i) *The interference with the land of Wagga Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Wagga Group Members.*

4.95. Further, by reason of the matters pleaded in paragraphs 4.21, 4.25, 4.40, 4.46, 4.81 and/or 4.82 to 4.89, at all material times it was reasonably foreseeable to a reasonable person in the Commonwealth's position that persons owning land in the Wagga Relevant Area (including Wagga Group Members) would suffer loss by the Commonwealth's use of the Wagga Base as pleaded in paragraphs 4.27 to 4.37, being pure economic loss, in the form of diminution in the value of land in the Wagga Relevant Area.

PARTICULARS

- (i) *Paragraphs 4.21, 4.25, 4.40, 4.46, 4.81 and/or 4.82 to 4.89 are repeated.*

4.96. By reason of the matters pleaded in paragraphs 4.94 and 4.95, the Wagga Nuisance constitutes a substantial and unreasonable interference with the use and enjoyment of the land owned by Wagga Group Members.

G.1.2 Causation, loss and damage

4.97. The Wagga Nuisance directly caused:

- (a) the Wagga Surface Water Contamination (as pleaded in paragraph 4.50);
- (b) the Wagga Groundwater Contamination (as pleaded in paragraph 4.55);
- (c) the Wagga Soil Contamination (as pleaded in paragraph 4.57);

- (d) the Wagga Biota Contamination (as pleaded in paragraph 4.59); and/or
- (e) the Wagga Contamination Land Value Affection (as pleaded in paragraph 4.80), and

the Wagga Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *Particulars of the losses of Wagga Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Wagga Group Members.*

G.1.3 Aggravated and exemplary damages

4.98. Further, on and from the Actual Knowledge Date, by continuing the Wagga Nuisance by:

- (a) continuing to do the acts as pleaded in paragraph 4.90 and/or sub-paragraph 4.91(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 4.91(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 4.82 to 4.89, the Commonwealth engaged in aggravating conduct, and Wagga Group Members claim aggravated damages.

4.99. Further, or alternatively, on and from the Actual Knowledge Date, by continuing the Wagga Nuisance by:

- (a) continuing to do the acts as pleaded in paragraph 4.90 and/or sub-paragraph 4.91(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 4.91(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 4.82 to 4.89, the Commonwealth engaged in conduct in contumelious disregard for the rights of Wagga Group Members, and Wagga Group Members claim exemplary damages.

G.2 Negligence

G.2.1 Duty of care

- 4.100. At all material times, persons other than the Commonwealth (including Wagga Group Members) had no capacity to control the activities of the Commonwealth on the Wagga Base, and in particular the use of AFFF Working Solution and AFFF on the Wagga Base.
- 4.101. At all material times, the land in the Wagga Relevant Area (including the land owned by Wagga Group Members) was physically proximate to the Wagga Base.
- 4.102. At all material times, by reason of the matters pleaded in paragraphs 4.100 to 4.101 persons owning, or considering purchasing land in the Wagga Relevant Area (including Wagga Group Members) were in a position of vulnerability.
- 4.103. By reason of the matters pleaded in paragraphs 4.21, 4.25, 4.40, 4.46, 4.81 and/or 4.82 to 4.89 a reasonable person in the Commonwealth's position would have foreseen a reasonably foreseeable and not insignificant risk of harm to persons owning, or acquiring land in the Wagga Relevant Area (including Wagga Group Members) by the Commonwealth's use of AFFF Working Solution and AFFF on the Wagga Base as pleaded in paragraphs 4.27 to 4.37, being pure economic loss, in the form of diminution in the value of their land (the **Wagga Risk of Harm**).

PARTICULARS

- (i) *Paragraphs 4.21, 4.25, 4.40, 4.46, 4.81 and/or 4.82 to 4.89 are repeated.*
- 4.104. By reason of the matters pleaded in paragraphs 4.100 to 4.103, the Commonwealth owed a duty to each and all of Wagga Group Members to exercise reasonable care, in the use of AFFF Working Solution and AFFF on the Wagga Base not to cause pure economic loss, in the form of diminution in the value of land in the Wagga Relevant Area (**Wagga Duty of Care**).
- 4.105. By reason of the matters pleaded in paragraphs 4.100 to 4.103, on and after the Wagga Contamination Knowledge date, alternatively the Actual Knowledge Date, the Commonwealth owed a duty to each and all of Wagga Group Members to exercise reasonable care to warn them that:
- (a) it had been using AFFF at the Wagga Base since or about 1970;

- (b) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Wagga Base and entered and/or contaminated the Wagga Alluvium Aquifer and/or contaminated the Wagga Surface Water Bodies; and
- (c) Spent AFFF was:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans,

(Wagga Duty to Warn).

G.2.2 Scope of Wagga Duty of Care

4.106. On and from 3 November 1972, the *Clean Waters Act 1970* (NSW) (**CWA NSW**):

- (a) prohibited persons in NSW from polluting any waters (meaning any river, stream, lake, lagoon, natural or artificial watercourse, dam or tidal waters (including the sea), and includes any underground or artesian water) or causing or permitting any waters to be polluted;
- (b) defined “pollute” to mean to place in or on waters any matter whether solid, liquid or gaseous, so that the physical, chemical or biological condition of the waters is changed, or to place in or on the waters any refuse, litter, debris or other matter, whether solid or liquid or gaseous, so that the change in the condition of the waters or the refuse, litter debris or other matter is likely to make the waters unclean, noxious, poisonous or impure, detrimental to the health, safety, welfare or property of persons, undrinkable for farm animals, poisonous or harmful to aquatic life, animals, birds or fish in or around waters or unsuitable for use in irrigation.

PARTICULARS

- (i) *CWA NSW, ss 5 and 16.*

4.107. On and from 1 July 1999, the *Protection of the Environment Operations Act 1997* (NSW) (**POEO NSW**):

- (a) prohibited persons in NSW from polluting any waters (meaning any river, stream, lake, lagoon, swamp, wetlands, unconfined surface water, natural or artificial watercourse, dam or tidal waters (including the sea), and any water stored in artificial works, any waste in water mains, water pipes, or water channels or any

underground or artesian water) or causing or permitting any waters to be polluted;

- (b) defined “pollution of waters” to mean placing in or on, or otherwise introducing into or onto, waters (whether through an act or omission) any matter, whether solid, liquid or gaseous so that the physical, chemical or biological condition of the waters is changed, or to place in or on the waters any refuse, litter, debris or other matter, whether solid or liquid or gaseous, so that the change in the condition of the waters or the refuse, litter debris or other matter is likely to make the waters unclean, noxious, poisonous or impure, detrimental to the health, safety, welfare or property of persons, undrinkable for farm animals, poisonous or harmful to aquatic life, animals, birds or fish in or around waters or unsuitable for use in irrigation;
- (c) prohibited wilfully or negligently disposing (including to cause or permit disposal) of waste in a manner that harms or is likely to harm the environment; and
- (d) defined “waste” to include any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration on the environment, or any discarded, rejected, unwanted, surplus or abandoned substance.

PARTICULARS

- (i) *POEO NSW, ss 115 and 120.*

4.108. At all material times:

- (a) from 3 November 1972 to 1 July 1999, the content of the CWA NSW (as pleaded in paragraph 4.106);
- (b) from 1 July 1999, the content of the POEA NSW (as pleaded in paragraph 4.107),

bound the Commonwealth by reason of the *Commonwealth Places (Application of Laws) Act 1970* (Cth), and/or informed the scope of what a reasonably person ought do in relation to conduct which it was reasonably foreseeable might result in environmental harm (including the Wagga Risk of Harm pleaded in paragraph 4.103).

4.109. The Commonwealth had the capacity to exercise control of the Wagga Training and Operations Activities and the use of AFFF Working Solution and AFFF on the Wagga

Base so as to take the precautions which a reasonable person in its position would have taken against the Wagga Risk of Harm, by:

- (a) not doing the following acts at all, or alternatively any time after the Actual Knowledge Date:
 - (i) allowing large quantities of AFFF Working Solution and AFFF to be discharged to bare ground;
 - (ii) allowing Spent AFFF and Fire Run-Off to flow directly onto bare ground in large quantities;
 - (iii) allowing Spent AFFF and Fire Run-Off to permeate or percolate into the soil at the Wagga Base;
 - (iv) allowing Spent AFFF and Fire Run-Off to be transmitted to the groundwater beneath the Wagga Base, including the Wagga Alluvium Aquifer (where it was likely to mingle with groundwater underlying areas off-base in the Wagga Relevant Area);
 - (v) allowing Spent AFFF and Fire Run-Off to drain into the surrounding water catchment areas (including via the Wagga Drainage System), including into the Wagga Surface Water Bodies;
 - (vi) allowing Spent AFFF and Fire Run-Off to be transmitted to the Wagga Surface Water Bodies; and/or
 - (vii) to the extent it stored store wastewater from the use of AFFF Working Solution and AFFF, it did so in such a way that it failed to avoid leakage to the surrounding environment;
- (b) doing the following things, at any time, or alternatively any time after the Actual Knowledge Date:
 - (i) investigating and assessing the risks associated with the use of AFFF Working Solution and AFFF before using, or continuing to use, AFFF Working Solution and AFFF (and not using them at all);
 - (ii) restricting the use of AFFF Working Solution and AFFF only for emergency activities;

- (iii) taking steps to contain or limit the use of AFFF Working Solution and AFFF in the Wagga Training and Operations Activities;
- (iv) taking steps to contain, capture, clean up and securely dispose of Spent AFFF and Fire Run-Off, such that it did not:
 - (A) flow directly onto bare ground;
 - (B) permeate or percolate into the soil at the Wagga Base;
 - (C) become transmitted to the groundwater beneath the Wagga Base, including the Wagga Alluvium Aquifer (where it was likely to mingle with groundwater underlying areas off-base in the Wagga Relevant Area);
 - (D) drain into the surrounding water catchment areas (including via the Wagga Drainage System), including into the Wagga Surface Water Bodies; and
 - (E) transmit to the Wagga Surface Water Bodies;
- (v) storing wastewater from the use of AFFF in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
- (vi) taking steps to remediate the contamination of the groundwater under the Wagga Base promptly after the time when it knew or ought reasonably to have known that groundwater was contaminated, as pleaded in paragraphs 33 to 35 (to the extent, which is unknown to the Applicants, that the contamination may at one time have been remediable); and/or
- (vii) taking steps to remediate contaminated soil on Wagga Base at any time promptly after the time when it knew or ought reasonably to have known that soil was, or was likely to have been, contaminated (including by removing that soil and disposing of it at an off-site disposal area so as to prevent Spent AFFF and Fire Run Off leaching, or further leaching into the groundwater or surface water, (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable)).

G.2.3 Scope of Duty to Warn

4.110. At all material times after the Wagga Contamination Knowledge Date, alternatively the Actual Knowledge Date, the Commonwealth had capacity to warn the general public, alternatively owners and residents of the Wagga Relevant Area, alternatively the market of potential purchasers of land in the Wagga Relevant Area (including Wagga Group Members) that:

- (a) it had been using AFFF Working Solution and AFFF at the Wagga Base since or about 1970;
- (b) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Wagga Base and entered and/or contaminated the Wagga Alluvium Aquifer and/or contaminated the Wagga Surface Water Bodies; and
- (c) Spent AFFF was:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans.

G.2.4 Breach of duty

4.111. By reason of the matters pleaded in paragraphs 4.27 to 4.37, 4.91 and 4.109, the Commonwealth breached the Wagga Duty of Care (the **Wagga Negligence**).

4.112. By reason of the matters pleaded in paragraphs 4.27 to 4.37, 4.92 and 4.110, the Commonwealth breached the Wagga Duty to Warn (the **Wagga Negligent Failure to Warn**).

G.2.5 Causation, loss and damage

4.113. The Commonwealth's Wagga Negligence caused:

- (a) the Wagga Surface Water Contamination (as pleaded in paragraph 4.50);
- (b) the Wagga Groundwater Contamination (as pleaded in paragraph 4.55);
- (c) the Wagga Soil Contamination (as pleaded in paragraph 4.57);
- (d) the Wagga Biota Contamination (as pleaded in paragraph 4.59); and/or
- (e) the Wagga Contamination Land Value Affection (as pleaded in paragraph 4.80), and

Wagga Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *The particulars to paragraph 4.97 are repeated.*

4.114. Further, or alternatively, the Commonwealth's Wagga Negligent Failure to Warn caused or materially contributed to some Wagga Group Members acquiring land in the Wagga Relevant Area, and Wagga Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *Particulars of the identity of those Wagga Group Members who would not have acquired land were it not for the Commonwealth's Wagga Negligent Failure to Warn will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Wagga Group Members, and the particulars to paragraph 4.97 are repeated.*

G.2.6 Aggravated and exemplary damages

4.115. Further, on and from the Actual Knowledge Date by:

- (a) continuing to do the acts as pleaded in paragraph 4.90 and/or sub-paragraph 4.91(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 4.91(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 4.82 to 4.89, the Commonwealth engaged in aggravating conduct, and Wagga Group Members claim aggravated damages.

4.116. Further, or alternatively, on and from the Actual Knowledge Date by:

- (a) continuing to do the acts as pleaded in paragraph 4.90 and/or sub-paragraph 4.91(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 4.91(b) (and each of them),

in circumstances where it where it had the knowledge as pleaded in paragraphs 4.82 to 4.89, the Commonwealth engaged in conduct in contumelious disregard for the rights of Wagga Group Members, and Wagga Group Members claim exemplary damages.

G.3 Breach of statutory duty

G.3.1 Liability

4.117. The Wagga Base is situated on Commonwealth land as defined in ss 27 and 525 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**).

4.118. Pursuant to s 28 of the EPBC Act, the Commonwealth or a Commonwealth agency must not take an action that has, will have, or is likely to have a significant impact on the environment, defined by s 528 non-exhaustively to include:

- (a) ecosystems and their constituent parts, including people and communities;
- (b) natural and physical resources;
- (c) the qualities and characteristics of locations, places and areas;
- (d) heritage values of places; and
- (e) the social, economic and cultural aspects of a thing mentioned in paragraph (a), (b), (c) or (d).

4.119. By its use of the Wagga Base on and from 16 July 1999, as pleaded in paragraphs 4.27 to 4.37 and 4.90 and/or 4.91, the Commonwealth took an action or actions that has or is likely to have a significant impact on the environment.

PARTICULARS

- (i) *These actions have had such an impact by reason of the matters pleaded in paragraphs 4.47 to 4.60, namely the Wagga Surface Water Contamination, Wagga Toxic Plume, the Wagga Groundwater Contamination, the Wagga Soil Contamination, and the Wagga Biota Contamination.*
- (ii) *These actions were likely to have such an impact by reason that they were reasonably foreseeable, by reason of the matters pleaded in paragraphs 4.21, 4.25, 4.40, 4.46 and 4.81.*

4.120. By reason of the matters pleaded in paragraph 4.119, the Commonwealth has contravened s 28 of the EPBC Act (**Wagga EPBC Act Breach**).

G.3.2 Causation, loss and damage

4.121. The Wagga EPBC Act Breach caused:

- (a) the Wagga Surface Water Contamination (as pleaded in paragraph 4.50);
- (b) the Wagga Groundwater Contamination (as pleaded in paragraph 4.55);

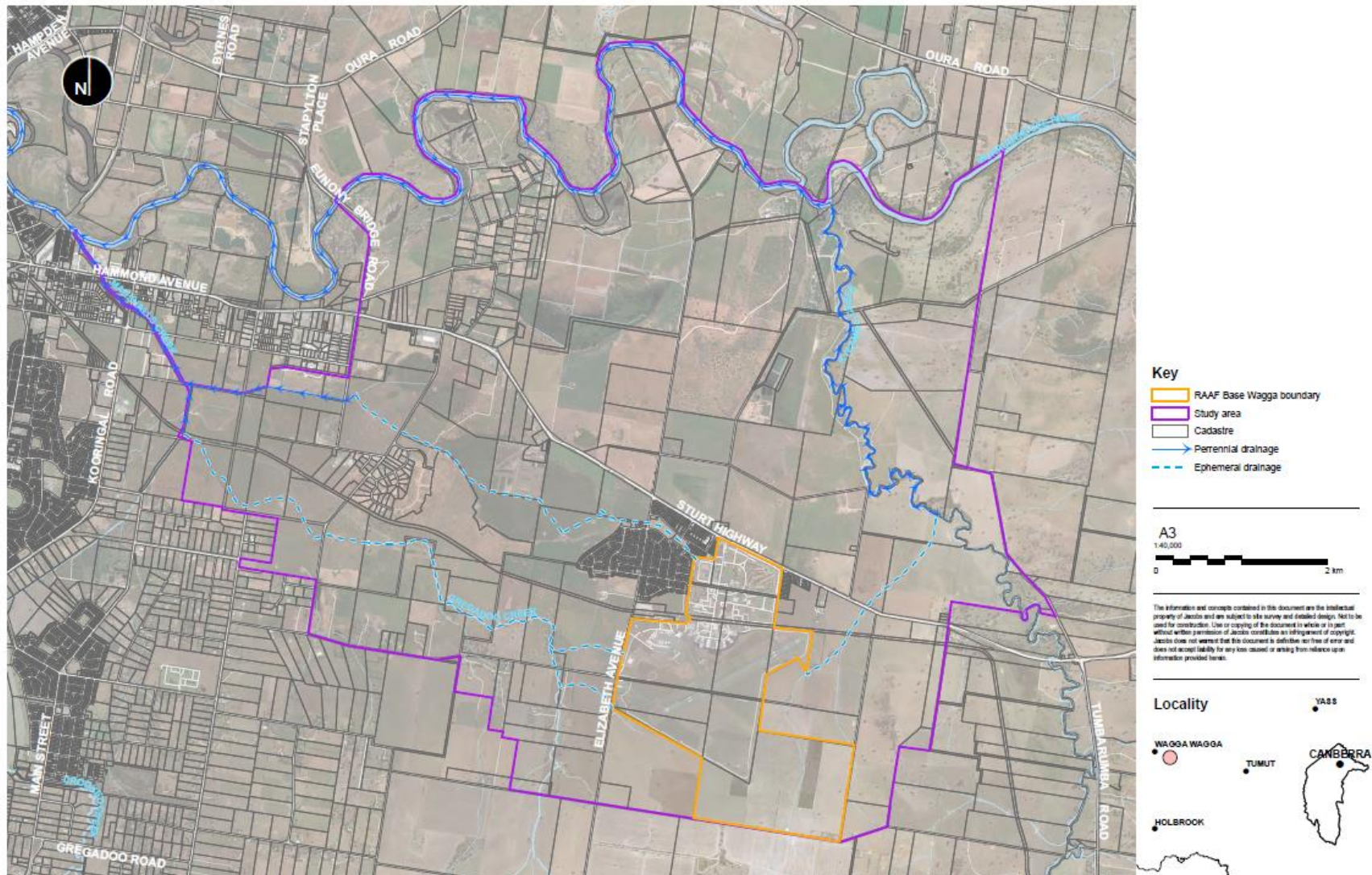
- (c) the Wagga Soil Contamination (as pleaded in paragraph 4.57);
- (d) the Wagga Biota Contamination (as pleaded in paragraph 4.59); and/or
- (e) the Wagga Contamination Land Value Affectation (as pleaded in paragraph 4.80), and

Wagga Group Members have thereby suffered loss and damage arising from the Wagga EPBC Act Breach.

PARTICULARS

- (i) *The particulars to paragraph 4.97 are repeated.*

ANNEXURE 4A: WAGGA RELEVANT AREA



SCHEDULE 5 – EDINBURGH BASE

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A THE EDINBURGH BASE AND SURROUNDS

A.1 The Edinburgh Base

- 5.1. Since about 1940, the Commonwealth has continuously owned and occupied an area of land approximately 10.77 kilometres square in size, located in Edinburgh in the Northern Adelaide Plains, approximately 25 kilometres north of the Adelaide central business district, known as RAAF Base Edinburgh (the **Edinburgh Base**).

PARTICULARS

- (i) *JBS&G Australia Pty Ltd, Department of Defence RAAF Base Edinburgh Environmental Investigation of PFAS – Detailed Site Investigation – Main Report (11 December 2018) (JBS&G DSI Report) at paragraphs 1, 2.1 and 4.*
- (ii) *The Commonwealth recently acquired land to accommodate the northern runway extension.*

- 5.2. Since about 1978, neighbouring land use in the region surrounding the Edinburgh Base has at times included:

- (a) in the north, a childcare facility, industrial, agricultural and recreational, with low-density residential land to the northeast;
- (b) in the east, industrial, residential and commercial;
- (c) in the south, agricultural (primary production), industrial, commercial and residential, with some areas designated as open space; and
- (d) in the west, agricultural (primary production) and industrial with some low-density residential.

PARTICULARS

- (i) *JBS&G DSI Report at paragraph 2.3 and Figure 4.*

A.2 The natural features of the Edinburgh Base and surrounding area

A.2.1 Climate

- 5.3. At all material times, the Edinburgh Base and the Edinburgh Relevant Area were situated in a climate which experienced its highest temperatures during the months of January and February, and its highest rainfall during the month of July.

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 3.4 and 3.4.1.*

- (ii) *JBS&G Australia Pty Ltd, Department of Defence RAAF Base Edinburgh Environmental Investigation of PFAS – Human Health Risk Assessment (HHRA) and Preliminary Ecological Risk Assessment (21 July 2019) (JBS&G HHERA) at paragraph 3.5*

A.2.2 Topography

- 5.4. At all material times, the Edinburgh Base and the Edinburgh Relevant Area were generally flat.

PARTICULARS

- (i) *JBS&G DSI Report at paragraph 3.3.*
- (ii) *JBS&G HHERA at paragraph 3.4.*

A.2.3 Soils

- 5.5. At all material times, the underlying sediment of the Edinburgh Base consisted of sandy silty clay material that was usually dark brown to black in colour with significant organic inclusions.

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 11.1.3 and 11.3.1.*

A.2.4 Hydrology

- 5.6. Since about 1978, the Edinburgh Base and the Edinburgh Relevant Area has at times contained:

- (a) to the south-southwest of the Edinburgh Base, the Kaurna Park Wetland which was constructed in the mid-1990s;
- (b) a semi-permanent inlet pond in the Kaurna Park Wetland;
- (c) constructed water and wetland features of the Springbank Waters residential estate, which were developed in approximately 2003,

(together, the **Edinburgh Surface Water Bodies**).

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 2.3, 3.3 and 11.5.1 and Figure 4.*

5.7. Since about 1978, the Edinburgh Base has at times contained a number of lined and unlined stormwater drainage channels that were fed by various catchment zones, which also formed part of the Edinburgh Surface Water Bodies, including:

- (a) Helps Road Drain, which was the most significant drainage channel and traversed through the centre of the Edinburgh Base, entering from the north-eastern corner and exiting at the mid-point of the southern boundary;
- (b) Taranaki Drain;
- (c) the Southern Detention Basin, which was constructed in 2003 to facilitate stormwater harvesting; and
- (d) Kaurua Park Wetland, which was constructed in the mid-1990s.

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 3.3 and 11.5.1.*
- (ii) *JBS&G HHRA & PERA at paragraphs 3.4 and 8.*

A.2.5 Hydrogeology

5.8. At all material times, the hydrogeology of the Edinburgh Base and Edinburgh Relevant Area comprised several aquifer systems, which included:

- (a) upper aquifers contained within the Quaternary aged formations, which were typically comprised of silty and sandy clays with isolated lenses of sand and gravel (**Quaternary Aquifers**);
- (b) underlying aquifers contained within the Tertiary aged sediments, which were typically confined aquifers and were developed for irrigation purposes (**Tertiary Aquifers**),

(together, the **Edinburgh Aquifers**).

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 3.2.1, 3.2.2 and 3.2.3.*
- (ii) *JBS&G Australia Pty Ltd, Department of Defence RAAF Base Edinburgh Environmental Investigation of PFAS – Detailed Site Investigation – Addendum Report (21 July 2019) (**JBS&G Addendum DSI Report**) at paragraphs 3.2 and 3.3.*
- (iii) *JBS&G HHERA Report at paragraph 3.2.*

Groundwater flow

- 5.9. At all material times, the groundwater of the Edinburgh Base and Edinburgh Relevant Area flowed in a general south-westerly direction, however with significant variability as influenced by unlined surface water features (such as stormwater drains and swales).

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 3.2.4, 11.4.2.*

The interaction of surface water and groundwater

- 5.10. At all material times, surface water recharged the groundwater at the Edinburgh Base and the Edinburgh Relevant Area, with a relatively high degree of variability in vertical hydraulic gradients both spatially and in magnitude, however downward vertical gradients typically occurred within proximity to stormwater drainage infrastructure.

PARTICULARS

- (i) *JBS&G DSI Report at paragraph 11.4.3.*
(ii) *JBS&G HHERA at paragraph 3.2.*

- 5.11. At all material times, Salisbury Water operated a scheme called the City of Salisbury Aquifer Storage and Recovery Scheme (**ASR Scheme**) whereby surface water was injected into the Tertiary Aquifers during times of high rainfall, where it was stored for subsequent recovery during drier times of the year.

- 5.12. The ASR Scheme distributed water for use as irrigation water, industrial process water, pond water, and for domestic use (plumbing for toilets).

- 5.13. The ASR Scheme included two injection and extraction bore areas located within the Edinburgh Relevant Area which injected water sourced from the Southern Detention Basis and the Kaurna Park Westland.

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 3.2.5.3*

A.2.6 Flooding

- 5.14. At all material times from about the mid 1990s, the Kaurna Park Wetland was constructed and intended to be used as a floodwater detention basin.

PARTICULARS

- (i) *JBS&G DSI Report at paragraph 3.3.*
- (ii) *Further particulars of flooding events on the Edinburgh Base may be provided after discovery and inspection.*

A.3 The artificial water-related features of the Edinburgh Base

5.15. Since about 1978, the features of the drainage system of the Edinburgh Base and Edinburgh Relevant Area at times included:

- (a) the Helps Road Drain, which:
 - (i) was one of the main stormwater drainage channels present within the Edinburgh Base;
 - (ii) was an open and unlined earthen drain, that discharged water from the Edinburgh Base across its southern boundary;
 - (iii) typically received stormwater captured on the Edinburgh Base east of the runway via a series of shallow unlined stormwater swales;
 - (iv) typically received stormwater generated on the Edinburgh Base to the east of the Helps Road Drain, either directly or via the Taranaki Drain;
 - (v) directed stormwater within the Helps Road Drain off-site to the Kaurua Park Wetland;
 - (vi) was realigned:
 - (A) during the construction of the Kaurua Park Wetland (in the mid-1990s) at its off-site portion to direct stormwater flows into the Kaurua Park Wetland;
 - (B) in approximately 2003, as a result of the commencement of residential development within the Springbank Waters residential estate;
 - (vii) prior to 2003, received stormwater generated on the Edinburgh Base and discharged stormwater across the Edinburgh Base's southern boundary without any on-site detention;
- (b) the Taranaki Drain, which:

- (i) was one of the main stormwater drainage channels present within the Edinburgh Base;
 - (ii) was an open and unlined earthen drain;
- (c) the Southern Detention Basin which:
 - (i) was constructed in 2003 to facilitate stormwater harvesting as part of the ASR Scheme;
 - (ii) received stormwater from the Helps Road Drain during low flow regimes, and directed excess stormwater not harvested by the ASR Scheme back to the Helps Road Drain where it exited the Edinburgh Base across the southern boundary;
- (d) a western drainage catchment area located to the west of the runway which comprised an unlined swale drain that:
 - (i) was identified as the Western Swale;
 - (ii) was constructed in the late 1990s or early 2000s;
 - (iii) conveys surface water from north to south and discharges to a swale located adjacent to the Adelaide-Port Augusta railway line;
- (e) the stormwater network on the Edinburgh Base acting as an ephemeral system;
- (f) the Kaurna Park Wetland, which:
 - (i) was constructed in the mid-1990s, as a floodwater detention basis;
 - (ii) represented an ephemeral surface water system;
 - (iii) directed stormwater through a meandering series of channels in a general northeast to southwest direction;
 - (iv) directed overflow stormwater back to the Helps Road Drain,

(together, the **Edinburgh Drainage System**).

PARTICULARS

- (i) *JBS&G DSI Report at paragraph 3.3.*

- (ii) *JBS&G HHERA Report at paragraph 8.1.*
- (iii) *Further particulars of the Edinburgh Drainage System and other drainage systems on the Edinburgh Base may be provided after discovery and inspection.*

5.16. At all material times, as a result of the Edinburgh Drainage System and its predominately unlined nature, the major surface water located on the Edinburgh Base and the Edinburgh Relevant Area (in the form of stormwater), had a high degree of leakage and seepage to the Edinburgh Aquifers.

PARTICULARS

- (i) *JBS&G DSI Report at paragraph 12.2.*

A.4 The foreseeable flow of water from the Edinburgh Base

5.17. At all material times, by reason of the matters pleaded in paragraphs 5.4 to 5.16 it was reasonably foreseeable that waters, liquids, and soluble materials discharged on Edinburgh Base would:

- (a) permeate, percolate or leach into the soil at the Edinburgh Base;
- (b) be transmitted to the groundwater beneath the Edinburgh Base, including into the Edinburgh Aquifers and mingle and flow with that groundwater;
- (c) mingle with other surface water on the Edinburgh Base (especially after periods of rain), and flow overland towards the Edinburgh Surface Water Bodies and:
 - (i) permeate or percolate into the soil over which the surface water overland flows occurred; and
 - (ii) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including into the Edinburgh Aquifers; and
- (d) be transmitted to the Edinburgh Surface Water Bodies.

B WATER USE AT THE RELEVANT AREA

B.1 Edinburgh Surface Water Bodies

5.18. At all material times, the Edinburgh Surface Water Bodies, including the Kaurna Park Wetland have been used by residents of the Edinburgh Relevant Area for fishing and catching of yabbies (together, the **Edinburgh Surface Water Usages**).

PARTICULARS

- (i) *JBS&G DSI Report at paragraph 2.3.*

B.2 Groundwater

5.19. At all material times, groundwater from the Edinburgh Aquifers has been used by Edinburgh Group Members for:

- (a) domestic use (including outside domestic activities, fruit, vegetable and lawn watering);
- (b) watering of livestock or poultry;
- (c) commercial irrigation purposes, including garden markets; and
- (d) industrial purposes

(together, the **Edinburgh Groundwater Usages**).

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 2.3, 3.2.5.2, 11.8.1, Table 11.15.*
- (ii) *JBS&G Addendum DSI Report at Table 3.3.*
- (iii) *JBS&G HHERA at paragraph 3.3.2 and Table 3.2.*

5.20. At all material times, there were 394 registered bores located within the Edinburgh Relevant Area, of which 50 registered bores were licenced to extract groundwater for private water supply purposes including the Edinburgh Groundwater Usages and which drew water from the Edinburgh Aquifers.

PARTICULARS

- (i) *JBS&G DSI Report at paragraph 3.2.5.2.*
- (ii) *JBS&G HHERA at paragraph 3.3.2, Table 3.1 and Appendix A.*
- (iii) *Some private bores are registered, while some are unregistered.*
- (iv) *Some Edinburgh Group Members have private bores on their land. The identity of all those Edinburgh Group Members who have private bores will be particularised following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Edinburgh Group Members.*

5.21. At all material times, the registered bores licenced to extract groundwater for private water supply purposes extracted ground water for:

- (a) irrigation purposes;
- (b) stock purposes;
- (c) domestic purposes; and
- (d) industrial purposes.

PARTICULARS

- (i) *JBS&G DSI Report at paragraph 3.2.5.2.*
- (ii) *JBS&G Addendum DSI Report at Table 3.3.*
- (iii) *JBS&G HHERA at Table 3.2.*

B.3 The foreseeable usage of water emanating from the Edinburgh Base

5.22. At all material times, by reason of the matters pleaded in paragraphs 5.17 to 5.20 above, it was reasonably foreseeable that waters, liquids, and soluble materials discharged and/or allowed to escape the Edinburgh Base which were transmitted to the Edinburgh Surface Water Bodies, and the Edinburgh Aquifers would be used by residents of the Edinburgh Relevant Area.

C THE COMMONWEALTH'S USE OF AFFF AT THE EDINBURGH BASE

C.1 Introduction

5.23. At all material times since the establishment of the Edinburgh Base, the Commonwealth has been responsible for conducting all of the activities conducted at the Edinburgh Base.

C.2 The Commonwealth's use of AFFF

5.24. As part of the operation of the Edinburgh Base since about 1978, the Commonwealth has regularly conducted fire drills, firefighting training, fire tests, mock emergency aircraft landing and accident drills, foam training, equipment testing (including the testing of nozzles, firefighting trucks, and fire suppression systems), firefighting, fire suppression, and like operations (both on and near Edinburgh Base) (**Edinburgh Training and Operations Activities**).

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 1.1, 1.1.1, 5.7 and 6 and Table 7.2 and Appendix D and E.*
- (ii) *Further particulars may be provided after discovery and inspection.*

5.25. At all material times in the period from about 1978 until a time unknown to the Applicants after about 2005, in the use and occupation of the Edinburgh Base for the purpose of the Edinburgh Training and Operations Activities, the Commonwealth:

- (a) used AFFF Concentrate;
- (b) mixed the AFFF Concentrate with water to create AFFF Working Solution; and
- (c) aspirated the AFFF Working Solution into a foam via nozzles on firefighting trucks and other mechanisms (the aspirated foam being known as AFFF).

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 1.1, 1.1.1 and 5.7, and Appendix E and F.*
- (ii) *JBS&G Addendum DSI Report at paragraph 1.2.1.*
- (iii) *Particular (i) to paragraph 13 of the Statement of Claim is repeated: the AFFF Concentrate used was principally a product known as “Light Water™” (being manufactured by the Minnesota Mining and Manufacturing Company (now known as 3M Company) and/or its subsidiary 3M Australia Pty Ltd).*
- (iv) *At a time unknown to the Applicants between in about 2003 to 2009, the Commonwealth transitioned to using “Ansulite” at the Edinburgh Base; JBS&G DSI Report at paragraph 1.1.1 and Appendix E The final bulk volume of legacy AFFF concentrate stored at the Edinburgh Base was decanted and replaced with “Ansulite” in December 2013: JBS&G DSI Report at paragraph 1.1.1.*

5.26. The Edinburgh Training and Operations Activities included those in and around:

- (a) the AFFF wastewater retention tank and the AFFF wastewater evaporation pond (**Edinburgh P1**);
- (b) the bulk fuel storage facility (**Edinburgh P2**);
- (c) the wastewater retention infrastructure, known as the Chesterfield Sumps, located at the eastern and western end of the Aircraft Hangars (**Edinburgh P3**);
- (d) the former fire training area and sub-surface waste dump located in the central northern portion of the airside operations area (**Edinburgh P4**);

- (e) the sub-surface waste dump located along the central portion of the western Site boundary (**Edinburgh P5**);
- (f) the former sewage treatment plant (**Edinburgh STP**) and fire training area located in the most southern point of the airside operations area, adjacent to the Helps Road Drain discharge point across the southwestern boundary, and Southern Detention Basin (**Edinburgh P6**).

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 5.1, 12.1, 12.1.1 and 13.1 and Table 12.1.*

Edinburgh P1

5.27. Edinburgh P1 was located to the east of the bulk fuel storage facility (located at Edinburgh P2) and included:

- (a) an AFFF wastewater retention tank (**Building 521**); and
- (b) an AFFF wastewater evaporation pond, which was constructed in about 2004 (**Edinburgh Evaporation Pond**).

5.28. Together Building 521 and the Edinburgh Evaporation Pond was the primary AFFF waste water management system infrastructure to receive AFFF wastewater from the Edinburgh Training and Operations Activities at the Edinburgh Base, which was received from:

- (a) weekly foam testing of ARFF vehicles;
- (b) automated hangar fire suppression systems;
- (c) a chemical storage shed;
- (d) incidental spills and vehicle washing;
- (e) static and full foam testing of fire trucks being sprayed directly into the Edinburgh Evaporation Pond.

5.29. Building 521:

- (a) contained a concrete lined tank which had base and sides, and associated pipe work, that leaked and was ineffective to ensure that AFFF Working Solution and AFFF did not leak;

- (b) historically overflowed to the surrounding areas and the adjacent open stormwater channel;
- (c) contained an earthen stormwater drain that flowed past the Edinburgh Evaporation Pond that ultimately connected to the Helps Road Drain.

5.30. The Edinburgh Evaporation Pond:

- (a) was constructed to retain PFOS/PFOA contaminated water from the AFFF closed system to stop the discharge of untreated water to the sewage system and or stormwater;
- (b) was ineffective to ensure that AFFF Working Solution and AFFF did not leak by reason of the cracks in its liner that resulted in the leaching of wastewater from the Edinburgh Evaporation Pond, overflow, and foam drift from the surface of the Edinburgh Evaporation Pond;
- (c) contained an earthen stormwater drain that flowed past the Edinburgh Evaporation Pond that ultimately connected to the Helps Road Drain.

5.31. The Edinburgh Training and Operations Activities at Edinburgh P1:

- (a) resulted in AFFF waste water being discharged directly to the sewer prior to 2004, when the Edinburgh Evaporation Pond was constructed;
- (b) resulted in the contamination of low lying areas, especially within the vicinity of Building 521;
- (c) included the disposal of AFFF from fire trucks to the Edinburgh Evaporation Pond;
- (d) involved large quantities of AFFF concentrate (estimated at 16,000 litres) being disposed directly into the Edinburgh Evaporation Pond during maintenance activities (such as changing the foam concentrate storage tank bladders);
- (e) resulted in spray and foam “fly-off” being discharged to the soil near the Edinburgh Evaporation Pond and other areas at times of high wastewater levels in the Edinburgh Evaporation Pond or windy conditions.

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 5.1, 5.2.2, 5.2.4, 5.2.7, 5.6, 7.2.1, 7.4, 12.1.1, 13.1 and Table 5.2, 7.2 and 12.1 and Appendix E.*

Edinburgh P2

5.32. At all material times, Edinburgh P2 contained a bulk fuel storage facility which:

- (a) was located to the west of Building 521 and the Edinburgh Evaporation Pond;
- (b) was constructed between the 1960s and 1970s and was extensively upgraded in 1999;
- (c) drained to an internal swale drain and stormwater drain which ultimately fed into the Helps Road Drain;
- (d) contained a 2,800 litre AFFF deluge system which:
 - (i) was installed in 1998;
 - (ii) was accidentally released historically resulting in the release of the entire contents of the deluge system of AFFF Concentrate;
 - (iii) in December 2013, was decanted to remove the final bulk volume of AFFF Concentrate stored at the Edinburgh Base and replaced with "Ansulite";
- (e) comprised two separate bunded areas, each with 2 x 1.5 ML aboveground storage tanks, storing 6 ML of F34 jet fuel as well as an older 30 kl tank which also stored jet fuel;
- (f) was supported by several fuel transport vehicles used for refuelling aircraft; which ran fuel to and from the bulk fuel storage facility.

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 1.1.1, 5.1, 5.2.2, 5.7, 7.2.1 and 13.1 and Tables 5.1 and 7.2.*

Edinburgh P3

- 5.33. At all material times, Edinburgh P3 contained a wastewater retention system, known as the Chesterfield Sumps, which was located at the eastern and western end of several aircraft hangars.
- 5.34. The aircraft hangars contained automated AFFF fire suppression systems which were fitted in 1995 and 1996 and each contained 8,000 litres AFFF Concentrate in a series of foam concentrate tanks.
- 5.35. The Training and Operations Activities at Edinburgh P3 included:
- (a) the testing of the of the automated AFFF fire suppression systems in the hangars, on a 5 yearly basis;
 - (b) the Chesterfield Sumps receiving AFFF waste water generated during the testing of the automated AFFF fire suppression systems via a series of stormwater grates on the adjacent tarmac area where water was directed (gravity fed) via an underground pipe.

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 5.1, 5.2.4, 5.7, 7.2.1, 12.1.1 and 13.1 and Table 7.2, and Appendix F.*

Edinburgh P4

- 5.36. Edinburgh P4:
- (a) was located in the central northern portion of the airside operation area;
 - (b) contained a former fire training area which consisted of six former burning off areas, three of which were bunded by earthen walls, a surface stockpile area, and general surface debris;
 - (c) contained sub-surface waste dump where a great variety of wastes were dumped.
- 5.37. The Edinburgh Training and Operations Activities within Edinburgh P4 included:
- (a) simulated responses to emergency events where mobile firefighting equipment was used, including the discharge of AFFF;
 - (b) the use of firefighting cannons, mounted on the fire trucks, directing a mixture of water and AFFF concentrate into a target area, typically at the end of a

hardstand area (e.g. at the edge of a taxiway), or various site features, such as the revetment (blast) walls within the ordnance unloading area in the southern portion of the airfield.

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 5.1, 5.2.1, 6, 7.2.1 and 13.1 and Table 7.2 and Appendix E and F.*

Edinburgh P5

5.38. At all material times, Edinburgh P5 contained a burning-off compound and sub-surface waste dump which:

- (a) was flat vacant land, located within a missile testing facility compound;
- (b) was used to eradicate, by incineration, redundant waste materials;
- (c) included a store building, coal bunker, incinerator and blower, shelter shed, oil drum stand and a kerbed burn off area;
- (d) contained a concrete drain which ran from the burn off area into a sump, northwest of the site.

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 5.1, 5.2.1, 6, 7.2.1 and 13.1 and Tables 5.2 and 7.2, and Appendix E.*

Edinburgh P6

5.39. At all material times, Edinburgh P6 contained the Edinburgh STP and fire training area located in the most southern point of the airside operations area, adjacent to the Helps Road Drain discharge point across the southwestern boundary, and the Southern Detention Basin.

5.40. The Edinburgh STP may have received AFFF wastewater prior to the construction of the Edinburgh Evaporation Pond in 2004.

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 5.1, 5.2.1, 7.2.1, 13.1 and Tables 5.2 and 7.2 and Appendix E.*

Edinburgh Additional areas

5.41. At all material times, the Edinburgh Training and Operations Activities also included those in and around the following locations:

- (a) an isolated aircraft parking area, located with the Edinburgh Base which was used as a landfill and contained a blackened large plane and a number of waste dumps;
- (b) a former burning off area that was used as a burning off compound to incinerate redundant waste materials and subsurface waste dump, and incorporated a store building, coal bunker, incinerator and blower, shelter shed, oil drum stand and a kerbed burn off area;
- (c) the airfield taxiway dump, which was used a dumping area for building and construction waste resulting from activities on the Edinburgh Base;
- (d) the former fire training areas:
 - (i) including the static rocket firing site and the smokeroom training building located in the southern portion of the airside operations area, where historic fire training activities would occur including firefighting personnel advancing to the intersection of the taxiways in the area and discharging water and AFFF from the fire truck cannons when stationary at the edge of the taxiway;
 - (ii) located in the eastern and western Pyramids where AFFF was discharged during training in the unsealed areas surrounding the historic ordnance storage pyramids;
 - (iii) along Taxiway Bravo, where approximately 50 metres either side of the taxiway, firefighting personnel would discharge water and AFFF from fire truck cannons (on both the eastern and western sides) when travelling along the taxiway;
 - (iv) known as the 1RTU fire training area, where firefighting personnel would discharge, train and use water and AFFF in the area, prior to it being redeveloped as a sporting ground and car park;
 - (v) in the Ordnance Unloading Area, located in the southern portion of the airside operations area, where firefighting personnel would use the

revetment walls within the ordnance unloading area as a target for discharge of AFFF during training exercises;

- (vi) around the Engine Run Up Facility, located to the northwest of the main apron;
- (vii) the suspected former fire training area adjacent to a parking area for aircraft refuelling tanker trucks, located to the west of the bulk fuel storage facility;
- (e) the location of a historical AFFF concentrate spill, resulting from accidental leakage from a fire truck foam tank;
- (f) the current fire station and former AFFF concentrate storage area located near the new Air Traffic Control Tower, where legacy AFFF Concentrate was historically stored and tested.

(together, the **Edinburgh Additional Areas**).

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 5.1, 12.1.1 and 13.1 and Tables 5.2, 7.2 and 12.1. and Appendix E and F.*
- (ii) *Further particulars may be provided after discovery and inspection.*

5.42. By reason of the matters pleaded in paragraphs 5.24 to 5.41 above, the Edinburgh Training and Operations Activities resulted in:

- (a) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground at the Edinburgh Base; and/or
- (b) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with Fire Run-Off, being discharged, or allowed to escape, to bare ground at the Edinburgh Base.

C.3 The Commonwealth's methods for disposal of Spent AFFF

5.43. At all material times:

- (a) Spent AFFF; and/or

(b) Fire Run-Off co-mingled with Spent AFFF,
was generally directed by the Commonwealth towards bare ground or the Edinburgh Drainage System.

PARTICULARS

- (i) *Paragraphs 5.24 to 5.42 are repeated.*
- (ii) *Further particulars may be provided after discovery and inspection.*

5.44. At all material times, to the extent that:

- (a) AFFF discharged in the course of the Edinburgh Training and Operations Activities; and/or
- (b) Fire Run-Off co-mingled with Spent AFFF,
was directed by the Commonwealth to the Edinburgh Drainage System they were ineffective to ensure that liquids contained in them did not leak into the soil below and around them.

C.4 Physical properties of AFFF and Spent AFFF

5.45. Paragraph 15 is repeated.

5.46. Paragraph 16 is repeated.

C.5 The foreseeable flow of Spent AFFF from the Edinburgh Base

5.47. At all material times, by reason of the matters pleaded in paragraphs 5.3 to 5.22 and 5.45 to 5.46 above, it was reasonably foreseeable that use of AFFF Working Solution and AFFF on the Edinburgh Base as pleaded in paragraphs 5.24 to 5.42 and/or 5.43 to 5.44 above would result in Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF:

- (a) being transmitted to the groundwater beneath the Edinburgh Base, including the Edinburgh Aquifers and mingle and flow with that groundwater, and being utilised by persons engaged in the Edinburgh Groundwater Usages;
- (b) mingling with other surface water on the Edinburgh Base (especially after periods of rain), and flowing overland towards and into the surrounding Edinburgh Surface Water Bodies outside the Edinburgh Base and:

- (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Edinburgh Aquifers;
- and being extracted and utilised by persons engaged in the Edinburgh Groundwater Usages; and
- (c) mingling with other surface water on the Edinburgh Base (especially after periods of rain), and flowing overland towards and into the surrounding Edinburgh Surface Water Bodies outside the Edinburgh Base and then being utilised by persons engaged in the Edinburgh Surface Water Usages.

D THE TOXIC PROPERTIES OF SPENT AFFF

D.1 The potential for AFFF to harm humans and the environment

5.48. Paragraph 18 is repeated.

5.49. Paragraph 19 is repeated.

5.50. Paragraph 20 is repeated.

5.51. Paragraph 21 is repeated.

5.52. Paragraph 22 is repeated.

D.2 The foreseeable flow and transmission of a toxic substance

5.53. At all material times, by reason of the matters pleaded in paragraphs 5.3 to 5.22 and 5.45 to 5.46 and 5.48 to 5.52 above, it was reasonably foreseeable that the use of AFFF on the Edinburgh Base as pleaded in paragraphs 5.24 to 5.42 and/or 5.43 to 5.44 above would result in an unnatural soluble substance containing synthetic chemicals:

- (a) permeating or percolating into the soil at the Edinburgh Base;
- (b) being transmitted to the groundwater beneath the Edinburgh Base, including the Edinburgh Aquifers and mingling and flowing with that groundwater;

- (c) mingling with other surface water on the Edinburgh Base (especially after periods of rain), and flowing overland towards and into the surrounding Edinburgh Surface Water Bodies outside the Edinburgh Base; and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Edinburgh Aquifers; and
- (d) being transmitted to the Edinburgh Surface Water Bodies.

E THE CONTAMINATION OF THE RELEVANT AREA

E.1 The contamination of the Edinburgh Surface Water Bodies

5.54. PFCs and PFC Contaminants have been detected in the Edinburgh Surface Water Bodies.

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 1.1, 7.2.2, 7.4, 8.1, 11.1.4, 11.5.3, 12.1.3, 13.1, 13.2 and Tables 2, 7.4, 7.5 and 12.1.*
- 5.55. The contamination of the Edinburgh Surface Water Bodies with PFCs and PFC Contaminants is the result of discharged AFFF Working Solution and AFFF on the Edinburgh Base resulting in Spent AFFF:
- (a) permeating or percolating into the soil at the Edinburgh Base;
 - (b) being transmitted to the groundwater beneath the Edinburgh Base, including the Edinburgh Aquifers and mingling and flowing with that groundwater;
 - (c) mingling with other surface water on the Edinburgh Base (especially after periods of rain), and flowing overland towards and into the surrounding Edinburgh Surface Water Bodies outside the Edinburgh Base; and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and

- (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Edinburgh Aquifers; and
- (d) being transmitted to the Edinburgh Surface Water Bodies.

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 1.1, 7.2.2, 7.4, 7.5, 8.1, 11.1.4, 11.5.3, 12.1.3, 12.2, 13.1, 13.2 and Tables 7.4 and 12.1.*
- 5.56. By reason of the matters pleaded in paragraph 5.54 and 5.55 above, the water in the Edinburgh Surface Water Bodies has become, and is likely to continue to remain, contaminated by, and a receptor of, PFC Contaminants originally emanating from the Edinburgh Base.

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 1.1, 7.2.2, 7.4, 7.5, 8.1, 11.1.4, 11.5.3, 12.2, 12.1.3, 13.1, 13.2 and Tables 7.4 and 12.1.*
- 5.57. By reason of the matters pleaded in paragraphs 5.54 to 5.56 above, water in the Edinburgh Surface Water Bodies have become, and will continue and remain, potentially hazardous and unfit for the Edinburgh Surface Water Usages (the **Edinburgh Surface Water Contamination**).

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 8.1 and 12.13.*
 - (ii) *JBS&G Addendum DSI Report at paragraphs 11.3 and 11.4.*
 - (iii) *JBS&G HHERA at paragraph 4.1.4 and Table 4.1.*
- 5.58. There is no practical or cost-effective way of remediating the Edinburgh Surface Water Contamination.

E.2 The contamination of the Groundwater

- 5.59. PFCs and PFC Contaminants emanating from the Edinburgh Base have been identified in the Edinburgh Aquifers under the Edinburgh Relevant Area (or part thereof).

PARTICULARS

- (i) *JBS&G DSI Report at pages xx-xxi, paragraphs 7.4, 8.1, 11.4.5.1, 11.4.5.2, 11.4.5.3, 12.1.3, 12.2, 13.1 and 13.2, and Tables 7.4, 10 and 12.1.*
- (ii) *JBS&G Addendum DSI Report at paragraphs 8.1.6, 8.1.8, 10.1.1 and 11.1 and Tables 4.2 and 4.3.*

5.60. The contamination of the Edinburgh Aquifers with PFCs and PFC Contaminants is the result of discharged AFFF Working Solution and AFFF on the Edinburgh Base resulting in Spent AFFF:

- (a) permeating or percolating into the soil at the Edinburgh Base;
- (b) being transmitted to the groundwater beneath the Edinburgh Base and mingling and flowing with that groundwater;
- (c) mingling with other surface water on the Edinburgh Base (especially after periods of rain), and flowing overland towards and into the surrounding water catchment areas outside the Edinburgh Base and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Edinburgh Aquifers; and
- (d) being transmitted to the Edinburgh Surface Water Bodies.

PARTICULARS

- (i) *JBS&G DSI Report at pages xx to xxi and paragraphs 8.1, 9.7.3, 11.4.5.3, 11.4.5.4, 11.4.5.5, 11.4.5.6 and 12.2.*
- (ii) *JBS&G Addendum DSI Report at paragraphs 10.1.1 and 11.1.*

5.61. By reason of the matters pleaded in paragraphs 5.59 and 5.60, groundwater in the Edinburgh Aquifers and beneath the Edinburgh Relevant Area has become, and is likely to continue to remain, contaminated by, and a receptor of, PFC Contaminants originally emanating from the Edinburgh Base.

PARTICULARS

- (i) *Widespread PFAS contamination has been identified in groundwater beneath and down hydraulic gradient of the Edinburgh Base that exceeds HBGVs for drinking water: JBS&G HHERA Report at paragraph 4.1.3.*
- (ii) *Particulars of the contamination of the groundwater under the land of Edinburgh Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Edinburgh Group Members.*

5.62. By reason of the matters pleaded in paragraph 5.61, groundwater in the Edinburgh Aquifers and beneath the Edinburgh Relevant Area has become, and is likely to continue to remain, potentially hazardous and unfit for Edinburgh Groundwater Usages (the **Edinburgh Groundwater Contamination**).

PARTICULARS

- (i) *The groundwater in the Edinburgh Aquifers is potentially hazardous and unfit for:*
 - a. *irrigation purposes because such usages result in the further spreading of PFC Contaminants to soils and uptake by plants, vegetables and fruits, and the exposure of people to PFC Contaminants: Parts D.1 above and E.5 below are repeated.*
 - b. *watering of livestock (including chickens) because such usages may result in the further spreading of PFC Contaminants to soils, uptake of PFC Contaminants by the livestock and the exposure of people to PFC Contaminants (particularly by consumption of livestock and eggs): Parts D.1 above and E.5 below are repeated.*
 - c. *swimming, domestic purposes, and water supply because such usages may result in the further exposure of people to PFC Contaminants: Parts D.1 above and E.5 below are repeated.*
- (ii) *JBS&G HHERA at paragraph 4.1.3 and Table 4.1.*
- (iii) *Further particulars of the contamination of the groundwater in the Edinburgh Aquifers under the Edinburgh Group Members' land will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Edinburgh Group Members.*

5.63. There is no practical or cost-effective way of remediating the Edinburgh Groundwater Contamination.

E.3 The contamination of soil in the Edinburgh Relevant Area

5.64. Soil and sediment on the land within the Edinburgh Relevant Area has become, and is likely to continue to become and remain, contaminated by PFC Contaminants emanating from the Edinburgh Base (the **Edinburgh Soil Contamination**) by:

- (a) overland flows of surface water commingled with Spent AFFF (containing PFC Contaminants) from the Edinburgh Base; and

- (b) discharge or application of groundwater containing PFC Contaminants extracted from the Edinburgh Aquifers by persons engaged in Edinburgh Groundwater Usage to the soils (by, in particular, irrigation).

PARTICULARS

- (i) *Particulars of the contamination of the soils on lands of Edinburgh Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Edinburgh Group Members.*
- (ii) *JBS&G DSI Report at page xx and paragraphs 5.2.2, 7.2.2, 8.1, 11.3.2, 11.3.3, 11.6, 13.1, 13.2 and Table 12.1.*
- (iii) *JBS&G HHERA at paragraph 4.1.2 and Table 4.1.*

5.65. There is no practical or cost-effective way of remediating the Edinburgh Soil Contamination.

E.4 The Edinburgh Biota Contamination

5.66. Aspects of the biotic and abiotic matrices within the Edinburgh Relevant Area have become and are likely to continue to remain, contaminated by PFC Contaminants, and be recirculated indefinitely within the Edinburgh Relevant Area (the **Edinburgh Biota Contamination**).

PARTICULARS

- (i) *JBS&G DSI Report at paragraphs 8.1, 12.1.3, 13.3, 13.4 and Table 12.3.*
- (ii) *JBS&G Addendum DSI Report at paragraphs 8.2.2.2, 8.2.3, 11.3 and 11.4.*
- (iii) *JBS&G HHERA at Table 4.1.*
- (iv) *Crops, market gardens and home-grown produce irrigated with PFAS contaminated groundwater (e.g. sourced from the Quaternary Aquifers);*
- (v) *Livestock (e.g. cattle, sheep, chickens), milk, and eggs where PFAS contaminated groundwater has been used as water supply for livestock (e.g. sourced from the Quaternary Aquifers);*
- (vi) *Edible aquatic biota (e.g. fish) caught from the Kaurna Park Wetland;*
- (vii) *Honey produced in bee hives located within, or in reasonable proximity to, the Edinburgh Relevant Area.*

- (viii) *Secondary sources of PFC contamination, leading to further redistribution of contamination and creation of additional exposure pathways for ongoing contamination of the biota generally (including humans): Braunig J, Baudel C, Heffernan A et al, Fate and redistribution of perfluoroalkyl acids through AFFF-impacted groundwater (2017).*

5.67. There is no practical or cost-effective way of remediating the Edinburgh Biota Contamination.

E.5 The announcement of the contamination

5.68. In October 2016, the Commonwealth published a factsheet titled “Department of Defence, RAAF Base Edinburgh (October 2016)’ (**Edinburgh October 2016 Factsheet**) which stated:

- (a) the Edinburgh Base had a legacy of using AFFF for emergency firefighting situations and fire fighter training;
- (b) in 2004, the Commonwealth commenced phasing out its use of AFFF containing PFOS and PFOA as active ingredients;
- (c) PFOS and PFOA belong to a group of chemicals known as per- and poly-fluoroalkyl substances (**PFAS**) and until recently, PFAS were known as ‘perfluorinated chemicals’ or ‘PFCs’;
- (d) PFAS were an emerging concern around the world because they are persistent in the environment;
- (e) that because PFAS persist in humans and the environment, it was recommended that human exposure be minimised;
- (f) a decision was made to remove the Edinburgh Base from the preliminary sampling program and progress directly to a detailed environmental investigation to determine the nature and extent of PFAS on, or in the vicinity of, the base
- (g) that the detailed environmental investigation would include:
 - (i) reviewing the historical use, storage and management of AFFF to identify potential sources of PFAS;

- (ii) sampling soil, sediment, surface water, and groundwater on and off Edinburgh Base to identify PFAS exposure in the vicinity;
 - (iii) identifying pathways and receptors for the potential migration of PFAS;
 - (iv) community and stakeholder engagement, including a water-use survey;
 - (v) a human health and ecological risk assessment (if required) to evaluate potential risks to the human population and ecology, and inform future action to mitigate risks;
- (h) when detailed environmental investigation reports were finalised and publicly released, residents, businesses, and local stakeholders would be consulted;
- (i) that a community briefing and information activity would be conducted prior to the commencement of the detailed environmental investigation at the Edinburgh Base; and
- (j) alternative sources of drinking water were being provided to eligible residents located in close proximity to the Edinburgh Base who did not have a town water connection, and relied on the use of a bore for drinking water, as well as to residents whose drinking water was sourced from a rainwater tank which contained or did contain bore water, and to residents in other exceptional circumstances.

PARTICULARS

- (i) *The Edinburgh October 2016 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/Docs/Edinburgh/FactSheets/EdinburghFactSheetOctober2016.pdf>

5.69. On or around 1 November 2016, the Commonwealth held a Community Walk-in Session (the **Edinburgh November 2016 Community Session**) at which its representatives advised:

- (a) there was a history of AFFF being used at the Edinburgh Base in emergency firefighting situations and for fire fighter training;
- (b) the AFFF that had been used at the Edinburgh Base contained PFAS—namely including perfluorooctane sulfonate and perfluorooctanoic acid;

- (c) PFAS were a class of manufactured chemical that had been used to make products that resist heat, stains, grease, and water;
- (d) PFAS were a concern around the world because they persist in the environment;
- (e) the Commonwealth commenced using AFFF containing PFOS/PFOA from the 1970s;
- (f) the Commonwealth was aware that PFOS/PFOA was an emerging persistent organic pollutant
- (g) alternative sources of drinking water were being provided to eligible residents;
- (h) a detailed environmental investigation would be undertaken to determine the nature and extent of PFAS on and in the vicinity of the Edinburgh Base and would include a preliminary site investigation (known as a **PSI**), a detailed site investigation (known as a **DSI**) and, if required, a human health and ecological risk assessment (known as a **HHERA**).

PARTICULARS

- (i) *The Edinburgh November 2016 Community Session was held on 1 November 2016 at which a slideshow presentation entitled “PFAS Investigation and Management Community Information Session RAAF Base Edinburgh Environmental Investigation” dated 31 October & 1 November 2016 (**Edinburgh November 2016 Presentation**). The Edinburgh November 2016 Presentation is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Edinburgh/Presentations/20161101FinalEdinburghPresentation.pdf>

- (ii) *Each of the statements in subparagraphs (a) to (h) was made in writing in the Edinburgh November 2016 Presentation, and/or spoken to orally at the Edinburgh November 2016 Community Session by representatives of the Commonwealth.*

5.70. In March 2017, the Commonwealth published a factsheet titled ‘RAAF Base Edinburgh: PFAS Investigation and Management Program’ (**Edinburgh March 2017 Factsheet**) which advised:

- (a) PFAS are generally present in AFFF which is a fire fighting foam that has been used extensively worldwide from about the 1970s by both military and civilian authorities;

- (b) in 2004, the Commonwealth commenced phasing out its use of legacy AFFF containing PFOS and PFOA as active ingredients;
- (c) the investigation is a staged assessment program and involves a PSI, a DSI and a HHERA and commenced in November 2016;
- (d) in December 2016 to February 2017, targeted preliminary soil and surface water samples were collected on and off-base and analysed and residents were asked to complete a water use survey;
- (e) twenty soil and surface water samples were collected on the Helps Road Drain, being the main drain that runs through the Edinburgh Base and the focus of the sampling because it feeds the two ASR systems – which confirmed low levels of PFAS with no results above the applicable residential (soil) and recreational (surface water) screening criteria;
- (f) the environmental investigation is complex and it will take time to fully evaluate, but there were a number of potential exposure pathways including dust, surface soil, surface water and groundwater (shallow and deep aquifers) – each of which would be considered as part of the investigation;
- (g) the next steps would be the investigation of the shallow and deep aquifers.

PARTICULARS

- (i) *The Edinburgh March 2017 Factsheet is published on:*

https://www.defence.gov.au/Environment/PFAS/Docs/Edinburgh/FactSheets/170323_Edinburgh_Factsheet.pdf

5.71. On or around 23 March 2017, the Commonwealth held a Community Walk-in Session (the **Edinburgh March 2017 Community Session**) at which its representatives advised:

- (a) from the 1970s, the Commonwealth commenced using AFFF containing PFOS/PFOA;
- (b) in 2003, the Commonwealth was aware that PFOS/PFOA was an emerging persistent organic pollutant and released a specification for the supply and testing of AFFF concentrates, and from 2004, the Commonwealth began phasing out use of the old foams for training and emergencies;

- (c) in 2015, the Commonwealth established the Defence National PFAS Investigation and Management Program;
- (d) the Commonwealth is providing drinking water to eligible residents who are located in close proximity to the Edinburgh Base and do not have a town water connection and rely on the use of a bore for drinking water and/or source drinking water from a rainwater tank that contains or in the past has contained bore water;
- (e) the data that exists about the use of AFFF at the Edinburgh Base is historical, complex and incomplete;
- (f) the initial focus of the investigation had been the main stormwater channel
- (g) twenty soil and surface water samples have been collected and analysed on and off the Edinburgh Base;
- (h) the results of the sampling confirm low levels of PFAS but no results above applicable residential (soil) and recreational (surface water) screening criteria had been determined.

PARTICULARS

- (i) *The Edinburgh March 2017 Community Session was held on 23 March 2017 at which a slideshow presentation entitled “PFAS Investigation & Management Community Information Session RAAF Base Edinburgh, SA” dated 23 March 2017 (**Edinburgh March 2017 Presentation**). The Edinburgh March 2017 Presentation is published on:*

https://www.defence.gov.au/Environment/PFAS/docs/Edinburgh/Presentations/170323_Edinburgh_Presentation.pdf
- (ii) *Each of the statements in subparagraphs (a) to (h) was made in writing in the Edinburgh March 2017 Presentation, and/or spoken to orally at the Edinburgh March 2017 Community Session by representatives of the Commonwealth.*

5.72. In October 2017, the Commonwealth published two factsheets titled ‘RAAF Base Edinburgh PFAS Investigation Background PFAS Investigation and Management Program’ and ‘RAAF Base Edinburgh Investigation Update PFAS Investigation and Management Program’ (together, the **Edinburgh October 2017 Factsheets**) which advised as follows:

- (a) the PSI in relation to the Edinburgh Base (**Edinburgh PSI**) has been completed;

- (b) the DSI in relation to the Edinburgh Base (**Edinburgh DSI**) commenced in April 2017 and involves sampling of soil, sediment, surface and ground water to collect information and better understand how PFAS moves through the environment;
- (c) the initial findings from the investigation indicate that:
 - (i) no residents have been found to be currently using shallow groundwater as a drinking water supply;
 - (ii) shallow groundwater bores on residential properties that have been sampled to date have not detected PFAS;
 - (iii) surface water PFAS levels on and off-Base are below current recreational water use guidelines;
 - (iv) PFAS levels in shallow groundwater have been detected at non-residential locations on and off-Base, some of which are above the health-based guidance values;
 - (v) there is currently no evidence of impacts to the deep groundwater (Tertiary 1) aquifer;
 - (vi) PFAS soil impacts are largely contained on-Base;
 - (vii) Off-Base PFAS soil levels are below relevant human health guidance values;
- (d) based on the investigation findings to date, a HHERA in relation to the Edinburgh Base (**Edinburgh HHERA**) has commenced, which is designed to assess and better understand the risks posed by PFAS to people and the environment;
- (e) the Edinburgh HHERA will continued through 2017 and 2018 and will involve additional and extended areas of sampling.

PARTICULARS

- (i) *The Edinburgh October 2017 Factsheets are published on:*
<https://www.defence.gov.au/Environment/PFAS/Docs/Edinburgh/FactSheets/20171005EDNBackgroundFactsheet.pdf>
<https://www.defence.gov.au/Environment/PFAS/Docs/Edinburgh/FactSheets/20171005EDNInvestigationUpdate.pdf>

5.73. On or around 1 November 2017, the Commonwealth held a Community Walk-in Session (the **Edinburgh November 2017 Community Session**) at which its representatives advised:

- (a) from the 1970s, the Commonwealth commenced using AFFF containing PFOS/PFOA;
- (b) in 2003, the Commonwealth was aware that PFOS/PFOA was an emerging persistent organic pollutant and released a specification for the supply and testing of AFFF concentrates, and from 2004, the Commonwealth began phasing out use of the old foams for training and emergencies;
- (c) the results of the Edinburgh PSI included:
 - (i) the identification of multiple potential source areas including AFFF storage and waste capture areas, bulk fuel storage area, fire station, fire training grounds and waste burial areas;
 - (ii) the identification of pathways including bring primarily surface water drainage and transport with groundwater;
 - (iii) the identification of receptors to inform the Edinburgh DSI including people and environmental such as plants and animals in water bodies and the Kauria Park Wetland;
 - (iv) two and five PFAS detections of on-Base soil and surface water samples, respectively, and two and four PFAS detections of off-Base soil and surface water samples, respectively;
- (d) the Edinburgh DSI commenced in April 2017 and involved the on and off-Base sampling in soil, groundwater, surface water and drainage lines;
- (e) the Commonwealth was aware:
 - (i) in relation to soils and sediments, there is a presence of PFAS in soils and sediments with some results above human health and ecological guidance values;
 - (ii) in relation to surface water there are concentrations above recreational guidance values detected on-Base, including low levels of PFAS

detected in the Helps Road Drain and Kaurna Park Wetland off-Base and 10 locations were above ecological guidance values;

- (iii) in relation to shallow groundwater, PFAS has been detected on and off-Base above health based guidance values;
 - (iv) in relation to the market garden aquifer, there is currently no evidence of impacts in the T1 Aquifer but this is based on limited access to private bores for sampling;
- (f) the Edinburgh HHERA will commence in late 2017 and is expected to be completed in 2018.

PARTICULARS

- (i) *The Edinburgh November 2017 Community Session was held on 1 November 2017 at St John's Parish Auditorium, Church Street, Salisbury at which a slideshow presentation entitled "PFAS Investigation & Management Community Information Session RAAF Base Edinburgh, SA" dated 1 November 2017 (**Edinburgh November 2017 Presentation**). The Edinburgh November 2017 Presentation is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Edinburgh/Presentations/20171101RAAFBaseEdinburghCWISPresentation.pdf>
- (ii) *Each of the statements in subparagraphs (a) to (f) was made in writing in the Edinburgh November 2017 Presentation, and/or spoken to orally at the Edinburgh November 2017 Community Session by representatives of the Commonwealth.*

5.74. In May 2018, the Commonwealth published a factsheet titled 'RAAF Base Edinburgh – Detailed Site Investigation Update PFAS Investigation and Management Program' (**Edinburgh May 2018 Factsheet**) which advised as follows:

- (a) the Edinburgh DSI commenced in November 2016 and was continuing;
- (b) the initial Edinburgh DSI results included:
 - (i) Off-base samples of soil and sediment have shown low levels of PFAS, below guidance values and on-base samples have had PFAS detects above the health based and ecological guidance values;

- (ii) surface water and sediment pore water samples have been detected above recreational health based guidance values on-base and some results, on and off-base, exceed ecological guidance values;
 - (iii) shallow groundwater (in the Quaternary Aquifers) have detected PFAS above the health based guidance values for drinking water extending off-base, to the south and west, Q1 and Q2 aquifers. However, no one has been identified as currently drinking this water;
 - (iv) no evidence of PFAS impacts in the deep groundwater (Tertiary Aquifers, T1) which is accessed by commercial users and market gardeners;
- (c) the investigation area has been updated as a result of off-base detects of PFAS at non-residential properties outside of the initial investigation area and includes the suburbs of Penfield, Direk, Burton, Salisbury North, Paralowie, Waterloo Corner, St Kilda and Bolivar.

PARTICULARS

- (i) *The Edinburgh May 2018 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/Docs/Edinburgh/FactSheets/201805EdinburghDSIFindings.pdf>

5.75. On or around 17 May 2018, the Commonwealth held a Community Walk-in Session (the **Edinburgh May 2018 Community Session**) at which its representatives advised:

- (a) from the 1970s, the Commonwealth commenced using AFFF containing PFOS/PFOA;
- (b) in 2003, the Commonwealth was aware that PFOS/PFOA was an emerging persistent organic pollutant and released a specification for the supply and testing of AFFF concentrates, and from 2004, the Commonwealth began phasing out use of the old foams for training and emergencies;
- (c) the general advice of SA Health was, as a precautionary approach, to consider that there may be potential for adverse health effects at high exposure levels and therefore minimise exposure and that using borewater contaminated with PFAS for domestic purposes (such as drinking, cooking, showering and watering edible plants) could potentially lead to significant exposure;
- (d) the Edinburgh DSI results included:

- (i) in relation to soil and sediments, there are results that exceed health based and ecological guidance values and only low levels have been detected off-base, below guidance values;
- (ii) in relation to surface water and sediment pore water, there are results that exceed health based and ecological guidance values and some results on and off-base exceed ecological guidance values, predominantly within the Kaurna Park Wetland;
- (iii) in relation to shallow groundwater (Quaternary Aquifers):
 - (A) results exceeding health based guidance values for drinking water extend off-base to the south and west (Q1 and Q2 aquifers);
 - (B) no one has been identified as currently drinking this water;
 - (C) there is evidence of impacts along the route of the Helps Road Drain;
 - (D) the full extent of impacts is not yet defined;
- (iv) in relation to deep groundwater (Tertiary Aquifers), there is no current evidence of PFAS impacts in the T1 Aquifer accessed by commercial users and market gardeners and the impacts in the T2 Aquifer are confined to operation of the Salisbury ASR at Edinburgh Parks South and the Kaurna Park Wetland;
- (e) remediation strategies may include source area removal, soil treatment and water treatment.

PARTICULARS

- (i) *The Edinburgh May 2018 Community Session was held on 17 May 2018 at which a slideshow presentation entitled “PFAS Investigation & Management Program RAAF Base Edinburgh SA Investigation Update” dated 17 May 2018 (**Edinburgh May 2018 Presentation**). The Edinburgh May 2018 Presentation is published on:*
<https://www.defence.gov.au/Environment/PFAS/Docs/Edinburgh/Presentations/201805EdinburghCommunityWalkinPresentation.pdf>
- (ii) *Each of the statements in subparagraphs (a) to (e) was made in writing in the Edinburgh May 2018 Presentation, and/or*

spoken to orally at the Edinburgh May 2018 Community Session by representatives of the Commonwealth.

5.76. In December 2018, the Commonwealth published a factsheet titled 'RAAF Base Edinburgh – Detailed Site Investigation Findings PFAS Investigation and Management Program' (**Edinburgh December 2018 Factsheet**) which advised as follows:

- (a) the Edinburgh DSI which commenced in May 2017 has now been completed;
- (b) the key findings of the Edinburgh DSI included:
 - (i) on-Base, PFAS has been detected at twelve sources areas (at elevated levels) with surface water (stormwater) and shallow groundwater being identified as the off-site migration pathways, including in:
 - (A) soil (elevated levels at former and current fire training areas and an area where firefighting foam concentrate was historically stored);
 - (B) surface water above human health guidance values for recreational waters in a small number of areas within the stormwater drainage network;
 - (C) shallow groundwater (Q1, Q2 and Q3 to date) above human health guidance values;
 - (ii) off-Base, PFAS concentrations above human health guidance values are limited to shallow groundwater and are present in edible aquatic biota (i.e. fish, yabbies) within the Kaurua Park Wetland;
- (c) the Edinburgh HHERA sampling will supplement the Edinburgh DSI including targeting the shallow aquifer water supply bores, and the edible aquatic biota, as well as determining whether the groundwater contamination has migrated to the Q4 aquifer.

PARTICULARS

- (i) *The Edinburgh December 2018 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/Docs/Edinburgh/FactSheets/201812.EDN.DSI.Factsheet.pdf>

5.77. On or around 11 December 2018, the Commonwealth held a Community Information Session (the **Edinburgh December 2018 Community Session**) at which its representatives advised:

- (a) from the 1970s, the Commonwealth commenced using AFFF containing PFOS/PFOA;
- (b) in 2003, the Commonwealth was aware that PFOS/PFOA was an emerging persistent organic pollutant and from 2004, the Commonwealth began phasing out use of the old foams for training and emergencies;
- (c) in 2010, the Commonwealth commenced the first PFAS environmental investigation in Oakey and in 2015 the PFAS Investigation and Management Program commenced;
- (d) the Edinburgh PSI:
 - (i) identified on-Base source areas, including AFFF storage and waste capture areas, bulk fuel storage area, fire station, fire training grounds and waste burial areas;
 - (ii) identified PFAS migration pathways including surface water drainage and transport within groundwater;
- (e) the Edinburgh DSI timeframes were extended because the groundwater contamination migration is deeper and further within the shallow Quaternary Aquifer system than anticipated in the earlier stages of the Edinburgh DSI;
- (f) the Edinburgh DSI on-Base findings included:
 - (i) in relation to soil, elevated levels of PFAS detected in soil at the former and current fire training areas and an area where firefighting foam concentrate was historically stored (near the new Air Traffic Control Tower);
 - (ii) in relation to groundwater, PFAS detected in the shallow Quaternary Aquifers (Q1, Q2 and Q3 to date);
 - (iii) in relation to surface water, PFAS was detected in surface water above human health guidance values for recreational waters in a small number of areas within the stormwater drainage network;

- (iv) in relation to sediment, samples from the stormwater drainage network, Helps Road Drain and Southern Detention Basin only detected low levels of PFAS, below human health guidance values;
- (g) the Edinburgh DSI off-Base findings included:
 - (i) low levels of PFAS detected in surface water and sediments;
 - (ii) PFAS detected in the shallow Quaternary Aquifers (Q1 to Q3 to date) at levels above human health guidance values for drinking water, but no one has been identified as drinking this water;
 - (iii) PFAS concentrations are present in edible aquatic biota (fish, yabbies) within the Kurna Park Wetland.
- (h) works are ongoing to assess whether contamination has migrated to the Q4 aquifer on or off-base;
- (i) the Edinburgh DSI has updated the Commonwealth's understanding of how PFAS moves off-base, the extent of PFAS contamination and the potential receptors at risk of exposure;
- (j) the interim risk assessment results of the Edinburgh HHERA included a potential elevated risk, to be addressed in the HHERA of:
 - (i) on-base, contact with soil, surface water or sediment or risks to higher order predators consuming aquatic plants and animals;
 - (ii) off-base, use of shallow quaternary aquifer bore water, consumption of edible aquatic biota from Kurna Park Wetland, and risks to higher order predators consuming aquatic plants and animals.

PARTICULARS

- (i) *The Edinburgh December 2018 Community Session was held on 11 December 2018 at which a slideshow presentation entitled "Community Information Session PFAS Investigation & Management Program RAAF Base Edinburgh | South Australia Detailed Site Investigation Update" dated 11 December 2018 (**Edinburgh December 2018 Presentation**). The Edinburgh December 2018 Presentation is published on:*
<https://www.defence.gov.au/Environment/PFAS/Docs/Edinburgh/Presentations/201812.EDN.DSI.Pres.pdf>

- (ii) *Each of the statements in subparagraphs (a) to (d) was made in writing in the Edinburgh December 2018 Presentation, and/or spoken to orally at the Edinburgh December 2018 Community Session by representatives of the Commonwealth.*

5.78. In August 2019, the Commonwealth published three factsheets titled 'RAAF Base Edinburgh Remediation Actions PFAS Investigation and Management Program', 'RAAF Base Edinburgh PFAS Management Area Plan & Ongoing Monitoring Plan PFAS Investigation and Management Program' and 'RAAF Base Edinburgh Detailed Site Investigation Addendum & Human Health and Ecological Risk Assessment PFAS Investigation and Management Program' (together the **Edinburgh August 2019 Factsheets**) which advised as follows:

- (a) the Commonwealth has implemented a number of remediation activities at the Fire Training Area, to target the known sources of PFAS contamination including conducting a soil washing trial, and installing and operating an on-Base water treatment plant to remove PFAS from groundwater beneath the area;
- (b) the Commonwealth has developed a PFAS Management Action Plan in relation to the Edinburgh Base (**Edinburgh PMAP**) which recommends actions to manage and reduce the risks of PFAS exposure for the Edinburgh community, including to manage the potentially elevated exposure risks identified in the Edinburgh HHERA;
- (c) the Edinburgh PMAP will be reviewed annually, or more frequently if more information or technology becomes available;
- (d) the potentially elevated exposure risks identified in the HHERA were:
 - (i) unlicensed use of Quaternary Aquifer groundwater, including potential future exposure risk to licensed users as a result of the future movement of PFAS;
 - (ii) exposure through consumption of carp from Kaurua Park Wetland or other locations within Helps Road Drain downstream of the Edinburgh Base; and
 - (iii) exposure to protected migratory birds from consumption of water based animals in Kaurua Park Wetland;
- (e) the recommendations contained in the Edinburgh PMAP included:

- (i) management of PFAS contaminated soils in key source areas at the Edinburgh Base to reduce future migration;
 - (ii) treatment of groundwater from the shallow Quaternary Aquifers beneath the Edinburgh Base;
 - (iii) ongoing monitoring of surface water and groundwater to evaluate the effectiveness of PFAS management and remediation options;
- (f) an ongoing monitoring plan in relation to the Edinburgh Base (**Edinburgh OMP**) has been prepared which included a sampling program to monitor and track the PFAS contamination over the coming years;
- (g) an Addendum to the Edinburgh DSI (**Edinburgh DSI Addendum**) has been completed which found that:
 - (i) PFAS was detected above drinking water guidance values in the Q4 Aquifer beneath the Edinburgh Base; and
 - (ii) all off-base Q4 Aquifer detections were below drinking water guidance values.
- (h) the Edinburgh HHERA has been completed, the findings of which, included that in addition to a number of low and acceptable exposure risks, there were a number of potentially elevated exposure risks off-Base which included:
 - (i) unlicensed use of Quaternary Aquifer bore water;
 - (ii) the consumption of edible water based animals from Kaurua Park Wetland; and
 - (iii) the consumption by higher order predators of water based species in the Kaurua Park Wetland.

PARTICULARS

- (i) *The Edinburgh August 2019 Factsheets are published on:*
 - <https://www.defence.gov.au/Environment/PFAS/Docs/Edinburgh/FactSheets/201908RemediationFactsheet.pdf>
 - <https://www.defence.gov.au/Environment/PFAS/Docs/Edinburgh/FactSheets/201908PMAPFactsheet.pdf>
 - <https://www.defence.gov.au/Environment/PFAS/Docs/Edinburgh/FactSheets/201908HHERAFactsheet.pdf>

- 5.79. On or around 27 August 2019, the Commonwealth held a Community Information Session (the **Edinburgh August 2019 Community Session**) at which its representatives advised:
- (a) from the 1970s, the Commonwealth commenced using AFFF containing PFOS/PFOA;
 - (b) in 2003, the Commonwealth was aware that PFOS/PFOA was an emerging persistent organic pollutant and from 2004, the Commonwealth began phasing out use of the old foams for training and emergencies;
 - (c) in 2010, the Commonwealth commenced the first PFAS environmental investigation in Oakey and in 2015 the PFAS Investigation and Management Program commenced;
 - (d) the Edinburgh DSI findings included:
 - (i) 12 source areas at the Edinburgh Base were assessed as significant with results being above relevant human health guidance values;
 - (ii) surface water (stormwater) and shallow groundwater confirmed as off-base migration pathways;
 - (iii) PFAS was detected in the shallow Quaternary Aquifers (Q1, Q2 and Q3) on and off-base;
 - (iv) off-base surface water samples only detected low levels of PFAS, all results being below relevant human health guidance values;
 - (e) the Edinburgh DSI Addendum findings included PFAS being detected above drinking water guidance values in the fourth (Q4) Quaternary Aquifer beneath the Edinburgh Base and a better understanding of the extent of horizontal migration of PFAS in shallow quaternary aquifers (particularly Q1 and Q2);
 - (f) the Edinburgh HHERA determined that there was a potentially elevated exposure risk for off-Base activities including unlicensed use of Quaternary Aquifer bore water, consumption of edible water based animals from Kaurua Park Wetland, and consumption by higher order predators of water based species in the Kaurua Park Wetland;
 - (g) the Edinburgh PMAP recommendations included:

- (i) work health and safety controls to limit exposure to people on-base;
 - (ii) soil remediation in key source areas to reduce future migration;
 - (iii) treatment of groundwater from the shallow Quaternary Aquifers beneath the Edinburgh Base;
 - (iv) minor engineering projects (such as upgrading or replacing firefighting waste water sumps on-Base;
 - (v) ongoing monitoring of surface water and groundwater to evaluate the effectiveness of PFAS management and remediation options, including 6 monthly reviews for 3 years for each of groundwater and surface water;
- (h) the Commonwealth has performed, or is performing, the following remediation actions:
- (i) the installation of an on-base water treatment plant, installed and commission in mid-August 2019, to remove PFAS from groundwater beneath the current fire training area;
 - (ii) the installation of a trial PFAS soil washing plant which is expected to be completed in late 2019.

PARTICULARS

- (i) *The Edinburgh August 2019 Community Session was held on 27 August 2019 at which a slideshow presentation entitled “Community Information Session PFAS Investigation & Management Program Detailed Site Investigation Addendum, Human Health and Ecological Risk Assessment and PFAS Management Area Plan” dated 27 August 2019 (**Edinburgh August 2019 Presentation**). The Edinburgh August 2019 Presentation is published on:*
<https://www.defence.gov.au/Environment/PFAS/Docs/Edinburgh/Presentations/201908EdinburghCommunityInformationSessionPresentation.pdf>
- (ii) *Each of the statements in subparagraphs (a) to (c) was made in writing in the Edinburgh August 2019 Presentation, and/or spoken to orally at the Edinburgh August 2019 Community Session by representatives of the Commonwealth.*

E.6 The injurious affectation to land in the Edinburgh Relevant Area

5.80. Land in the Edinburgh Relevant Area (including the land of Edinburgh Group Members) has become, and is likely to remain:

- (a) affected by the Edinburgh Surface Water Contamination; and/or
- (b) affected by the Edinburgh Groundwater Contamination; and/or
- (c) affected by the Edinburgh Soil Contamination; and/or
- (d) affected by the Edinburgh Biota Contamination.

PARTICULARS

- (i) *As to subparagraph (a), paragraphs 5.54 to 5.58 are repeated.*
- (ii) *As to subparagraph (b), paragraphs 5.59 to 5.63 are repeated.*
- (iii) *As to subparagraph (c), paragraph 5.64 to 5.65 is repeated.*
- (iv) *As to subparagraph (d), paragraphs 5.66 to 5.67 is repeated.*

5.81. Further, or alternatively, by reason of:

- (a) the Edinburgh Surface Water Contamination; and/or
- (b) the Edinburgh Groundwater Contamination; and/or
- (c) the Edinburgh Soil Contamination; and/or
- (d) the Edinburgh Biota Contamination,

land in the Edinburgh Relevant Area (including the land of Edinburgh Group Members) has become, and is likely to remain land, of which occupiers and produce, livestock and biota from which, have ongoing and largely unavoidable exposure to PFC Contaminants through multiple potential pathways (**Edinburgh Ongoing Contaminant Exposure**).

PARTICULARS

- (i) *Paragraphs 5.54 to 5.67 are repeated.*
- (ii) *Braunig J, Baudel C, Heffernan A et al, Fate and redistribution of perfluoroalkyl acids through AFFF-impacted groundwater (2017).*

5.82. Further, or alternatively, there exists a material risk that:

- (a) land in the Edinburgh Relevant Area (including land owned by Edinburgh Group Members) may be recorded on a register established pursuant to s 109 of the *Environmental Protection Act 1993* (SA) (**EPA SA**); and
- (b) owners of land in the Edinburgh Relevant Area (including land owned by Edinburgh Group Members) will be obligated to disclose to prospective purchasers that land is and/or that there is a risk that land may be contaminated by PFC Contaminants (with any contract of sale subject to rescission if disclosure is not made).

PARTICULARS

- (i) *As to subparagraph (a):*
 - (A) *An owner or occupier of a site must notify the Authority after becoming aware of the existence of site contamination at the site or in the vicinity of the site that affects or threatens water occurring naturally under the ground or introduced to an aquifer or other area under the ground: 83A EPA SA.*
 - (B) *Site contamination exists if chemical substances are present on or below the surface of the site in concentrations above the background concentrations and the chemical substances have, at least in part, come to be present there as a result of an activity at the site or elsewhere and the presence of the chemical substance in those concentrations has resulted in actual or potential harm to the health or safety of human beings that is not trivial taking into account current or proposed land uses, actual or potential harm to water that is not trivial or other actual or potential harm that is not trivial, taking into account current or proposed land uses.*
- (ii) *The obligations in subparagraph (b) arise under s 83A EPA SA and/or at common law in respect of the risk of contamination to land.*

5.83. Further, or alternatively, by reason of the matters pleaded in paragraphs 5.54 to 5.82, there exists a material risk that by reason of the Edinburgh Surface Water Contamination and/or Edinburgh Groundwater Contamination and/or the Edinburgh Soil Contamination and/or the Edinburgh Biota Contamination that persons may be unable to conduct activities growing crops, feedstock, fruits and vegetables intended for human consumption, on land in the Edinburgh Relevant Area.

PARTICULARS

- (i) *Parts D.1 above and E.5 below are repeated.*

5.84. By reason of the matters pleaded in paragraphs 5.54 to 5.82, land in the Edinburgh Relevant Area has become, and is likely to remain:

- (a) land which is, or may be perceived by prospective purchasers of land to be, unfit for residential purposes or human occupancy because occupiers and visitors have ongoing and largely unavoidable exposure to PFC Contaminants through multiple potential pathways;
- (b) land which is, or may be perceived by prospective purchasers of land to be unfit for agricultural purposes, including use for growing crops for human consumption, growing feedstock or providing pasture for livestock intended for human consumption, or growing fruits and vegetables intended for human consumption.

PARTICULARS

- (i) *The particulars to paragraphs 5.54 to 5.82 are repeated.*

5.85. By reason of the matters pleaded in paragraph 5.84, land in the Edinburgh Relevant Area has become, and is likely to remain, injuriously affected in its value (**Edinburgh Contamination Land Value Affection**).

PARTICULARS

- (i) *The quantum of the adverse affection on the value of the land of Edinburgh Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Edinburgh Group Members.*

E.7 The reasonable foreseeability of the injurious affection to the value of land in the Edinburgh Relevant Area

5.86. At all material times, by reason of the matters pleaded in paragraphs 5.3 to 5.22 and 5.45 to 5.53 above, it was reasonably foreseeable that use of AFFF Working Solution and/or AFFF on the Edinburgh Base as pleaded in paragraphs 5.24 to 5.44 would result in:

- (a) the Edinburgh Surface Water Contamination;
- (b) the Edinburgh Groundwater Contamination;
- (c) the Edinburgh Soil Contamination;

- (d) the Edinburgh Biota Contamination; and/or
- (e) the Edinburgh Contamination Land Value Affectation.

F THE COMMONWEALTH'S ACTS AND OMISSIONS

F.1 The Commonwealth's knowledge

F.1.1 The Commonwealth's knowledge of the Edinburgh Base and its surrounds

5.87. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) the matters pleaded in Section A1 above;
- (b) the matters pleaded in Section A2 above;
- (c) the matters pleaded in Section A3 above;
- (d) that waters, liquids, and soluble materials discharged on Edinburgh Base would:
 - (i) permeate, percolate or leach into the soil at the Edinburgh Base;
 - (ii) be transmitted to the groundwater beneath the Edinburgh Base, including into the Edinburgh Aquifers and mingle and flow with that groundwater;
 - (iii) mingle with other surface water on the Edinburgh Base (especially after periods of rain), and flow overland towards the Edinburgh Surface Water Bodies and:
 - (A) permeate or percolate into the soil over which the surface water overland flows occurred; and
 - (B) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including into the Edinburgh Aquifers; and
 - (iv) be transmitted to the Edinburgh Surface Water Bodies.

PARTICULARS

- (i) *As to sub-paragraph (a), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Edinburgh Base.*

- (ii) *As to sub-paragraph (b), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Edinburgh Base or artificial features which the Commonwealth developed, constructed, upgraded and utilised.*
- (iii) *As to sub-paragraph (c), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Edinburgh Base or artificial features which the Commonwealth developed, constructed, upgraded and utilised.*
- (iv) *As to sub-paragraph (d), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) to (c) above.*

F.1.2 The Commonwealth's knowledge of water use at the Edinburgh Relevant Area

5.88. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) the matters pleaded in Section B1 above;
- (b) the matters pleaded in Section B2 above; and
- (c) that waters, liquids, and soluble materials discharged and/or allowed to escape the Edinburgh Base which were transmitted to the Edinburgh Surface Water Bodies, and the Edinburgh Aquifers would be used by residents of the Edinburgh Relevant Area.

PARTICULARS

- (i) *As to sub-paragraph (a), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person occupying the land comprising the Edinburgh Base.*
- (ii) *As to sub-paragraph (b), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person occupying the land comprising the Edinburgh Base.*
- (iii) *As to sub-paragraph (c), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) and (b) above.*

F.1.3 The Commonwealth's knowledge of the potential flow of Spent AFFF and Fire Run-Off from the Edinburgh Base

5.89. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) that the Edinburgh Training and Operations Activities (and ancillary storage, containment and disposal practices) resulted in:
 - (i) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground; and/or
 - (ii) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with Fire Run-Off, being discharged, or allowed to escape, to bare ground;
- (b) the matters pleaded in Section C4 above; and
- (c) that use of AFFF Working Solution and AFFF on the Edinburgh Base would result in Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF:
 - (i) being transmitted to the groundwater beneath the Edinburgh Base, including the Edinburgh Aquifers and mingle and flow with that groundwater, and being utilised by persons engaged in the Edinburgh Groundwater Usages;
 - (ii) mingling with other surface water on the Edinburgh Base (especially after periods of rain), and flowing overland towards and into the surrounding Edinburgh Surface Water Bodies outside the Edinburgh Base and:
 - (A) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (B) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Edinburgh Aquifers;

and being extracted and utilised by persons engaged in the Edinburgh Groundwater Usages; and
 - (iii) mingling with other surface water on the Edinburgh Base (especially after periods of rain), and flowing overland towards and into the surrounding Edinburgh Surface Water Bodies outside the Edinburgh Base and then being utilised by persons engaged in the Edinburgh Surface Water Usages.

PARTICULARS

- (i) *As to sub-paragraph (a), these were matters known to the Commonwealth as the entity responsible for conducting the Edinburgh Training and Operations Activities, and using AFFF Concentrate, AFFF Working Solution and AFFF, and disposing of the same.*
- (ii) *As to sub-paragraph (b), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person using AFFF Concentrate, AFFF Working Solution and AFFF.*
- (iii) *As to sub-paragraph (c), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) and (b) above, together with the matters pleaded in sub-paragraph 5.87(d).*

F.1.4 The Commonwealth's knowledge of the toxic properties of Spent AFFF and Fire Run-Off

5.90. Paragraph 33 is repeated.

5.91. Paragraph 34 is repeated.

5.92. Further, or alternatively, at all material times from 16 May 2000, alternatively 2003, the Commonwealth knew that its Edinburgh Training and Operations Activities at the Edinburgh Base using AFFF Working Solution and AFFF were:

- (a) potentially damaging to the environment; and/or
- (b) potentially causative of adverse health effects in humans.

PARTICULARS

- (i) *As to sub-paragraph (a) see Schedule 9.*
- (ii) *As to sub-paragraph (b), the matters referred to in particular (i) involved knowledge of the contamination of groundwater, and it may be inferred that a person who knew that groundwater was contaminated also knew that there existed a potential for adverse health effects in humans who may consume groundwater.*
- (iii) *See the documents listed in JBS&G DSI Report at paragraph 16.*

5.93. Paragraph 35 is repeated.

5.94. Further, or alternatively, at all material times from no later than 2008 (**Edinburgh Contamination Knowledge Date**), the Commonwealth knew or ought reasonably to

have known that AFFF Working Solution, AFFF, and Spent AFFF had contaminated groundwater under the Edinburgh Base.

PARTICULARS

(iv) *JBS&G DSI Report at Appendix E.*

F.2 The Commonwealth's conduct

F.2.1 The Commonwealth's deliberate conduct

5.95. At all material times, the Commonwealth's:

- (a) use of AFFF in the Edinburgh Training and Operations Activities, as pleaded in paragraphs 5.24 to 5.42; and/or
- (b) method of disposal of AFFF and Spent AFFF, as pleaded in paragraph 5.43,

was deliberate.

F.2.2 The Commonwealth's careless conduct

5.96. Further, or alternatively, by reason of the matters pleaded in paragraphs 5.24 to 5.44 at all material times on and after each of the times identified in paragraphs 5.90 to 5.94 the Commonwealth carelessly:

- (a) did the following acts:
 - (i) it allowed large quantities of AFFF to be discharged to bare ground;
 - (ii) it allowed Spent AFFF and Fire Run-Off to flow directly onto bare ground in large quantities;
 - (iii) it allowed Spent AFFF and Fire Run-Off to permeate or percolate into the soil at the Edinburgh Base;
 - (iv) it allowed Spent AFFF and Fire Run-Off to be transmitted to the groundwater beneath the Edinburgh Base, including the Edinburgh Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Edinburgh Relevant Area);
 - (v) it allowed Spent AFFF and Fire Run-Off to drain into the surrounding water catchment areas (including via the Edinburgh Drainage System), including into the Edinburgh Surface Water Bodies; and/or

- (vi) it allowed Spent AFFF and Fire Run-Off to be transmitted to the Edinburgh Surface Water Bodies; and/or
 - (vii) to the extent it stored wastewater from the use of AFFF, doing so in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
- (b) made the following omissions:
- (i) it failed to investigate and assess, or to do so adequately, the risks associated with the use of AFFF before using, or continuing to use AFFF;
 - (ii) it failed to restrict, or to do so adequately, the use of AFFF Working Solution and AFFF only to emergencies;
 - (iii) it failed to take any or any adequate steps to contain or limit the use of AFFF Working Solution and AFFF in Edinburgh Training and Operations Activities;
 - (iv) it failed to take any or any adequate steps to contain, capture, clean up and securely dispose of Spent AFFF and Fire Run-Off, such that it did not:
 - (A) flow directly onto bare ground;
 - (B) permeate or percolate into the soil at the Edinburgh Base;
 - (C) become transmitted to the groundwater beneath the Edinburgh Base, including the Edinburgh Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Edinburgh Relevant Area);
 - (D) drain into the surrounding water catchment areas (including via the Edinburgh Drainage System), including into the Edinburgh Surface Water Bodies; and
 - (E) transmit to the Edinburgh Surface Water Bodies;
 - (v) it failed to store wastewater from the use of AFFF Working Solution and AFFF in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);

- (vi) it failed to take any or any adequate steps to remediate the contamination of the groundwater under the Edinburgh Base at any time after the time when it knew or ought reasonably to have known that groundwater was contaminated, as pleaded in paragraphs 5.90 to 5.94 (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable); and/or
- (vii) it failed to take any or any adequate steps to remediate the contamination of the soil on Edinburgh Base at any time after the time when it knew or ought reasonably to have known that soil was contaminated (including to prevent Spent AFFF and Fire Run Off leaching, or further leaching into the groundwater or surface water, (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable).

PARTICULARS

- (i) *As to subparagraph (a)(i), paragraphs 5.24 to 5.44 are repeated.*
- (ii) *As to subparagraph (a)(ii), paragraphs 5.24 to 5.44 are repeated.*
- (iii) *As to subparagraph (a)(iii), paragraphs 5.24 to 5.44 and 5.64 to 5.65 are repeated.*
- (iv) *As to subparagraph (a)(iv), paragraphs 5.24 to 5.44 and 5.59 to 5.63 are repeated.*
- (v) *As to subparagraph (a)(v), paragraphs 5.24 to 5.44 and 5.54 to 5.58 are repeated.*
- (vi) *As to subparagraph (a)(vi), paragraphs 5.24 to 5.44 and 5.54 to 5.58 is repeated.*
- (vii) *As to subparagraph (a)(vii), paragraphs 5.24 to 5.44 and 5.54 to 5.67 are repeated.*
- (viii) *As to subparagraph (b)(i), paragraphs 5.24 to 5.44 and 5.90 to 5.94 are repeated.*
- (ix) *As to subparagraph (b)(ii), paragraphs 5.24 to 5.44 are repeated.*
- (x) *As to subparagraph (b)(iii), paragraphs 5.24 to 5.44 are repeated.*
- (xi) *As to subparagraph (b)(iv), paragraphs 5.24 to 5.44 and 5.54 to 5.67 are repeated.*
- (xii) *As to subparagraph (b)(v), paragraphs 5.24 to 5.44 are repeated.*
- (xiii) *As to subparagraph (b)(vi), paragraphs 5.24 to 5.44 and 5.90 to 5.94 are repeated.*

(xiv) *As to subparagraph (b)(vii), paragraphs 5.24 to 5.44 and 5.90 to 5.94 are repeated.*

5.97. Further, or alternatively, the Commonwealth:

- (a) failed, at all material times after the Edinburgh Contamination Knowledge Date, to warn persons resident in the Edinburgh Relevant Area that:
 - (i) it had been using AFFF Working Solution and AFFF at the Edinburgh Base since or about 1978;
 - (ii) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Edinburgh Base and entered and/or contaminated, the Edinburgh Aquifers, Edinburgh Surface Water Bodies; and/or
 - (iii) Spent AFFF was:
 - (A) potentially damaging to the environment; and/or
 - (B) potentially causative of adverse health effects in humans.

5.98. Further, or alternatively, the Commonwealth failed, at all material times after the inception of the *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, Volume 1, Ch6(6), to comply with that measure by providing all relevant information on site contamination for persons resident in the Edinburgh Relevant Area.

G THE COMMONWEALTH'S LIABILITY

G.1 Nuisance

G.1.1 Liability in nuisance

5.99. By its use of the Edinburgh Base as pleaded in paragraphs 5.24 to 5.44 and 5.95 to 5.96, the Commonwealth has created, and continued, an interference with the use and enjoyment of the land owned by Edinburgh Group Members (the **Edinburgh Nuisance**), in that:

- (a) their land is affected by the Edinburgh Surface Water Contamination and such contamination is irreparable (and paragraphs 5.54 to 5.58 are repeated);
- (b) they are no longer able safely to use Private Edinburgh Bores on their land to access the Edinburgh Aquifers as a water supply for Edinburgh Groundwater

Usages, given the Edinburgh Aquifers are irretrievably contaminated (and paragraphs 5.59 to 5.63 are repeated);

- (c) their soil has sustained Edinburgh Soil Contamination, and such contamination is irretrievable (and paragraphs 5.64 to 5.65 are repeated);
- (d) their land is affected by the Edinburgh Biota Contamination, and such contamination is irretrievable (and paragraphs 5.66 to 5.67 are repeated); and
- (e) those occupying their land are subject to the Edinburgh Ongoing Contaminant Exposure.

PARTICULARS

- (i) *The interference with the land of Edinburgh Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Edinburgh Group Members.*

5.100. Further, by reason of the matters pleaded in paragraphs 5.17, 5.22, 5.47, 5.53, 5.86 and/or 5.87 to 5.94, at all material times it was reasonably foreseeable to a reasonable person in the Commonwealth's position that persons owning land in the Edinburgh Relevant Area (including Edinburgh Group Members) would suffer loss by the Commonwealth's use of the Edinburgh Base as pleaded in paragraphs 5.24 to 5.44, being pure economic loss, in the form of diminution in the value of land in the Edinburgh Relevant Area.

PARTICULARS

- (i) *Paragraphs 5.17, 5.22, 5.47, 5.53, 5.86 and/or 5.87 to 5.94 are repeated.*

5.101. By reason of the matters pleaded in paragraphs 5.99 and 5.100, the Edinburgh Nuisance constitutes a substantial and unreasonable interference with the use and enjoyment of the land owned by Edinburgh Group Members.

G.1.2 Causation, loss and damage

5.102. The Edinburgh Nuisance directly caused:

- (a) the Edinburgh Surface Water Contamination (as pleaded in paragraph 5.57);
- (b) the Edinburgh Groundwater Contamination (as pleaded in paragraph 5.62);

- (c) the Edinburgh Soil Contamination (as pleaded in paragraph 5.64);
- (d) the Edinburgh Biota Contamination (as pleaded in paragraph 5.66); and/or
- (e) the Edinburgh Contamination Land Value Affection (as pleaded in paragraph 5.85); and

the Edinburgh Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *Particulars of the losses of Edinburgh Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Edinburgh Group Members.*

G.1.3 Aggravated and exemplary damages

5.103. Further, on and from the Actual Knowledge Date, by continuing the Edinburgh Nuisance by:

- (a) continuing to do the acts as pleaded in paragraph 5.95 and/or sub-paragraph 5.96(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 5.96(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 5.87 to 5.94, the Commonwealth engaged in aggravating conduct, and Edinburgh Group Members claim aggravated damages.

5.104. Further, or alternatively, on and from the Actual Knowledge Date, by continuing the Edinburgh Nuisance by:

- (a) continuing to do the acts as pleaded in paragraph 5.95 and/or sub-paragraph 5.96(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 5.96(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 5.87 to 5.94, the Commonwealth engaged in conduct in contumelious disregard for the rights of Edinburgh Group Members, and Edinburgh Group Members claim exemplary damages.

G.2 Negligence

G.2.1 Duty of care

- 5.105. At all material times, persons other than the Commonwealth (including Edinburgh Group Members) had no capacity to control the activities of the Commonwealth on the Edinburgh Base, and in particular the use of AFFF Working Solution and AFFF on the Edinburgh Base.
- 5.106. At all material times, the land in the Edinburgh Relevant Area (including the land owned by Edinburgh Group Members, was physically proximate to the Edinburgh Base.
- 5.107. At all material times, by reason of the matters pleaded in paragraphs 5.105 to 5.106 persons owning, or considering purchasing land in the Edinburgh Relevant Area (including Edinburgh Group Members) were in a position of vulnerability.
- 5.108. By reason of the matters pleaded in paragraphs 5.17, 5.22, 5.47, 5.53, 5.86 and/or 5.87 to 5.94 a reasonable person in the Commonwealth's position would have foreseen a reasonably foreseeable and not insignificant risk of harm to persons owning, or acquiring land in the Edinburgh Relevant Area (including Edinburgh Group Members) by the Commonwealth's use of AFFF Working Solution and AFFF on the Edinburgh Base as pleaded in paragraphs 5.24 to 5.44, being pure economic loss, in the form of diminution in the value of their land in the Edinburgh Relevant Area (the **Edinburgh Risk of Harm**).

PARTICULARS

- (i) *Paragraphs 5.17, 5.22, 5.47, 5.53, 5.86 and/or 5.87 to 5.94 are repeated.*

- 5.109. By reason of the matters pleaded in paragraphs 5.105 to 5.108, the Commonwealth owed a duty to each and all of Edinburgh Group Members to exercise reasonable care, in the use of AFFF Working Solution and AFFF on the Edinburgh Base not to cause pure economic loss, in the form of diminution in the value of land in the Edinburgh Relevant Area (**Edinburgh Duty of Care**).
- 5.110. By reason of the matters pleaded in paragraphs 5.105 to 5.108, on and the Edinburgh Contamination Knowledge Date, alternatively the Actual Knowledge Date, the Commonwealth owed a duty to each and all of Edinburgh Group Members to exercise reasonable care to warn them that:
- (a) it had been using AFFF at the Edinburgh Base since or about 1978;

- (b) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Edinburgh Base and entered and/or contaminated the Edinburgh Aquifers and/or contaminated the Edinburgh Surface Water Bodies; and
- (c) Spent AFFF was:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans.

(Edinburgh Duty to Warn).

G.2.2 Scope of Edinburgh Duty of Care

5.111. On and from 1 May 1993, the EPA SA:

- (a) prohibited a person from undertaking an activity that pollutes, or might pollute, the environment unless the person takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm;
- (b) defined “pollute” to mean discharge, emit, dispose of or distribute pollutants, or cause or fail to prevent the discharge, emission, depositing, disposal, disturbance or escape of pollutants;
- (c) defined “pollutants” to mean any solid, liquid or gas (or combination thereof) including waste, smoke, dust, fumes and odour, noise, or heat;
- (d) defined “environment” to mean the land, air, water, organisms and ecosystems, and includes human-made or modified structures or areas and the amenity values of an area.

PARTICULARS

- (i) EPA SA s 3, 25.

5.112. At all material times from 1995, the content of the EPA SA (as pleaded in paragraph 5.111) bound the Commonwealth by reason of the *Commonwealth Places (Application of Laws) Act 1970* (Cth), and/or informed the scope of what a reasonably person ought do in relation to conduct which it was reasonably foreseeable might result in environmental harm (including the Edinburgh Risk of Harm pleaded in paragraph 5.108).

5.113. The Commonwealth had the capacity to exercise control of the Edinburgh Training and Operations Activities and the use of AFFF Working Solution and AFFF on the Edinburgh Base so as to take the precautions which a reasonable person in its position would have taken against the Edinburgh Risk of Harm, by:

- (a) not doing the following acts at all, or alternatively any time after the Actual Knowledge Date:
 - (i) allowing large quantities of AFFF Working Solution and AFFF to be discharged to bare ground;
 - (ii) allowing Spent AFFF and Fire Run-Off to flow directly onto bare ground in large quantities;
 - (iii) allowing Spent AFFF and Fire Run-Off to permeate or percolate into the soil at the Edinburgh Base;
 - (iv) allowing Spent AFFF and Fire Run-Off to be transmitted to the groundwater beneath the Edinburgh Base, including the Edinburgh Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Edinburgh Relevant Area);
 - (v) allowing Spent AFFF and Fire Run-Off to drain into the surrounding water catchment areas (including via the Edinburgh Drainage System), including into the Edinburgh Surface Water Bodies;
 - (vi) allowing Spent AFFF and Fire Run-Off to be transmitted to the Edinburgh Surface Water Bodies; and/or
 - (vii) to the extent it stored store wastewater from the use of AFFF Working Solution and AFFF, it did so in such a way that it failed to avoid leakage to the surrounding environment;
- (b) doing the following things, at any time, or alternatively any time after the Actual Knowledge Dates:
 - (i) investigating and assessing the risks associated with the use of AFFF Working Solution and AFFF before using, or continuing to use, AFFF Working Solution and AFFF (and not using them at all);

- (ii) restricting the use of AFFF Working Solution and AFFF only for emergency activities;
- (iii) taking steps to contain or limit the use of AFFF Working Solution and AFFF in the Edinburgh Training and Operations Activities;
- (iv) taking steps to contain, capture, clean up and securely dispose of Spent AFFF and Fire Run-Off, such that it did not:
 - (A) flow directly onto bare ground;
 - (B) permeate or percolate into the soil at the Edinburgh Base;
 - (C) become transmitted to the groundwater beneath the Edinburgh Base, including the Edinburgh Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Edinburgh Relevant Area);
 - (D) drain into the surrounding water catchment areas (including via the Edinburgh Drainage System), including into the Edinburgh Surface Water Bodies; and
 - (E) transmit to the Edinburgh Surface Water Bodies;
- (v) storing wastewater from the use of AFFF in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
- (vi) taking steps to remediate the contamination of the groundwater under the Edinburgh Base promptly after the time when it knew or ought reasonably to have known that groundwater was, or was likely to have been, contaminated, as pleaded in paragraphs 33 to 35ne (to the extent, which is unknown to the Applicants, that the contamination may at one time have been remediable); and/or
- (vii) taking steps to remediate contaminated soil on the Edinburgh Base at any time promptly after the time when it knew or ought reasonably to have known that soil was contaminated (including by removing that soil and disposing of it at an off-site disposal area so as to prevent Spent AFFF and Fire Run Off leaching, or further leaching into the groundwater or

surface water, (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable).

G.2.3 Scope of Duty to Warn

5.114. At all material times after each of the Edinburgh Contamination Knowledge Date, alternatively the Actual Knowledge Date, the Commonwealth had capacity to warn the general public, alternatively owners and occupiers in the Edinburgh Relevant Area, alternatively potential purchasers of land in the Edinburgh Relevant Area (including Edinburgh Group Members) that:

- (a) it had been using AFFF Working Solution and AFFF at the Edinburgh Base since or about 1978;
- (b) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Edinburgh Base and entered and/or contaminated the Edinburgh Aquifers and/or contaminated the Edinburgh Surface Water Bodies; and
- (c) Spent AFFF was:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans.

G.2.4 Breach of duty

5.115. By reason of the matters pleaded in paragraphs 5.24 to 5.44, 5.96 and 5.113, the Commonwealth breached the Edinburgh Duty of Care (the **Edinburgh Negligence**).

5.116. By reason of the matters pleaded in paragraphs 5.24 to 5.44, 5.97 and 5.114, the Commonwealth breached the Duty to Warn (the **Edinburgh Negligent Failure to Warn**).

G.2.5 Causation, loss and damage

5.117. The Commonwealth's Edinburgh Negligence caused:

- (a) the Edinburgh Surface Water Contamination (as pleaded in paragraph 5.57);
- (b) the Edinburgh Groundwater Contamination (as pleaded in paragraph 5.62);
- (c) the Edinburgh Soil Contamination (as pleaded in paragraph 5.64);

- (d) the Edinburgh Biota Contamination (as pleaded in paragraph 5.66); and/or
- (e) the Edinburgh Contamination Land Value Affectation (as pleaded in paragraph 5.85);

Edinburgh Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *The particulars to paragraph 5.102 are repeated.*

5.118. Further, or alternatively, the Commonwealth's Edinburgh Negligent Failure to Warn caused or materially contributed to some Edinburgh Group Members acquiring land in the Edinburgh Relevant Area, and Edinburgh Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *Particulars of the identity of those Edinburgh Group Members who would not have acquired land were it not for the Commonwealth's Edinburgh Negligent Failure to Warn will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Edinburgh Group Members, and the particulars to paragraph 5.102 are repeated.*

G.2.6 Aggravated and exemplary damages

5.119. Further, on and from the Actual Knowledge Date by:

- (a) continuing to do the acts as pleaded in paragraph 5.95 and/or sub-paragraph 5.96(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 5.96(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 5.87 to 5.94, the Commonwealth engaged in aggravating conduct, and Edinburgh Group Members claim aggravated damages.

5.120. Further, or alternatively, on and from the Actual Knowledge Date by:

- (a) continuing to do the acts as pleaded in paragraph 5.95 and/or sub-paragraph 5.96(a) (and each of them); and/or

- (b) continuing to fail to do the things as pleaded in sub-paragraph 5.96(b) (and each of them),

in circumstances where it where it had the knowledge as pleaded in paragraphs 5.87 to 5.94, the Commonwealth engaged in conduct in contumelious disregard for the rights of Edinburgh Group Members, and Edinburgh Group Members claim exemplary damages.

G.3 Breach of statutory duty

G.3.1 Liability

5.121. The Edinburgh Base is situated on Commonwealth land as defined in ss 27 and 525 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**)

5.122. Pursuant to s 28 of the EPBC Act, the Commonwealth or a Commonwealth agency must not take an action that has, will have, or is likely to have a significant impact on the environment, defined by s 528 non-exhaustively to include:

- (a) ecosystems and their constituent parts, including people and communities;
- (b) natural and physical resources;
- (c) the qualities and characteristics of locations, places and areas;
- (d) heritage values of places; and
- (e) the social, economic and cultural aspects of a thing mentioned in paragraph (a), (b), (c) or (d).

5.123. By its use of the Edinburgh Base on and from 16 July 1999, as pleaded in paragraphs 5.24 to 5.44 and 5.95 and/or 5.96, the Commonwealth took an action or actions that has or is likely to have a significant impact on the environment.

PARTICULARS

- (i) *These actions have had such an impact by reason of the matters pleaded in paragraphs 5.54 to 5.67, namely the Edinburgh Surface Water Contamination, the Edinburgh Groundwater Contamination, the Edinburgh Soil Contamination, and the Edinburgh Biota Contamination*
- (ii) *These actions were likely to have such an impact by reason that they were reasonably foreseeable, by reason of the matters pleaded in paragraphs 5.17, 5.22, 5.47, 5.53 and 5.86.*

5.124. By reason of the matters pleaded in paragraph 5.123, the Commonwealth has contravened s 28 of the EPBC Act (**Edinburgh EPBC Act Breach**).

G.3.2 Causation, loss and damage

5.125. The Edinburgh EPBC Act Breach caused:

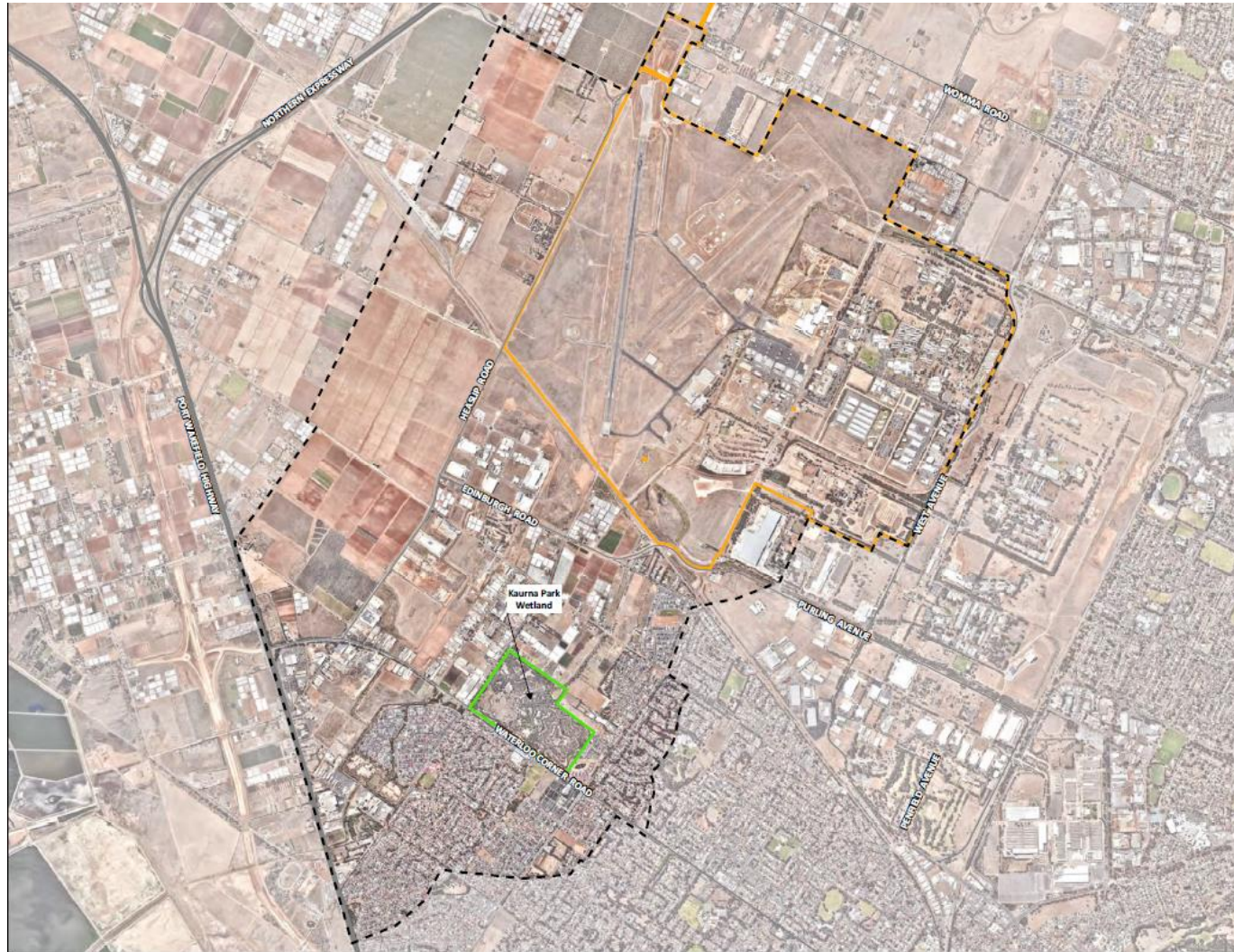
- (a) the Edinburgh Surface Water Contamination (as pleaded in paragraph 5.57);
- (b) the Edinburgh Groundwater Contamination (as pleaded in paragraph 5.62);
- (c) the Edinburgh Soil Contamination (as pleaded in paragraph 5.64);
- (d) the Edinburgh Biota Contamination (as pleaded in paragraph 5.66); and/or
- (e) the Edinburgh Contamination Land Value Affection (as pleaded in paragraph 5.85); and

Edinburgh Group Members have thereby suffered loss and damage arising from the Edinburgh EPBC Act Breach.

PARTICULARS

- (i) *The particulars to paragraph 5.102 are repeated.*

ANNEXURE 5A: EDINBURGH RELEVANT AREA



SCHEDULE 6 – BANDIANA BASE

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A THE BANDIANA MILITARY AREA AND SURROUNDS

A.1 The Bandiana Base

- 6.1. Since about 1942, the Commonwealth has continuously owned and occupied an area of land approximately 6.5 kilometres square in size, located in the Murray River Valley, approximately 3 kilometres south east of Wodonga, Victoria (**Bandiana Base**).

PARTICULARS

- (i) *Golder Associates Pty Ltd, PFAS Detailed Site Investigation: Bandiana Military Area – (14 September 2018) (**Golder DSI Report**) at paragraphs ES 2.0, 5.3.*

- 6.2. At all material times, the Bandiana Base was comprised of three barracks:

- (a) Gaza Ridge Barracks, North Bandiana (**North Bandiana Barracks**);
- (b) Gaza Ridge Barracks, South Bandiana (**South Bandiana Barracks**);
- (c) Wadsworth Barracks, East Bandiana (**East Bandiana Barracks**).

PARTICULARS

- (i) *Golder DSI Report at paragraphs 1.0, 5.1. 5.3.*

- 6.3. At all material times, neighbouring land use in the region surrounding the Bandiana Base was and is:

- (a) in the north, residential, recreational and farming;
- (b) in the east, residential, recreational, rural and agricultural;
- (c) in the south, recreational, rural, agricultural, industrial;
- (d) in the west, the Wodonga Township including residential, commercial and industrial.

PARTICULARS

- (i) *Golder DSI Report at paragraphs 5.2, 5.4.*

A.2 The natural features of the Bandiana Base and surrounding area

A.2.1 Climate

- 6.4. At all material times, the Bandiana Base and the Relevant Area were situated in a climate which had rainfall characterised by marked fluctuations unaffected by seasonality.

PARTICULARS

- (i) *Golder DSI Report at paragraph 6.2*

A.2.2 Topography

- 6.5. At all material times, the Bandiana Base was situated in a landscape known as the Upper Murray, which formed a network of low-lying and relatively flat river and creek floodplains, scattered by higher rising hills.

PARTICULARS

- (i) *Golder DSI Report at paragraph 6.1.*

- 6.6. At all material times, the Bandiana Base was situated in a plain between Huon Hill, located in the north east and Bears Hill, located in the south west.
- 6.7. At all material times, the Bandiana Base contained a topographic divide that ran across the Bandiana Base at the South Bandiana Barracks in a general north to south alignment, forming two catchment areas being:
- (a) the west of the divide, where the surface gently slopes in a north-westerly direction towards the Murray River and Wodonga Creek, via Jack in the Box Creek (**Jack in the Box Creek Catchment**); and
 - (b) the east of the divide, where the surface slopes in an easterly and north easterly direction, towards the Kiewa River (**Kiewa River Catchment**), which ultimately connects to the broader Murray River catchment.

PARTICULARS

- (i) *Golder DSI Report at paragraph 6.1, 6.4.1, 6.4.2.*

A.2.3 Soils

- 6.8. At all material times, the geology underlying the Bandiana Base was:
- (a) at the South Bandiana Barracks, unconsolidated hill-wash deposits, being colluvial deposits comprising sands, silts, clays and gravels;

- (b) at the North Bandiana Barracks:
 - (i) at the northern and western portions, fine grained red brown sediments (clays and silts) with some interbedded sands; and
 - (ii) at the southern portion approaching the unnamed creek, an increase in coarser sands (brown, orange brown, and grey brown);
- (c) at the East Bandiana Barracks, a combination of clay, silts and sands with the upper profile dominated by brown sandy soils, underlain by brown clay dominated soils.

PARTICULARS

(i) Golder DSI Report at paragraph 6.5.2

A.2.4 Hydrology

- 6.9. At all material times, the Bandiana Base was surrounded by a network of rivers, creeks and dams to the west and east of the topographic divide (**Bandiana Surface Water Bodies**).
- 6.10. At all material times, the Bandiana Surface Water Bodies to the west of the topographic divide included:
- (a) Wodonga Creek; and
 - (b) Jack in the Box Creek, which:
 - (i) flowed in north north-westerly direction, from the north west portion of Bandiana Base, and discharged to Wodonga Creek;
 - (ii) was an intermittent surface watercourse, with variable sections being constructed along its water course;
 - (iii) was connected by gullies and shallow drainage channels that ran across the western most portion of Bandiana Base, which were typically dry but contained pools of surface water following periods of heavy rain.
- 6.11. At all material times, the Bandiana Surface Water Bodies to the east of the topographic divide included:
- (a) Middle Creek, which:

- (i) was the dominant drainage in area and a permanent surface watercourse;
 - (ii) flowed in a north east direction along the south eastern edge of the Relevant Area;
 - (iii) discharged into Kiewa River
- (b) an unnamed creek, which
 - (i) ran north of Middle Creek and was a permanent surface watercourse;
 - (ii) originated as a result of drainage channels which discharged to a series of stormwater ponds (wetlands) located at the entry to South Bandiana Barracks and flowed through North Bandiana Barracks to the north east;
 - (iii) was modified by the construction of ponds and channels;
 - (iv) discharged into Kiewa River;
- (c) Kiewa River, which
 - (i) ultimately received water from Middle Creek and the unnamed creek;
 - (ii) flowed north to its confluence with the Murray River along a meandering course and contained a number of small billabongs and secondary branches;
 - (iii) flowed with considerable seasonal variation with August to October exhibiting its highest water levels;
 - (iv) was a geomorphologically active zone with active erosion, transport and deposition of sediments occurring;
 - (v) was an unregulated system with no major dams or weir structures to regulate supply or extraction of water;
 - (vi) was very responsive to significant rainfall events and was susceptible to flooding events along its the lower reaches and eastern banks;
- (d) Murray River, which received water from the Kiewa River.

PARTICULARS

(i) *Golder DSI Report at paragraph 6.1, 6.4.1, 6.4.2.*

Surface water drainage

- 6.12. At all material times, surface water across the Bandiana Base drained via a complex network of swales and channels within the open areas, and curbs, gutters and underground stormwater pipes within the developed portions of the Bandiana Base.

PARTICULARS

(i) *Golder DSI Report paragraph 6.4.1*

- 6.13. At all material times, the features of the surface water across the Bandiana Base included:

- (a) surface water flow through the upper portions of the drainage network were variable and only carried water during rain events;
- (b) surface water flow in the lower portions of the drainage network, such as Middle Creek and the lower reaches of Jack in the Box Creek, were more consistent.

PARTICULARS

(i) *Golder DSI Report at paragraph 6.4.1.*

A.2.5 Hydrogeology

- 6.14. At all material times the primary aquifer units of the Relevant Area were the Shepparton Fluvium, the Shepparton Colluvium and, to a lesser extent, the Coonambigdal Fluvium, which contained locally a well-developed network of shoestring sands acting as the main paths for groundwater flow (together, the **Bandiana Aquifers**).

PARTICULARS

(i) *Golder DSI Report at paragraph 6.6.1.*

Groundwater flow

- 6.15. At all material times, the groundwater flow of the Bandiana Base and the Relevant Area was influenced by a groundwater divide which occurred through central South Bandiana Barracks, where:

- (a) to the west of the divide, groundwater flowed generally towards the north-west towards Wodonga Creek;
- (b) to the east of the divide (which encompassed the eastern portion of South Bandiana Barracks, North Bandiana Barracks, and East Bandiana Barracks), groundwater flowed generally towards the north-east to the Kiewa River.

PARTICULARS

- (i) *Golder DSI Report at paragraph 6.6.3.*
- (ii) *The groundwater divide is understood to be generally consistent with the topography of the land and influenced by Bears Hill and Huon Hill; Golder DSI Report at paragraph 6.6.3.*
- (iii) *Groundwater on North Bandiana is influenced by the topography of Huon Hill whereby it flows to the south-east within the norther portion situated on the Shepparton Colluvium, before slightly re-orientating more towards the east and the Kiewa River where the BMA transitions to Shepparton Fluvium and topography becomes gentler; Golder DSI Report at paragraph 6.6.3.*

The interaction of surface water and groundwater

6.16. At all material times, the groundwater and surface water at the Bandiana Base and Relevant Area interacted with each other by way of discharging groundwater both from and to the Bandiana Surface Water Bodies, including at:

- (a) Middle Creek and the unnamed creek in the eastern part of the Bandiana Base, where those Bandiana Surface Water Bodies acted as losing streams, by recharging to the groundwater flow system;
- (b) the deeper portions of the Jack in the Box Creek Catchment, including the Wodonga Creek, and the Kiewa River Catchment where those Bandiana Surface Water Bodies acted as gaining streams, by receiving groundwater flow.

PARTICULARS

- (i) *Golder DSI Report at paragraph 6.6.4, Table 10.*

A.2.6 Flooding

- 6.17. At all material times, the Bandiana Surface Water Bodies, including the Kiewa River, were subject to flooding events including at times of heavy rainfall.

PARTICULARS

(i) *Golder DSI Report at paragraphs 6.4.2, 6.4.3, 6.5.1.*

- 6.18. At all material times, by reason of the matters pleaded in paragraphs 6.5 to 6.17, the Bandiana Base and the Relevant Area were prone to flooding, associated overland flow, which resulted in the discharge of surface water to groundwater and groundwater to surface water.

A.3 The artificial water-related features of the Bandiana Base

- 6.19. In the course of its occupation and use of the Bandiana Base, the Commonwealth constructed, developed, and/or upgraded a drainage system (the **Bandiana Drainage System**) consisting of a complex network of swales and channels within the open areas, and curbs, gutters and underground stormwater pipes within the developed portions of the Bandiana Base.
- 6.20. The Bandiana Drainage System consisted of redundant or abandoned infrastructure and a pipe and pit drainage network that was of variable quality and integrity, dependent on the age of the infrastructure.
- 6.21. In the course of its occupation and use of the Bandiana Base, the Commonwealth also installed an additional stormwater pond in North Bandiana Barracks (wetlands) and two large stormwater ponds (settling ponds) on East Bandiana Barracks, which directed water into two main directions.
- 6.22. At all material times, there were numerous registered and unregistered bores located in the Relevant Area, including for the use of domestic, irrigation and commercial purposes, in the Jack in the Box Catchment and the Kiewa River Catchment areas (the **Bandiana Bores**).

PARTICULARS

(i) *Golder DSI Report at paragraphs 6.4.1, 6.6.7, 7.1.*

A.4 The foreseeable flow of water from the Bandiana Base

6.23. At all material times, by reason of the matters pleaded in paragraphs 6.5 to 6.22, it was reasonably foreseeable that waters, liquids, and soluble materials discharged on Bandiana Base would:

- (a) pool, permeate, percolate or leach into the soil at the Bandiana Base;
- (b) be transmitted to the groundwater beneath the Bandiana Base, including into the Bandiana Aquifers and mingle and flow with that groundwater;
- (c) mingle with other surface water on the Bandiana Base (especially after periods of rain), and flow overland towards the Bandiana Surface Water Bodies and:
 - (i) permeate or percolate into the soil over which the surface water overland flows occurred; and
 - (ii) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including into the Bandiana Aquifers; and
- (d) be transmitted to the Bandiana Surface Water Bodies.

B WATER USE AT THE RELEVANT AREA

B.1 Bandiana Surface Water Bodies

6.24. At all material times, the Bandiana Surface Water Bodies have been used by residents of the Relevant Area for:

- (a) recreation, including fishing (yabbies);
- (b) swimming;
- (c) irrigation, including from the Kiewa River;
- (d) domestic purposes including for watering fruit and vegetable gardens, watering grounds, watering livestock, watering poultry,

(together, the **Bandiana Surface Water Usages**).

PARTICULARS

- (i) *Golder DSI Report at paragraphs 6.4.1, 7.1, 7.2, 7.3.*

B.2 Groundwater

6.25. At all material times, groundwater from the Bandiana Aquifers has been used by some Bandiana Group Members for:

- (a) drinking;
 - (b) domestic purposes;
 - (c) irrigation purposes including watering fruit and vegetable gardens; and
 - (d) watering of livestock and poultry,
- (together, the **Bandiana Groundwater Usages**).

PARTICULARS

- (i) *Golder DSI Report at paragraphs 7.1, 7.2, 7.3.*

B.3 The foreseeable usage of water emanating from the Bandiana Base

6.26. At all material times, by reason of the matters pleaded in paragraphs 6.23 to 6.25 above, it was reasonably foreseeable that waters, liquids, and soluble materials discharged and/or allowed to escape the Bandiana Base which were transmitted to the Bandiana Surface Water Bodies, and the Bandiana Aquifers would be used by residents of the Relevant Area.

C THE COMMONWEALTH'S USE OF AFFF AT THE BANDIANA BASE

C.1 Introduction

6.27. At all material times since the establishment of the Bandiana Base, the Commonwealth has been responsible for conducting all of the activities conducted at the Bandiana Base.

C.2 The Commonwealth's use of AFFF

6.28. As part of the operation of the Bandiana Base since a date unknown to the Applicant but in about the 1970s the Commonwealth has regularly conducted fire drills, firefighting training, fire tests and like operations (both on and near Bandiana Base) including responding to operational and emergency needs (**Bandiana Training and Operations Activities**).

PARTICULARS

- (i) Golder DSI Report at paragraphs 1.1, 9.1.1, 9.1.2, 9.1.5, 9.1.6, 9.1.7, 9.1.8, 9.1.11, 9.1.12, 9.1.13, 9.1.14 and 9.3.1.*
- (ii) Further particulars may be provided after discovery and inspection.*

6.29. At all material times in the period since a date unknown to the Applicant but in about the 1970s until a time unknown to the Applicants after about 2004, in the use and occupation of the Bandiana Base for the purpose of the Bandiana Training and Operations Activities, the Commonwealth:

- (a) used AFFF Concentrate;
- (b) mixed the AFFF Concentrate with water to create AFFF Working Solution; and
- (c) aspirated the AFFF Working Solution into a foam via nozzles on firefighting trucks and other mechanisms (the aspirated foam being known as AFFF).

PARTICULARS

- (i) Golder DSI Report at paragraphs 1.1, 9.1.1, 9.1.2, 9.1.5, 9.1.6, 9.1.7, 9.1.8, 9.1.11, 9.1.12, 9.1.13, 9.1.14 and 9.3.1.*
- (ii) From approximately 1976 the AFFF Concentrate used was principally a product known as “Light WaterTM” (being manufactured by the Minnesota Mining and Manufacturing Company (now known as 3M Company) and/or its subsidiary 3M Australia Pty Ltd.*
- iii) At a time unknown to the Applicants in about 2003 or 2004, the Commonwealth transitioned to using “Ansulite”.*

6.30. The Bandiana Training and Operations Activities included those in and around:

- (a) the former fire training ground located in the western portion of South Bandiana Barracks (**Bandiana Former Fire Training Ground**);
- (b) Bandiana BFS Former Fire Training Ground;
- (c) Bandiana Fuel Handling Facility;
- (d) Bandiana Current Fire Training Area;
- (e) Bandiana Old Fire Station;
- (f) Bandiana POL Building;

- (g) Bandiana Warehouse 13;
- (h) Bandiana Building 100;
- (i) Bandiana Current Fire Station;
- (j) Bandiana Building 592; and
- (k) Bandiana Football Field.

PARTICULARS

- (i) *Golder DSI Report at paragraphs 9.1.1, 9.1.2, 9.1.5, 9.1.6, 9.1.7, 9.1.8, 9.1.11, 9.1.12, 9.1.13, 9.1.14 and 9.3.1.*
- (ii) *Further particulars may be provided after discovery and inspection.*

Bandiana Former Fire Training Ground

6.31. At all material times, the Bandiana Former Fire Training Ground:

- (a) was located in a large area of vacant land known as the Close Training Area;
- (b) was used by the Petroleum Platoon as an area for fuel handling training and fire training exercises prior to the construction of the current facilities utilised at South Bandiana Barracks;
- (c) operated prior to 1994;
- (d) contained:
 - (i) an earthen bund; and
 - (ii) two open metal sheds approximately 150 metres east and north east of the earthen bund, which were associated with two large concerted banded areas (now removed) that were used to house mobile petroleum above ground storage tanks for fuel handling training
- (e) was subject to flooding in the northern portion of the area and retained surface water in the earthen bund and drainage channels;

6.32. The Bandiana Training and Operations Activities at the Bandiana Former Fire Training Ground:

- (a) involved filling the earthen bund with water, transferring fuel into the bund and setting it alight, and utilising firefighting foam to extinguish the fire;
- (b) involved smaller scale firefighting activities which were undertaken prior to combating the larger fire in the earthen bund;
- (c) is likely to have involved the use of AFFF LightWater™;
- (d) resulted in fluids containing AFFF Working Solution and AFFF being discharged into the soil, sediment, surface water and/or groundwater of the Bandiana Base and Relevant Area.

6.33. At all material times, the Bandiana Former Fire Training Ground discharged surface water from the earthen bund to the north north-west through bushland or via drainage channels and swales, before discharging to Jack in the Box Creek.

PARTICULARS

- (i) *Golder DSI Report at paragraph 9.1.1.*

Bandiana BFS Former Fire Training Ground

6.34. At all material times, the Bandiana BFS Former Fire Training Ground:

- (a) was located in the south-western portion of the current Close Training Area;
- (b) operated as a training area from the 1980s to approximately 1993;
- (c) contained a concrete run, pressure vessel, pipe work, sump and header unit;
- (d) contained, within the surrounding area, a small shallow earth dam and a small rectangular concrete pond with associated pipework located approximately 10 metres and 45 metres south west of the concrete run, respectively, which both may have been used as part of the Bandiana Training and Operation Activities;
- (e) was located in an area of open ground, short grass and scattered trees, with no formal drainage network.

6.35. The Bandiana Training and Operations Activities at the Bandiana BFS Former Fire Training Ground:

- (a) took place on a monthly basis;

- (b) involved the filling of pressure vessels with fuels, pressurising the vessels using a fire pump and then igniting the pressurised fuel released through the header unit;
- (c) resulted in the discharge of approximately 560 litres of AFFF per annum;
- (d) resulted in fluids containing AFFF Working Solution and AFFF being discharged into the soil of the Bandiana Base and Relevant Area.

6.36. At all material times, the Bandiana BFS Former Fire Training Ground discharged surface water gently to the north-west entering the drainage lines running to the north along the western property boundary before ultimately joining Jack in the Box Creek.

PARTICULARS

- (i) *Golder DSI Report at paragraph 9.1.2.*

Bandiana Fuel Handling Facility

6.37. At all material times, the Bandiana Fuel Handling Facility:

- (a) was an area used for training in refuelling of vehicles and bulk fuel handling;
- (b) included:
 - (i) three large open training shelters:
 - (A) which were accessed via a circular road with associated earthen bunds where vehicles could be refuelled using temporary bulk fuel storage bladders;
 - (B) which each had a concrete surface which drained to a tripled interceptor trap located to the north.
 - (ii) metal pipes connecting the earthen bunds to the concrete training shelters used for transferring fuel from the fuel storage bladders into the sheltered areas for dispensing tanks or vehicles.
 - (iii) a pond which was filled with water using fire hydrants located nearby;
 - (iv) two hardstand areas which were used for fuel transfers and fuel tanker wash down and contained its own stormwater system;

- (v) a fenced storage compound which contained training foam, and was used to store AFFF products (including PFAS containing);
- (vi) an electrical substation;
- (vii) a small petroleum laboratory (shipping container) designed to simulate a mobile laboratory for petrochemical testing, established for training purposes.

6.38. The Bandiana Training and Operations Activities at the Bandiana Fuel Handling Facility:

- (a) involved the use of AFFF for equipment testing and fire training activities in the open grassed area to the west of the fenced storage compound;
- (b) involved the use of the small grassed area to the east of a training warehouse to disassemble, empty and reload fire extinguishers prior to 2010;
- (c) resulted in fluids containing AFFF Working Solution and AFFF being discharged into the soil and/or surface water of the Bandiana Base and Relevant Area.

6.39. At all material times, the Bandiana Fuel Handling Facility discharged surface water runoff in two directions, either to the west towards Jack in the Box Creek or to the north towards the stormwater collection ponds (wetlands) at the entry to the South Bandiana Barracks.

PARTICULARS

- (i) *Golder DSI Report at paragraph 9.1.5.*

Bandiana Current Fire Training Area

6.40. At all material times, the Bandiana Current Fire Training Area:

- (a) was located in the central-western portion of South Bandiana Barracks;
- (b) was constructed in approximately 1993 and has undergone a series of upgrades following its commission;
- (c) consisted of a large shallow concrete bund, covered with a metal grill forming a platform on which the training activities took place.

6.41. The Bandiana Training and Operations Activities at the Bandiana Current Fire Training Area:

- (a) took place for approximately 30 to 40 days per year;
- (b) involved the use of a mock fuel tanker and various trays, and two 200 litre drums cut in half and mounted on stands, which were used for lighting small fires for first extinguisher training;
- (c) involved the spraying of foam towards a flame zone fuelled by eight large LPG cylinders;
- (d) involved the release of water and foam on the training platform, draining to two large in ground stormwater retention tanks, with remaining water being directed into a facility sediment pond which is discharged to stormwater or to sewer;
- (e) typically involved the use of AFFF until approximately 2010, which were stored in 20 litre drums;
- (f) resulted in fluids containing AFFF Working Solution and AFFF being discharged into the soil and/or surface water of the Bandiana Base and Relevant Area.

6.42. At all material times, the Bandiana Current Fire Training Area discharged surface water into an underground stormwater drain, ultimately towards Jack in the Box Creek.

PARTICULARS

(i) *Golder DSI Report at paragraph 9.1.6.*

Bandiana Old Fire Station

6.43. At all material times, the Bandiana Old Fire Station:

- (a) was located in the southern central portion of South Bandiana Barracks;
- (b) contained a wash point and a large diameter groundwater extraction bore formerly used for pump lift testing;
- (c) operated until 1993 until the current fire station was constructed.

6.44. The Bandiana Training and Operations Activities at the Bandiana Old Fire Station:

- (a) were held on a fortnightly basis;
- (b) involved the use of 28 drums of AFFF per month;
- (c) involved the use AFFF in the period prior to 1993;

- (d) involved the use of AFFF based extinguishers to extinguish fires fuelled by petrol, paint, aviation fuel and other flammable liquids;
- (e) involved the conduct of demonstrations of foam blankets across the ground surface to provide evidence of being able to smother a fire if required;
- (f) resulted in equipment being flushed nearby, including fire trucks being washed down within the wash point, and washed using AFFF;
- (g) resulted in fluids containing AFFF Working Solution and AFFF being discharged into the soil and/or groundwater of the Bandiana Base and Relevant Area.

6.45. At all material times, the Bandiana Old Fire Station discharged surface water to the west into formed drainage channels and towards Jack in the Box Creek.

PARTICULARS

(i) *Golder DSI Report at paragraph 9.1.7.*

Bandiana POL Building

6.46. At all material times, the Bandiana POL Building:

- (a) was located to the west of the main entrance to the South Bandiana Barracks;
- (b) was the man transport refuelling depot for the Bandiana Base and contained three self-bunded (double skinned) above ground storage tanks, and an inground purceptor installed during 2014;
- (c) contained a 90 litre AFFF fire extinguisher;
- (d) may have contained a foam locker which contained two to four 20 litre drums of AFFF and hoses which could be used in the event of a fuel fire.

6.47. The Bandiana Training and Operations Activities at the Bandiana POL Building resulted in fluids containing AFFF Working Solution and AFFF being discharged into the groundwater of the Bandiana Base and Relevant Area.

6.48. At all material times, the Bandiana POL Building discharged surface water to stormwater drains or open spoon drains which drain into the stormwater ponds (wetlands) at the entrance to South Bandiana Barracks.

PARTICULARS

(i) *Golder DSI Report at paragraph 9.1.8.*

Bandiana Warehouse 13

6.49. At all material times, the Bandiana Warehouse 13:

- (a) was located along the southern boundary of North Bandiana Barracks;
- (b) was an area where expired fire extinguishers were emptied onto grassed areas;
- (c) contained no formal drainage channels from the grassed areas and generally sloped to the north to north east.

6.50. The Bandiana Training and Operations Activities at the Bandiana Warehouse 13 resulted in fluids containing AFFF Working Solution and AFFF being discharged into the surface water of the Bandiana Base and Relevant Area.

6.51. At all material times, the Bandiana Warehouse 13 discharged surface water to large formed channel (unnamed creek) directly to the north, and ultimately discharges into the Kiewa River.

PARTICULARS

(i) *Golder DSI Report at paragraph 9.1.11.*

Bandiana Building 100

6.52. At all material times, the Bandiana Building 100:

- (a) was the location where Heavy Armoured Vehicle maintenance training occurred, and some foam training activities; and
- (b) was used to store foams including by way of a foam locker, which contained between four and five 20 litre drums of foam concentrate along with the associated fire fighting equipment.

6.53. The Bandiana Training and Operations Activities at the Bandiana Building 100 resulted in fluids containing AFFF Working Solution and AFFF being discharged into the ground water of the Bandiana Base and Relevant Area.

6.54. At all material times, the Bandiana Building 100 discharged surface water to the south via the kerb/gutter and piped network or within open channels, ultimately to the Kiewa River.

PARTICULARS

(i) *Golder DSI Report at paragraph 9.1.11.*

Bandiana Current Fire Station

6.55. At all material times, the Bandiana Current Fire Station:

- (a) was located in East Bandiana Barracks;
- (b) was constructed in 1993;
- (c) comprised a main building which housed fire trucks, two storage sheds, and a vehicle wash point;

6.56. The Bandiana Training and Operations Activities at the Bandiana Current Fire Station:

- (a) involved the use of AFFF products in a number of areas around the fire station including:
 - (i) the fire training area, which was unsealed and conducted in the earthen bund;
 - (ii) grassed areas to west of the wash point where equipment testing was conducted using AFFF, which was stopped in approximately 2004;
 - (iii) the concrete area near the wash point which drained to a tripled interceptor trap which discharged to the stormwater network;
- (b) resulted in fluids containing AFFF Working Solution and AFFF being discharged into the soil and/or ground water of the Bandiana Base and Relevant Area.

6.57. At all material times, the Bandiana Current Fire Station discharged surface water to pits located to east and north east of building, which entered the drainage channel to the north east and eventually entered Kiewa River.

PARTICULARS

(i) *Golder DSI Report at paragraph 9.1.12.*

Bandiana Building 592

6.58. At all material times, the Bandiana Building 592 was the location of unit fire training which was conducted on flat, open ground.

- 6.59. The Bandiana Training and Operations Activities at the Bandiana Building 592 resulted in fluids containing AFFF Working Solution and AFFF ponding and being discharged into the ground water of the Bandiana Base and Relevant Area.
- 6.60. At all material times, the Bandiana Building 592 discharged to the east and ultimately into Kiewa River.

PARTICULARS

- (i) *Golder DSI Report at paragraph 9.1.13.*

Bandiana Football Field

- 6.61. At all material times, the Bandiana Football Field:
- (a) was located in the south-eastern corner of East Bandiana Barracks;
 - (b) was used at times for fire training activities;
 - (c) was primarily flat and contained ponded surface water.
- 6.62. The Bandiana Training and Operations Activities at the Bandiana Football Field resulted in fluids containing AFFF Working Solution and AFFF being discharged into the ground water of the Bandiana Base and Relevant Area.
- 6.63. At all material times, the Bandiana Football Field discharged surface water to the south-east towards Middle Creek and ultimately into Kiewa River.

PARTICULARS

- (i) *Golder DSI Report at paragraph 9.1.14.*

Bandiana Additional Areas

- 6.64. At all material times, the additional locations around the Bandiana Base that the Bandiana Training and Operations Activities are likely to have occurred include:
- (a) at the South Bandiana Barracks:
 - (i) former Q-Stores;
 - (ii) a former vehicle / truck wash point
 - (iii) vehicle wash bays associated with the transport service station;

- (iv) ad hoc locations for training or display purposes;
- (b) at the North Bandiana Barracks:
 - (i) a former warehouse;
 - (ii) two former Q-Stores;
- (c) at the East Bandiana Barracks:
 - (i) two former workshops where fire trucks were serviced
 - (ii) building 910;
 - (iii) three POL storage facilities;
 - (iv) an engine test house and truck dyno facility,

(together, the **Bandiana Additional Areas**).

PARTICULARS

- (i) *Golder DSI Report at paragraph 9.3.1.*

6.65. The Bandiana Training and Operations Activities at the Bandiana Additional Areas resulted in fluids containing AFFF Working Solution and AFFF being discharged or leaking into the soil, sediment, surface water and/or groundwater of the Bandiana Base and Bandiana Relevant Area.

PARTICULARS

- (i) *Golder DSI Report paragraph 9.3.1.*
- (ii) *Further particulars may be provided after discovery and inspection.*

6.66. By reason of the matters pleaded in paragraphs 6.28 to 6.65 above, the Bandiana Training and Operations Activities resulted in:

- (a) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground at the Bandiana Base; and/or

- (b) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with Fire Run-Off, being discharged, or allowed to escape, to bare ground at the Bandiana Base.

C.3 The Commonwealth's methods for disposal of Spent AFFF

6.67. At all material times:

- (a) Spent AFFF; and/or
- (b) Fire Run-Off co-mingled with Spent AFFF,

was generally directed by the Commonwealth towards bare ground or the Bandiana Drainage System.

PARTICULARS

- (i) Paragraphs 6.28 to 6.66 are repeated.*
- (ii) The Applicants do not, with their present state of knowledge, know the quantities of Spent AFFF and/or Fire Run-Off directed to bare ground and the earthen drains comprising the Bandiana Drainage System.*
- (iii) Further particulars may be provided after discovery and inspection.*

6.68. At all material times, to the extent that:

- (a) AFFF discharged in the course of the Bandiana Training and Operations Activities; and/or
- (b) Fire Run-Off co-mingled with Spent AFFF,

was directed by the Commonwealth to the Bandiana Drainage System they were ineffective to ensure that liquids contained in them did not leak into the soil below and around them.

C.4 Physical properties of AFFF and Spent AFFF

6.69. Paragraph 15 is repeated.

6.70. Paragraph 16 is repeated.

C.5 The foreseeable flow of Spent AFFF from the Bandiana Base

6.71. At all material times, by reason of the matters pleaded in paragraphs 6.4 to 6.26 and 6.69 to 6.70 above, it was reasonably foreseeable that use of AFFF Working Solution and AFFF on the Bandiana Base as pleaded in paragraphs 6.28 to 6.66 and/or 6.67 to

6.68 above would result in Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF:

- (a) being transmitted to the groundwater beneath the Bandiana Base, including the Bandiana Aquifers and mingle and flow with that groundwater, and being utilised by persons engaged in the Bandiana Groundwater Usages;
- (b) mingling with other surface water on the Bandiana Base (especially after periods of rain), and flowing overland towards and into the surrounding Bandiana Surface Water Bodies outside the Bandiana Base and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Bandiana Aquifers;and being extracted and utilised by persons engaged in the Bandiana Groundwater Usages; and
- (c) mingling with other surface water on the Bandiana Base (especially after periods of rain), and flowing overland towards and into the surrounding Bandiana Surface Water Bodies outside the Bandiana Base and then being utilised by persons engaged in the Bandiana Surface Water Usages.

D THE TOXIC PROPERTIES OF SPENT AFFF

D.1 The potential for AFFF to harm humans and the environment

6.72. Paragraph 18 is repeated.

6.73. Paragraph 19 is repeated.

6.74. Paragraph 20 is repeated.

6.75. Paragraph 21 is repeated.

6.76. Paragraph 22 is repeated.

D.2 The foreseeable flow and transmission of a toxic substance

6.77. At all material times, by reason of the matters pleaded in paragraphs 6.4 to 6.26 and 6.69 to 6.70 and 6.72 to 6.76 above, it was reasonably foreseeable that the use of AFFF on the Bandiana Base as pleaded in paragraphs 6.28 to 6.66 and/or 6.67 to 6.68 above would result in an unnatural soluble substance containing synthetic chemicals:

- (a) permeating or percolating into the soil at the Bandiana Base;
- (b) being transmitted to the groundwater beneath the Bandiana Base, including the Bandiana Aquifers and mingling and flowing with that groundwater;
- (c) mingling with other surface water on the Bandiana Base (especially after periods of rain), and flowing overland towards and into the surrounding Bandiana Surface Water Bodies outside the Bandiana Base and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Bandiana Aquifers; and
- (d) being transmitted to the Bandiana Surface Water Bodies.

E THE CONTAMINATION OF THE RELEVANT AREA

E.1 The contamination of the Bandiana Surface Water Bodies

6.78. PFCs and PFC Contaminants have been detected in the Bandiana Surface Water Bodies.

PARTICULARS

- (i) *Golder DSI Report at paragraphs ES 7.0, 9.1.1, 9.1.5, 9.1.6, 9.1.11, 9.3.2, 9.3.3, 9.3.4, 9.4.2, 9.4.3, 9.4.5, 9.4.6, 9.4.7, 9.5.2, 10.1.2, 10.1.3, 10.2.2 and 11.0.*

6.79. The contamination of the Bandiana Surface Water Bodies with PFCs and PFC Contaminants is the result of discharged AFFF Working Solution and AFFF on the Bandiana Base resulting in Spent AFFF:

- (a) permeating or percolating into the soil at the Bandiana Base;
- (b) being transmitted to the groundwater beneath the Bandiana Base, including the Bandiana Aquifers and mingling and flowing with that groundwater;
- (c) mingling with other surface water on the Bandiana Base (especially after periods of rain), and flowing overland towards and into the surrounding Bandiana Surface Water Bodies outside the Bandiana Base and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Bandiana Aquifers; and
- (d) being transmitted to the Bandiana Surface Water Bodies.

PARTICULARS

- (i) *Golder DSI Report at paragraphs 9.3.2, 9.3.3, 9.3.4, 9.4.2, 9.4.3, 9.4.5, 9.4.6, 9.4.7, 9.5.2, 10.1.2, 10.1.3, 10.2.2 and 11.0.*

6.80. By reason of the matters pleaded in paragraph 6.78 and 6.79 above, the water in the Bandiana Surface Water Bodies has become, and is likely to continue to remain, contaminated by, and a receptor of, PFC Contaminants originally emanating from the Bandiana Base.

PARTICULARS

- (i) *Golder DSI Report at paragraphs ES 7.0, 9.1.1, 9.1.5, 9.1.6, 9.1.11, 9.3.2, 9.3.3, 9.3.4, 9.4.2, 9.4.3, 9.4.5, 9.4.6, 9.4.7, 9.5.2, 10.1.2, 10.1.3, 10.2.2 and 11.0.*

6.81. By reason of the matters pleaded in paragraphs 6.78 to 6.80 above, water in the Bandiana Surface Water Bodies have become, and will continue and remain, potentially hazardous and unfit for the Bandiana Surface Water Usages (the **Bandiana Surface Water Contamination**).

PARTICULARS

- (i) *Golder DSI Report at paragraphs ES 7.0, 9.1.1, 9.1.5, 9.1.6, 9.1.11, 9.3.2, 9.3.3, 9.3.4, 9.4.2, 9.4.3, 9.4.5, 9.4.6, 9.4.7, 9.5.2, 10.1.2, 10.1.3, 10.2.2 and 11.0.*

6.82. There is no practical or cost-effective way of remediating the Bandiana Surface Water Contamination.

E.2 The contamination of the Groundwater

6.83. PFCs and PFC Contaminants emanating from the Bandiana Base have been identified in the Bandiana Aquifers under the Relevant Area (or part thereof).

PARTICULARS

- (i) *Golder DSI Report at paragraphs ES 7.0, 9.1.1, 9.1.7, 9.1.9, 9.1.11, 9.1.12, 9.1.13, 9.1.14, 9.3.2, 9.3.3, 9.3.4, 9.4.2, 9.4.6, 9.5.2, 10.1.2, 10.1.3, 10.2.2 and 11.0.*

6.84. The contamination of the Bandiana Aquifers with PFCs and PFC Contaminants is the result of discharged AFFF Working Solution and AFFF on the Bandiana Base resulting in Spent AFFF:

- (a) permeating or percolating into the soil at the Bandiana Base;
- (b) being transmitted to the groundwater beneath the Bandiana Base, including the Bandiana Aquifers and mingling and flowing with that groundwater;
- (c) mingling with other surface water on the Bandiana Base (especially after periods of rain), and flowing overland towards and into the surrounding water catchment areas outside the Bandiana Base and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Bandiana Aquifers; and
- (d) being transmitted to the Bandiana Surface Water Bodies.

PARTICULARS

- (i) *Golder DSI Report at paragraphs ES 7.0, 9.1.1, 9.1.7, 9.1.9, 9.1.11, 9.1.12, 9.1.13, 9.1.14, 9.3.2, 9.3.3, 9.3.4, 9.4.2, 9.4.6, 9.5.2, 10.1.1, 10.1.2.1, 10.1.2, 10.2.1, 10.1.3, 10.2.2, 10.2.2.1 and 11.0.*

6.85. By reason of the matter pleaded in paragraphs 6.83 and 6.84, groundwater in the Aquifers and beneath the Relevant Area (including under land owned by many Bandiana Group Members) has become, and is likely to continue to remain, contaminated by, and a receptor of, PFC Contaminants originally emanating from the Bandiana Base.

PARTICULARS

- (i) *Golder DSI Report at paragraph 10.1.3, 10.2.2, 10.2.3.*
- (ii) *Particulars of the contamination of the groundwater under the land of Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Bandiana Group Members.*

6.86. By reason of the matters pleaded in paragraph 6.85, groundwater in the Bandiana Aquifers and beneath the Relevant Area (including land owned by Group Members) has become, and is likely to continue to remain, potentially hazardous and unfit for Bandiana Groundwater Usages (the **Bandiana Groundwater Contamination**).

PARTICULARS

- (i) *Golder DSI Report at paragraph 10.1.3, 10.2.2, 10.2.3.*
- (ii) *The groundwater in the Bandiana Aquifers is potentially hazardous and unfit for:*
 - A) *irrigation purposes because such usages result in the further spreading of PFC Contaminants to soils and uptake by plants, vegetables and fruits, and the exposure of people to PFC Contaminants: Parts D.1 above and E.5 below are repeated.*
 - B) *watering of livestock (including chickens and sheep) because such usages may result in the further spreading of PFC Contaminants to soils, uptake of PFC Contaminants by the livestock and the exposure of people to PFC Contaminants (particularly by consumption of livestock and eggs): Parts D.1 above and E.5 below are repeated.*
 - C) *swimming, domestic purposes, and water supply because such usages may result in the further exposure of people to PFC Contaminants: Parts D.1 above and E.5 below are repeated.*

- (ii) *Further particulars of the contamination of the groundwater in the Bandiana Aquifers under the Group Members' land will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Bandiana Group Members.*

6.87. There is no practical or cost-effective way of remediating the Bandiana Groundwater Contamination.

E.3 The contamination of soil in the Relevant Area

6.88. Soil on the land within the Bandiana Relevant Area (including soil on land owned by Bandiana Group Members) has become, and is likely to continue to become and remain, contaminated by PFC Contaminants emanating from the Bandiana Base (the **Bandiana Soil Contamination**) by:

- (a) overland flows of surface water commingled with Spent AFFF (containing PFC Contaminants) from the Bandiana Base; and
- (b) discharge or application of groundwater containing PFC Contaminants extracted from the Bandiana Aquifers by persons engaged in Bandiana Groundwater Usage to the soils (by, in particular, irrigation).

PARTICULARS

- (i) *Golder DSI Report at paragraph 10.1.2.*
- (ii) *Particulars of the contamination of the soils on lands of Bandiana Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Bandiana Group Members.*

6.89. There is no practical or cost-effective way of remediating the Bandiana Soil Contamination.

E.4 The Broader Biota Contamination

6.90. Aspects of the biotic and abiotic matrices within the Relevant Area (including on land owned by Bandiana Group Members) are likely to be contaminated by PFC Contaminants, and be recirculated indefinitely within the Bandiana Relevant Area (the **Bandiana Broader Biota Contamination**).

PARTICULARS

- (i) *Golder DSI Report at paragraphs 10.1.3, 10.2.2.1 and 10.2.3.*
- (ii) *Ingestion of produce (including livestock, fruit, vegetables and eggs) irrigated with impacted groundwater (or impacted surface water) and/or fish and crustaceans from the Surface Water Bodies are secondary sources of PFC contamination: Golder DSI Report at paragraphs 10.1.3, 10.2.3.*
- (iii) *Secondary sources of PFC contamination, leading to further redistribution of contamination and creation of additional exposure pathways for ongoing contamination of the biota generally (including humans): Braunig J, Baudel C, Heffernan A et al, Fate and redistribution of perfluoroalkyl acids through AFFF-impacted groundwater (2017).*

6.91. There is no practical, cost-effective way of remediating the Bandiana Broader Biota Contamination.

E.5 The announcement of the contamination

6.92. In October 2016, the Commonwealth published a document titled “Department of Defence, Albury Wodonga Military Area (October 2016)” (the **Bandiana Contamination Announcement**) which stated:

- (a) the Bandiana Base had a legacy of using AFFF for emergency firefighting situations and fire fighter training;
- (b) in 2004, the Commonwealth commenced phasing out its use of AFFF containing PFOS and PFOA as active ingredients;
- (c) PFOS and PFOA belong to a group of chemicals known as per- and poly-fluoroalkyl substances (**PFAS**) and until recently, PFAS were known as ‘perfluorinated chemicals’ or ‘PFCs’;
- (d) PFAS were an emerging concern around the world because they are persistent in the environment;
- (e) that because PFAS persist in humans and the environment, it was recommended that human exposure be minimised;
- (f) based on the outcome of preliminary sampling, it had been determined that Bandiana Base would be subject to a detailed environmental investigation;
- (g) that the detailed environmental investigation would include:

- (i) reviewing the historical use, storage and management of AFFF to identify potential sources of PFAS;
 - (ii) sampling soil, sediment, surface water, and groundwater on and off Bandiana Base to identify PFAS exposure in the vicinity;
 - (iii) identifying pathways and receptors for the potential migration of PFAS;
 - (iv) community and stakeholder engagement, including a water-use survey;
 - (v) a human health and ecological risk assessment (if required) to evaluate potential risks to the human population and ecology, and inform future action to mitigate risks;
- (h) when detailed environmental investigation reports were finalised and publicly released, residents, businesses, and local stakeholders would be consulted;
- (i) that a community briefing and information activity would be conducted prior to the commencement of the detailed environmental investigation at the Bandiana Base; and
- (j) alternative sources of drinking water were being provided to eligible residents located in close proximity to the Bandiana Base who did not have a town water connection, and relied on the use of a bore for drinking water, as well as to residents whose drinking water was sourced from a rainwater tank which contained or did contain bore water, and to residents in other exceptional circumstances.

PARTICULARS

- (i) *The Bandiana Contamination Announcement is published on:*

<https://www.defence.gov.au/Environment/PFAS/Docs/General/PSPFactSheets/PSPFactSheetAlburyWodongaFinal.pdf>

- (ii) *The Bandiana Contamination Announcement referred to a report by Jones Lang LaSalle titled “Defence per- and poly-fluoroalkyl Substances (PFAS) – Environmental Management Preliminary Sampling Program – Albury Wodonga Military Area (Bandiana: Final Report)” dated September 2016, which was publicly released on 8 November 2016.*

6.93. In March 2017, the Commonwealth published a factsheet titled ‘Bandiana Military Training Area: PFAS Investigation & Management Program’ (**Bandiana March 2017**

Factsheet) which confirmed that the detailed environmental investigation would commence in July 2017.

PARTICULARS

(i) *The Bandiana March 2017 Factsheet is published on:*

<https://www.defence.gov.au/Environment/PFAS/Docs/Bandiana/FactSheets/FactSheetAlburyWodongaMarch2017.pdf>

6.94. On or around 28 March 2017, the Commonwealth held a community walk-in session (the **Bandiana March 2017 Community Information Session**) at which its representatives advised:

- (a) a detailed environmental investigation was being conducted into the presence of PFAS on and in the vicinity of Bandiana Base;
- (b) the preliminary site investigation (**PSI**) had been completed in June 2016 and the key findings were that that PFAS was detected in two surface water samples;
- (c) the remaining detailed environmental investigation would include a detailed site investigation (**DSI**) and a Human Health and Ecological Risk Assessment (**HHRA**) if required.

PARTICULARS

(i) *The Bandiana March 2017 Community Information Session was held on 28 March 2017 at which a slideshow presentation entitled “PFAS Investigation and Management Community Information Session: Albury Wodonga Military Area – Bandiana VIC” dated March 2017 (**Bandiana March 2017 Presentation**). The Bandiana March 2017 Presentation is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Bandiana/Presentations/AlburyWodongaMilitaryAreaPresentationCommunityWalkinSession28March2017.pdf>

(ii) *Each of the statements in subparagraphs (a) to (c) was made in writing in the Bandiana March 2017 Presentation, and/or spoken to orally at the Bandiana March 2017 Community Information Session by representatives of the Commonwealth.*

6.95. In August 2017, the Commonwealth published a factsheet titled ‘Bandiana Military Area Community Update Factsheet: PFAS Investigation & Management Program’ (**Bandiana August 2017 Factsheet**) which advised as follows:

- (a) a detailed environmental investigation was being conducted into the presence of PFAS on and in the vicinity of Bandiana Base;
- (b) the PSI has been completed which involved a historical review of AFFF use and storage to identify on-base sources, develop an understanding of migration pathways of PFAS from the source and identify potential receptors;
- (c) the DIS is planned to commence in October 2017 and will involve on and off-base sampling.

PARTICULARS

- (i) *The Bandiana August 2017 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/Docs/Bandiana/FactSheets/170821BandianaFactsheet.pdf>

6.96. In June 2018, the Commonwealth published a community newsletter titled 'Bandiana Military Area Investigation - Community Newsletter: PFAS Investigation & Management Program' (**Bandiana June 2018 Newsletter**) which advised as follows:

- (a) sampling for the DSI was complete;
- (b) a Human Health and Ecological Risk Assessment (HHRA) is being conducted to understand any potential exposure to people and the environment

PARTICULARS

- (i) *The Bandiana June 2018 Newsletter is published on:*
<https://www.defence.gov.au/Environment/PFAS/Docs/Bandiana/FactSheets/201806BandianaCommunityNewsletter.pdf>

6.97. In September 2018, the Commonwealth published a factsheet titled 'Bandiana Military Area – Detailed Site Investigation Findings: PFAS Investigation & Management Program' (**Bandiana September 2018 Factsheet**) which advised as follows:

- (a) the DSI had been completed;
- (b) the key findings of the DIS were:
 - (i) no properties that are known to use bore water for drinking have had a detection above the drinking water health-based guidance value;
 - (ii) twelve areas within the base were identified as PFAS Source Areas;

- (iii) the main way PFAS has moved off-base is via surface water into the Jack in the Box Creek catchment and via surface water and groundwater into the Kiewa River catchment;
 - (iv) water extracted from Wodonga Creek - including that by North East Water for the municipal town supply – is below drinking water guidance values. As such, it is safe to continue to drink;
 - (v) based on the results obtained it is safe to swim in and use for recreation purposed the Wodonga Creek, Jack in the Box Creek and the main Kiewa River channel;
 - (vi) there are some areas of the Jack in the Box Creek close to the base and in the ox-bow lakes on the Kiewa River floodplain where PFAS impacts may present an unacceptable exposure risk to people should they accidentally (or routinely) swallow the water;
- (c) the HHRA will be undertaken to further assess the potential exposure risks identified in the DSI.

PARTICULARS

- (i) *The Bandiana September 2018 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/Docs/Bandiana/FactSheets/201809BandianaDSIFactsheet.pdf>

6.98. On or around 17 September 2018, the Commonwealth held a community walk-in session (the **Bandiana September 2018 Community Information Session**) at which its representatives advised:

- (a) the DSI had been completed;
- (b) the key findings of the DIS were:
 - (i) the bore that was identified as being used for drinking water was tested and returned results below the drinking water health-based guidance value;
 - (ii) Wodonga town water is safe to drink;
 - (iii) the Wodonga Creek, most of Jack in the Box Creek and the main Kiewa River channel are safe to swim in and use for recreation (boating etc.);

- (iv) PFAS levels are higher in some areas of the Jack in the Box Creek close to the base and in the ox-bow lakes on the Kiewa River floodplain;
- (v) the HHERA will assess the risk of exposure risks identified in the DSI.

PARTICULARS

- (i) *The Bandiana September 2018 Community Information Session was held on 17 September 2018 at which a slideshow presentation entitled "Community Information Session: PFAS Investigation and Management Program: Bandiana Military Area DSI Update" dated 17 September 2018 (**Bandiana September 2018 Presentation**). The Bandiana September 2018 Presentation is published on:*
<https://www.defence.gov.au/Environment/PFAS/Docs/Bandiana/Presentations/201809BandianaCommunityInformationSessionPresentation.pdf>
- (ii) *Each of the statements in subparagraphs (a) to (b)(i)-(v) was made in writing in the Bandiana September 2018 Presentation, and/or spoken to orally at the Bandiana September 2018 Community Information Session by representatives of the Commonwealth.*

E.6 The injurious affectation to land in the Relevant Area

6.99. Land in the Bandiana Relevant Area (including the land of Bandiana Group Members) has become, and is likely to remain:

- (a) affected by the Bandiana Surface Water Contamination; and/or
- (b) affected by the Bandiana Groundwater Contamination; and/or
- (c) affected by the Bandiana Soil Contamination; and/or
- (d) affected by the Bandiana Broader Biota Contamination.

PARTICULARS

- (i) *As to subparagraph (a), paragraphs 6.78 to 6.82 are repeated.*
- (ii) *As to subparagraph (b), paragraphs 6.83 to 6.87 are repeated.*
- (iii) *As to subparagraph (c), paragraphs 6.88 to 6.89 are repeated.*
- (iv) *As to subparagraph (d), paragraphs 6.90 to 6.91 are repeated.*

6.100. Further, or alternatively, by reason of:

- (a) the Bandiana Surface Water Contamination; and/or

- (b) the Bandiana Groundwater Contamination; and/or
- (c) the Bandiana Soil Contamination; and/or
- (d) the Bandiana Broader Biota Contamination,

land in the Bandiana Relevant Area (including the land of Bandiana Group Members) has become, and is likely to remain land, of which occupiers and produce, livestock and biota from which, have ongoing and largely unavoidable exposure to PFC Contaminants through multiple potential pathways (**Bandiana Ongoing Contaminant Exposure**).

PARTICULARS

- (i) *As to subparagraph (a), paragraphs 6.78 to 6.82 are repeated.*
- (ii) *As to subparagraph (b), paragraphs 6.83 to 6.87 are repeated.*
- (iii) *As to subparagraph (c), paragraphs 6.88 to 6.89 are repeated.*
- (iv) *As to subparagraph (d), paragraphs 6.90 to 6.91 are repeated.*
- (v) *Braunig J, Baudel C, Heffernan A et al, Fate and redistribution of perfluoroalkyl acids through AFFF-impacted groundwater (2017).*

6.101. Further, or alternatively, there exists a material risk that:

- (a) land in the Bandiana Relevant Area (including land owned by Bandiana Group Members) may be recorded on a public register by the Environment Protection Authority Victoria following the issue of a section 62A or 31A notice, pursuant to the *Environmental Protection Act 1970* (Vic) (**EPA**).
- (b) owners of land in the Bandiana Relevant Area (including land owned by Bandiana Group Members) will be obligated to disclose to prospective purchasers that land is and/or that there is a risk that land may be contaminated by PFC Contaminants (with any contract of sale subject to rescission if disclosure is not made).

6.102. Further, or alternatively, by reason of the matters pleaded in paragraphs 6.78 to 6.101, there exists a material risk that by reason of the Bandiana Surface Water Contamination and/or Bandiana Groundwater Contamination and/or the Bandiana Soil Contamination and/or the Bandiana Broader Biota Contamination that persons may be unable to conduct activities growing crops, feedstock, fruits and vegetables intended for human consumption on land in the Bandiana Relevant Area.

PARTICULARS

- (i) Parts D.1 above and E.5 below are repeated.
- (ii) *There is a material risk that persons who supply stock feeds that are grown within the Relevant Area may be obliged to disclose the possible presence of PFOS/PFOA.*

6.103. By reason of the matters pleaded in paragraphs 6.78 to 6.102, land in the Bandiana Relevant Area has become, and is likely to remain:

- (a) land which is, or may be perceived by prospective purchasers of land to be, unfit for residential purposes or human occupancy because occupiers and visitors have ongoing and largely unavoidable exposure to PFC Contaminants through multiple potential pathways;
- (b) land which is, or may be perceived by prospective purchasers of land to be unfit for agricultural purposes, including use for growing crops for human consumption, growing feedstock for livestock intended for human consumption, pasture for livestock intended for human consumption and fruits and vegetables intended for human consumption.

PARTICULARS

- (i) *The particulars to paragraphs 6.78 to 6.102 are repeated.*

6.104. By reason of the matters pleaded in paragraph 6.103, land in the Relevant Area has become, and is likely to remain, injuriously affected in its value (**Bandiana Contamination Land Value Affection**).

PARTICULARS

- (i) *The quantum of the adverse affection on the value of the land of Bandiana Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Bandiana Group Members.*

E.7 The reasonable foreseeability of the injurious affection to the value of land in the Bandiana Relevant Area

6.105. At all material times, by reason of the matters pleaded in paragraphs 6.4 to 6.26 and 6.69 to 6.77 above, it was reasonably foreseeable that use of AFFF Working Solution and/or AFFF on the Bandiana Base as pleaded in paragraphs 6.28 to 6.68 would result in:

- (a) the Bandiana Surface Water Contamination;
- (b) the Bandiana Groundwater Contamination;
- (c) the Bandiana Soil Contamination;
- (d) the Bandiana Broader Biota Contamination; and/or
- (e) the Bandiana Contamination Land Value Affectation.

F THE COMMONWEALTH'S ACTS AND OMISSIONS

F.1 The Commonwealth's knowledge

F.1.1 The Commonwealth's knowledge of the Bandiana Base and its surrounds

6.106. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) the matters pleaded in Section A1 above;
- (b) the matters pleaded in Section A2 above;
- (c) the matters pleaded in Section A3 above;
- (d) that waters, liquids, and soluble materials discharged on Bandiana Base would:
 - (i) permeate, percolate or leach into the soil at the Bandiana Base;
 - (ii) be transmitted to the groundwater beneath the Bandiana Base, including into the Bandiana Aquifers and mingle and flow with that groundwater;
 - (iii) mingle with other surface water on the Bandiana Base (especially after periods of rain), and flow overland towards the Bandiana Surface Water Bodies and:
 - (A) permeate or percolate into the soil over which the surface water overland flows occurred; and
 - (B) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including into the Bandiana Aquifers; and

- (iv) be transmitted to the Bandiana Surface Water Bodies.

PARTICULARS

- (i) *As to sub-paragraph (a), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Bandiana Base.*
- (ii) *As to sub-paragraph (b), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Bandiana Base or artificial features which the Commonwealth developed, constructed, upgraded and utilised.*
- (iii) *As to sub-paragraph (c), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Bandiana Base or artificial features which the Commonwealth developed, constructed, upgraded and utilised.*
- (iv) *As to sub-paragraph (d), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) to (c) above.*

F.1.2 The Commonwealth's knowledge of water use at the Bandiana Relevant Area

6.107. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) the matters pleaded in Section B1 above;
- (b) the matters pleaded in Section B2 above; and
- (c) that waters, liquids, and soluble materials discharged and/or allowed to escape the Bandiana Base which were transmitted to the Bandiana Surface Water Bodies, and the Bandiana Aquifers would be used by residents of the Bandiana Relevant Area.

PARTICULARS

- (i) *as to sub-paragraph (a), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person occupying the land comprising the Bandiana Base.*
- (ii) *as to sub-paragraph (b), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person occupying the land comprising the Bandiana Base.*
- (iii) *as to sub-paragraph (c), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to*

have known of the matters referred to in sub-paragraphs (a) and (b) above.

F.1.3 The Commonwealth's knowledge of the potential flow of Spent AFFF and Fire Run-Off from the Bandiana Base

6.108. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) that the Bandiana Training and Operations Activities (and ancillary storage, containment and disposal practices) resulted in:
 - (i) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground; and/or
 - (ii) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with Fire Run-Off, being discharged, or allowed to escape, to bare ground;
- (b) the matters pleaded in Section C4 above; and
- (c) that use of AFFF Working Solution and AFFF on the Bandiana Base would result in Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF:
 - (i) being transmitted to the groundwater beneath the Bandiana Base, including the Bandiana Aquifers and mingle and flow with that groundwater, and being utilised by persons engaged in the Bandiana Groundwater Usages;
 - (ii) mingling with other surface water on the Bandiana Base (especially after periods of rain), and flowing overland towards and into the surrounding Bandiana Surface Water Bodies outside the Bandiana Base; and:
 - (A) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (B) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred, including the Bandiana Aquifers;

and being extracted and utilised by persons engaged in the Bandiana Groundwater Usages; and

- (iii) mingling with other surface water on the Bandiana Base (especially after periods of rain), and flowing overland towards and into the surrounding Bandiana Surface Water Bodies outside the Bandiana Base and then being utilised by persons engaged in the Bandiana Surface Water Usages.

PARTICULARS

- (i) *As to sub-paragraph (a), these were matters known to the Commonwealth as the entity responsible for conducting the Bandiana Training and Operations Activities, and using AFFF Concentrate, AFFF Working Solution and AFFF, and disposing of the same.*
- (ii) *As to sub-paragraph (b), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person using AFFF Concentrate, AFFF Working Solution and AFFF.*
- (iii) *As to sub-paragraph (c), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) and (b) above, together with the matters pleaded in sub-paragraph 6.106(d).*

F.1.4 The Commonwealth's knowledge of the toxic properties of Spent AFFF and Fire Run-Off

6.109. Paragraph 33 is repeated.

6.110. Paragraph 34 is repeated.

6.111. Further, or alternatively, at all material times from 16 May 2000, alternatively 2003, the Commonwealth knew that its Bandiana Training and Operations Activities at the Bandiana Base using AFFF Working Solution and AFFF were:

- (a) potentially damaging to the environment; and/or
- (b) potentially causative of adverse health effects in humans.

PARTICULARS

- (i) *As to sub-paragraph (a), the particulars to paragraph 34 are repeated*

- (ii) *As to sub-paragraph (b), the matters referred to in particular (i) involved knowledge of the contamination of groundwater, and it may be inferred that a person who knew that groundwater was contaminated also knew that there existed a potential for adverse health effects in humans who may consume groundwater, or produce (including livestock and eggs) watered with groundwater.*

6.112. Paragraph 35 is repeated.

6.113. Further, or alternatively, at all material times from no later than 2005 (**Bandiana Contamination Knowledge Date**), the Commonwealth knew or ought reasonably to have known that AFFF Working Solution, AFFF, and Spent AFFF had contaminated groundwater under the Bandiana Base.

PARTICULARS

- (i) *Appendix P to the Golder DSI Report.*

F.2 The Commonwealth's conduct

F.2.1 The Commonwealth's deliberate conduct

6.114. At all material times, the Commonwealth's:

- (a) use of AFFF in the Bandiana Training and Operations Activities, as pleaded in paragraphs 6.28 to 6.66; and/or
- (b) method of disposal of AFFF and Spent AFFF, as pleaded in paragraph 6.67, was deliberate.

F.2.2 The Commonwealth's careless conduct

6.115. Further, or alternatively, by reason of the matters pleaded in paragraphs 6.28 to 6.68 at all material times on and after each of the times identified in paragraphs 6.109 to 6.113 the Commonwealth carelessly:

- (a) did the following acts:
 - (i) it allowed large quantities of AFFF to be discharged to bare ground;
 - (ii) it allowed Spent AFFF and Fire Run-Off to flow directly onto bare ground in large quantities;
 - (iii) it allowed Spent AFFF and Fire Run-Off to permeate or percolate into the soil at the Bandiana Base;

- (iv) it allowed Spent AFFF and Fire Run-Off to be transmitted to the groundwater beneath the Bandiana Base, including the Bandiana Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Bandiana Relevant Area);
 - (v) it allowed Spent AFFF and Fire Run-Off to drain into the surrounding water catchment areas (including via the Bandiana Drainage System), including into the Bandiana Surface Water Bodies; and/or
 - (vi) it allowed Spent AFFF and Fire Run-Off to be transmitted to the Bandiana Surface Water Bodies; and/or
 - (vii) to the extent it stored wastewater from the use of AFFF, doing so in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
- (b) made the following omissions:
- (i) it failed to investigate and assess, or to do so adequately, the risks associated with the use of AFFF before using, or continuing to use AFFF;
 - (ii) it failed to restrict, or to do so adequately, the use of AFFF Working Solution and AFFF only to emergencies;
 - (iii) it failed to take any or any adequate steps to contain or limit the use of AFFF Working Solution and AFFF in Training and Operations Activities;
 - (iv) it failed to take any or any adequate steps to contain, capture, clean up and securely dispose of Spent AFFF and Fire Run-Off, such that it did not:
 - (A) flow directly onto bare ground;
 - (B) permeate or percolate into the soil at the Bandiana Base;
 - (C) become transmitted to the groundwater beneath the Bandiana Base, including the Bandiana Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Bandiana Relevant Area);

- (D) drain into the surrounding water catchment areas (including via the Bandiana Drainage System), including into the Bandiana Surface Water Bodies; and
- (E) transmit to the Bandiana Surface Water Bodies;
- (v) it failed to store wastewater from the use of AFFF Working Solution and AFFF in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
- (vi) it failed to take any or any adequate steps to remediate the contamination of the groundwater under the Bandiana Base at any time after the time when it knew or ought reasonably to have known that groundwater was contaminated, as pleaded in paragraphs 6.109 to 6.113 (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable); and/or
- (vii) it failed to take any or any adequate steps to remediate the contamination of the soil on the Bandiana Base at any time after the time when it knew or ought reasonably to have known that soil was contaminated (including to prevent Spent AFFF and Fire Run Off leaching, or further leaching into the groundwater or surface water, (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable).

PARTICULARS

- (i) *As to subparagraph (a)(i), paragraphs 6.28 to 6.68 are repeated.*
- (ii) *As to subparagraph (a)(ii), paragraphs 6.28 to 6.68 are repeated.*
- (iii) *As to subparagraph (a)(iii), paragraphs 6.28 to 6.68 and 6.88 to 6.89 are repeated.*
- (iv) *As to subparagraph (a)(iv), paragraphs 6.28 to 6.68 and 6.83 to 6.87 are repeated.*
- (v) *As to subparagraph (a)(v), paragraphs 6.28 to 6.68 and 6.78 to 6.82 are repeated.*
- (vi) *As to subparagraph (a)(vi), paragraphs 6.28 to 6.68 and 6.78 to 6.82 are repeated.*
- (vii) *As to subparagraph (a)(vii), paragraphs 6.28 to 6.68 and 6.78 to 6.91 are repeated.*

- (viii) *As to subparagraph (b)(i), paragraphs 6.28 to 6.68 and 6.109 to 6.113 are repeated.*
- (ix) *As to subparagraph (b)(ii), paragraphs 6.28 to 6.68 are repeated.*
- (x) *As to subparagraph (b)(iii), paragraphs 6.28 to 6.68 are repeated.*
- (xi) *As to subparagraph (b)(iv), paragraphs 6.28 to 6.68 and 6.78 to 6.91 are repeated.*
- (xii) *As to subparagraph (b)(v), paragraphs 6.28 to 6.68 are repeated.*
- (xiii) *As to subparagraph (b)(vi), paragraphs 6.28 to 6.68 and 6.109 to 6.113 are repeated.*
- (xiv) *As to sub-paragraph (b)(vii), paragraphs 6.28 to 6.68 and 6.109 to 6.113 are repeated.*

6.116. Further, or alternatively, the Commonwealth:

- (a) failed, at all material times after the Bandiana Contamination Knowledge Date, to warn persons resident in the Bandiana Relevant Area that:
 - (i) it had been using AFFF Working Solution and AFFF at the Bandiana Base since about the 1970s;
 - (ii) Spent AFFF had. or was likely to have, permeated and percolated into the soil at the Bandiana Base and entered and/or contaminated, the Bandiana Aquifer, Bandiana Surface Water Bodies; and/or
 - (iii) Spent AFFF was:
 - (A) potentially damaging to the environment; and/or
 - (B) potentially causative of adverse health effects in humans; and/or

6.117. Further, or alternatively, the Commonwealth failed, at all material times after the inception of the *National Environmental Protection (Assessment of Site Contamination)*

Measure 1999, Volume 1, Ch6(6), to comply with that measure by providing all relevant information on site contamination for persons resident in the Bandiana Relevant Area.

G THE COMMONWEALTH'S LIABILITY

G.1 Nuisance

G.1.1 Liability in nuisance

6.118. By its use of the Bandiana Base as pleaded in paragraphs 6.28 to 6.68 and 6.114 to 6.115, the Commonwealth has created, and continued, an interference with the use and enjoyment of the land owned by the Bandiana Group Members (**the Bandiana Nuisance**), in that:

- (a) their land is affected by the Bandiana Surface Water Contamination and such contamination is irreparable (and paragraphs 6.78 to 6.82 are repeated);
- (b) they are no longer able safely to use Bandiana Private Bores on their land to access the Bandiana Aquifers as a water supply for Bandiana Groundwater Usages, given the Bandiana Aquifers are irreparably contaminated (and paragraphs 6.83 to 6.87 are repeated);
- (c) their soil has sustained Bandiana Soil Contamination, and such contamination is irreparable (and paragraphs 6.88 to 6.89 are repeated);
- (d) their land is affected by the Bandiana Broader Biota Contamination, and such contamination is irreparable (and paragraphs 6.90 to 6.91 are repeated); and
- (e) those occupying their land are subject to the Bandiana Ongoing Contaminant Exposure.

PARTICULARS

- (i) *The interference with the land of Bandiana Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Group Members.*

6.119. Further, by reason of the matters pleaded in paragraphs 6.23, 6.26, 6.71, 6.77, 6.105 and/or 6.106 to 6.113, at all material times it was reasonably foreseeable to a reasonable person in the Commonwealth's position that persons owning land in the Bandiana Relevant Area (including Bandiana Group Members) would suffer loss by the

Commonwealth's use of the Bandiana Base as pleaded in paragraphs 6.28 to 6.68, being pure economic loss, in the form of diminution in the value of land in the Bandiana Relevant Area; and/or

PARTICULARS

- (i) *Paragraphs 6.23, 6.26, 6.71, 6.77, 6.105 and/or 6.106 to 6.113 are repeated.*

6.120. By reason of the matters pleaded in paragraphs 6.118 and 6.119, the Bandiana Nuisance constitutes a substantial and unreasonable interference with the use and enjoyment of the land owned by Bandiana Group Members.

G.1.2 Causation, loss and damage

6.121. The Bandiana Nuisance directly caused:

- (a) the Bandiana Surface Water Contamination (as pleaded in paragraph 6.81);
- (b) the Bandiana Groundwater Contamination (as pleaded in paragraph 6.86);
- (c) the Bandiana Soil Contamination (as pleaded in paragraph 6.88);
- (d) the Bandiana Broader Biota Contamination (as pleaded in paragraph 6.90); and/or
- (e) the Bandiana Contamination Land Value Affectation (as pleaded in paragraph 6.104); and

the Bandiana Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *Particulars of the losses of Bandiana Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Bandiana Group Members.*

G.1.3 Aggravated and exemplary damages

6.122. Further, on and from the Actual Knowledge Date, by continuing the Bandiana Nuisance by:

- (a) continuing to do the acts as pleaded in paragraph 6.114 and/or sub-paragraph 6.115(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 6.115(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 6.106 to 6.113, the Commonwealth engaged in aggravating conduct, and the Bandiana Group Members claim aggravated damages.

6.123. Further, or alternatively, on and from the Actual Knowledge Date, by continuing the Nuisance by:

- (a) continuing to do the acts as pleaded in paragraph 6.114 and/or sub-paragraph 6.115(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 6.115(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 6.106 to 6.113, the Commonwealth engaged in conduct in contumelious disregard for the rights of the Bandiana Group Members, and Bandiana Group Members claim exemplary damages.

G.2 Negligence

G.2.1 Duty of care

6.124. At all material times, persons other than the Commonwealth (including Bandiana Group Members) had no capacity to control the activities of the Commonwealth on the Bandiana Base, and in particular the use of AFFF Working Solution and AFFF on the Bandiana Base.

6.125. At all material times, the land in the Bandiana Relevant Area (including the land owned by Bandiana Group Members, was physically proximate to the Bandiana Base.

6.126. At all material times, by reason of the matters pleaded in paragraphs 6.124 to 6.125 persons owning, or considering purchasing land in the Bandiana Relevant Area (including Bandiana Group Members) were in a position of vulnerability.

6.127. By reason of the matters pleaded in paragraphs 6.23, 6.26, 6.71, 6.77, 6.105 and/or 6.106 to 6.113 a reasonable person in the Commonwealth's position would have foreseen a reasonably foreseeable and not insignificant risk of harm to persons owning,

or acquiring land in the Bandiana Relevant Area (including Bandiana Group Members) by the Commonwealth's use of AFFF Working Solution and AFFF on the Bandiana Base as pleaded in paragraphs 6.28 to 6.68, being pure economic loss, in the form of diminution in the value of their land (the **Bandiana Risk of Harm**).

PARTICULARS

(i) *Paragraphs 6.23, 6.26, 6.71, 6.77, 6.105 and/or 6.106 to 6.113 are repeated.*

6.128. By reason of the matters pleaded in paragraphs 6.124 to 6.127, the Commonwealth owed a duty to each and all of Bandiana Group Members to exercise reasonable care, in the use of AFFF Working Solution and AFFF on the Bandiana Base not to cause pure economic loss, in the form of diminution in the value of land in the Bandiana Relevant Area (**Bandiana Duty of Care**).

6.129. By reason of the matters pleaded in paragraphs 6.124 to 6.127, on and after each of the Bandiana Contamination Knowledge Date, alternatively the Actual Knowledge Date, the Commonwealth owed a duty to each and all of Bandiana Group Members to exercise reasonable care to warn them that:

- (a) it had been using AFFF at the Bandiana Base since about the 1970s;
- (b) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Bandiana Base and entered and/or contaminated the Bandiana Aquifers and/or contaminated the Bandiana Surface Water Bodies; and
- (c) Spent AFFF was:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans,

(**Bandiana Duty to Warn**).

G.2.2 Scope of Bandiana Duty of Care

6.130. On and from 1 March 1973, the *Environment Protection Act 1970* (VIC) (**EPA VIC**):

- (a) prohibited persons from polluting any waters (meaning means any waters in the environment and includes river, stream, reservoir, tank, billabong, creek, anabranch, canal, drain, spring, swamp, channel, lake, lagoon, natural or artificial water course, dam, tidal waters, or coastal waters and includes

underground or artesian water) or causing or permitting any waters to be polluted so that the physical, chemical, or biological condition of the waters is so changed as to make or be reasonably expected to make those waters or any part of those waters unclean, noxious, poisonous or impure, detrimental to the health, welfare, safety, or property of human beings, poisonous or harmful to animals, birds, wildlife, fish or other aquatic life, or to plants or detrimental to any beneficial use made of those waters.

- (b) defined:
- (i) “pollution” to include any direct or indirect alteration the physical, thermal, chemical, biological, or radio-active properties of any part of the environment by discharging, emitting, or depositing wastes so as to affect any beneficial use adversely, to cause a condition which is hazardous or potentially hazardous to public health, safety, or welfare, or to animals, birds, wildlife fish or aquatic life, or to plants
 - (ii) “waste” to include any matter prescribed to be waste and any matter, whether liquid, solid, gaseous, or radio-active, which is discharged, emitted, or deposited in the environment in such volume, constituency or manner as to cause an alteration of the environment

PARTICULARS

(i) *EPA VIC, s 39*

6.131. On and from 22 May 1984, the *Environment Protection Act 1970* (VIC), as amended by the *Environment Protection (Review) Act 1984* (**Amended EPA VIC**):

- (a) prohibited persons in Victoria from polluting any waters (including any reservoir, tank, billabong, anabranch, canal, spring, swamp, natural or artificial channel, lake, lagoon, waterway, dam, tidal water, coastal water or groundwater) so that the condition of the waters is so changed as to make or be reasonably expected to make those waters noxious or poisonous, harmful or potentially harmful to the health welfare, safety or property of human beings, poisonous, harmful or potentially harmful to animals, birds, wildlife, fish or other aquatic life, poisonous, harmful or potentially harmful to plants or other vegetation or detrimental to any beneficial use made of those waters
- (b) prohibited persons in Victoria from causing or permitting waste to be placed or left in any position whereby it could reasonably be expected to gain access to

any waters in circumstances where if access was gained the waste would be likely to result in those waters being polluted;

(c) defined:

(i) “pollute” to include causing or permitting pollution;

(ii) “waste” to include any matter whether solid, liquid, gaseous or radioactive which is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment, and any discarded, rejected, unwanted, surplus or abandoned matter;

PARTICULARS

(ii) *EPA VIC, s 39*

6.132. At all material times:

(a) from 1 March 1973 to 22 May 1984, the content of the EPA VIC (as pleaded in paragraph 6.130);

(b) from 22 May 1984 to 2018, the content of the Amended EPA VIC (as pleaded in paragraph 6.131),

bound the Commonwealth by reason of the *Commonwealth Places (Application of Laws) Act 1970* (Cth), and/or informed the scope of what a reasonably person ought do in relation to conduct which it was reasonably foreseeable might result in environmental harm (including the Bandiana Risk of Harm pleaded in paragraph 6.127).

6.133. The Commonwealth had the capacity to exercise control of the Training and Operations Activities and the use of AFFF Working Solution and AFFF on the Bandiana Base so as to take the precautions which a reasonable person in its position would have taken against the Bandiana Risk of Harm, by:

(a) not doing the following acts at all, or alternatively any time after each of Actual Knowledge Dates:

(i) allowing large quantities of AFFF Working Solution and AFFF to be discharged to bare ground;

- (ii) allowing Spent AFFF and Fire Run-Off to flow directly onto bare ground in large quantities;
 - (iii) allowing Spent AFFF and Fire Run-Off to permeate or percolate into the soil at the Bandiana Base;
 - (iv) allowing Spent AFFF and Fire Run-Off to be transmitted to the groundwater beneath the Bandiana Base, including the Bandiana Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Bandiana Relevant Area);
 - (v) allowing Spent AFFF and Fire Run-Off to drain into the surrounding water catchment areas (including via the Bandiana Drainage System), including into the Bandiana Surface Water Bodies;
 - (vi) allowing Spent AFFF and Fire Run-Off to be transmitted to the Bandiana Surface Water Bodies; and/or
 - (vii) to the extent it stored store wastewater from the use of AFFF Working Solution and AFFF, it did so in such a way that it failed to avoid leakage to the surrounding environment;
- (b) doing the following things, at any time, or alternatively any time after each of the Actual Knowledge Dates:
- (i) investigating and assessing the risks associated with the use of AFFF Working Solution and AFFF before using, or continuing to use, AFFF Working Solution and AFFF (and not using them at all);
 - (ii) restricting the use of AFFF Working Solution and AFFF only for emergency activities;
 - (iii) taking steps to contain or limit the use of AFFF Working Solution and AFFF in the Training and Operations Activities;
 - (iv) taking steps to contain, capture, clean up and securely dispose of Spent AFFF and Fire Run-Off, such that it did not:
 - (A) flow directly onto bare ground;
 - (B) permeate or percolate into the soil at the Bandiana Base;

- (C) become transmitted to the groundwater beneath the Bandiana Base, including the Bandiana Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Bandiana Relevant Area);
 - (D) drain into the surrounding water catchment areas (including via the Bandiana Drainage System), including into the Bandiana Surface Water Bodies; and
 - (E) transmit to the Bandiana Surface Water Bodies;
- (v) storing wastewater from the use of AFFF in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
 - (vi) taking steps to remediate the contamination of the groundwater under the Bandiana Base promptly after the time when it knew or ought reasonably to have known that groundwater was, or was likely to have been, contaminated, as pleaded in paragraphs 6.109 to 6.113 (to the extent, which is unknown to the Applicants, that the contamination may at one time have been remediable); and/or
 - (vii) taking steps to remediate contaminated soil on the Bandiana Base at any time promptly after the time when it knew or ought reasonably to have known that soil was contaminated (including by removing that soil and disposing of it at an off-site disposal area so as to prevent Spent AFFF and Fire Run Off leaching, or further leaching into the groundwater or surface water, (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable).

G.2.3 Scope of Duty to Warn

6.134. At all material times after each of the Bandiana Contamination Knowledge Date, alternatively the Actual Knowledge Date, the Commonwealth had capacity to warn the general public, alternatively owners and residents of the Bandiana Relevant Area, alternatively potential purchasers of land in the Bandiana Relevant Area (including Bandiana Group Members) that:

- (a) it had been using AFFF Working Solution and AFFF at the Bandiana Base since the date referred to in paragraph 6.28;

- (b) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Bandiana Base and entered and/or contaminated the Bandiana Aquifers and/or contaminated the Bandiana Surface Water Bodies; and
- (c) Spent AFFF was:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans.

G.2.4 Breach of duty

6.135. By reason of the matters pleaded in paragraphs 6.28 to 6.68, 6.115 and 6.133, the Commonwealth breached the Bandiana Duty of Care (the **Bandiana Negligence**).

6.136. By reason of the matters pleaded in paragraphs 6.28 to 6.68, 6.116 and 6.134, the Commonwealth breached the Duty to Warn (the **Bandiana Negligent Failure to Warn**).

G.2.5 Causation, loss and damage

6.137. The Commonwealth's Bandiana Negligence caused:

- (a) the Bandiana Surface Water Contamination (as pleaded in paragraph 6.81);
- (b) the Bandiana Groundwater Contamination (as pleaded in paragraph 6.86);
- (c) the Bandiana Soil Contamination (as pleaded in paragraph 6.88);
- (d) the Bandiana Biota Contamination (as pleaded in paragraph 6.90); and/or
- (e) the Bandiana Contamination Land Value Affectation (as pleaded in paragraph 6.104);

and the Bandiana Group Members have thereby suffered loss and damage.

PARTICULARS

(i) The particulars to paragraph 6.121 are repeated.

6.138. Further, or alternatively, the Commonwealth's Bandiana Negligent Failure to Warn caused or materially contributed to some Bandiana Group Members acquiring land in the Bandiana Relevant Area, and Bandiana Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *Particulars of the identity of those Bandiana Group Members who would not have acquired land were it not for the Commonwealth's Bandiana Negligent Failure to Warn will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Bandiana Group Members, and the particulars to paragraph 6.121 are repeated.*

G.2.6 Aggravated and exemplary damages

6.139. Further, on and from the Actual Knowledge Date by:

- (a) continuing to do the acts as pleaded in paragraph 6.114 and/or sub-paragraph 6.115(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 6.115(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 6.106 to 6.113, the Commonwealth engaged in aggravating conduct, and Bandiana Group Members claim aggravated damages.

6.140. Further, or alternatively, on and from the Actual Knowledge Date by:

- (a) continuing to do the acts as pleaded in paragraph 6.114 and/or sub-paragraph 6.115(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 6.115(b) (and each of them),

in circumstances where it where it had the knowledge as pleaded in paragraphs 6.106 to 6.113, the Commonwealth engaged in conduct in contumelious disregard for the rights of Bandiana Group Members, and Bandiana Group Members claim exemplary damages.

G.3 Breach of statutory duty

G.3.1 Liability

6.141. The Bandiana Base is situated on Commonwealth land as defined in ss 27 and 525 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**)

6.142. Pursuant to s 28 of the EPBC Act, the Commonwealth or a Commonwealth agency must not take an action that has, will have, or is likely to have a significant impact on the environment, defined by s 528 non-exhaustively to include:

- (a) ecosystems and their constituent parts, including people and communities;
- (b) natural and physical resources;
- (c) the qualities and characteristics of locations, places and areas;
- (d) heritage values of places; and
- (e) the social, economic and cultural aspects of a thing mentioned in paragraph (a), (b), (c) or (d).

6.143. By its use of the Bandiana Base on and from 16 July 1999, as pleaded in paragraphs 6.28 to 6.68 and 6.114 and/or 6.115, the Commonwealth took an action or actions that has or is likely to have a significant impact on the environment.

PARTICULARS

- (i) *These actions have had such an impact by reason of the matters pleaded in paragraphs 6.78 to 6.91, namely the Bandiana Surface Water Contamination, the Bandiana Groundwater Contamination, the Bandiana Soil Contamination, and the Bandiana Biota Contamination*
- (ii) *These actions were likely to have such an impact by reason that they were reasonably foreseeable, by reason of the matters pleaded in paragraphs 6.23, 6.26, 6.71, 6.77 and 6.105.*

6.144. By reason of the matters pleaded in paragraph 6.143, the Commonwealth has contravened s 28 of the EPBC Act (**Bandiana EPBC Act Breach**).

G.3.2 Causation, loss and damage

6.145. The Bandiana EPBC Act Breach caused:

- (a) the Bandiana Surface Water Contamination (as pleaded in paragraph 6.81);
- (b) the Bandiana Groundwater Contamination (as pleaded in paragraph 6.86);
- (c) the Bandiana Soil Contamination (as pleaded in paragraph 6.88);
- (d) the Bandiana Biota Contamination (as pleaded in paragraph 6.90); and/or

- (e) the Bandiana Contamination Land Value Affectation (as pleaded in paragraph 6.104); and

Bandiana Group Members have thereby suffered loss and damage arising from the Bandiana EPBC Act Breach.

PARTICULARS

The particulars to paragraph 6.121 are repeated.

ANNEXURE 6A: BANDIANA RELEVANT AREA



SCHEDULE 7 – TOWNSVILLE BASE

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A THE TOWNSVILLE BASE AND SURROUNDS

A.1 The Townsville Base

- 7.1. Since about the early 1940s, the Commonwealth has continuously owned and occupied an area of land approximately 7.38 square kilometres in size and approximately five kilometres west from the centre of Townsville in Queensland known as RAAF Base Townsville (the **Townsville Base**).

PARTICULARS

- (i) *WSP Australia Pty Ltd, Department of Defence RAAF Base Townsville Detailed Site Investigation – PFAS (May 2018) (**WSP DSI Report**) at paragraphs 2.1 and 3.1.1.*
 - (ii) *Department of Defence, RAAF Townsville: 0874 PFAS Management Area Plan (December 2019) (**PMAP Report**) at paragraph 2.1.*
- 7.2. At all material times, the neighbouring land use in the area of the Townsville Base, has at times included:
- (a) the Townsville Airport, which adjoins the south-east portion of the Townsville Base;
 - (b) the Townsville City Council areas which include:
 - (i) the suburbs of Pallarenda and Rowes Bay (which reached their current extents in the 1970s), West End and Belgian Gardens which are primarily residential and contain various public facilities and parklands;
 - (ii) the suburb of Garbutt which is used for residential and commercial/light industrial land use (with the industrial section being largely developed in the 1980s and 1990s), and includes the Garbutt State School, Melrose Park and Harold Phillips Park; and
 - (iii) the suburbs of Mount Louisa and Bohle (which were largely developed in the 1980s and 1990s) and Mount St John (which was developed in the 2000s) which are predominately zoned commercial/light industrial, (together, the **TCC Areas**); and
 - (c) an ecological area occupying a size of land of approximately 44.6 square kilometres and includes the Townsville Town Common Conservation Park

(**Town Common**), the Bohle River and the Bohle River Estuary (**Townsville Ecological Area**).

PARTICULARS

- (i) *WSP DSI Report at paragraphs 2.1, 2.2.1, 2.2.2, 2.2.3, 2.3.1 and 3.1.1.*

7.3. The Townsville Base, the Townsville Airport, the TCC Areas and the Townsville Ecological Area each constitutes a section of the Townsville Relevant Area.

PARTICULARS

- (i) *WSP DSI Report at paragraph 2.2.*

A.2 The natural features of the Townsville Base and surrounding area

A.2.1 Climate

7.4. At all material times, the Townsville Base and the Townsville Relevant Area were situated in a tropical climate with distinct monsoonal wet and dry seasons.

7.5. At all material times, the Townsville Base and the Townsville Relevant Area is subject to heavy rainfall events in the wet season, which results in standing water being present over much of the Townsville Base in a typical wet season.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 2.3.2 and 8.3.2.*
- (ii) *WSP Australia Pty Ltd, Department of Defence, RAAF Townsville Human Health Risk Assessment (October 2018) (**WSP HHRA Report**) at paragraph 5.2.1.*

A.2.2 Topography

7.6. At all material times, the general topography of the Townsville Relevant Area is flat and low lying.

7.7. At all material times, the Townsville Base and the Townsville Airport are and were:

- (a) generally flat with a minor decline from south-west to north-west; and
- (b) low lying and subject to flooding.

7.8. At all material times, the TCC Areas are and were generally flat, with the following additional conditions in sections of the TCC Areas:

- (a) in the northern section, a significant rise in elevation as a result of the Many Peaks Range;
- (b) in the north eastern section, a slight rise in elevation towards the east;
- (c) in the eastern section, a rise towards the north-east;
- (d) in the southern section, a slight rise towards the south southwest of Garbutt and parts of the suburb of Mount St John being low lying and subject to flooding;
- (e) in the western section, a decline from east to west towards the Bohle River.

7.9. At all material times, the Townsville Ecological Area is and was generally flat and low lying, with a significant rise in elevation towards the northern section of Town Common where the Many Peaks Ranges are located.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 2.3.1 and 8.5.1.*

A.2.3 Soils

- 7.10. At all material times, the soil underlying the Townsville Base and the Townsville Relevant Area has predominantly comprised clay, silt, sand and gravel.
- 7.11. The underlying geology of the Townsville Base and Townsville Relevant Area permitted the passage of rainwater (and surface water) to the groundwater below the Townsville Base.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 2.3.3 and 8.3.2.*

A.2.4 Hydrology

- 7.12. At all material times, by reason of its flat and low-lying topography, surface water on the Townsville Base and Townsville Relevant Area have low or slow flow rates.
- 7.13. At all material times, the Townsville Base and Townsville Relevant Area are subject to heavy rainfall events during the wet season, and standing water is present over much of the Townsville Base during that time.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 8.3.2 and 8.5.1.*

7.14. At all material times, surface water on or around the Townsville Base and Townsville Relevant Area (including rainwater, flooding, or overland flow) was predominantly discharged into three catchment areas, being:

- (a) the Bohle River drainage sub-basin (**Bohle River Catchment**);
 - (b) Three Mile Creek (**Three Mile Creek Catchment**);
 - (c) Mundy Creek (**Mundy Creek Catchment**),
- (together, the **Townsville Catchments**).

PARTICULARS

(i) *WSP DSI Report at paragraph 2.3.6.*

7.15. At all material times, the key bodies of surface water of the Townsville Relevant Area included:

- (a) the wetlands of the Town Common;
 - (b) the Bohle River;
 - (c) Mundy Creek;
 - (d) Louisa Creek and Peewee Creek;
 - (e) Three Mile Creek,
- (together, the **Townsville Surface Water Bodies**).

7.16. The various features of the Townsville Surface Water Bodies include:

- (a) the Town Common wetlands, which received overland flow from the Townsville Base during heavy rainfall events;
- (b) on the western side of the Townsville Base and in the Town Common, large ponded water bodies occur in the wetlands which were permanent;
- (c) the upper reach of the Bohle River being the only watercourse in the Townsville Relevant Area to have observable fresh flowing water that was not tidally influenced;

- (d) the upper reaches of the Mundy Creek catchment being heavily modified into unlined drains;
- (e) the upper reaches of Louisa Creek receiving discharge from the Mount St John water treatment plant;
- (f) the upper reaches of Three Mile Creek receive water from the Townsville Base via a valved pipework on the northern boundary;
- (g) to the north of the Townsville Base in the upper reaches of Three Mile Creek and the tributaries of Mundy Creek, smaller ponds are present.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 7.4.1.2 and 8.5.1.*

7.17. The features of the drainage system on the Townsville Base include:

- (a) a catchment area size of approximately 7 square kilometres made up of mostly mix grassed and wetland areas, with the remainder being buildings and hardstand;
- (b) the wetland areas generally internally draining, and only discharging at times of heavy rainfall;
- (c) the majority of the drainage flowing towards the north-west into the Louisa Creek flood plain and the Bohle Estuary;
- (d) localised drainage issues at the south-western section of the Townsville Base, due to a concentrated proportion of impervious area and minimum hydraulic capacity of the drainage network;
- (e) in the south east corner of the Townsville Base, a network of drains direct flow to the east and then north into the Mundy Creek Catchment and, in turn, Rowes Bay;
- (f) a drainage network running north, which discharges through valved pipework on the Base's northern boundary and ultimately into Three Mile Creek;
- (g) a drain running along the eastern boundary at the northern end of the Townsville Base which discharges into the wetlands that run north;

- (h) a drainage network running north near the eastern boundary of the Townsville Base which run north and south and ultimately discharge into Mundy Creek and then Rowes Bay;
- (i) a drain that appears to drain east into the watercourse that runs south-east to the north of the Belgian Gardens Cemetery, joining Mundy Creek before flowing into Rowes Bay;
- (j) a network of pumps, at sections adjacent to the runways, designed to prevent the flooding of the runways, which pump from sumps into the wetlands on the western, north-western and northern sides of the Townsville Base.

PARTICULARS

- (i) *WSP DSI Report at paragraph 2.3.6.*

7.18. The drains near the runway and on the eastern border of the Townsville Base, run through the Townsville Airport, into Rowes Bay and exit at Mundy Creek.

PARTICULARS

- (i) *WSP DSI Report at paragraph 2.3.6.*

7.19. The features of the drainage system in the TCC Areas include:

- (a) at the northern suburb of Pallarenda, a watercourse that runs from Three Mile Creek to the Town Common towards Rowes Bay and exits towards the ocean;
- (b) a network of drains that drains sections of the eastern and northern parts of Garbutt, Belgian Gardens and the northern part of West End to Mundy Creek and discharges into Rowes Bay;
- (c) two perennial lakes within the suburb of Bohle, which has major watercourses running on the east, south and west side of the suburb;
- (d) canals running through the south-western section of Garbutt, which flow west into Peewee Creek, which flows north from Mt Louisa, joining Louisa Creek in the wetlands to the west of the Townsville Base;
- (e) at the south-west of Mount St John, rural water storage is located and canals and drainage on the northern section flow into Louisa Creek;
- (f) at the south-western section of Garbutt and most of the suburb of West End drain to the south, entering an unnamed lake, which overflows eastward into

National Creek, which ultimately then flows north-east, entering Cleveland Bay at the Port of Townsville.

PARTICULARS

(i) *WSP DSI Report at paragraph 2.3.6.*

7.20. The features of the drainage system of the Townsville Ecological Area include:

- (a) a large part of the estuarine system and drainage from the Bohle River, including Peewee Creek, Louisa Creek, and Three Mile Creek;
- (b) the Town Common, which contained a perennial lake and three rural water storage areas, and received surface water run-off from the Townsville Base and from the TCC Areas suburbs of Bohle, Mount Louisa and part of Garbutt.

PARTICULARS

(i) *WSP DSI Report at paragraph 2.3.6.*

7.21. At all material times, significant areas of the Townsville Base and the Townsville Relevant Area constituted a high or medium flooding hazard and low-lying areas of the Townsville Relevant Area were subject to regular inundation.

PARTICULARS

(i) *WSP DSI Report at paragraph 2.3.7.*

7.22. During the wet season, the Townsville Relevant Area was subject to heavy rainfall events, after which, several swamps would be consistently flooded, and surface water would be present across much of the Townsville Relevant Area.

PARTICULARS

(i) *WSP DSI Report at paragraphs 7.4.1.1 and 8.3.2.*

7.23. At all material times, surface water on and around the Townsville Base (including rainwater, floodwaters, or overland flow) generally tends to pool, pond and percolate or permeate into the soil after wet weather or inundation for lengthy periods.

PARTICULARS

(i) *WSP DSI Report at paragraph 8.3.2.*

A.2.5 Hydrogeology

Townsville Base

7.24. At all material times, the Townsville Base was underlain by three, interconnected aquifers:

- (a) a shallow perched unconfined aquifer in the western, north-western and northern sections of the Townsville Base, freshwater and sandy;
 - (b) a middle, semi-confined aquifer; and
 - (c) a deeper, semi-confined aquifer located in sands and gravels,
- (together, the **Townsville Aquifers**).

PARTICULARS

- (i) *WSP DSI Report at paragraphs 2.3.4 and 5.1.2.1.*

7.25. At all material times, groundwater levels at the Townsville Base fluctuated with the dry and wet seasons, generally reaching a low point near the end of the year prior to the start of the wet season in November and December.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 7.3.2 and 8.3.3.*

7.26. At all material times, there was a strong interaction between the groundwaters and surface waters of the Townsville Base and the Townsville Relevant Area, by reason of:

- (a) the permeability of the near-surface soils;
- (b) the shallow groundwater table, including the shallow perched unconfined aquifer;
- (c) the presence of large areas of grassed ground;
- (d) the amount of unlined surface drains used to discharged surface water;
- (e) the leakage/seepage from the unlined drains and drainage channels;
- (f) the regular inundation of the Townsville Base and Townsville Relevant Area with standing water at and after times of heavy rainfall.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 2.3.4, 2.3.8, 8.3.2 and 8.3.4.*

A.3 The artificial water-related features of the Townsville Base

7.27. In the course of its occupation and use of the Townsville Base, the Commonwealth constructed, developed, and/or upgraded the drainage system of the Townsville Base (**Townsville Drainage System**) including as follows:

- (a) the construction of 5 Aviation Regiments (**5 AVN**) in the 1970s, with a significant extension in the early 1990s, which resulted in drainage being directed south and then west into Peewee Creek;
- (b) the construction of the perimeter road to the west of Runway 13/31, which resulted in the creation on Lake Lydeamore, which had previously been an ephemeral wetland.
- (c) in 2000, the construction of ordnance loading aprons (**OLAs**), which altered the hydrology in that area by creating a landlocked wetland between the OLAs and reducing the size of the wetlands in that vicinity, which resulted in directing surface water flow to drains to the northern Townsville Base boundary, ultimately discharging to Three Mile Creek.

A.4 The foreseeable flow of water from the Townsville Base

7.28. At all material times, by reason of the matters pleaded in paragraphs 7.6 to 7.27, it was reasonably foreseeable that waters, liquids, and soluble materials discharged on Townsville Base would:

- (a) permeate or percolate into the soil at the Townsville Base;
- (b) be transmitted to the groundwater beneath the Townsville Base and mingle and flow with that groundwater (including in a direction towards the Townsville Surface Water Bodies);
- (c) mingle with other surface water on the Townsville Base (especially after periods of rain), and flow overland towards and into the surrounding water catchment areas outside the Townsville Base (including the Townsville Surface Water Bodies) and:
 - (i) permeate or percolate into the soil over which the surface water overland flows occurred; and

- (ii) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred; and
- (d) be transmitted to the Townsville Surface Water Bodies.

B WATER USE AT THE RELEVANT AREA

B.1 The Townsville Surface Water Usages

7.29. At all material times, the Townsville Surface Water Bodies have been used by the residents of the Townsville Relevant Area for:

- (a) fishing (including for bait and for food); and
- (b) swimming (in the freshwater areas of the Bohle River);
- (c) incidental recreational activities,

(the **Townsville Surface Water Usages**).

PARTICULARS

- (i) *WSP DSI Report at paragraph 5.1.2.3.*
- (ii) *WSP HHRA Report at paragraph 5.2.2.4.*

B.2 Groundwater

7.30. From about 1976, groundwater from the Townsville Aquifers has at times been used by some Townsville Group Members for:

- (a) domestic and recreational use, including watering lawns and gardens (following discharge into the Townsville Surface Water Bodies); and
- (b) for drinking water in parts of Rowes Bay and Pallarenda

(together, the **Townsville Groundwater Usages**).

PARTICULARS

- (i) *WSP DSI Report at paragraphs 2.3.5, 5.1.2.1 5.1.2.2 and 7.3.1.*
- (ii) *WSP HHRA Report at paragraph 5.2.3.5.*

- 7.31. At all material times, some residents in the Townsville Relevant Area had private bores on their land which drew groundwater and engaged in the Townsville Groundwater Usages.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 2.3.4, 2.3.5, 5.1.3, 7.3.1 and 7.6.3.*
- (ii) *WSP HHRA Report at paragraph 5.2.3.5.*
- (iii) *Some private bores are registered, while some are unregistered.*
- (iv) *The best particulars the Applicants can provide of the private bores in the Townsville Relevant Area are contained in the WSP DSI Report at Table 5.5 and Figure 6, Appendix A (which is a map and list of 20 registered bores, but which does not take into account unregistered bores).*
- (v) *Some Townsville Group Members have private bores on their land. The identity of all those Townsville Group Members who have private bores will be particularised following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Townsville Group Members.*

B.3 The foreseeable usage of water emanating from the Townsville Base

- 7.32. At all material times, by reason of the matters pleaded in paragraphs 7.28 to 7.31 above, it was reasonably foreseeable that waters, liquids, and soluble materials discharged and/or allowed to escape the Townsville Base which were transmitted to the Townsville Surface Water Bodies, and the Townsville Aquifers would be used by residents of the Townsville Relevant Area.

C THE COMMONWEALTH'S USE OF AFFF AT THE TOWNSVILLE BASE

C.1 Introduction

- 7.33. At all material times since the establishment of the Townsville Base, the Commonwealth has been responsible for conducting all of the activities conducted at the Townsville Base.

C.2 The Commonwealth's use of AFFF

- 7.34. As part of the operation of the Townsville Base and since about 1976, the Commonwealth has regularly conducted fire drills, firefighting training, fire tests, mock

emergency aircraft landing and accident drills, foam training, equipment testing (including the testing of nozzles, firefighting trucks, and fire suppression and deluge systems), firefighting, fire suppression, storage and handling of firefighting equipment and fire suppressions, tank washing and purging, simulations for Open Day demonstrations and like operations (both on and near Townsville Base and in designated and non-designated areas) (the **Townsville Training and Operations Activities**).

PARTICULARS

- (i) *WSP DSI Report at paragraph 3.2.1*
- (ii) *Further particulars may be provided after discovery and inspection.*

7.35. At all material times in the period since about 1976 until a time unknown to the Applicants after about 2004, in the use and occupation of the Townsville Base for the purpose of the Townsville Training and Operation Activities, the Commonwealth:

- (a) used AFFF Concentrate;
- (b) mixed the AFFF Concentrate with water to create AFFF Working Solution; and
- (c) aspirated the AFFF Working Solution into a foam via nozzles on firefighting trucks and other mechanisms (the aspirated foam being known as AFFF).

PARTICULARS

- (i) *WSP DSI Report at paragraphs 2.4, 2.5 and 3.2.1.*
- (ii) *The AFFF Concentrate used was principally a product known as "Light WaterTM" (being manufactured by the Minnesota Mining and Manufacturing Company (now known as 3M Company) and/or its subsidiary 3M Australia Pty Ltd).*
- (iii) *At a time unknown to the Applicants from approximately mid-2003 through to about 2005, the Commonwealth transitioned to using "Ansulite": WSP DSI Report at paragraph 3.2.1 of WSP DSI Report.*

7.36. The Townsville Training and Operation Activities included those in and around:

- (a) the area known as former fire training ground NQ0105 (**Townsville Former Fire Training Ground NQ0105**);
- (b) the area known as former fire training ground NQ0106 (**Townsville Former Fire Training Ground NQ0106**);

- (c) the area known as the Pad Braham (**Townsville Pad Braham**);
- (d) the area known as runway 13/31 (**Townsville Runway 13/31**);
- (e) the area known as fire station NQ0055 (**Townsville Fire Station NQ0055**);
- (f) the area known as fuel farm 2 NG0099 (**Townsville Fuel Farm 2 NQ0099**);
- (g) 5 AVN (**Townsville 5 AVN**);
- (h) the area known as former fire training ground NQ0054 (**Townsville Former Fire Training Ground NQ0054**);
- (i) the area known as the former cadet training area (**Townsville Former Cadet Training Area**).

(i) *WSP DSI Report at paragraphs 3.2.1 and 9.7.*

Townsville Former Fire Training Ground NQ0105

7.37. The Townsville Former Fire Training Ground NQ0105:

- (a) was predominately used during the 1970s and 1980s;
- (b) was one of the primary areas used for fire training at the Townsville Base;
- (c) was located at the northern end of Runway 01/19 and contained four discrete training areas;
- (d) contained a grassed area, with some areas of un-grassed salt pans, and was generally flat (with a very slight gradient to the south-west).

7.38. The Townsville Training and Operation Activities at the Townsville Former Fire Training Ground NQ0105 included live fire training and the use of AFFF Working Solution and AFFF.

7.39. At all material times, the features of the drainage network of the Townsville Former Fire Training Ground NQ0105 included:

- (a) a drainage network consisting of grassed swales to concrete-floored open drain;
- (b) drained surface waters being directed north into the wetlands beyond the northern boundary of the Townsville Base and eventually into Three Mile Creek,

or east into the watercourse on the northern side of the Belgian Gardens Cemetery and eventually into Mundy Creek and the Town Common;

- (c) ultimately discharged to the Three Mile Catchment.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 3.2.1, 8.2.1, 8.4.1, 8.5.2 and 9.7.*

Townsville Former Fire Training Ground NQ0106

7.40. The Townsville Former Fire Training Ground NQ0106:

- (a) was used for significant amounts of live fire training prior to the construction of the OLAs in 2000;
- (b) contained two discrete areas of grassed ground immediately south of OLA8 and OLA9, with the OLA taxiway cutting across the middle of the areas.

7.41. The Townsville Training and Operations Activities at the Townsville Former Fire Training Ground NQ0106:

- (a) included live fire training and the use of AFFF Working Solution and AFFF;
- (b) involved the burning of any available fuels and scrap materials in un-lined earthen pits.

7.42. At all material times, the features of the drainage network of the Townsville Former Fire Training Ground NQ0106 included:

- (a) a drainage network consisting of grassed swales to concrete-floored open drain;
- (b) drained surface waters being directed to:
 - (i) at the northern section, to an internal draining pond at the OLAs;
 - (ii) at the south section, to wetlands and ultimately the Town Common;
 - (iii) ultimately the Bohle River Catchment.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 3.2.1, 8.2.1, 8.4.1, 8.5.2 and 9.7.*

Townsville Pad Braham

7.43. The Townsville Pad Braham:

- (a) was located in the north-western extremity of the Townsville Base;
- (b) was predominately grassed;
- (c) from about 1976, was an area where fire training was at times conducted (using AFFF Working Solution and AFFF); and
- (d) the location of a vehicle rollover that resulted in the release of 980 litres of AFFF concentrate.

7.44. At all material times, the features of the drainage network of Townsville Pad Braham included:

- (a) no formed drains and discharged surface water by overland flow which was directed to wetlands on the western edge, and ultimately to the Town Common/Louisa Creek;
- (b) ultimately discharged to the Bohle River Catchment.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 3.2.1, 8.2.1, 8.4.1, 8.5.2 and 9.7.*

Townsville Runway 13/31

7.45. The Townsville Runway 13/31:

- (a) was a primary area used for fire training at the Townsville Base, with the western end of Townsville Runway 13/31 being used frequently during the 1970s and 1980s;
- (b) was also used for stockpiling of impacted soils generated by on-Base development activities;
- (c) was located in the central-western portion of the Townsville Base;
- (d) comprised a central bitumen road with gravel edges and slight cambered grassed banks along its length.

7.46. The Townsville Training and Operations Activities at Townsville Runway 13/31 included:

- (a) live fire training and the use of AFFF Working Solution and AFFF, to control fires in aircraft shells and cars;
- (b) the weekly sparging of AFFF from fire trucks along the entire length of the runway, with up to 50 litres of AFFF being discharged at each event;
- (c) over a three-year period in the 1970s, the routine burning of tyres to create a “mock-plane”.

7.47. At all material times, the features of the drainage network of Townsville Runway 13/31 contained no formed drains and discharged surface water by overland flow off the runway, to the south into wetlands and Lake Lydeamore, and ultimately to Louisa Creek and ultimately discharged to the Bohle River Catchment.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 3.2.1, 8.2.1, 8.4.1, 8.5.2, 8.5.4. and, 9.7.*

Townsville Fire Station NQ0055

7.48. The Townsville Fire Station NQ0055:

- (a) comprised the fire station and surrounding flat grassed area located in the centre of the Townsville Base;
- (b) contained:
 - (i) a small bunded fire training area with a 2,000 litre separator attached;
 - (ii) a drum storage shed (Building 115) that was adjacent to the fire station, in which AFFF, fuel and oil was stored in 200 litre drums on unsealed earth;
 - (iii) an old structural training area which was used for fire training with AFFF;
 - (iv) a sump in which waste water was disposed of.

7.49. The Townsville Training and Operations Activities at Townsville Fire Station NQ0055 included:

- (a) included hot fire training using hand-held fire extinguishers;
- (b) extensive testing of equipment and purging of fire trucks that contained AFFF, which occurred most commonly on the grassed area at the site;
- (c) the live fire training exercise of lighting and extinguishing a fuel tanker, located to the northeast of the fire station.

7.50. At all material times, the features of the drainage network of Townsville Fire Station NQ0055 included:

- (a) discharging of surface water by grassed swales and drains and overland flow to on-Base ephemeral wetlands, and ultimately to the Town Common during wet weather events;
- (b) ultimately discharging to the Bohle River Catchment;

PARTICULARS

- (i) *WSP DSI Report at paragraphs 3.2.1, 8.2.1, 8.4.1, 8.5.2, 8.5.4 and, 9.7.*

Townsville Fuel Farm 2 NQ0099

7.51. In the 1970s and 1980s, the Townsville Fuel Farm 2 NQ0099 was the site of the testing of firefighting systems and water truck purging (rather than fire training activities), which resulted in AFFF Working Solution and AFFF being discharged on the soil.

7.52. At all material times, the features of the drainage network of Townsville Fuel Farm 2 NQ0099 included:

- (a) discharging of surface water by grassed swales and overland flow towards the north, to on-Base wetlands and ultimately Town Common;
- (b) ultimately discharging to the Bohle River Catchment.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 8.2.1, 8.4.1, 8.5.2 and 9.7.*

Townsville 5 AVN

7.53. The Townsville 5 AVN:

- (a) was developed in the 1970s with significant extensions occurring in the early 1990s;
- (b) has at times consisted of Building 236, Building 295, the Wash Point (Building 366) and the Ground Support Equipment compound.

7.54. At all material times:

- (a) Building 236 was a hangar located in the south-western section of the Townsville Base which contained an AFFF fire deluge system (until mid-2017 when it was changed to a water-charged deluge system);
- (b) Building 295 was a hangar located in the south-western section of the Townsville Base with an AFFF fire deluge system;
- (c) the Wash Point:
 - (i) was located at the southern boundary of the Townsville Base, and was sealed;
 - (ii) included a collection sump and small water treatment plant (foam fractionator) that was designed to collect impacted water for removal by pumping and treatment in the foam fractionator;
 - (iii) was the designated area for testing AFFF systems on vehicles;
 - (iv) was located adjacent to the Ground Support Equipment compound, which was a laydown area that was used for the storage of AFFF drums, was not always sealed and was never bunded.

7.55. The Townsville Training and Operations Activities at Building 236 included accidental discharges and spills at the site by way of the fire deluge systems.

7.56. At all material times, the features of the drainage network of Building 236 included:

- (a) discharging surface water to the east to a drain with a concrete base and grassed banks, which included a surface water interceptor at the edge of the concrete slab.
- (b) overflow from the interceptor flowing south and discharging into Peewee Creek at the Townsville Base's south-western corner, which subsequently joined Louisa Creek.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 3.1.1, 3.2.1, 8.2.1, 8.4.1, 8.5.2 and 9.7.*

- 7.57. The Townsville Training and Operations Activities at Building 295 included discharges, leakages or overflow of AFFF or diluted AFFF as a result of accidental triggers of fire suppression systems and spills from overflows of a separation tank.
- 7.58. At all material times, the features of the drainage network of Building 295 included discharging surface water from the hangar westwards, entering a drain on the western Townsville Base boundary via the separation tank, which ultimately flowed westwards to wetlands associated with Louisa Creek.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 3.2.1, 8.2.1, 8.4.1, 8.5.2 and 9.7.*

- 7.59. The Townsville Training and Operations Activities at the Wash Point:
- (a) involved the testing of AFFF systems on vehicles;
 - (b) resulted in overflows of untreated water from the sump which was discharged to a grassed area to the north of the wash bay;
 - (c) resulted in AFFF Working Solution and AFFF impacting the soil, surface water, and groundwater to ultimately impact Louisa Creek and Peewee Creek.
- 7.60. At all material times, the features of the drainage network of the Wash Point included discharged surface water by drains from the Ground Support Equipment compound north to the grassed area which then flowed into a swale that runs north before ultimately discharging into Peewee Creek.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 3.2.1, 5.2.4, 8.2.1, 8.4.1, 8.5.2 and, 5.2.4, 9.7.*

Townsville Former Fire Training Ground NQ0054

- 7.61. The Townsville Former Fire Training Ground NQ0054:
- (a) was located in the south-eastern section of the Townsville Base in a flat grassed area located at the southern edge of the Townsville Airport; and

- (b) was at all material times up until late 2005, a primary location of fire training on the Townsville Base.

7.62. The Townsville Training and Operations Activities at the Townsville Former Fire Training Ground NQ0054:

- (a) included live fire training and the use of AFFF Working Solution and AFFF;
- (b) involved the discharge AFFF onto the unsealed ground through routine fire training activities;
- (c) included the weekly testing of AFFF, including the mixing within and the purging equipment where approximately 200 litres of diluted AFFF would be discharged at a time;
- (d) involved the testing and fire training activities being conducted across the entire area, however, the majority taking place in the southern part of the area to the south of the drainage channel.

7.63. At all material times, the features of the drainage network of the Townsville Former Fire Training Ground NQ0054 included:

- (a) discharging surface water east by grassed swales to concrete floored drains and concrete drains towards Mundy Creek;
- (b) ultimately discharging to the Mundy Creek Catchment;

PARTICULARS

- (i) *WSP DSI Report at paragraphs 3.2.1, 8.2.1, 8.4.1, 8.5.2, 8.5.4 and, 9.7.*

Townsville Former Cadet Training Area / 38 Squadron and Domestic Area

7.64. The Townsville Former Cadet Training Area, 38 Squadron and Domestic Area (**Former Cadet Training Area**):

- (a) was located on the grassed field adjacent to north of the on-Base kindergarten/childcare centre where Air Cadets and trainees conducted fire training;
- (b) was used to conduct “Open Day Demonstrations”, where foam was produced at open day events in the 1970s and 1980s.

7.65. The Townsville Training and Operations Activities at the Townsville Former Cadet Training Area:

- (a) resulted in the production and discharge of approximately one truck load (200 litres) of foam at each event; and
- (b) resulted in AFFF Working Solution and AFFF impacting the soil, surface water and groundwater, and impacting the Mundy Creek Catchment and Garbutt.

7.66. At all material times, the features of the drainage network of Former Cadet Training Area included discharging overland flow from the grassed field via a popped network of drains, to stormwater drains and concrete drains towards Mundy Creek and ultimately to the Mundy Creek Catchment.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 3.2.1, 8.4.1, 8.5.2, 8.5.4 and, 9.7.*

7.67. By reason of the matters pleaded in paragraphs 7.34 to 7.66 above, the Townsville Training and Operations Activities resulted in:

- (a) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground at the Townsville Base; and/or
- (b) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with Fire Run-Off, being discharged, or allowed to escape, to bare ground at the Townsville Base.

C.3 The Commonwealth's methods for disposal of Spent AFFF

7.68. At all material times:

- (a) Spent AFFF; and/or
- (b) Fire Run-Off co-mingled with Spent AFFF,

was generally directed by the Commonwealth towards bare ground and the Townsville Drainage System.

PARTICULARS

- (i) *Paragraphs 7.34 to 7.67 are repeated.*
- (ii) *The Applicants do not, with their present state of knowledge, know the quantities of Spent AFFF and/or Fire Run-Off*

directed to bare ground and the earthen drains comprising the Townsville Drainage System.

(iii) Further particulars may be provided after discovery and inspection.

7.69. At all material times, to the extent that:

- (a) AFFF discharged in the course of the Townsville Training and Operations Activities; and/or
- (b) Fire Run-Off co-mingled with Spent AFFF,

was directed by the Commonwealth to the Townsville Drainage System they were ineffective to ensure that liquids contained in them did not leak into the soil below and around them.

C.4 Physical properties of AFFF and Spent AFFF

7.70. Paragraph 15 is repeated.

7.71. Paragraph 16 is repeated.

C.5 The foreseeable flow of Spent AFFF from the Townsville Base

7.72. At all material times, by reason of the matters pleaded in paragraphs 7.4 to 7.32 and 7.70 to 7.71 above, it was reasonably foreseeable that use of AFFF Working Solution and AFFF on the Townsville Base as pleaded in paragraphs 7.34 to 7.67 and/or 7.68 to 7.69 above would result in Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF:

- (a) being transmitted to the groundwater beneath the Townsville Base and mingle and flow with that groundwater (including in a general direction towards the Townsville Surface Water Bodies), and being utilised by persons engaged in the Townsville Groundwater Usages;
- (b) mingling with other surface water on the Townsville Base (especially after periods of rain), and flowing overland generally towards and into the surrounding water catchment areas outside the Townsville Base (including to the Townsville Surface Water Bodies) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and

(ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred;

and being extracted and utilised by persons engaged in the Townsville Groundwater Usages;

(c) mingling with other surface water on the Townsville Base (especially after periods of rain), and flowing overland generally towards and into the surrounding water catchment areas outside the Townsville Base (including the Townsville Surface Water Bodies) and then being utilised by persons engaged in the Townsville Surface Water Usages.

D THE TOXIC PROPERTIES OF SPENT AFFF

D.1 The potential for AFFF to harm humans and the environment

7.73. Paragraph 18 is repeated.

7.74. Paragraph 19 is repeated.

7.75. Paragraph 20 is repeated.

7.76. Paragraph 21 is repeated.

7.77. Paragraph 22 is repeated.

D.2 The foreseeable flow and transmission of a toxic substance

7.78. At all material times, by reason of the matters pleaded in paragraphs 7.4 to 7.32 and 7.70 to 7.71 and 7.73 to 7.77 above, it was reasonably foreseeable that the use of AFFF on the Townsville Base as pleaded in paragraphs 7.34 to 7.67 and/or 7.68 to 7.69 above would result in an unnatural soluble substance containing synthetic chemicals:

- (a) permeating or percolating into the soil at the Townsville Base;
- (b) being transmitted to the groundwater beneath the Townsville Base and mingling and flowing with that groundwater (including in a general direction towards the Townsville Surface Water Bodies);
- (c) mingling with other surface water on the Townsville Base (especially after periods of rain), and flowing overland generally towards and into the surrounding

water catchment areas outside the Townsville Base (including the Townsville Surface Water Bodies) and:

- (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred; and
- (d) being transmitted to the Townsville Surface Water Bodies.

E THE CONTAMINATION OF THE TOWNSVILLE SURFACE WATER BODIES

E.1 The contamination of the Townsville Surface Water Bodies and Townsville Catchments

7.79. PFCs and PFC Contaminants have been detected in the Townsville Surface Water Bodies.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 7.7.2 and, 8.5.4.*
- (ii) *Department of Defence, PFAS Investigation & Management Program Community Information Session – RAAF Base Townsville, Queensland (9 May 2018) at slide headed “Outcomes of the DSI – Surface Water and Sediment Results”.*
- (iii) *WSP, Department of Defence, RAAF Base Townsville – Seasonal Monitoring Report 1 – PFAS (December 2019) (WSP SMR1) at paragraphs 7.7.2.2.*
- (iv) *WSP, Department of Defence, RAAF Base Townsville – Seasonal Monitoring Report 2 – PFAS (December 2019) (WSP SMR2) at paragraphs 6.5.2, 6.5.2.1, 6.5.4 and, 6.5.4.1.*
- (v) *PMAP Report at paragraph 2.4.2.*

7.80. The discharge of Spent AFFF and Fire Run-Off to the bare ground of the Townsville Base has resulted in the contamination of the Townsville Catchments.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 8.5.3, 8.5.4 and 9.7.*

7.81. The contamination of the Townsville Surface Water Bodies and Townsville Catchments with PFCs and PFC Contaminants is the result of discharged AFFF Working Solution and AFFF on the Townsville Base resulting in Spent AFFF:

- (a) permeating or percolating into the soil at the Townsville Base;
- (b) being transmitted to the groundwater beneath the Townsville Base and mingling and flowing with that groundwater (including in a general direction towards the Townsville Surface Water Bodies);
- (c) mingling with other surface water on the Townsville Base (especially after periods of rain), and flowing overland in a direction, towards and into the surrounding water catchment areas outside the Townsville Base (including the Townsville Catchments and Townsville Surface Water Bodies) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred; and
- (d) being transmitted to the Townsville Surface Water Bodies.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 8.2.1, 8.5.2, 8.5.3, 8.5.4, 9.4 and, 9.7.*

7.82. By reason of the matters pleaded in paragraph 7.79 and 7.81 above, the water in the Townsville Surface Water Bodies and the Townsville Catchments has become, and is likely to continue to remain, contaminated by, and a receptor of, PFC Contaminants originally emanating from the Townsville Base.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 8.5.3 and 8.5.4.*
- (ii) *WSP SMR1 at paragraphs 8.4.3 and 8.4.5.*
- (iii) *WSP SMR2 at paragraphs 7.2.3, 7.2.4.1, 7.2.4.2, 7.2.4.3, 7.2.4.4, 7.2.4.5 and, 7.2.4.6.*

7.83. By reason of the matters pleaded in paragraphs 7.79 to 7.82 above, water in the Townsville Surface Water Bodies and the Townsville Catchments have become, and will continue and remain, potentially hazardous and unfit for the Townsville Surface Water Usages (the **Townsville Surface Water Contamination**).

PARTICULARS

- (i) *WSP DSI Report at paragraphs 8.5.3 and 8.5.4.*
- (ii) *WSP SMR1 at paragraphs 8.4.3 and 8.4.5.*

- (iii) *WSP SMR2 at paragraphs 7.2.3, 7.2.4.1, 7.2.4.2, 7.2.4.3, 7.2.4.4, 7.2.4.5 and, 7.2.4.6.*

7.84. There is no practical or cost-effective way of remediating the Townsville Surface Water Contamination.

E.2 The contamination of Groundwater

7.85. A series of large and diffuse plumes of PFCs and PFC Contaminants emanating from the Townsville Base have been identified in the majority of groundwater under the Townsville Relevant Area (or part thereof), extending to the east and north-east from the south-eastern section, west and north west from 5 AVN and north from the northern end of the runway (the **Townsville Toxic Plume**).

PARTICULARS

- (i) *WSP DSI Report at paragraphs 8.4, 8.4.3 and, 10.3.*
(ii) *WSP SMR1 at paragraphs 7.6.1, 7.6.2, 7.6.3 and, 7.6.4.*
(iii) *WSP SMR2 at paragraphs 6.4, 6.4.1, 6.4.2, 6.4.3 and, 6.4.4.*

7.86. The Townsville Toxic Plume is the result of discharged AFFF Working Solution and AFFF on the Townsville Base resulting in Spent AFFF:

- (a) permeating or percolating into the soil at the Townsville Base;
- (b) being transmitted to the groundwater beneath the Townsville Base and mingling and flowing with that groundwater (including in a general direction towards the Townsville Surface Water Bodies);
- (c) mingling with other surface water on the Townsville Base (especially after periods of rain), and flowing overland, towards and into the surrounding water catchment areas outside the Townsville Base (including the Townsville Surface Water Bodies) and:
 - (i) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (ii) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred; and
- (d) being transmitted to the Townsville Surface Water Bodies.

PARTICULARS

- (i) *WSP DSI at paragraphs 8.4.1 and, 8.4.2.*

7.87. By reason of the matter pleaded in paragraphs 7.85 and 7.86, groundwater beneath the Townsville Relevant Area (including under land owned by many Townsville Group Members) has become, and is likely to continue to remain, contaminated by, and a receptor of, PFC Contaminants originally emanating from the Townsville Base.

PARTICULARS

- (i) *WSP DSI Report at paragraphs 7.6.3, 7.6.4 and 8.4.1.*
- (ii) *The PFC Contaminant concentrations measured in groundwater (predominantly PFOS and PFHxS) in the Townsville Relevant Area exceed the adopted screening criteria for the protection of beneficial use of groundwater for irrigation, potable and non-domestic water use and maintenance of ecosystems: WSP DSI at paragraph 7.6.3*
- (iii) *The groundwater in the Townsville Aquifers have been contaminated with high levels of PFC Contaminants(WSP DSI at paragraph 7.6.3.*
- (iv) *WSP SMR1 at paragraphs 7.6.3 and 7.6.4.*
- (v) *Particulars of the contamination of the groundwater under the land of Townsville Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Townsville Group Members.*

7.88. By reason of the matters pleaded in paragraph 7.87, groundwater beneath the Townsville Relevant Area (including land owned by Townsville Group Members) has become, and is likely to continue to remain, potentially hazardous and unfit for Townsville Groundwater Usages (the **Townsville Groundwater Contamination**).

PARTICULARS

- (i) *The groundwater in the Townsville Aquifer is potentially hazardous and unfit for drinking: Parts D.1 above and E.5 below are repeated.*
- (ii) *The groundwater in the Townsville Aquifers are potentially hazardous and unfit for:*
 - A *irrigation purposes because such usages result in the further spreading of PFC Contaminants to soils and uptake by plants, vegetables and fruits, and the exposure of people to PFC Contaminants: Parts D.1 above and E.5 below are repeated.*
 - B *watering of livestock (including chickens) because such usages may result in the further spreading of PFC*

Contaminants to soils, uptake of PFC Contaminants by the livestock and the exposure of people to PFC Contaminants (particularly by consumption of livestock and eggs): Parts D.1 above and E.5 below are repeated.

C swimming and domestic purposes because such usages may result in the further exposure of people to PFC Contaminants: Parts D.1 above and E.5 below are repeated.

(iii) WSP DSI at paragraphs 7.6, 7.6.3 and, 7.6.4.

(iv) WSP HHRA Report at paragraph 9.2 and, 9.2.1.2.

(v) Further particulars of the contamination of the groundwater in the Townsville Aquifer under the Townsville Group Members' land will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Townsville Group Members.

7.89. There is no practical or cost-effective way of remediating the Townsville Toxic Plume, or the Townsville Groundwater Contamination.

E.3 The contamination of soil

7.90. Soil on the land within the Townsville Relevant Area (including soil on land owned by Townsville Group Members) has become, and is likely to continue to become and remain, contaminated by PFC Contaminants emanating from the Townsville Base (the **Townsville Soil Contamination**) by:

- (a) overland flows of surface water commingled with Spent AFFF (containing PFC Contaminants) from the Townsville Base; and
- (b) discharge or application of groundwater containing PFC Contaminants extracted from the Townsville Aquifers by persons engaged in Groundwater Usage to the soils (by, in particular, irrigation).

PARTICULARS

(i) WSP DSI at paragraph 7.5.

(ii) WSP SMR1 at paragraphs 7.5.3, 8.1 and, 8.1.2.

(iii) Particulars of the contamination of the soils on lands of Townsville Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Townsville Group Members.

7.91. There is no practical or cost-effective way of remediating the Townsville Soil Contamination.

E.4 The Townsville Biota Contamination

7.92. Extensive other aspects of the biotic and abiotic matrices within the Townsville Relevant Area (including on land owned by Townsville Group Members) have become and are likely to continue to remain, contaminated by PFC Contaminants, and be recirculated indefinitely within the Townsville Relevant Area (the **Townsville Biota Contamination**).

PARTICULARS

- (i) *Fruit and vegetables from residential gardens in the Townsville Relevant Area and fish and crustaceans from the Townsville Surface Water Bodies have been found to contain PFCs and PFC Contaminants to varying degrees: .(WSP HHRA Report at paragraph 7.4.3.)*
- (ii) *Ingestion of produce (including fruit and vegetables) irrigated with impacted groundwater (or impacted surface water) and/or fish and crustaceans from the Townsville Surface Water Bodies are secondary sources of PFC contamination: WSP HHRA Report at paragraphs 9.2, 9.2.1.2 and, 12.*
- (iii) *Secondary sources of PFC contamination, leading to further redistribution of contamination and creation of additional exposure pathways for ongoing contamination of the biota generally (including humans): Braunig J, Baudel C, Heffernan A et al, Fate and redistribution of perfluoroalkyl acids through AFFF-impacted groundwater (2017).*

7.93. There is no practical, cost-effective way of remediating the Townsville Biota Contamination.

E.5 The announcement of the contamination

7.94. On a date shortly before 29 November 2016, the Commonwealth published a document titled 'Department of Defence, RAAF Base Townsville (October 2016)' (the **Townsville Contamination Announcement**) which stated:

- (a) the Townsville Base had a legacy of using AFFF for emergency firefighting situations and fire fighter training;

- (b) in 2004, the Commonwealth commenced phasing out its use of AFFF containing PFOS and PFOA as active ingredients;
- (c) PFOS and PFOA belong to a group of chemicals known as per- and poly-fluoroalkyl substances (**PFAS**) and until recently, PFAS were known as 'perfluorinated chemicals' or 'PFCs';
- (d) PFAS were an emerging concern around the world because they are persistent in the environment;
- (e) that because PFAS persist in humans and the environment, it was recommended that human exposure be minimised;
- (f) based on the outcome of preliminary sampling, it had been determined that Townsville would be subject to a detailed environmental investigation;
- (g) that the detailed environmental investigation would include:
 - (i) reviewing the historical use, storage and management of AFFF to identify potential sources of PFAS;
 - (ii) sampling soil, sediment, surface water, and groundwater on and off Townsville Base to identify PFAS exposure in the vicinity;
 - (iii) identifying pathways and receptors for the potential migration of PFAS;
 - (iv) community and stakeholder engagement, including a water-use survey;
 - (v) a human health and ecological risk assessment (if required) to evaluate potential risks to the human population and ecology, and inform future action to mitigate risks;
- (h) when detailed environmental investigation reports were finalised and publicly released, residents, businesses, and local stakeholders would be consulted;
- (i) that a community briefing and information activity would be conducted prior to the commencement of the detailed environmental investigation at the Townsville Base; and
- (j) alternative sources of drinking water were being provided to eligible residents located in close proximity to the Townsville Base who did not have a town water connection, and relied on the use of a bore for drinking water, as well as to

residents whose drinking water was sourced from a rainwater tank which contained or did contain bore water, and to residents in other exceptional circumstances.

PARTICULARS

- (i) *The Townsville Contamination Announcement is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/General/PSPFactSheets/PSPFactSheetTownsvilleFinal.pdf>

7.95. On or around 29 November 2016, the Commonwealth convened a community briefing (the **Townsville November 2016 Community Information Session**) at which its representatives made the following statements:

- (a) there was a history of AFFF being used at the Townsville Base in emergency firefighting situations and for fire fighter training;
- (b) the AFFF that had been used at the Townsville Base contained PFAS—namely including perfluorooctane and perfluorooctanoic acid;
- (c) PFAS were a class of manufactured chemical that had been used to make products that resist heat, stains, grease, and water;
- (d) PFAS were a concern around the world because they persist in the environment;
- (e) the Commonwealth commenced using AFFF containing PFOS/PFOA from the 1970s;
- (f) the Commonwealth was aware that PFOS/PFOA was an emerging persistent organic pollutant;
- (g) enHealth recommends that because PFOS and PFOA persist in humans and the environment that human exposure be minimised;
- (h) PFAS had been detected in groundwater and surface water samples collected from locations on the Townsville Base;
- (i) alternative sources of drinking water were being provided to eligible residents;
- (j) a detailed environmental investigation would be undertaken to determine the nature and extent of PFAS on and in the vicinity of the Townsville Base; and

- (k) a human health and ecological risk assessment would be undertaken (if required) to evaluate risks to human health and ecology, and to inform future action to mitigate risks.

PARTICULARS

- (i) *The Townsville November 2016 Community Information Session was held on 29 November 2016 at Townsville, at which a slideshow presentation entitled “PFAS Investigation and Management: Community Information Session – RAAF Base Townsville Environmental Investigation” dated 29 November 2016, was made (**Townsville November 2016 Presentation**). The Townsville November 2016 Presentation is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Townsville/Presentations/PresentationCommunityWalkinSession29November.pdf>

- (ii) *Each of the statements in subparagraphs (a) to (k) was made in writing in the Townsville November 2016 Presentation, and/or spoken to orally at the Townsville November 2016 Community Information Session by representatives of the Commonwealth.*

7.96. In June 2017, the Commonwealth published a factsheet titled ‘PFAS Investigation & Management Program’ (**Townsville June 2017 Factsheet**) which advised as follows:

- (a) a detailed environmental investigation was being conducted into the presence of PFAS on and in the vicinity of Townsville Base;
- (b) stage one of the investigation, being the preliminary site investigation (known as a **PSI**) has been completed which involved a historical review of AFFF use and storage to identify on-base sources, develop an understanding of migration pathways of PFAS from the source and identify potential receptors;
- (c) a detailed site investigation (known as a **DSI**) would commence and involve on and off-base sampling of soil, sediments, groundwater, surface water, plants and animals to build on the PSI information and characterise the nature and extent of contamination.

PARTICULARS

- (i) *The Townsville June 2017 Factsheet is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Townsville/FactSheets/FactsheetCommunityWalkinSession20170614.pdf>

7.97. In November 2017, the Commonwealth published a factsheet titled 'RAAF Townsville - Investigation Update PFAS Investigation and Management Program' (**Townsville November 2017 Factsheet**) which advised:

- (a) the PSI in relation to the Townsville Base has been completed;
- (b) the DSI in relation to the Townsville Base (**Townsville DSI**) is expected to be completed in late 2017 or early 2018; and
- (c) based on the initial findings of the Townsville DSI, a human health risk assessment in relation the Townsville Base (**Townsville HHRA**) has commenced to evaluate potential risks to the human population and ecology.

PARTICULARS

(i) *The Townsville November 2017 Factsheet is published on:*

<https://www.defence.gov.au/Environment/PFAS/docs/Townsville/FactSheets/20171128RAAFBaseTownsvilleFactsheet.pdf>

7.98. In May 2018, the Commonwealth published a factsheet titled 'RAAF Base Townsville – Detailed Site Investigation Findings PFAS Investigation and Management Program' (the **Townsville May 2018 Factsheet**), advising as follows:

- (a) the Townsville DSI has been completed;
- (b) the Townsville DSI involved the sampling of soil, sediment, surface water and groundwater to collect information to better understand how PFAS moves through the environment;
- (c) a summary of the Townsville DSI findings included:
 - (i) PFOS was the most commonly detected PFAS, which is consistent with the historical use of firefighting foam;
 - (ii) PFAS has been detected in groundwater on- and off the Townsville Base in exceedance of the drinking water and recreational human-health guidance values;
 - (iii) PFAS has been detected in soil however no soil samples were in exceedance of the human-health guidance values, except for two locations on-Base;

- (iv) it is likely elevated concentrations of PFAS in groundwater, at a distance from the Townsville Base, were transported there by surface water which then infiltrated to groundwater in the underlying aquifer;
 - (v) PFAS was detected in surface water and sediment on and off the Townsville Base at concentrations in exceedance of the nominated guidelines which indicates PFAS is being transported by surface water and sediment from the Townsville Base into the Town Common Conservation Park, Louisa Creek, Three Mile Creek and Mundy Creek catchments;
- (d) the results of a water use survey (**Survey**) included the identification of:
- (i) residential groundwater bores in the suburbs of Garbutt, Belgian Gardens, Rowes Bay, West End and Pallarenda;
 - (ii) most uses of groundwater being limited to the irrigation of lawns and some minor use for gardens including those with vegetables.

PARTICULARS

- (i) *The Townsville May 2018 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Townsville/FactSheets/201805RAAFBaseTownsvilleFactsheetDSIFindings.pdf>

7.99. On or around 9 May 2018, the Commonwealth held a community walk-in session (the **Townsville May 2018 Community Information Session**) at which its representatives advised the outcomes of the Townsville DSI, which included that:

- (a) PFAS was detected in soils in Garbutt and the Townsville Town Common;
- (b) PFAS was detected off-Base in groundwater in excess of the drinking water guidance in the Town Common, Rowes Bay, Belgian Gardens, Garbutt and Bohle;
- (c) PFAS detected in groundwater at a distance from the Townsville Base are considered to be a result of surface water PFAS transport with subsequent infiltration of PFAS impacted water into the underlying aquifer;

- (d) PFAS was detected in surface water and sediment on and off-Base at concentrations in exceedance of the nominated guidelines, which indicates that PFAS is being transported by surface water and sediment from the Townsville Base into the Townsville Town Common, Louisa Creek, Three Mile Creek and Mundy Creek catchments;
- (e) the Commonwealth was to:
 - (i) undertake to complete the Townsville HHRA and an Ecological Risk Assessment (**Townsville ERA**) which will identify any risks of exposure to humans and the environment that require management; and
 - (ii) develop a PFAS Management Area Plan (**Townsville PMAP**);
- (f) wet season sampling including surface water, groundwater and sediment have also been taken, the results of which will be presented in an addendum report to the DSI report.

PARTICULARS

- (i) *The Townsville May 2018 Community Information Session was held on 9 May 2018 at Townsville, at which a slideshow presentation entitled “Community Presentation PFAS Investigation and Management Program: RAAF Base Townsville, Queensland Detailed Site Investigation” dated May 2018 (**Townsville May 2018 Presentation**). The Townsville May 2018 Presentation is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Townsville/Presentations/201805TownsvillePresentationCommunityWalkinSession.pdf>
- (ii) *Each of the statements in subparagraphs (a) to (f) was made in writing in the Townsville May 2018 Presentation, and/or spoken to orally at the Townsville May 2018 Community Information Session by representatives of the Commonwealth.*

7.100. In October 2018, the Commonwealth published a further factsheet titled ‘RAAF Base Townsville – Human Health Risk Assessment Findings: PFAS Investigation and Management Program’ (the **Townsville October 2018 Factsheet**) providing a summary of the results of the Townsville HHRA which included that:

- (a) there was an elevated exposure risk by eating more than three serves a week of fish flesh from the Townsville Relevant Area;

- (b) there was low level to approaching a potentially elevated level of exposure risk by way of incidental ingestion soil or groundwater (from likely from on-Base excavation activities).

PARTICULARS

- (i) *The Townsville October 2018 Factsheet is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Townsville/FactSheets/201810RAAFBaseTownsvilleHHRAFactsheet.pdf>

7.101. On 31 October 2018, the Commonwealth held a Community Information Session (**Townsville October 2018 Community Information Session**) at which its representatives advised the outcomes of the Townsville HHRA including:

- (a) confirming the risk activities as outlined in the Townsville October 2018 Factsheet;
- (b) indicating the Townsville ERA was due to be finalised and released by early 2019; and
- (c) the Townsville PMAP was due to be released in early 2019.

PARTICULARS

- (i) *At the Townsville October 2018 Community Information Session a slideshow presentation entitled “Community Information Session PFAS Investigation and Management Program: Human Health Risk Assessment and Next Steps” dated 31 October 2018, was made (**Townsville October 2018 Presentation**). The Townsville October 2018 Presentation is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Townsville/Presentations/201810TownsvillePresentationCommunityInformationSession.pdf>
- (ii) *Each of the statements in subparagraphs (a) to (c) was made in writing in the Townsville October 2018 Presentation, and/or spoken to orally at the Townsville May 2018 Community Information Session by representatives of the Commonwealth.*

7.102. In December 2019, the Commonwealth published a further factsheet titled ‘RAAF Base Townsville Ecological Risk Assessment & Seasonal Monitoring Findings: PFAS Investigation and Management Program’ (the **Townsville December 2019 Factsheet**

1) providing a summary of the results of the Townsville ERA and seasonal monitoring findings which included that:

- (a) surface water discharge during high-flow events has been identified as the main method for PFAS moving off the Townsville Base into the Town Common, Louisa Creek, Three Mile Creek and Mundy Creek catchments;
- (b) concentrations of PFAS in groundwater were generally higher when measured following rainfall events;
- (c) there is the potential for unacceptable PFAS exposure to ecological receptors within the Townsville Relevant Area primarily driven by:
 - (i) the discharge of PFAS-impacted surface water from the Townsville Base into waterways and the Townsville Town Common Conservation Park during periods of high flow;
 - (ii) bioaccumulation of PFAS in aquatic and terrestrial organisms; and
 - (iii) risk of organisms with bioaccumulated PFAS being a food source for higher-order animals;
- (d) an additional round of sampling for surface water, sediment and groundwater was undertaken in October 2019 with this data being presented in a report, expected to be released in the first-quarter of 2020.

PARTICULARS

- (i) *The Townsville December 2019 Townsville Factsheet 1 is published on:*

<https://www.defence.gov.au/environment/pfas/Townsville/CommunityUpdates.asp>

7.103. In December 2019, the Commonwealth published a further factsheet titled 'RAAF Base Townsville PFAS Management Area Plan & Ongoing Monitoring: PFAS Investigation and Management Program' (the **Townsville December 2019 Factsheet 2**) providing a summary of the details of the Townsville PMAP which included that:

- (a) the Townsville PMAP will guide the Commonwealth Department of Defence to:
 - (i) manage the key sources of contamination such as fire training and fire station areas;

- (ii) reduce PFAS migration from the Townsville Base; and
 - (iii) reduce the amount of PFAS in the environment.
- (b) the recommendations from the Townsville PMAP are:
- (i) remediating on-base PFAS source areas, to minimise future migration of PFAS in surface water, such as excavation and off-base disposal of PFAS impacted soil to landfill or incineration;
 - (ii) diverting surface water away from source areas to reduce PFAS migration from the Townsville Base.
- (c) The Townsville PMAP will be reviewed annually, or more frequently if new information or technology arises which has the potential to impact the Townsville PMAP objectives.

PARTICULARS

- (i) *The Townsville December 2019 2 Factsheet 2 is published on:*
<https://www.defence.gov.au/Environment/PFAS/docs/Townsville/FactSheets/201912RAAFBaseTownsvillePMAPFactsheet.pdf>

7.104. On 4 December 2019, the Commonwealth held a Community Information Session (**Townsville December 2019 Community Information Session**) at which its representatives advised of the updates from the detailed environmental investigation including:

- (a) from the seasonal monitoring events PFAS was detected off-base in groundwater in excess of the drinking water guidance in the Townsville Town Common, Rowes Bay, Belgian Gardens, Garbutt and Bohle;
- (b) PFAS is being transported by surface water and sediment from the Townsville Base into the Town Common Louisa Creek, Three Mile Creek and Mundy Creek catchments;
- (c) PFAS impacted surface water can percolate to groundwater.;

PARTICULARS

- (i) *At the Townsville December 2019 Community Information Session a slideshow presentation entitled "Community*

Information Session PFAS Investigation and Management Program: Seasonal Monitoring, Ecological Risk Assessment and PFAS Management Area Plan” dated 4 December 2019, was made (Townsville December 2019 Presentation). The Townsville December 2019 Presentation is published on:

<https://www.defence.gov.au/Environment/PFAS/docs/Townsville/Presentations/201912TownsvillePresentationCommunityInformationSession.pdf>

- (ii) *Each of the statements in subparagraphs (a) to (c) was made in writing in the Townsville December 2019 Presentation, and/or spoken to orally at the Townsville May 2018 Community Information Session by representatives of the Commonwealth.*

E.6 The injurious affectation to land in the Townsville Relevant Area

7.105. Land in the Townsville Relevant Area (including the land of Townsville Group Members) has become, and is likely to remain:

- (a) affected by the Townsville Surface Water Contamination;
- (b) affected by the Townsville Groundwater Contamination;
- (c) affected by the Townsville Soil Contamination; and/or
- (d) affected by the Townsville Biota Contamination.

PARTICULARS

- (i) *As to subparagraph (a), paragraphs 7.79 to 7.84 are repeated.*
- (ii) *As to subparagraph (b), paragraphs 7.85 to 7.89 are repeated.*
- (iii) *As to subparagraph (c), paragraphs 7.90 to 7.91 are repeated.*
- (iv) *As to subparagraph (d), paragraphs 7.92 to 7.93 are repeated.*
- (v) *WSP DSI Report at paragraphs 5.3, 7.5, 7.6, 7.6.3, 7.6.4, 8.4.1, 8.5.3 and 8.5.4.*
- (vi) *WSP HHRA Report at paragraphs 7.4.3, 9.2, 9.2.1.2 and 12.*
- (vii) *WSP SMR1 at paragraphs 8.1, 8.3, 8.3.2, 8.3.3, 8.4.3 and 8.4.5.*
- (viii) *WSP SMR2 at paragraphs 7.1.2.1, 7.1.3, 7.2.3, 7.2.4.1, 7.2.4.2, 7.2.4.3, 7.2.4.4, 7.2.4.5 and 7.2.4.6.*

7.106. Further, or alternatively, by reason of:

- (a) the Townsville Surface Water Contamination;
- (b) the Townsville Groundwater Contamination;
- (c) the Townsville Soil Contamination;
- (d) the Townsville Biota Contamination,

land in the Townsville Relevant Area (including the land of Townsville Group Members) has become, and is likely to remain land, of which occupiers and produce, livestock and biota from which, have ongoing and largely unavoidable exposure to PFC Contaminants through multiple potential pathways (**Townsville Ongoing Contaminant Exposure**).

PARTICULARS

- (i) *Paragraphs 7.79 to 7.93 are repeated.*
- (ii) *WSP DSI Report at paragraph 9.5.*
- (iii) *WSP HHRA Report at paragraph 9.2.*
- (iv) *Braunig J, Baudel C, Heffernan A et al, Fate and redistribution of perfluoroalkyl acids through AFFF-impacted groundwater (2017).*

7.107. Further, or alternatively, there exists a material risk that:

- (a) land in the Townsville Relevant Area (including land owned by Townsville Group Members) may be recorded on the environmental management register or the contaminated land register (**EMR/CLR**) established pursuant to s 540A(1)(d) of the *Environmental Protection Act 1994* (Qld) (**EPA Q**) pursuant to ss 371 or 372 of the EPA; and
- (b) owners of land in the Townsville Relevant Area (including land owned by Townsville Group Members) may be obligated to disclose to prospective purchasers that land is and/or that there is a risk that land may be contaminated by PFC Contaminants (with any contract of sale subject to rescission if disclosure is not made).

PARTICULARS

- (i) *As to subparagraph (a):*
A land may be placed on the EMR/CLR if it is “contaminated land”, that is, if it is contaminated by a “hazardous contaminant”, being a contaminant that, if, improperly treated, stored, disposed of or otherwise

managed is likely to cause serious or material environmental harm because of its quantity, concentration, acute or chronic toxic effects, carcinogenicity, teratogenicity, mutagenicity, corrosiveness, explosiveness, radioactivity or flammability or its physical, chemical or infectious characteristics; (EPA(Q) schedule 4).

B PFOS/PFOA are “emerging contaminants”, and subparagraph 7.95(f) is repeated.

- (ii) The obligations in subparagraph (b) arise under s 408 of the EPA Q if land is recorded on the EMR/CLR and/or at common law in respect of the risk of contamination to land.*

7.108. By reason of the matters pleaded in paragraphs 7.79 to 7.107, land in the Townsville Relevant Area has become, and is likely to remain land which is, or may be perceived by prospective purchasers of land to be, unfit for residential purposes or human occupancy because occupiers and visitors have ongoing and largely unavoidable exposure to PFC Contaminants through multiple potential pathways.

PARTICULARS

- (i) The particulars to paragraphs 7.79 to 7.107 are repeated.*

7.109. By reason of the matters pleaded in paragraph 7.108, land in the Townsville Relevant Area has become, and is likely to remain, injuriously affected in its value (**Townsville Contamination Land Value Affection**).

PARTICULARS

- (i) The quantum of the adverse affection on the value of the land of Townsville Group Members will be given following opt out, the determination of the Applicants’ claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Townsville Group Members.*

E.7 The reasonable foreseeability of the injurious affection to the value of land in the Townsville Relevant Area

7.110. At all material times, by reason of the matters pleaded in paragraphs 7.4 to 7.32 and 7.70 to 7.78 above, it was reasonably foreseeable that use of AFFF Working Solution and/or AFFF on the Townsville Base as pleaded in paragraphs 7.34 to 7.69 would result in:

- (a) the Townsville Surface Water Contamination;
- (b) the Townsville Groundwater Contamination;

- (c) the Townsville Soil Contamination;
- (d) the Townsville Biota Contamination; and/or
- (e) the Townsville Contamination Land Value Affectation.

F THE COMMONWEALTH'S ACTS AND OMISSIONS

F.1 The Commonwealth's knowledge

F.1.1 The Commonwealth's knowledge of the Townsville Base and its surrounds

7.111. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) the matters pleaded in Section A1 above;
- (b) the matters pleaded in Section A2 above;
- (c) the matters pleaded in Section A3 above;
- (d) that waters, liquids, and soluble materials discharged on Townsville Base would:
 - (i) permeate or percolate into the soil at the Townsville Base;
 - (ii) be transmitted to the groundwater beneath the Townsville Base and mingle and flow with that groundwater (including in a direction towards the Townsville Surface Water Bodies);
 - (iii) mingle with other surface water on the Townsville Base (especially after periods of rain), and flow overland towards and into the surrounding water catchment areas outside the Townsville Base (including the Townsville Surface Water Bodies) and:
 - (A) permeate or percolate into the soil over which the surface water overland flows occurred; and
 - (B) be transmitted to the groundwater beneath the soil over which the surface water overland flows occurred; and
 - (iv) be transmitted to the Townsville Surface Water Bodies.

PARTICULARS

- (i) *As to sub-paragraph (a), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Townsville Base.*
- (ii) *As to sub-paragraph (b), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Townsville Base or artificial features which the Commonwealth developed, constructed, upgraded and utilised.*
- (iii) *As to sub-paragraph (c), these were natural features which ought reasonably to have been known to a reasonable person occupying the land comprising the Townsville Base or artificial features which the Commonwealth developed, constructed, upgraded and utilised.*
- (iv) *As to sub-paragraph (d), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) to (c) above.*

F.1.2 The Commonwealth's knowledge of water use at Townsville

7.112. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) the matters pleaded in Section B1 above;
- (b) the matters pleaded in Section B2 above; and
- (c) that waters, liquids, and soluble materials discharged and/or allowed to escape the Townsville Base which were transmitted to the Townsville Surface Water Bodies, and the Townsville Aquifers would be used by residents of the Townsville Relevant Area.

PARTICULARS

- (i) *as to sub-paragraph (a), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person occupying the land comprising the Townsville Base.*
- (ii) *as to sub-paragraph (b), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person occupying the land comprising the Townsville Base.*
- (iii) *as to sub-paragraph (c), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) and (b) above.*

F.1.3 The Commonwealth's knowledge of the potential flow of Spent AFFF and Fire Run-Off from the Townsville Base

7.113. At all material times, the Commonwealth knew, or ought reasonably to have known each of:

- (a) that the Townsville Training and Operation Activities (and ancillary storage, containment and disposal practices) resulted in:
 - (i) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF being discharged, or allowed to escape, to bare ground; and/or
 - (ii) very large quantities of AFFF Concentrate, AFFF Working Solution, AFFF and Spent AFFF co-mingled with Fire Run-Off, being discharged, or allowed to escape, to bare ground;
- (b) the matters pleaded in Section C4 above; and
- (c) that use of AFFF Working Solution and AFFF on the Townsville Base would result in Spent AFFF and/or Fire Run-Off co-mingled with Spent AFFF:
 - (i) being transmitted to the groundwater beneath the Townsville Base and mingle and flow with that groundwater (including in a general direction towards the Townsville Surface Water Bodies), and being utilised by persons engaged in the Townsville Groundwater Usages;
 - (ii) mingling with other surface water on the Townsville Base (especially after periods of rain), and flowing overland generally towards and into the surrounding water catchment areas outside the Townsville Base (including to the Townsville Surface Water Bodies) and:
 - (A) permeating or percolating into the soil over which the surface water overland flows occurred; and
 - (B) being transmitted to the groundwater beneath the soil over which the surface water overland flows occurred;

and being extracted and utilised by persons engaged in the Townsville Groundwater Usages;

- (iii) mingling with other surface water on the Townsville Base (especially after periods of rain), and flowing overland generally towards and into the surrounding water catchment areas outside the Townsville Base (including the Townsville Surface Water Bodies) and then being utilised by persons engaged in the Townsville Surface Water Usages.

PARTICULARS

- (i) *As to sub-paragraph (a), these were matters known to the Commonwealth as the entity responsible for conducting the Townsville Training and Operation Activities, and using AFFF Concentrate, AFFF Working Solution and AFFF, and disposing of the same.*
- (ii) *As to sub-paragraph (b), these were matters which were readily observable to, and ought reasonably to have been known by a reasonable person using AFFF Concentrate, AFFF Working Solution and AFFF.*
- (iii) *As to sub-paragraph (c), this ought reasonably to have been known to a reasonable person who knew or ought reasonably to have known of the matters referred to in sub-paragraphs (a) and (b) above, together with the matters pleaded in sub-paragraph 7.111(d).*

F.1.4 The Commonwealth's knowledge of the toxic properties of Spent AFFF and Fire Run-Off

7.114. Paragraph 33 is repeated.

7.115. Paragraph 34 is repeated.

7.116. Further, or alternatively, at all material times from 16 May 2000, alternatively 2003, the Commonwealth knew that its Townsville Training and Operations Activities at the Townsville Base using AFFF Working Solution and AFFF were:

- (a) potentially damaging to the environment; and/or
- (b) potentially causative of adverse health effects in humans.

PARTICULARS

- (i) *As to sub-paragraph (a), the particulars to paragraph 34 are repeated.*
- (ii) *As to sub-paragraph (b), the matters referred to in particular (i) involved knowledge of the contamination of groundwater, and it may be inferred that a person who knew that groundwater was contaminated also knew that there existed a potential for adverse health effects in humans who may*

consume groundwater, or produce (including livestock) watered with groundwater.

7.117. Paragraph 35 is repeated.

7.118. Further, or alternatively, at all material times from sometime in 2003 (**Townsville Contamination Knowledge Date**), the Commonwealth knew or ought reasonably to have known that AFFF Working Solution, AFFF, and Spent AFFF had contaminated groundwater under the Townsville Base.

PARTICULARS

- (i) WSP DSI Report at part 12 and Appendix D.*
- (ii) As to sub-paragraph (a) see Schedule 9.*
- (iii) As to sub-paragraph (b), the matters referred to in particular (i) involved knowledge of the contamination of groundwater, and it may be inferred that a person who knew that groundwater was contaminated also knew that there existed a potential for adverse health effects in humans who may consume groundwater.*

F.2 The Commonwealth's conduct

F.2.1 The Commonwealth's deliberate conduct

7.119. At all material times, the Commonwealth's:

- (a) use of AFFF in the Townsville Training and Operations Activities, as pleaded in paragraphs 7.34 to 7.67; and/or
 - (b) method of disposal of AFFF and Spent AFFF, as pleaded in paragraph 7.68,
- was deliberate.

F.2.2 The Commonwealth's careless conduct

7.120. Further, or alternatively, by reason of the matters pleaded in paragraphs 7.34 to 7.69 at all material times on and after each of the times identified in paragraphs 7.114 to 7.118 the Commonwealth carelessly:

- (a) did the following acts:
 - (i) it allowed large quantities of AFFF to be discharged to bare ground;
 - (ii) it allowed Spent AFFF and Fire Run-Off to flow directly onto bare ground in large quantities;

- (iii) it allowed Spent AFFF and Fire Run-Off to permeate or percolate into the soil at the Townsville Base;
 - (iv) it allowed Spent AFFF and Fire Run-Off to be transmitted to the groundwater beneath the Townsville Base, including the Townsville Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Townsville Relevant Area);
 - (v) it allowed Spent AFFF and Fire Run-Off to drain into the surrounding water catchment areas (including via the Townsville Drainage System), including into the Townsville Surface Water Bodies; and/or
 - (vi) it allowed Spent AFFF and Fire Run-Off to be transmitted to the Townsville Surface Water Bodies; and/or
 - (vii) to the extent it stored store wastewater from the use of AFFF Working Solution and AFFF, it did so in such a way that it failed to avoid leakage to the surrounding environment;
- (b) made the following omissions:
- (i) it failed to investigate and assess, or to do so adequately, the risks associated with the use of AFFF before using, or continuing to use AFFF;
 - (ii) it failed to restrict, or to do so adequately, the use of AFFF Working Solution and AFFF only to emergencies;
 - (iii) it failed to take any or any adequate steps to contain or limit the use of AFFF Working Solution and AFFF in the Townsville Training and Operations Activities;
 - (iv) it failed to take any or any adequate steps to contain, capture, clean up and securely dispose of Spent AFFF and Fire Run-Off, such that it did not:
 - (A) flow directly onto bare ground;
 - (B) permeate or percolate into the soil at the Townsville Base;

- (C) become transmitted to the groundwater beneath the Townsville Base (where it was likely to mingle with groundwater underlying areas off-base in the Townsville Relevant Area);
 - (D) drain into the surrounding water catchment areas (including via the Townsville Drainage System), including into Townsville Surface Water Bodies; and
 - (E) transmit to the Townsville Surface Water Bodies;
- (v) it failed to store wastewater from the use of AFFF Working Solution and AFFF in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
 - (vi) it failed to take any or any adequate steps to remediate the contamination of the groundwater under the Townsville Base at any time after the time when it knew or ought reasonably to have known that groundwater was contaminated, as pleaded in paragraphs 7.114 to 7.118 (to the extent, which is unknown to the Applicants, that the contamination may at one time have been remediable); and/or
 - (vii) it failed to take any or any adequate steps to remediate the contamination of the soil on the Townsville Base at any time after the time when it knew or ought reasonably to have known that soil was contaminated (including to prevent Spent AFFF and Fire Run Off leaching, or further leaching into the groundwater or surface water, (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable).

PARTICULARS

- (i) *As to subparagraph (a)(i), paragraphs 7.34 to 7.69 are repeated.*
- (ii) *As to subparagraph (a)(ii), paragraphs 7.34 to 7.69 are repeated.*
- (iii) *As to subparagraph (a)(iii), paragraphs 7.34 to 7.69 and 7.90 to 7.91 are repeated.*
- (iv) *As to subparagraph (a)(iv), paragraphs 7.34 to 7.69 and 7.85 to 7.89 are repeated.*
- (v) *As to subparagraph (a)(v), paragraphs 7.34 to 7.69 and 7.79 to 7.84 are repeated.*

- (vi) *As to subparagraph (a)(vi), paragraphs 7.34 to 7.69 and 7.79 to 7.84 are repeated.*
- (vii) *As to subparagraph (a)(vii), paragraphs 7.34 to 7.69 and 7.79 to 7.93 are repeated.*
- (viii) *As to subparagraph (b)(i), paragraphs 7.34 to 7.69 and 7.114 to 7.118 are repeated.*
- (ix) *As to subparagraph (b)(ii), paragraphs 7.34 to 7.69 are repeated.*
- (x) *As to subparagraph (b)(iii), paragraphs 7.34 to 7.69 are repeated.*
- (xi) *As to subparagraph (b)(iv), paragraphs 7.34 to 7.69 and 7.79 to 7.93 are repeated.*
- (xii) *As to subparagraph (b)(v), paragraphs 7.34 to 7.69 are repeated.*
- (xiii) *As to subparagraph (b)(vi), paragraphs 7.34 to 7.69 and 7.114 to 7.118 are repeated.*
- (xiv) *As to subparagraph (b)(vii), paragraphs 7.34 to 7.69 and 7.114 to 7.118 are repeated.*

7.121. Further, or alternatively, the Commonwealth:

- (a) failed, at all material times after the Townsville Contamination Knowledge Date, to warn persons resident in the Townsville Relevant Area that:
 - (i) it had been using AFFF Working Solution and AFFF at the Townsville Base since or about 1976;
 - (ii) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Townsville Base and entered and/or contaminated, the Townsville Aquifers, Townsville Surface Water Bodies, and the Townsville Catchments; and/or
 - (iii) Spent AFFF was:
 - (A) potentially damaging to the environment; and/or
 - (B) potentially causative of adverse health effects in humans; and/or

7.122. Further, or alternatively, the Commonwealth failed, at all material times after the inception of the *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, Volume 1, Ch6(6), to comply with that measure by providing all relevant information on site contamination for persons resident in the Townsville Relevant Area.

G THE COMMONWEALTH'S LIABILITY

G.1 Nuisance

G.1.1 Liability in nuisance

7.123. By its use of the Townsville Base as pleaded in paragraphs 7.34 to 7.69 and 7.119 to 7.120, the Commonwealth has created, and continued, an interference with the use and enjoyment of the land owned by Townsville Group Members (**the Townsville Nuisance**), in that:

- (a) their land is affected by the Townsville Surface Water Contamination and/or the Townsville Groundwater Contamination, and such contamination is irremediable (and paragraphs 7.79 to 7.89 are repeated);
- (b) they are no longer able safely to use private bores on their land to access the Townsville Aquifers as a water supply for Townsville Groundwater Usages, given the Townsville Aquifers are irremediably contaminated (and paragraphs 7.85 to 7.89 are repeated);
- (c) their soil has sustained Townsville Soil Contamination, and such contamination is irremediable (and paragraphs 7.90 to 7.91 are repeated);
- (d) their land is affected by the Townsville Biota Contamination, and such contamination is irremediable (and paragraphs 7.92 to 7.93 are repeated); and
- (e) those occupying their land are subject to the Townsville Ongoing Contaminant Exposure.

PARTICULARS

- (i) *The interference with the land of Townsville Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Townsville Group Members.*

7.124. Further, by reason of the matters pleaded in paragraphs 7.28, 7.32, 7.72, 7.78, 7.110 and/or 7.111 to 7.118, at all material times it was reasonably foreseeable to a reasonable person in the Commonwealth's position that persons owning land in the Townsville Relevant Area (including Townsville Group Members) would suffer loss by the Commonwealth's use of the Townsville Base as pleaded in paragraphs 7.34 to 7.69,

being pure economic loss, in the form of diminution in the value of land in the Townsville Relevant Area.

PARTICULARS

- (i) *Paragraphs 7.28, 7.32, 7.72, 7.78, 7.110 and/or 7.111 to 7.118 are repeated.*

7.125. By reason of the matters pleaded in paragraphs 7.123 and 7.124, the Townsville Nuisance constitutes a substantial and unreasonable interference with the use and enjoyment of the land owned by Townsville Group Members.

G.1.2 Causation, loss and damage

7.126. The Townsville Nuisance directly caused:

- (a) the Townsville Surface Water Contamination (as pleaded in paragraph 7.83);
- (b) the Townsville Groundwater Contamination (as pleaded in paragraph 7.88);
- (c) the Townsville Soil Contamination (as pleaded in paragraph 7.90);
- (d) the Townsville Biota Contamination (as pleaded in paragraph 7.92); and/or
- (e) the Townsville Contamination Land Value Affectation (as pleaded in paragraph 7.109),

and Townsville Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *Particulars of the losses of Townsville Group Members will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Townsville Group Members.*

G.1.3 Aggravated and exemplary damages

7.127. Further, on and from the Actual Knowledge Date, by continuing the Townsville Nuisance by:

- (a) continuing to do the acts as pleaded in paragraph 7.119 and/or sub-paragraph 7.120(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 7.120(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 7.111 to 7.118, the Commonwealth engaged in aggravating conduct, and Townsville Group Members claim aggravated damages.

7.128. Further, or alternatively, on and from the Actual Knowledge Date, by continuing the Townsville Nuisance by:

- (a) continuing to do the acts as pleaded in paragraph 7.119 and/or sub-paragraph 7.120(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 7.120(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 7.111 to 7.118, the Commonwealth engaged in conduct in contumelious disregard for the rights of Townsville Group Members, and Townsville Group Members claim exemplary damages.

G.2 Negligence

G.2.1 Townsville Duty of care

7.129. At all material times, persons other than the Commonwealth (including Townsville Group Members) had no capacity to control the activities of the Commonwealth on the Townsville Base, and in particular the use of AFFF Working Solution and AFFF on the Townsville Base.

7.130. At all material times, the land in the Townsville Relevant Area (including the land owned by Townsville Group Members) was physically proximate to the Townsville Base.

7.131. At all material times, by reason of the matters pleaded in paragraphs 7.129 to 7.130 persons owning, or considering purchasing land in the Townsville Relevant Area (including Townsville Group Members) were in a position of vulnerability.

7.132. By reason of the matters pleaded in paragraphs 7.28, 7.32, 7.72, 7.78, 7.110 and/or 7.111 to 7.118 a reasonable person in the Commonwealth's position would have foreseen a reasonably foreseeable and not insignificant risk of harm to persons owning, or acquiring land in the Townsville Relevant Area (including Townsville Group Members) by the Commonwealth's use of AFFF Working Solution and AFFF on the Townsville Base as pleaded in paragraphs 7.34 to 7.69, being pure economic loss, in the form of diminution in the value of their land (the **Townsville Risk of Harm**).

PARTICULARS

- (i) *Paragraphs 7.28, 7.32, 7.72, 7.78, 7.110 and/or 7.111 to 7.118 are repeated.*

7.133. By reason of the matters pleaded in paragraphs 7.129 to 7.132, the Commonwealth owed a duty to each and all of the Townsville Group Members to exercise reasonable care, in the use of AFFF Working Solution and AFFF on the Townsville Base not to cause pure economic loss, in the form of diminution in the value of land in the Townsville Relevant Area (**Townsville Duty of Care**).

7.134. By reason of the matters pleaded in paragraphs 7.129 to 7.132, on and after the Actual Knowledge Date, alternatively the Townsville Contamination Knowledge Date, the Commonwealth owed a duty to each and all of Townsville Group Members to exercise reasonable care to warn them that:

- (a) it had been using AFFF at the Townsville Base since or about 1976;
- (b) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Townsville Base and entered and/or contaminated the Townsville Aquifer and/or contaminated the Townsville Surface Water Bodies; and
- (c) Spent AFFF was:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans,

(**Townsville Duty to Warn**).

G.2.2 Scope of Townsville Duty of Care

7.135. On and from 1 March 1973, the *Clean Waters Act 1971* (Qld) (**CWA Q**):

- (a) obliged occupiers of land in Queensland (including the Crown) to keep and use premises, conduct any trade, industry or process and operate works and control equipment in or on such premises in such a manner as to avoid “water pollution” by the discharge of wastes therefrom, and so that any matter or thing, whether solid, liquid or gaseous is not placed in or on such premises in such a manner that “water pollution” is caused or is likely to be caused by any part of such matter or thing falling or being carried or washed or blown into any waters or by the percolation of any part of such matter or thing into any waters; and

- (b) defined “water pollution” to mean any change in the properties of any “waters” (meaning all waters of Queensland, including underground waters, tidal waters, lakes, water storages, rivers, streams and watercourses (including the bed and banks of any such waters) such as to cause or be likely to cause a nuisance or render such waters harmful, detrimental or injurious to public health, safety or welfare or to domestic, commercial, industrial, agricultural recreational or other legitimate uses thereof or to livestock, wild animals, birds, fish or other aquatic life.

PARTICULARS

- (i) *CWA Q ss 4, 8 and 31.*

7.136. On and from 1 March 1995, the EPA Q:

- (a) obliged persons not to cause “environmental harm”, being any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an “environmental value” (being a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety), unless the person takes all reasonable and practicable measures to prevent or minimise the harm; and
- (b) made it an offence to cause or allow a contaminant to be placed in a position where it could reasonably be expected to cause:
 - (i) environmental nuisance (being unreasonable interference or likely interference with an environmental value by, inter alia, an unhealthy condition because of contamination); and
 - (ii) material environmental harm (being environmental harm (other than environmental nuisance) that was not trivial or negligible in nature, extent or context or that causes actual or potential loss or damage to property of more than \$5,000.

PARTICULARS

- (i) *As to sub-paragraph (a), EPA Q ss 9, 14 and 36.*
- (ii) *As to subparagraph (b), EPA Q ss 15 and, 16, 126.*

7.137. At all material times:

- (a) from 1 March 1973 to 1 March 1995, the content of the CWA Q (as pleaded in paragraph 7.135); and

- (b) from 1 March 1995 onwards, the content of the EPA Q (as pleaded in paragraph 7.136),

bound the Commonwealth by reason of the *Commonwealth Places (Application of Laws) Act 1970* (Cth), and/or informed the scope of what a reasonable person ought do in relation to conduct which it was reasonably foreseeable might result in environmental harm (including the Townsville Risk of Harm pleaded in paragraph 7.132).

7.138. The Commonwealth had the capacity to exercise control of the Townsville Training and Operations Activities and the use of AFFF Working Solution and AFFF on the Townsville Base so as to take the precautions which a reasonable person in its position would have taken against the Townsville Risk of Harm, by:

- (a) not doing the following acts at all, or alternatively any time after each of Actual Knowledge Date:
- (i) allowing large quantities of AFFF Working Solution and AFFF to be discharged to bare ground;
 - (ii) allowing Spent AFFF and Fire Run-Off to flow directly onto bare ground in large quantities;
 - (iii) allowing Spent AFFF and Fire Run-Off to permeate or percolate into the soil at the Townsville Base;
 - (iv) allowing Spent AFFF and Fire Run-Off to be transmitted to the groundwater beneath the Townsville Base, including the Townsville Aquifers (where it was likely to mingle with groundwater underlying areas off-base in the Townsville Relevant Area);
 - (v) allowing Spent AFFF and Fire Run-Off to drain into the surrounding water catchment areas (including via the Townsville Drainage System), including into Townsville Surface Water Bodies;
 - (vi) allowing Spent AFFF and Fire Run-Off to be transmitted to the Townsville Surface Water Bodies; and/or
 - (vii) to the extent it stored wastewater from the use of AFFF, doing so in such a way that it did not leak into surrounding soil (so as to avoid leakage to

the surrounding environment) failed to avoid leakage to the surrounding environment;

- (b) doing the following things, at any time, or alternatively any time after each of the Actual Knowledge Date:
 - (i) investigating and assessing the risks associated with the use of AFFF Working Solution and AFFF before using, or continuing to use, AFFF Working Solution and AFFF (and not using them at all);
 - (ii) restricting the use of AFFF Working Solution and AFFF only for emergency activities;
 - (iii) taking steps to contain or limit the use of AFFF Working Solution and AFFF in the Townsville Training and Operations Activities;
 - (iv) taking steps to contain, capture, clean up and securely dispose of Spent AFFF and Fire Run-Off, such that it did not:
 - (A) flow directly onto bare ground;
 - (B) permeate or percolate into the soil at the Townsville Base;
 - (C) become transmitted to the groundwater beneath the Townsville Base, including the Townsville Aquifer (where it was likely to mingle with groundwater underlying areas off-base in the Townsville Relevant Area);
 - (D) drain into the surrounding water catchment areas (including via the Townsville Drainage System), including into Townsville Surface Water Bodies; and
 - (E) transmit to the Townsville Surface Water Bodies;
 - (v) storing wastewater from the use of AFFF in such a way that it did not leak into surrounding soil (so as to avoid leakage to the surrounding environment);
 - (vi) taking steps to remediate the contamination of the groundwater under the Townsville Base promptly after the time when it knew or ought reasonably to have known that groundwater was, or was likely to have been,

contaminated, as pleaded in paragraphs 33 to 35 (to the extent, which is unknown to the Applicants, that the contamination may at one time have been remediable); and/or

- (vii) taking steps to remediate contaminated soil on the Townsville Base at any time promptly after the time when it knew or ought reasonably to have known that soil was contaminated (including by removing that soil and disposing of it at an off-site disposal area so as to prevent Spent AFFF and Fire Run Off leaching, or further leaching into the groundwater or surface water, (to the extent, which is unknown to the Applicant, that the contamination may at one time have been remediable).

G.2.3 Scope of Townsville Duty to Warn

7.139. At all material times after the Townsville Contamination Knowledge Date, alternatively the Actual Knowledge Date, the Commonwealth had capacity to warn the general public, alternatively owners and residents of the Townsville Relevant Area, alternatively potential purchasers of land in the Townsville Relevant Area (including Townsville Group Members) that:

- (a) it had been using AFFF Working Solution and AFFF at the Townsville Base since or about 1976;
- (b) Spent AFFF had, or was likely to have, permeated and percolated into the soil at the Townsville Base and entered and/or contaminated the Townsville Aquifers and/or contaminated the Townsville Surface Water Bodies; and
- (c) Spent AFFF was:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans.

G.2.4 Breach of duty

7.140. By reason of the matters pleaded in paragraphs 7.34 to 7.69, 7.120 and 7.138, the Commonwealth breached the Townsville Duty of Care (the **Townsville Negligence**).

7.141. By reason of the matters pleaded in paragraphs 7.34 to 7.69, 7.121 and 7.139, the Commonwealth breached the Townsville Duty to Warn (the **Townsville Negligent Failure to Warn**).

G.2.5 Causation, loss and damage

7.142. The Commonwealth's Townsville Negligence caused:

- (a) the Townsville Surface Water Contamination (as pleaded in paragraph 7.83);
- (b) the Townsville Groundwater Contamination (as pleaded in paragraph 7.88);
- (c) the Townsville Soil Contamination (as pleaded in paragraph 7.90);
- (d) the Townsville Biota Contamination (as pleaded in paragraph 7.92); and/or
- (e) the Townsville Contamination Land Value Affectation (as pleaded in paragraph 7.109), and

Townsville Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *The particulars to paragraph 7.126 are repeated.*

7.143. Further, or alternatively, the Commonwealth's Townsville Negligent Failure to Warn caused or materially contributed to some Townsville Group Members acquiring land in the Townsville Relevant Area, and Townsville Group Members have thereby suffered loss and damage.

PARTICULARS

- (i) *Particulars of the identity of those Townsville Group Members who would not have acquired land were it not for the Commonwealth's Townsville Negligent Failure to Warn will be given following opt out, the determination of the Applicants' claim and identified common issues at an initial trial and if and when it is necessary for a determination to be made of the individual claims of those Townsville Group Members, and the particulars paragraph 7.126 is repeated.*

G.2.6 Aggravated and exemplary damages

7.144. Further, on and from each of the Townsville Actual Knowledge Dates by:

- (a) continuing to do the acts as pleaded in paragraph 7.119 and/or sub-paragraph 7.120(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 7.120(b) (and each of them),

in circumstances where it had the knowledge as pleaded in paragraphs 7.111 to 7.118, the Commonwealth engaged in aggravating conduct, and Townsville Group Members claim aggravated damages.

7.145. Further, or alternatively, on and from each of the Townsville Actual Knowledge Dates by:

- (a) continuing to do the acts as pleaded in paragraph 7.119 and/or sub-paragraph 7.120(a) (and each of them); and/or
- (b) continuing to fail to do the things as pleaded in sub-paragraph 7.120(b) (and each of them),

in circumstances where it where it had the knowledge as pleaded in paragraphs 7.111 to 7.118, the Commonwealth engaged in conduct in contumelious disregard for the rights of Townsville Group Members, and Townsville Group Members claim exemplary damages.

G.3 Breach of statutory duty

G.3.1 Liability

7.146. The Townsville Base is situated on Commonwealth land as defined in ss 27 and 525 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**).

7.147. Pursuant to s 28 of the EPBC Act, the Commonwealth or a Commonwealth agency must not take an action that has, will have, or is likely to have a significant impact on the environment, defined by s 528 non-exhaustively to include:

- (a) ecosystems and their constituent parts, including people and communities;
- (b) natural and physical resources;
- (c) the qualities and characteristics of locations, places and areas;
- (d) heritage values of places; and
- (e) the social, economic and cultural aspects of a thing mentioned in paragraph (a), (b), (c) or (d).

7.148. By its use of the Townsville Base on and from 16 July 1999, as pleaded in paragraphs 7.34 to 7.69 and 7.119 and/or 7.120, the Commonwealth took an action or actions that has or is likely to have a significant impact on the environment.

PARTICULARS

- (i) *These actions have had such an impact by reason of the matters pleaded in paragraphs 7.79 to 7.93, namely the Townsville Surface Water Contamination, Townsville Toxic Plume, the Townsville Groundwater Contamination, the Townsville Soil Contamination, and the Townsville Biota Contamination*
- (ii) *These actions were likely to have such an impact by reason that they were reasonably foreseeable, by reason of the matters pleaded in paragraphs 7.28, 7.32, 7.72, 7.78 and 7.110.*

7.149. By reason of the matters pleaded in paragraph 7.148, the Commonwealth has contravened s 28 of the EPBC Act (**Townsville EPBC Act Breach**).

G.3.2 Causation, loss and damage

7.150. The Townsville EPBC Act Breach caused:

- (a) the Townsville Surface Water Contamination (as pleaded in paragraph 7.83);
- (b) the Townsville Groundwater Contamination (as pleaded in paragraph 7.88);
- (c) the Townsville Soil Contamination (as pleaded in paragraph 7.90);
- (d) the Townsville Biota Contamination (as pleaded in paragraph 7.92); and/or
- (e) the Townsville Contamination Land Value Affectation (as pleaded in paragraph 7.109),

and Townsville Group Members have thereby suffered loss and damage arising from the Townsville EPBC Act Breach.

PARTICULARS

- (i) *The particulars to paragraph 7.126 are repeated.*

ANNEXURE 7A: TOWNSVILLE RELEVANT AREA



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