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Form 17
Rule 8.05(1)(a)

Statement of Claim

No. of 2026

Federal Court of Australia

District Registry: Victoria

Division: General

THE COMMONWEALTH OF AUSTRALIA

Applicant

3M COMPANY (DELAWARE COMPANY NUMBER 262413)

First Respondent

3M AUSTRALIA PTY LTD (ACN 000 100 096)

Second Respondent

Filed on behalf of: The Commonwealth of Australia, Applicant

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Table of Contents

A.	THE PARTIES.....	1
A.1	The Parties	1
A.2	3M's organisational and management structure	6
A.3	3M and 3M Australia shared directors, senior employees and product information processes	13
B.	THE COMMONWEALTH'S BASES	17
C.	3M AQUEOUS FILM FORMING FOAM.....	21
C.1	3M development of 3M AFFF	21
C.2	Properties of 3M AFFF.....	25
D.	THE EMERGENCE OF ENVIRONMENTAL AND TOXICITY CONCERNS WITH 3M'S FLUOROCHEMICAL PRODUCTS.....	35
D.1	Period prior to 1973	35
D.2	The period between 1973 to 1979	43
D.3	The period between 1980 to 2000	59
E.	PROCUREMENT OF 3M AFFF BY DEFENCE.....	79
E.1	Period Prior to 1973.....	79
E.2	The period between 1973 to 1979	86
E.3	Period between 1980 and 2000	92
F.	USE OF 3M AFFF AT THE BASES.....	106
F.1	Use of 3M AFFF at the Bases pre-2003	106
F.2	Storage and Disposal of 3M AFFF	107
F.3	Management and disposal of 3M AFFF	107
F.4	Cessation of use of 3M AFFF	107
F.5	Knowledge of 3M and 3M Australia as to the uses of 3M AFFF	108
F.6	Contamination Sources	109
G.	INVESTIGATION INTO POTENTIAL PFAS CONTAMINATION, IDENTIFICATION OF CONTAMINATION AND ONGOING MONITORING ..	110
G.1	Environmental Guidelines for Management of PFAS Contamination	110
G.2	Investigation and Ongoing Monitoring	115
H.	CONTAMINATION PATHWAYS AND RECEPTORS AT THE DEFENCE BASES AND SURROUNDING AREAS	116
H.1	Contamination Pathways	116
H.2	Contamination Receptors.....	116
H.3	Continuing Contamination: Categories of Bases and surrounding areas	117
H.4	New or increased contamination by reason of new exceedances of Drinking Water Guidelines and Recreational Water Guidelines	118
H.5	PFAS Management Areas and prioritisation of Bases.....	119
H.6	PFAS Management Areas.....	122
H.7	Imposition of restrictions and guidelines.....	123

I.	REMEDICATION AND MITIGATION ACTIVITIES	124
I.1	Remediation and Mitigation Activities.....	124
J.	COSTS ARISING FROM THE PFAS CONTAMINATION	125
K.	PUBLIC NUISANCE.....	132
K.1	3M.....	132
K.2	3M Australia	139
L.	CLAIMS UNDER THE ENVIRONMENTAL PROTECTION ACT 2017	145
M.	MISLEADING OR DECEPTIVE CONDUCT	151
M.1	Conduct of 3M and 3M Australia	151
M.2	Trade and Commerce.....	159
M.3	Future Matters.....	159
M.4	Statutory Attribution.....	160
M.5	Misleading or Deceptive Conduct	160
M.6	Causation, loss and damage	165
N.	RELIEF.....	170
O.	GLOSSARY.....	172
Table A		176
	Table A, Part I : 3M directors and senior employees.....	179
	Table A, Part II : Committees and Projects.....	277
	Table A, Part III : 3M Australia directors and associated roles of 3M or of its other international subsidiaries.....	287
	Table A, Part IV : Composition of the directors of 3M Australia.....	296
	Table A, Part V : Table of 3M Annual Reports	302
SCHEDULE 1 – Jervis Bay Base		307
SCHEDULE 2 – Albatross Base.....		360
SCHEDULE 3 – Blamey Base		403
SCHEDULE 4 – Holsworthy Base		451
SCHEDULE 5 – Richmond Base		491
SCHEDULE 6 – Singleton Base		527
SCHEDULE 7 – Wagga Base		575
SCHEDULE 8 – Williamtown Base.....		636
SCHEDULE 9 – Darwin Base		691
SCHEDULE 10 – Robertson Base		742
SCHEDULE 11 – Tindal Base.....		781
SCHEDULE 12 – Amberley Base		833
SCHEDULE 13 – Cairns Base		896
SCHEDULE 14 – Lavarack Base.....		952
SCHEDULE 15 – Oakey Base.....		995

SCHEDULE 16 – Townsville Base.....	1047
SCHEDULE 17 – Wide Bay Base	1098
SCHEDULE 18 – Edinburgh Base	1133
SCHEDULE 19 – Bandiana Base.....	1178
SCHEDULE 20 – Cerberus Base	1222
SCHEDULE 21 – East Sale Base	1266
SCHEDULE 22 – Williams Base.....	1309
SCHEDULE 23 – Pearce Base	1381
SCHEDULE 24 – Gingin Base	1426
SCHEDULE 25 – Holt Base	1471
SCHEDULE 26 – Learmonth Base.....	1522
SCHEDULE 27 – Stirling Base	1557

A. THE PARTIES

A.1 The Parties

1. The Applicant, the **Commonwealth** of Australia is represented in this proceeding by the **Department** of Defence and the Australian **Defence** Force, which consists of the Royal Australian **Navy**, the Australian **Army**, and the Royal Australian **Air Force**.
2. The First Respondent, **3M** Company (formerly known as the Minnesota Mining and Manufacturing Company) at all material times:
 - (a) is and was a company incorporated in the state of Delaware in the United States of America and by reason of the matters in subparagraphs (e) and (g), capable of being sued in Australia;
 - (b) is and was a foreign corporation within the meaning of the *Competition and Consumer Act 2010* (Cth) (**CCA**) and the *Trade Practices Act 1974* (Cth) (**TPA**);

Particulars

‘Foreign corporation’ is defined in section 4 of the CCA and section 4 of the TPA.

- (c) is and was the owner of the Second Respondent;

Particulars

3M is the owner of 3M International Holding B.V., a company incorporated in the Netherlands. 3M Australia is a fully owned subsidiary of 3M International Holding B.V.

- (d) controlled and directed the conduct of the Second Respondent;

Particulars

That 3M controlled and directed the conduct of the Second Respondent is inferred from the following facts and matters, being that at all material times 3M:

- (a) was the ultimate owner of 100 per cent of the shares of 3M Australia, as set out in the particulars to paragraph 2(c) above;
- (b) implemented a policy or practice that a substantial portion of the Second Respondent’s directors be appointed from its own directors or senior employees;

- (c) determined, or otherwise approved the appointment, of the Second Respondent's managing director, who (save for the period between 1972 to 1988) was also a director of 3M;

Further to (b) and (c) above, the Commonwealth refers to:

- (i) 3M Public Relations Department, *Our Story So Far – Notes from the first 75 years of 3M Company* (Minnesota Mining and Manufacturing Company, 1977) (**HOL.0001.0058.0245** at .0284, .0297);
- (ii) Colin Rimington, *From Minnesota Mining and Manufacturing to 3M Australia Pty Ltd – The Story of an Innovative Company*, (Sid Harta Publishers, 2013) (**HOL.0001.0058.0660** at .0668-.0671);
- (iii) 3M Company, *A Century of Innovation: The 3M Story*, (3M Company, Ed 1, 2002) (**HOL.0001.0040.0292** at .0444-.0446);
- (iv) the fact that at all times since 1952, the directors of the Second Respondent have included 3M directors or senior employees. **Table A, Part III** annexed to this Statement of Claim, further sets out the Commonwealth's present understanding of the directors of the Second Respondent, as well as their roles as directors or senior employees of 3M. **Table A, Part IV** annexed to this Statement of Claim identifies the crossover between 3M employees and the directors of the Second Respondent;
- (v) the fact that, since 1952, all of the Second Respondent's managing directors have also been 3M directors or senior employees, with the exception of the period between 1972 to 1988, when Bruce Chapman was appointed managing director (but who immediately prior to his appointment had been the managing director of 3M's Far East Operations);
- (d) set and approved the financial targets and product sales budgets for the Second Respondent (see Lester C Krogh et al, '3M's International Experience' (1990) 33(5) Research Technology Management 23 (**HOL.0001.0057.08162** at .08164);
- (e) provided product data and information (including as to their environmental properties or safety) to the Second Respondent (as described in paragraphs 6 and 10 below);
- (f) required the Second Respondent to adhere to its own internal policies and processes, including in relation to the sale and marketing of products (as described in paragraph 6 below) and from at least 1975 onwards, its

environmental program ‘Pollution Prevention Pays’ (as described in paragraph 6 below);

Further to (f) above, the Commonwealth refers to:

- (i) 3M Public Relations Department, *Our Story So Far – Notes from the first 75 years of 3M Company* (Minnesota Mining and Manufacturing Company, 1977) (**HOL.0001.0058.0245** at .0286, .0289-.0291);
- (ii) Lester C Krogh et al, ‘3M’s International Experience’ (1990) 33(5) *Research Technology Management* 23 (**HOL.0001.0057.08162** at .08164 and .08166);
- (iii) Geoffrey Nicholson, ‘How 3M Manages Its Global Laboratory Network’, (1994) 37(4) *Research Technology Management* 21 (**HOL.0001.0057.08168** at .08170);
- (iv) Ernest Gundling, *The 3M Way to Innovation: Balancing People and Profit*, (Kodansha International Ltd, 2000) (**HOL.0001.0058.0385** at .0449);
- (v) 3M Company, *A Century of Innovation: The 3M Story*, (3M Company, Ed 1, 2002) (**HOL.0001.0040.0292** at .0445 and .0457);
- (vi) 3M’s Pollution Prevention Pays program, designed in 1975 by the Environmental Engineering and Pollution Control Department (**HOL.0001.0040.0292** at .0485-.0487) and adopted by the Corporate Responsibility Committee. The program is stated to apply to all “3M U.S. and O.U.S [outside United States] operations”, as set out in 3M, ‘**Environmental, Health, Safety, and Regulatory** (EHS&R) Profile of Perfluorobutane Sulfonate (PFBS),’ (Technical Data Bulletin, 2002) (**ENV.2000.0019.8898**) which stated:

“3M...will continue to recognize and exercise its responsibility to:

- *Solve its own environmental pollution).and conservation problems*
- *Prevent pollution at the source wherever and whenever possible*
- *Develop products that will have a minimum effect on the environment*
- *Conserve natural resources through the use of reclamation and other appropriate methods*
- *Assure that its facilities and products meet and sustain the regulations of all federal, state and local environmental agencies*

- *Assist, wherever possible, governmental agencies and other official organizations engaged in the environmental activities” (.8902).*
- (e) between about 1962 to about 2003, developed, manufactured, marketed and distributed for worldwide sale, including in Australia:
- (i) various fire-fighting foam products comprising an aqueous film forming foam sold under the brand name ‘3M Light Water’, in 6 per cent and 3 per cent concentrates (**3M AFFF**); and
 - (ii) the chemicals required to manufacture 3M AFFF;

Particulars

From about 1949, 3M developed a range of fluorochemical products (described in more detail in paragraph 20 below), which included in their chemical composition, certain per and poly-fluoroalkyl substances (**PFAS**) (described in more detail in paragraph 19 below) (collectively referred to as **3M’s fluorochemical products**).

PFAS are a large, complex group of synthetic chemicals, which are soluble in water. They are commonly referred to as ‘forever chemicals’, as they have strong carbon-fluorine bonds, making them extremely resistant to natural attenuation processes (such as naturally occurring physical, chemical and biological processes). As a result, if they are introduced into soils or waters, they can remain present for long periods of time (described in more detail in paragraph 26 below).

Once in the environment (i.e. soils and waters), PFAS can enter people, plants and animals, primarily via exposure to contaminated waters, soils, food or air. Once PFAS enters the body, they tend to bind to proteins in blood and the liver, and are not easily eliminated. As a result, they have been associated with a range of adverse effects (described in more detail in paragraph 27 below).

From about 1962, 3M used some of these fluorochemical products to manufacture 3M AFFF, including those described in paragraphs 22 and 24 below.

The Commonwealth otherwise refers to **Part C** below.

- (f) between about 1966 to about 2003, supplied or exported to the Second Respondent:
- (i) 3M AFFF;

- (ii) the requisite formulas and constituent chemicals for the manufacture of 3M AFFF,

for on sale to third parties in Australia, including the Commonwealth;

- (g) a company carrying on business in Australia within the meaning of section 5(1)(g) of the CCA, and section 5 of the TPA, either directly or by and/or through the Second Respondent.

Particulars

By engaging in the conduct described in subparagraph (f) above and in **Part E** of this Statement of Claim, 3M was carrying on business within Australia.

- 3. The Second Respondent, **3M Australia** Pty Ltd (formerly known as Minnesota Mining and Manufacturing (Australia) Pty Ltd), at all material times:

- (a) is and was a company incorporated in New South Wales and capable of being sued;
- (b) is and was wholly owned by 3M;
- (c) between at least about 1966 to about 2003, was the importer from 3M for sale in Australia of:
 - (i) 3M AFFF; and
 - (ii) the chemicals required to manufacture 3M AFFF;
- (d) in the course of selling 3M AFFF and the chemicals required to manufacture 3M AFFF in Australia, did so as the representative, and with the authority, of 3M;

Particulars

The Commonwealth refers to **Part E** of this Statement of Claim, including, without limitation, that no distinction was made between the First and Second Respondents in their dealings with the Commonwealth (documents, brochures, correspondence and the like were presented as from “3M”).

Further particulars may be provided after discovery.

- (e) in the course of carrying on its business in Australia, was the agent of 3M.

Particulars

That 3M Australia was the agent of 3M is to be implied from at least the matters set out in paragraphs 2(c), 3(c) and 3(d) above.

4. 3M AFFF was a type of firefighting foam that was designed by 3M to be used in, and was primarily used for, the suppression of Class B, flammable liquid fires, especially those involving hydrocarbon fuels.

Particulars

Class B fires are classified as such by standards ISO3941 (International); AS/NZS 1850 (Australia/New Zealand); DIN EN2 Classification of fires (Europe); NFPA 10 Chapter 5.2.1–5.2.5 (USA).

A.2 3M's organisational and management structure

5. From about 1960 onwards, 3M's operational structure was divided into various product or other management groups, including at least:
 - (a) a **Board** of directors, together with associated committees of the directors, including from about 1972 onwards, the **Corporate Responsibility Committee**;

Particulars

The Corporate Responsibility Committee was known variously as: Committee on Corporate Responsibility; Corporate Responsibility Committee; and Public Issues Committee.

- (b) the **Chemical Products Group**, and its associated division, the **Fluorochemicals Division**;

Particulars

The Chemical Products Group was known variously as: Chemical Products; Chemicals and Plastics; Coated Abrasives, Adhesives, Chemicals; Abrasives, Adhesives, Chemicals; Abrasives, Adhesives, Building Services, Chemicals; and Chemicals, Film and Allied Products.

From about 1980 onwards, as part of an overall management restructure within 3M, the Chemical Products Group became part of the Industrial and Electronic Sector (also known as the Industrial and Consumer Sector).

The Fluorochemicals Division was known variously as, or was otherwise part of, the following: Fluorochemicals Division; Chemical Division; Industrial Chemical Products; Chemicals Resources Division and/or the Commercial Chemicals Division; Chemicals, Film and Allied Products; Speciality Chemical and Film; Speciality Chemicals; and Speciality Adhesives and Chemicals.

The Commonwealth refers to 3M's Annual Reports for the period from about 1955 to 2005. An index of the Annual Reports is at **Table A, Part V** annexed to this Statement of Claim.

- (c) the **Environmental Engineering and Pollution Control Department**;

Particulars

The Environmental Engineering and Pollution Control Department was known variously as: Water and Sanitary Engineering Department and Environmental Engineering and Pollution Control.

The Commonwealth refers to 3M's Annual Reports for the period from about 1955 to 2005. An index of the Annual Reports is at **Table A, Part V** annexed to this Statement of Claim.

- (d) an **International Operations Group**, and its associated division, 3M Australia.

Particulars

The International Operations Group was known variously as: Foreign Group; International Division; International Operations; and International.

The Commonwealth refers to 3M's Annual Reports for the period from about 1955 to 2005. An index of the Annual Reports is at **Table A, Part V** annexed to this Statement of Claim.

6. From about 1960 onwards, the aforementioned groups or divisions had the following responsibilities:

- (a) the Corporate Responsibility Committee was responsible for:
- (i) setting management policies, including environmental policies;

- (ii) reviewing fluorochemical studies prepared or otherwise commissioned by the Environmental Engineering and Pollution Control Department and presenting the information for consideration to the 3M Board;

Particulars

The Commonwealth refers to:

- (a) subparagraphs (f)(vi) of the particulars to paragraph 2(d);
- (b) Minutes from a meeting of 3M executives on 12 July 1978, to discuss investigations of fluorochemicals in human blood and the methods for communicating their findings to the industry, the public, and appropriate government agencies resolving that there was “no need” to report their findings to the United States Environmental Protection Agency (US EPA) under section 8(e) of the *Toxic Substances Control Act 1976 (TSCA)*, recording dissatisfaction with the levels of organic fluorine in employees’ blood and suggesting the use of protective suits. This document is referred to in letter from MotleyRice on behalf of the Court appointed Plaintiff’s Executive Committee dated 7 December 2021 (USA.1000.0002.5365) and may be provided after discovery;
- (c) 3M Minutes of Meeting, ‘Annual Meeting, Board of Directors’, 12 May 1981 (USA.0001.0001.1221 at .1249); and
- (d) deposition of Jon Gerber (3M Company designee), *Aqueous Film-Forming Foams (AFFF) Products Liability Litigation, Multidistrict Litigation No. 2873 in the United States District Court, South Carolina, Charlestown Division*, filed 22 December 2021 (USA.1000.0001.0788 at .0980-.0984), in which Mr Gerber stated, regarding the Corporate Responsibility Committee:

“...my understanding at the time, would have had responsibility for evaluating information for potential reporting under TSCA 8(e), among other responsibilities.”

Regarding whether the Corporate Responsibility Committee was made aware that 3M was of the opinion that the organic fluorine found in the blood of the general population was PFOS:

“My understanding based on the documents that I’ve reviewed is that, you know, this information, the investigations of fluorochemicals in blood, was sent to the corporate responsibility committee for...evaluation for TSCA 8(e)...My expectation is that all of the relevant

information that 3M had would have been evaluated by the corporate responsibility committee for TSCA 8(e) purposes.”

- (b) the Chemical Products Group was responsible for the management of:
 - (i) the Fluorochemicals Division;
 - (ii) the worldwide sale of 3M’s fluorochemical products, including:
 - (1) the provision of information about (including the information identified in paragraph 10(a) below), and other technical support for, 3M’s fluorochemical products;
 - (2) the setting of global business strategies for the marketing of 3M’s fluorochemical products;

Particulars

The Commonwealth refers to:

- (a) 3M Public Relations Department, *Our Story So Far – Notes from the first 75 years of 3M Company* (Minnesota Mining and Manufacturing Company, 1977) (**HOL.0001.0058.0245** at .0289-.0291);
 - (b) Lester Krogh et al, ‘3M’s International Experience’ (1990), 33(5) *Research Technology Management* 23 (**HOL.0001.0057.08162** at .08164 and .08166-.08167); and
 - (c) Geoffrey Nicholson, ‘How 3M Manages Its Global Laboratory Network’, (1994) 37(4) *Research Technology Management* 21 (**HOL.0001.0057.08168** at .08170).
- (c) the Fluorochemicals Division was responsible for the research, development and production of 3M’s fluorochemical products (including the products set out further below in **Part C**);

Particulars

The Commonwealth refers to:

- (a) Neil MacKay, *A Chemical History of 3M 1933-1990*, (3M Chemical, Film & Allied Products Group, 1991) (**HOL.0001.0008.2667** at .2702-.2703, .2715);
- (b) 3M Company, Annual Report, 1956 (**HOL.0001.0052.0146** at .0168).

- (d) the Environmental Engineering and Pollution Control Department was responsible for:
 - (i) implementing policies or processes within 3M to manage, minimise or otherwise reduce potential sources of pollution arising from 3M's products and processes;
 - (ii) the testing of 3M's fluorochemical products, on an on-going basis, including as to their environmental properties or safety;
 - (iii) the preparation of Product Environmental Data Sheets (**PEDS**);
 - (iv) ensuring the worldwide compliance by 3M and its subsidiaries on environmental issues, including 3M's own environmental policies and guidelines as well as any government regulatory requirements; and
 - (v) the development of 3M's Pollution Prevention Pays program, adopted in 1975.

Particulars

- (a) As to paragraphs 6(d)(i) and (iv), the Commonwealth refers to:
 - (i) from about 1997, persons who accessed 3M's website (www.mmm.com) in order to obtain information regarding 3M's environmental management, were automatically re-directed to a landing page which described the function of the Environmental Engineering Pollution Control Department maintained on that website among other things;
- (b) As to paragraph 6(d)(ii), the Commonwealth refers to:
 - (i) the conduct alleged in paragraphs 54 and 55;
 - (ii) 3M Technical Report Summaries prepared or otherwise distributed by the Environmental Engineering and Pollution Control Department, including those referred to in the particulars to paragraph 48 and subparagraphs (b)-(d) of the particulars to paragraph 55;
- (c) As to 6(d)(iii) the Commonwealth refers to:
 - (i) 3M PEDS which were prepared or otherwise distributed by the Environmental Engineering and Pollution Control Department including those referred to at paragraphs 96(b), 103(c) and 109(a); and

- (d) As to 6(d)(v), the Commonwealth refers to:
 - (i) 3M Company, *A Century of Innovation: The 3M Story*, (3M Company, 2002) (**HOL.0001.0040.0292** at .0485-.0487).
- (e) the International Operations Group was responsible for the overall management of 3M Australia, including its adherence to any 3M business strategies, and in particular those set by the Chemical Products Group in respect of 3M's fluorochemical products.

Particulars

The Commonwealth refers to:

- (a) the particulars to paragraph 2(e) above;
 - (b) 3M Public Relations Department, *Our Story So Far – Notes from the first 75 years of 3M Company* (3M Company, 1977) (**HOL.0001.0058.0245** at .0289-.0291); and
 - (c) 3M Company Annual Reports for 1975 and 1980 (**HOL.0001.0051.0824** at .0829; **HOL.0001.0051.1058** at .1061-.1062).
7. From about 1960 onwards, the senior employees of 3M included:
- (a) for the Chemical Products Group – a Vice President (or equivalent) who:
 - (i) until about 1975, was required to report to the President/Chief Executive Officer of 3M;
 - (ii) between about 1975 to about 1980, was required to report to the President of US Operations, who in turn was required to:
 - (1) report to the President/Chief Executive Officer of 3M; and
 - (2) exchange information and otherwise work closely with the President of International Operations;
 - (iii) from about 1980 onwards, was required to report to the Executive Vice President (or equivalent) of the Industrial and Consumer Sector, who in turn was required to report to the President/Chief Executive Officer of 3M;

- (b) for the Fluorochemicals Division – a General Manager (or equivalent), who was required to report to the Vice President (or equivalent) of the Chemical Products Group;
- (c) for the Environmental Engineering and Pollution Control Department – an executive officer who was required to report to the President/Chief Executive Officer of 3M;
- (d) for the International Operations Group – a Vice President who:
 - (i) until about 1975, was required to report to the President/Chief Executive Officer of 3M;
 - (ii) between about 1975 to about 1980, was required to report to the President of International Operations, who in turn was required to:
 - (1) report to the President/Chief Executive Officer of 3M; and
 - (2) exchange information and otherwise work closely with, the President of US Operations;
 - (iii) from about 1980 onwards, required to report to the President/Chief Executive Officer of 3M.

Particulars

The Commonwealth refers to:

- (a) 3M's organisational charts for 1955 (**HOL.0001.0052.0117** at .0144-.0145) and 1975 (**HOL.0001.0051.0824** at .0830-.0831), which detail the management and reporting structure that was in place at 3M from time to time;
- (b) 3M's Annual Reports for the period 1955 to 2005, which identify the various persons within 3M who held management roles including as division officers, corporate (or group) officers, executive officers and/or on the board of directors; and
- (c) **Table A, Part I** annexed to this Statement of Claim sets out the Commonwealth's present understanding of the various 3M directors and senior employees, including their job title (if capable of identification) or the nature of their roles as well as the period of their involvement, who worked or were otherwise involved in, the operations of each of the Fluorochemicals Division, the Chemical Group, the Environmental Engineering and Pollution

Control Department, and the International Operations Division.

A.3 3M and 3M Australia shared directors, senior employees and product information processes

8. At all material times between 1952 to at least 2005, 3M Australia's directors also included various 3M directors and other senior employees of 3M.

Particulars

The Commonwealth refers to:

- (a) 3M Annual Reports between 1951 and 2005; and
- (b) Register of directors and senior employees of 3M Australia from 1951 to 2005/ the date of this pleading.

Table A, Part III annexed to this Statement of Claim also sets out the Commonwealth's present understanding of the directors of 3M Australia and their roles as directors or as senior employees of 3M, at the times specified in the table.

9. From about 1960 onwards, the directors of 3M Australia were required to report to 3M's Vice President of the International Operations Group.
10. From about 1973 onwards:
- (a) the Chemical Products Group was responsible for providing product and other technical support services in relation to 3M's fluorochemical products to 3M Australia, including:
 - (i) by way of the supply of:
 - (1) Material Safety Data Sheets (**MSDSs**) (as prepared by the Chemical Products Group);
 - (2) PEDS (as prepared by Environmental Engineering and Pollution Control Department); and
 - (3) other product documents and information, such as brochures, specifications and technical documents;
 - (ii) providing technical and product support, including by way of **Technical Councils**, Forums or Committees;

Particulars

As to paragraph 10(a)(i), the fact that the Chemicals Products Group was responsible for providing product and other information to 3M Australia can be inferred from the provision of 3M MSDSs and other product information by 3M Australia to the Commonwealth, as set out further in paragraphs 77, 82, 84, 96, 97, 103, 108 and 109 below.

As to paragraph 10(a)(ii), as best as the Commonwealth can presently say, sometime in about the 1950s or 1960s, Dr Robert (Bob) Adams established at least 3M's Technical Council and/or the Technical Forum for the purpose of technology sharing within 3M. Technical leaders from all laboratories within 3M, including international subsidiaries, were invited to attend these meetings and to share information about their technologies.

In addition, personnel from international subsidiaries were regularly offered and provided with product training at 3M, including in relation to new products and other programs.

The Commonwealth refers to:

- (a) Geoffrey Nicholson, 'How 3M Manages Its Global Laboratory Network', (1994) 37(4) *Research technology management* 21 (HOL.0001.0057.08168 at .08169-.08171);
 - (b) Lester Krogh et al, '3M's International Experience' (1990), 33(5) *Research Technology Management* 23 (HOL.0001.0057.08162 at .08165-.08166);
 - (c) 3M Public Relations Department, *Our Story So Far – Notes from the first 75 years of 3M Company* (3M Company, 1977) (HOL.0001.0058.0245 at .0288-.0290, .0336-.0337, and .0365-.0366);
 - (d) 3M Company, *A Century of Innovation: The 3M Story*, (3M Company, 2002) (HOL.0001.0040.0292 at .0373);
 - (e) Ernest Gundling, *The 3M Way to Innovation: Balancing People and Profit*, (Kodansha International Ltd, 2000) (HOL.0001.0058.0385 at .0423); and
 - (f) 3M Company Annual Reports for 1970, 1976 and 1980 (HOL.0001.0051.1563 at .1569; HOL.0001.0051.0868 at .0884; HOL.0001.0051.1058 at .1068).
- (b) the Vice President of the Chemical Products Group was responsible for ensuring timely communications between 3M and 3M Australia about 3M's fluorochemical products.

Particulars

In or about 1973, 3M implemented organisational changes for the purpose of ensuring a more rapid introduction of new products overseas and to facilitate the development of products to meet the requirements of international customers. The Vice President of each of 3M's eight product groups was given the responsibility for providing products and supporting services to worldwide markets and was to foster timely communication with 3M's international companies.

The Commonwealth refers to 3M's 1973 Annual Report (**HOL.0001.0051.1675** at .1680).

That 3M supplied 3M Australia with MSDSs, PEDS and other documents and information can be inferred from the matters set out below at paragraphs 75(c), 77, 84, 96, 97, 103 and 108.

Further, from about 1996 onwards, persons who accessed 3M Australia's website (www.3m.com.au) in order to obtain product information including about 3M AFFF, were automatically re-directed to 3M's website (www.3m.com), and in particular to product lists maintained on that website.

11. By reason of the above matters, at all material times from 1973 onwards:

- (a) when directors and senior employees of 3M, including those in the Fluorochemicals Division, the Chemical Products Group or the Environmental Engineering and Pollution Control Department, became aware of, or otherwise received, information about the environmental properties or safety of 3M's fluorochemical products (as detailed further below in **Part D**), they were obliged to, and routinely did, inform senior employees of 3M Australia about those matters; and
- (b) directors and senior employees of 3M Australia were obliged to, and routinely did, seek information from 3M's senior employees, including those in the Fluorochemicals Division, the Chemical Products Group, the Environmental Engineering and Pollution Control Department, about 3M's fluorochemical products, and in particular as to their environmental properties or safety.

Particulars

That directors and senior employees of both 3M and 3M Australia routinely sought and exchanged information about 3M's fluorochemical products can be inferred from the fact that 3M Australia regularly provided the Commonwealth with 3M product information for 3M AFFF, including (at least):

brochures, MSDSs, and PEDS (as set out in paragraphs 75(c), 77, 82, 84, 96, 97, 103, 108 and 109, in **Part E** below).

B. THE COMMONWEALTH'S BASES

12. The Commonwealth has continuously owned, occupied, managed or controlled, relevantly, the following properties (collectively, the **Bases**):

Australian Capital Territory (administered)

- (a) since at least 1958, Navy Bases Jervis Bay Range Facility and HMAS Creswell, located in Jervis Bay, Jervis Bay Territory under the *Jervis Bay Territory Acceptance Act 1915* (Cth) (**Jervis Bay Base**) as set out further in **Schedule 1, Section A**;

New South Wales

- (b) since about 1941, Navy Base HMAS Albatross, located in Nowra, New South Wales (**Albatross Base**) as set out further in **Schedule 2, Section A**;
- (c) since about 1939, Army Base Blamey Barracks (also known as Kapooka Military Area), located in Kapooka, New South Wales (**Blamey Base**) as set out further in **Schedule 3, Section A**;
- (d) since about 1936, Army Base Holsworthy Barracks, located in Holsworthy, Sydney, New South Wales (**Holsworthy Base**) as set out further in **Schedule 4, Section A**;
- (e) since about 1921, Airforce Base Richmond, located in Richmond, New South Wales (**Richmond Base**) as set out further in **Schedule 5, Section A**;
- (f) since about 1939, Army Base Singleton Military Area, located in Singleton, New South Wales (**Singleton Base**) as set out further in **Schedule 6, Section A**;
- (g) since about 1939, Airforce Base Wagga, located in Wagga Wagga, New South Wales (**Wagga Base**) as set out further in **Schedule 7, Section A**;
- (h) since about 1941, Air Force Base Williamtown in Williamtown, New South Wales (**Williamtown Base**) as set out further in **Schedule 8, Section A**;

Northern Territory

- (i) since about 1940, Airforce Base Darwin, located in Darwin, the Northern Territory (**Darwin Base**) as set out further in **Schedule 9, Section A**;

- (j) since about 1989, Army Base Robertson Barracks, located in Darwin, Northern Territory (**Robertson Base**) as set out further in **Schedule 10, Section A**;
- (k) since about 1987, Airforce Base Tindal, located in Katherine, Northern Territory (**Tindal Base**) as set out further in **Schedule 11, Section A**;

Queensland

- (l) since about 1938, Airforce Base Amberley, located in Ipswich, Queensland (**Amberley Base**) as set out further in **Schedule 12, Section A**;
- (m) since about 1943, Navy Base HMAS Cairns, located in Cairns, Queensland (**Cairns Base**) as set out further in **Schedule 13, Section A**;
- (n) since about 1967, Army Base Lavarack Barracks, located in Townsville, Queensland (**Lavarack Base**) as set out further in **Schedule 14, Section A**;
- (o) since about 1942, Army Base Swartz Barracks (formerly known as Army Aviation Centre Oakey), located in Oakey, Queensland (**Oakey Base**) as set out further in **Schedule 15, Section A**;
- (p) since about 1940, Airforce Base Townsville, located in Townsville, Queensland (**Townsville Base**) as set out further in **Schedule 16, Section A**;
- (q) since about 1958, Army Base Wide Bay Training Area, located in Tin Can Bay, Queensland (**Wide Bay Base**) as set out further in **Schedule 17, Section A**;

South Australia

- (r) since about 1954, Airforce Base Edinburgh, located in Edinburgh, South Australia (**Edinburgh Base**) as set out further in **Schedule 18, Section A**;

Victoria

- (s) since about 1969, Army Military Area Bandiana, in Wodonga, Victoria (**Bandiana Base**) as set out further in **Schedule 19, Section A**;
- (t) since about 1911, Navy Base HMAS Cerberus, in Hastings, Victoria (**Cerberus Base**) as set out further in **Schedule 20, Section A**;

- (u) since about 1943, Air Force Base East Sale, in East Sale, Victoria (**East Sale Base**) as set out further in **Schedule 21, Section A**;
- (v) since about 1921, Air Force Base Williams in Point Cook and Laverton, Victoria (**Williams Base**) as set out further in **Schedule 22, Section A**;

Western Australia

- (w) since about 1938, Airforce Base Pearce, in Bullsbrook, Western Australia (**Pearce Base**) as set out further in **Schedule 23, Section A**;
 - (x) since about the mid-1960's, Airforce Base Gingin Satellite Area, located near Gingin, Western Australia (**Gingin Base**) as set out further in **Schedule 24, Section A**;
 - (y) since about 1967, Navy Base Naval Communication Station Harold E Holt A and B, located in Exmouth, Western Australia (**Holt Base**) as set out further in **Schedule 25, Section A**;
 - (z) since about 1943, Airforce Base Learmonth, located in Learmonth, Western Australia (**Learmonth Base**) as set out further in **Schedule 26, Section A**;
 - (aa) since about 1978, Navy Base HMAS Stirling, located in Garden Island, Western Australia (**Stirling Base**) as set out further in **Schedule 27, Section A**.
13. Each of the Bases has been used by the Commonwealth for the purpose of conducting various Defence related activities, including training and operational activities, as set out in **Schedules 1 to 27, Section A**.
 14. Further, the Commonwealth owns, occupies, manages or controls a number of other properties including land, facilities and other infrastructure which have also been used by the Commonwealth for various purposes, including training and operational activities of Commonwealth entities. 3M AFFF was used at these sites, and the existence of PFAS contamination is not yet known and is currently being investigated.

Particulars

The Commonwealth properties currently being investigated are: Woodside Base in South Australia, Puckapunyal Base in Victoria, the Chowder Bay Precinct/Gunners Barracks sites and Garden Island Defence Precinct in New South Wales.

Further particulars may be provided after discovery.

15. The relevant geographical features and physical structures of each of the Bases is set out in **Schedules 1 to 27, Section A.**
16. The surrounding areas of each of the Bases, including relevant geographical features, is set out in **Schedules 1 to 27, Section B.**
17. The use of:
 - (a) groundwater sources at each of the Bases and surrounding areas is set out in **Schedules 1 to 27, Section C.1;** and
 - (b) surface water sources at each of the Bases and surrounding areas is set out in **Schedules 1 to 27, Section C.2.**
18. In the premises of the matters set out in **Schedules 1 to 27, Sections A to C**, at all material times, it was reasonably foreseeable to each of:
 - (a) 3M; and/or
 - (b) 3M Australia,that the groundwaters and surface waters at the Bases and surrounding areas may be used by:
 - (c) the Commonwealth, for each of the purposes specified in **Schedules 1 to 27, Section C**, respectively; and/or
 - (d) the owners and/or occupiers of surrounding areas for each of the purposes specified in **Schedules 1 to 27, Section C.**

Particulars

The purposes for which groundwater and surface water were, and are, used at each of the Bases and surrounding areas constitute every day, commonplace usages that can reasonably be expected to occur in any Australian community.

C. 3M AQUEOUS FILM FORMING FOAM

C.1 3M development of 3M AFFF

19. From about 1949 onwards, 3M developed and manufactured a range of PFAS compounds, including:
- (a) perfluorooctane sulfonate (**PFOS**) (CAS No 2795-39-3) (also known as perfluorooctanesulfonic acid potassium salt/heptadecafluorooctanesulfonic acid salt);
 - (b) perfluorohexanesulfonic acid (**PFHxS**) (CAS No 3871-99-6) (also known as potassium perfluoroalkyl sulfonate and potassium perfluorohexane sulfonate/tridecafluorohexane-1 sulfonic acid potassium salt); and
 - (c) perfluorooctanoic acid (**PFOA**) (CAS No 3825-26-1) (also known as ammonium perfluorooctanoate or perfluorooctanoic acid ammonium salt or pentadecafluorooctanoic acid ammonium salt).

Particulars

As set out above in the particulars to paragraph 2(e), PFAS are a large, complex group of synthetic chemicals. They are soluble in water.

Each of the compounds referred to above are the stable end product that results from the degradation of precursor PFAS substances.

The Commonwealth otherwise refers to a paper prepared by 3M titled 'The Science of Organic Fluorochemistry', 5 February 1999 (**DEF.0088.0001.0001**).

Since about 1965, the CAS Registry operated by the Chemical Abstracts Service, a division of the American Chemical Society, has maintained a registry of identified chemical substances (by reference to a unique identification number). These numbers are then utilised by other regulators, including the Australian Industrial Chemicals Introduction Scheme (formerly the National Industrial Chemicals Notification and Assessment Scheme or NICNAS) in order to accurately identify chemical products. The CAS numbers identified above in relation to each of the PFAS compounds refer to the unique identification numbers assigned to them by the CAS Registry.

Further particulars may be provided after discovery and the provision of expert reports.

20. From about 1949 onwards, 3M used the PFAS compounds identified in paragraph 19 above to develop and manufacture various fluorochemical surfactants including, relevantly:

- (a) **FC-95**, a type of fluorosurfactant, which comprised the following compounds:
 - (i) PFOS (approximately 82–86%);
 - (ii) PFHxS (approximately 3–8%);
 - (iii) potassium nonafluoro-1-butanesulfonate (CAS No 29420-49-3) (or KPBS) (approximately 3–7%);
 - (iv) potassium perfluoroheptanesulfonate (CAS No 60270-55-5) (or potassium PFHpS) (approximately 2–6%); and
 - (v) potassium perfluoropentane-1-sulphonate (CAS No 3872-25-1) (or potassium PFPeS) (approximately 1–3%);
- (b) **FC-143**, a type of fluorosurfactant, which comprised the following compounds:
 - (i) PFOA (approximately 96.5 to 100%);
 - (ii) ammonium perfluorohexanoate (CAS No 21615-47-4) (also known as undecafluorohexanoic acid ammonium salt) (approximately 0- 1.5%);
 - (iii) ammonium perfluoroheptanoate (CAS No 6230-43-4) (approximately 0-1 %); and
 - (iv) heptafluorononanoic acid ammonium salt (also known as ammonium perfluorononanoate) (CAS No 4149-60-4) (approximately 0-1%);
- (c) **FM-3422**, a type of fluorosurfactant, which is also known as N-EtFOSE Alcohol (or N-ethylperfluorooctane sulfonamidoethanol), and which is a precursor of, or otherwise degrades to, PFOS.

Particulars

Fluorosurfactants are a specific type of fluorinated substance that are synthetic chemicals containing multiple fluorine atoms in their hydrophobic tails.

As to the composition of some of the fluorosurfactants referred to above, the Commonwealth refers by way of example to the following MSDSs:

- (a) In respect of FC-95, 3M MSDS, 9 May 2001 (**HOL.0001.0039.1259**);
- (b) In respect of FC-143, 3M MSDS, 27 August 2001 (**HOL.0001.0039.1266**); and
- (c) In respect of FM-3422, the Commonwealth understands this is likely a reference to a 3M branded product known as FC-10 or Fluorad FC-10 (or by its CAS No 1691-99-2), the molecular formula is $C_{12}H_{10}F_{17}NO_3S$. It further understands that this product was likely a component of 3M's product known as FC-807, or Scotchban (**USA.1000.0002.1961** at .1976-.1977);

As best as the Commonwealth can presently say, the fluorosurfactants identified above were used in a variety of products that were either manufactured or sold by 3M, or were sold by 3M to others for use in the manufacture and sale of its products. In particular:

- (d) Prior to about 1962, 3M used or added FC-95 as part of a mist and vapour suppressant that was used in chrome plating operations, and was primarily used by the Udyllite Corporation;
- (e) FC-143 was used in, or added to, a variety of products including DuPont's Teflon; and
- (f) FM-3422 was used in, or added to, a variety of products including 3M's products known as FC-807 (or Scotchban and/or Scotchgard).

Further particulars may be provided after discovery and the provision of expert reports.

21. In or about 1962, at the request of the United States Navy (**US Navy**), 3M commenced the development of 3M AFFF.

Particulars

From about March 1962 onwards, the US Navy began exploring alternative options for fire-fighting foams that were stable in the presence of silicones, and could otherwise be used to extinguish petroleum fires. Relevantly, during the course of various testing, it was discovered by the US Navy that upon mixing a solution of one of 3M's fluorochemical products (most likely FC-95) together with water, and placing it on top of gasoline, the mixture created a surface seal or barrier, such that the underlying gasoline and/or its vapours could not be ignited.

From about June 1962 to about 1968, 3M scientists then developed various formulations of 3M AFFF which were tested by both it and the US Navy, including (at least) the following product formulations:

- (a) a formulation based upon 3M's L-1083 product;
- (b) a formulation known as FX-1831;
- (c) a formulation known as FC-1941 (a 6% foam concentrate); and
- (d) other formulations which were known by 3M's registered trademark "Light Water", including formulations that were compatible with sea water.

The Commonwealth refers to Neil MacKay, *A Chemical History of 3M 1933-1990*, (3M Chemical, Film & Allied Products Group, 1991) (**HOL.0001.0008.2667** at .2753-.2754).

Further particulars may be provided after discovery and the provision of expert reports.

22. From about 1962 onwards, 3M then developed and manufactured various 3M AFFF for sale, including, relevantly:

- (a) a product known as **FC-194**, a 6% concentrate;
- (b) a product known as **FC-199**, a 6% concentrate;
- (c) a product known as **FC-200**, a 6% concentrate;
- (d) a product known as **FC-206**, a 6% concentrate;
- (e) (at least) some or all of the component parts of a product known as **FC-3034**, a 6% concentrate;
- (f) (at least) some or all of the component parts of a product known as **FC-3003**, a 6% concentrate; and
- (g) (at least) some or all of the component parts of a product known as **FC-3002**, a 3% concentrate.

Particulars

Each of the products in subparagraphs (a)-(g) were sold by 3M and 3M Australia to the Commonwealth in the circumstances set out in **Part E** below.

As to subparagraph (a), between about 1962 to 1969, 3M developed and manufactured at least FC-194, as well as the following 3M AFFF: FC-183, FC-195 and FC-196.

As to subparagraphs (b)-(g), between about 1969 to 2002, 3M developed and manufactured at least FC-200, FC-206 (and variants FC-206CE (6% concentrate) and FC-206CF (6% concentrate)), and (at least) the PFAS containing component parts of FC-3034, FC-3003 and FC-3002, as well as the following 3M AFFF: FC-185A (1% concentrate), FC-197, FC-201F, FC-203, FC-203CE (3% concentrate), FC-203CF (3% concentrate), FC-401, FC-600 (3 or 6% concentrates), FC-600F, FC-602, FC-603F (3% concentrate), FC-783F (3% concentrate), FC-786F, FC-787F (3 or 6% concentrates), FC-3046, FC-3047, FC-3048 (3% concentrate), FC-3049 (3% concentrate), FC-3052 (1% concentrate), FC-4040 and FX-9162.

Further particulars may be provided after discovery.

C.2 Properties of 3M AFFF

23. From about 1962 onwards, 3M AFFF were comprised of complex proprietary mixtures, which contained at least the following:

- (a) water (used as a primary solvent);
- (b) surfactants (typically FC-95 or like fluorosurfactants, which included PFOS, PFHxS and PFOA, or like products which degraded to or otherwise were precursors of PFOS, PFHxS and PFOA, and which were used to decrease the surface tension of the foam and enhance foam spreading);
- (c) foaming agents (used to help produce and maintain the foam structure); and
- (d) solvents and stabilisers (included in the product to improve the effectiveness and shelf life of the foam).

Particulars

The precise composition of 3M AFFF was known only to 3M and/or 3M Australia, but the inclusion of FC-95 (or like products, which included in their composition PFOS, PFHxS and PFOA or their precursors) in 3M AFFF is to be inferred from the following:

- (a) letter from 3M to the US EPA dated 11 May 2000, in which 3M described FC-95 (CAS No 2795-39-3) as a “*perfluorooctylsulfonate (PFOS) salt*” with its

application including “*film former in fire fighting foams*” and that it was deliberately added to (at least) the following 3M AFFF: FC-201F, FC-203, FC-203CF, FC-206CF, FC-401, FC-600, FC-600F, FC-602, FC-603F, FC-783F, FC-786F, FC-4040 and FX-9162 (as POSF, or potassium perfluorooctylsulfonate, which is also known as **K-PFOS**, and is a precursor of PFOS) (**HOL.0001.0041.0492**); and

- (b) the existence of PFOS, PFHxS, PFOA and other PFAS chemicals in the soils and waters of the Bases, primarily in and around areas where 3M AFFF was used, as is set out further below at paragraphs 121 and 134.

Further particulars may be provided after discovery and the provision of expert reports.

- 24. The following 3M AFFF were comprised of at least the following (with the precise formulations varying from time to time):

- (a) FC-194:
 - (i) water;
 - (ii) fluoroalkyl surfactants, which likely included precursors to PFOA, PFHxS and/or PFOS;

Particulars

The precise composition of FC-194 is not known to the Commonwealth, however, a study conducted by Bogdan Z. Dlugogorski et al, ‘Compatibility of aqueous film-forming foams (AFFF) with sea water’ (2021) 120 *Fire Safety Journal* 1, concluded that FC-194 likely included at least some precursors to PFOA, as well as K-PFOS: see esp. Section 3 and Table 5 (**HOL.0001.0041.0681 .0686-0688, .0692-.0693**).

Further particulars may be provided after discovery and the provision of expert reports.

- (b) FC-199:
 - (i) water;
 - (ii) fluoroalkyl surfactants, which likely included precursors to PFOA, PFHxS and/or PFOS;

Particulars

The precise composition of FC-199 is not known to the Commonwealth, however, a study conducted by Bogdan Z. Dlugogorski et al, 'Compatibility of aqueous film-forming foams (AFFF) with sea water' (2021) 120 *Fire Safety Journal* 1, concluded that FC-199 likely included at least some precursors to PFOA, as well as K-PFOS: see esp. Section 3 and Table 5 (**HOL.0001.0041.0681** .0686-0688, .0692-.0693).

Further particulars may be provided after discovery and the provision of expert reports.

(c) FC-200:

- (i) water;
- (ii) fluoroalkyl surfactants, which likely included precursors to PFOA, PFHxS and/or PFOS;

Particulars

The precise composition of FC-200 is not known to the Commonwealth, however, a study conducted by Bogdan Z. Dlugogorski et al, 'Compatibility of aqueous film-forming foams (AFFF) with sea water' (2021) 120 *Fire Safety Journal* 1, concluded that FC-200 likely included at least some precursors to PFOA, as well as K-PFOS: see Section 3 (**HOL.0001.0041.0681**).

Further particulars may be provided after discovery and the provision of expert reports.

(d) FC-206:

- (i) water;
- (ii) diethylene glycol butyl ether (also referred to as diethylene glycol monobutyl ether);
- (iii) urea;
- (iv) synthetic detergents. (also referred to as triethanolamine);

- (v) fluoroalkyl surfactants (also referred to as amphoteric fluoroalkymide derivatives or perfluoroalkyl sulfonate salts), including at least PFOS, PFHxS and PFOA, or their precursors;

Particulars

As to the composition of FC-206, the Commonwealth refers by way of example to the following MSDSs:

- (a) 3M Australia, MSDS for FC-206CE, 3 April 2002 (**DEF.3000.0536.0766**);
- (b) 3M, MSDS for FC-206CF, 19 February 1997 (**HOL.0001.0039.1688**), and 4 September 1998 (**HOL.0001.0039.1311**);
- (c) 3M Australia, MSDS for FC-206CF, 23 April 2001 (**NIC.0003.0001.4023**); and
- (d) Chem Watch, MSDS for FC-206CE, 25 October 1995 (**DEF.1005.0001.0038**).

Further particulars may be provided after discovery and the provision of expert reports.

- (e) FC-3034:
 - (i) water;
 - (ii) diethylene glycol butyl ether (also known as butyl carbitol, diethylene glycol monobutyl ether, or ethanol 2-(2-butoxyethoxy));
 - (iii) synthetic detergents;
 - (iv) fluoroalkyl surfactants (also referred to as amphoteric fluoroalkymide derivatives or perfluoroalkyl sulfonate salts), including at least PFOS, PFHxS and PFOA, or their precursors;

Particulars

As to the composition of FC-3034, the Commonwealth refers by way of example to the following MSDSs:

- (a) 3M Australia, MSDSs for FC-3034, 30 October 1985 (**DEF.1137.0010.0362**), 15 March 2000 (**DEF.3002.0829.6048**), 12 April 2001 (**DEF.3000.0373.0246**), 5 April 2002 (**DEF.3000.0009.6519**);

- (b) 3M, MSDSs for FC-3034, December 1984 (**DEF.1137.0010.0362** at .0366), November 1985 (**DEF.8004.0001.0001** at .0354), 10 September 1991 (**INF.1008.0002.0154**), and 11 March 1992 (**DEF.5512.0003.0011**); and
- (c) ChemAlert, MSDS for FC-3034, 15 July 2011 (**DEF.7000.0010.0731**).

Further particulars may be provided after discovery and the provision of expert reports.

- (f) FC-3003:
 - (i) water;
 - (ii) diethylene glycol monobutyl ether;
 - (iii) synthetic detergents;
 - (iv) fluoroalkyl surfactants, including at least PFOS, PFHxS and PFOA or their precursors;

Particulars

As to the composition of FC-3003, the Commonwealth refers by way of example to the following MSDSs:

- (a) 3M, MSDS for FC-3003, 11 March 1992 (**DEF.1005.0001.0045**); and
- (b) 3M Australia, MSDSs for FC-3003, 15 February 1996 (**DEF.3013.0048.4418**), 4 March 2002 (**DEF.1085.0001.0191**).

Further particulars may be provided after discovery and the provision of expert reports.

- (g) FC-3002:
 - (i) water;
 - (ii) diethylene glycol butyl ether (also referred to as 2- (2-butyoxyethoxy));
 - (iii) synthetic detergents;
 - (iv) fluoroalkyl surfactants (also referred to as amphoteric fluoralkymide derivates or perfluoroalkyl sulfonate salts), including at least PFOS, PFHxS and PFOA, or their precursors.

Particulars

As to the composition of FC-3002, the Commonwealth refers by way of example to the following MSDSs:

- (a) 3M Australia, MSDSs for FC-3002, 7 May 1997 (DEF.0023.0001.0098), 12 October 1999 (DEF.3002.0165.5638), 3 March 2000 (DEF.3002.0662.3773), 8 April 2002 (DEF.1085.0001.0184); and
- (b) ChemAlert, MSDS for FC-3002, 27 July 2012 (DEF.7000.0010.0718).

Further particulars may be provided after discovery and the provision of expert reports.

25. At all material times, each of:

- (a) PFOS,
- (b) PFHxS, and
- (c) PFOA,

which formed part of 3M AFFF described above in paragraphs 23 to 24 and which contained variants of PFAS:

- (i) were persistent in soil and water;
- (ii) were mobile in soils, surface water and groundwater;
- (iii) could migrate significant distances in soils and waters;
- (iv) were subject to sorption;
- (v) were not biodegradable;
- (vi) were potentially toxic;
- (vii) were bio-accumulative and persistent in the human body, and in animals;
- (viii) tended to bio-magnify in the food chain;

- (ix) were potentially carcinogenic, and have been associated with the following effects:
 - (1) increased levels of cholesterol in the blood;
 - (2) increased levels of uric acid in the blood;
 - (3) reduced kidney function;
 - (4) alterations in some indicators of immune function;
 - (5) altered levels of thyroid hormones and sex hormones with effects on fertility and puberty; and
 - (6) lower birth weight in babies;
- (x) were readily absorbed by humans and animals, including by:
 - (1) drinking water containing the compounds;
 - (2) consuming produce from land and/or water containing the compounds;
 - (3) consuming meat from animals that have grazed on land containing the compounds and/or consumed water from sources on the land or produce grown from land containing the compounds;
 - (4) inhalation including of dust generated from surface soils containing the compounds; and
 - (5) dermal contact including skin with impacted soil and ground and surface water containing the compounds.

Particulars

The Commonwealth refers to the particulars to paragraph 20 above and to paragraphs 27(b), 30-32, 34, 35, 38-40, 42-44, 47-49, 51, 54-56, 59-60, 63 and 67 below.

Further particulars may be provided after the provision of expert reports.

26. Further, at all material times, by reason of the matters in paragraphs 25(i) to (v) above, once each of:

- (a) PFOS,
- (b) PFHxS, and
- (c) PFOA,

which formed part of 3M AFFF described in paragraphs 23 to 24 above and which contained variants of PFAS, are discharged into the environment:

- (i) they remain present in the environment, including in the soils and groundwaters, and do not naturally break down into harmless end products; and
- (ii) are difficult to contain in the environment, and ultimately, to remove or remediate effectively.

Particulars

As set out in paragraph 2(e) above, PFAS have strong carbon-fluorine bonds, making them extremely resistant to natural attenuation processes (such as naturally occurring physical, chemical and biological processes).

PFAS remain in soil for long periods of time, because they move slowly and interact strongly with soil, before moving down through the soil toward groundwater (during and after rainfall), and up through the soil towards the surface during dry periods (where waters in the soil are evaporating). As a result, PFAS continue to leach into groundwater and impact surface water from areas for long periods of time after the source is removed.

Further, as PFAS do not break down in the environment, they are readily spread over large areas above the ground in surface water and below the ground in groundwater.

The Commonwealth refers to:

- (a) Charles J. Newell et al, ‘A Long Way to Go: Challenges and Strategies for Managing PFAS in Groundwater’ (2025) 35(4) *Remediation Journal* e70028 1 (HOL.0001.0057.0032);
- (b) Charles J. Newell et al, ‘Monitored natural attenuation to manage PFAS impacts to groundwater: Potential Guidelines’, (2021) 31(4) *Remediation Journal* 1, 11 (HOL.0001.0057.0021); and

- (c) Charles J. Newell et al, ‘Comparing PFAS to other groundwater contaminants: Implications for remediation’ (2020) 30(3) *Remediation Journal* 7, 26 (HOL.0001.0057.0001).

Further particulars may be provided after the provision of expert evidence.

27. By reason of the matters in paragraphs 23 to 26 above, at all material times, it was the case that 3M AFFF:

- (a) was potentially damaging to the environment; and

Particulars

The Commonwealth refers to and repeats the particulars to paragraphs 25-26 above.

- (b) was potentially causative of adverse health effects in humans.

Particulars

As set out in paragraph 2(e) above, PFAS can enter people, plants and animals through exposure to contaminated water, soil, food or air. In humans, exposure is typically from drinking contaminated water.

Once PFAS enter the body, they tend to bind to proteins in blood and the liver, and because of their chemical stability, they are not easily metabolised and can remain in the body for long periods. Repeat exposure can result in bioaccumulation (where the concentration of PFAS in an organism increases over time because the organism absorbs them faster than it can eliminate them).

Biomagnification (i.e. the process by which small concentrations of PFAS are absorbed by lower order organisms, which are then consumed by larger animals and humans) can also occur, resulting in increased concentrations in humans.

Multiple studies have concluded that there are (at least) associations between PFOS and PFOA levels in humans and: elevated blood cholesterol; higher blood uric levels (or hyperuricemia); impaired kidney function and chronic kidney disease; immunological effects (including inverse associations between PFAS chemicals such as PFHxS and antibody levels after vaccinations); and kidney and testicular cancer.

Further, since approximately November 2023, the International Agency for Research on Cancer has evaluated and classified PFOA as being carcinogenic to humans (i.e.

Group 1) on the basis that there is sufficient evidence for cancer in experimental animals and strong mechanistic evidence that PFOA exhibits key characteristics of carcinogens in exposed humans; and PFOS as being possibly carcinogenic to humans (i.e. Group 2B) on the basis of strong mechanistic evidence for key characteristics of carcinogens, including in exposed humans.

PFOS, PFHxS and PFOA are also listed in Annex A as persistent organic pollutants, in accordance with the provisions of the Stockholm Convention on Persistent Organic Pollutants, opened for signature 23 May 2001, 2256 UNTS 119 (entered into force 17 May 2004).

The Commonwealth refers to:

- (a) Project of the National Centre for Epidemiology and Population Health, Research School of Population Health, the Australian National University, The PFAS Health Study: Systemic Literature Review, 2018, report prepared for the Commonwealth (**DOD.0001.0083.8783**); and
- (b) IARC, 'Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS)' (2025) 135 *IARC Monographs on the Identification of Carcinogenic Hazards to Humans* 1-754 (**HOL.0001.0057.0049**).

Further particulars may be provided after the provision of expert reports.

- 28. By reason of the matters in **Part F.5** below, at all material times, it was reasonably foreseeable that the Commonwealth would engage in each of the uses of 3M AFFF at the Bases set out in **Schedules 1 to 27, Section D**.
- 29. Further, by reason of the matters in paragraphs 25 and 26, at all material times, it was reasonably foreseeable that waters, liquids and soluble materials containing 3M AFFF discharged at the Bases may:
 - (a) permeate into the soil, sediment, asphalt and concrete at the Bases and into the soil, sediment, asphalt and concrete in the areas surrounding the Bases;
 - (b) mingle with other surface water at the Bases (particularly after periods of rain) and flow towards and into the surrounding drainage and sewerage networks and other surface water outside the Bases; and
 - (c) leach into, and flow with, the groundwaters underlying the Bases, including by vertical migration, and areas surrounding the Bases.

D. THE EMERGENCE OF ENVIRONMENTAL AND TOXICITY CONCERNS WITH 3M'S FLUOROCHEMICAL PRODUCTS

D.1 Period prior to 1973

30. On a date presently unknown to the Commonwealth, but prior to June 1963, 3M knew from its own testing that FC-95 (or PFOS) was potentially "toxic".

Particulars

3M's knowledge is to be inferred from the existence of a "Technical Information" document published by the Chemical Products Group titled "3M Brand Fluorochemical Surfactants: FC-95, FC-98, FC-128, FC-134, FX-161, FC-170, FX-172" issued on 15 June 1963, p 44, which detailed the results of acute oral dosage toxicity tests conducted on adult rats and mice of various 3M fluorosurfactant products, including at least FC-95. The document stated that FC-95 was classified by 3M as being "moderately toxic" based on lethal effects on test species exposed to prescribed doses and concentrations.

Further particulars may be provided after discovery.

31. From about 1966 to about 1970, 3M undertook research and testing, and obtained reports, as to the acute toxicity of some of 3M's fluorochemical products, and in particular some formulations of 3M AFFF, being at least FC-194, FC-195 and FC-196.

Particulars

As best as the Commonwealth can presently say, 3M obtained (at least) the following toxicology reports, on or shortly after the dates of those reports:

- (a) Industrial Bio-Test Laboratories Inc, 'Acute Toxicity Studies on FC-194, Lot 3, Acute Oral Toxicity – Albino Rats, Eye Irritation Test – Albino Rabbits, 3M Reference No T-4933', 14 February 1966;
- (b) Lifestream Laboratories, 'Acute Toxicity Studies on L-1872, Acute Oral Toxicity – Albino Rats, Eye Irritation Study – Albino Rabbits, Skin Irritation Study – Albino Rabbits, 3M Reference No T-5022 (Project No 763)', 1 April 1968;
- (c) Lifestream Laboratories, 'Acute Oral Toxicity – Albino Rats, Eye Irritation Study – Albino Rabbits, Skin Irritation Study – Albino Rabbits, 3M Reference T-4936, FC-195 (Project No 1264)', 7 July 1969; and

- (d) Lifestream Laboratories, 'Acute Toxicity Studies on L-2542, Lot 2, Acute Oral Toxicity – Albino Rats, Eye Irritation Study – Albino Rabbits, Skin Irritation Study – Albino Rabbits, 3M Reference No T-4939, FC-196 (Project No 1369)', 27 January 1970.

That 3M obtained and/or received the abovementioned reports can be inferred from the fact that each of the reports are referred to in an index of 3M Toxicology and Human Health Studies that was submitted by 3M to the US EPA on or about 8 September 2000 (**USA.1000.0002.2073** at .2113).

Further particulars may be provided after discovery.

32. By around no later than July 1971, 3M had received notices of concern:

- (a) from internal sources within 3M, particularly from the Chemical Products Group and/or the Environmental, Engineering and Pollution Control Department; and
- (b) externally, from users of 3M AFFF,

as to the environmental impact of 3M's fluorochemical products including 3M AFFF.

Particulars

As best as the Commonwealth can presently say, sometime prior to about 1966, the Environmental Engineering and Pollution Control Department, together with the Woodbury Township Board and the Minnesota Department of Health, had been investigating odour and potential groundwater contamination arising from the discarding of waste chemicals from 3M's Chemolite plant, located in Cottage Grove, Washington County, Minnesota (**3M Chemolite plant**), at a waste disposal site in Woodbury (**USA.1000.0001.0048**). A number of 3M's fluorochemical products, including 3M's fluorosurfactants, were manufactured at 3M's Chemolite plant.

As part of that investigation process, in 1966, 3M conducted studies of the groundwater conditions in the vicinity of the Woodbury waste disposal site, which concluded in a report dated January 1967 that chemical wastes placed in the disposal pits had penetrated the surrounding groundwater and may be a health hazard and that the potential health hazards should be fully determined (**HOL.0001.0022.4711**, see e.g. .4734, .4736).

Further, in a letter to the Editor of the National Fire Protection Association's *Fire Journal* dated 15 June 1970, the Chemical Concentrates Corporation stated that it had conducted testing of at least one of the 3M AFFF formulations, being FC-194,

and had concluded that it was *“highly derogatory to marine life and the entire test program had to be abandoned to avoid severe local stream pollution”* (USA.1000.0001.0049).

In or about November 1970, Hugh M Bryce (then Technical Director of the Chemical Division and Chairman of the 3M Technical Council), provided a response to the Chemical Concentrates Corporation’s letter, which was subsequently published in the National Fire Protection Association’s ‘Letters to the Association’ (1970) 64(6) *Fire Journal* 87 (HOL.0001.0056.0148 at .0240), in which it was stated that *“...the use of “Light Water” brand agents could not have any significant adverse effect on fish or other marine life in either fresh or salt water”*.

The Commonwealth generally refers to:

- (a) file note of conversation between F B Richerson (3M) and Mr Johannes (State Water Pollution Control Board, 3M) dated 26 August 1958 (USA.1000.0004.9631) regarding the 3M Chemolite plant, where it was recorded that the authors wished to discourage State analysis of Chemolite waste discharge into the Mississippi River because *“...they might find something in our wastes which we are ourselves not aware of and definitely do not want this information in the State Health Board’s records”*, and a desire to avoid a public hearing into permit conditions *“at all costs”*;
- (b) Minnesota Department of Health, Investigation of Waste Disposal Minnesota Mining and Manufacturing Company, Chemolite Plant Washington County, 22-26 September 1958 (USA.1000.0003.3575, see e.g. .3587–3588; .3589–.3590) which reported on the results of toxicity testing using undiluted effluent from 3M’s waste lagoon and found that all test fish died within 3 to 5 minutes with adverse effects including serious impairment of essential processes noted at various dilution ratios;
- (c) 3M interoffice memorandum from Dr J T Ling (Environmental Engineering and Pollution Control, 3M) to various 3M personnel dated 3 November 1960 (USA.1000.0003.3605), regarding Chemolite monthly water report with central analytical laboratory report No 3873; and
- (d) 3M interoffice memorandum from L C Houdeek (Field Engineering) to H S Parkinson (Engineering) dated 1 December 1961 (USA.1000.0003.3725), which proposed relocating the waste pond at the 3M Chemolite plant and referred to a report prepared for 3M by Dr J T Ling (Environmental Engineering and Pollution Control, 3M), titled *“The Waste Disposal Problem, Chemolite Plant”*, 31 July 1961.

Further particulars may be provided after discovery.

33. After the above concerns were raised:

- (a) 3M continued its investigations into the disposal of waste chemicals at the 3M Chemolite plant; and

Particulars

As best as the Commonwealth can presently say, some time in March 1967, senior employees of 3M, including J T Ling, R O Laine and C E Kiester, had a meeting with the Chairman of the Minnesota Water Pollution Control Commission (Dr M M Hargreaves) about the disposal of waste chemicals at the 3M Chemolite plant, during which Dr Hargreaves strongly suggested that 3M conduct the following toxicity tests:

- (a) *“More intensive bioassay work... including long term toxicity to fish and aquatic life, fish tainting, etc...”* and
- (b) *“...including observations of the long term accumulated effect of the chemicals in the ground water on test animals. Analysis of the bone marrow, spleen, and fatty tissues in the test animals, among other things, should be analyzed for accumulation of these chemicals....”*

Further, many of 3M’s fluorochemical products were manufactured and developed at the 3M Chemolite plant, including (at least) FC-95.

The Commonwealth refers to:

- (c) 3M internal correspondence prepared by C E Kiester (Water and Sanitary Engineering), dated 24 March 1967, (HOL.0001.0030.7714 esp. at .7715), regarding ‘Woodbury Ground Water Problem’; and
- (d) Neil MacKay, *A Chemical History of 3M 1933-1990*, (3M Chemical, Film & Allied Products Group, 1991) (HOL.0001.0008.2667 at .2700, .2740).

Further particulars may be provided after discovery.

- (b) senior employees of (at least) the Fluorochemicals Division and/or the Environmental Engineering and Pollution Control Department were tasked with investigating, researching or considering various ecological aspects of fluorocarbons including their ultimate disposal fate (the **Ecological Aspects of Fluorocarbons Project**).

Particulars

As best as the Commonwealth can presently say, some time prior to July 1971, Robert M Adams (then Director, and Vice

President, Research and Development, 3M) requested that Dr Hugh Bryce (then Technical Director of the Chemical Division/Chairman of the Technical Council, 3M), prepare a report on various ecological aspects of fluorocarbons, including their ultimate disposal fate (USA.1000.0001.0053).

Dr Bryce received input for that report from Dr J T Ling (Officer, Environmental Engineering and Pollution Control Department, 3M) and various other employees of 3M's Environmental Engineering and Pollution Control Department, including E D Benforado, C Kiester and/or S Yunis (USA.1000.0001.0051), including a suggestion to include the following words in his report: "*there are many unknowns regarding the environmental impact of fluorocarbons*" and "*the data substantiating the nonbiodegradability of fluorocarbons is very limited*".

Table A, Part I and **Table A, Part II** annexed to this Statement of Claim sets out the Commonwealth's present understanding of the various 3M directors and senior employees involved in the Ecological Aspects of Fluorocarbons Project, together with the information they obtained or received.

Further particulars may be provided after discovery.

34. Between 1970 and 1972, 3M undertook research and testing, and obtained various reports as to the toxic and other effects of some of its fluorochemical products, including 3M AFFF (being FC-200).

Particulars

As best as the Commonwealth can presently say, 3M obtained (at least) the following reports, on or shortly after the dates of those reports:

- (a) Biosearch Inc, Primary Skin Irritation Study, 3M Reference T-269, 1 October 1970;
- (b) Biosearch Inc, Acute Oral Toxicity – Rats, 3M Reference No T-289, 24 February 1971;
- (c) three reports prepared by Biosearch Inc, Primary Skin Irritation Study – Rabbits, 3M Reference No T-361, Primary Eye Irritation Study – Rabbits, 3M Reference No T-361, and Acute Oral Toxicity – Rats, 3M Reference No T-361, 9 December 1971; and
- (d) two reports prepared by Bionomics Inc, Acute toxicity of Light Water (FC-200) to bluegills, and Acute toxicity of Light Water (FC-200) to grass shrimp, fiddler crabs and mummichogs, September 1972, (USA.1000.0001.0057), which demonstrated acute toxicity of Light Water (i.e. FC-200) to some marine organisms.

The Commonwealth does not presently have copies of the reports referred to in sub-paragraphs (a) to (c), but it can be inferred that 3M obtained and/or received those reports from the fact that each of the reports are referred to in an index of 3M Toxicology and Human Health Studies that were submitted by 3M to the US EPA on or about 8 September 2000 (USA.1000.0002.2073 at .2113-.2115).

Further particulars may be provided after discovery.

35. The research and testing undertaken by or on behalf of 3M referred to above concluded that:
- (a) at least PFOS and PFOA (or their precursors), would not decompose in the environment, and consequently, some components of 3M AFFF (being those components containing PFOS or PFOA, or their precursors), would not decompose in the environment; and

Particulars

The Commonwealth repeats the particulars to sub-paragraph 33(b) above, and refers to a 3M interoffice memorandum from Dr H G Bryce (Technical Director, Chemical Division) to Mr R M Adams (Vice President, Research and Development) dated 13 September 1971, (USA.1000.0001.0053 at .0055-.0056), titled "Ecological Aspects of Fluorocarbons", which stated (in respect of fluorochemical surfactants) that "...*These products consist of a conventional hydrocarbon backbone as functional group to which has been attached chemically certain perfluoroalkyl groups such as C₈F₁₇. Approximately 50% of the weight is the fluorocarbon group, while the rest is the hydrocarbon in make up... From B,O,D, and C,O,D, determinations, it is known that the hydrocarbon portions of these compounds are decomposed biologically*" and "*the undecomposed portion will be either a perfluoroalkyl carboxylic or sulfonic derivative or a perfluoroalkyl hydride. The perfluoroalkyl acid derivatives would be expected to be adsorbed by the soil... However, it should be noted that the soil has a limited capacity for absorbing these non biodegradable acidic derivatives... should non-degraded liquid fluorocarbons not be volatilised before mixing with ground water, this would be reason for concern*" and finally "*...It is reasonable to assume that the elutriation process, should enable the soil to retain essentially 500ppm before leaching into groundwater, or surface water systems. In any case the salts of fluorocarbon acids are only moderately toxic as the LD50 values are greater than 200mg/kg. Hence even if they did eventually reach potable water systems their concentrations would not be sufficient to cause any real concern in view of the dilution factors involved.*"

The report was also copied to the following 3M officers or senior employees: Richard (Dick) A Guenther (Chemical Division, 3M), James (Jim) Johnson (Technical Service Manager of the Chemical Division and Environmental Laboratory of the Environmental Engineering and Pollution Control, 3M), Dr J (Don) LaZerte (then Technical Director, Chemical Division, 3M), Dr Joseph T Ling (Environmental Engineering and Pollution Control, 3M), J E Long (Toxicology Department, 3M), Dr William (Bill) H Pearlson (Fluorination Research and Development and Fluorochemicals Division, 3M) and Arthur K Telfer (then Division Vice President, Chemical Division, 3M).

Table A, Part I and **Table A, Part II** annexed to this Statement of Claim sets out the Commonwealth's present understanding of the various 3M directors and senior employees involved in the Ecological Aspects of Fluorocarbons Project, together with the information they obtained or received.

Further particulars may be provided after discovery or by way of expert evidence.

- (b) at least one 3M AFFF formulation, being FC-200, was potentially harmful or toxic to marine life.

Particulars

The Commonwealth refers to the two reports prepared by Bionomics Inc, September 1972, which indicated that FC-200 had toxic effects upon bluegills, grass shrimp, fiddler crabs and mummichogs (per subparagraph (d) of the particulars to paragraph 34 above) (**USA.1000.0001.0057**).

Further particulars may be provided after discovery or by way of expert evidence.

- 36. By reason of the above matters, and by no later than 1972, 3M knew or ought to have known:
 - (a) that at least some of 3M's fluorochemical products, and therefore some components of 3M AFFF, were potentially harmful or otherwise toxic to animals;
 - (b) that at least some of 3M's fluorochemical products, and therefore some components of 3M AFFF:
 - (i) did not biodegrade;
 - (ii) were otherwise persistent in soil and water; and

- (iii) could leach from soil into groundwater or surface water systems and potentially migrate into drinking water and other areas.

Particulars

That 3M knew or ought to have known that PFOS and PFOA, and by extension, FC-95 and components of 3M AFFF, did not biodegrade and that FC-200 was potentially toxic to some animals, is to be inferred from the fact of its receipt of the material referred to in the particulars to paragraphs 30-35 above.

Table A, Part I annexed to this Statement of Claim further sets out the Commonwealth's present understanding of the information obtained or received by various 3M directors and senior employees at or around this time.

Further particulars may be provided after discovery.

- 37. Further, by reason of the matters set out above in paragraphs 8 to 11 and 30 to 36 , by no later than 1973, 3M Australia ought to have known:
 - (a) that at least some of 3M's fluorochemical products, and therefore some components of 3M AFFF, were potentially harmful or otherwise toxic to animals;
 - (b) that at least some of some of 3M's fluorochemical products, and therefore some components of 3M AFFF:
 - (i) did not biodegrade;
 - (ii) were otherwise persistent in soil and water; and
 - (iii) could leach from soils into groundwater or surface water systems and potentially migrate into drinking water and other areas.

Particulars

That 3M Australia ought to have known that (at least) PFOS and PFOA, and therefore, by extension, at least FC-95 and some components of 3M AFFF, did not biodegrade; or that FC-200 (or some of its components) was potentially toxic to some animals, is to be inferred from the matters set out in paragraphs 2(e), 8-11, and 36 above.

D.2 The period between 1973 to 1979

38. Between about 1973 and 1974, 3M undertook further testing of its fluorochemical products, including at least FC-95 and some 3M AFFF, being FC-200, FC-203 and FC-206.

Particulars

As best as the Commonwealth can presently say, between about March 1973 and August 1974, Dale Bacon (Environmental Engineering and Pollution Control Department, 3M) requested 3M's own analysts to undertake biodegradation and toxicity testing of at least FC-95, and 3M AFFF being FC-200, FC-203 and FC-206, the results of which are recorded in a number of variously dated laboratory worksheets (**HOL.0001.0002.0971**; **HOL.0001.0004.1164**; **HOL.0001.0006.3350**).

Further, between about January 1974 and August 1974, 3M requested external consultants to undertake a range of toxicity testing of at least FC-95, and 3M AFFF being FC-203 and FC-206, as follows:

- (a) Industrial Bio-Test Laboratories Inc, Algicidal Activity of two samples labelled 'A' and 'B', 23 January 1974, report prepared for 3M (**USA.1000.0004.9229**), in respect of PFOS, FC-95 or as a component of FC-203;
- (b) Bionomics EG&G Inc, Acute Toxicity of Sample C to Atlantic Oyster (*Crassostrea virginica*), July 1974, report prepared for 3M (**HOL.0001.0033.3525**), in respect of PFOS, FC-95 or as a component of FC-206 or L-3243;
- (c) Bionomics EG&G Inc, Acute Toxicity of Sample C to Water Flea (*Daphnia Magna*) and Scud (*Gammarus fasciatus*), August 1974, report prepared for 3M (**HOL.0001.0014.3117**), in respect of PFOS, FC-95 or as a component of FC-206 or L-3243; and
- (d) Warf Institute, Primary Skin and Primary Irritation reports in Albino Rabbits, 14 November 1974, report prepared for 3M (**HOL.0001.0035.2242**), in respect of FC-95.

Further particulars may be provided after discovery.

39. The results of the testing undertaken by or on behalf of 3M, as referred to above, indicated that FC-95, and some 3M AFFF:
- (a) were potentially harmful or toxic to some animals; and

Particulars

The Commonwealth refers to:

- (a) 3M's internal toxicity testing in relation to fathead minnows and rainbow trout (**HOL.0001.0004.1164**) (**HOL.0001.0006.3350**) which indicated various levels of toxicity to the tested species;
- (b) the reports identified in paragraphs (a)-(c) of the particulars to paragraph 38 above, which indicated various levels of toxicity to the tested species; and
- (c) the report identified in paragraph (d) of the particulars to paragraph 38 above, which concluded that FC-95 was not irritating to the skin of Albino rabbits, but was irritating to the eyes.

Further particulars may be provided after discovery or by way of expert evidence.

- (b) did not fully biodegrade.

Particulars

The Commonwealth refers to the laboratory worksheets (**HOL.0001.0002.0971**) identified in the particulars to paragraph 38 above.

Further particulars may be provided after discovery or by way of expert evidence.

40. In or about February 1974:

- (a) the US Air Force published a report in relation to the biodegradability and toxicity of one 3M AFFF formulation, being FC-200, which concluded that:
 - (i) biodegradation of 3M AFFF when they represent the only source of organic matter is not practical;
 - (ii) the fluorocarbon surfactant component of 3M AFFF was, at best, only partially biodegradable;
 - (iii) discharge of 3M AFFF into sanitary sewers where physically practical should be done, although there was no indication that 3M AFFF was amenable to detoxification by biological waste treatment and further testing was required;

Particulars

The Commonwealth refers to the report by Lt Ronald H Kroop and Sgt Joseph E Martin (US Air Force), Treatability of Aqueous Film-Forming Foams used for Fire Fighting, February 1974 (**DOD.0001.0001.6109**, see e.g. .6133, .6183, .6187, .6196, .6197, and .6199).

- (b) the US Air Force published another report in relation to the biodegradability and toxicity of one 3M AFFF formulation, being FC-200, which concluded that:
 - (i) respiration studies with sewage activated sludge microorganisms using various concentrations of FC-200 demonstrated a retarded or complete inhibition of respiration of FC-200 at certain concentrations;
 - (ii) FC-200 was the most toxic of the fire fighting foams evaluated by the US Air Force to fathead minnows;
 - (iii) extended biochemical oxygen demand studies indicated a time requirement of several days for microorganisms to acclimate to FC-200;
 - (iv) static extended biochemical oxygen demand tests demonstrated difficulty with biodegradation of FC-200 based on the remaining concentrations of chemical oxygen demand and total oxygen demand after 20 and 30 days of contact time with seed microorganisms; and
 - (v) based on the toxicity evaluations performed, FC-200 should not be used if other fire fighting foams are available.

Particulars

The Commonwealth refers to the report by Captain Jerry F Thomas and Major Edward E Lefebvre (US Air Force), Biodegradability and Toxicity of FC-200, Aqueous Film Forming Foam, February 1974 (**USA.1000.0002.4995** at .5001-.5002, .5019-.5022, .5028, .5030).

- 41. On a date presently unknown to the Commonwealth but after their publication, 3M obtained copies of the abovementioned US Air Force reports.

Particulars

That 3M obtained a copy of the abovementioned US Air Force reports can be inferred from:

- (a) in respect of the report referred to in paragraph 40(a) above, the fact that it is listed in an index of 3M Toxicology and Human Health Studies that were submitted by 3M to the US EPA on or about 8 September 2000 (**USA.1000.0002.2073** at .2098); and
- (b) in respect of the report referred to in paragraph 40(b) above, the fact that 3M had obtained other internal reports from the US military, including from the US Navy and the US Air Force, as are listed in the index of 3M Toxicology and Human Health Studies submitted by 3M to the US EPA on or about 8 September 2000 (see e.g. **USA.1000.0002.2073** at .2095 and following, esp. items 3, 9-11, 14, 31, 35, 43, 45, 50-52).

Further particulars may be provided after discovery.

42. Further, by no later than about 1975, senior employees (at least) of 3M were aware that university researchers Dr Donald Taves and Dr Warren Guy had identified the presence of a non-exchangeable form of fluoride in human blood serum.

Particulars

On or about 16 March 1968, Dr Taves (Department of Pharmacology, University of Rochester School of Medicine) published 'Evidence that there are Two Forms of Fluoride in Human Serum', (1968) 217 *Nature* 1050–1051, in which it was recorded that two forms of fluoride had been observed in human blood serum; an exchangeable fluoride and an unknown or unidentified, non-exchangeable fluoride (**DOD.0001.0025.3004**).

Subsequently, on at least two occasions between about 14 August 1975 and 22 August 1975, Dr Guy (College of Medicine, University of Florida) attempted to obtain information from 3M about the potential source(s) of fluorocarbon carboxylic acids found in human blood samples from Texas and New York. Dr Guy suspected that the source was either Teflon cookware or Scotchgarded fabrics, both of which were manufactured by 3M, using FC-143. The Commonwealth refers to two internal 3M memorandums dated 14 August 1975 (**USA.0001.0002.7617**) and 22 August 1975 (**USA.1000.0007.0276**).

On or about 25 August 1975, Dr Guy and Dr Taves presented a session at the American Chemical Society (ACS) meeting in Chicago titled 'Characteristics and Concentrations of organic fluoro compounds found in human tissues' and a copy of their

paper was provided to R Mitsch (3M) on about 16 October 1975 (USA.0001.0001.0614). On or around 6 November 1976, the paper was published as an article titled 'Organic fluorocompounds in human plasma – prevalence and characterisation' (1976) 28 *ACS Symposium Series* 117-134 (HOL.0001.0024.7335).

That 3M received copies of these reports can also be inferred from the fact that they are referred to in the index of 3M Toxicology and Human Health Studies that were submitted to the US EPA on or about 8 September 2000 (USA.1000.0002.2073 at .2100, .2096).

43. In or about June 1976, 3M undertook further testing of some of its 3M AFFF formulations, including at least FC-206.

Particulars

As best as the Commonwealth can presently say, in about June 1976, Dale Bacon (Environmental Engineering and Pollution Control Department, 3M) requested 3M analysts to undertake biodegradation and toxicity testing of 3M AFFF including at least FC-206, the results of which are recorded in a number of laboratory worksheets (HOL.0001.0002.8886; HOL.0001.0018.6748)

Further particulars may be provided after discovery.

44. The results of the testing undertaken by or on behalf of 3M referred to above indicated that some 3M AFFF formulations:
- (a) were potentially harmful or toxic to some animals; and

Particulars

The Commonwealth refers to the laboratory worksheet (HOL.0001.0018.6748) identified in the particulars to paragraph 43 above, which indicated that FC-206 was potentially harmful or toxic to fathead minnows in certain concentrations.

Further particulars may be provided after discovery or by way of expert evidence.

- (b) did not fully biodegrade.

Particulars

The Commonwealth refers to:

- (a) the reports identified in paragraphs 38 and 40(a) above; and
- (b) the laboratory worksheet (**HOL.0001.0002.8886**) identified in the particulars to paragraph 43 above.

Further particulars may be provided after discovery or by way of expert evidence.

45. On dates presently unknown to the Commonwealth, but likely in or about 1977, 3M commenced:

- (a) various investigations into the source of fluoride in human blood serum, including by testing the blood of its workers, referred to internally by names such as **Fluorochemicals in Blood** or **Organic Fluorine Compounds in Blood**; and
- (b) a number of research projects known internally as the **Fate of Fluorochemicals** whereby 3M conducted and obtained a range of studies into the biological toxicity and environmental effects of each of FC-95, FC-143 and FM-3422.

Particulars

Table A, Part I and **Table A, Part II** annexed to this Statement of Claim sets out the Commonwealth's present understanding of the directors and senior employees of 3M, including from the Fluorochemicals Division, the Chemical Products Group, Environmental Engineering and Pollution Control and/or other internal 3M groups or departments who were involved in either the Fluorochemicals in Blood investigation or the Fate of Fluorochemicals Project, including the information they obtained or received.

The Commonwealth also refers to the particulars to paragraph 47 below.

Further particulars may be provided after discovery.

46. On a date presently unknown to the Commonwealth but no later than 1978, 3M also established the 3M Fluorochemical Technical Review Committee (**FC Tech Review Committee**), which was responsible for the guidance, planning and evaluation of studies conducted by, or on behalf of, the Chemical Products Group and/or 3M's Medical Department including in relation to the investigations referred to in paragraph 45 above.

Particulars

Table A, Parts I and II annexed to this Statement of Claim sets out the Commonwealth's present understanding of the FC Tech Review Committee's members which comprised of (at least) various senior employees of 3M, including from the Fluorochemicals Division, the Chemical Products Group and/or other internal 3M groups or departments.

The Commonwealth also refers to Exhibit 1989, *State of Minnesota v 3M Company* (Court File No. 27-CV-10-28862), which was publicly released by the Minnesota Attorney-General, titled '3M's FC Committees Chart', undated, which stated that it describes (in chart form) "*3M's current understanding of various committees, groups and teams that had direct involvement in FC issues*" (**USA.1000.0003.9018** at .9018).

Further particulars may be provided after discovery.

47. The testing and research conducted by 3M as part of the Fluorochemicals in Blood investigation, referred to in paragraph 45(a) above, concluded that the unidentified fluoride was either PFOS or PFOA.

Particulars

The Commonwealth refers to:

- (a) a chronology included in a 3M document dated approximately 1977 (**USA.1000.0002.1961** commencing at .1979), which records that in or about 1975, 3M's Central Research Laboratory undertook testing which identified the fluoride as being PFOS or its salts (at .1979);
- (b) 3M Minutes of Meeting, 'FC Technical Review Committee', 4 May 1978 (**USA.1000.0002.5219**), which records that FC-143 had been determined in plasma, serum, urine and rat liver, and that FM-3422 had been determined in plasma, serum and rat liver (at .5220-.5221);
- (c) 3M Technical Report, Analysis of Selected Decatur Employee Serum for Sulfonic and Carboxylic Fluorochemicals, 4 October 1979 (author and requestor unknown) (**HOL.0001.0030.7508** see e.g. .7510), which noted the report of organic fluoride levels reported in 'Analytic Report 7194' and subsequent attempt to "*further characterize the fluoride serum value and attempt to identify the presence of 3M fluorochemicals*". The 3M Technical Report identified the presence of PFOS, PFHS and PFOA in the tested employees' blood

serum resulting in further analysis that was confined to a single serum sample; and

- (d) 3M Phone Conversation Report prepared by R A Prokop to L C Krogh, J D LaZerte and copied to (at least) R J Davis, L J Magill, T J Scheuerman, L D DeSimone, R A Prokop, F D Griffith and F A Ubel dated 26 July 1979 (USA.1000.0001.0204), regarding a discussion between R A Prokop with Eugene Berman, attorney for DuPont, in respect of 'Disclosure of information on levels of fluorochemicals in blood' which noted the review of information on fluorochemicals in blood and concluded *"since there were no adverse health effects, there was no reasons for"* notification to the US EPA and records that Prokop stated *"...I thought we would be reluctant to publish any serum organic fluorine levels at the present time since we do not know what they mean. I also told him that I thought the earliest that we might be willing to publish would be after completion of our epidemiology study."*

48. As part of the Fate of Fluorochemicals Project referred to in paragraph 45(b) above, between about 1976 and 1979, 3M conducted its own testing, and obtained reports from external consultants, in respect of each of FC-95, FC-143 and FM-3422, including as to their potential:

- (a) bioaccumulation or bio-concentration;
- (b) toxicity to animals; and
- (c) resistance to biodegradation.

Particulars

The Commonwealth refers to:

- (a) Technical Report Summaries as to the bioaccumulation or bio-concentration potential of the products:
 - (i) M T Elnabarawy (3M, Environmental Engineering and Pollution Control Department), Bioconcentration of FM 3422 in Bluegill Sunfish and in Channel Catfish, 17 May 1977 (USA.1000.0001.0096), addressed to A N Welter (3M, Environmental Lab, Environmental Engineering and Pollution Control);
 - (ii) A N Welter (3M, Environmental Engineering and Pollution Control Department), 'Aquatic Fate of a Fluorochemical: FM 3422, 14 October 1977

- (**USA.1000.0001.0096** at .0101-.0109), addressed to D L Bacon (3M, Environmental Laboratory, Environmental Engineering and Pollution Control); and
- (iii) James E Gagnon (3M, Environmental Engineering and Pollution Control Department), Bioaccumulation of Fluorochemicals in Tennessee River Fish relating to FM-3422, 22 May 1979 (**USA.1000.0001.0194**), addressed to D L Bacon (3M, Environmental Laboratory, Environmental Engineering and Pollution Control), copied to D Ricker (3M, SA & CD Quality Assurance), A N Welter (3M, Environmental Lab, Environmental Engineering and Pollution Control) and A Mendel (3M, Fate of the Fluorochemicals Project member);
- (b) As to the potential toxicity to animals of FC-95, FC-143 and FM-3422:
- (i) A N Welter (3M, Environmental Engineering and Pollution Control Department), Aquatic Fate of a Fluorochemical: FM 3422, 14 October 1977 (**USA.1000.0001.0096** at .0101-.0109), addressed to D L Bacon (3M, Environmental Laboratory, Environmental Engineering and Pollution Control);
- (ii) Jon Belisle (3M, Central Analytical Laboratory), Report No 6967 IRDC 137-092: FC- 95/Monkey, 4 August 1978 (**USA.1000.0003.4025**), requested by J E Long (3M, Toxicology Department), concerning toxicity testing of FC-95 on rhesus monkeys;
- (iii) Jon Belisle (3M, Analytical and Properties Research Laboratory), IRDC 137-088: FM-3422/Monkey, 16 August 1978, (**HOL.0001.0006.1401**), addressed to J E Long (3M, Toxicology Department), undertaken as part of the 'Trace Fluorochemicals in the Environment' Project, concerning toxicity testing of FM-3422 on monkeys;
- (iv) International Research and Development Corporation, Ninety Day Subacute Rhesus Monkey Toxicity Study, 10 November 1978, report prepared for 3M (**DOD.0001.0001.6683**), in respect of FC-143;
- (v) International Research and Development Corporation, Ninety Day Subacute Rhesus Monkey Toxicity Study, 18 December 1978, report prepared for 3M (**HOL.0001.0002.2636**), in respect of FC-95; and
- (vi) R A Nelson (3M, Member, FC Tech Review Committee), FC-95, FC-143 and FM-3422 – 90 Day

Subacute Toxicity Studies Conducted at IRDC –
Review of Final Reports and Summary, 20 March
1979 (USA.1000.0002.2726);

- (c) As to the potential resistance to biodegradation of FC-95, FC-143 and FM-3422:
 - (i) E A Reiner (3M, Environmental Engineering and Pollution Control Department), Biodegradation Studies of Fluorocarbons – II, 9 January 1978 (USA.1000.0001.0113), in respect of FM-3422 and addressed to D L Bacon (3M, Environmental Laboratory, Environmental Engineering and Pollution Control); and
 - (ii) E A Reiner (3M, Environmental Engineering and Pollution Control Department), Biodegradation Studies of Fluorocarbons – III, 19 July 1978 (USA.1000.0001.0139), in respect of FC-95 and FC-143 and addressed to D L Bacon (3M, Environmental Laboratory, Environmental Engineering and Pollution Control);
- (d) As to a summary of the overall results for each of FC-95, FC-143 and FM-3422:
 - (i) A N Welter (3M, Environmental Engineering and Pollution Control Department), Final Comprehensive Report on FM-3422, 7 February 1979 (USA.1000.0001.0156), addressed to R A Prokop (3M, Commercial Chemicals Division), copied to D L Bacon (3M, Environmental Laboratory, Environmental Engineering and Pollution Control), R L Bohon (3M, Environmental Laboratory, Environmental Engineering and Pollution Control) and V Pothapragada (3M, Speciality Materials Division);
 - (ii) A N Welter (3M, Environmental Engineering and Pollution Control Department), Final Comprehensive Report: FC-95, 15 March 1979 (USA.1000.0001.0169), addressed to R A Prokop (3M, Commercial Chemicals Division), copied to D L Bacon (3M, Environmental Laboratory, Environmental Engineering and Pollution Control), R L Bohon (3M, Environmental Laboratory, Environmental Engineering and Pollution Control) and V Pothapragada (3M, Speciality Materials Division); and
 - (iii) A N Welter (3M, Environmental Engineering and Pollution Control Department), Final Comprehensive Report: FC 143, 23 March 1979 (USA.1000.0001.0181), addressed to R A Prokop (3M, Commercial Chemicals Division), copied to D L Bacon (3M, Environmental Laboratory,

Environmental Engineering and Pollution Control),
R L Bohon (3M, Environmental Laboratory,
Environmental Engineering and Pollution Control)
and Y(sic) Pothapragada (3M, Speciality Materials
Division).

Further particulars may be provided after discovery and expert
evidence.

49. The testing and research conducted as part of the Fate of Fluorochemicals Project concluded that each of FC-95 (or PFOS) and FC-143 (or PFOA):
- (a) were potentially harmful or otherwise toxic to animals;
 - (b) did not biodegrade;
 - (c) were persistent in soil and water;
 - (d) bioconcentrated and/or bioaccumulated in animals; and
 - (e) could leach from soil into groundwater or surface water systems and potentially migrate into drinking water and other areas.

Particulars

The Commonwealth refers to the findings and results set out in the reports identified in paragraph 48 above.

In particular, the reports record (amongst other things) that:

- (a) levels of FC-95 concentrate, or build up, over time in blood serum (**HOL.0001.0006.1401** see e.g. 1403);
- (b) during a toxicity study of FC-95 on Rhesus monkeys, all of the animals died within the first few days until the concentrations were significantly lowered (**USA.1000.0003.4025** see e.g. .4025);
- (c) even at lower dosages of FC-95, Rhesus monkeys exhibited signs of toxicity including gastrointestinal distress (**HOL.0001.0002.2636** see e.g. .2639-.2640);
- (d) FC-95 and FC-143 were completely resistant to biodegradation (**USA.1000.0001.0139** see e.g. .0140; **USA.1000.0001.0169** see e.g. .0173) and were likely to persist in the environment for extended periods unaltered by microbial catabolism; and
- (e) FC-95 was highly mobile in Brill sandy loam soil (**USA.1000.0001.0169** see e.g. .0179).

Table A, Part I annexed to this Statement of Claim further sets out the Commonwealth's present understanding of the information obtained or received by various 3M directors and senior employees at or around this time.

50. From time to time during the period 1976 to about 1979:

(a) members of the FC Tech Review Committee; and/or

(b) other directors and senior employees of 3M,

conducted meetings, the purpose of which was to, amongst other things:

(c) discuss and consider the information obtained as part of the Fluorochemicals in Blood investigation and the Fate of Fluorochemicals Project;

(d) identify further research or testing required to be undertaken; and

(e) consider the necessity of making formal disclosures to external agencies or regulators, including the US EPA.

Particulars

As best as the Commonwealth can presently say, the FC Tech Review Committee conducted meetings on at least 12 April 1978 (USA.1000.0001.0135) and 4 May 1978 (USA.1000.0002.5219).

Other meetings of 3M officers and senior employees were relevantly conducted on at least 28 February 1978 (USA.1000.0007.0282), 28 April 1978 (USA.1000.0003.3970) and 8 May 1978 (HOL.0001.0009.3860).

Further, on at least two occasions (being in or about February 1977 and then on or about 7 November 1977), various senior employees of 3M, including (at least) L C Krogh, J D LaZerte, T J Scheuerman and F A Ubel made presentations to the Corporate Responsibility Committee in relation to the Fluorochemicals in Blood investigation, which included (at least) the provision of a chronology, detailing, amongst other things, the initial contact made by Dr Guy to Dr J D LaZerte and the subsequent steps taken by various senior employees of 3M to investigate the source of the fluorine (including identifying it as PFOS), and to determine its presence and levels in 3M workers' blood (USA.0001.0001.0695).

Table A, Part I and **Table A, Part II** annexed to this Statement of Claim sets out the Commonwealth's present

understanding of the directors and senior employees of 3M, including from the Fluorochemicals Division, the Chemical Products Group, Environmental Engineering and Pollution Control and/or other internal 3M groups or departments who were involved in the FC Tech Review Committee, including the information they obtained or received.

51. On or about 8 May 1978, despite the results of its testing indicating that each of FC-95, FC-143 and FM-3422 were toxic, 3M determined that this did not constitute a ‘substantial risk’ under the TSCA, and therefore, determined that it was not necessary to report those findings to the US EPA.

Particulars

The Commonwealth refers to a 3M internal memorandum from R A Prokop (3M, Commercial Chemicals Division) dated 10 May 1978 (**HOL.0001.0009.3860**), which noted the presence of the following 3M employees at the meeting on 8 May 1978: R J Davis, L C Krogh, J D LaZerte, R A Nelson, J A Pendergrass, T J Scheuerman, F A Ubel, the internal correspondence noted “*Results indicate that FC-95, FM-3422 and FC-143 are toxic*” and “*it was decided that the toxicity of FC-95, FM-3422 and FC-143 does not constitute a substantial risk and should not be reported at this time.*”

52. By reason of the above matters at paragraphs 38 to 51, by at least 1979, 3M knew or ought to have known:

(a) that at least:

- (i) PFOS and PFOA;
- (ii) further and alternatively, FC-95, FC-143 and FM-3422;
- (iii) and consequently, some components of 3M AFFF,

were potentially harmful or otherwise toxic to animals;

Particulars

That 3M knew or ought to have known that PFOS and PFOA, and by extension, at least FC-95, FC-143 and FM-3422, and some components of 3M AFFF, were potentially toxic to some animals, is to be inferred from the fact of its receipt of the material referred to in the particulars to paragraphs 39(a), 40(b), 44(a), 48(b) and 49(a) above.

Table A, Part I annexed to this Statement of Claim further sets out the Commonwealth's present understanding of the information obtained or received by various 3M directors and senior employees at or around this time.

Further particulars may be provided after discovery

- (b) that at least:
 - (i) PFOS and PFOA;
 - (ii) further and alternatively, FC-95, FC-143 and FM-3422;
 - (iii) and consequently, some components of 3M AFFF:
 - (1) did not biodegrade;
 - (2) were persistent in soil and water;
 - (3) and could leach from soil into groundwater or surface water systems and potentially migrate into drinking water and other areas;

Particulars

That 3M knew or ought to have known that PFOS and PFOA, and by extension, FC-95, FC-143 and FM-3422, and some components of 3M AFFF, did not biodegrade, were persistent in soil and water, and could leach from soil into groundwater or surface water systems and potentially migrate into drinking waters and other areas, is to be inferred from that fact of its receipt of the material referred to in the particulars to paragraphs 39(b), 40(a), 40(b), 44(b), 48(c), 49(b), 49(c) and 49(e) above.

Table A, Part I annexed to this Statement of Claim further sets out the Commonwealth's present understanding of the information obtained or received by various 3M directors and senior employees at or around this time.

Further particulars may be provided after discovery

- (c) that at least:
 - (i) PFOS and PFOA;
 - (ii) further and alternatively, FC-95, FC-143 and FM-3422,
 - (iii) and consequently, some components of 3M AFFF,

bioconcentrated and/or bioaccumulated in animals; and

Particulars

That 3M knew or ought to have known that PFOS and PFOA, and by extension, FC-95, FC-143 and FM-3422, and some components of 3M AFFF, bioconcentrated and/or bioaccumulated in animals, is to be inferred from that fact of its receipt of the material referred to in the particulars to paragraphs 48(a) and 49(d) above.

Table A, Part I annexed to this Statement of Claim further sets out the Commonwealth's present understanding of the information obtained or received by various 3M directors and senior employees at or around this time.

Further particulars may be provided after discovery

(d) that at least:

- (i) PFOS and PFOA;
- (ii) further and alternatively, FC-95 or FC-143,
- (iii) and consequently, some components of 3M AFFF,

were present in human tissue, and in particular blood serum.

Particulars

That 3M knew or ought to have known that PFOS and PFOA, and by extension, at least FC-95 and FC-143 and therefore, some components of 3M AFFF, were present in human tissue, and in particular blood serum, is to be inferred from that fact of its receipt of the material referred to in the particulars to paragraphs 42 and 47 above.

Table A, Part I annexed to this Statement of Claim further sets out the Commonwealth's present understanding of the information obtained or received by various 3M directors and senior employees at or around this time.

Further particulars may be provided after discovery

53. By reason of the matters at paragraphs 8 to 11 and 38 to 51, by at least 1979, 3M Australia ought to have known:

(a) that at least:

- (i) PFOS and PFOA;

- (ii) further and alternatively, FC-95, FC-143 and FM-3422;
 - (iii) and consequently, some components of 3M AFFF,
were potentially harmful or otherwise toxic to animals;
- (b) that at least:
 - (i) PFOS and PFOA;
 - (ii) further and alternatively, FC-95 and FC-143;
 - (iii) and consequently, some components of 3M AFFF:
 - (1) did not biodegrade;
 - (2) were persistent in soil and water;
 - (3) could leach from soil into groundwater or surface water systems and
potentially migrate into drinking water and other areas;
- (c) that at least:
 - (i) PFOS and PFOA;
 - (ii) further and alternatively, FC-95, FC-143 and FM-3422;
 - (iii) and consequently, some components of 3M AFFF,
bioconcentrated and/or bioaccumulated in animals; and
- (d) that at least:
 - (i) PFOS and PFOA;
 - (ii) further and alternatively, FC-95 or FC-143;
 - (iii) and consequently, some components of 3M AFFF,
were present in human tissue, and in particular, blood serum.

Particulars

That 3M Australia ought to have known that (at least) PFOS and PFOA, and therefore, by extension, at least FC-95 and FC-143, and some components of 3M AFFF:

- (a) were potentially harmful or otherwise toxic to animals;
- (b) did not biodegrade;
- (c) were persistent in soil and water;
- (d) could leach from soils into groundwater or surface water systems and potentially migrate into drinking water and other areas;
- (e) bioconcentrated and/or bioaccumulated in animals; and
- (f) were present in human tissue, and in particular blood serum,

is to be inferred from the matters set out in paragraphs 2(e), 8 to 11, and 52 above.

D.3 The period between 1980 to 2000

54. From about 1980 to at least about 1981, 3M received notices of concerns from external parties in relation to some 3M AFFF formulations, including at least FC-200, FC-206 and FC-3017, and in particular, as to their environmental safety or effects.

Particulars

The Commonwealth refers to:

- (a) 3M report summarising and addressing a study conducted by Dr H Hellman and D Muller, for the West German Department of Water Technology, Environmental Impact of Fire Extinguishing Foam Compounds, 10 April 1979 (**HOL.0001.0001.9088**), which was received by (at least) Eric Reiner of 3M's Environmental Engineering and Pollution Control Department by no later than 7 March 1980 (see .9090).

The report (which appears from .9091) compared the environmental impacts of six AFFF products, including some 3M AFFF formulations (FC-200, FC-206 and FC-3017) and concluded that they were potentially toxic and difficult to degrade and therefore could disturb and impair the drinking water supplies (at .9100-.9102, .9016-.9107). Further, the report identified that only parts of the products could be broken down (or biodegraded) and as a result biodegradation results could be manipulated by a manufacturer by the addition of compounds that could easily be broken down (at .9099);

- (b) Technical Memorandum from Dr D B Chan (Civil Engineering Laboratory) to Commander, Naval Facilities Engineering Command dated August 1980 (USA.1000.0002.4985), which concluded that AFFF-laden wastewater has toxic effects upon the receiving environment. It is inferred this document was received by 3M at or around the time of its publication, by reason of the fact that it is listed in an index of 3M Toxicology and Human Health Studies that were submitted by 3M to the US EPA on or about 8 September 2000 (USA.1000.0002.2073 at .2095 (item 11); and
- (c) 3M internal correspondence from L Ludford (Public Relations) to L Krogh (Executive) dated 8 September 1981 (USA.1000.0001.0239), which reported on detailed questioning by a journalist about Light Water and his responses, including “3M knows of no evidence that suggests fire fighters are exposed to a health danger because they use Light Water”, the transfer of 14 women workers and concerning additional toxicology tests, “I also emphasized that the only test information he has now is preliminary and that most toxicologists are very cautious about extrapolating preliminary test results on rodents to human beings.”

Further particulars may be provided after discovery.

55. Subsequently, between about 1980 and about 1984, 3M undertook various biodegradation testing of some 3M AFFF formulations (including at least FC-203, FC-203A, FC-203NFP, FC-206, FC-600 and FC-3017), the results of which confirmed that 3M AFFF was not fully biodegradable.

Particulars

Between about June 1980 to July 1984, 3M undertook its own testing, and/or obtained reports from consultants, in relation to the biodegradability of some 3M AFFF including at least FC-203, FC-206, FC-600 and FC-3017.

The Commonwealth refers to:

- (a) biodegradation tests conducted by the Environmental Engineering and Pollution Control Department at the request of Eric Reiner or Dale Bacon between 29 January 1980 and 19 February 1980, the results of which are recorded in various laboratory worksheets regarding FC-203 (HOL.0001.0026.6197) and includes a comparison of various 3M AFFF or AFFF (i.e. FC-200, FC-201, FC-203, AF-3, AF-5, and Sipex OLS) (at .6206);
- (b) Eric Reiner (3M, Environmental Engineering and Pollution Control Department), Biodegradation of

- ‘LIGHT WATER’ Products in OECD Test 6/80, 30 June 1980 (**HOL.0001.0030.8502**), addressed to J A Pignato, regarding FC-203, FC-206 and FC-3017 and which concluded that the products are “*nearly completely degraded in 21 days under the conditions of the modified OECD Screening Test*” (at .8508), but made no analysis of the amount of fluorochemical proportion of the solution that remained (see e.g. .8053);
- (c) 3M internal correspondence from E A Reiner to J A Pignato (Commercial Chemicals Division), copied to Dale Bacon and R L Bohon (Environmental Engineering and Pollution Control Department) and D R Ricker (SA & CD Quality Assurance), dated 6 August 1980 (**HOL.0001.0018.4870**), regarding FC-203 and the effect of biodegradation on the foaming of Light Water products;
 - (d) 3M internal correspondence from E A Reiner (Commercial Chemicals Division) to K F Schroeder (3M Nuess, Germany) and copied to D L Bacon (Environmental Laboratory, Environmental Engineering and Pollution Control), R L Bohon, R Gritzky (3M Neuess, Germany), D R Ricker and J A Pignato (Commercial Chemicals Division) dated 21 April 1983 (**HOL.0001.0035.5369**), in which it was stated “*We hope the attached OECD test results and this explanation of the biodegradation data in the table which you provided are helpful to you in dealing with potential customers concerned about biodegradation. If you or your customers have any further questions about biodegradation test results on 3M AFFF products, feel free to contact us. We’ll do our best in trying to get a satisfactory answer for you and your customers*”, and which attached a copy of an Environmental Engineering and Pollution Control Technical Report Summary titled ‘OECD Biodegradation Testing on FC-600 and FC-203’ prepared by Eric Reiner addressed to K F Schroeder (3M Neuss, Germany), 21 April 1983, regarding FC-203 and FC-206 and which concluded that FC-203 and FC-600 are “*readily biodegradable*” according to the recommended 70% DOC removal criteria of the Modified OECD Screening Test.” (at .5379), despite concerns, including with characterisation of the sample and the fact that, again, it made no analysis of the amount of fluorochemical proportion of the solution that remained (at .5370);
 - (e) Eric Reiner (3M, Environmental Engineering and Pollution Control Department), Repeat OECD Biodegradation Tests on FC-600 and FC-203, 16 June 1983 (**HOL.0001.0039.0312**), addressed to R L Bohon (3M, Environmental Laboratory, Environmental

Engineering and Pollution Control) regarding FC-203 and FC-600 but again made no analysis of the amount of fluorochemical proportion of the solution that remained (at .0313); and

- (f) Eric Reiner (3M, Environmental Engineering and Pollution Control), Modified OECD Screening Test on FC-203, FC-203A and FC-600, 9 July 1984 (**HOL.0001.0020.1010**), addressed to D Reese (Toxicology, 3M Germany), copied to R L Bohon (3M, Environmental Laboratory, Environmental Engineering and Pollution Control), D R Ricker (3M, SA & CD Quality Assurance) and D W Kent, regarding FC-203, FC-203A, FC-203NFP, and FC-600 which concluded that the tested products are “readily biodegradable” (at .1013) but again made no analysis of the amount of fluorochemical proportion of the solution that remained (at .1011).

Further particulars may be provided after discovery or by way of expert evidence.

56. Additionally, in or about April 1981, 3M implemented and publicly announced a policy of not permitting women “*of child bearing potential*” to work at its Decatur, Alabama plant, “*so they will not be exposed to a type of fluorochemical that can cause birth defects in rats*” (being, relevantly FC-143).

Particulars

The Commonwealth refers to a draft press release prepared by Lowell Luford, 27 April 1981 (**USA.1000.0001.0237**), which included the above quotes attributed to Phil Rath (Chemical Resources Division Plant, 3M) and which further stated “*As a precautionary measure, approximately 25 women of childbearing potential have received job reassignments at the 3M Decatur plant this week so they will not be exposed to a type of fluorochemical that can cause birth defects in rats. Preliminary results of a recent 3M toxicology study showed that three related fluorochemicals affected eye development in the fetuses of rats, according to Phil Rath, manager of the Chemical resources Division plant*”.

On or about 5 May 1981, the Board of Directors met and Dr R M Adams, Chairman of the Corporate Responsibility Committee provided an update on the results of the fluorochemical studies, and it was further noted “*...Female employees at two locations have been transferred out of production areas utilizing fluorochemical materials. Although there is no evidence to support significant hazards to human health, this action was taken as a precautionary measure.*” The Commonwealth refers to 3M Minutes of Meeting,

‘Annual Meeting, Board of Directors’, 12 May 1981
(**HOL.0001.0007.8120** at .8148).

Further particulars may be provided after discovery.

57. Further:

- (a) on a date presently unknown to the Commonwealth, but likely in the early 1980s, 3M established the 3M Fluorochemical Study Committee (**FC Study Committee**), which was responsible for evaluating and making recommendations as to further research proposals and/or future studies; and

Particulars

Table A, Part I and **Table A, Part II** annexed to this Statement of Claim sets out the Commonwealth’s present understanding of the directors and senior employees of 3M who were members of the FC Study Committee, and the information that they received or obtained.

Further particulars may be provided after discovery.

- (b) by no later than 1981, 3M also established the 3M Fluorochemical Toxicology Steering Committee (or Task Force) (**FC Tox Committee**), which was responsible for supervising 3M’s toxicology testing program and evaluating 3M’s responsibilities to its employees and customers.

Particulars

Table A, Part I and **Table A, Part II** annexed to this Statement of Claim sets out the Commonwealth’s present understanding of the directors and senior employees of 3M who were members of the FC Tox Committee, and the information that they received or obtained.

Further particulars may be provided after discovery.

58. In or about 1983, one or both of the FC Study Committee and the FC Tox Committee considered:

- (a) the need for 3M to conduct further research into its fluorochemical products, including by way of a proposed research project known internally as the “Fate of Fluorochemicals – Phase II”; and

Particulars

The Commonwealth refers to:

- (a) document titled 'Fate of Fluorochemicals – Phase II' prepared or edited by Eric Reiner, 20 May 1983, which stated that it included "*pertinent information*" from the Commercial Chemicals, Agricultural Products, Ricker Laboratories, Central Research Analytical Services and 3M Toxicology "*from their experience on selected fluorochemicals*" (USA.1000.0001.0241), and identified further areas for studies to be undertaken including: the fate of fluorochemicals in soil systems; as well as chronic effects on biota from exposure to realistic environmental concentrations;
- (b) 3M internal correspondence from R Bohon (Environmental Engineering and Pollution Control) to J LaZerte (Commercial Chemicals Division) dated 25 May 1983 (USA.1000.0001.0356) and copied to 3M employees J T Ling, D Bacon, E Reiner, W Pearlson, D Ricker, F Griffith and S Leahy, which attached the proposal referred to in (a) above (and noting it had been reviewed by each of M Case, W Pearlson, D Hagen, W Perkins, G Hunt and S Bandal), and stated "*The Phase I Fate of the Fluorochemical Study (1977-79) yielded information which led to the conclusion that although fluorochemicals were extremely persistent, they caused no apparent adverse environmental effects. Since that time, however, new information has been brought to our attention which suggests the need to reassess the validity of this conclusion. Persistence continues to be a key concern and trigger by environmental agencies in the selection of chemicals for further review and testing, both domestically... and internationally.... Recent mammalian studies conducted by Riker Laboratories indicate that in addition to demonstrating strong protein binding properties (a form of bioaccumulation), certain fluorochemicals tend to be excreted extremely slowly...[these studies]... raise questions regarding the effect on other organisms...*";
- (c) document titled 'Questions and Answers on the Need for the Fate of Fluorochemicals Phase II study' prepared by Eric Reiner, 13 July 1983 (USA.1000.0001.0372 esp. at paragraphs 2 and 3);
- (d) 3M Minutes of Meeting, 'Fate of Fluorochemicals', 16 August 1983 (USA.1000.0001.0375) during which 3M chemists concluded that "*the mere persistence of [3M fluorochemicals], especially if coupled with bioaccumulation, is sufficient to raise alarm in the minds of many regulatory agencies.*" Attendees at this meeting

included: R Bohon, E Reiner, J D LaZerte, W Pearlson and R Prokop.

Table A, Part I and **Table A, Part II** annexed to this Statement of Claim sets out the Commonwealth's present understanding of the information received by the directors and senior employees of 3M at or around this time.

Further particulars may be provided after discovery.

- (b) the findings of further testing undertaken on a range of its fluorochemical products and in particular, FC-95, including in relation to the presence of those products in 3M workers' blood serum.

Particulars

The Commonwealth refers to:

- (a) 3M internal correspondence from W McCormick (Medical, Toxicology Services) to D Ricker (Commercial Chemicals Division) and copied to F Griffith and F Ubel dated 26 September 1983 (**HOL.0001.0014.5808**) regarding Skin Absorption Studies on Surfactants and summarising final reports from Riker Safety Evaluation Laboratory on the dermal toxicity and absorption studies conducted on FC-95, FC-98, FC-99, FC-128, FC-129, FC-14 and FC-135;
- (b) 3M internal correspondence addressed to various senior employees of 3M (R L Bohon, M T Case, R J Davis, J D Johnson, W C McCormick, A M Norberg, W H Pearlson, P F Reichle, D E Roach, T J Scheuerman, W F Scown, S D Sorensen, J K Sugg, A C West, F D Griffith, D F Hagen, L C Krogh, J D LaZerte, S M Leahy, J J McKeown, R E Ober, F A Ubel) dated 8 April 1983 (**USA.0001.0001.1343**), attaching Minutes of the Fluorochemical Studies Committee Meeting, in which it was recorded that Don Roach (3M, Medical Department) *"expressed concern that the FC in worker's blood is not falling to the extent anticipated, and he asked if further reduction in worker exposure could be accomplished...."*
- (c) 3M internal correspondence addressed to various senior employees of 3M (D E Roach, P F Richler, R Alness, D D Dvorak, S D Sorensen, F A Ubel, A Ridlehoover and D Fong) dated 31 August 1984 (**USA.1000.0003.4531**), in respect of 'Organic Fluorine Levels', which stated *"...The test results... seem to substantiate a trend that has been developing over the past 12-18 months – a tendency for these levels in a number of people to no longer show the previous pattern of decline, in fact, a fair number are now demonstrating an increase in blood fluorine levels...unless we see some evidence of improvement in*

this last batch of tests,,, we must view this present trend with serious concern..”.

Table A, Part I and **Table A, Part II** annexed to this Statement of Claim sets out the Commonwealth’s present understanding of the information received by the directors and senior employees of 3M at or around this time.

Further particulars may be provided after discovery.

59. Between about 1985 and 1990, 3M received notices of concerns from parties external to 3M in relation to some 3M AFFF formulations, and in particular as to their environmental safety or effects.

Particulars

The Commonwealth refers to:

- (a) S M Salazar (US Navy), Toxicity of Aqueous Film Forming Foams to Marine Organisms: Literature Review and Biological Assessment (Marine Environmental Quality Assessment Program), July 1985 (**DEF.3004.0028.2114**), which reviewed literature and data on the toxicity of a number of 3M AFFF including FC-199, FC-200, FC-203, FC-203A, FC-203C, FC-206, FC-206A, FC-206C, FC-708B, and which it is inferred was received by 3M at or around the time of its publication, by reason of the fact that it is listed in an index of 3M Toxicology and Human Health Studies that were submitted by 3M to the US EPA on or about 8 September 2000 (**USA.1000.0002.2073** at .2099 (item 52));
- (b) letter from Boots & Coots Fire Protective Equipment Inc to 3M dated 3 June 1988 (**USA.1000.0001.0395**), which was provided to at least Eric Reiner (3M, Environmental Laboratory, Environmental Engineering and Pollution Control); and
- (c) Ekkehard Ising (German Army), Investigations of toxic effects and biological degradability of foam extinguishing agents in the waste water, about 29 March 1990 (**HOL.0001.0010.6759**), in relation to FC-203. It is inferred this report was received by 3M at or around the time of its publication, by reason of the fact that it was provided by 3M to the US EPA on or about 26 June 2000 (as denoted on the cover sheet of the document at .6760), and because 3M subsequently undertook further testing of some 3M AFFF in response (as set out further in paragraph 60 below).

Table A, Part I and **Table A, Part II** annexed to this Statement of Claim sets out the Commonwealth’s present

understanding of the information received by the directors and senior employees of 3M at or around this time.

Further particulars may be provided after discovery.

60. In or about 1991, 3M undertook further testing on some of 3M AFFF formulations, which confirmed that FC-95 (added as a filmer) was likely one of the major contributors to the toxicity of 3M AFFF.

Particulars

The Commonwealth refers to 3M, Environmental Effects of Light Water Brand AFFF and Components, 1 April 1991, (USA.1000.0001.0402 see e.g. .0404, .0423) prepared by R Howell (3M, Environmental Laboratory, Environmental Engineering and Pollution Control) and addressed to M T Pike.

Further particulars may be provided after discovery or by way of expert evidence.

61. Subsequently, and by no later than 1992, 3M established:
- (a) the Fluorochemical Steering Committee (**FC Steering Committee**), which was responsible for overseeing the operational risk management processes and activities in business manufacturing and commercialising 3M's fluorochemical products; and

Particulars

Table A, Part I and **Table A, Part II** annexed to this Statement of Claim sets out the Commonwealth's present understanding of the directors and senior employees of 3M who were members of the FC Steering Committee, and the information that they received or obtained.

Further particulars may be provided after discovery.

- (b) the FC Technical Advisory Committee (**FC Tech Advisory Committee**), which was responsible for reviewing various scientific proposals for fluorochemical projects.

Particulars

Table A, Part I and **Table A, Part II** annexed to this Statement of Claim sets out the Commonwealth's present understanding of the directors and senior employees of 3M who were members of the FC Tech Advisory Committee, and the information that they received or obtained.

Further particulars may be provided after discovery.

62. In or about 1994, one or both of the FC Steering Committee or the FC Tech Advisory Committee considered the need for further studies and testing to be undertaken in respect of 3M's fluorochemical products.

Particulars

The Commonwealth refers to:

- (a) 3M internal correspondence from R Howell (Environmental Engineering and Pollution Control Department) to C Olson (Specialty Adhesives & Chemical Division, 3M), and copied to: D Bacon, C Chow, J Johnson, E Reiner, and D Ricker dated 5 February 1992 (USA.1000.0001.0437), which attached a proposal for studying the environmental effects of fluorochemicals (including those used to make sultone foamers, i.e. FC-128/129, a component of some 3M AFFF (see .0441) and the bioaccumulation potential of FC-95, FC-143, FM-3422 and FC-128 (see .0448)), together with a copy of the 'Fate of the Fluorochemicals Phase II' proposal, referred to in the particulars to paragraph 58 above; and
- (b) various 3M interoffice memoranda or messages between officers and senior employees of 3M, dated between 3 February 1994 and 19 April 1994 (USA.1000.0001.0571).

Table A, Part I annexed to this Statement of Claim sets out the Commonwealth's present understanding of the information received by the directors and senior employees of 3M at or around this time.

Further particulars may be provided after discovery.

63. From no later than about 1998 and onwards, 3M received notices of concerns raised by 3M senior employees about its fluorochemical products, and in particular PFOS, and its potential environmental effects or risks.

Particulars

As best as the Commonwealth can presently say, in or about May 1998, Eric Reiner (3M, Environmental Engineering and Pollution Control Department) prepared a document titled 'Environmentally Relevant Properties of 3M Fluorochemicals' in which he identified that:

- (a) perfluorochemicals were persistent;
- (b) due to their high stability, inexperienced analysts sometimes reached a misinterpretation that fluorochemicals are biodegradable because no detectable

organic carbon remains in a product that contained perfluorinated moieties after biodegradation tests;

- (c) **PFOS was not known to degrade under any natural non-combustion conditions; fluorochemicals can bioaccumulate;**
- (d) **PFOS had been found in fish and at in eagles at locations away from major manufacture or application sites; and**
- (e) fluorochemicals are being released into the environment, and are present in wastewater (**USA.1000.0001.0581**) (**emphasis added**).

Further, in or about December 1998, Richard Purdy prepared a document titled ‘Pioneer Risk Assessment of Adverse Effects in Marine Mammals from PFOS in the Food Chain’, in which he identified that PFOS had been found in the blood of rats not knowingly exposed to PFOS; and PFOS was likely in fishmeal and fledgling eagles’ blood and sea mammals. Dr Purdy concluded that there was a significant risk of ecological harm due to environmental levels of PFOS, and that it should be reported to the US EPA. As best as the Commonwealth can presently say, a copy of Dr Purdy’s report was provided to (at least) G L Adams (3M US Corporate) (**USA.1000.0001.0596**).

Dr Purdy later resigned from 3M on about 28 March 1999, citing his concerns about the dangers of PFOS and his “*profound disappointment*” in 3M’s handling of environmental risks associated with the manufacture and use of PFOS and its precursors (**USA.1000.0001.0612**).

Table A, Part I annexed to this Statement of Claim sets out the Commonwealth’s present understanding of the information received by the directors and senior employees of 3M at or around this time.

Further particulars may be provided after discovery.

64. In about 1998, 3M established a range of committees, including (at least) the:

- (a) EHS&R Working Group;
- (b) Exposure Assessment Team;
- (c) FC Core Team;
- (d) FC Exposure Team;
- (e) FC Working Group,

which were broadly tasked with managing and responding to matters related to 3M's fluorochemical products, including as to their environmental safety.

Particulars

Table A, Part I and **Table A, Part II** annexed to this Statement of Claim sets out the Commonwealth's present understanding of the directors and senior employees of 3M who were members of the EHS&R Working Group, Exposure Assessment Team, FC Core Team, FC Exposure Team and FC Working Group, and the information that they obtained or received.

The Commonwealth again refers to the document titled '3M's FC Committees Chart' (referred to in paragraph 46 above (**HOL.0001.0009.5040**)).

Further particulars may be provided after discovery.

65. In or about December 1998, 3M developed and implemented a 'Science Publication Strategy' in relation to the release and publication of scientific and technical information in relation to 3M's fluorochemical products.

Particulars

The Commonwealth refers to a 3M document titled 'Science Publication Strategy', 10 December 1998 (**HOL.0001.0039.1701**) which noted "*Publication of scientific and technical information on the FC issue should follow a strategic plan so that key findings can be understood in the context of the published scientific literature. Under this strategy, the science needed to evaluate the safety of PFOS (i.e. the available occupational and toxicology studies) will be published -- or in press -- and thus available to be cited when the publication on serum levels in the general population is published. This will allow the serum level findings to be placed in an understandable, credible context which demonstrates that there is no medical or scientific basis to attribute any adverse health effects to 3M products.*"

Further particulars may be provided after discovery.

66. On or about 15 May 1998, 3M made a limited disclosure to the US EPA in relation to PFOS.

Particulars

The Commonwealth refers to a letter from 3M to the US EPA dated 15 May 1998 (**USA.1000.0001.0587**), in which 3M identified the presence of PFOS in human blood serum "*at very low (i.e. parts per billion ("ppb")) levels*" but stated that

“3Ms epidemiological study of its own workers indicates no adverse effects at parts per million levels” and “3M does not believe that any reasonable basis exists to conclude that PFOS “presents a substantial risk of injury to health or the environment””.

Further particulars may be provided after discovery.

67. Between about 1999 and 2000, 3M again considered the results of its earlier testing and reporting in relation to its fluorochemical products, and undertook or obtained further testing in relation to some of its fluorochemical products, including at least PFOS.

Particulars

The Commonwealth refers to:

- (a) Pathology Associates International, Pathology Review of Reported Tumorigenesis in a Two Year Study of FM-3924 in Rats, 25 November 1998 (USA.1000.0001.0589);
- (b) 3M, The Science of Organic Fluorochemistry, 5 February 1999 (USA.1000.0001.0600);
- (c) 3M, ‘Fluorochemical Use, Distribution and Release Overview’, 26 May 1999 (USA.1000.0001.0621);
- (d) 3M, Summary PFOS Rat Toxicology Screen, October 1999 (USA.1000.0001.0639); and
- (e) Covance Laboratories Inc, 26-Week Capsule Toxicity Study with Perfluorooctane Sulfonic Acid Potassium Salt (PFOS; T-6295) in Cynomolgus Monkeys (draft report), 12 April 2000 (DEF.0088.0001.0323).

Table A, Part I annexed to this Statement of Claim sets out the Commonwealth’s present understanding of the information received by the directors and senior employees of 3M at or around this time.

Further particulars may be provided after discovery.

68. On about 9 May 2000, 3M reported the above information to 3M’s board of directors.

Particulars

The Commonwealth refers to:

- (a) document titled ‘Chuck Kiester’s Board of Directors Presentation’, 9 May 2000 (USA.1000.0001.0640); and
- (b) 3M Minutes of Meeting, ‘Annual Meeting, Board of Directors’, 9 May 2000 (USA.1000.0001.0647).

Table A, Part I annexed to this Statement of Claim sets out the Commonwealth's present understanding of the information received by the directors and senior employees of 3M at or around this time.

Further particulars may be provided after discovery.

69. On or about 14 May 2000, 3M developed and implemented a communication plan known as 'Project Spring' in relation to its reporting and disclosure of matters related to 3M's fluorochemical products, including to regulators such as the USA EPA, as well as to affected employees, customers and its international subsidiaries.

Particulars

The Commonwealth refers to a 3M document titled 'Project Spring Communication Plan' dated May 2000 (USA.0001.0003.0057) which stated:

- (a) under the heading 'Key Messages for All Constituents' *"3M is phasing out of perfluorooctanyl chemistry used in certain repellents and surfactant products by the end of this year... Advanced research recently has discovered that very small amounts of these materials are widespread in the environment, including humans"* and *"These products are safe...and have been for decades"* (at .0070);
- (b) under the heading 'Facts on 3M Perfluorooctanyl Chemistry': *"There are no human health or environmental risks associated with low levels of these materials. (We can state this with confidence based on information gathered from over 20 years of medical monitoring of 3M employees and numerous scientific studies by 3M scientists and outside experts.)"* (at .0078);
- (c) *"Note: Sound bite (analogy): This is like a small piece of plastic by the side of the road ... it doesn't do any harm, but you'd rather not see it there"* (at .0079); and
- (d) under the heading Baukol Memo to OUS: *"...Enclosed are materials that will help you address the transition with your customers, employees and suppliers. These materials include key messages, facts sheets and questions and answers....*
....Advanced research shows that very small amounts of materials from this chemistry are widespread in the environment, including humans, and are persistent. All existing scientific evidence indicates that the presence of these materials at extremely low levels does not pose a human health or environmental risk" (at .0100).

70. On 16 May 2000, 3M publicly announced that:

- (a) it would be phasing out certain products containing perfluoro-octanyl chemistry, including some firefighting foams, and would work with customers to ensure a smooth transition;
- (b) *“...while the chemistry has been used effectively for more than 40 years and our products are safe, our decision to phase out production is based on our principles of responsible environmental management”*;
- (c) such phase-out was because the perfluoro-octanyl chemistry had been found to persist in the environment and in people at *“extremely low levels”*; and
- (d) notwithstanding this environmental persistence, its products were *“safe”* and *“[a]ll existing scientific knowledge indicates that the presence of these materials at these very low levels does not pose a human health or environmental risk”*,

(the **3M Announcement**).

Particulars

The Commonwealth refers to 3M Public Relations, ‘3M Phasing Out Some of its Specialty Materials’ (Announcement, 16 May 2000) (**DOD.9000.0002.0879; DEF.0003.0001.6617**), with the comments identified in subparagraph (b) said to have been attributable to Dr Charles Reich (Executive Vice President, Specialty Materials, 3M).

71. On 25 May 2000, 3M issued a notice addressed to its fire protection customers, which stated that it would phase out the manufacture of all Class B firefighting foams sold under the name “3M” and “Light Water” brands. It was further stated that:

- (a) *“We have made this difficult decision because extensive scientific research has shown that low levels of material from this particular chemistry are widespread in the environment, including living organisms, and that they persist for long periods of time. Although this same research shows that the use of these products does not pose a risk to people, 3M is taking this action now because it is consistent with our longstanding corporate values and environmental principles.”*; and

- (b) 3M Class B foam agents that were “*currently in the field are safe to use*”, would “*remain effective for years*” and there was “*no reason to return any of these products you may have in inventory due to 3M’s announcement*”.

Particulars

The Commonwealth refers to Lou Lindberg (Business Development Manager, 3M Specialty Materials), ‘Important Notice to 3M Fire Protection Systems Customers’ (Notice, 25 May 2000) (USA.1000.0001.1703 at .1704).

72. By reason of the above matters at paragraphs 54 to 71 above, by no later than 1984, or alternatively 1994, 3M knew or ought to have known:

- (a) that at least:
 - (i) PFOS and PFOA;
 - (ii) further and alternatively, FC-95, FC-143 and FM-3422;
 - (iii) further and alternatively, some components of 3M AFFF,were potentially harmful or otherwise toxic to animals,

Particulars

That 3M knew or ought to have known that PFOS and PFOA, and by extension, FC-95, FC-143 and FM-3422, and some components of 3M AFFF, were potentially toxic to some animals, is to be inferred from that fact of its receipt of the material referred to in the particulars to paragraphs 56, 58(a) and 67 above.

Table A, Part I annexed to this Statement of Claim further sets out the Commonwealth’s present understanding of the information obtained or received by various 3M directors and senior employees at or around this time.

Further particulars may be provided after discovery.

- (b) that at least:
 - (i) PFOS and PFOA;
 - (ii) further and alternatively, FC-95 and FC-143;

(iii) and consequently, some components of 3M AFFF:

- (1) did not biodegrade;
- (2) were persistent in soil and water;
- (3) could leach from soils into groundwater or surface water systems and potentially migrate into drinking waters and other areas;

Particulars

That 3M knew or ought to have known that PFOS and PFOA, and by extension, FC-95 and FC-143, and some components of 3M AFFF, did not biodegrade, were persistent in soil and water, and could leach from soils into groundwater or surface water systems and potentially migrate into drinking waters and other areas, is to be inferred from that fact of its receipt of the material referred to in the particulars to paragraphs 54, 55, 58(a), 59, 60, 62, 63 and 68 above.

Table A, Part I annexed to this Statement of Claim further sets out the Commonwealth's present understanding of the information obtained or received by various 3M directors and senior employees at or around this time.

Further particulars may be provided after discovery.

(c) that at least:

- (i) PFOS and PFOA;
- (ii) further and alternatively, FC-95, FC-143 and FM-3422;
- (iii) and consequently, some components of 3M AFFF,

bioconcentrated and/or bioaccumulated in animals;

Particulars

That 3M knew or ought to have known that PFOS and PFOA, and by extension, FC-95, FC-143 and FM-3422, and some components of 3M AFFF, bioconcentrated and/or bioaccumulated in animals, is to be inferred from that fact of its receipt of the material referred to in the particulars to paragraphs 58(a), 63 and 68 above.

Table A, Part I annexed to this Statement of Claim further sets out the Commonwealth's present understanding of the

information obtained or received by various 3M directors and senior employees at or around this time.

Further particulars may be provided after discovery.

(d) that at least:

- (i) PFOS and PFOA;
- (ii) further and alternatively, FC-95 or FC-143;
- (iii) and consequently, some components of 3M AFFF,

were present in human tissue, and in particular blood serum.

Particulars

That 3M knew or ought to have known that PFOS and PFOA, and by extension, FC-95 and FC-143, and some components of 3M AFFF, were present in human tissue, and in particular blood serum, is to be inferred from that fact of its receipt of the material referred to in the particulars to paragraphs 42 and 47 above.

Table A, Part I annexed to this Statement of Claim further sets out the Commonwealth's present understanding of the information obtained or received by various 3M directors and senior employees at or around this time.

Further particulars may be provided after discovery.

73. By reason of the above matters at paragraphs 8 to 11 and 54 to 71 above, by no later than 1984, or alternatively 1994, 3M Australia ought to have known:

(a) that at least:

- (i) PFOS and PFOA;
- (ii) further and alternatively, FC-95, FC-143 and FM-3422;
- (iii) further and alternatively, some components of 3M AFFF,

were potentially harmful or otherwise toxic to animals;

(b) that at least:

- (i) PFOS and PFOA;

- (ii) further and alternatively, FC-95 and FC-143;
- (iii) and consequently, some components of 3M AFFF:
 - (1) did not biodegrade;
 - (2) were persistent in soil and water;
 - (3) could leach from soil into groundwater or surface water systems and potentially migrate into drinking water and other areas;
- (c) that at least:
 - (i) PFOS and PFOA;
 - (ii) further and alternatively, FC-95, FC-143 and FM-3422;
 - (iii) and consequently, some components of 3M AFFF,
bioconcentrated and/or bioaccumulated in animals;
- (d) that at least:
 - (i) PFOS and PFOA;
 - (ii) further and alternatively, FC-95 or FC-143;
 - (iii) and consequently, some components of 3M AFFF,
were present in human tissue, and in particular blood serum.

Particulars

That 3M Australia ought to have known that (at least) PFOS and PFOA, and therefore, by extension, at least FC-95, FC-143, FM-3422, and some components of 3M AFFF:

- (a) were potentially harmful or otherwise toxic to animals;
- (b) did not biodegrade;
- (c) were persistent in soil and water;
- (d) could leach from soil into groundwater or surface water systems and potentially migrate into drinking water and other areas;
- (e) bioconcentrated and/or bioaccumulated in animals; and

(f) were present in human tissue, and in particular blood serum,

is to be inferred from the matters set out in paragraphs 2(e), 8 to 11, and 72 above.

E. PROCUREMENT OF 3M AFFF BY DEFENCE

E.1 Period Prior to 1973

74. Prior to about 1973, Defence utilised water or protein-based fire fighting foams in its fire protection or firefighting activities at the Bases.
75. From about 1966, the Commonwealth commenced investigations into a range of options and products for use in its fire protection or firefighting activities, as follows:
 - (a) from about 1966 onwards, Defence initially investigated the installation of either water deluge sprinklers or high expansion foam sprinklers for use in hangar protection systems at various Bases;

Particulars

From about 1966 onwards, Defence began exploring options for its fire extinguishing systems, and in particular hangar protection systems, at various Bases. At or around this time, Defence was considering the installation and usage of either water deluge sprinklers or high expansion foam sprinklers.

In about June 1966, the Commonwealth Fire Board, which was responsible for making recommendations concerning the protection of Commonwealth buildings from fires, recommended the installation of a water deluge system in the (then) proposed C130E, located at Richmond Base.

The recommendation was based on the (then) requirements of the National Fire Protection Association Code No 409 (Standard on Aircraft Hangars).

This advice was consistent with the position taken by the (then) Department of Air (then responsible for the operation of federal civilian airports), which, in about May 1968, also proposed recommending the use of water deluge systems for its aircraft hangars.

The Commonwealth refers to:

- (a) Department of Air Minute Paper, 'Fire Protection in Hangars – Policy', 1 June 1966 (NAA.0001.0002.0778);
- (b) letter from the Secretary for Headquarters Operational Command for the RAAF to The Director General for the Department of Works dated 9 August 1966 (NAA.0001.0002.0769), in relation to Fire Protection in Aircraft Hangars for C130, F-111A and Orion Aircraft;
- (c) letter from the Group Captain for Air Member for Supply and Equipment to Office of the Air Attache for the Australian Embassy dated 15 August 1966

- (NAA.0001.0002.0766), in relation to Fire Protection in Aircraft Hangars;
- (d) letter from the Managing Director of Fire Control Pty Ltd to The Director General of the Department of Works dated 16 August 1966 (NAA.0001.0002.0740 at .0740-.0743), in relation to Aircraft Hangar Fire Protection;
 - (e) letter from the Group Captain for Air Member for Supply and Equipment to Senior RAAF Officer for RAAF Staff London dated 23 August 1966 (NAA.0001.0002.0761), in relation to Fire Protection in Aircraft Hangars;
 - (f) letter from the Managing Director for Fire Control Pty Ltd to The Director General for the Department of Works dated 29 August 1966 (NAA.0001.0002.0715), in relation to Fire Protection of Aircraft Hangars;
 - (g) telex message from RAAF Air Attache to the Department of Air, dated on or around May 1968 (NAA.0001.0002.1047);
 - (h) memorandum from the Director-General to the Director of Works dated 31 May 1968 (NAA.0001.0004.0122 at .0178-.0182), in relation to Fire Protection for RAAF Hangars;
 - (i) letter from the Director of Works to the Director-General dated 26 June 1968 (NAA.0001.0004.0122 at .0159), in relation to Fire Protection for RAAF Hangars; and
 - (j) Royal Australian Air Force, RAAF Fire Protection of Hangars – Hangars Proposed for Deluge Systems, dated approximately 1968 (NAA.0001.0004.0122 at .0177).
- (b) in about 1967 and 1968, members of Defence and other Commonwealth employees attended at least two product demonstrations of 3M AFFF;

Particulars

On about 9 November 1967, members of Defence attended a product demonstration of 3M AFFF conducted by Wormald Bros Inc, which was held at the DCA Fire School in Mascot, New South Wales.

Subsequently, members of Defence, as well as other Commonwealth employees (including those employed by the Department of Air) attended a further product demonstration held at the Williamstown Base on or about 18 April 1968. This demonstration included the use of 3M AFFF, protein foams and dry chemical powders for helicopter crash fire fighting.

The Commonwealth refers to:

- (a) Royal Australian Air Force Minute Paper, 'Aircraft Fire Fighting – Foam Equipment' which enclosed 3M Light

Water Brand Fire Fighting Liquid Foaming Concentrate FC-194 Brochure, 17 November 1967 (NAA.0001.0009.0001 at .0268-.0275); and

(b) Royal Australian Air Force Minute Paper, 'Helicopter Fire Rescue Demonstration', 8 May 1968 (NAA.0001.0009.0001 at .0229-.0232).

(c) in or about November 1967, Defence obtained a 3M product brochure titled '3M "Light Water" Brand Fire Fighting Liquid Foaming Concentrate FC-194', which stated (amongst other things) that:

- (i) 3M 'Light Water' brand Fire Fighting Agent FC-194 was "*non-toxic*";
- (ii) 3M 'Light Water' brand products had been widely tested; and
- (iii) 3M 'Light Water' brand products were more effective than other fire fighting foams;

Particulars

The Commonwealth refers to Royal Australian Air Force Minute Paper 'Aircraft Fire Fighting – Foam Equipment' enclosing 3M product brochure titled '3M "Light Water" Brand Fire Fighting Liquid Foaming Concentrate FC-194' (NAA.0001.0009.0001 at .0268-.0275).

In the product brochure, it was stated (amongst other things) that (at .0270-.0275):

"3M "LIGHT WATER" Brand Fire Fighting Agent FC-194 is a completely new, synthetic, non-toxic, foam forming concentrate for 'Class B' flammable fuel fire prevention and extinguishment."

"LIGHT WATER" Agent has been tested and proved to be the most effective foaming agent ever developed."

"LIGHT WATER" Brand Liquid Concentrates have been tested for comparative and quantitative fire extinguishment efficiency in a multitude of fire situations over the five years since they were first originated. These tests have been conducted by fire protection engineers in the Navy, the fire equipment industry, the Marines and the Coast Guard, the petroleum refining industry, numerous federal, foreign, and state agencies, and many others. The liquid has also been tested by the fire protection services and industries of numerous foreign countries."

- (d) following the 3M product demonstrations in 1967 and 1968, the Commonwealth, including Defence, commenced investigating the use of 3M AFFF:
 - (i) as an alternative to water deluge sprinklers in hangar suppression systems; or
 - (ii) as a replacement for the protein foams then used in firefighting trucks and other firefighting appliances.

Particulars

After the demonstrations in 1967 and 1968, Defence began considering the use of 3M AFFF as an alternative to water deluge sprinklers, and/or as a replacement to the protein foams then used in firefighting trucks and other firefighting appliances, albeit for limited activities only due to the costs of purchasing 3M AFFF.

The Commonwealth refers to Royal Australian Air Force Minute Paper, 'Aircraft Fire Fighting – Foam Equipment', 17 November 1967, which enclosed 3M Light Water Brand Fire Fighting Liquid Foaming Concentrate FC-194 Brochure (NAA.0001.0009.0001 at .0229-.0232 and .0268-.0275).

76. Subsequently, in about December 1971, Defence sought additional product information in respect of 3M AFFF, including:
- (a) the degree of its use;
 - (b) its acceptance by other nation's armed services;
 - (c) specifications for its supply; and
 - (d) any problems with the products.

Particulars

The Commonwealth refers to a message from Army Melbourne to Australian Army, Washington D.C and Australian Army, London dated 21 December 1971 (DOD.0001.1864.1950 at .2004).

77. On or about 14 January 1972, in response to the request referred to above, 3M Australia provided the Commonwealth with the following documents:
- (a) 3M product brochure titled 'Light Water Brand Aqueous Film Forming Foam', which stated (amongst other things):

- (i) 3M was continuously carrying out research into the use of 3M Light Water;
 - (ii) 3M Light Water brand AFFF met the requirements of the US Military specification, MIL-F-24385; and
 - (iii) 3M Light Water Brand Liquid Concentrate had been widely tested;
- (b) a copy of a letter from the 3M International Division dated 26 August 1971, which in turn enclosed copies of US Specification MIL-F-24385 (Navy) dated 21 November 1969, together with an interim amendment to that document dated 1 July 1971 (MILSPEC), which primarily set out fire extinguishment performance requirements for the US Navy.

Particulars

As to subparagraph (a), the Commonwealth refers to a letter from Maj L.G. Doyle, Office of the Military Attaché and Australian Army staff, Washington DC to Army Headquarters Melbourne dated 14 January 1972 (**DOD.0001.1864.1950** at .2005), which enclosed two 3M brochures and stated that they were provided by “*the local office of 3M company*”.

The product brochure referred to in subparagraph (a) above (**DOD.0001.1864.1950** at .2007) stated (amongst other things):

“‘LIGHT WATER’ Brand Concentrate is a scientifically designed product based on fluoro-chemical wetting agents and has resulted from several years of research. Cooperative research work is being continuously carried out with the Chemical Dynamics Branch of the US Naval Research Laboratory and with industry users to find new areas of application.”; (at .2008);

“‘LIGHT WATER’ Brand AFFF Concentrate meets the requirements of MIL-F-24385” (at .2008);

“‘LIGHT WATER’ Brand Liquid Concentrate has been tested for comparative and quantitative fire extinguishment efficiency in a multitude of fire situations over the years since it was first originated. These tests have been conducted by fire protection engineers in the Navy, the fire equipment industry, the Marines and Coast Guard, the petroleum refining industry, numerous federal, foreign, and state agencies, and many others. The liquid has also been tested by the fire protection services and industries of numerous foreign countries” (at .2009).

As to subparagraph (b), that 3M Australia also provided the Commonwealth with copies of MILSPEC is to be inferred

from the existence of internal correspondence from 3M Company, International Division dated 26 August 1971 to 'All Chemical Sales Managers' from E J Glisky (St Paul International) and copied to P D Detomaso, A P Genovese and J Lacey, which was attached to a copy of an interim amendment to MILSPEC dated 1 July 1971 (**DOD.0001.1864.1950** at .2026-.2033) and is otherwise co-located with a copy of MILSPEC (as at 21 November 1969) (at .2013-.2025) in a Defence file titled 'Light Water Foam – Development'.

78. From about 1971 to mid-1972, the Commonwealth conducted a range of tests on the overall performance or operational effectiveness of various firefighting foams and foaming agents then available, including 3M AFFF.

Particulars

In or around 1971, the (then) Department of Civil Aviation (formerly the Department of Air), Fire Services Training School evaluated the overall effectiveness of available firefighting foams and/or foaming agents. Tests were conducted on six products, including: a standard protein foam compound manufactured in accordance with DCA/F/2382 (the standard then applicable for protein foams); a protein foam compound with a fluorinated additive manufactured by 'National Aerofoam' of the United States of America known as AL3; a fluoroprotein foam compound manufactured by Pyrens Aust. known as Plus-F; a fluoroprotein foam compound manufactured by Angus Fire Armour of the United Kingdom known as FP.70; a foaming agent containing surfactants and stabilizers produced by the Chemical Concentrates Corp of the US known as Full Spectrum; and an aqueous solution of perfluorocarbon surfactants a film forming foam, manufactured by 3M and known as Light Water, type FC-194.

Following on from that testing, in around December 1971, the Army conducted further trials of the 3M product known as 'Light Water' Foam Compound and compared it with protein foams.

In early 1972, comparative trials were then conducted at a number of Bases between 'Protein Foam' (the (then) in-service item), and the new 3M product called 'Light Water Foam', type FC-199. This included the following:

- (a) on or around 18 to 19 January 1972 at Amberley Base; (**DOD.0001.1864.1950** at .2035, .2039-.2048);
- (b) on or around 9 to 10 May 1972 at Oakey Base (**DOD.0001.1864.1950** at .1973); and

- (c) on or around July 1972 at Puckapunyal Base (**DOD.0001.1864.1950** at .1975, .1976).

The Commonwealth refers to:

- (d) Department of Civil Aviation, Fire Service Training School Test and Development: Project "B" Foaming Agents: Controlled Tests, 31 May 1971 (**DOD.0001.1864.1950** at .2036 and .2069-.2080);
- (e) letter from the Australian Military Board to the Chief Engineer of Northern Command, Victoria Barracks dated 10 December 1971 (**DOD.0001.1864.1950** at .2039-.2040), in relation to the evaluation of Light Water Foam Compound; and
- (f) 3M Australia, Trial Report No.102 Lightwater Foam Compound, 15 May 1972 (**DOD.0001.1864.1950** at .1964-.1972), with enclosed 14 coloured slides in respect of testing at the Oakey Base (at .1960-.1961).
- (g) Letter from Australian Army Staff to Army Headquarters dated 5 January 1972, referring to demonstrations held in the UK (**DOD.0001.1864.1950** at .2036)

79. In about September 1972, the Commonwealth purchased small quantities of 3M AFFF from 3M Australia, for limited use in certain firefighting equipment.

Particulars

In or around September 1972:

- (a) Army had requested the purchase of an initial delivery of 500 gallons of 3M AFFF, for use on a small trailer unit. It was anticipated that this unit would consume approximately 2,500 gallons per year;
- (b) Air Force had requested a quantity of 300 gallons of 3M AFFF for use in small helicopter bell units for fighting aircraft crash fires off airports. Consideration was also being given for use in larger units, for general fire fighting purposes;
- (c) Navy had obtained small quantities of 3M AFFF for the purposes of conducting comparison tests with protein foams; and
- (d) the Department of Civil Aviation had purchased quantities of 3M AFFF for evaluation purposes.

The Commonwealth refers to:

- (e) letter from Controller, Central Army Supply Agency to Director (Contracts) of Contracts and Disposals Branch for Department of Supply dated 10 November 1972

(**DOD.0001.1864.1950** at .1951), in relation to the supply of foam; and

- (f) letter from Director (Contracts) of Contracts and Disposals Branch for Department of Supply to Controller, Central Army Supply Agency dated 22 September 1972 (**DOD.0001.1864.1950** at .1952-.1956) in relation to the supply of foam, and enclosed correspondence with 3M Company in relation to the supply of foam.

- 80. On about 19 September 1972, 3M Australia provided the Commonwealth with a supply proposal for the purchase of 3M AFFF, in which 3M Australia offered to supply the Commonwealth with large quantities of 3M AFFF at a reduced price.

Particulars

The supply proposal is in writing and is contained in a letter from 3M Australia to the Commonwealth Department of Supply dated 19 September 1972 (**DOD.0001.1864.1950** at .1954-.1956.) The document records that the ‘current price structure’ for 3M AFFF ranged between \$13 to \$14.50 (dependent upon the volume of US gallons purchased), but proposed a reduced (or special) pricing structure of \$8 per US gallon purchased provided 10,000 gallons were purchased on a 1 year contract period, so that “*it can become an economic situation for more general usage*” and “*commercially viable*”.

E.2 The period between 1973 to 1979

FC-200

- 81. From about 11 January 1973 until about 1974, the Commonwealth purchased a 3M AFFF, namely **FC-200**, from 3M Australia, for use in further performance and operational effectiveness testing of the product and in particular in fixed fire suppression systems in aircraft hangars.

Particulars

The Commonwealth refers to the Commonwealth of Australia Gazette No. 3, 11 January 1973 (**DEF.0056.0001.0133** at .0170).

- 82. On or around 20 March 1973, 3M provided a ‘Certificate of Conformance/Analysis’ to the Commonwealth to the effect that FC-200, which had been shipped to 3M Australia, conformed to ‘3M specifications’ and met the requirements of MILSPEC (Amendment 5).

Particulars

The Commonwealth refers to 'Certificate of Conformance/Analysis' signed by 3M, 20 March 1973 (DEF.6059.0001.2465; NAA.0001.0002.2140).

83. Some time prior to 12 December 1973, in response to a request from the Commonwealth, either 3M or 3M Australia made various statements to the Commonwealth in respect of the properties of FC-200 (a 3M AFFF), to the effect that it:
- (a) was non-toxic to humans;
 - (b) was non-irritating to humans;
 - (c) would not harm grass;
 - (d) was biodegradable; and
 - (e) was not expected to adversely affect the ecology of receiving streams in the vicinity of its use, nor was its foaming likely to be a problem in natural water courses.

Particulars

The Commonwealth refers to a letter from the Department of Housing and Construction Aircraft Hangars to the Director of Works dated 12 December 1973 (NAA.0001.0004.1654 at .1654) regarding 'Aircraft Hangars – Pop-Up Foam Sprinkler Fire Suppression Systems'. The letter recorded the statements set out above as made by unknown persons from 3M to a Mr D Ruff (Supervising Mechanical Engineer, Department of Works).

84. Some time prior to 13 December 1973, 3M or 3M Australia provided the Commonwealth with various product information in respect of FC-200 as follows:
- (a) a product description and physical properties table, which stated that 3M 'Light Water' Brand Concentrate met all requirements of MILSPEC;
 - (b) safety and toxicity information, which stated that:
 - (i) *"FC-200 Concentrate is classified as being nontoxic orally"*;
 - (ii) *"No special precautions are necessary in handling of 6% solutions"*;

- (iii) *“We have no record of any toxicological problem arising from use of “LIGHT WATER” Agent in fire extinguishment”;*
- (iv) *“The normal dilution of FC-200 Concentrate in fire fighting situations should be sufficient to insure there would be no adverse effect on aquatic life”;*
- (v) *“Biodegradability tests in accordance with “Standard Methods [for the Examination of Water and Waste Water, 13th Edition, 1971] on FC-200 premix show that the agent is biodegradable”;*
- (vi) *“Oxygen uptake evaluation has also indicated that FC-200 will not hinder the activity of micro-organisms in biological treatment systems”;* and
- (vii) *“The concentration of FC-200 encountered in normal use situations is not expected to adversely effect the ecology of receiving streams in the vicinity of the area of application”.*

Particulars

The Commonwealth refers to:

- (a) G W Curtis, Fire Protection General Information F.F.F. Foam or Light Water Fire Extinguisher, 13 December 1973, (NAA.0001.0008.2050), which stated *“Attached is a photo-copy of an extract from 3M Catalogue referring to light water FC 200”*; and
- (b) 3M, Concentrate Product Description and General Properties, together with Table 1-1 Physical Properties for ‘Light Water’ Concentrate FC-200, and Safety and Handling Toxicity and Environmental Effects (NAA.0001.0003.2200 at .2202-.2204).

85. On 13 December 1973, the Commonwealth sought further information about FC-200 from 3M or 3M Australia, in respect of any possible side effects and general environmental effects from the use of 3M AFFF including:

- (a) whether it was or could be made biodegradable;
- (b) if it was not, biodegradable, its anticipated life when floating on a water surface;
- (c) the possibility of any later additive that would induce its dispersal;
- (d) what degree of dilution would be needed to make the product harmless;

- (e) whether it is likely to have any toxic effect on plants, animals or fish;
- (f) whether it had any corrosive or otherwise deleterious effects on various metals, plastics and the like;
- (g) whether it had any effect on groundwater supply;
- (h) in the unlikely event that permission could be obtained to discharge into a water course, what treatment and precautions are required; and
- (i) in the event of ponding or holding areas being required, the degree of time for separation to allow settlement and pumping or other removal of residue.

Particulars

The Commonwealth refers to document titled 'Fire Protection General Information F.F.F. Foam or Light Water Extinguisher' prepared by G W Curtis (P.M.D), 13 December 1973 (NAA.0001.0008.2050).

86. Some time prior to January 1974, either 3M or 3M Australia made statements to the Commonwealth to the effect that FC-200 was:
- (a) non-poisonous to animals; and
 - (b) should not have a serious effect on vegetation.

Particulars

The Commonwealth refers to Department of Housing and Construction, 'Technical Briefing for Fire Detection, Alarm, Roof Venting and Suppression Systems for SRA Hangars, RAAF Bases, Amberley and Townsville 3AD Hangar, RAAF Base Amberley', 30 January 1974 (NAA.0001.0002.2099 at .2116).

87. Some time prior to 25 March 1974, and in response to the Commonwealth's request for information set out in paragraph 85 above, either 3M or 3M Australia made statements to the following effect:
- (a) FC-200 in 6% solution is biodegradable;
 - (b) FC-200 in 6% solution is non-toxic;

- (c) nil corrosive or deleterious effect on material listed;
- (d) by its bio-degradability, its dilution in use, and further dilution in streams, no significant effect can be expected on ground water supplies (if any) located downstream;
- (e) nil treatment foreseen other than the additional dilution prior to reaching the stream; and
- (f) in view of the above, special holding areas would appear to be unnecessary.

Particulars

The Commonwealth refers to a document titled ‘Ref. Folios 79/80 – Use of FC200 (Light Water) Foam’ signed by R Fredman TAC on 25 March 1974 which was provided to the Commonwealth by persons unknown on behalf of either 3M or 3M Australia (**NAA.0001.0008.2033**).

That the information was provided to the Commonwealth by 3M or 3M Australia can reasonably be inferred from the fact that the request referred to in paragraph 85 above, requested that the information be obtained “*from the Manufacturer*”.

FC-206

88. From about 7 January 1975 until about 1980, the Commonwealth purchased 3M AFFF, namely **FC-206**, from 3M Australia on the condition that it met the requirements of MILSPEC (as varied from time to time).

Particulars

The Commonwealth refers to the following documents:

- (a) Contract Acceptance and Purchase Order dated 7 January 1975 and issued to 3M Australia for delivery of 1,000 gallons of AFFF at \$6 per gallon by 2 January 1976. The order specifies that the consignment must comply with MIL-F-24385 (i.e. MILSPEC) Light Water Brand Type, FC-206 (**DEF.6059.0001.2255; NAA.0001.0002.1930**);
- (b) Procurement Demand (No E2383) for final delivery on 16 June 1975 of Aqueous Film Forming Foam (AFFF) Compound to US Specification MIL-F-24385 and RAAF Technical Requirement Specification K52B with the source of supply identified as 3M Company Products

‘Light Water’ for 400 Drums (of 5 Imperial Gallons) (NAA.0001.0002.1943); and

- (c) Various extracts from the Commonwealth Gazettes for the period 1975 to 1980, which referred to the purchase or supply of 3M AFFF to the Commonwealth, copies of which can be provided on request.

- 89. At or around the time of the Commonwealth’s initial purchasing of FC-206, it was also investigating the purchase of alternative products to 3M AFFF, including Wormald International’s ‘Aero-Foam 6’ or ‘Aer-O-Water-6’.

Particulars

In or about 22 January 1975, the Commonwealth was investigating the purchase of Wormald International’s ‘Aero-Foam 6’ or ‘Aer-O-Water-6’, as an alternative to 3M AFFF.

Between about January and March 1975, the Commonwealth conducted a number of corrosion and fire tests on that product, in order to compare its performance to 3M AFFF. It was ultimately concluded that whilst both products met the requirements of MIL-SPEC, 3M AFFF should be preferred to the Wormald International product, due to corrosion issues in aircraft hangars.

The Commonwealth refers to the following documents:

- (a) Minute Paper, 4210/6/4 Supply of AFFF Foam Compound, 22 January 1975 (NAA.0001.0002.1955 see esp. at .1956);
- (b) Department of Defence (Air Office) Minute Paper, AF1511/941/1 Aircraft Hangars – Fire Protection – Aqueous Film Forming Foam, 10 March 1975 (NAA.0001.0002.1950); and
- (c) Department of Defence internal correspondence from J Lessels (AIRCDRE, DGAW-AF) regarding supply of AFFF compound, 22 May 1975 (NAA.0001.0002.1944).

- 90. From around May 1978, MILSPEC was amended to include various environmental impact testing requirements for 6 per cent AFFF (**MILSPEC B**), and in particular, in respect of toxicity and biodegradability.

Particulars

The Commonwealth refers to clauses 4.7.13, 4.7.13.1, 4.7.13.2 and 4.7.13.3 of MILSPEC B (HOL.0001.0051.0001).

E.3 Period between 1980 and 2000

FC-3034

91. On or around March 1981 until about 1994, the Commonwealth purchased 3M AFFF, namely **FC-3034**, from 3M Australia, on the condition that the 3M AFFF supplied complied with the applicable Defence Standard (as varied from time to time) (**Defence Standard**).

Particulars

From around 1981 until about 31 December 1984, Defence entered into a Period Contract with 3M Australia for the supply of 3M AFFF under Period Contract number PV 6374.

Between 1 July 1986 and 30 June 1989, Defence entered into a Period Contract with 3M Australia for the supply of 3M AFFF under Period Contract number PV 7136, which superseded PV 6374.

Between 1 July 1989 and 30 June 1992, Defence entered into a Period Contract with 3M Australia for the supply of 3M AFFF under Period Contract number PV8059, which superseded PV 7136.

The Commonwealth refers to the following documents:

- (a) Request for Tender number RT 09/63393X-1 with a closing date of 31 October 1985 (**DEF.1137.0010.0390**);
- (b) Period Contract 7136 for the supply of FC-3034 (**DEF.9500.0004.2243**), and in particular, clauses 10 and 11;
- (c) Period Contract PV8059 for the supply of FC-3034 (**DEF.9500.0004.2399**), and in particular, clauses 9 and 16;
- (d) Amendments to Period Contract PV8059 dated August 1989 (**DEF.9500.0004.2123**), 5 February 1990 (**DEF.9500.0004.2146**), 14 February 1991 (**DEF.9500.0004.2142**) and 21 January 1993 (**DEF.9500.0004.2138**);
- (e) Extensions to Period Contract PV8059 to 31 December 1992 (**DEF.9500.0004.2232**) and 30 June 1993 (**DEF.9500.0004.2145**);
- (f) Period Contract PV8059 acceptance of 3M Australia tender dated 11 November 1988, for the period between 1 July 1989 and 30 June 1992. (**DEF.9500.0004.2255** at .2256), and in particular, clauses 9 and 16; and
- (g) Various extracts from the Commonwealth Gazettes for the period 1981 to 1994, which referred to the purchase

or supply of 3M AFFF to the Commonwealth, copies of which can be provided on request.

92. Throughout the period from about 1981 to about 1994, the Commonwealth also investigated and considered the purchase of alternative products to 3M AFFF.

Particulars

The Commonwealth refers to the following:

- (a) letter from Clive Broadbent (Director of Engineering to the Department of Housing and Construction) to the Director of the Department of Housing and Construction QLD Region dated 31 July 1984 (**NAA.0001.0002.0441** at .0450);
- (b) Department of Defence Minutes of Meeting, 'AFFF-Fire Fighting Equipment Project Management Team Tender Evaluation Meeting', 17 May 1989 (**DEF.9500.0004.2218** at .2220);
- (c) Facsimile Transmission from Defence Contracting Melbourne to 3M Australia Pty Ltd dated 13 June 1989 (**DEF.9500.0004.2234** at .2235);
- (d) Department of Defence Tender Comparative Statement – Contractual Features for 3% and 6% concentrate AFFF products supplied by 3M Australia, Chubb, Orion Safety for evaluation against DEF (AUST) 5603C and DEF (AUST) 5639, 10 May 1989 (**DEF.9500.0004.2228**);
- (e) Meeting of the Defence Standardisation Fire Fighting Equipment Subcommittee held on or around 19 July 1989 where representatives of 3M Australia were in attendance to discuss matters arising from the tender evaluation of the 3% and 6% concentrates against DEF (AUST) 5603C and DEF (AUST) 5639 (**DOD.0001.1864.2120** at .2182-.2183);
- (f) letter from the Secretary for the Fire Fighting Equipment Subcommittee to the National Sales Manager, 3M Australia Pty Ltd dated 29 May 1989. (**DOD.0001.1864.2120** at .2184-.2185);
- (g) letter from Secretary for the Fire Fighting Equipment Subcommittee to the Principal Engineer, Civil Aviation Authority dated 30 May 1989; (**DOD.0001.1864.2120** at .2186-.2187); and
- (h) the fact of FC-3034 being listed in the Australian Defence Qualified Products List as conforming to DEF (AUST) 5603, March 1981 (**NAA.0001.0002.0441** at .0451).

93. During the period from about 1981 to about 1994, the following Defence Standards applied to the supply of 3M AFFF at 6% concentrate:

- (a) Defence Standard **DEF (AUST) 5603**, from at least July 1980;
- (b) Defence Standard **DEF (AUST) 5603B (Draft No 1)**, which was previously described as DEF(AUST) 5603A, from at least July 1985;
- (c) Defence Standard **DEF (AUST) 5603B (Draft No 2)**, from at least August 1987;
- (d) Defence Standard **DEF (AUST) 5603C**, from at least September 1988; and
- (e) Defence Standard **DEF (AUST) 5603D**, from at least March 1992.

Particulars

The relevant Australian Defence Standards are **DEF.1137.0010.0375**, **DEF.1137.0010.0298**, **DEF.9500.0004.2149** and **DEF.3002.0508.0851**.

The Commonwealth is presently not able to locate DEF (AUST) 5603 and a complete version of DEF (AUST) 5603B Draft No 1. The existence of these standards is inferred by reference to them in later standards.

94. At all material times, the Defence Standards required 3M Australia to:

- (a) until about March 1992, *“provide evidence that the surfactants in the [3M] AFFF shall not have any significant detrimental effect on the environment, not present a waste disposal problem”*;
- (b) from about March 1992:
 - (i) *“provide evidence that the surfactants in the AFFF shall not have any significant detrimental effect on the environment, nor present a waste disposal problem”*; and
 - (ii) *“All surfactants used in the AFFF shall be biodegradable to a minimum of 80 per cent when tested in accordance with AS 1792”*.

Particulars

As set out in paragraph 91 above, the contracts and other arrangements entered into between the Commonwealth and

3M Australia required all supplies of 3M AFFF to conform to the requirements of the Defence Standards (subject to any variations and concessions identified in the contract or other arrangements).

The Defence Standards set out the requirements in (a) in clause 4.10 and (b) in clause 4.4.7.1 (i.e. of DEF (AUST) 5603D).

The Commonwealth refers to:

- (a) DEF (AUST) 5603B (Draft No 2) (**DEF.1137.0010.0298** at .0302);
- (b) DEF (AUST) 5603C (**DEF.9500.0004.2149** at .2153);
- (c) DEF (AUST) 5603D (**DEF.3002.0508.0851** at .0862);
- (d) Commonwealth Government, 'Australian Defence Standards Interim Numerical Index of Australian Defence [DEF (AUST)] Standards', June 1981. (**DOD.0001.1856.5647** at .5664 and .5670). That a provision to the above effect was contained in DEF(AUST) 5603 is to be inferred from their inclusion in later iterations of the Standard as set out above; and
- (e) Department of Defence, Minutes of Meeting, Project Management Team conference for supply of Fire Fighting Requirement (Period Contracts for period '86 to '88) Minutes held on 18 August 1985 (**DOD.0001.1864.1912** at .1913-.1914), which noted that DEF (AUST) 5603A was received in mid July 1985, however, it was recorded that since the meeting was held it was agreed to call this Specification Draft No 1 Def (AUST) 5603B.

95. Further, on 14 June 1983, the Commonwealth specifically requested 3M Australia to identify whether:

- (a) 3M AFFF had any harmful environmental effects; and
- (b) disposal of 3M AFFF after testing systems presented any problems.

Particulars

The Commonwealth refers to a letter from GA Mayes, (Inspector, Royal Australian Navy) to Mr Kevin Parry, (National Sales Manager, 3M Australia) dated 4 June 1983 (**DEF.1137.0010.0425** at .0426).

96. Some time prior to 18 June 1986, 3M Australia provided Defence with the following:

- (a) a 3M MSDS for FC-3034 dated December 1984, which stated that 3M:

- (i) recommended disposal of FC-3034 by “[b]leed[ing] spent solutions and small product quantities, <5 gal., to a wastewater treatment system. Reduce discharge rate if foaming occurs. Mix with flammable material and incinerate in an industrial or commercial facility...”;
 - (ii) with respect to health hazard data, stated that “FC-3034 is considered practically non-toxic orally”; and
 - (iii) recorded that “[t]he information on this Data Sheet represents our current data and best opinion as to the proper use and handling of this product under normal conditions...”;
- (b) a 3M PEDS for FC-3034 dated 26 May 1982, which stated that:
 - (i) firefighting wastes should be disposed of, if possible, by “... pretreating in an oil-water separator followed by bleeding to a wastewater treatment system. Serious foaming can be prevented by adjusting the discharge rate so that the FC-3034 concentration reaching the aeration basin will be <50mg/l (1 gallon of FC-3034 concentrate in >20,000 gallons of sewage).”;
 - (ii) FC-3034 could be disposed of by “bleed[ing] to a wastewater treatment system in accordance with local regulations.”;

Particulars

The documents were provided to the Commonwealth by 3M Australia prior to a pre-production meeting held on 18 June 1986.

The Commonwealth refers to the Minutes of the Pre-Production Meeting on 18 June 1986, dated 6 August 1986 (DEF.1137.0010.0353), together with attachments B (DEF.1137.0010.0362) (the 3M MSDS), C (DEF.1137.0010.0368) (the 3M PEDS).

- (c) 3M Product Toxicity Summary for FC 3034, which stated that FC-3034 “may be classified as practically non-toxic via single dose ingestion”.

Particulars

The Commonwealth refers to the 3M Product Toxicity Summary for FC-3034, March 1985 (DEF.1137.0010.0370),

which was also annexed to the Minutes of the Pre-production meeting on 18 June 1986 (DEF.1137.0010.0353).

The Commonwealth refers to the Minutes of the Pre-Production Meeting on 18 June 1986, 6 August 1986 (DEF.1137.0010.0353) and Annexure C to those minutes (DEF.1137.0010.0368).

97. On or about 18 August 1987, 3M Australia provided Defence with the following documents:

- (a) A 3M MSDS for FC-3034 dated November 1985, which stated that:
 - (i) 3M recommended disposal by “*bleed[ing] spent solutions and small product quantities, <5 gal., to a wastewater treatment system*”; and
 - (ii) FC-3034 was “*considered practically non-toxic orally*”;
- (b) A 3M ‘Environmental Data’ Sheet dated 21 March 1986 which stated that:
 - (i) 3M Light Water Brand AFFF “*wastes are treatable in a wastewater treatment system if disposed of in accordance with 3M recommendations*”;
 - (ii) 3M Light Water Brand AFFF products “*are biodegradable and have low toxicity, but can cause foaming at higher than recommended discharge concentrations*”;
 - (iii) “*3M AFFF is biodegradable*”;
 - (iv) 3M Light Water Brand AFFF wastes “*are treatable in a biological treatment system*”;
 - (v) “*Laboratory studies have shown that foaming, not toxicity is what causes problems from improper disposal to wastewater treatment systems*”; and
 - (vi) “*3M recommends metered discharge of [3M] LIGHT WATER Brand AFFF wastes to “flowing sewers”...*”.

Particulars

The Commonwealth refers to the following documents:

- (a) letter sent from G. M. Paterson (3M Australia Toxicology & Environment Coordinator) to Kinhill Engineers dated 18 August 1987 (DEF.8004.0001.0001 at .0353), which enclosed the documents referred to below, and stated that

“This is the only product of this nature we currently supply to the Australian Defence Forces”;

- (b) 3M, MSDS for FC-3034, November 1985 (DEF.8004.0001.0001 at .0354-.0355); and
- (c) 3M, Light Water Brand AFFF Wastes Disposal Recommendations and Hazard Evaluation, 21 March 1986 (DEF.8004.0001.0001 at .0367-.0371).

FC-3003

- 98. In about April 1993, Defence received quotations for the supply of AFFF for the period between 1 September 1993 to 31 August 1996, from various suppliers including 3M Australia.

Particulars

Supply offers were received from 3M Australia, Orion Safety Industries, Tyco Laboratories Asia Pacific Ltd (trading as Grinnell Supply Sales) and Chubb Fire.

The Commonwealth refers to the Minute Paper, for ‘Supply of Foam Liquid Film Fire Extinguishing Aqueous (AFFF) – 6 per cent Concentrate’, 3 August 1993 (DEF.1137.0010.0256).

- 99. Following the process referred to in paragraph 98 above, from about September 1993 to about 2001, the Commonwealth purchased 3M AFFF, namely **FC-3003**, from 3M Australia, on the condition that the 3M AFFF supplied complied with the applicable Defence Standard (as varied from time to time).

Particulars

The Commonwealth refers to:

- (a) Standing Offer Acceptance Number 9309-074-30 Conditions of Contract, on or about 7 September 1993 (DEF.1137.0010.0233; DEF.1137.0010.0234), and in particular, clauses 20.1, 21.2 and 21.3;
- (b) Standing Offer Acceptance Number 9310-012-30, on or about 10 June 1999 (DEF.1087.0001.0071), and in particular, clause 11.9;
- (c) Standing Offer Acceptance Number 9705-011-12 with date of acceptance of 30 April 1998, which was subject to a series of amendments including Amendment No 1 to SO No 9705-011-12 (DEF.1087.0001.0063) and Amendment No 3 to SO No 9705-011-12 (DEF.1087.0001.0091); and

- (d) Department of Defence, Purchase Order and Contract for supply of FC-3003 Aqueous Film Forming Foam from 3M Australia for delivery by 18 May 1999 to RAAF Base Williamtown, 30 April 1999 (**DOD.0001.0003.0300** at .0390).

100. From about September 1993 to about 2001, the supply of 3M AFFF at 6 per cent concentrates was subject to DEF (AUST) 5603D.

Particulars

The Commonwealth refers to Australian Defence Standard, DEF (AUST) 5603D, March 1992 (**DEF.3002.0508.0851**).

101. From about September 1993 to about 2002, clause 4.4.7.1 of DEF (AUST) 5603D required 3M Australia to:

“... provide evidence that the surfactants in the AFFF shall not have any significant detrimental effect on the environment, nor present a waste disposal problem. All surfactants used in the AFFF shall be biodegradable to a minimum of 80 per cent when tested in accordance with AS 1792.”

Particulars

The Commonwealth refers to and repeats the particulars to paragraph 100 above.

102. In accordance with the terms of the Standing Offer referred to in paragraph 99 above, from September 1993 to about 2001, 3M Australia provided to Defence certificates of compliance for each batch of 3M AFFF, which were to the effect that 3M Australia certified their conformance to the applicable Defence Standard.

Particulars

The Commonwealth refers to a 3M Release Note which includes a Contractor’s Certification dated 19 October 1999 for a batch of 3M AFFF, FC-3003, that was certified to have been supplied in accordance with the requirements of the DEF (AUST) 5603D and conform in all respects with the conditions and requirements of the Standing Offer (**DOD.0001.0003.3646**).

The 3M Release Note was provided to Frank Bonifacio, Quality Assurance Representative, Directorate of Quality Assurance (Air Force) for the purposes of a Quality Assurance Audit of 3M Australia’s sub-contracted manufacturer of AFFF

on or about 23 November 1999 (**DOD.0001.0003.0300** at .0332, see also .0327-.0330).

That 3M Australia provided, and continued to provide, certifications of a similar nature is to be inferred from the fact of the terms of the Standing Offer, this Certificate, and the Commonwealth's continued acceptance of 3M AFFF during this period.

103. Further, some time after about 1998, 3M Australia provided Defence with a '3M Light Water Products and Systems Engineering Manual', which included the following:

- (a) a 3M Australia document titled '3M Technical Information – 3M Light Water Aqueous Film Forming Foams – AFFF FC-3003' issued in 1996 which stated that:
 - (i) FC-3003 meets the requirements of DEF (AUST) 5603D;
 - (ii) data from a programme of ongoing testing to assess the impact of 3M firefighting foam on the natural environment indicate that:
 - (1) *“3M AFFF products are low in toxicity to tested aquatic organisms”;*
 - (2) *“Aquatic life is not adversely affected when 3M AFFF products are used and disposed of properly”;*
 - (3) *“3M AFFF products can be successfully treated in biological waste water treatment systems”;*
- (b) a 3M Product Toxicity Summary Sheet dated November 1998 for FC-3003 which stated the FC-3003 may be classified as *“practically non-toxic”*;
- (c) a 3M PEDS for FC-3003 dated November 1988, which stated that:
 - (i) the product was *“readily biodegradable”*; and
 - (ii) 3M recommended spent solution and small quantities of FC-3003 be bled to a wastewater treatment system.

Particulars

The Commonwealth refers to a 3M Light Water Products and Systems Engineering Manual, undated (**DEF.7101.0062.3787**) which contained copies of the

documents referred to above at (a) (at .3798–.3799), (b) (at .3800), (c) (at .3804–.3810).

FC-3002

104. From about July 1989 until about 2003, the Commonwealth purchased 3M AFFF, namely **FC-3002**, from 3M Australia on the condition that the 3M AFFF supplied complied with the applicable Defence Standard.

Particulars

Between 1 July 1989 until 30 June 1992, FC-3002 was available for purchase under Period Contract number PV8059, which was then extended and amended from time to time.

The Commonwealth refers to:

- (a) Contract number PV8059 between the Department of Defence and 3M Australia in the period 1 July 1989 to 30 June 1992, which in addition to FC-3034, approved supply under the Period Contract of FC-3002 in accordance with DEF (AUST) 5639, and in particular, clause 9;
- (b) Contract Amendments on or about August 1989 (**DEF.9500.0004.2123**), on or about 5 February 1990 (**DEF.9500.0004.2146**), on or about 14 February 1991 (**DEF.9500.0004.2142**) and on or about 21 January 1993 (**DEF.9500.0004.2138**);
- (c) Contract Extensions to 31 December 1992 (**DEF.9500.0004.2232**) and 30 June 1993 (**DEF.9500.0004.2145**); and
- (d) various extracts from the Commonwealth Gazettes and Contract Notices for the period about May 2000 to May 2003, which refer to the purchase or supply of 3% concentrate 3M AFFF to the Commonwealth, copies of which can be made available upon request.

105. Through the period 1989 to about 2003, the Commonwealth investigated and considered the purchase of alternative products to 3M AFFF.

Particulars

The Commonwealth refers to the following:

- (a) Department of Defence Minutes of Meeting, ‘AFFF-Fire Fighting Equipment Project Management Team Tender Evaluation Meeting’, 17 May 1989 (**DEF.9500.0004.2218** at .2220–.2221);

- (b) Facsimile Transmission from Defence Contracting Melbourne to 3M Australia Pty Ltd dated 13 June 1989 (**DEF.9500.0004.2234** at .2235);
- (c) Department of Defence, Tender Comparative Statement – Contractual Features for 3% and 6% concentrate AFFF products supplied by 3M Australia, Chubb and Orion Safety for evaluation against DEF (AUST) 5603C and DEF (AUST) 5639, 10 May 1989 (**DEF.9500.0004.2228**);
- (d) meeting of the Defence Standardisation Fire Fighting Equipment Subcommittee held on or around 19 July 1989 where representatives of 3M Australia were in attendance to discuss matters arising from the tender evaluation of the 3% and 6% concentrates against DEF (AUST) 5603C and DEF (AUST) 5639 (**DOD.0001.1864.2120** at .2182-.2183);
- (e) letter from the Secretary for the Fire Fighting Equipment Subcommittee to the National Sales Manager, 3M Australia Pty Ltd dated 29 May 1989 (**DOD.0001.1864.2120** at .2184-.2185);
- (f) letter from Secretary for the Fire Fighting Equipment Subcommittee to the Principal Engineer, Civil Aviation Authority dated 30 May 1989 (**DOD.0001.1864.2120** at .2186-.2187); and
- (g) email from G W Hellman (Air Force), 22 September 1999 (**DEF.1004.0009.0001**).

106. From about July 1989 to about 2003, the supply of 3M AFFF at 3 per cent concentrates was subject to **DEF (AUST) 5639**.

Particulars

The Commonwealth refers to Australian Defence Standard, DEF (AUST) 5639, September 1988 (**DEF.9500.0004.2183**; **DEF.8006.0003.0271**).

107. From:

- (a) about July 1989 to January 1998, clause 4.10 of DEF (AUST) 5639 required 3M Australia to:

“...provide evidence that the surfactants in the AFFF shall not have any significant detrimental effect on the environment, nor present a waste disposal problem.”

- (b) about January 1998 to about 2003, clause 4.4.7.1 of DEF (AUST) 5369 required 3M Australia to:

“... provide evidence that the surfactants in the AFFF shall not have any significant detrimental effect on the environment, nor present a waste disposal problem. All surfactants used in the AFFF shall be biodegradable to a minimum of 80 per cent when tested in accordance with AS 1792.”

Particulars

The Commonwealth refers to clause 4.10 of DEF (AUST) 5639 (**DEF.9500.0004.2183** at .2187) and clause 4.4.7.1 of DEF(AUST) 5639 (**DEF.8006.0003.0271** at .0278).

108. Around the time of or during the supply of FC-3002 to Defence, 3M Australia provided Defence with the following:

- (a) a 3M Australia document titled ‘3M Technical Information – 3M Light Water Aqueous Film Forming Foams – 3M AFFF, FC-3002’ issued in about 1996, which stated that:

- (i) FC-3002 meets the requirements of DEF (AUST) 5639;
- (ii) *“Light Water AFFF concentrates undergo a programme of ongoing testing to assess the impact of 3M firefighting foam on the natural environment”*;
- (iii) data from that ongoing testing indicates that:
 - (1) *“3M AFFF products are low in toxicity to tested aquatic organisms”*;
 - (2) *“Aquatic life is not adversely affected when 3M AFFF products are used and disposed of properly”*;
 - (3) *“3M AFFF products can be successfully treated in biological wastewater treatment systems”*;

- (b) a 3M Australia MSDS for FC-3002 issued 7 May 1997, which stated that:
- (i) spent solutions should be discharged to a wastewater treatment system;
 - (ii) environmental data and ecotoxicity information was *“not determined”*.

Particulars

The Commonwealth refers to:

- (a) 3M Technical Information, 3M Light Water Aqueous Film Forming Foams AFFF FC-3002, undated (DEF.0023.0001.0098); and
- (b) 3M Australia, MSDS for FC-3002, 7 May 1997 (DEF.0023.0001.0098 from .0100).

109. Further, on about 22 July 1999, 3M Australia:

- (a) provided the Commonwealth with a 3M PEDS issued 19 February 1993, which stated that:
 - (i) *“Light Water Brand AFFF and ATC waste are treatable in a wastewater treatment system if disposed of according to 3M recommendations. These products have low toxicity to the microorganisms in wastewater treatment systems even at concentrations much higher than those recommended by 3M...”*;
 - (ii) *“3M recommends handling wastes resulting from the use of Light Water AFFF products by pretreatment in an oil/water separator...”* and *“...the waste may [then] be metered into a sewer that flows to a wastewater treatment system. Meter such wastes into the sewage system at a rate sufficiently low so that the AFFF will not cause excessive foaming in the aeration basin of the wastewater treatment system...”*;
 - (iii) *“...3M AFFF wastes are treatable in a biological wastewater treatment system. Light Water AFFF usage wastes are approximately 99% water and therefore have very low concentrations of organic compounds.... [and whilst some fluorochemical surfactants present may not fully biodegrade] ...Possible fates of the nondegradable materials in wastewater treatment systems include sorption onto the microbial solids or passage out of the system with the treated wastewater. In any event, their concentration will be very low.”*; and
 - (iv) *“Finally, laboratory tests on both the individual product components and the product concentrates have determined the low toxicity of these materials to activated sludge bacteria, so discharge to ordinary wastewater treatment is reasonable. Laboratory studies have shown that foaming, not toxicity, is*

usually the cause of problems from improper disposal of AFFF wastes to wastewater treatment systems.” and concluded... “3M recommends metered discharge of Light Water AFFF wastes to flowing sewers...”;

- (b) and otherwise recommended that the Commonwealth should *“trickle... [fire fighting water] through a water waste treatment system either on base or unique to the fire training facility (as per 3M recommendations on disposal of fire fighting foams...”*.

Particulars

The Commonwealth refers to a letter from Ted Schaefer (3M Australia, Technical Product Specialist) to Chief Petty Officer V Young (Royal Australian Navy Officer) dated 22 July 1999 (**DEF.1137.0010.0081** at .0082) and 3M Environmental Laboratory, PEDS for 3M Light Water Brand Aqueous Film Forming Foam (AFFF) Disposal Recommendations and Hazard Evaluation, 19 February 1993 (**DEF.1137.0010.0083** esp. at .0083-.0084, .0087-.0088).

F. USE OF 3M AFFF AT THE BASES

F.1 Use of 3M AFFF at the Bases pre-2003

110. Between the early 1970s until around 2003, the Commonwealth used 3M AFFF supplied pursuant to the arrangements pleaded in **Part E** above, in the course of **Training and Operation Activities** at each of the Bases as set out further in **Schedules 1 to 27, Section D.1.**

Particulars

The Training and Operation Activities included:

- (a) responding to emergencies;
 - (b) conducting fire drills;
 - (c) conducting firefighting training, fire tests, mock emergency aircraft landing and accident drills; and
 - (d) conducting foam training and nozzle (monitor) testing, including the testing of firefighting trucks and equipment.
111. The Training and Operation Activities occurred, in respect of each of the Bases, in and around areas including (but not limited to) fire training areas and pits, fire stations, fuel facilities, hangars, runways, workshops, storage and other ancillary areas (**Base Use Areas**), as is set out further for each of them in **Schedules 1 to 27, Sections A and D.1.**
112. In the course of the Training and Operation Activities, the Commonwealth:
- (a) mixed 3M AFFF with water to create a working solution;
 - (b) aspirated the working solution into a foam via nozzles on firefighting trucks and other mechanisms; and
 - (c) discharged the foam onto combustion fires, which then co-mingled with other combustion by-products,
- (the 3M AFFF working solution, the aspirated foam, and the discharge are hereafter referred to together as being **3M AFFF**).

113. At all times when the Commonwealth used 3M AFFF at the Bases in and around the Base Use Areas, 3M AFFF:
- (a) was soluble in water;
 - (b) contained some, or all, of PFOS, PFHxS and PFOA (or their respective precursors) and other PFAS compounds; and
 - (c) had the properties alleged in paragraph 25 and 26 above.
114. During the conduct of the Training and Operation Activities at each of the Bases, large quantities of 3M AFFF were discharged to, or in and around, the Base Use Areas, as is set out further in **Schedules 1 to 27, Section D.1 and D.3.**

F.2 Storage and Disposal of 3M AFFF

115. 3M AFFF was stored by the Commonwealth at the Bases, in respect of each of them, as is set out further in **Schedules 1 to 27, Section D.2.**

F.3 Management and disposal of 3M AFFF

116. 3M AFFF was disposed of by the Commonwealth at the Bases, in respect of each of them, as is set out further in **Schedules 1 to 27, Section D.3.**

F.4 Cessation of use of 3M AFFF

117. The Commonwealth did not procure 3M AFFF after 2003.

Particulars

The Commonwealth refers to:

- (a) Email from Grahame Ross (3M Australia) to Fred Glavimans dated 21 February 2001 (**DEF.3008.0240.4334**), in relation to “3M Light Water AFFF Agents”; and
 - (b) Unsigned letter from Grahame Ross (3M Australia) to Max McAlister, (Executive Fire Safety Officer) dated 3 September 2001 (**DEF.1078.0002.0136**).
118. The Commonwealth phased out the use of 3M AFFF at each of the Bases as is set out further in **Schedules 1 to 27, Section D.3.**

F.5 Knowledge of 3M and 3M Australia as to the uses of 3M AFFF

119. At all material times, each of:

- (a) 3M; and/or
- (b) 3M Australia,

knew, or ought to have known, that the Commonwealth was using 3M AFFF purchased from 3M Australia, for activities in the nature of the Training and Operation Activities.

Particulars

The 3M AFFF was designed by 3M to be used in, and were primarily used for, the suppression of Class B fires. The Commonwealth generally refers to and repeats paragraph 19 to 22 above.

Further, the Commonwealth purchased 3M AFFF from 3M Australia for the express purpose of using it in fire suppression systems and other firefighting equipment for the overall purpose of fire extinguishment. The Commonwealth generally refers to and repeats **Part E** above.

120. In the premises:

- (a) 3M; and/or
- (b) 3M Australia,

knew, or ought to have known, that the Commonwealth's use of 3M AFFF would, or was likely to, from time to time, result in the discharge of 3M AFFF onto the land or waters at the Bases and into the surrounding areas.

Particulars

3M AFFF was designed by 3M to be mixed with water to create a working solution, before being aspirated into a foam via fire equipment (including fire trucks and other mechanisms) and then being discharged onto fires. The aspirated foam was designed to 'float' on the surface of the fire's fuel in order to create a thick, rapid spreading 'blanket' that then released water to extinguish the fire's flames. The Commonwealth refers generally to the 3M Light Water Brand Fire Fighting Liquid Foaming Concentrate FC-194 Brochure (DEF.6059.0001.0270; **DOD.0001.1864.1950;**

NAA.0001.0009.0001 at .0270-.0275; **DOD.0001.1864.1950** at .0229-.0232 and .0268-.0275).

That 3M AFFF then discharged, and ultimately settled, on the land or waters in areas where fires occurred or where fire testing took place, was an ordinary and expected consequence of that usage.

F.6 Contamination Sources

121. By reason of the Training and Operations Activities, 3M AFFF, has been discharged in or around the Base Use Areas in each of the Bases as pleaded in **Schedules 1 to 27, Section D.4**, and has resulted in the deposit and accumulation of PFAS in soil, sediment, water, asphalt and concrete at those Base Use Areas at the Bases, as well as into surrounding areas (both on and off Bases) (**Base Contamination Sources**).

Particulars

The Base Contamination Sources in respect of the Defence Bases is as pleaded in Schedules **1 to 27, Section D.4**.

G. INVESTIGATION INTO POTENTIAL PFAS CONTAMINATION, IDENTIFICATION OF CONTAMINATION AND ONGOING MONITORING

G.1 Environmental Guidelines for Management of PFAS Contamination

122. Prior to about 2016, guidance values (or ‘screening’ or ‘exceedance’ values) that were to be used for the purpose of:

- (a) detecting, identifying and investigating the existence PFAS contamination (and in particular, the existence of PFOS, PFOA and PFHxS contamination) in water and soil; and
- (b) for determining any measures that may need to be undertaken, including further investigations, monitoring or other remedial steps, so as to address any potential risks to human health and other ecological values,

were generally determined on an ad-hoc (or site-specific basis), including by reference to the provisions of the following:

- (c) National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as varied);
- (d) Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000);
- (e) National Health and Medical Research Council (NHMRC) Guidelines for Managing Risks in Recreational Water (2008 ARG); and

Particulars

The Commonwealth refers to the 2008 ARG (HOL.0001.0052.6360).

The 2008 ARG describes its legal status as follows: “The primary aim of these guidelines is to protect the health of humans from threats posed by the recreational use of coastal, estuarine and fresh waters... These guidelines should be used to ensure that recreational water environments are managed as safely as possible so that as many people as possible can benefit from using the water.

These guidelines are not mandatory; rather, they have been developed as a tool for state and territory governments to develop legislation and standards appropriate for local conditions and circumstances. The aim of the guidelines is to encourage the adoption of a nationally harmonised approach

for the management of the quality of coastal, estuarine and fresh waters used for recreation...”

- (f) NHMRC Australian Drinking Water Guidelines (**2011 ADWG**).

Particulars

The Commonwealth refers to the 2011 ADWG (**DOD.0001.0062.0002**).

The 2011 ADWG describes its legal status as follows: “The Guidelines ... are designed to provide an authoritative reference on what defines safe, good quality water, how it can be achieved and how it can be assured. They are concerned both with safety from a health point of view and with aesthetic quality. The Guidelines are not mandatory standards; however, they provide a basis for determining the quality of water to be supplied to consumers in all parts of Australia.”

123. In or about October 2016, the Commonwealth published the Environmental Management Guidance on PFOS and PFOA, which included methodologies for determining exceedance values for levels of PFOS and PFOA in water and soil.

Particulars

The Commonwealth refers to the Draft Environmental Management Guidance on Perfluorooctane Sulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA), October 2016 (**HOL.0001.0059.2200**).

124. In November 2016, the NHMRC published an updated version 3.3 of the ADWG (**2016 ADWG**), which included a methodology for determining exceedances for drinking water values.

Particulars

The Commonwealth refers to the 2016 ADWG (**HOL.0001.0039.3528**).

125. In about 2017, Food Standards Australia and New Zealand (**FSANZ**) developed and published a Hazard Assessment Report – PFOS, PFOA and PFHxS, which sets out health-based guidance values for PFOS, PFHxS and PFOA, and in particular in respect of human exposure from PFAS in foods, and identified methods for calculating ‘tolerable daily intake’ levels.

Particulars

The Commonwealth refers to the FSANZ, Hazard Assessment Report – PFOS, PFOA and PFHxS, 2017 (**DEF.3002.0924.0672**).

126. In January 2018, the first PFAS National Environmental Management Plan (**PFAS NEMP**) was published. The PFAS NEMP included environmental guideline (or exceedance) values for each of PFOS, PFHxS and PFOA, including in respect of values for soil, water, human health risks and other ecological protection.

Particulars

The Commonwealth refers to the PFAS NEMP, January 2018 (**HOL.0001.0059.1837**). See particularly, Tables 1 (Health-based guidance values for use in site investigations), 2 (Soil criteria for investigation – human health-based guidance values), 3 (Soil criteria for investigation – ecological guideline values), 4 (Terrestrial biota guideline values) and 5 (Aquatic ecosystems: freshwater and marine water guideline values).

127. In August 2018, the NHMRC published an updated version 3.5 of the ADWG (**2018 ADWG**). The 2018 ADWG included, for the first time, health-based guideline values for acceptable PFAS levels in drinking water as follows:

- (a) PFOS and PFHxS – 0.07µg/L; and
- (b) PFOA – 0.56µg/L.

Particulars

The Commonwealth refers to the 2018 ADWG (**HOL.0001.0039.4691**).

128. In 2019, the NHMRC published the Guidance on PFAS in Recreational Water (**2019 ARG**). The 2019 ARG included, for the first time, health-based guideline values for acceptable levels of PFAS in recreational waters including combined and independent values for exposures to:

- (a) PFOS and PFHxS – namely, that concentrations in recreational waters should not exceed 2µg/L; and

Particulars

The recreational water guideline value of 2µg/L for total PFOS and PFHxS is determined as follows:

$$2\mu\text{g/L} = (0.02\mu\text{g/kg body weight/day} \times 365 \text{ days/year} \times 70\text{kg} \times 0.1) / 30 \text{ L/year.}$$

The Commonwealth refers to the 2019 ARG (HOL.0001.0046.5560 at .5566-.5567).

- (b) PFOA – namely, that concentrations in recreational waters should not exceed 10µg/L.

Particulars

The recreational water guideline value of 10ug/L for PFOA is determined as follows:

$$10\mu\text{g/L} = (0.16\mu\text{g/kg body weight/day} \times 365 \text{ days/year} \times 70\text{kg} \times 0.1) / 30\text{L/year.}$$

The Commonwealth refers to the 2019 ARG (HOL.0001.0053.2300 at .2304-.2305).

129. In January 2020, the PFAS NEMP was updated and reissued, including the environmental guideline (or exceedance) values for each of PFOS, PFHxS and PFOA, including by adopting the guideline values of each of the 2018 ADWG and 2019 ARG, and otherwise updating or reissuing guideline values in respect of values for soil, water, human health risks and other ecological protection.

Particulars

The Commonwealth refers to the PFAS NEMP Version 2.0, January 2020 (HOL.0001.0045.5759). See particularly, Tables 1 (Human health guideline values developed by health regulators), 2 (Human health investigation levels for soil), 3 (ecological guideline values for soil), 4 (biota guideline values), and 5 (ecological water quality guideline values developed by water regulators).

130. In March 2025, the PFAS NEMP was further updated and reissued, including the environmental guideline (or exceedance) values for each of PFOS, PFHxS and PFOA, including in respect of values for soil, water, human health risks and other ecological protection.

Particulars

The Commonwealth refers to the PFAS NEMP Version 3.0, March 2025 (**HOL.0001.0059.1889**). See particularly, Tables 4 (Human health guideline values developed by health regulators), 5 (Human health investigation levels for soil), 6 (ecological guideline values for soil), 7 (biota guideline values), and 8 (ecological water quality guideline values developed by water regulators).

131. On 25 June 2025, the NHMRC released a further revised version of the ADWG (**2025 ADWG**), which decreased the PFAS guideline values contained in the 2018 ADWG, and set independent values for PFOS and PFHxS, rather than setting a combined value (as in the 2018 ADWG), as follows:

- (a) PFOA – 0.2µg/L;
- (b) PFOS – 0.0008µg/L; and
- (c) PFHxS – 0.03µg/L.

Particulars

The Commonwealth refers to the 2025 ADWG (**HOL.0001.0039.2278**).

132. In January 2026, the NHMRC released a draft of a further revised version of the Guidelines for Managing Risks in Recreational Water (**2026 Draft ARG**), which proposes the use of health-based screening guideline values that are 20 times the 2025 ADWG for PFAS, or effectively, as follows:

- (a) PFOA – 4µg/L;
- (b) PFOS – 0.16µg/L; and
- (c) PFHxS – 0.6µg/L.

Particulars

The Commonwealth refers to the 2026 Draft ARG (**HOL.0001.0053.2300**).

G.2 Investigation and Ongoing Monitoring

133. Since about 2011, the Commonwealth has undertaken **Investigations and Ongoing Monitoring Activities** to ascertain and investigate the extent of potential PFAS contamination at the Bases and their surrounding areas, and to identify measures to address any risks arising from the contamination, and to monitor, on an ongoing basis, any identified contamination.

Particulars

The Commonwealth has undertaken the Investigations and Ongoing Monitoring Activities in respect of each of the Bases as pleaded in **Schedules 1 to 27, Section E**.

134. The Investigations and Ongoing Monitoring Activities undertaken at each of the Bases:
- (a) detected widespread levels of PFAS in groundwater (**Base Groundwater Contamination**), surface water (**Base Surface Water Contamination**), soils and sediment (**Base Soil Contamination**) and/or sewage and in the sewage systems (**Base Sewage Contamination**) at each of the Bases and the surrounding areas, arising from the Base Contamination Source Areas (collectively, the **Base PFAS Contamination**); and
 - (b) concluded that there were a range of potential risks to human health and the environment posed by the Base PFAS Contamination at each of the Bases.

Particulars

The Investigations and Ongoing Monitoring Activities at the Bases principally investigated the presence of PFAS in the groundwaters, surface waters, soils and sediments, of each of the Bases and their surrounding areas, in accordance with adopted screening or guidance values and identified:

- (a) the Base PFAS Contamination at each of the Bases; and
- (b) various potential risks to human health and the environment posed by the Base PFAS Contamination at each of the Bases,

and is set out further in respect of each of the Bases as pleaded in **Schedules 1 to 27, Section F.1**.

H. CONTAMINATION PATHWAYS AND RECEPTORS AT THE DEFENCE BASES AND SURROUNDING AREAS

H.1 Contamination Pathways

135. PFAS contained within the Base PFAS Contamination continues to migrate from the Base Contamination Source Areas to areas within the Bases and surrounding areas (both new and existing), through the following pathways:

- (a) continually leaching into, and flowing with, the groundwater underlying the Bases, including by vertical migration through soil or sediment to the groundwater systems at the Bases, and migrating into areas surrounding the Bases;
- (b) leaching from the Base concrete, asphalt, soil or sediment into surface water, and thereafter flowing into and along the drainage systems or networks, and other water courses at the Bases and surrounding areas, and being discharged into catchments and other areas;
- (c) dispersal of soil at the Bases through surface water, along drainage lines and other overland flows of surface water across the Bases and surrounding areas; and
- (d) discharge of PFAS contained within the treated liquid effluent and residual solids that may leach into soil and groundwater or surface waters from sewage treatment plants at the Bases into other areas (such as for irrigation).

Particulars

The pathways for the migration of the Base PFAS Contamination at each of the Bases is as pleaded in **Schedules 1 to 27, Part F.2.**

H.2 Contamination Receptors

136. The Base PFAS Contamination at some of the Bases and their surrounding areas, has resulted in, and will continue to result in, human and animal (and aquatic and terrestrial organisms) exposure to PFAS (the **Human and Animal Exposure**).

Particulars

The Human and Animal Exposure occurred, and continues to occur, in respect of each of the Bases as pleaded in **Schedules 1 to 27, Part F.3**.

137. The Base PFAS Contamination at each of the Bases and their surrounding areas, has resulted in, and will continue to result in, potential adverse effects to other ecological receptors (including flora, fauna, biota and various ecosystems), including by way of uptake or exposure to PFAS, and bioaccumulation of PFAS (the **Ecological Exposure**).

Particulars

The Ecological Receptor Exposure occurred, and continues to occur, in respect of each of the Bases as pleaded in **Schedules 1 to 27, Part F.3**.

H.3 Continuing Contamination: Categories of Bases and surrounding areas

138. By reason of the matters set out in paragraphs 135 to 137 above, some of the Bases and surrounding areas, as pleaded in **Schedules 1 to 27, Part F.4**, by reason of continual leaching and/or dispersal of PFAS within the Base and surrounding areas, and/or to new and additional areas within the Base and surrounding areas that are being contaminated as PFAS migrates, can be characterised as either:

- (a) a **Steady State Base** (or **Category 1**); or
- (b) an **Expanding Base** (or **Category 2**).

Particulars

Some of the Bases and their respective surrounding areas are geographically constituted as ‘steady-state’ or ‘expanding’.

A ‘Steady State Base’ constitutes a Base in which the migration of PFAS has reached its geographical limit within that Base and surrounding areas, notwithstanding the continual leaching or dispersal of PFAS within that Base and surrounding areas (**Category 1**).

An ‘Expanding Base’ constitutes a Base in which the migration of PFAS has not yet reached its geographical limit, notwithstanding the leaching or dispersal of PFAS within that Base and surrounding areas, and is migrating to new and additional areas within that Base and surrounding areas (**Category 2**).

H.4 New or increased contamination by reason of new exceedances of Drinking Water Guidelines and Recreational Water Guidelines

139. By reason of the decrease in health-based guidance values of:

- (a) drinking water, in accordance with the guideline values set out in the 2018 ADWG and/or alternatively, the 2025 ADWG (as set out further in paragraphs 127 and 131 above); and
- (b) further or alternatively, waters used for recreational purposes, in accordance with the guideline values set out in the 2019 ARG and/or alternatively, the 2026 Draft ARG (as set out further in paragraphs 128 and 132 above),

new and/or additional areas of contamination have been, and will continue to be, identified at each of the Bases and surrounding areas (as pleaded in the **Schedules 1 to 27**, at **Section F.4) (Exceedance of ADWG and ARG Base or Category 3)**).

Particulars

An 'Exceedance of ADWG and ARG Base' is a Base in which the contamination arising from PFAS exceeds guideline values for acceptable PFAS levels in:

- (a) drinking water in the 2018 ADWG and/or 2025 ADWG; and further or alternatively;
- (b) in recreational waters in the 2019 ARG and/or the 2026 Draft ARG.

The categories which have been identified in respect of the Bases as pleaded in **Schedules 1 to 27** are as follows:

- (c) as to Bases which are Category 1 Bases and also Category 3 Bases;
 - (i) Albatross Base – **Schedule 2, Section F.4**;
 - (ii) Darwin Base – **Schedule 9, Section F.4**;
 - (iii) Robertson Base – **Schedule 10, Section F.4**;
 - (iv) Cairns Base – **Schedule 13, Section F.4**;
 - (v) Lavarack Base – **Schedule 14, Section F.4**;
 - (vi) Townsville Base – **Schedule 16, Section F.4**;
 - (vii) Cerberus Base – **Schedule 20, Section F.4**;
 - (viii) Williams Base – **Schedule 22, Section F.4**;
 - (ix) Stirling Base – **Schedule 27, Section F.4**;

- (d) as to Bases which are Category 2 Bases and also Category 3 Bases;
 - (i) Jervis Bay Base – **Schedule 1, Section F.4;**
 - (ii) Blamey Base – **Schedule 3, Section F.4;**
 - (iii) Holsworthy Base – **Schedule 4, Section F.4;**
 - (iv) Richmond Base – **Schedule 5, Section F.4;**
 - (v) Singleton Base – **Schedule 6, Section F.4;**
 - (vi) Wagga Base – **Schedule 7, Section F.4;**
 - (vii) Williamtown Base – **Schedule 8, Section F.4;**
 - (viii) Tindal Base – **Schedule 11, Section F.4;**
 - (ix) Amberley Base – **Schedule 12, Section F.4;**
 - (x) Oakey Base – **Schedule 15, Section F.4;**
 - (xi) Edinburgh Base – **Schedule 18, Section F.4;**
 - (xii) Bandiana Base – **Schedule 19, Section F.4;**
 - (xiii) East Sale Base – **Schedule 21, Section F.4;**
 - (xiv) Pearce Base – **Schedule 23, Section F.4;**
 - (xv) Gingin Base – **Schedule 24, Section F.4;**
 - (xvi) Holt Base – **Schedule 25, Section F.4;**
 - (xvii) Learmonth Base – **Schedule 26, Section F.4;**
- (e) as to Bases which are solely Category 3 Bases;
 - (i) Wide Bay Base – **Schedule 17, Section F.4.**

140. Further, as the Base PFAS Contamination continues leaching and migrating at the Bases and into surrounding areas, including by reason of the new exceedances set out in paragraph 139 above, the Commonwealth will be required to undertake additional or increased investigations, management, remediation and mitigation activities in order to minimise the risks arising to human health and the environment as a result of the continuing contamination.

H.5 PFAS Management Areas and prioritisation of Bases

141. In 2015, the Defence National PFAS Investigation and Management Program was established to manage the risks to humans, animals and the environment associated with PFAS contamination on or around Defence properties.
142. In or around late 2014 or early 2015, the Commonwealth engaged CH2M Hill Australia Pty Ltd to conduct a desktop review of the Defence estate to identify, review and prioritise

facilities across the Defence estate where AFFF may have been used or released, to progress works effectively and to address potential liabilities and risks.

Particulars

The Commonwealth refers to CH2M, Defence Estate Legacy PFC Review, July 2015, prepared for the Commonwealth (DEF.0003.0003.5583) (the **CH2M Report**).

143. The CH2M Report identified 72 properties across the Defence estate where AFFF had been used, or potentially used, and ranked them according to risk factors associated with AFFF impacts.

Particulars

The Commonwealth refers to the CH2M Report (DEF.0003.0003.5583), which ranked the Bases as either:

- (a) 'High Priority' – namely, Bases that have widespread confirmed impacts associated with AFFF, or where there was a high risk that identified impacts or potential sources of AFFF have the potential to impact human health or the environment;
- (b) 'Moderately High Priority' – namely, Bases that have one or more sites within the Base with confirmed impacts associated with AFFF or where there was a high risk that identified impacts or potential AFFF sources have the potential to impact human health or the environment;
- (c) 'Medium Priority' – namely, Bases where further investigation is warranted due to the identification of data gaps that indicate that the actual or potential use or storage of AFFF has the potential to impact human health or the environment; and
- (d) 'Low Priority' – namely, Bases where the information reviewed indicates that there is no current or former use or storage of AFFF at the Base.

10 'High Priority' Bases were identified, including: Oakey Base, Williamtown Base, Amberley Base, Richmond Base, East Sale Base, Tindal Base, Townsville Base, Edinburgh Base, Darwin Base and Williams Base (Point Cook).

24 'Moderately High Priority' Bases were identified, including: Jervis Bay Base, Blamey Base, Albatross Base, Holsworthy Base, Wagga Base, Singleton Base, Robertson Base, Cairns Base, Lavarack Base, Gingin Base, Stirling Base, Holt Base, Learmonth Base, Pearce Base, Cerberus Base and Bandiana Base.

38 ‘Medium Priority’ Bases were identified, including Williams Base (Laverton) and Wide Bay Base. (DEF.7000.0010.0312 at .0513).

144. In or about mid-2015, the Commonwealth engaged Golder Associates to review and update the risk ranking contained in the CH2M Report by identifying properties where there was potential for impacts to human and sensitive ecological users of surface water or groundwater.

Particulars

The Commonwealth refers to Golder Associates, PFC Assessment – Development of a Priority List of Properties, 27 October 2015, prepared for the Commonwealth (**2015 Golder Report**) (DEF.0005.0002.0409 at .0419-.0441), which ranked the Bases as either:

- (a) Category 1 – Priority List of Properties, which were Bases where further assessment investigation and/or action was required regarding potential PFAS impacts on and/or off Base;
- (b) Category 2 – Bases with data gaps requiring addressing, which were Bases where the available information had shown some uncertainty as to the potential for PFAS contamination either on Base or off Base; or
- (c) Category 3 – Bases with low potential for significant PFAS contamination, which did not warrant priority investigation or action at that stage.

16 ‘Category 1’ Bases were identified, including: Jervis Bay Base, Richmond Base, Holsworthy Base, Albatross Base, Wagga Base, Tindal Base, Darwin Base, Robertson Base, Townsville Base, Amberley Base, Edinburgh Base, East Sale Base, Bandiana Base, Cerberus Base, Stirling Base and Pearce Base. Williamstown Base, Oakey Base and Williams Base were not included in the ‘Category 1’ Bases, as further investigations had already commenced on those properties (see e.g. DEF.7000.0010.0312 at .0613-.0615, .0629).

20 ‘Category 2’ Bases were identified, including: Blamey Base, Singleton Base, Lavarack Base, Cairns Base, Williams Base (Laverton), Learmonth Base, Gingin Base and Holt Base.

31 ‘Category 3’ Bases were identified, including: Williams Base (Laverton) and Wide Bay Base.

The Commonwealth refers to Golder Associates, PFC Assessment – Development of a Priority List, 27 October 2015, prepared for the Commonwealth

(DEF.0005.0002.0409 at .0436-.0442), Appendix C to Appendix E.

145. In around 2016, Golder Associates was engaged to conduct a data gap assessment for each of the properties identified as Category 2 properties in the 2015 Golder Report, to determine whether they should be reclassified as Category 1 or Category 3 or if further investigations were required to re-categorise them.

Particulars

As a result of the further assessment of the Category 2 properties and the re-categorisation of those properties:

- (a) 24 Category 1 Bases were identified, including: Jervis Bay Base, Richmond Base, Holsworthy Base, Albatross Base, Wagga Base, Tindal Base, Darwin Base, Robertson Base, Townsville Base, Amberley Base, Edinburgh Base, East Sale Base, Bandiana Base, Cerberus Base, Stirling Base, Pearce Base, Singleton Base, Lavarack Base, Cairns Base, Learmouth Base, Gingin Base and Holt Base;
- (b) Three Category 2 Bases were identified, including: Blamey Base and Williams (Laverton) Base; and
- (c) 38 Category 3 Bases were identified, including: Wide Bay Base.

The Commonwealth refers to:

- (d) Golder Associates, PFAS Environmental Management Program: Category 2 Properties – Data Gap Assessment, 7 September 2016, prepared for the Commonwealth (DEF.3001.0076.4503 at .4507); and
- (e) Department of Defence, PFAS Environmental Management Program: Revised Categorisation of Properties and Investigation Order, 7 September 2016 (DEF.3001.0076.4456 at .4471, .4486-.4492, Appendix C to Appendix E).

H.6 PFAS Management Areas

146. As a result of the above matters and by reason of the identification of the Base PFAS Contamination at each of the Bases, the Commonwealth has identified areas at each of the Bases and their surrounding areas, which required, and continue to require, investigations, monitoring and/or remediation to occur in order to delineate and otherwise manage or minimise the risks arising to human health and the environment from the Base PFAS Contamination (**Base PFAS Management Areas**).

Particulars

The Base PFAS Management Areas are set out further for each of the Bases in **Schedules 1 to 27, at Section G.1.**

H.7 Imposition of restrictions and guidelines

147. As a result of the above matters, and by reason of the identification of the Base PFAS Contamination at each of the Bases, various restrictions, guidelines and/or guidance on groundwater and surface water uses and the consumption of animals or other foods at the Bases and surrounding areas have been imposed or published as pleaded further in **Schedules 1 to 27, Section G.2.**

Particulars

The imposition of restrictions and the publication of guidelines and/or guidance at the Bases and surrounding areas is set out further in **Schedule 1 to 27, Section G.2.**

I. REMEDIATION AND MITIGATION ACTIVITIES

I.1 Remediation and Mitigation Activities

148. Since about 2012 onwards, the Commonwealth has undertaken **Remediation and Mitigation Activities** to mitigate the effects of the Base PFAS Contamination and to manage or otherwise minimise the potential risks arising to human health and the environment from the Base PFAS Contamination and provide adequate information to affected persons.

Particulars

The Remediation and Mitigation Activities undertaken by the Commonwealth at each of the Bases is set out further in **Schedules 1 to 27, Section H**.

149. Further, as the Base PFAS Contamination continues leaching and migrating at the Bases and into surrounding areas, it is likely that the Commonwealth will be required to undertake future investigations, monitoring, remediation and mitigation activities in order to monitor the extent of, and mitigate the effects of, and to manage or otherwise minimise the potential risks arising to human health and the environment from the Base PFAS Contamination.

Particulars

The Commonwealth will likely be required to undertake further investigations, monitoring, remediation and mitigation activities, including:

- (a) ongoing monitoring programs;
- (b) new or ongoing groundwater, surface water and soil remediation programs;
- (c) identifying and implementing other measures to address any risks arising from the Base PFAS Contamination;
- (d) the ongoing operation of and/or construction of new infrastructure projects, including in relation to the supply of alternative drinking water, and sewerage infrastructure; and
- (e) ongoing provision of information to affected persons and other agencies about the PFAS Contamination at the Bases and surrounding areas.

J. COSTS ARISING FROM THE PFAS CONTAMINATION

150. The Commonwealth has incurred substantial costs in undertaking the Investigations and Ongoing Monitoring Activities and the Remediation and Mitigation Activities at the Bases.

Particulars

The Commonwealth's best estimate, as at the date of this pleading, as to the costs incurred in undertaking the Investigations and Ongoing Monitoring Activities and Remediation and Mitigation Activities at the Bases is set out in **Schedules 1 to 27, Section I**.

Further particulars may be provided after discovery and expert evidence.

151. The Commonwealth has also incurred costs and expenses associated with claims brought against the Commonwealth by third parties alleging loss and damage arising from the PFAS Contamination at the Bases and the areas surrounding the Bases.
152. The following representative proceedings under Part IVA of the *Federal Court of Australia Act* 1976 (the **FCA Act**) were commenced against the Commonwealth:
- (a) proceeding NSD 1908/2016, *Smith & Others v Commonwealth of Australia*, instituted on 2 November 2016 with respect to Williamstown Base (the **Williamstown Class Action**);
 - (b) proceeding NSD 1155/2017, *Hudson & Others v Commonwealth of Australia*, instituted on 11 July 2017 with respect to Oakey Base (the **Oakey Class Action**);
 - (c) proceeding NSD 1388/2018, *Bartlett & Another v Commonwealth of Australia*, instituted on 2 August 2018 with respect to Tindal Base (the **Tindal Class Action**);
 - (d) proceeding NSD 431/2020, *Haswell & Another v Commonwealth of Australia*, instituted on 15 April 2020 with respect to Pearce, Darwin, Richmond, Wagga, Edinburgh, Bandiana and Townsville Bases (the **Haswell Class Action**); and
 - (e) proceeding NSD 70/2021, *Wreck Bay Aboriginal Community Council v Commonwealth of Australia*, instituted on 2 February 2021 with respect to Jervis Bay Base (the **Wreck Bay Class Action**),
- (collectively, the **Class Actions**).

153. With the exception of the Wreck Bay Class Action, in each of the Class Actions it was alleged that the Commonwealth's use of 3M AFFF at the relevant Base had caused:

- (a) a diminution in value of certain land in the areas surrounding the Base;
- (b) a diminution in value of certain businesses in the areas surrounding the Base; or
- (c) both of (a) and (b).

Particulars

- (a) Williamstown Class Action Fourth Further Amended Statement of Claim dated 4 October 2019, paragraphs 65, 107, 123, 143, 160, 170, 186, 208, 224, 231, 234;
- (b) Oakey Class Action Further Amended Statement of Claim dated 9 December 2019, paragraphs 79, 81 and 87-88;
- (c) Tindal Class Action Further Amended Statement of Claim dated 29 August 2019, paragraphs 95, 97 and 103-104; and
- (d) Haswell Class Action Statement of Claim dated 15 April 2020, Schedule 1 (Pearce Base) paragraphs 1.105, 1.111 and 1.112; Schedule 2 (Darwin Base) paragraphs 2.144, 2.152 and 2.153; Schedule 3 (Richmond Base) paragraphs 3.102, 3.110 and 3.111; Schedule 4 (Wagga Base) paragraphs 4.95, 4.103 and 4.104; Schedule 5 (Edinburgh Base) paragraphs 5.100, 5.108 and 5.109; Schedule 6 (Bandiana Base) paragraphs 6.119, 6.127 and 6.128; and Schedule 7 (Townsville Base) paragraphs 7.124, 7.132 and 7.133.

154. In the Wreck Bay Class Action, it was alleged that the Commonwealth's use of 3M AFFF at the relevant Base had caused:

- (a) the loss of use and enjoyment, including cultural loss, of the land in certain areas surrounding the Jervis Bay Base;
- (b) a diminution in value of certain land in the area surrounding the Jervis Bay Base; or
- (c) both of (a) and (b).

Particulars

Wreck Bay Class Action Statement of Claim dated
2 February 2021, paragraphs 1.105, 1.107, 1.113 and 1.114.

155. Pursuant to section 33V of the FCA Act, the Federal Court of Australia approved settlements of:

- (a) the Williamstown Class Action, Oakey Class Action and the Tindal Class Action on 5 June 2020;
- (b) the Wreck Bay Class Action on 19 June 2023; and
- (c) the Haswell Class Action on 25 August 2023,

(the **Class Action Settlements**).

Particulars

The settlement approval decisions are *Smith v Commonwealth of Australia (No 2)* [2020] FCA 837; *Wreck Bay Aboriginal Community Council v Commonwealth of Australia* [2023] FCA 660; and *Haswell v Commonwealth of Australia (No 3)* [2023] FCA 1093.

156. Pursuant to the Class Action Settlements, the Commonwealth has paid to the applicants and group members in settlement of the Class Actions:

- (a) \$86 million with respect to the Williamstown Class Action;
- (b) \$34 million with respect to the Oakey Class Action;
- (c) \$92.5 million with respect to the Tindal Class Action;
- (d) \$22 million with respect to the Wreck Bay Class Action; and
- (e) \$132.7 million with respect to the Haswell Class Action.

157. In addition to the Class Action Settlements, the Commonwealth incurred costs and expenses associated with the Class Actions.

Particulars

The Commonwealth's best estimate, as at the date of this pleading, as to the costs and expenses incurred in respect of the Class Actions, as at the date of this pleading, is set out in:

- (a) with respect to the Williamstown Class Action, **Schedule 8, Section I**;

- (b) with respect to the Oakey Class Action, **Schedule 15, Section I**;
- (c) with respect to the Tindal Class Action, **Schedule 11, Section I**;
- (d) with respect to the Wreck Bay Class Action, **Schedule 1, Section I**; and
- (e) with respect to the Haswell Class Action: **Schedule 23, Section I** (Pearce); **Schedule 9, Section I** (Darwin); **Schedule 5, Section I** (Richmond); **Schedule 7, Section I** (Wagga); **Schedule 18, Section I** (Edinburgh); **Schedule 19; Section I** (Bandiana); and **Schedule 16, Section I** (Townsville) Bases.

Further particulars may be provided after discovery and expert evidence.

158. In addition to the Class Actions, third parties, who were not applicants or group members in the Class Actions, have brought claims against the Commonwealth alleging loss and damage arising from the PFAS Contamination at the Bases and the areas surrounding the Bases (**Non-Class Action Claims**).
159. The Commonwealth has paid settlement payments in respect of the Non-Class Action Claims.

Particulars

The Commonwealth's best estimate, as at the date of this pleading, as to the settlement payments made in the Non-Class Action Claims, is set out in **Schedules 1 to 27, Section I**.

Further particulars may be provided after discovery and expert evidence.

160. Further, the Commonwealth has also incurred costs and expenses arising from the Non-Class Action Claims.

Particulars

The Commonwealth's best estimate, as at the date of this pleading, as to the costs and expenses associated with the Non-Class Action Claims, as at the date of this pleading, is set out in **Schedules 1 to 27, Section I**.

Further particulars may be provided after discovery and expert evidence.

161. The Commonwealth has also incurred substantial costs:

- (a) which are not attributable to a single Base (but rather relate to two or more Bases), or are costs which relate to the investigation, ongoing monitoring, remediation and mitigation activities of the Base PFAS Contamination as a whole;

Particulars

The Commonwealth's best estimate, as at the date of this pleading, of the costs incurred in the period up to and including 31 December 2025, is \$214,569,244.24. This amount relates to the costs of investigations, ongoing monitoring, remediation and mitigation at the Bases or in the areas surrounding the Bases incurred on a national basis.

Further particulars may be provided after discovery and expert evidence.

- (b) in relation to the removal of PFAS contaminated soils arising from capital, facilities and other infrastructure works conducted at the Bases;

Particulars

The Commonwealth's best estimate, as at the date of this pleading, as to the costs incurred in relation to the removal of PFAS contaminated soil arising from capital, facilities and infrastructure works conducted at the Bases, as at the date of this pleading, is set out in **Schedules 1 to 27, Section I**.

Further particulars may be provided after discovery and expert evidence.

- (c) in relation to the funding of research concerning the investigations, monitoring, remediation and mitigation, including as to the potential human health and ecological impacts, of the Base PFAS Contamination; and

Particulars

The Commonwealth's best estimate of the costs incurred, as at the date of this pleading, is \$51,490,532.00, in relation to research, including:

- (a) research grants paid to the Department of Health, Disability and Ageing;
- (b) the Commonwealth's PFAS Research Program; and
- (c) Commonwealth funded research programs with third parties including the CSIRO and the Australian National University.

Further particulars may be provided after discovery and expert evidence.

- (d) incurred by other Departments of the Commonwealth, and are not otherwise included in the Schedules, in relation to investigations, monitoring, remediation and mitigation of PFAS Contamination at the Bases.

Particulars

The Commonwealth's best estimate, as at the date of this pleading, of the costs incurred by Commonwealth Government Departments, other than the Department of Defence, is \$1,779,669.33. This amount relates to amounts contracted and committed by the Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts.

Further particulars may be provided after discovery and expert evidence.

162. The Commonwealth is likely to incur further costs in respect of the PFAS Contamination at the Bases, including costs associated with further investigations, ongoing monitoring, remediation and mitigation activities at the Bases and the areas surrounding the Bases.

Particulars

The Commonwealth's best estimate, as at the date of this pleading, of the future costs, which it anticipates will be incurred are:

- (a) from 1 July 2026, and for a projected period of 10 years ending on 30 June 2036, is set out in **Schedules 1 to 27, Section I**. This amount relates to the further costs for investigations, ongoing monitoring, remediation and mitigation activities and the supply of uncontaminated water (both on an ongoing or continued basis and/or by reason of new exceedances of 2025 ADWG) at the relevant Bases; and
- (b) \$51,217,044.59, this amount relates to the further costs of investigations, ongoing monitoring, remediation and mitigation activities and the supply of uncontaminated water (both on an ongoing or continued basis and/or by reason of new exceedances of 2025 ADWG) which are not attributable to a single Base (but rather relate to two or more Bases), or are costs which relate to Base PFAS Contamination as a whole.

Further particulars may be provided after discovery and expert evidence.

163. The Commonwealth may incur further amounts associated with claims that have been, or may be, brought against it by third parties alleging loss and damage arising from the Base PFAS Contamination.

Particulars

As at the date of this pleading, the following claims have been brought against the Commonwealth:

- (a) in relation to Blamey Base, the proceedings identified in **Schedule 3, Section I** (paragraph 32);
- (b) in relation to Wagga Base, the proceedings identified in **Schedule 7, Section I** (paragraph 33);
- (c) in relation to Tindal Base, the proceedings identified in **Schedule 11, Section I** (paragraph 34); and
- (d) in relation to Oakey Base, the proceedings identified in **Schedule 15, Section I** (paragraph 34).

The Commonwealth is not presently able to quantify the amounts that it may incur in respect of any loss or damages claimed in those proceedings.

As to the future claims that may be brought against the Commonwealth, the Commonwealth is not presently able to provide particulars of any amounts it may incur.

Further particulars may be provided prior to trial.

K. PUBLIC NUISANCE

K.1 3M

164. At all material times, 3M:

- (a) developed and manufactured 3M AFFF for sale as pleaded in paragraphs 2 and 19 to 22;
- (b) supplied 3M AFFF to 3M Australia for sale in Australia, as pleaded in paragraph 2 and 11;
- (c) knew or ought to have known the matters pleaded in paragraphs 37, 52 and 72; and
- (d) did not, at any time prior to 2003, inform the Commonwealth that 3M AFFF had the properties pleaded in paragraph 23 to 29, and was therefore:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans.

165. By reason of the matters in paragraph 164:

- (a) 3M Australia supplied 3M AFFF to the Commonwealth until about 2003;
- (b) the Commonwealth used 3M AFFF in the course of the Training and Operation Activities at each of the Bases as pleaded in paragraphs 110 to 114 and corresponding **Schedules 1 to 27, Section D**;
- (c) 3M AFFF used by the Commonwealth at the Bases:
 - (i) was released or discharged onto the concrete, asphalt, soil or sediment and into surface water and groundwater at the Bases in or around the Base Use Areas;
 - (ii) accumulated in concrete, asphalt, soil or sediment, surface water and groundwater at the Bases in or around the Base Use Areas;
 - (iii) leached from the concrete, asphalt, soil or sediment into the surface waters at the Bases and flowed into and along drainage systems or networks and other water courses at the Bases and surrounding areas before being discharged into water catchment areas and other areas;

- (iv) leached from soil into the groundwater underlying the Bases and surrounding areas, and migrated to the groundwater beneath the Base and surrounding areas, before subsequently flowing with that groundwater;
 - (v) was dispersed through surface water at the Bases, along drainage lines and other overland flows of surface water across the Bases and surrounding areas;
 - (vi) was discharged through the groundwater at the Bases to surface water bodies or drainage systems or networks at the Bases or surrounding areas;
 - (vii) entered the groundwater via surface water at the Bases, particularly through infiltration from the drainage systems or networks at the Bases or surrounding areas;
 - (viii) accumulated in the sewerage systems at some of the Bases, and mixed with treated liquid effluent and residual solids, before being discharged to into, or used in other areas;
- (d) the soil, surface water and groundwater at the Bases and within the surrounding areas have been impacted by the:
- (i) Soil Contamination;
 - (ii) Surface Water Contamination;
 - (iii) Groundwater Contamination; and
 - (iv) for some of the Bases, Sewage Contamination;
- (e) humans, animals and other ecological receptors at the Bases and surrounding areas have been impacted by the:
- (i) Human and Animal Exposure; and/or
 - (ii) Ecological Receptor Exposure;
- (f) owners and/or occupiers of land within the areas surrounding the Bases (including the Commonwealth):
- (i) have sustained Soil Contamination;

- (ii) have had their land affected by the Surface Water Contamination; and/or
- (iii) as a consequence of the Surface Water Contamination and Groundwater Contamination, may no longer be able to:
 - (1) use the surface water in the areas surrounding the Bases for the surface water usages; and/or
 - (2) use bores on their properties for the groundwater usages; and/or
 - (3) otherwise enjoy the environmental features within the areas surrounding the Bases; and
- (iv) may be exposed to PFAS through multiple potential exposure pathways, including the Human and Animal Exposure.

166. In the premises, in engaging in the conduct pleaded in paragraph 164, 3M has:

- (a) created, and continued, a significant and ongoing interference with the public right to the convenient and comfortable use and enjoyment of the environment (both water and land), by hindering access to contaminant-free water for a range of activities in the Bases and surrounding areas; and
- (b) caused significant and ongoing annoyance, inconvenience, discomfort, anxiety, distress and vexation to persons in the areas surrounding the Bases.

167. 3M knew, or ought to have known, that the conduct pleaded in paragraph 164 would:

- (a) create, and continue, a significant and ongoing interference with the public right to the convenient and comfortable use and enjoyment of the environment (of both water and land), in the Bases and surrounding areas; and
- (b) cause significant and ongoing annoyance, inconvenience, discomfort, anxiety, distress and/or vexation to owners and/or occupiers of land within the areas surrounding the Bases.

Particulars

The Commonwealth refers to and repeats paragraphs 17 to 18, 28 to 29, 36 to 37, 52, 72, 119 to 120 above.

168. In the premises, by reason of the matters pleaded in paragraph 164 to 167, 3M has created and continued a substantial and unreasonable interference with:

- (a) the Commonwealth's use and enjoyment of the Bases; and
- (b) the use and enjoyment of the areas surrounding the Bases by owners and/or occupiers of land within the areas surrounding the Bases,

(the **Public Nuisance**).

Particulars

The Commonwealth refers to **Schedules 1 to 27, Sections F and G**.

Continuing Nuisance

169. The Public Nuisance caused by 3M's conduct is continuing, by reason of:

- (a) existing areas which continue to be affected by the continual leaching and/or dispersal of PFAS within the Bases and/or surrounding areas, notwithstanding the migration of PFAS has reached its geographical limit within that Base and surrounding areas, that is, **Category 1 Bases**; and/or

Particulars

Category 1 Bases are as follows:

- (a) Albatross Base – **Schedule 2, Section F.4**;
 - (b) Darwin Base – **Schedule 9, Section F.4**;
 - (c) Robertson Base – **Schedule 10, Section F.4**;
 - (d) Cairns Base – **Schedule 13, Section F.4**;
 - (e) Lavarack Base – **Schedule 14, Section F.4**;
 - (f) Townsville Base – **Schedule 16, Section F.4**;
 - (g) Cerberus Base – **Schedule 20, Section F.4**;
 - (h) Williams Base – **Schedule 22, Section F.4**; and
 - (i) Stirling Base – **Schedule 27, Section F.4**.
- (b) existing areas which continue to be affected by the continual leaching and/or dispersal of PFAS within the Bases and surrounding areas, and new and additional areas are being contaminated within the Bases and and/or surrounding areas as the PFAS

continues to migrate or leach but has not yet reached its geographical limit within that Base and surrounding areas, that is, **Category 2 Bases**; and/or

Particulars

The Continuing Contamination in **Category 2 Bases** and surrounding areas is set out in:

- (a) Jervis Bay Base – **Schedule 1, Section F.4**;
 - (b) Blamey Base – **Schedule 3, Section F.4**;
 - (c) Holsworthy Base – **Schedule 4, Section F.4**;
 - (d) Richmond Base – **Schedule 5, Section F.4**;
 - (e) Singleton Base – **Schedule 6, Section F.4**;
 - (f) Wagga Base – **Schedule 7, Section F.4**;
 - (g) Williamtown Base – **Schedule 8, Section F.4**;
 - (h) Tindal Base – **Schedule 11, Section F.4**;
 - (i) Amberley Base – **Schedule 12, Section F.4**;
 - (j) Oakey Base – **Schedule 15, Section F.4**;
 - (k) Edinburgh Base – **Schedule 18, Section F.4**;
 - (l) Bandiana Base – **Schedule 19, Section F.4**;
 - (m) East Sale Base – **Schedule 21, Section F.4**;
 - (n) Pearce Base – **Schedule 23, Section F.4**;
 - (o) Gingin Base – **Schedule 24, Section F.4**;
 - (p) Holt Base – **Schedule 25, Section F.4**; and
 - (q) Learmonth Base – **Schedule 26, Section F.4**.
- (c) existing areas and/or new and additional areas within Bases and/or surrounding areas, in which PFAS Contamination exceeds guideline values for acceptable PFAS levels in drinking water in the 2018 ADWG and/or 2025 ADWG or in recreational waters in the 2019 ARG and/or 2026 Draft ARG, that is, **Category 3 Bases**.

Particulars

Category 3 Bases are as follows:

- (a) Jervis Bay Base – **Schedule 1, Section F.4**;
- (b) Albatross Base – **Schedule 2, Section F.4**;
- (c) Blamey Base – **Schedule 3, Section F.4**;
- (d) Holsworthy Base – **Schedule 4, Section F.4**;
- (e) Richmond Base – **Schedule 5, Section F.4**;

- (f) Singleton Base – **Schedule 6, Section F.4;**
- (g) Wagga Base – **Schedule 7, Section F.4;**
- (h) Williamstown Base – **Schedule 8, Section F.4;**
- (i) Darwin Base – **Schedule 9, Section F.4;**
- (j) Robertson Base – **Schedule 10, Section F.4;**
- (k) Tindal Base – **Schedule 11, Section F.4;**
- (l) Amberley Base – **Schedule 12, Section F.4;**
- (m) Cairns Base – **Schedule 13, Section F.4;**
- (n) Lavarack Base – **Schedule 14, Section F.4;**
- (o) Oakey Base – **Schedule 15, Section F.4;**
- (p) Townsville Base – **Schedule 16, Section F.4;**
- (q) Wide Bay Base – **Schedule 17, Section F.4;**
- (r) Edinburgh Base – **Schedule 18, Section F.4;**
- (s) Bandiana Base – **Schedule 19, Section F.4;**
- (t) Cerberus Base – **Schedule 20, Section F.4;**
- (u) East Sale Base – **Schedule 21, Section F.4;**
- (v) Williams Base – **Schedule 22, Section F.4;**
- (w) Pearce Base – **Schedule 23, Section F.4;**
- (x) Gingin Base – **Schedule 24, Section F.4;**
- (y) Holt Base – **Schedule 25, Section F.4;**
- (z) Learmonth Base – **Schedule 26, Section F.4;** and
- (aa) Stirling Base – **Schedule 27, Section F.4.**

170. By reason of 3M's Public Nuisance, the Commonwealth has suffered and continues to suffer loss and damage.

Particulars

The Commonwealth has suffered loss and damage as pleaded in **Part J** and as set out in **Schedules 1 to 27, Section I.**

The Commonwealth is likely to suffer further loss and damage as pleaded in **Part J** and as set out in **Schedules 1 to 27, Section I.**

171. The loss and damage suffered by the Commonwealth is substantial and appreciably greater in degree than that suffered by the general public.
172. In the premises, 3M is liable to pay damages to the Commonwealth for the Public Nuisance.

173. Further, by reason of the matters pleaded in paragraphs 2, 4, 18 to 20, 22, 28 to 29, 36, 52 and 72, and the conduct of 3M identified in **Part E**, the Commonwealth is entitled to exemplary damages from 3M.

Particulars

As set out in paragraphs 29, 36, 52 and 72, from at least the dates identified therein, 3M has known, or ought to have known, that each of PFOS, PFHxS and PFOA, and consequently, that some components of 3M AFFF, were: potentially harmful or otherwise toxic to animals; did not biodegrade; persisted in soils and waters; were mobile in soils and could leach from soils into groundwater or surface water systems and potentially migrate into drinking water and other areas; bio-concentrated in animals; and were present in human tissue and blood.

Despite knowing by no later than 1979, that these variants of PFAS persist indefinitely, bioaccumulate and bio-concentrate in both humans and animals, were associated with a range of adverse effects (including those set out in paragraph 27 above, and in particular to the environment, including that they were toxic to certain species), and would be routinely released into the environment during their intended use in firefighting activities, 3M continued to manufacture, market, distribute and sell 3M AFFF or its component parts including PFOS, PFHxS and PFOA, until at least 2003.

Further, despite holding information about the properties and risks associated with these variants of PFAS, 3M took no steps, or no meaningful steps, to properly or adequately warn purchasers of 3M AFFF as to those risks, or of appropriate measures that ought to have been taken to contain or minimise the release of PFAS into the broader environment.

As a consequence, PFAS have been widely released into the environment, resulting in a range of impacts. As set out in paragraph 26 above, once these variants of PFAS are discharged into the environment they are difficult to contain, remove or otherwise effectively remediate.

In the circumstances, the conduct of 3M has been intentional and reprehensible, and there has been a conscious, contumelious, contemptuous or outrageous disregard for the rights of the Commonwealth and the broader Australian public, including Defence personnel and those living in the areas surrounding the Bases, who have been affected by the presence and continued migration of the Base PFAS Contamination.

The conduct of 3M is deserving of the Court's disapprobation and condign punishment by way of an award of exemplary damages commensurate with the resources of 3M.

K.2 3M Australia

174. At all material times, 3M Australia:

- (a) supplied 3M AFFF to the Commonwealth, as pleaded in **Part E**;
- (b) knew or ought to have known the matters pleaded in paragraphs 37, 52 and 72;
- (c) did not, at any time prior to 2003, inform the Commonwealth that 3M AFFF had the properties pleaded in paragraphs 23 to 29, and were therefore:
 - (i) potentially damaging to the environment; and/or
 - (ii) potentially causative of adverse health effects in humans.

175. By reason of the matters in paragraph 174:

- (a) the Commonwealth purchased 3M AFFF from 3M Australia until about 2003;
- (b) the Commonwealth used 3M AFFF in the course of the Training and Operation Activities at each of the Bases as pleaded in paragraphs 110 to 114 above and as set out further in respect of each of the Bases in **Schedules 1 to 27, Section D**;
- (c) 3M AFFF used by the Commonwealth at the Bases:
 - (i) was released or discharged onto the concrete, asphalt, soil or sediment and into surface water and groundwater at the Bases in or around the Base Use Areas;
 - (ii) accumulated in concrete, asphalt, soil or sediment, surface water and groundwater at the Bases in or around the Base Use Areas;
 - (iii) leached from the concrete, asphalt and soil or sediment into surface water at the Bases and flowed into and along drainage systems or networks and other water courses at the Bases and surrounding areas before being discharged into water catchment areas and other areas;
 - (iv) leached from soil into the groundwater underlying the Bases and surrounding areas, and migrated to the groundwater beneath the Bases and surrounding areas, before subsequently flowing with that groundwater;

- (v) was dispersed through surface water at the Bases, along drainage lines and other overland flows of surface water across the Bases and surrounding areas;
 - (vi) was discharged through the groundwater at the Bases to surface water bodies or drainage systems or networks at the Bases or surrounding areas;
 - (vii) entered the groundwater via surface water at the Bases, particularly through infiltration from the drainage systems or networks at the Bases or surrounding areas;
 - (viii) accumulated in the sewerage systems at some of the Bases, and mixed with treated liquid effluent and residual solids, before being discharged into, or used in other areas;
- (d) the soil, surface water and groundwater at the Bases and the surrounding areas have been impacted by the:
- (i) Soil Contamination;
 - (ii) Surface Water Contamination;
 - (iii) Groundwater Contamination; and
 - (iv) for some of the Bases, Sewage Contamination.
- (e) humans, animals and other ecological receptors at the Bases and the surrounding areas have been impacted by the:
- (i) Human and Animal Exposure; and/or
 - (ii) Ecological Receptor Exposure;
- (f) owners and/or occupiers of land within the areas surrounding the Bases (including the Commonwealth):
- (i) have sustained Soil Contamination;
 - (ii) have had their land affected by the Surface Water Contamination; and/or

- (iii) as a consequence of the Surface Water Contamination and Groundwater Contamination, may no longer be able to:
 - (1) use the surface water in the areas surrounding the Bases for the surface water usages; and/or
 - (2) use bores on their properties for the groundwater usages; and/or
 - (3) otherwise enjoy the environmental features within the areas surrounding the Bases; and
- (iv) may be exposed to PFAS through multiple potential exposure pathways, including the Human and Animal Exposure.

176. In the premises, in engaging in the conduct pleaded in paragraphs 174, 3M Australia has:

- (a) created, and continued, a significant and ongoing interference with the public right to the convenient and comfortable use and enjoyment of the environment (of both water and land), by hindering access to contaminant-free water for a range of activities in the Bases and surrounding areas; and
- (b) caused significant and ongoing annoyance, inconvenience, discomfort, anxiety, distress and vexation to occupiers and/or owners of land in the areas surrounding the Bases.

177. 3M Australia knew, or ought to have known, that the conduct pleaded in paragraph 174 would:

- (a) create, and continue, a significant and ongoing interference with the public right to the convenient and comfortable use and enjoyment of the environment (of both water and land), in the Bases and surrounding areas; and
- (b) cause a significant and ongoing annoyance, inconvenience, discomfort, anxiety, distress and/or vexation to occupiers and/or owners of land within the areas surrounding the Bases.

Particulars

The Commonwealth refers to and repeats paragraphs 17 to 18, 28 to 29, 36 to 37, 52, 72, 119 to 120 above.

178. In the premises, by reason of the matters pleaded in paragraphs 174 to 177, 3M Australia has created and continued a Public Nuisance.

Particulars

The Commonwealth refers to **Schedules 1 to 27, Sections F and G.**

179. The Public Nuisance caused by 3M Australia's conduct is continuing, by reason of:

- (a) existing areas which continue to be affected by the continual migration or leaching of PFAS within the Bases and/or surrounding areas, notwithstanding the migration of PFAS has reached its geographical limit within that Base and surrounding areas, that is, **Category 1** Bases;

Particulars

The Commonwealth refers to and repeats the particulars to paragraph 169(a) above.

- (b) existing areas which continue to be affected by the continual migration or leaching of PFAS within the Bases and/or surrounding areas, and new and additional areas are being contaminated within the Bases and/or surrounding areas as the PFAS continues to migrate or leach but has not yet reached its geographical limit within that Base and surrounding areas, that is **Category 2** Bases; and/or

Particulars

The Commonwealth refers to and repeats the particulars to paragraph 169(b) above.

- (c) existing areas and/or new and additional areas within the Bases and/or surrounding areas, in which the PFAS Contamination exceeds guideline values for acceptable PFAS levels in drinking water in the 2018 ADWG and/or 2025 ADWG or in recreational waters in the 2019 ARG and/or 2026 Draft ARG, that is **Category 3** Bases.

Particulars

The Commonwealth refers to and repeats the particulars to paragraph 169(c) above.

180. By reason of 3M Australia's Public Nuisance, the Commonwealth has suffered and continues to suffer loss and damage.

Particulars

The Commonwealth has suffered loss and damage as pleaded in **Part J** and as pleaded in **Schedules 1 to 27, Section I**.

The Commonwealth is likely to suffer further loss and damage as pleaded in **Part J** and as pleaded in **Schedules 1 to 27, Section I**.

181. The loss and damage suffered by the Commonwealth is substantial and appreciably greater in degree than that suffered by the general public.
182. In the premises, 3M Australia is liable to pay damages to the Commonwealth for the Public Nuisance.
183. Further, by reason of the matters pleaded in paragraphs 3, 4, 18, 28 to 29, 37, 53, 73 and the conduct of 3M Australia identified in **Part E**, the Commonwealth is entitled to exemplary damages from 3M Australia.

Particulars

As 3M's agent, and as set out in paragraphs 3, 37, 53 and 73, from at least the dates identified therein, 3M Australia ought to have known that each of PFOS, PFHxS and PFOA, and consequently, that some components of 3M AFFF, were: potentially harmful or otherwise toxic to animals; did not biodegrade; persisted in soils and waters; were mobile in soils and could leach from soils into groundwater or surface water systems and potentially migrate into drinking waters and other areas; bio-concentrated in animals; and were present in human tissue and blood.

Despite this knowledge, 3M Australia continued to manufacture, market, distribute and sell 3M AFFF to the Commonwealth (as set out further in **Part E**), until at least 2003.

Further, 3M Australia took no steps, or no meaningful steps, to properly or adequately warn purchasers of 3M AFFF (including the Commonwealth) as to those risks, or of appropriate measures that ought to have been taken to contain or minimise the release of PFAS into the broader environment.

As a consequence, PFAS have been widely released into the environment, resulting in a range of impacts. As set out in paragraph 26 above, once these variants of PFAS are

discharged into the environment they are difficult to contain, remove or otherwise effectively remediate.

In the circumstances, the conduct of 3M Australia has been intentional and reprehensible, and there has been a conscious, contumelious, contemptuous or outrageous disregard for the rights of the Commonwealth and the broader Australian public, including Defence personnel and those living in the areas surrounding the Bases, who have been affected by the presence and continued migration of the Base PFAS Contamination.

The conduct of 3M Australia is deserving of the Court's disapprobation and condign punishment by way of an award of exemplary damages commensurate with the resources of 3M Australia.

L. CLAIMS UNDER THE ENVIRONMENTAL PROTECTION ACT 2017

184. Each of the Bandiana, Cerberus, East Sale and Williams Bases are located in Victoria (**Victorian Bases**).
185. The use of 3M AFFF at the Victorian Bases (as set out above at **Part F.1** and set out further in each of **Schedules 19 to 22, Section D**), has resulted in those Bases and their surrounding areas, being contaminated within the meaning of section 35 of the *Environmental Protection Act 2017* (**EP Act**) (the **Victorian Base Contamination**).

Particulars

Each of the Victorian Bases is contaminated by reason of the existence of the Groundwater Contamination, Surface Water Contamination, Soil Contamination and for Bandiana Base, Sewage Contamination, as is set out further:

- (a) in respect of Bandiana Base – **Schedule 19, Section F.1**;
 - (b) in respect of Cerberus Base – **Schedule 20, Section F.1**;
 - (c) in respect of East Sale Base – **Schedule 21, Section F.1**;
 - (d) in respect of Williams Base – **Schedule 22, Section F.1**.
186. By reason of:
- (a) the Commonwealth's ownership, control and/or use of:
 - (i) Bandiana Base;
 - (ii) Cerberus Base;
 - (iii) East Sale Base;
 - (iv) Williams Base; and
 - (b) the Victorian Base Contamination,
- since 1 July 2021, the Commonwealth has been obliged, pursuant to section 39 of the EP Act to take steps to minimise the risks of harm to human health and/or the environment arising from the Victorian Base Contamination, including taking steps to:
- (i) identify, investigate and/or assess the extent of the Victorian Base Contamination; and/or

- (ii) minimise the risks of harm to human health and the environment from Victorian Base Contamination, including by conducting ongoing monitoring and other remedial activities; and/or
- (iii) clean up the Victorian Base Contamination; and/or
- (iv) provide adequate information about the Victorian Base Contamination to any persons who may be affected by it, including (but not limited to) government and quasi-government agencies, neighbouring land owners, local residents, and/or other recreational users of the land and waterways located nearby to the Victorian Bases,

(the **Duty to Manage Contamination**).

187. In compliance with the Duty to Manage Contamination set out above, the Commonwealth:

- (a) has undertaken the following:
 - (i) the Bandiana Investigations and Ongoing Monitoring Activities, as set out further in **Schedule 19, Section E**;
 - (ii) the Bandiana Remediation and Mitigation Activities, as set out further in **Schedule 19, Section H**;
 - (iii) the Cerberus Investigations and Ongoing Monitoring Activities, as set out further in **Schedule 20, Section E**;
 - (iv) the Cerberus Remediation and Mitigation Activities, as set out further in **Schedule 20, Section H**;
 - (v) the East Sale Investigations and Ongoing Monitoring Activities, as set out further in **Schedule 21, Section E**;
 - (vi) the East Sale Remediation and Mitigation Activities, as set out further in **Schedule 21, Section H**;
 - (vii) the Williams Investigations and Ongoing Monitoring Activities, as set out further in **Schedule 22, Section E**;

(viii) the Williams Remediation and Mitigation Activities, as set out further in **Schedule 22, Section H**;

- (b) is likely to be required to undertake further investigations, monitoring and remediation and mitigation activities in order to monitor the extent of, ameliorate the effects of, and to manage or otherwise minimise the risks arising to human health and the environment from the Victorian Base Contamination,

Particulars

The Commonwealth refers to and repeats the particulars to paragraph 149.

(the **Victorian Contamination Measures**).

188. As a consequence of undertaking the Victorian Contamination Measures, the Commonwealth has incurred costs, or is likely to incur costs, as follows:

- (a) as to Bandiana Base – the costs and expenses set out in **Schedule 19, Section I**;
- (b) as to Cerberus Base – the costs and expenses set out in **Schedule 20, Section I**;
- (c) as to East Sale Base – the measures set out in **Schedule 21, Section I**;
- (d) as to Williams Base – the measures set out in **Schedule 22, Section I**,

(the **Victorian Base Contamination Costs**).

189. The Victorian Base Contamination Costs:

- (a) are reasonable; and
- (b) were, or likely to be causally connected to, or incurred in complying with, the Duty to Manage Contamination.

190. By reason of:

- (a) 3M's development and manufacture of 3M AFFF for sale, as set out in paragraph 2 and **Part C** above, and in circumstances where:
 - (i) 3M AFFF had the properties pleaded in paragraphs 23 to 29;

- (ii) 3M knew or ought to have known of the matters pleaded in paragraphs 37, 53 and 73;
- (iii) 3M made the statements and engaged in the conduct set out in **Part E** above, and in particular at paragraphs 96, 97, 103, 108 and 109;
- (iv) further or alternatively, 3M failed to inform, or alternatively adequately inform, the Commonwealth that:
 - (1) there was a material risk that even if 3M AFFF was disposed of in accordance with 3M's disposal recommendations it:
 - (A) resisted degradation and persisted and accumulated in the environment; and
 - (B) was potentially harmful to humans, animals or the environment;
 - (2) there were significant adverse environmental effects associated with the use of 3M AFFF;
- (v) further or alternatively, 3M failed to warn, or alternatively adequately warn, the Commonwealth that 3M AFFF:
 - (1) had the properties pleaded in paragraphs 23 to 29; and
 - (2) as a consequence were potentially:
 - (A) damaging to the environment; and
 - (B) causative of adverse health effects in humans;
- (b) 3M Australia's sale of 3M AFFF to the Commonwealth, as set out in **Part E** above, and in circumstances where:
 - (i) 3M AFFF had the properties pleaded in paragraphs 23 to 29;
 - (ii) 3M Australia ought to have known of the matters pleaded in paragraphs 37, 52 and 72;

- (iii) as set out in paragraphs 91 to 94, 99 to 101 and 104 to 107 above, it was a condition or requirement of the Commonwealth's purchase of 3M AFFF that:
 - (1) from at least 1980 onwards, 3M Australia would provide the Commonwealth with evidence that 3M AFFF shall not:
 - (A) have any significant detrimental effect on the environment; nor
 - (B) present a waste disposal problem;
 - (2) from at least 1993 onwards, 3M Australia would provide the Commonwealth with evidence that the surfactants in 3M AFFF:
 - (A) shall not have any significant detrimental effect on the environment; nor
 - (B) present a waste disposal problem; and
 - (C) were biodegradable to a minimum of 80 per cent when tested in accordance with Australian Standard 1792;
 - (3) from at least 1980 onwards, provide certificates of compliance for each batch of 3M AFFF, to the effect that 3M Australia certified their conformance to the applicable Defence Standards (as applied from time to time);
- (iv) 3M Australia made the statements and engaged in the conduct set out in **Part E** above, and in particular at paragraphs 96, 97, 103, 108 and 109;
- (v) further or alternatively, 3M Australia failed to inform, or alternatively adequately inform, the Commonwealth that:
 - (1) there was a material risk that even if 3M AFFF was disposed of in accordance with 3M's disposal recommendations it:
 - (A) resisted degradation and persisted in the environment; and
 - (B) was potentially harmful to humans, animals or the environment;

- (2) there were significant adverse environmental effects associated with the use of 3M AFFF;
- (vi) further or alternatively, 3M failed to warn, or alternatively adequately warn, the Commonwealth that 3M AFFF:
 - (1) had the properties pleaded in paragraphs 23 to 29; and
 - (2) as a consequence, were potentially:
 - (A) damaging to the environment; and
 - (B) causative of adverse health effect in humans,

each of 3M and 3M Australia are persons who were responsible for causing or contributing to the Victorian Base Contamination.

191. By reason of the matters set out in paragraph 184 to 190, and pursuant to section 39(3) of the EP Act, the Commonwealth is entitled to recover from 3M and/or 3M Australia, as a debt due to it, the sum equal to the costs referred to in paragraph 188 above.

Particulars

The Victorian Base Contamination Costs are presently at least \$56,182,934.96, and it is anticipated that further costs will be incurred by the Commonwealth, on and from 1 January 2026 for a projected period of 10 years ending on 30 June 2036, and totalling approximately \$66,977,830.84.

M. MISLEADING OR DECEPTIVE CONDUCT

M.1 Conduct of 3M and 3M Australia

Biodegradability Representation

192. By engaging in the conduct pleaded in paragraphs 83(d), 84(b)(v), 87(a), 87(d), 97(b)(ii) 102, 103(a)(i), 103(c)(i) and 108(a)(i) above:

(a) 3M, further or alternatively;

(b) 3M Australia,

represented to the Commonwealth:

(c) by no later than 1973, that 3M AFFF were biodegradable,

Particulars

The representation in subparagraph (c) arose from the statements by 3M and 3M Australia to the Commonwealth that various 3M AFFF products supplied to the Commonwealth were biodegradable. The Commonwealth refers to and repeats the particulars to the paragraphs identified above.

The conduct alleged in the paragraphs identified above was conduct of 3M because:

(a) insofar as the statements were made by a person (paragraphs 83(d), 87(a), 87(d)), they were made by a person acting with actual or ostensible authority of 3M; and

(b) insofar as the statements were in writing (paragraphs 84(b)(v), 97(b)(ii), 102, 103(a)(i), 103(c)(i), 108(a)(i)), they were contained in documents written and published by 3M.

Further or alternatively, the Commonwealth says that the conduct alleged in the paragraphs identified above was conduct of 3M Australia because:

(c) insofar as the statements were made by a person, (paragraphs 83(d), 87(a), 87(d)), they were made by a person acting with actual or ostensible authority of 3M Australia; and

(d) insofar as the statements were in writing (paragraphs 84(b)(v), 97(b)(ii), 102, 103(a)(i), 103(c)(i), 108(a)(i)), they were contained in documents written and published

by 3M and adopted and conveyed by 3M Australia to the Commonwealth.

(the **Biodegradability Representations**).

Disposal Representations

193. Further, by engaging in the conduct pleaded in paragraphs 84(b)(ii), 87(f), 96(a)(i), 96(b)(i), 97(b)(ii), 97(b)(v), 102, 103(a)(i), 108(a)(i) and 109:

- (a) 3M, further or alternatively;
- (b) 3M Australia,

represented to the Commonwealth:

- (c) by no later than 1973, that beyond diluting spent 3M AFFF in order to limit its foaming, and mixing with flammable material to incinerate, no special measures were required to safely dispose of 3M AFFF.

Particulars

The representation in subparagraph (c) arose from the statements by 3M and 3M Australia to the Commonwealth as to the safe disposal of 3M AFFF. The Commonwealth refers to and repeats the particulars to the paragraphs identified above.

The conduct alleged in the paragraphs identified above was conduct of 3M because:

- (a) insofar as the statements were made by a person (paragraph 87(f)), they were made by a person acting with actual or ostensible authority of 3M; and
- (b) insofar as the statements were in writing (paragraphs 84(b)(ii), 96(a)(i), 96(b)(i), 97(b)(ii), 97(b)(v), 102, 103(a)(i), 108(a)(i), 109), they were contained in documents written and published by 3M.

Further or alternatively, the Commonwealth says that the conduct alleged in the paragraphs identified above was conduct of 3M Australia because:

- (c) insofar as the statements were made by a person (paragraph 87(f)), they were made by a person acting with actual or ostensible authority of 3M Australia; and
- (d) insofar as the statements were in writing (paragraphs 84(b)(ii), 96(a)(i), 96(b)(i), 97(b)(ii), 97(b)(v), 102,

103(a)(i), 108(a)(i), 109), they were contained in documents written and published by 3M and adopted and conveyed by 3M Australia to the Commonwealth.

194. Further, by engaging in the conduct pleaded in paragraphs 87(f), 96(a)(i), 96(b), 97(a)(i), 97(b)(i), 97(b)(iv), 97(b)(vi), 103(a)(ii)(3), 103(c)(ii), 108(a)(iii)(3), 108(b)(i), 109(a)(i), 109(a)(iv), and 109(b):

(a) 3M, further or alternatively;

(b) 3M Australia,

represented to the Commonwealth:

(c) by no later than 1974 that it was appropriate to dispose of spent 3M AFFF into a biological wastewater treatment system,

Particulars

The representation in subparagraph (c) arose from the statements by 3M and 3M Australia to the Commonwealth as to the safe disposal of 3M AFFF. The Commonwealth refers to and repeats the particulars to the paragraphs identified above.

The conduct alleged in the paragraphs identified above was conduct of 3M because:

- (a) insofar as the statements were made by a person (paragraph 87(f)), they were made by a person acting with actual or ostensible authority of 3M; and
- (b) insofar as the statements were in writing (paragraphs 96(a)(i), 96(b), 97(a)(i), 97(b)(i), 97(b)(iv), 97(b)(vi), 103(a)(ii)(3), 103(c)(ii), 108(a)(iii)(3), 108(b)(i), 109(a)(i), 109(a)(iv), 109(b)), they were contained in documents written and published by 3M.

Further or alternatively, the Commonwealth says that the conduct alleged in the paragraphs identified above was conduct of 3M Australia because:

- (c) insofar as the statements were made by a person, (paragraph 87(f)), they were made by a person acting with actual or ostensible authority of 3M Australia; and
- (d) insofar as the statements were in writing (paragraphs 96(a)(i), 96(b), 97(a)(i), 97(b)(i), 97(b)(iv), 97(b)(vi), 103(a)(ii)(3), 103(c)(ii), 108(a)(iii)(3), 108(b)(i), 109(a)(i), 109(a)(iv), 109(b)), they were contained in

documents written and published by 3M and adopted and conveyed by 3M Australia to the Commonwealth.

(paragraphs 193 and 194 being the **Disposal Representations**).

Toxicity Representations

195. Further, by engaging in the conduct pleaded in paragraphs 83(a), 83(b), 84(b)(i), 84(b)(iii), 84(b)(iv), 86(a), 87(b), 96(a)(ii), 96(c), 97(a)(ii), 97(b)(ii), 103(a)(ii)(1), 103(a)(ii)(2), 103(b), 108(a)(iii)(1) and 108(a)(iii)(2):

(a) 3M, further or alternatively;

(b) 3M Australia,

represented to the Commonwealth:

(c) by no later than 1973, that 3M AFFF does not adversely affect or present a hazard to humans, animals or aquatic life;

Particulars

The representation in subparagraph (c) arose from the statements by 3M and 3M Australia to the Commonwealth that various 3M AFFF products supplied to the Commonwealth were ‘practically non-toxic’, were not irritating to humans and not poisonous to animals, and had no adverse effect on aquatic life. The Commonwealth refers to and repeats the particulars to the paragraphs identified above.

The conduct alleged in the paragraphs identified above was conduct of 3M because:

(a) insofar as the statements were made by a person (paragraphs 83(a), 83(b), 86(a)), they were made by a person acting with actual or ostensible authority of 3M; and

(b) insofar as the statements were in writing (paragraphs 84(b)(i), 84(b)(iii), 84(b)(iv), 87(b), 96(a)(ii), 96(c), 97(a)(ii), 97(b)(ii), 103(a)(ii)(1), 103(a)(ii)(2), 103(b), 108(a)(iii)(1) 108(a)(iii)(2)), they were contained in documents written and published by 3M.

Further or alternatively, the Commonwealth says that the conduct alleged in the paragraphs identified above was conduct of 3M Australia because:

(c) insofar as the statements were made by a person (paragraphs 83(a), 83(b), 86(a)), they were made by a

person acting with actual or ostensible authority of 3M Australia; and

- (d) insofar as the statements were in writing (paragraphs 84(b)(i), 84(b)(iii), 84(b)(iv), 87(b), 96(a)(ii), 96(c), 97(a)(ii), 97(b)(ii), 103(a)(ii)(1), 103(a)(ii)(2), 103(b), 108(a)(iii)(1), 108(a)(iii)(2)), they were contained in documents written and published by 3M and adopted and conveyed by 3M Australia to the Commonwealth.
- (d) further or alternatively, by no later than 1998 that 3M AFFF does not adversely affect or present a hazard to humans, animals or aquatic life when disposed of in accordance with the disposal methods recommended by 3M Australia and 3M,

Particulars

The representation in subparagraph (d) arose from the statements by 3M and 3M Australia to the Commonwealth that various 3M AFFF products supplied to the Commonwealth were ‘practically non-toxic’, were not irritating to humans and not poisonous to animals, and had no adverse effect on aquatic life, when disposed of in accordance with the disposal methods recommended by 3M and 3M Australia. The Commonwealth refers to and repeats the particulars to, relevantly, paragraphs 103(a)(ii)(1), 103(a)(ii)(2), 103(b), 108(a)(iii)(1), 108(a)(iii)(2) above.

The conduct, which consisted of written statements:

- (a) was conduct of 3M because the statements were contained in documents written and published by 3M; further or alternatively,
- (b) was conduct of 3M Australia because the statements were contained in documents written and published by 3M and adopted and conveyed by 3M Australia to the Commonwealth.

(the **Toxicity Representations**).

Environmental Safety Representations

196. Further, by engaging in the conduct pleaded in paragraphs 83(c), 83(e), 84(b)(vi), 84(b)(vii), 86(b), 87(d), 87(e), 102, 103(a)(i), 108(a)(i) and 108(b)(ii):

- (a) 3M, further or alternatively,
- (b) 3M Australia,

represented to the Commonwealth:

- (c) by no later than 1973, that there were no significant adverse environmental effects associated with the use of 3M AFFF;

Particulars

The representation in subparagraph (c) arose from the statements by 3M and 3M Australia to the Commonwealth that various 3M AFFF products supplied to the Commonwealth would not harm the environment. The Commonwealth refers to and repeats the particulars to the paragraphs identified above.

The conduct alleged in the paragraphs identified above was conduct of 3M because:

- (a) insofar as the statements were made by a person (paragraphs 83(c), 83(e), 86(b)), they were made by a person acting with actual or ostensible authority of 3M; and
- (b) insofar as the statements were in writing (paragraphs 84(b)(vi), 84(b)(vii), 87(d), 87(e), 102, 103(a)(i), 108(a)(i), 108(b)(ii)), they were contained in documents written and published by 3M.

Further or alternatively, the Commonwealth says that the conduct alleged in the paragraphs identified above was conduct of 3M Australia because:

- (c) insofar as the statements were made by a person (paragraphs 83(c), 83(e), 86(b)), they were made by a person acting with actual or ostensible authority of 3M Australia; and
- (d) insofar as the statements were in writing (paragraphs 84(b)(vi), 84(b)(vii), 87(d), 87(e), 102, 103(a)(i), 108(a)(i), 108(b)(ii)), they were contained in documents written and published by 3M, and adopted and conveyed by 3M Australia to the Commonwealth.

- (d) by no later than 1974, that there were no significant adverse environmental effects associated with the use of 3M AFFF when disposed of in accordance with the disposal methods recommended by 3M and 3M Australia,

Particulars

The representation in subparagraph (d) arose from the statements by 3M and 3M Australia to the Commonwealth that various 3M AFFF products supplied to the Commonwealth would not harm the environment when disposed of in accordance with the disposal methods recommended by 3M and 3M Australia. The Commonwealth

refers to and repeats the particulars to, relevantly, paragraphs 102, 103(a)(i), 108(a)(i), and 108(b)(ii) above.

The conduct, which consisted of written statements:

- (a) was conduct of 3M because the statements were contained in documents written and published by 3M; further or alternatively,
- (b) was conduct of 3M Australia because the statements were contained in documents written and published by 3M and adopted and conveyed by 3M Australia to the Commonwealth.

(the **Environmental Safety Representations**).

Non-disclosure of material information

197. 3M and/or 3M Australia did not disclose to the Commonwealth, and it was the fact:

- (a) from at least 1973, that 3M AFFF is not biodegradable;

Particulars

The Commonwealth refers to and repeats paragraphs 25(a)-(c), (v), 35(a), 39(b), 41, 44(b), 49(b) and 55 above.

Further particulars will be provided following expert evidence.

- (b) from at least 1973, that 3M AFFF required special measures prior to or during its disposal to ensure it was disposed of safely;

Particulars

The Commonwealth refers to and repeats paragraphs 25-27 above.

Further particulars will be provided following expert evidence.

- (c) bleeding 3M AFFF into biological wastewater treatment systems was an inappropriate method of disposal, by reason of the properties of 3M AFFF (as set out in paragraph 26 and 27 above), and in particular owing to the potential for each of PFOS, PFHxS and PFOA to persist in soil and water, to bioaccumulate and by reason of their potential toxicity to humans and animals;

Particulars

The Commonwealth refers to and repeats paragraphs 197(a) and 26-27 above.

Further particulars will be provided following expert evidence.

- (d) 3M AFFF may adversely affect or present a hazard to humans, animals or aquatic life;

Particulars

The Commonwealth refers to and repeats paragraphs 25(a)-(c), (vi)-(x), 27(b), 30, 35(b), 39(a), 40(b), 42, 44(a), 49(a), 49(d), 56 and 60 above.

Further particulars will be provided following expert evidence.

- (e) 3M AFFF may adversely affect or present a hazard to humans, animals or aquatic life even when disposed of in accordance with the disposal methods recommended by 3M Australia and 3M, by reason of the properties of 3M AFFF (as set out in paragraphs 25 to 27 above), and in particular owing to the potential for each of PFOS, PFHxS and PFOA to bioaccumulate and by reason of their potential toxicity to humans and animals;

Particulars

The Commonwealth refers to and repeats paragraphs 197(d) and 25-27 above.

Further particulars will be provided following expert evidence.

- (f) there were significant adverse environmental effects associated with the use of 3M AFFF;

Particulars

The Commonwealth refers to and repeats paragraphs 25(a)-(c), (i)-(iv), 26, 27(a), 49(c) and 49(e) above.

Further particulars will be provided following expert evidence.

- (g) there were significant adverse environmental effects associated with the use of 3M AFFF even when disposed of in accordance with the disposal methods recommended

by 3M and 3M Australia, by reason of the properties of 3M AFFF (as set out in paragraph 26 and 27 above), and in particular owing to the potential for each of PFOS, PFHxS and PFOA to persist in soil and water, to bioaccumulate and by reason of their potential toxicity to humans and animals.

Particulars

The Commonwealth refers to and repeats paragraphs 197(f) and 25-27 above.

Further particulars will be provided following expert evidence.

198. In failing to disclose the matters in paragraph 197 above (together or separately to the extent proven):

(a) 3M, further or alternatively;

(b) 3M Australia,

represented to the Commonwealth that each Respondent was not aware of any of the matters, and accordingly of any risk of the matters, in paragraph 197(a) to (g) above,

(the **No Risk Representation**).

(the representations pleaded in paragraphs 192 to 197 collectively, **the 3M Representations**).

M.2 Trade and Commerce

199. The conduct of:

(a) 3M, further or alternatively;

(b) 3M Australia,

in making the 3M Representations was conduct in trade or commerce in Australia.

M.3 Future Matters

200. To the extent that any of the 3M Representations were representations as to future matters, the Commonwealth relies on section 4 of the ACL and section 51A of the TPA.

M.4 Statutory Attribution

201. Further or alternatively to paragraphs 192(b), 193(b), 194(b), 195(b), 196(b) and 197, to the extent that the 3M Representations were made by 3M Australia, it acted:

- (a) on behalf of 3M in making the 3M Representations;
- (b) as the agent of 3M, with actual or apparent authority to engage in the relevant conduct that conveyed the 3M Representations;
- (c) at the direction, or with the consent or agreement, of a director, employee or agent of 3M with actual or apparent authority to give the direction, consent or agreement;
- (d) by reason of the matters in subparagraphs (a) to (c) above, 3M is responsible for the 3M Representations; and
- (e) by reason of the matters alleged in subparagraphs (a) to (c) above, for the purposes of the Commonwealth's claims under the ACL and the TPA, such conduct is deemed to be the conduct of 3M by operation of section 139B(2) of the CCA and section 84(2) of the TPA.

Particulars

As to the allegation that 3M Australia acted as the agent of 3M, the Commonwealth refers to and repeats paragraph 3(e) above.

As to the allegation that 3M Australia acted at the direction or with the consent or agreement of 3M, such direction, consent, or agreement is to be inferred from the conduct of 3M Australia alleged in paragraphs 192(b), 193(b), 194(b), 195(b), 196(b) and 197, and/or the agency relationship alleged between 3M and 3M Australia.

Further particulars may be provided after discovery.

M.5 Misleading or Deceptive Conduct

Biodegradability Representations

202. The Biodegradability Representations were false in that:

- (a) 3M AFFF was not biodegradable;

Particulars

The Commonwealth refers to and repeats paragraphs 25(a)-(c), (v), 35(a), 39(b), 41, 44(b), 49(b) and 55 above.

Further particulars will be provided following expert evidence.

- (b) 3M, further or alternatively, 3M Australia, knew from at least 1973 that 3M AFFF was not biodegradable.

Particulars

As to the knowledge of 3M and 3M Australia, the Commonwealth refers to and repeats paragraphs 36(b)(i), 37(b)(i), 41, 52(b)(i)-(iii),(1), 53(b)(i)-(ii), (1), 55, 72(b)(iii),(1) and 73(b)(iii)(1).

Further particulars may be provided after discovery and lay evidence.

Disposal Representations

203. The Disposal Representations were false in that:

- (a) special measures, beyond diluting spent 3M AFFF in order to limit its foaming, were required to safely dispose of 3M AFFF;

Particulars

The Commonwealth refers to and repeats paragraphs 25-27 above.

Further particulars will be provided following expert evidence.

- (b) 3M, further or alternatively, 3M Australia, knew at all material times that special measures beyond diluting 3M AFFF in order to limit its foaming, were required to safely dispose of 3M AFFF; further

Particulars

The knowledge of 3M and 3M Australia is to be inferred from the characteristics of PFAS-components of 3M AFFF including the persistence, mobility, capacity to migrate, toxicity and capacity to bioaccumulate of PFAS, as set out in paragraphs 25-27 above.

Further particulars may be provided after discovery and lay evidence.

- (c) it was not appropriate to dispose of 3M AFFF into a biological wastewater treatment system;

Particulars

The Commonwealth refers to and repeats paragraphs 26-27 above.

Further particulars will be provided following expert evidence.

- (d) 3M, further or alternatively, 3M Australia, knew at all material times that it was not appropriate to dispose of 3M AFFF into a biological wastewater treatment system.

Particulars

The knowledge of 3M and 3M Australia is to be inferred from the characteristics of PFAS-components of 3M AFFF including the persistence, mobility, capacity to migrate, toxicity and capacity to bioaccumulate, as set out in paragraphs 25-27 above.

Further particulars may be provided after discovery and lay evidence.

Toxicity Representations

204. The Toxicity Representations were false in that:

- (a) 3M AFFF may adversely affect or present a hazard to humans, animals, and aquatic life;

Particulars

The Commonwealth refers to and repeats paragraphs 25(a)-(c), (vi)-(x), 27(b), 30, 35(b), 39(a), 40(b), 42, 44(a), 49(a), 49(d), 56 and 60 above.

Further particulars will be provided following expert evidence.

- (b) 3M, further or alternatively, 3M Australia, knew from at least 1963 that 3M AFFF may adversely affect or present a hazard to humans, animals, and aquatic life; further

Particulars

As to the knowledge of 3M and 3M Australia, the Commonwealth refers to and repeats paragraphs 30, 36(a), 37(a), 41, 42, 52(a), 52(c), 52(d), 53(a), 53(c), 53(d), 56, 60, 72(a), 72(c), 72 (d), 73(a), 73(c) and 73(d) above.

Further particulars may be provided after discovery and lay evidence.

- (c) 3M AFFF may adversely affect or present a hazard to humans, animals or aquatic life, even when disposed of in accordance with the disposal methods recommended by 3M and 3M Australia;

Particulars

The Commonwealth refers to and repeats paragraphs 25(a)-(c), (vi)-(x), 27(b), 30, 35(b), 39(a), 40(b), 42, 44(a), 49(a), 49(d), 56 and 60 above.

Further particulars will be provided following expert evidence.

- (d) 3M, further or alternatively, 3M Australia, knew at all material times that 3M AFFF may adversely affect or present a hazard to humans, animals or aquatic life even when disposed of in accordance with the disposal methods recommended by 3M and 3M Australia.

Particulars

The knowledge of 3M and 3M Australia as to the inadequacy of its recommended disposal methods is to be inferred from the knowledge alleged in paragraph 203(b) above, and from the characteristics of PFAS-components of 3M AFFF including the persistence, mobility, capacity to migrate, toxicity and capacity to bioaccumulate, as set out in paragraphs 25-27 above.

Further particulars may be provided after discovery and lay evidence.

Environmental Safety Representations

205. The Environmental Safety Representations were false in that:

- (a) there were significant adverse environmental effects associated with the use of 3M AFFF;

Particulars

The Commonwealth refers to and repeats paragraphs 25(a)-(c), (i)-(iv), 26, 27(a), 49(c) and 49(e) above.

Further particulars will be provided following expert evidence.

- (b) 3M, further or alternatively, 3M Australia, knew from at least 1972 that there were significant adverse environmental effects associated with the use of 3M AFFF; further

Particulars

As to the knowledge of 3M and 3M Australia, the Commonwealth refers to and repeats paragraphs 36(b)(ii)-(iii), 37(b)(ii)-(iii), 52(b)(i)-(iii),(2),(3), 53(b)(i)-(iii),(2),(3), 72(b)(i)-(iii),(2),(3) and 73(b)(i)-(iii),(2),(3) above.

Further particulars may be provided after discovery and lay evidence.

- (c) by no later than 1974, there were significant adverse environmental effects associated with the use of 3M AFFF even when disposed of in accordance with the disposal methods recommended by 3M and 3M Australia;

Particulars

The Commonwealth refers to and repeats paragraphs 25(a)-(c), (i)-(iv), 26, 27(a), 49(c) and 49(e) above.

Further particulars will be provided following expert evidence.

- (d) 3M, further or alternatively, 3M Australia, knew at all material times that there were significant adverse environmental effects associated with the use of 3M AFFF even when disposed of in accordance with the disposal methods recommended by 3M and 3M Australia.

Particulars

The knowledge of 3M and 3M Australia as to the inadequacy of its recommended disposal methods is to be inferred from the knowledge alleged in paragraph 204(b) above, and from the characteristics of PFAS-components of 3M AFFF including the persistence, mobility, capacity to migrate, toxicity and capacity to bioaccumulate, as set out in paragraphs 25-27 above.

Further particulars may be provided after discovery and lay evidence.

No Risk Representations

206. The No Risk Representations were false by reason:

- (a) of the matters pleaded in paragraph 197;
- (b) that 3M, further or alternatively, 3M Australia knew each of the matters pleaded in paragraph 197.

Particulars

As to the knowledge of 3M and 3M Australia, the Commonwealth refers to and repeats paragraphs 202(b), 203(b), 203(d), 204(b), 204(d), 205(b) and 205(d) above.

Further particulars may be provided after discovery and lay evidence.

207. In the premises, in making each of the 3M Representations (together or separately to the extent proven):

- (a) 3M, further or alternatively
- (b) 3M Australia,

contravened section 52 of the TPA, alternatively, section 18 of the ACL.

M.6 Causation, loss and damage

208. In reliance on some or all of the 3M Representations (together or separately to the extent proven), the Commonwealth entered into contracts with 3M Australia to acquire 3M AFFF, and used 3M AFFF, in the circumstances pleaded in **Parts E and F** above.

Particulars

That the Commonwealth relied on the 3M Representations in entering into contracts with 3M Australia to acquire 3M AFFF is to be inferred from the facts and matters set out in **Part E**, in particular:

- (a) the Commonwealth's attendance at product demonstrations of 3M AFFF (paragraph 75(b));
- (b) the Commonwealth seeking product information in respect of 3M AFFF including in relation to the characteristics of the products and any known problems with the products (paragraphs 76, 85, and 95);
- (c) 3M and/or 3M Australia supplying the Commonwealth with brochures for and information about 3M AFFF (paragraphs 75(c), 77, 83, 84, 86, 87, 96, 97, 103 and 108), including at the request of the Commonwealth in the circumstances set out above;
- (d) the Commonwealth using and testing 3M AFFF prior to purchasing it (paragraphs 78 and 79);
- (e) 3M Australia offering to supply the Commonwealth with 3M AFFF (paragraph 80);
- (f) 3M and/or 3M Australia supplying 3M AFFF to the Commonwealth with written confirmation that the products complied with, amongst other things, MILSPEC and the Defence Standards in place from time to time (paragraphs 82 and 102); and
- (g) from 1975, the Commonwealth requiring 3M and/or 3M Australia to provide the Commonwealth with written confirmation that the 3M AFFF supplied to it complied with, amongst other things, MILSPEC and the Defence Standards (paragraphs 88, 91, 99 and 104).

209. Further or alternatively, it was within the reasonable expectation of 3M and/or 3M Australia that statements made in connection with the sale of 3M AFFF to the Commonwealth would be relied on by the Commonwealth for the purpose of deciding whether to purchase 3M AFFF.

Particulars

That the Commonwealth refers to and repeats sub-paragraphs (ii), (iii), (vi) and (vii) of the particulars to paragraph 208 above.

210. If 3M, further or alternatively, 3M Australia, had not made the 3M Representations:

- (a) the Commonwealth would not have acquired and used 3M AFFF in the circumstances set out in **Parts E and F**, or at all;

Particulars

The Commonwealth refers to and repeats the matters set out in paragraphs 74, 75(a), 78, 89, 92 and 105 above.

- (b) alternatively, the Commonwealth would have acquired 3M AFFF but:
 - (i) used it in different or more limited ways, including:
 - (1) limiting it to emergency use only (such as in fire trucks for emergency responses only), and further or alternatively, using training foams or water to conduct training and equipment testing activities;
 - (2) further or alternatively, conducting less frequent training and equipment testing activities;
 - (3) further or alternatively, only using it for training and equipment testing activities in areas:
 - (A) which were lined so as to prevent discharge to groundwater and other areas;
 - (B) further or alternatively, where spent 3M AFFF could be prevented from entering storm water systems and other overland water bodies;
 - (C) further or alternatively, where spent 3M AFFF could otherwise be captured or contained, including in waste capture systems or tanks before being treated by waste management contractors;
 - (ii) further or alternatively, developed and implemented specific policy and directions with respect to the safe use, storage and disposal of 3M AFFF.

Particulars

That the Commonwealth would have taken the measures identified above is to be inferred from its conduct on and from about 2003, after 3M made the announcement referred to at

paragraph 69 above, and after the Commonwealth ceased purchasing and phased out the use of 3M AFFF, including:

- (a) its disposal of 3M AFFF, and the use of alternative products, including other AFFF products (with lower toxicity issues), water and training foams;
- (b) its implementation of various guidelines, which imposed various restrictions and other limitations upon the use or storage of AFFFs, including:
 - (i) updating the Defence Manual of Fire Protection Engineering in or about August 2003, and in particular Annex A to Chapter 15 relating to the storage, collection, containment, treatment and disposal of AFFF and AFFF wastewater (**DEF.1005.0007.0002**);
 - (ii) the draft Environmental Guidelines for procurement, use and disposal of AFFF products, 2 September 2005 (**DEF.3010.0286.6400**);
 - (iii) the Environmental Guidelines for Management of AFFF Products, June 2007 (**DEF.0002.0001.0007**);
 - (iv) the AFFF Procurement and Usage Interim Policy, August 2008 (**DEF.6035.0013.0208**);
- (c) its development, implementation and application of DEF (AUST) 5706 'Foam, Liquid Fire Extinguishing; 3% and 6% Concentrate, Specification' issued 1 August 2003 (**DEF.3004.0081.4724**);
- (d) other restrictions being placed on the use of fire training areas and equipment at the Bases; and
- (e) the upgrading of fire training and storage areas, to include linings, bunding, and other capture or containment systems or storage tanks.

211. Had the Commonwealth not acquired and used 3M AFFF:

- (a) the Base PFAS Contamination would not have occurred; and
- (b) the Commonwealth would not have incurred the costs and expenses associated with the Class Action Settlements and settlement of the Non-Class Action Claims as pleaded in paragraphs 156, 157, 159 and 160.

212. Further or alternatively, had the Commonwealth acquired 3M AFFF but used it in the manner and taken the steps pleaded at paragraphs 210(b) above:

- (a) the Base PFAS Contamination would not have occurred, or alternatively, the extent of the Base PFAS Contamination would have been substantially less than it is;

- (b) the Commonwealth would not have incurred the costs and expenses associated with the Class Action Settlements and settlement of the Non-Class Action Claims as pleaded in paragraphs 156, 157, 159 and 160; and
- (c) alternatively, the quantum of the costs and expenses that the Commonwealth would have incurred would have been substantially less than the quantum of the costs and expenses pleaded in paragraphs, 156, 157, 159 and 160 above.

213. In the premises of paragraphs 208 to 212 above, by reason of:

- (a) 3M's contraventions pleaded in paragraph 207(a) above;
- (b) further or alternatively, 3M Australia's contraventions pleaded in paragraph 207(b) above,

the Commonwealth has suffered loss and damage.

Particulars

The loss and damage suffered by the Commonwealth is:

- (a) the value of the costs and expenses pleaded in paragraphs, 156, 157, 159 and 160 above which would not have been incurred; and
- (b) alternatively, the difference between value of the costs and expenses pleaded in paragraphs 156, 157, 159 and 160 above and the substantially lesser costs and expenses pleaded in paragraph 212 above.

N. RELIEF

214. On the grounds stated in the statement of claim (**SOC**) (and using the same defined terms as in the SOC), the Commonwealth claims:

- (a) Damages;
- (b) A declaration that 3M and 3M Australia have committed and continue to commit nuisance against the Commonwealth in respect of pollution at, and migration from, each of the Bases;
- (c) Alternatively to (a), an order requiring 3M and 3M Australia to reimburse the Commonwealth for its reasonable efforts to abate the nuisance;
- (d) Further to (a) or (c), equitable damages for future losses arising from the Commonwealth's reasonable efforts to abate the continuing nuisance, including by:
 - (i) removing and safely disposing of the PFAS contamination of each of the Bases;
 - (ii) removing and safely disposing of the PFAS contamination affecting properties and waterways in the areas surrounding each of the Bases;
 - (iii) securing areas most at risk from the potential migration of PFAS contamination from the Bases;
- (e) Further or alternatively to (a), pursuant to section 39(3) of the EP Act, the sum of \$56,182,934.96;
- (f) Further to (e), a declaration that pursuant to section 39(3) of the EP Act, the Commonwealth is entitled to recover its reasonable future costs incurred in complying with the duty under section 39(1) in relation to the Victorian Bases;
- (g) Damages pursuant to:
 - (i) section 82 of the TPA in respect of the contraventions of the TPA; and
 - (ii) further or alternatively, section 236 of Schedule 2 of the CCA.
- (h) Exemplary damages;
- (i) Interest, including pursuant to statute;

- (j) Costs;
- (k) Such further or other relief as the Court considers just or necessary.

Fiona McLeod AO

Kate Burke

Lindy Barrett

Emily Golshtein

Counsel for the Applicant

O. GLOSSARY

Term	Paragraph defined in
A	
ACS	42
Albatross Base	12(b)
Amberley Base	12(l)
B	
Bandiana Base	12(s)
Bases	12
Base Contamination Sources	121
Base Groundwater Contamination	134(a)
Base PFAS Contamination	134(a)
Base PFAS Management Areas	146
Base Sewage Contamination	134(a)
Base Soil Contamination	134(a)
Base Surface Water Contamination	134(a)
Base Use Areas	111
Biodegradability Representations	192
Blamey Base	12(c)
C	
Cairns Base	12(m)
Category 1	138(a)
Category 1 Bases	169(a)
Category 2	138(b)
Category 2 Bases	169(b)
Category 3	139
Category 3 Bases	169(c)
CCA	2(b)
Cerberus Base	12(t)
Chemical Products Group	5(b), 6(b)
CH2M Report	142
Class Actions	152
Class Action Settlements	155
Corporate Responsibility Committee	5(a), 6(a)
D	
Darwin Base	12(i)
Defence Standard	91
DEF (AUST) 5603	93(a)
DEF (AUST) 5603B (Draft No 1)	93(b)
DEF (AUST) 5603B (Draft No 2)	93(c)
DEF (AUST) 5603C	93(d)
DEF (AUST) 5603D	93(e)
DEF (AUST) 5639	106
Disposal Representations	194
Duty to Manage Contamination	186
E	
East Sale Base	12(u)
Ecological Aspects of Fluorocarbons project	33(b)
Ecological Exposure	137

Term	Paragraph defined in
Edinburgh Base	12(r)
EHS&R	2(d)
Environmental Engineering and Pollution Control Department	5(c), 6(d)
Environmental Safety Representations	196
EP Act	185
Exceedance of ADWG and ARG Base	139
Expanding Base	138(b)
F	
Fate of Fluorochemicals	45(b)
FCA Act	152
FC Steering Committee	61(a)
FC Study Committee	57(a)
FC Tech Advisory Committee	61(b)
FC Tech Review Committee	46
FC Tox Committee	57(b)
FC-95	20(a)
FC-143	20(b)
FC-194	22(a)
FC-199	22(b)
FC-200	22(c)
FC-206	22(d)
FC-3034	22(e)
FC-3003	22(f)
FC-3002	22(g)
FM-3422	20(c)
Fluorochemicals Division	5(b), 6(c)
Fluorochemicals in Blood	45(a)
FSANZ	125
G	
Gingin Base	12(x)
H	
Haswell Class Action	152(d)
Holsworthy Base	12(d)
Holt Base	12(y)
Human and Animal Exposure	136
I	
International Operations Group	5(d), 6(e)
Investigations and Ongoing Monitoring Activities	133, 134(a)
J	
Jervis Bay Base	12(a)
K	
K-PFOS	23(d)
L	
Lavarack Base	12(n)
Learmonth Base	12(z)
M	
MILSPEC	77(b)
MSDS	10(a)(i)(1)
N	
No Risk Representation	198
NHMRC	122(e)

Term	Paragraph defined in
Non-Class Action Claims	158
O	
Oakey Base	12(o)
Oakey Class Action	152(b)
Organic Fluorine Compounds in Blood	45(a)
P	
PEDS	6(d)(iii)
Pearce Base	12(w)
PFAS	2(e)(ii)
PFAS NEMP	126
PFHxS	19(b)
PFOA	19(c)
PFOS	19(a)
Public Nuisance	168
R	
Remediation and Mitigation Activities	148
Richmond Base	12(e)
Robertson Base	12(j)
S	
Singleton Base	12(f)
Steady State Base	138(a)
Stirling Base	12(aa)
T	
Technical Councils	10(a)(ii)
Tindal Base	12(k)
Tindal Class Action	152(c)
Training and Operation Activities	110
Townsville Base	12(p)
Toxicity Representations	195
TPA	2(b)
TSCA	6
U	
US EPA	6(a)
US Navy	21
V	
Victorian Base Contamination	185
Victorian Base Contamination Costs	188
Victorian Contamination Measures	187
Victorian Bases	184
W	
Wagga Base	12(g)
Wide Bay Base	12(q)
Williams Base	12(v)
Williamtown Base	12(h)
Williamtown Class Action	152(a)
Wreck Bay Class Action	152(e)
Other characters	
2008 ARG	122(e)
2011 ADWG	122(f)
2015 Golder Report	144
2016 ADWG	124

Term	Paragraph defined in
2018 ADWG	127
2019 ARG	128
2025 ADWG	131
2026 Draft ARG	132
3M	2
3M AFFF	2(e)(i), 112
3M Announcement	70
3M Australia	3
3M Chemolite plant	32(b)
3M's fluorochemical products	2(e)(ii)
the 3M Representations	198

Table A**Notes:**

1. This table is referred to in the Statement of Claim (**SOC**) at particulars to 2(d), 5(b), 7(d), 8, 33(b), 35(a), 36(b), 45(b), 46, 49(e), 50(e), 52, 57, 58, 59, 61, 62, 63, 64, 67, 68, 72.
2. **Table A, Part I** of this table sets out the Commonwealth's present understanding of the various 3M directors and senior employees, including their job title (if capable of identification) or the nature of their roles as well as the period of their involvement, who worked or were otherwise involved in, the operations of each of the Fluorochemicals Division, the Chemical Products Group, the Environmental Engineering and Pollution Control Department, and the International Operations Group: SOC 5 . Further particulars may be provided after discovery.
3. **Table A, Part II** of this table sets out the Commonwealth's present understanding of the various 3M directors and senior employees who were involved in various committees and projects as defined in the SOC, being:
 - (a) the Ecological Aspects of Fluorocarbons Project (SOC 33(b));
 - (b) the Fluorochemicals in Blood Investigation (SOC 45(a), 47);
 - (c) the Fate of Fluorochemicals Project (SOC 45(b), 48-49);
 - (d) the FC Tech Review Committee (SOC 46);
 - (e) the Corporate Responsibility Committee (SOC 5(a), 6(a) and 50);
 - (f) the FC Study Committee (SOC 57(a));

- (g) the FC Tox Committee (SOC 57(b));
- (h) the FC Steering Committee (SOC 61(a));
- (i) the FC Tech Advisory Committee (SOC 61(b));
- (j) the EHS&R Working Group (SOC 64(a));
- (k) the Exposure Assessment Team (SOC 64(b));
- (l) the FC Core Team (SOC 64(c));
- (m) the FC Exposure Team (SOC 64((d); and
- (n) the FC Working Group (SOC 64(e)).

For the avoidance of doubt, each of the people in **Table A, Part II** of this table also appear in **Table A, Part I**. Further particulars may be provided after discovery.

4. **Table A, Part III** of this table sets out the Commonwealth's present understanding of the directors of 3M Australia and their roles as directors or officeholders of 3M or of its associated international subsidiaries, at the times specified in the table: SOC 8. For the avoidance of doubt, some of the people in **Table A, Part III** also appear in **Table A, Part I** (if a director of 3M Australia is also a director or a senior employee of 3M). Further particulars may be provided after discovery.
5. **Table A, Part IV** of this table sets out the Commonwealth's present understanding of the composition of the directors of 3M Australia, including those directors who were directors or senior employees of 3M, or of its associated international subsidiaries, at the times specified in the table. Further particulars may be provided after discovery.

6. **Table A, Part V** of this table sets out a chronological list of the 3M Annual Reports for the period 1951 to 2005.

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Table A, Part I: 3M directors and senior employees

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
Adams, G L	From at least 1987 to at least 1999		Corporate Product Responsibility (at least 2000)	Member, EHS&R Working Group (from 1998) Member, Exposure Assessment Team (from about 1998) Member, FC Working Group (from about 1998)	Recipient, Letter to Harry Torabi of US Army Corps of Engineers, 'Disposal of Light Water Brand AFFF Agents' dated 4 February 1987 (USA.1000.0001.1506) Recipient, internal correspondence regarding risk to the environment due to the presence of PFOS dated 12 March 1998 (USA.1000.0001.0596) Recipient, internal correspondence regarding Rich Purdy's resignation dated 28 March 1999 (USA.1000.0001.0612) Attendee, EHS&R Working Group on 10 August 1999, and recipient of Minutes dated 31 August 1999 (USA.0001.0001.3416)
Adams, R M	1949-1986	Director, Board of Directors (1970-1986)	Chemist, Central Research (Polymer Section) (from about 1949 to about 1953) Sales Representative (from about 1953) Eastern Region Sales Representative, Fluorochemical Products (from about 1954)	Executive Committee (1973-1984) Corporate Responsibility Committee (1975-1985)	Requestor, report on various ecological aspects of fluorocarbons, including their ultimate disposal fate (USA.1000.0001.0053; USA.1000.0001.0051) Recipient, interoffice memorandum titled 'Ecological Aspects of Fluorocarbons' dated 13 September 1971 (USA.1000.0001.0053) Author, interoffice correspondence in relation to 'Ecological Aspects of Fluorocarbons' dated 13 September 1971 (USA.1000.0001.0053)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Sales Manager, Fluorochemicals Division (from about 1956 to about 1958)		Attendee, Corporate Responsibility Committee presentations in February 1977 and November 1977 (USA.0001.0001.0695)
			Technical Director, Fluorochemicals Division (from 1958)		Attendee, Meeting on 12 July 1978 in relation to fluorochemicals in blood, as referred to in interoffice correspondence, dated 26 May 1978 (USA.1000.0002.5149)
			Technical Director, Chemical Division (1962-1966)		Recipient, interoffice correspondence in relation a meeting on 28 July 1978 regarding fluorochemicals in blood dated 7 August 1978 (USA.1000.0002.5212)
			Technical Director, International Division (1966-1968)		Attendee, Meeting of Directors where Dr R Adams of the Corporate Responsibility Committee reported on the results of further fluorochemical studies dated 12 May 1981, (HOL.0001.0007.8120)
			General Manager, New Business Ventures Division (1968 to about 1969)		
			Vice President Research and Development (1969-1981)		Recipient, internal correspondence regarding a telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239)
			Senior Vice President, Technology Services (1981-1985)		
Ahlness, R L	At least 1978		Specialty Chemicals (at least 1984)	Presenter, FC Tech Review Committee (1978)	Recipient, interoffice memorandum from Dr J T Ling (Environmental Engineering and Pollution Control, 3M) to various 3M personnel regarding Chemolite monthly water report with central

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					analytical laboratory report No 3873, dated 3 November 1960 (USA.1000.0003.3605) Attendee, Fluorochemicals Technical Review Committee Meeting on 4 May 1978 (USA.1000.0002.5219) Recipient, Minutes of Meeting of Fluorochemicals Technical Review Committee Meeting dated 10 May 1978 (USA.1000.0002.5219) Recipient, internal correspondence regarding Organic Fluorine Levels dated 31 August 1984 (USA.1000.0003.4531)
Allison, J	At least 1998 to at least 2005		Legal counsel (at least 2000)	Member, EHS&R Working Group (from about 1998) Member, FC Core Team (from about 1998) Member, FC Working Group (from about 1998) Member, Environmental Strategy Team (from about 2005)	
Bacon, D L	At least 1973 to at least 2004		Environmental Laboratory, Environmental Engineering and Pollution Control	Fate of the Fluorochemicals Project member (from about 1978 to about 1983)	Requestor and recipient, biodegradation and toxicity testing of at least FC-95, and 3M AFFF being FC-200, FC-203 and FC-206: see results in variously dated laboratory worksheets (HOL.0001.0002.0971) (HOL.0001.0004.1164) (HOL.0001.0006.3350)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
				Member, FC Steering Committee (from about 1992)	Requestor and recipient, biodegradation and toxicity testing of 3M AFFF including at least FC-206, see results in laboratory worksheets (HOL.0001.0002.8886; HOL.0001.0018.6748)
				Member, EHS&R Working Group (from 1998)	Requestor, dehydrogenase activity testing for PFOS dated 29 January 1974 (HOL.0001.0002.0971)
				Member, Exposure Assessment Team (from about 1998)	Requestor, acute toxicity to fish (fathead minnow) testing for PFOS dated 15 February 1974 (HOL.0001.0004.1164)
				Member, FC Core Team (from about 1998)	Recipient, internal memorandum titled ‘Aquatic Fate of A Fluorochemical: FM 3422’ dated 14 October 1977 (USA.1000.0001.0096)
				Member, FC Working Group (from about 1998)	Recipient, 3M internal memorandum titled ‘Biodegradation Studies of Fluorocarbons – II’ dated 9 January 1978 (USA.1000.0001.0113)
					Recipient, Minutes from Fate of Fluorochemical Project Informational Meeting on 24 February 1978, dated 28 February 1978 (USA.1000.0007.0282)
					Recipient, 3M internal memorandum titled ‘Biodegradation Studies of Fluorocarbons – III’ dated 19 July 1978 (USA.1000.0001.0139)
					Recipient, Technical Report Summary titled ‘Fate of Fluorochemical Project – Aquatic Toxicity Studies: FM 3925’ dated 8 January 1979 (HOL.0001.0001.2857 at .2865)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, internal memorandum titled 'Final Comprehensive Report on FM 3422' dated 7 February 1979 (USA.1000.0001.0156)
					Recipient, internal memorandum titled 'Final Comprehensive Report: FC 95' dated 15 March 1979 (USA.1000.0001.0169)
					Recipient, internal memorandum titled 'Final Comprehensive Report: FC 143' dated 23 March 1979 (USA.1000.0001.0181)
					Recipient, internal memorandum titled 'Bioaccumulation of fluorochemicals in Tenn. River Fish' dated 22 May 1979 (USA.1000.0001.0194)
					Recipient, Technical Report Summary titled 'Bioaccumulation of Fluorochemicals in Tenn. River Fish' relating to 78-2740 dated 22 May 1979 (HOL.0001.0001.0370 at .0378)
					Recipient, Technical Report Summary titled 'Photolysis of FM 3422 on Soil' relating to Fate of Fluorochemicals dated 10 December 1979 (HOL.0001.0010.1955)
					Recipient, Technical Report Summary titled 'Fluorochemicals in Tennessee River Fish' relating to 78-2740, dated 28 December 1979 (HOL.0001.0001.0370 at .0375)
					Recipient, Technical Report Summary 'Detection of Fluorochemicals in Decatur Wastewater', obtained as part of the Fate of Fluorochemicals

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Project, dated 23 June 1980 (USA.1000.0003.4224)
					Recipient, internal correspondence regarding FC-203, FC-206 and FC-3017 dated 6 August 1980 (HOL.0001.0018.4870)
					Recipient, Technical Report Summary 'Multi-Phase Exposure/Recovery Algal Assay Test Method' dated 16 November 1981 (HOL.0001.0008.3091 at .3094)
					Recipient, Letter to William Runyon of Andrews Airforce Base from E Reiner 'Disposal of Mil-spec AFFF Waste' dated 9 December 1981 (USA.1000.0001.1503)
					Recipient, Technical Report Summary 'Multi-Phase Exposure/Recovery Algal Assay Test Method' dated 16 December 1981 (HOL.0001.0005.3086 at .3088).
					Recipient, Technical Report Summary 'Multi-Phase Algal Assay Test Method' dated 30 December 1981 (HOL.0001.0015.0993 at .0996)
					Recipient, internal correspondence titled 'Mil-Spec AFFF BOD and COD testing' attaching summary of BOD, Carbanaceous BOD and COD data on MIL-SPEC AFFF product (FC-203C) results obtained from external laboratories including Pace, Serco, Capsule, and Galbraith dated 25 May 1982 (HOL.0001.0024.5772)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, internal memorandum titled 'Biodegradation tests' dated 21 April 1983 (HOL.0001.0035.5369)
					Recipient, internal correspondence regarding Fate of Fluorochemicals – Phase II dated 25 May 1983 (USA.1000.0001.0356)
					Recipient, internal correspondence regarding FC-129 Biodegradability dated 30 December 1988 (USA.0001.0018.0260)
					Recipient, internal correspondence regarding need for further studies and testing dated 5 February 1992 (USA.1000.0001.0437) also enclosing copy of internal memo 'Fate of Fluorochemicals Phase II' dated 25 May 1983 and 'Fate of Fluorochemicals - Phase II' (1983).
					Recipient, 3M internal correspondence regarding Fluorochemicals in the Environment dated 5 February 1992 (HOL.0001.0015.2327)
					Attendee, Fluorochemicals Steering Committee Meeting on 21 July 1992, and recipient of Minutes dated 22 July 1992 (USA.0001.0002.8728)
					Recipient, internal correspondence regarding Rich Purdy's resignation dated 28 March 1999 (USA.1000.0001.0612)
					Attendee, meeting of the FC Core Issues Team on 14 May 1999, and recipient of Minutes dated 20 May 1999 ((USA.0001.0001.3343))

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Attendee, EHS&R Working Group on 10 August 1999, and recipient of Minutes dated 31 August 1999 (USA.0001.0001.3416)
Bandal, S K	At least 1978		Unknown		Reviewer of scientific aspects of 'Fate of Fluorochemicals – Phase II' (1983) (USA.1000.0001.0241) proposal, (HOL.0001.0009.5040)
Baratto, J	About 1963 to about 2005		Chemical Engineer (1963) Executive, Research & Development, Corporate Technology (2002-2004)	Member, FC Working Group (from about 1998)	
Beach, S	At least 1998		Unknown	Member, Exposure Assessment Team (from about 1998)	
Belisle, J	At least 1976 to at least 1980		Central Research Laboratories (from about 1980)	Fate of the Fluorochemicals Project member (from about 1978 to about 1979)	Author, interoffice correspondence in relation to the determination and characterisation of trace fluorochemicals dated 26 August 1976 (USA.1000.0003.3862) Author, internal correspondence regarding 'Fluorochemicals in Blood' dated 9 August 1977 (USA.0001.0018.0080) Author, interoffice correspondence in relation to fluorochemicals in blood dated 3 November 1977 (USA.1000.0003.3908)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, Minutes from Fate of Fluorochemical Project Informational Meeting on 24 February 1978, dated 28 February 1978 (USA.1000.0007.0282) Recipient, internal laboratory memorandum regarding “IRDC 137-092: FC-95/Monkey” dated 3 August 1978 (HOL.0001.0024.8955). Author, internal laboratory memorandum titled “IRDC 137-092: FC095/Monkey” dated 4 August 1978 (USA.1000.0003.4025) Author, 3M internal memorandum titled “IRDC 137-088: FM-3422/Monkey” dated 16 August 1978 (HOL.0001.0006.1401) Author, ‘A Method for the Determination of Perfluorooctanoic Acid In Blood and Other Biological Samples’ dated 1978 (USA.0001.0018.0260)
Boardman, T	At least 1973 to 2010		Lawyer Office of General Counsel (from at least 200-2005) Assistant Secretary (2005)	Member, FC Working Group (from about 1998)	
Bohon, R L	At least 1976 to at least 1983		Manager, Environmental Laboratory (at least 1976) Environmental Laboratory,	Fate of the Fluorochemicals Project member (from about 1978 to about 1983)	Author, Letter to Craig Alig (Naval Ships), ‘FC-206’ dated 25 June 1976 (DOD.0001.0001.6510 at .6639-.6641) Recipient, Minutes from Fate of Fluorochemical Project Informational Meeting on 24 February

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Environmental Engineering and Pollution Control (at least 1983)	Member, FC Study Committee (from about 1983)	1978, dated 28 February 1978 (USA.1000.0007.0282) Recipient, Technical Report Summary 'Fate of Fluorochemical Project – Aquatic Toxicity Studies: FM 3925' dated 8 January 1979 (HOL.0001.0001.2857 at .2865) Recipient, Technical Report Summary 'Final Comprehensive Report on FM 3422' dated 7 February 1979 (USA.1000.0001.0156) Recipient, Technical Report Summary 'Final Comprehensive Report: FC 95' dated 15 March 1979 (USA.1000.0001.0169) Recipient, Technical Report Summary 'Final Comprehensive Report: FC 143' dated 23 March 1979 (USA.1000.0001.0181) Recipient, internal correspondence 'Effect of Biodegradation on Foaming of "Light Water" products' dated 6 August 1980, regarding FC-203, FC-206 and FC-3017 (HOL.0001.0018.4870) Recipient, Technical Report Summary 'Multi-Phase Exposure/Recovery Algal Assay Test Method' dated 16 December 1981 (HOL.0001.0008.3091 at .3094) Recipient, Technical Report Summary 'Multi-Phase Algal Assay Test Method' dated 30 December 1981 (HOL.0001.0015.0993 at .0996) Recipient, internal correspondence 'Mil-Spec AFFF BOD and COD testing' dated 25 May 1982, attaching summary of BOD, Carbanaceous

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					BOD and COD data on MIL-SPEC AFFF product (FC-203C) results obtained from external laboratories including Pace, Serco, Capsule, and Galbraith (HOL.0001.0024.5772) Attendee, meeting on 16 March 1983 of Fluorochemical Study Committee and recipient of Minutes dated 8 April 1983 (USA.0001.0001.1343) Recipient, internal memorandum titled 'Biodegradation tests' dated 21 April 1983 (HOL.0001.0035.5369) Recipient, internal correspondence regarding 'Fate of Fluorochemicals – Phase II' dated 25 May 1983(USA.1000.0001.0356) Author, internal correspondence regarding 'Fate of Fluorochemicals – Phase II' dated 25 May 1983 (USA.1000.0001.0356) Recipient, Technical Report Summary 'Repeat OECD Biodegradation Tests on FC-600 and FC-203' dated 16 June 1983 (USA.0001.0018.0402) Attendee, meeting held on 16 August 1983, in relation to the fate of fluorochemicals (USA.1000.0001.0375) Recipient, internal memorandum 'Modified OECD Screening Test on FC-203, FC-203A, and FC-600' dated 9 July 1984 (HOL.0001.0020.1010)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
Boyd, J	At least 1975 to at least 2001		Scotchgard Division (at least 1975) Business Director, Protective Materials Division (at least 1993)	Member, FC Steering Committee (from about 1992) Member, FC Working Group (from about 1998)	
Burris, J M	At least 1998 to at least 1999		Medical Department (at least 1998)		Author, 'An epidemiologic investigation of reproductive hormones in men with occupational exposure to perfluorooctanoic acid' (1998), <i>Journal of Occupational Environmental Medicine</i> , 40, 7 pp 614-622 (HOL.0001.0058.2923) Requestor, Laboratory Report 'Analysis of FCs in Samples of Children's Sera' dated 21 May 1999 (HOL.0001.0013.7381) Principal Investigator, 'Determination of Serum Fluorochemical Levels in Sumitomo 3M Employees' dated 3 September 1999 (HOL.0001.0027.8433)
Burton, C	At least 1992 to at least 1998		Fluorochemical Process and Technology Centre	Member, FC Tech Advisory Committee (from about 1992) Member, FC Steering Committee (from about 1992) Member, EHS&R Working Group (from about 1998)	Attendee, EHS&R Working Group on 10 August 1999, and recipient of Minutes dated 31 August 1999 (USA.0001.0001.3416)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
				Member, Exposure Assessment Team (from about 1998)	
Bryce, H G	1949- 1982		Catalytic Section, Central Research Department (1949) Head of New Products Laboratory (approximately 1952) In charge of Product Development and Applications Laboratory, Fluorochemicals Division (prior to 1959) Development Manager, Fluorochemicals Division (approximately 1959) Assistant Technical Director, Chemical Division (Commercial Chemicals) (from 1962) Technical Director, Chemical Division (approximately 1966 to 1973) Chairman, 3M Technical Council Executive Director/Vice President/Staff Vice	Ecological Aspects of Fluorocarbons Project (approximately 1971)	Author, 3M response Letter published in National Fire Protection Association's <i>Fire Journal</i> (1970) (HOL.0001.0056.0148) Recipient, 3M interoffice correspondence in relation to Ecological Aspects of Fluorocarbons dated 31 August 1971 (USA.1000.0001.0051) Recipient, 3M interoffice correspondence in relation to Ecological Aspects of Fluorocarbons dated 13 September 1971 (USA.1000.0001.0053)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			President, Central Research Laboratory (from about 1973 to about 1982)		
Butenhoff, J	At least 1998 to at least 2004		Toxicologist (from about 2004) Toxicology Services	Member, EHS&R Working Group (from 1998) Member, Exposure Assessment Team (from about 1998) Member, FC Working Group (from about 1998) Member, FC Steering Committee	Attendee, Fluorochemicals Steering Committee Meeting on 21 July 1992, and recipient of Minutes dated 22 July 1992 (USA.0001.0002.8728) Recipient, internal correspondence regarding Rich Purdy's resignation dated 28 March 1999 (USA.1000.0001.0612) Author, 3M internal document titled 'PFOS Environmental Risk: Potential TSCA 8(e) Substantial Risk' dated April 1999 (USA.1000.0001.0618)
Case, M	At least 1978 to at least 1998		Manager, Pathology-Toxicology Safety Evaluation Laboratory (1980) Riker Safety Evaluation (1983)	Member, FC Tech Review Committee (from about 1978) Member, FC Study Committee (from about the early 1980s) Member, Exposure Assessment Team (from about 1998) Member, FC Working Group (from about 1998)	Attendee, meeting regarding review of animal studies on 28 April 1978, as referred to in Minutes dated 17 May 1978 (USA.1000.0003.3970) Referred to in correspondence to Dr Harold Hodge of the School of Medicine at the University of California in relation to fluorochemical toxicity studies and meeting on 12 April 1979, dated 12 February 1979 (USA.1000.0002.5153) Attendee, meeting on 12 April 1979, in relation to Fluorochemicals in Blood Program as referred to in interoffice correspondence dated 26 April 1979 (USA.0001.0001.1000) and 7 June 1979 (USA.1000.0002.2809)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Attendee, meeting on 13 April 1979, to review Fluorochemicals in Blood Program and to discuss future plans (USA.1000.0001.1308) and recipient of Minutes dated 26 April 1979 (USA.1000.0001.1320) and 7 June 1979 (USA.0001.0001.1022) Recipient, Report titled ‘Absorption of FC-143-14C in Rats after a Single Oral Dose’ dated 28 December 1979 (HOL.0001.0002.5517) Recipient, Report titled ‘Extent and Route of Excretion and Tissue Distribution of Total Carbon-14 in Rats after a Single Intravenous Dose of FC-95-14-C’ dated 28 December 1979 (HOL.0001.0012.7859) Reviewer of scientific aspects of ‘Fate of Fluorochemicals – Phase II’ (1983) (USA.1000.0001.0241) proposal, (HOL.0001.0009.5040). Attendee, meeting on 16 March 1983 of Fluorochemical Study Committee and recipient of Minutes dated 8 April 1983 (USA.0001.0001.1343) Alternative Study Monitor of Report titled ‘26-Week Capsule Toxicity Studies With PFOS In Cynomolgus Monkeys’ dated August 1988 (USA.1000.0002.4489) Author, 3M internal document titled “PFOS Environmental Risk: Potential TSCA 8(e)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Substantial Risk' dated April 1999 (USA.1000.0001.0618)
					Study Monitor, PFOS Oral Rat Toxicology Screen tests April and June 1999 (USA.0001.0018.0302)
					Attendee, EHS&R Working Group on 10 August 1999, and recipient of Minutes dated 31 August 1999 (USA.0001.0001.3416)
					Study Monitor, PFOS Oral Rat Toxicology Screen dated October 1999 (USA.0001.0018.0302)
Chow, CS			Environmental Engineering and Pollution control (1992)		Recipient, internal correspondence regarding need for further studies and testing dated 5 February 1992 (USA.1000.0001.0437) also enclosing copy of internal memo 'Fate of Fluorochemicals Phase II' dated 25 May 1983 and 'Fate of Fluorochemicals - Phase II' (1983). Recipient, 3M internal correspondence regarding Fluorochemicals in the Environment dated 5 February 1992 (HOL.0001.0015.2327)
Cove, L	At least 1992		Unknown	Member, FC Tech Advisory Committee (from about 1992)	
Cowman, C	Unknown		Speciality Chemicals Division	Member, FC Tech Advisory Committee	
Davis, R	At least 1978 to at least 1983		Office of General Counsel (1983)	Fate of the Fluorochemicals Project member (from about 1978)	Recipient, Minutes from Fate of Fluorochemical Project Informational Meeting on 24 February 1978, dated 28 February 1978 (USA.1000.0007.0282)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
				Member, FC Tox Committee (from about 1981)	Recipient, Minutes of Meeting from Fluorochemicals Technical Review Committee (interoffice correspondence) dated 12 April 1978 (USA.1000.0001.0135)
				Member, FC Study Committee (from about 1983)	Recipient, Minutes of Meeting regarding review of animal studies on 28 April 1978, dated 17 May 1978 (USA.1000.0003.3970)
					Attendee, meeting on 8 May 1978 in relation to results of Animal Studies at I.R.D.C as referred to in internal correspondence dated 10 May 1978 (HOL.0001.0009.3860)
					Recipient, Minutes of Meeting of Fluorochemicals Technical Review Committee Meeting dated 10 May 1978 (USA.1000.0002.5219)
					Attendee, meeting on 5 June 1978, as referred to in interoffice correspondence dated 1 June 1978 (USA.1000.0002.5151)
					Attendee, meeting on 22 May 1978 in relation to fluorochemicals in blood as referred to in interoffice correspondence dated 8 June 1978 (USA.0001.0001.0837)
					Recipient, interoffice correspondence in relation a meeting on 28 July 1978 regarding fluorochemicals in blood dated 7 August 1978 (USA.1000.0002.5212)
					Recipient, internal correspondence attaching phone conversation report of telephone call

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					between R Prokop and Eugene Berman Dupont on 26 July 1979 (USA.1000.0001.0204) Recipient, internal correspondence re telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239) Attendee, meeting on 16 March 1983 of Fluorochemical Study Committee and recipient of Minutes dated 8 April 1983 (USA.0001.0001.1343)
Desimone, L D	1957-2001	Director (1986-2001) Chairman of the Board and Chief Executive Officer (1991–2001)	Chemical Engineer, 3M Canada (1957-1961) Technical position, 3M Australia (unknown dates, likely sometime between about 1961-1965) General Manager, 3M Brazil (1965 to approximately 1968) Managing Director, 3M Brazil (1971-1975) Vice President, 3M Latin America (1975-1979) Group Vice President, Abrasives, Adhesives,		Attendee, meeting regarding disclosure of fluorochemicals in blood dated 27 May 1980 (USA.1000.0001.1326) Recipient, internal correspondence attaching phone conversation report of telephone call between R Prokop and Eugene Berman Dupont on 26 July 1979 (USA.1000.0001.0204) Recipient, Chuck Kiester's Board Presentation, May 2000 (USA.1000.0001.0640) Attendee, Board of Directors meeting regarding update on initiatives to date regarding fluorochemicals business dated 9 May 2000 (USA.0001.0018.0303) Maker of certain statements contained in 3M announcement dated 16 May 2000 (DEF.0003.0001.6617)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Building Service and Chemicals (1979-1981) Executive Vice President, Life Sciences (1981-1984) Executive Vice President, Industrial and Consumer Sector (1984-1989) Vice President, Information and Imaging Technologies Sector and Corporate Services (1989-1991)		
Dick, L	At least 1998		Unknown	Member, Exposure Assessment Team (from about 1998)	
Dietz, C	At least 1979 to 1991		Vice President, Legal Affairs General Counsel	Corporate Responsibility Committee (1979-1981, 1985-1991)	Attendee, Corporate Responsibility Committee presentations in February 1977 and November 1977 (USA.0001.0001.0695) Attendee, Meeting of Directors, where Dr R Adams of the Corporate Responsibility Committee reported on the results of further fluorochemical studies dated 12 May 1981 (HOL.0001.0007.8120)
DiPasquale, T	At least 1992 to at least 2005		Legal Counsel	Member, FC Steering Committee (from about 1992)	Attendee, Meeting of the FC Core Issues Team on 14 May 1999, and recipient of Minutes dated 20 May 1999 (USA.0001.0001.3343)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
				Member, FC Working Group (from about 1998) Member, FC Core Team (from about 1998) Member, Environmental Strategy Team (from about 2005)	Attendee, EHS&R Working Group on 10 August 1999, and recipient of Minutes dated 31 August 1999 (USA.0001.0001.3416)
Dougherty, M	At least 1998		Unknown	Member, Exposure Assessment Team (from about 1998) Member, FC Core Team (from about 1998) Member, FC Working Group (from about 1998)	Attendee, Meeting of the FC Core Issues Team on 14 May 1999, and recipient of Minutes dated 20 May 1999 (USA.0001.0001.3343)
Dworak, D	At least 1998		Chemical Fluoro Manufacturing – Chemolite Centre (1984)	Member, FC Working Group (from about 1998)	Recipient, internal correspondence Organic Fluorine Levels dated 31 August 1984 (USA.1000.0003.4531) Recipient, email from M Santoro, ‘Cottage Grove Wells’ which refers to levels of PFOS and PFOA exceeding drinking water health advisory levels at Well No 5 at Cottage Grove, and that about 80% of the plant had been using bottled water for drinking since the mid-1980s, dated 3 July 2001 (USA.0001.0001.3798)
Elnabarawy, M T	At least 1977		Environmental Engineering and		Author, Technical Report Summary ‘Bioconcentration of FM 3422 in Bluegill Sunfish

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Pollution Control Department (1977)		and In Channel Catfish' dated 17 May 1977 (USA.1000.0001.0096) Recipient, Technical Report Summary 'Fate of Fluorochemical Project – Aquatic Toxicity Studies: FM 3925' dated 8 January 1979 (HOL.0001.0001.2857 at .2865) Author, Technical Report Summary 'Aquatic Toxicity Testing: FC-143 (Lot-37) L.R 5625' dated 8 May 1980 (HOL.0001.0005.2530 at .2532) Recipient, Dynamic Bioassay Report #26241, 'Dynamic 96-Hour Acute Toxicity of 3M Sample 1-3 to Fathead Minnows (Pimephales promelas)' dated 29 September 1980 (HOL.0001.0005.0840 at .0843) Author, Technical Report Summary, 'Aquatic Toxicity Testing: CS-2151, Lot 3 (LR 62608) dated 19 November 1980 (HOL.0001.0030.6698) Author, 'Daphnid Bioassay: CS-2151, Lot 3 (LR-64578)' dated 5 February 1981 (HOL.0001.0015.5042) Author, Technical Report Summary, 'Algal Assay: Bottle Test (AA:BT), Toxicity Testing FC-206C' dated 12 June 1981 (HOL.0001.0036.8586 at .8589) Author, Technical Report Summary, 'Algal Assay: Bottle Test (AA:BT), Toxicity Testing FC-206C dated 23 June 1981 (HOL.0001.0022.8805)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Author, Technical Report Summary 'Multi-Phase Exposure/Recovery Algal Assay Test Method' dated 16 November 1981 (HOL.0001.0008.3091 at .3094)
					Author, Technical Report Summary, 'Algal Assay: Bottle Test (AA:BT), Toxicity Testing FC-203C' dated 6 December 1981 (HOL.0001.0022.7021)
					Recipient, Technical Report Summary 'Multi-Phase Exposure/Recovery Algal Assay Test Method' dated 16 December 1981 (HOL.0001.0008.3091 at .3094).
					Author, Technical Report Summary 'Multi-Phase Algal Assay Test Method' dated 30 December 1981 (HOL.0001.0015.0993 at .0996)
					Recipient, Flow-Through Acute Toxicity Report #30175, 'Dynamic Acute Toxicity of 3M-I to Fathead Minnows (<i>Pimephales promelas</i>)' dated 29 March 1983 (HOL.0001.0023.0799)
					Author, Technical Report Summary 'Aquatic Toxicity Testing: FC-600 (Belgium-AFFF) LR 9595 dated 21 July 1983 (HOL.0001.0018.9951 at .9954)
					Recipient, internal memorandum, 'Oakdale Incinerator Ash Oil and Grease extracts' dated 27 June 1984 (HOL.0001.0017.4674)
					Recipient, 'Acute Toxicity of E2566-2 to <i>Daphnia magna</i> ' dated 15 January 1988 (HOL.0001.0012.4715 at .4717)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, 'Acute Toxicity of E2566-1 to Fathead Minnow (<i>Pimephales promelas</i>)' dated 15 January 1988 (HOL.0001.0003.2650 at .2653). Recipient, internal correspondence, 'Results of Salmon Fry Bioassay on FC-2038' dated 28 December 1988 (HOL.0001.0021.8257 at .8260) Author, internal correspondence 'Screening-Level Risk Assessment for Organofluorine Substances in Philippines Well Water' dated 25 July 2000 (USA.1000.0003.6255)
Falco, M	At least 1992 to at least 1998		Senior Environmental Engineer (at least 1992) Director, Environmental Issues Management (at least 1999)	Member, FC Core Team (from about 1998)	Recipient, email 'FC's and Past Disposal Sites' dated 1 September 1998 (USA.0001.0001.3217) Attendee, Meeting of the FC Core Issues Team on 14 May 1999, and recipient of Minutes dated 20 May 1999 (USA.0001.0001.3343).
Favorite, J	At least from 1978		Lawyer	Fate of the Fluorochemicals Project member (from about 1978)	Recipient, Minutes of Fate of Fluorochemical Project Informational Meeting on 24 February 1978, dated 28 February 1978 (USA.1000.0007.0282)
Fenner, M	At least 1998		Unknown	Member, FC Working Group (from about 1998)	
Fischer, D A	At least from 1978		Unknown	Fate of the Fluorochemicals Project member (from about 1978)	Recipient, Minutes of Fate of Fluorochemical Project Informational Meeting on 24 February 1978, dated 28 February 1978 (USA.1000.0007.0282)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Attendee, meeting on 22 May 1978 in relation to fluorochemicals in blood as referred to in interoffice correspondence dated 8 June 1978 (USA.0001.0001.0837) Recipient, internal correspondence 1981 regarding a telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September (USA.1000.0001.0239)
Fong, D	At least 1984		Unknown		Recipient, internal correspondence 'Organic Fluorine Levels' regarding fluorine measurements in worker's blood dated 31 August 1984 (USA.1000.0003.4531)
Freier, H E	At least 1960		Central Research Laboratories	Presenter, FC Tech Review Committee (1978)	Recipient, Central Analytical Laboratory Report on Water Analysis, Chemolite Plant dated 3 November 1960 (USA.1000.0003.3605) Recipient, Central Analytical Laboratory Report on Water Analysis, Chemolite Plant dated 6 December 1960 (USA.1000.0003.3605) Attendee, meeting with Guy and Taves at University of Rochester on 16 December 1975 (USA.0001.0001.0695) Caller, conversations with Taves on 13 May 1976 and 20 October 1976 (USA.1000.0001.1296) Recipient, interoffice correspondence in relation to the determination and characterisation of trace fluorochemicals dated 26 August 1976 (USA.1000.0003.3862)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, internal correspondence 'Fluorochemicals in Blood' dated 9 August 1977 (USA.0001.0018.0080) Recipient, interoffice correspondence in relation to fluorochemicals in blood dated 3 November 1977 (USA.1000.0003.3908) Attendee, Fluorochemicals Technical Review Committee Meeting on 4 May 1978 (USA.1000.0002.5219) Recipient, Minutes of Fluorochemicals Technical Review Committee Meeting dated 10 May 1978 (USA.1000.0002.5219). Recipient, Report titled 'Absorption of FC-143-14C in Rats after a Single Oral Dose' dated 28 December 1979 (HOL.0001.0002.5517) Recipient, report titled 'Extent and Route of Excretion and Tissue Distribution of Total Carbon-14 in Rats after a Single Intravenous Dose of FC-95-14-C' dated 28 December 1979 (HOL.0001.0012.7859)
Gagnon, J E	At least from 1979 to at least 2001		Environmental Engineering and Pollution Control Department (at least 1979 to at least 1980)		Author, Technical Report Summary titled 'Bioaccumulation of Fluorochemicals in Tennessee River Fish' relating to FM-3422, dated 22 May 1979 (USA.1000.0001.0194) Author, Technical Report Summary titled Bioaccumulation of Fluorochemicals in Tenn. River Fish relating to 78-2740 dated 22 May 1979 (HOL.0001.0001.0370 at .0378)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient and Requestor, Technical Report Summary titled 'AR No. 7238 – Determination of Fluorinated Alcohols in Fish Extracts' relating to A000007 dated 23 October 1979 (HOL.0001.0001.0370 at .0388) Author, Technical Report Summary titled 'Photolysis of FM 3422 on Soil' relating to Fate of Fluorochemicals dated 10 December 1979 (HOL.0001.0010.1955) Author, Technical Report Summary titled 'Fluorochemicals in Tennessee River Fish' relating to 78-2740, dated 28 December 1979 (HOL.0001.0001.0370 at .0375) Author, internal memorandum, 'Oakdale Incinerator Ash Oil and Grease extracts' dated 27 June 1984 (HOL.0001.0017.4674)
Gahlon, D	At least 1998		Executive, Public Relations and Corporate Communications (2001-2005)	Member, FC Core Team (from about 1998)	
Garry, D	At least 1998		Unknown	Member, Exposure Assessment Team (from about 1998) Member, FC Working Group (from about 1998)	

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
Gordon, S	At least 1992		Toxicology Services	Member, FC Tech Advisory Committee (from about 1992)	
Green, C	At least from 1978		Unknown	Fate of the Fluorochemicals Project member (from about 1978)	Recipient, Minutes of Fate of Fluorochemical Project Informational Meeting on 24 February 1978, dated 28 February 1978 (USA.1000.0007.0282)
Gregory, J	At least 1998		Executive, Dyneon, Specialty Materials Market (2001)	Member, FC Working Group (from about 1998)	
Griffith, F	At least 1978 to at least 1988		Toxicology Services (1979 to about 1988)	Member, FC Tech Review Committee (from about 1978) Member, FC Tox Committee (from about 1981)	Referred to in correspondence to Dr Harold Hodge of the School of Medicine at the University of California in relation to fluorochemical toxicity studies and meeting on 12 April 1979 dated 12 February 1979 (USA.1000.0002.5153) Attendee, meeting on 12 April 1979, in relation to Fluorochemicals in Blood Program as referred to in interoffice correspondence dated 26 April 1979 (USA.0001.0001.1000) and 7 June 1979 (USA.1000.0002.2809) Attendee, meeting to review Fluorochemicals in Blood Program and to discuss future plans dated 13 April 1979 (USA.1000.0001.1308) and recipient of Minutes dated 26 April 1979 (USA.1000.0001.1320) and 7 June 1979 (USA.1000.0001.1302) Recipient, record of phone conversation report of telephone call between R Prokop and Eugene

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Berman Dupont dated 26 July 1979 (USA.1000.0001.0204) Recipient, internal correspondence regarding a telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239) Recipient of Minutes of Fluorochemical Study Committee Meeting dated 8 April 1983 (USA.0001.0001.1343) Recipient, internal correspondence regarding Fate of Fluorochemicals – Phase II dated 25 May 1983 (USA.1000.0001.0356) including copy of ‘Fate of Fluorochemicals – Phase II’ (1983) (USA.1000.0001.0241) Recipient, internal correspondence ‘Skin Absorption Studies on Surfactants’ dated 26 September 1983 (HOL.0001.0014.5808)
Guenther, R (Dick) A	1947 to 1985		Chemical Division		Recipient, interoffice memorandum, ‘Ecological Aspects of Fluorocarbons’ dated 13 September 1971 (USA.1000.0001.0053)
Guthrie, D R		Director, Board of Directors (1969-1979)	Division Engineer, Central Research Department (1948-1949) Vice President, Coated Abrasives and Related Products Division (1962-1966)	Executive Committee (1969-1979) Corporate Responsibility Committee (1975- 1979) Finance Committee (1975-1979)	Author, interoffice correspondence, ‘Residence Well Water Sampling Woodbury Township and Cottage Grove Village’ dated 18 October 1966 (USA.1000.0004.8430)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Vice President, Engineering and Staff Manufacturing (1966 – 1979)		
Hagen, D	At least 1978 to at least 1983		Central Research Laboratories (at least 1976 to at least 1979) General Research Analytical Services (1983)	Fate of the Fluorochemicals Project member (from about 1978 to about 1983)	Recipient, call from Taves regarding request for assistance in developing a chromatographic method from analysing perfluoro-octanoic acid on 4 May 1976 (USA.1000.0001.1296) Recipient, interoffice correspondence in relation to the determination and characterisation of trace fluorochemicals dated 26 August 1976 (USA.1000.0003.3862) Attendee, Corporate Responsibility Committee presentations in February 1977 and November 1977 (USA.0001.0001.0695) Recipient, Minutes from Fate of Fluorochemical Project Informational Meeting on 24 February 1978, dated 28 February 1978 (USA.1000.0007.0282) Author, ‘Method for the Determination of Perfluorooctanoic Acid in Blood and Other Biological Samples’ received 24 April 1979 (USA.0001.0018.0456) Author, Technical Report Summary titled ‘AR No. 7238 – Determination of Fluorinated Alcohols in Fish Extracts’ relating to A000007 dated 23 October 1979 (HOL.0001.0001.0370 at .0388)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Reviewer of scientific aspects of 'Fate of Fluorochemicals – Phase II' (1983) (USA.1000.0001.0241) proposal, (HOL.0001.0009.5040) Recipient of Minutes of Fluorochemical Study Committee Meeting dated 8 April 1983 (USA.0001.0001.1343)
Hakes, D	At least 1998		Product Steward Specialist (from about 1998)	Member, Exposure Assessment Team (from about 1998)	
Hansen, P	At least 1998		Unknown	Member, FC Working Group (from about 1998)	
Hanson Jr, C W	At least 1973 to 1981		Division Officer/General Manager, Chemical Resources (1973 to at least 1981)		Invited to appear before Fluorochemicals Technical Committee (with R L Ahlness) to provide a status report as to steps being taken to minimize employees' exposure to fluorochemicals, in or about April or May 1978 (USA.0001.0018.0083) Attendee, meeting in relation to fluorochemicals in blood on 22 May 1978 as referred to in interoffice correspondence dated 8 June 1978 (USA.0001.0001.0837) Recipient, interoffice correspondence in relation a meeting on 28 July 1978 in relation to fluorochemicals in blood dated 7 August 1978 (USA.1000.0002.5212) Recipient, internal correspondence regarding a telephone call between L.F Ludford and Karl

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239)
Harnetty, M	1969 to at least 2002		Sales Representative, of at least Light Water AFFF and Fluoroinert fluids, Chicago (1969-1973) Sales Manager, Commercial Chemicals Division (1973-1977) International Marketing Manager (1977- 1980) National Sales Manager, Industrial Chemical Products (1980- 1983) Managing Director, 3M Venezuela (1983-1986) General Manager, Industrial Chemical Products (1986 – 1987) Business Unit Executive, Industrial Chemical Products, Industrial and Electronic Sector (1987 to at least 1990) Business Unit Executive, Protective Materials,	Member, FC Working Group (from about 1998)	

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Speciality Materials Markets (2001- 2002)		
Hegg, G L	At least 1950 to at least 1991	Director, 3M Australia (1956, 1962-1966, 1972-1981)	Officer/Vice President, Australia- Asia, International (1971-1974) Vice President, Australia-Asia-Canada (1975-1981) Executive, Commercial Chemicals Division (1981-1982) Vice President, Memory Technologies Group (1982-1985) Vice President, Strategic Planning Services (1986 to at least 1991)		Recipient, internal correspondence regarding a telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239)
Hohenstein, G	At least 2005		Unknown	Member, Environmental Strategy Team (from about 2005)	
Howell, R	At least 1991 to at least 1992		Environmental Laboratory, Environmental Engineering and Pollution Control (from about 1991)	Member, FC Tech Advisory Committee (from about 1992)	Author, internal correspondence regarding need for further studies and testing dated 5 February 1992 (USA.1000.0001.0437) also enclosing copy of internal memo 'Fate of Fluorochemicals Phase II' dated 25 May 1983 and 'Fate of Fluorochemicals - Phase II' (1983).

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Senior Environmental Engineer, Environmental Science and Assessment Group		Author, 3M Technical Report ‘Environmental Effects of Light Water Brand AFFF and Components’ (1991) (USA.1000.0001.0402) Recipient, 3M internal correspondence regarding Fluorochemicals in the Environment dated 5 February 1992 (HOL.0001.0015.2327) Recipient, interoffice memorandum regarding FC-135 testing recommendations dated 15 April 1994 (USA.1000.0001.0571) Recipient, interoffice memorandum regarding FC-135 testing dated 22 April 1994 (USA.1000.0001.0571)
Hunt, G	At least 1983		Unknown		Reviewer of scientific aspects of ‘Fate of Fluorochemicals – Phase II’ (1983) (USA.1000.0001.0241) proposal, (HOL.0001.0009.5040)
Hunter, J S	At least 1998		Unknown	Member, Exposure Assessment Team (from about 1998)	Recipient, Email ‘FC’s and Past Disposal Sites’ dated 1 September 1998 (USA.0001.0001.3217)
Ihlenfeld, J	1978 to at least 2005		Senior Engineer, Telecomm Products (1978 to unknown date) Research Specialist (unknown) Technical Manager (unknown)	Member, FC Steering Committee (from about 1992) Member, FC Working Group (from about 1998)	

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Laboratory Manager (unknown) Business Director (unknown) General Manager, Performance Materials Division (at least 1999) Division Vice President, Performance Materials Division (1999-2001) 3M Germany (unknown) 3M Belgium (unknown) 3M Sumitomo Japan (2001-2002) Senior Vice President, Asia Pacific (unknown) Vice President, Research and Development (2002 – 2005) Senior Vice President, Research and Development (2005)		
Jacobson A F	At least 1947 to 1996	Director (1984-1996) Chairman and Chief Executive Officer (1986-1991)	Chemical Engineer, Tape Product and Control Lab (1947-1950) Technical Assistant to Plant Manager,		Recipient, internal correspondence regarding a telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Hutchinson Minnesota Plant (1950-1953) Technical Assistant to Plant Manager/Production Superintendent of Tape Production, Bristol Pennsylvania (1953-1959) Manager, Bristol Plant (1961-1963) General Manager, Industrial Tape Division (1963-1968) Division Officer, Industrial Tape, Tape and Allied Products (1968-1971) Vice President/General Manager, 3M Canada (early 1970s) Vice President, 3M Europe (1974-1975) Group Vice President, Tape and Allied Products (1975-1981)		

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Executive Vice President, Industrial and Consumer Sector (1981-1984) President, US Operations (1984-1985)		
Johnson, J D (Jim)	At least 1978 to at least 1992		Technical Service Manager, Chemical Division Riker Drug Metabolism (at least 1983) Environmental Laboratory (at least 1992)	Member, FC Tech Review Committee (from about 1978) Member, FC Tech Advisory Committee (from about 1992) Member, FC Study Committee (as at 1983)	Author, Report titled 'Absorption of FC-143-14C in Rats after a Single Oral Dose' dated 28 December 1979 (HOL.0001.0002.5517) Author, Report titled 'Extent and Route of Excretion and Tissue Distribution of Total Carbon-14 in Rats after a Single Intravenous Dose of FC-95-14-C' dated 28 December 1979 (HOL.0001.0012.7859) Attendee/presenter on FC metabolism studies, meeting of Fluorochemical Study Committee on 16 March 1983 and recipient of Minutes dated 8 April 1983 (USA.0001.0001.1343) Recipient, internal correspondence regarding need for further studies and testing dated 5 February 1992 (USA.1000.0001.0437) also enclosing copy of internal memo 'Fate of Fluorochemicals Phase II' dated 25 May 1983 and 'Fate of Fluorochemicals - Phase II' (1983). Recipient, 3M internal correspondence regarding Fluorochemicals in the Environment dated 5 February 1992 (HOL.0001.0015.2327) Attendee, Fluorochemicals Steering Committee Meeting on 21 July 1992, and recipient of

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Minutes dated 22 July 1992 (USA.0001.0002.8728)
Johnson, T	At least 1998		Unknown	Member, Exposure Assessment Team (from about 1998) Member, FC Exposure Team (from about 1998)	
Kent, D W	At least 1984		Unknown		Recipient, internal memorandum titled ‘Modified OECD Screening Test on FC-203, FC-203A, and FC-600’ dated 9 July 1984 (HOL.0001.0020.1010)
Klinger D W	At least 1981		Unknown		Recipient, internal correspondence dated 8 September 1981 regarding a telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239)
Krall, J	At least from 1978		Unknown	Fate of the Fluorochemicals Project member (from about 1978)	Recipient, Minutes of Fate of Fluorochemical Project Informational Meeting on 24 February 1978, dated 28 February 1978 (USA.1000.0007.0282)
Krogh, L	1952 to 1990		Senior Chemist, Central Research (1952-1954)	Member, FC Tox Committee (from about 1981)	Recipient, internal correspondence regarding record of telephone conversation on 14 August 1975 with Dr Warren Guy dated 20 August 1975 (USA.0001.0002.7617)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Manager, Research and Development (Abrasives Laboratory) (1954- 1964)		Recipient, interoffice correspondence regarding telephone call with Dr Warren Guy dated 22 August 1975 (USA.1000.0007.0276)
			Director, Chemical Research Laboratory, later Director, Corporate Technical Planning and Coordination (1964- 1969)		Attendee, meeting on 8 May 1978 in relation to results of Animal Studies at I.R.D.C as referred to in interoffice correspondence dated 10 May 1978 (HOL.0001.0009.3860)
			General Manager, New Business Division (formerly New Products Division) (1969-)		Attendee, meeting on 22 May 1978 in relation to fluorochemicals in blood as referred to in interoffice correspondence dated 8 June 1978 (USA.0001.0001.0837)
			Executive Director, Central Research Laboratories (from about 1970 to 1973)		Attendee, meeting on 5 June 1978 as referred to in interoffice correspondence dated 1 June 1978 (USA.1000.0002.5151)
			General Manager, Commercial Chemicals Division (from about 1973 to 1981)		Author, interoffice correspondence in relation a meeting on 28 July 1978 in relation to fluorochemicals in blood dated 7 August 1978 (USA.1000.0002.5212)
			Vice President, Research and Development, Industrial and Consumer Sector (1981)		Attendee, meeting on 28 July 1978 in relation to fluorochemicals in blood dated 23 August 1978 (USA.0001.0002.8725)
			Vice President/Senior Vice President, Research and Development (1982 to 1990)		Referred to in correspondence to Dr Harold Hodge of the School of Medicine at the University of California in relation to fluorochemical toxicity studies and meeting on 12 April 1979 dated 12 February 1979 (USA.1000.0002.5153)
					Attendee, meeting on 12 April 1979, in relation to Fluorochemicals in Blood Program as referred to in interoffice correspondence dated 26 April 1979

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					(USA.0001.0001.1000) and 7 June 1979 (USA.1000.0002.2809) Attendee, meeting on 13 April 1979, to review Fluorochemicals in Blood Program and to discuss future plans (USA.1000.0001.1308) and recipient of Minutes dated 26 April 1979 (USA.1000.0001.1320) and 7 June 1979 (USA.1000.0001.1302) Recipient, internal correspondence attaching phone conversation report of telephone call between R Prokop and Eugene Berman Dupont on 26 July 1979 (USA.1000.0001.0204) Recipient, internal correspondence regarding telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239) Recipient of Minutes of Meeting of Fluorochemical Study Committee dated 8 April 1983 (USA.0001.0001.1343)
Kuhrmeyer, C A	1951 to at least 1992	Director, Board of Directors (1975-1980)	Vice President, Duplicating Products Division (1966-1970) Group Vice President, Graphic Systems (1970-1978)	Executive Committee (1975-1980) Corporate Responsibility Committee (1975-1980)	Attendee, Corporate Responsibility Committee presentations in February 1977 and November 1977 (USA.0001.0001.0695)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Group Vice President, Business Products (1978-1980) Vice President, Administration (1980 to at least 1992)		
LaZerte, J (Don)	1949-1987		Group Vice President, Graphic Systems (1970-1979) Vice President, Administration (1980 to at least 1992) Catalytic Section, Central Research (from 1949) Process Development Section, Fluorochemicals Division, New Products Development Group Supervisor, Process Department Section (1954) Supervisor, Fluorochemicals Process Development Section (from 1958) Manager, Fluorochemicals Research and	Fate of the Fluorochemicals Project member (from about 1978 to about 1983) Member, FC Tech Review Committee (about 1978 onwards)	Recipient, 3M interoffice memorandum titled 'Ecological Aspects of Fluorocarbons' dated 13 September 1971 (USA.1000.0001.0053) Recipient, 3M interoffice correspondence from D Ricker in relation to Toxicity Testing of FC-95, CC 7410-16 dated 14 November 1974 (HOL.0001.0035.2242) Recipient, correspondence to Warf Institute in relation to eye and skin irritation testing, dated 24 October 1974 (HOL.0001.0035.2242) Recipient, 3M interoffice correspondence regarding reports on the primary skin irritation and eye irritation assessment conducted with FC-95, dated 14 November 1974 (HOL.0001.0035.2242) Recipient, internal correspondence regarding record of a telephone conversation on 14 August 1975 with Dr Warren Guy dated 20 August 1975 (USA.0001.0002.7617) Recipient, call from Dr Warren Guy on 22 August 1975 (USA.1000.0001.1296)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Development, Chemical Division		Author, interoffice correspondence regarding a telephone call with Dr Warren Guy dated 22 August 1975 (USA.1000.0007.0276)
			Commercial Chemicals Division Lab (1983)		Recipient, interoffice correspondence in relation to the determination and characterisation of trace fluorochemicals dated 26 August 1976 (USA.1000.0003.3862)
			Technical Director, Industrial Chemical Division (until 1987)		Recipient, call from Taves on 22 September 1975 (USA.1000.0001.1296)
					Attendee, meeting with Guy and Taves on 16 December 1975 (USA.1000.0001.1296)
					Reviewer, fluorochemical in blood issues with members of the Personal Care Products team, April 1977 (USA.1000.0001.1296)
					Reviewer, fluorochemicals in blood with members of the Home Health Care Products on 15 June 1977 (USA.0001.0001.1296)
					Recipient, internal correspondence 'Fluorochemicals in Blood' dated 9 August 1977 (USA.0001.0018.0080)
					Recipient, interoffice correspondence in relation to fluorochemicals in blood dated 3 November 1977 (USA.1000.0003.3908)
					Recipient, Minutes of Fate of Fluorochemical Project Informational Meeting on 24 February 1978, dated 28 February 1978 (USA.1000.0007.0282)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Attendee, Fluorochemicals Technical Review Committee Meeting on 12 April 1978 (USA.1000.0001.0135)
					Recipient, Minutes of Meeting to discuss review of animal studies on 28 April 1978, dated 17 May 1978 (USA.1000.0003.3970)
					Attendee, Fluorochemicals Technical Review Committee Meeting on 4 May 1978 (USA.1000.0002.5219)
					Attendee, meeting in relation to results of Animal Studies at I.R.D.C on 8 May 1978, as referred to in interoffice correspondence dated 10 May 1978 (HOL.0001.0009.3860)
					Attendee, meeting in relation to fluorochemicals in blood on 22 May 1978 as referred to in interoffice correspondence dated 8 June 1978 (USA.0001.0001.0837)
					Recipient, Minutes of Fluorochemicals Technical Review Committee Meeting dated 10 May 1978 (USA.1000.0002.5219)
					Attendee, meeting on 5 June 1978, as referred to in interoffice correspondence dated 1 June 1978 (USA.1000.0002.5151)
					Recipient, interoffice correspondence in relation a meeting on 28 July 1978 in relation to fluorochemicals in blood dated 7 August 1978 (USA.1000.0002.5212)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Attendee, meeting on 28 July 1978 in relation to fluorochemicals in blood dated 23 August 1978 (USA.0001.0002.8725) Referred to in correspondence to Dr Harold Hodge of the School of Medicine at the University of California in relation to fluorochemical toxicity studies and meeting on 12 April 1979 dated 12 February 1979 (USA.1000.0002.5153) Attendee, meeting in relation to Fluorochemicals in Blood Program on 12 April 1979, as referred to in interoffice correspondence dated 26 April 1979 (USA.0001.0001.1000) and 7 June 1979 (USA.1000.0002.2809) Attendee, meeting to review Fluorochemicals in Blood Program and to discuss future plans dated 13 April 1979, (USA.1000.0001.1302/ USA.0001.0001.1022) and recipient of Minutes dated 26 April 1979 (USA.1000.0001.1320) and 7 June 1979 (USA.1000.0001.1302) Recipient, phone conversation report of telephone call between R Prokop and Eugene Berman Dupont on 26 July 1979 (USA.1000.0001.0204) Recipient, report titled 'Absorption of FC-143-14C in Rats after a Single Oral Dose' dated 28 December 1979 (HOL.0001.0002.5517) Recipient, report titled 'Extent and Route of Excretion and Tissue Distribution of Total Carbon-14 in Rats after a Single Intravenous Dose

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					of FC-95-14-C' dated 28 December 1979 (HOL.0001.0012.7859) Recipient, internal correspondence regarding telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239) Recipient of Minutes of Fluorochemical Study Committee Meeting dated 8 April 1983 (USA.0001.0001.1343) Recipient, internal correspondence regarding Fate of Fluorochemicals – Phase II dated 25 May 1983 (USA.1000.0001.0356) Attendee, meeting held in relation to the fate of fluorochemicals dated 16 August 1983 (USA.1000.0001.0375)
Leahy, S M	At least 1956 to at least 1992				Recipient of Minutes of Fluorochemical Study Committee Meeting dated 8 April 1983 (USA.0001.0001.1343) Recipient, internal correspondence regarding Fate of Fluorochemicals – Phase II dated 25 May 1983 (USA.1000.0001.0356) Recipient, Minutes of Meeting held in relation to the fate of fluorochemicals on 16 August 1983 (USA.1000.0001.0375) Recipient of Minutes of Fluorochemicals Steering Committee Meeting on 21 July 1992, dated 22 July 1992 (USA.0001.0002.8728)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Group Vice President, Chemicals, Film and Allied Products Group (1982-1984) Sector Executive, Commercial Chemicals, Chemicals, Film and Allied Products Group (1984-1986) Vice President, Chemicals, Film and Allied Products Group (1986 to at least 1992)		
Lehr, L	At least 1947 to 1990	Director, Board of Directors (1974-1990) Vice Chairman of the Board (1979) Chairman of the Board (1980-1986) Chief Executive Officer (1979-1986)	Division Vice President – Medical Products, Tape and Allied Products (later Health Care Products and Services) (1966-1972) Group Vice President – Health Care Products and Services (later Tape and Allied Products) (1972-1975) President – US Operations (1975-1978)	Executive Committee (1974 to at least 1983) Finance Committee (1975 to at least 1983) Nominating/Board Organisation Committee (1975 to at least 1989) Committee on Corporate Responsibility (1974) Compensation Committee (at least 1985 to at least 1989)	Attendee, Meeting in relation to fluorochemicals in blood on 12 July 1978, as referred to in interoffice correspondence dated 26 May 1978 (USA.1000.0002.5149) Referred to in interoffice correspondence dated 1 June 1978 (USA.1000.0002.5151) Recipient, interoffice correspondence in relation a meeting on 28 July 1978 in relation to fluorochemicals in blood dated 7 August 1978 (USA.1000.0002.5212)
LePage, R A	At least 1983		Unknown		Recipient, Minutes of Meeting in relation to the fate of fluorochemicals on 16 August 1983 (USA.1000.0001.0375)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
Ling, J T	1962 to at least 1983		Water and Sanitary Engineering (1966) Staff Executive - Environmental Engineering and Pollution Control (from at about 1974 to about 1983) Manager, Environmental and Civil Engineering		Requestor, Central Analytical Laboratory Report on Water Analysis, Chemolite Plant dated 3 November 1960 (USA.1000.0003.3605) Author, interoffice memorandum to various 3M personnel regarding Chemolite monthly water report with central analytical laboratory report No 3873, 3 November 1960 (USA.1000.0003.3605) Requestor, Central Analytical Laboratory Report on Water Analysis, Chemolite Plant dated 6 December 1960 (USA.1000.0003.3605) Recipient, interoffice correspondence regarding rebuilding and relocation of sewage pond – Chemolite Plant dated 1 December 1961 (USA.1000.0003.3725) Recipient, interoffice correspondence in relation to Residence Well Water Sampling Woodbury Township and Cottage Grove Village dated 18 October 1966 (USA.1000.0004.8430) Recipient and Attendee, interoffice correspondence in relation to Minutes of Meeting on Woodbury Ground Water Problem dated 24 March 1967 (HOL.0001.0030.7714) Recipient, 3M interoffice correspondence in relation to Ecological Aspects of Fluorocarbons dated 31 August 1971 (USA.1000.0001.0051) Recipient, 3M interoffice memorandum titled 'Ecological Aspects of Fluorocarbons' dated 13 September 1971 (USA.1000.0001.0053)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, internal correspondence regarding Fate of Fluorochemicals – Phase II dated 25 May 1983 (USA.1000.0001.0356)
Logan, P	At least 1998		Unknown	Member, FC Exposure Team (from about 1998)	
Lohmiller, J F	At least 1981		Unknown	Member, FC Tox Committee (from about 1981)	Recipient, internal correspondence regarding a telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239)
Long, J E	At least 1971 to at least 1980		Toxicology Department Toxicology Services (1974 to about 1980)	Member, FC Tech Review Committee (about 1978 onwards)	Recipient, 3M interoffice memorandum titled 'Ecological Aspects of Fluorocarbons' dated 13 September 1971 (USA.1000.0001.0053) Recipient, 3M interoffice correspondence in relation to Toxicity Testing of FC-95, CC 7410-16 dated 16 October 1974 (HOL.0001.0035.2242) Author, correspondence to Warf Institute in relation to eye and skin irritation testing, dated 24 October 1974 (HOL.0001.0035.2242) Requestor, Warf Institute Report in relation to skin and eye irritation dated 31 October 1974 (HOL.0001.0035.2242) Author, 3M interoffice correspondence regarding reports on the primary skin irritation and eye irritation assessment conducted with FC-95, dated 14 November 1974 (HOL.0001.0035.2242)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, interoffice correspondence regarding a telephone call with Dr Warren Guy dated 22 August 1975 (USA.1000.0007.0276) Attendee, meeting with Guy and Taves on 16 December 1975 (USA.1000.0001.1296) Recipient, interoffice correspondence in relation to the determination and characterisation of trace fluorochemicals dated 26 August 1976 (USA.1000.0003.3862) Supplier of liver and blood samples of FC-43 exposed rats to Central Research Laboratory in January 1977 (USA.1000.0001.1296) Proposer, various chronic toxicity/carcinogenic studies of FC-807 metabolite, FC-143 and Ethyl FOSE Alcohol dated 6 July 1977 (USA.1000.0001.1296) Recipient, internal correspondence 'Fluorochemicals in Blood' dated 9 August 1977 (USA.0001.0018.0080) Recipient, interoffice correspondence in relation to fluorochemicals in blood dated 3 November 1977 (USA.1000.0003.3908) Attendee, Fluorochemicals Technical Review Committee Meeting on 12 April 1978 (USA.1000.0001.0135) Attendee, meeting to discuss review of animal studies dated 28 April 1978 (USA.1000.0003.3970)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Attendee, Fluorochemicals Technical Review Committee Meeting on 4 May 1978 (USA.1000.0002.5219)
					Recipient, Minutes of Fluorochemicals Technical Review Committee Meeting dated 10 May 1978 (USA.1000.0002.5219)
					Attendee, meeting in relation to fluorochemicals in blood on 22 May 1978 as referred to in interoffice correspondence dated 8 June 1978 (USA.0001.0001.0837)
					Attendee, meeting on 5 June 1978, as referred to in interoffice correspondence dated 1 June 1978 (USA.1000.0002.5151)
					Requestor, internal laboratory memorandum re 'IRDC 137-092: FC-95/Monkey' dated 3 August 1978 (HOL.0001.0024.8955).
					Requestor, internal laboratory memorandum titled 'IRDC 137-092: FC095/Monkey' dated 4 August 1978 (USA.1000.0003.4025)
					Recipient, interoffice correspondence in relation a meeting on 28 July 1978 in relation to fluorochemicals in blood dated 7 August 1978 (USA.1000.0002.5212)
					Attendee, meeting on 28 July 1978 in relation to fluorochemicals in blood dated 23 August 1978 (USA.0001.0002.8725)
					Requestor and recipient, 3M internal memorandum titled 'IRDC 137-088: FM-

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					3422/Monkey' dated 16 August 1978 (USA.1000.0001.0194)
Looney, L	At least 1998 to at least 2005		Business Unit Executive, Advertising, Public Relations and Design Services (2001-2005)	Member, FC Working Group (from about 1998)	
Ludford, L	At least 1981		Public Relations (at least 1981)	Member, FC Tox Committee (from about 1981)	Author, internal correspondence regarding reassignment of pregnant staff dated 27 April 1981 (USA.1000.0001.0237) Author, internal correspondence regarding a telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239)
Magill, L	At least 1978 to at least 1992		Manager, Regulatory Affairs Department, Commercial Chemical Division (from about 1980)	Fate of the Fluorochemicals Project member (from about 1978) Member, FC Tech Review Committee (from about 1978) Member, FC Tech Advisory Committee (from about 1992)	Recipient, Minutes of Fate of Fluorochemical Project Informational Meeting on 24 February 1978, dated 28 February 1978 (USA.1000.0007.0282) Attendee, Fluorochemicals Technical Review Committee Meeting on 12 April 1978 (USA.1000.0001.0135) Recipient, Minutes of Meeting to discuss review of animal studies dated 28 April 1978 (USA.1000.0003.3970) Attendee, Fluorochemicals Technical Review Committee Meeting on 4 May 1978 (USA.1000.0002.5219)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, Minutes of Meeting of Fluorochemicals Technical Review Committee Meeting dated 10 May 1978 (USA.1000.0002.5219) Attendee, meeting on 22 May 1978 in relation to fluorochemicals in blood as referred to in interoffice correspondence dated 8 June 1978 (USA.0001.0001.0837) Recipient, internal correspondence attaching phone conversation report of telephone call between R Prokop and Eugene Berman Dupont on 26 July 1979 (USA.1000.0001.0204) Recipient, Report titled 'Absorption of FC-143-14C in Rats after a Single Oral Dose' dated 28 December 1979 (HOL.0001.0002.5517) Recipient, Report titled 'Extent and Route of Excretion and Tissue Distribution of Total Carbon-14 in Rats after a Single Intravenous Dose of FC-95-14-C' dated 28 December 1979 (HOL.0001.0012.7859)
Mandel, J H	1992 - 2003		Associate Medical Director (1992- 1998) Director, Occupational Medicine (1998-2003) Member, 3M Company Institutional Review Board (1995-2003) Chair, 3M External Advisory Panel on	Member, FC Tech Advisory Committee (from about 1992) Member, Exposure Assessment Team (from about 1998) Member, FC Exposure Team (from about 1998)	Attendee, Fluorochemicals Steering Committee Meeting on 21 July 1992, and recipient of Minutes dated 22 July 1992 (USA.0001.0002.8728) Co-Author, 'Mortality among employees in PFOA production plant' (1996) <i>Journal of occupational Medicine</i> 35, pp 950-954 (HOL.0001.0058.2918) Co-Author 'Serum perfluorooctanoic acid and hepatic enzymes, lipoproteins and cholesterol: a study of occupational exposed men' (1996)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Fluorochemicals (1998-2003)	Member, FC Working Group (from about 1998)	<i>American Journal of Industrial Medicine</i> 29, pp 560-568 (HOL.0001.0058.2909)
			Member, 3M European Fluorochemical Consultancy (1998-2003)	Member, EHS&R Working Group (from about 1998)	Co-Author, 'An Epidemiological Investigation of Reproductive Hormones in Men with Occupational Exposure to Perfluorooctanoic Acid' (1998), <i>Journal of Occupational and Environmental Medicine</i> 40(7) pp 614-622 (HOL.0001.0058.2923) Recipient, Email from M Santoro, 'Cottage Grove Wells' which refers to levels of PFOS and PFOA exceeding drinking water health advisory levels at Well No 5 at Cottage Grove, and that about 80% of the plant had been using bottled water for drinking since the mid-1980s, dated 3 July 2001 (USA.0001.0001.3798)
Marhevka, J	At least 1992		Corporate Research Laboratory	Member, FC Tech Advisory Committee (from about 1992)	
McBride J C	At least 1981		Unknown		Recipient, internal correspondence regarding telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239)
McCormick, W	At least 1978 to at least 1983		Manager, Toxicology Services, Medical Department (1979-1983)	Member, FC Tech Review Committee (from about 1978)	Recipient, internal correspondence regarding telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239) Recipient, letter to William Runyon of Andrews Airforce Base from

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
				Member, FC Study Committee (from about the early 1980s)	E Reiner 'Disposal of Mil-spec AFFF Waste' dated 9 December 1981 (USA.1000.0001.1503) Attendee, meeting on 16 March 1983 of Fluorochemical Study Committee and recipient of Minutes dated 8 April 1983 (USA.0001.0001.1343) Author, internal correspondence, 'Skin Absorption Studies on Surfactants' dated 26 September 1983 (HOL.0001.0014.5808)
McKeown, J J	At least 1983		Industrial & Consumer Sector Research & Development Administration (1983)		Recipient of Minutes of Fluorochemical Study Committee Meeting dated 8 April 1983 (USA.0001.0001.1343)
McNamara, M	At least 1998		Unknown	Member, Exposure Assessment Team (from about 1998)	
Mendel, A	At least 1977 to at least 1980		Unknown	Fate of the Fluorochemicals Project member (from about 1977 to about 1980)	Recipient, Minutes from Fate of Fluorochemical Project Informational Meeting on 24 February 1978, dated 28 February 1978 (USA.1000.0007.0282) Recipient, Technical Report Summary 'Fate of Fluorochemical Project – Aquatic Toxicity Studies: FM 3925' dated 8 January 1979 (HOL.0001.0001.2857 at .2865) Recipient, Technical Report Summary titled 'Bioaccumulation of Fluorochemicals in Tenn. River Fish' relating to 78-2740 dated 22 May 1979 (HOL.0001.0001.0370 at .0378)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, Technical Report Summary titled 'Photolysis of FM 3422 on Soil' relating to Fate of Fluorochemicals dated 10 December 1979 (HOL.0001.0010.1955) Recipient, Technical Report Summary titled 'Fluorochemicals in Tennessee River Fish' relating to 78-2740, dated 28 December 1979 (HOL.0001.0001.0370 at .0375) Author, Technical Report Summary 'Detection of Fluorochemicals in Decatur Wastewater', obtained as part of the Fate of Fluorochemicals Project, dated 23 June 1980 (USA.1000.0003.4224)
Millet, G	At least 1998		Unknown	Member, FC Core Team (from about 1998)	
Moore, G	At least 1965 to about 2011		Synthetic Organic Chemist, Central Research Laboratory (from at least 1965) Fluoromaterials Research (from approximately 1981) Corporate Scientist, Corporate Materials Research Lab (at least 1989)	Member, Exposure Assessment Team (from about 1998)	

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Corporate Scientist, Fluorochemical Centre (at least 1990)		
Mutsch, E	At least 1978		Unknown	Member, FC Tech Review Committee (from about 1978)	
Myers, W R (Bill)	From at least 1981 to at least 2005		Performance Materials, European Business Unit (prior to 2003) Business Unit Executive, Dyneon, Industrial Business Sector (2003–2005)	Member, Exposure Assessment Team (from about 1998)	
Nash, M A	At least 1998 to at least 2005		Lawyer	Member, EHS&R Working Group (from about 1998) Member, Exposure Assessment Team (from about 1998) Member, FC Working Group (from about 1998) Member, Environmental Strategy Team (from about 2005)	Recipient, Email from M Santoro, ‘Cottage Grove Wells’ which refers to levels of PFOS and PFOA exceeding drinking water health advisory levels at Well No 5 at Cottage Grove, and that about 80% of the plant had been using bottled water for drinking since the mid-1980s, dated 3 July 2001 (USA.0001.0001.3798)
Nelson, R A (Bob)	1963-1997		Veterinarian/Toxicologist, Biochemical Research Group Laboratory,	Member, FC Tech Review Committee (from about 1978)	Attendee, Fluorochemicals Technical Review Committee Meeting on 12 April 1978 (USA.1000.0001.0135)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Central Research (from at least 1963) Riker Laboratories, Safety Evaluation Group (from at least 1976)		Attendee, meeting to discuss review of animal studies on 28 April 1978 (USA.1000.0003.3970) Attendee, Fluorochemicals Technical Review Committee Meeting on 4 May 1978 (USA.1000.0002.5219) Recipient, Minutes of Fluorochemicals Technical Review Committee Meeting dated 4 May 1978 (USA.1000.0002.5219) Attendee, meeting in relation to results of Animal Studies at I.R.D.C on 8 May 1978 as referred to in internal correspondence dated 10 May 1978 (HOL.0001.0009.3860) Attendee, meeting on 5 June 1978, as referred to in interoffice correspondence dated 1 June 1978 (USA.1000.0002.5151) Referred to in correspondence to Dr Harold Hodge of the School of Medicine at the University of California in relation to fluorochemical toxicity studies and meeting on 12 April 1979 dated 12 February 1979 (USA.1000.0002.5153) Author (based on signature), memo titled 'FC-95, FC-143 and FM-3422 – 90 Day Subacute Toxicity Studies Conducted at IRDC – Review of Final Reports and Summary' dated 20 March 1979 (USA.1000.0002.2726) Attendee, meeting in relation to Fluorochemicals in Blood Program on 12 April 1979 as referred to in interoffice correspondence dated 26 April 1979

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					(USA.0001.0001.1000) and 7 June 1979 (USA.1000.0002.2809) Attendee, meeting to review Fluorochemicals in Blood Program and to discuss future plans on 13 April 1979 (USA.1000.0001.1302/ USA.0001.0001.1022) and recipient of Minutes dated 26 April 1979 (USA.1000.0001.1320) and 7 June 1979 (USA.1000.0001.1302) Recipient, Report titled 'Absorption of FC-143-14C in Rats after a Single Oral Dose' dated 28 December 1979 (HOL.0001.0002.5517) Recipient, Report titled 'Extent and Route of Excretion and Tissue Distribution of Total Carbon-14 in Rats after a Single Intravenous Dose of FC-95-14-C' dated 28 December 1979 (HOL.0001.0012.7859)
Nelson, W (Bill)	At least 1998 to at least 2007		Public Affairs (at least 2000) Corporate Communications (at least 2007)	Member, FC Core Team (from about 1998) Member, Environmental Strategy Team (from about 2005)	
Norberg, A	At least the early 1980s		Industrial & Consumer Sector, Research & Development, Regulatory Affairs (at least 1983)	Member and Secretary, FC Study Committee (from about the early 1980s)	Attendee, meeting of Fluorochemical Study Committee on 16 March 1983 and recipient of Minutes dated 8 April 1983 (USA.0001.0001.1343)
Ober, R E	At least 1978 to at least 1983		Riker Drug Metabolism (at least 1983)	Member, FC Tech Review Committee (from about 1978)	Attendee, Fluorochemicals Technical Review Committee Meeting on 12 April 1978 (USA.1000.0001.0135)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Attendee, meeting to discuss review of animal studies on 28 April 1978 (USA.1000.0003.3970)
					Attendee, Fluorochemicals Technical Review Committee Meeting on 4 May 1978 (USA.1000.0002.5219)
					Recipient, Minutes of Fluorochemicals Technical Review Committee Meeting dated 10 May 1978 (USA.1000.0002.5219)
					Referred to in correspondence to Dr Harold Hodge of the School of Medicine at the University of California in relation to fluorochemical toxicity studies and meeting on 12 April 1979 dated 12 February 1979 (USA.1000.0002.5153)
					Attendee, meeting in relation to Fluorochemicals in Blood Program on 12 April 1979 as referred to in interoffice correspondence dated 26 April 1979 (USA.0001.0001.1000) and 7 June 1979 (USA.1000.0002.2809)
					Attendee, meeting to review Fluorochemicals in Blood Program and to discuss future plans on 13 April 1979 (USA.1000.0001.1302/ USA.0001.0001.1022) and recipient of Minutes dated 26 April 1979 (USA.1000.0001.1320) and 7 June 1979 (USA.1000.0001.1302)
					Recipient, Report titled 'Absorption of FC-143-14C in Rats after a Single Oral Dose' dated 28 December 1979 (HOL.0001.0002.5517)
					Recipient, Report titled 'Extent and Route of Excretion and Tissue Distribution of Total

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Carbon-14 in Rats after a Single Intravenous Dose of FC-95-14-C' dated 28 December 1979 (HOL.0001.0012.7859) Recipient of Minutes of Fluorochemical Study Committee Meeting dated 8 April 1983 (USA.0001.0001.1343)
Olsen, G	At least 1998 to at least 2004		Medical Department (from about 1998) Clinical Epidemiologist (from about 2004)	Member, Exposure Assessment Team (from about 1998) Member, FC Exposure Team (from about 1998)	Author 'An epidemiologic investigation of reproductive hormones in men with occupational exposure to perfluorooctanoic acid' (1998), <i>Journal of Occupational Environmental Medicine</i> , 40, pp 614-622 (HOL.0001.0058.2923) Requestor, Laboratory Report 'Analysis of FCs in Samples of Children's Sera', dated 21 May 1999 (HOL.0001.0013.7381) Attendee, EHS&R Working Group on 10 August 1999, and recipient of Minutes dated 31 August 1999 (USA.0001.0001.3416)
Olson, C	At least 1992		Speciality Chemicals Division Chemical, Film and Allied Group Compliance	Member, FC Tech Advisory Committee (from about 1992)	Recipient, internal correspondence regarding need for further studies and testing dated 5 February 1992 (USA.1000.0001.0437) also enclosing copy of internal memo 'Fate of Fluorochemicals Phase II' dated 25 May 1983 and 'Fate of Fluorochemicals - Phase II' (1983). Attendee, Fluorochemicals Steering Committee Meeting on 21 July 1992, and recipient of Minutes dated 22 July 1992 (USA.0001.0002.8728)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, internal correspondence regarding FC-135 testing dated 13 April 1994 (USA.1000.0001.0571)
Ordway Jr, J G*	At least 1972 to 1992	Director, Board of Directors (1972-1992)	*Nil apart from Director. Other roles include: Chairman of the board, MacArthur Co., distributor and contractor of construction specialty products (1977- 1987) Retired Chairman of the board, MacArthur Co., distributor and contractor of construction specialty products (1988- 1992)	Corporate Responsibility Committee (1972- 1988) Audit committee (1972- 1984) Compensation Committee (1985- 1992) Board organisation committee (1989- 1992)	Attendee, Corporate Responsibility Committee presentations in February 1977 and November 1977 (USA.0001.0001.0695) Attendee, meeting of Directors where Dr R Adams of the Corporate Responsibility Committee reported on the results of further fluorochemical studies on 12 May 1981 (HOL.0001.0007.8120)
Palmquist, J	At least 1998 to at least 2005		Assistant General Counsel, 3M Corporate Affairs (at least 2005)	Member, FC Working Group (from about 1998)	
Paschke, R A (Bob)	At least 1984 to at least 2005		Environmental Engineering Manager, Environmental Technology and Safety Services (at least 2003) Corporate Environmental Programs Manager (at least 2005)	Member, Environmental Strategy Team (from about 2005)	Recipient, internal correspondence regarding Oakdale Incinerator Ash Oil & Grease Extracts dated 27 June 1984 (HOL.0001.0017.4674) Recipient, Email 'FC's and Past Disposal Sites' dated 1 September 1998 (USA.0001.0001.3217) Recipient, Email from M Santoro, 'Cottage Grove Wells' which refers to levels of PFOS and PFOA exceeding drinking water health advisory levels at Well No 5 at Cottage Grove, and that about 80% of the plant had been using bottled water for

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					drinking since the mid-1980s, dated 3 July 2001 (USA.0001.0001.3798).
Pauly, D R	At least 1981		Unknown	Member, FC Tox Committee (from about 1981)	Recipient, internal correspondence regarding telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239)
Pearlson, W (Bill) H	1947-1985		Chemical Division Laboratory, Fluorochemical Development Project (from about 1947) Catalytic Section Leader, Central Research Department (1949) Supervisor, Process Development Laboratory, Fluorochemicals Division (about the 1950s) Supervisor, Fluorination Research and Development (about the 1950s) Commercial Chemicals Division (1983)	Member, FC Tech Review Committee (about 1978 onwards) Member and Chair, FC Study Committee (from early 1980s) Member, FC Tox Committee (from about 1981)	Recipient, 3M interoffice memorandum titled 'Ecological Aspects of Fluorocarbons' dated 13 September 1971 (USA.1000.0001.0053) Attendee, meeting in relation to fluorochemicals in blood on 22 May 1978 as referred to in interoffice correspondence dated 8 June 1978 (USA.0001.0001.0837) Recipient, internal correspondence regarding telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239) Attendee, meeting of Fluorochemical Study Committee on 16 March 1983 and recipient of Minutes dated 8 April 1983 (USA.0001.0001.1343) Reviewer of scientific aspects of 'Fate of Fluorochemicals – Phase II' (1983) (USA.1000.0001.0241) proposal, (HOL.0001.0009.5040)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, internal correspondence regarding Fate of Fluorochemicals – Phase II dated 25 May 1983 (USA.1000.0001.0356) including copy of 'Fate of Fluorochemicals – Phase II' (1983) (USA.1000.0001.0241) Attendee, meeting in relation to the fate of fluorochemicals on 16 August 1983 (USA.1000.0001.0375)
Pitblado, J M	At least 1946 to 1981	Director, Board of Directors (1978-1981)	Chemical Engineer (at least 1946) Branch Sales Manager (at least 1951) Division General Manager/Officer, Building Services and Cleaning Products, Abrasives, Adhesives, Building Service and Chemicals (1968-1974) Group Vice President, Abrasives, Adhesives, Building Service and Chemicals (1975-1979) President, US Operations (1979-1981)	Executive Committee (1978-1981) Finance Committee (1979-1981)	Attendee, meeting in relation to fluorochemicals in blood on 12 July 1978, as referred to in interoffice correspondence dated 26 May 1978 (USA.1000.0002.5149) Recipient, interoffice correspondence in relation a meeting on 28 July 1978 in relation to fluorochemicals in blood dated 7 August 1978 (USA.1000.0002.5212) Attendee, meeting of Directors where Dr R Adams of the Corporate Responsibility Committee reported on the results of further fluorochemical studies on 12 May 1981 (HOL.0001.0007.8120)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
Pignato, J A	At least 1977 to at least 1992		Commercial Chemicals Division Fire Protection Systems Department (at least 1977) Applications Manager, Engineering Fluids and Systems Laboratory (at least 1992)		Recipient, Technical Report Summary dated 30 June 1980 (HOL.0001.0030.8502) Recipient, internal correspondence regarding FC-203, FC-206 and FC-3017 dated 6 August 1980 (HOL.0001.0018.4870) Recipient, Letter to William Runyon of Andrews Airforce Base from E Reiner 'Disposal of Mil-spec AFFF Waste' dated 9 December 1981 (USA.1000.0001.1503) Recipient, internal correspondence 'Mil-Spec AFFF BOD and COD testing' attaching summary of BOD, Carbanaceous BOD and COD data on MIL-SPEC AFFF product (FC-203C) results obtained from external laboratories including Pace, Serco, Capsule, and Galbraith dated 25 May 1982 (HOL.0001.0024.5772) Recipient, internal memorandum titled 'Biodegradation tests' dated 21 April 1983 (HOL.0001.0035.5369)
Pike, M T	At least 1979 to at least 1993		Commercial Chemical Division (at least 1979) Specialty Chemicals Division (at least 1993)		Recipient (copy), Letter to Harry Torabi of US Army Corps of Engineers re Disposal of Light Water Brand AFFF Agents dated 4 February 1987 (USA.1000.0001.1506) Recipient, Letter from Boots & Coots Fire Protective Equipment Inc dated 3 June 1988 (USA.1000.0001.0395)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, internal correspondence, 'Results of Salmon Fry Bioassay on FC-2038' dated 28 December 1988 (HOL.0001.0021.8257 at .8260) Recipient, Internal correspondence regarding FC-129 Biodegradability dated 30 December 1988 (USA.0001.0018.0260) Recipient, 3M Technical Report 'Environmental Effects of Light Water Brand AFFF and Components' (1991) (USA.1000.0001.0402)
Pendergrass, J A	At least 1967 to at least 1979		Associate Director, Medical Department (at least 1978 to at least 1979)		Recipient, 3M interoffice correspondence regarding reports on the primary skin irritation and eye irritation assessment conducted with FC-95, dated 14 November 1974 (HOL.0001.0035.2242) Recipient, internal correspondence dated 20 August 1975, regarding record of telephone conversation on 14 August 1975 with Dr Warren Guy (USA.0001.0002.7617) Recipient, interoffice correspondence regarding telephone call with Dr Warren Guy dated 22 August 1975 (USA.1000.0007.0276) Recipient, interoffice correspondence in relation to the determination and characterisation of trace fluorochemicals dated 26 August 1976 (USA.1000.0003.3862) Recipient, interoffice correspondence in relation to fluorochemicals in blood dated 3 November 1977 (USA.1000.0003.3908)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Attendee, meeting in relation to results of Animal Studies at I.R.D.C on 8 May 1978 as referred to in interoffice correspondence dated 10 May 1978 (HOL.0001.0009.3860)
					Attendee, meeting on 5 June 1978, as referred to in interoffice correspondence dated 1 June 1978 (USA.1000.0002.5151)
					Attendee, meeting in relation to fluorochemicals in blood on 22 May 1978 as referred to in interoffice correspondence dated 8 June 1978 (USA.0001.0001.0837)
					Recipient, interoffice correspondence in relation to a meeting regarding fluorochemicals in blood on 28 July 1978 dated 7 August 1978 (USA.1000.0002.5212)
					Attendee, meeting in relation to fluorochemicals in blood on 28 July 1978 as referred to in Minutes of Meeting dated 23 August 1978 (USA.0001.0002.8725)
					Referred to in correspondence to Dr Harold Hodge of the School of Medicine at the University of California in relation to fluorochemical toxicity studies and meeting on 12 April 1979 dated 12 February 1979 (USA.1000.0002.5153)
					Attendee, meeting in relation to Fluorochemicals in Blood Program on 12 April 1979 as referred to in interoffice correspondence dated 26 April 1979 (USA.0001.0001.1000) and 7 June 1979 (USA.1000.0002.2809)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Attendee, Meeting to review Fluorochemicals in Blood Program and to discuss future plans on 13 April 1979 (USA.1000.0001.1308) and recipient of Minutes dated 26 April 1979 (USA.1000.0001.1320) and 7 June 1979 (USA.1000.0001.1302) Recipient, Report titled ‘Absorption of FC-143-14C in Rats after a Single Oral Dose’ dated 28 December 1979 (HOL.0001.0002.5517) Recipient, Report titled ‘Extent and Route of Excretion and Tissue Distribution of Total Carbon-14 in Rats after a Single Intravenous Dose of FC-95-14-C’ dated 28 December 1979 (HOL.0001.0012.7859)
Perkins, R	At least 1992		Toxicology Services	Member, FC Tech Advisory Committee (from about 1992)	Attendee, Fluorochemicals Steering Committee Meeting on 21 July 1992, and recipient of Minutes dated 22 July 1992 (USA.0001.0002.8728)
Perkins, W	At least 1983		Unknown		Reviewer of scientific aspects of ‘Fate of Fluorochemicals – Phase II’ (1983) (USA.1000.0001.0241) proposal, (HOL.0001.0009.5040)
Pothapragada, V	At least 1978 to at least 2009		Speciality Materials Division Materials Resource Laboratory (at least 2009)	Member, FC Tech Review Committee (from about 1978) Member, FC Tech Advisory Committee (from about 1992)	Recipient, Technical Report Summary ‘Final Comprehensive Report on FM 3422’ dated 7 February 1979 (USA.1000.0001.0156) Recipient, Technical Report Summary ‘Final Comprehensive Report: FC 95’ dated 15 March 1979 (USA.1000.0001.0169)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, Technical Report Summary 'Final Comprehensive Report: FC 143' dated 23 March 1979 (USA.1000.0001.0181)
Povlaski, M	At least 1998		Unknown	Member, Exposure Assessment Team (from about 1998) Member, FC Working Group (from about 1998)	
Prokop, R A	At least 1978 to at least 1983		Commercial Chemicals Division	Fate of the Fluorochemicals Project member (from about 1978 to about 1983) Member, FC Tech Review Committee (from about 1978) Member, FC Tox Committee (from about 1981)	Recipient, interoffice correspondence in relation to the determination and characterisation of trace fluorochemicals dated 26 August 1976 (USA.1000.0003.3862) Recipient, internal correspondence 'Fluorochemicals in Blood' dated 9 August 1977 (USA.0001.0018.0080) Recipient, interoffice correspondence in relation to fluorochemicals in blood dated 3 November 1977 (USA.1000.0003.3908) Author, Minutes of Fate of Fluorochemical Project Informational Meeting on 24 February 1978, dated 28 February 1978 (USA.1000.0007.0282) Attendee, Fluorochemicals Technical Review Committee Meeting on 12 April 1978 (USA.1000.0001.0135) Attendee, meeting to discuss review of animal studies on 28 April 1978 (USA.1000.0003.3970)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Attendee, Fluorochemicals Technical Review Committee Meeting on 4 May 1978 (USA.1000.0002.5219)
					Recipient, Minutes of Fluorochemicals Technical Review Committee Meeting dated 10 May 1978 (USA.1000.0002.5219).
					Attendee, on 8 May 1978 in relation to results of Animal Studies at I.R.D.C on 8 May 1978 as referred to in interoffice correspondence dated 10 May 1978 (HOL.0001.0009.3860)
					Attendee, Meeting on 5 June 1978, as referred to in interoffice correspondence dated 1 June 1978 (USA.1000.0002.5151)
					Attendee, meeting in relation to fluorochemicals in blood on 22 May 1978 as referred to in interoffice correspondence dated 8 June 1978 (USA.0001.0001.0837)
					Recipient, internal laboratory memorandum regarding 'IRDC 137-092: FC-95/Monkey' dated 3 August 1978 (HOL.0001.0024.8955)
					Recipient, internal laboratory memorandum titled 'IRDC 137-092: FC095/Monkey' dated 4 August 1978 (USA.1000.0003.4025)
					Recipient, interoffice correspondence in relation a meeting on 28 July 1978 in relation to fluorochemicals in blood dated 7 August 1978 (USA.1000.0002.5212)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Attendee, meeting in relation to fluorochemicals in blood on 28 July 1978 as referred to in Minutes of Meeting dated 23 August 1978 (USA.0001.0002.8725) Recipient, Technical Report Summary 'Fate of Fluorochemical Project – Aquatic Toxicity Studies: FM 3925' dated 8 January 1979 (HOL.0001.0001.2857 at .2865) Recipient, Technical Report Summary 'Final Comprehensive Report on FM 3422' dated 7 February 1979 (USA.1000.0001.0156) Author and referred to in correspondence to Dr Harold Hodge of the School of Medicine at the University of California in relation to fluorochemical toxicity studies and meeting on 12 April 1979 dated 12 February 1979 (USA.1000.0002.5153) Recipient, Technical Report Summary 'Final Comprehensive Report: FC 95' dated 15 March 1979 (USA.1000.0001.0169) Recipient, Technical Report Summary 'Final Comprehensive Report: FC 143' dated 23 March 1979 (USA.1000.0001.0181) Attendee, meeting in relation to Fluorochemicals in Blood Program on 12 April 1979 as referred to in interoffice correspondence dated 26 April 1979 (USA.0001.0001.1000) and 7 June 1979 (USA.1000.0002.2809)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Attendee, Meeting to review Fluorochemicals in Blood Program and to discuss future plans on 13 April 1979 (USA.1000.0001.1308) and recipient of Minutes dated 26 April 1979 (USA.1000.0001.1320) and 7 June 1979 (USA.1000.0001.1302) Author, 3M Phone Conversation Report regarding a discussion with Eugene Berman, attorney for DuPont, in respect of 'Disclosure of information on levels of fluorochemicals in blood' dated 26 July 1979 (USA.1000.0001.0204) Recipient, Report titled 'Absorption of FC-143-14C in Rats after a Single Oral Dose' dated 28 December 1979 (HOL.0001.0002.5517) Recipient, Report titled 'Extent and Route of Excretion and Tissue Distribution of Total Carbon-14 in Rats after a Single Intravenous Dose of FC-95-14-C' dated 28 December 1979 (HOL.0001.0012.7859) Recipient, internal correspondence regarding a telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239) Attendee, meeting in relation to the fate of fluorochemicals on 16 August 1983 (USA.1000.0001.0375)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
Purdy, R	At least 1998		Scientist	Member, Exposure Assessment Team (from about 1998)	Author ‘Pioneer Risk Assessment of Adverse Effects in Marine Mammals from PFOS in the Food Chain’ dated 3 December 1998 (HOL.0001.0011.9420) Author, internal correspondence regarding Risk to the environment due to the presence of PFOS dated 12 March 1998 (USA.1000.0001.0596) Author, internal correspondence regarding Rich Purdy’s resignation dated 28 March 1999 (USA.1000.0001.0612)
Reagen, W K (Bill)	At least 1998 to at least 2008		Laboratory Manager (at least 2008)	Member, Exposure Assessment Team (from about 1998)	Tester, terminated study ‘PFOS And PFOAA Study in Goats’ initiated 19 May 1992 (USA.0001.0002.9136) Attendee, EHS&R Working Group on 10 August 1999, and recipient of Minutes dated 31 August 1999 (USA.0001.0001.3416)
Reed, K	At least 1998 to at least 2005		Unknown	Member, FC Core Team (from about 1998) Member, Environmental Strategy Team (from about 2005)	
Reese, D	At least 1984		Toxicology, 3M Germany		Recipient, internal memorandum titled ‘Modified OECD Screening Test on FC-203, FC-203A, and FC-600’ dated 9 July 1984 (HOL.0001.0020.1010)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
Reich, C	1968 to 2004		Division Vice President, Dental Products Division (1990-1997) Division Vice President Occupational Health and Environmental Safety (1997-1998) Group Vice President, Chemical Markets Group (1998) Executive Vice President, Speciality Materials and Communications Markets (1999-2001) Executive Vice President, Electro and Communications Markets (2001) Executive Vice President, Health Care Business (2002 - 2004)	Member, FC Core Team (from about 1998) Member, FC Working Group (from about 1998)	Author, Letter to the US EPA re TSCA Section 8(e) – Perfluorooctane Sulfonate dated 15 May 1998 (USA.1000.0001.0587) Author, ‘EPA Proposed Meeting’ dated in or about May 1998 (USA.0001.0002.8693) Attendee, meeting of the FC Core Issues Team on 14 May 1999 and recipient of Minutes dated 20 May 1999 ((USA.0001.0001.3343)) Maker of certain statements contained in 3M announcement dated 16 May 2000 (DEF.0003.0001.6617)
Reihle, P (also referred to as “Reichle”)	At least the early 1980s		Chemolite Factory Administration (1983) Speciality Chemical Division – Chemolite Centre (1984)	Member, FC Study Committee (from about the early 1980s) Member, FC Tox Committee (from about 1981)	Attendee, meeting of Fluorochemical Study Committee on 16 March 1983 and recipient of Minutes dated 8 April 1983 (USA.0001.0001.1343) Recipient, internal correspondence ‘Organic Fluorine Levels’ regarding fluorine measurements

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					in worker's blood dated 31 August 1984 (USA.1000.0003.4531)
Reiner, E A	At least 1976 to at least 1998		Environmental Lab, Environmental Engineering and Pollution Control (from about 1980)	Fate of the Fluorochemicals Project member (from about 1978 to about 1983) Member, Exposure Assessment Team (from about 1998)	Author, 3M internal memorandum titled 'Biodegradation Studies of Fluorocarbons – II' dated 9 January 1978 (USA.1000.0001.0113) Author, 3M internal memorandum titled 'Biodegradation Studies of Fluorocarbons – III' dated 19 July 1978 (USA.1000.0001.0139) Recipient, Technical Report Summary 'Fate of Fluorochemical Project – Aquatic Toxicity Studies: FM 3925' dated 8 January 1979 (HOL.0001.0001.2857 at .2865) Author, 'Biodegradation of "LIGHT WATER" Products in OECD Test' dated 30 June 1980 (HOL.0001.0001.2095) Requester, Product Ecological Assessment Request for Laboratory Work dated 24 January 1980 (HOL.0001.0026.6197) Contributor, 'Technical Awareness', German Agency Draft Report – Technical Communications Centre –201-2CN dated 7 March 1980 (HOL.0001.0001.9088) Recipient, Technical Report Summary 'Aquatic Toxicity Testing: FC-143 (Lot-37) L.R 5625' dated 8 May 1980 (HOL.0001.0005.2530 at .2532) Author, Technical Report Summary dated 30 June 1980 (HOL.0001.0030.8502)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Author, Technical Report Summary, 'Effect of Biodegradation on Foaming of "Light Water" Products' regarding FC-203, FC-206 and FC-3017 dated 6 August 1980 (HOL.0001.0018.4870)
					Recipient, Technical Report Summary, 'Aquatic Toxicity Testing: CS-2151, Lot 3 (LR 62608) dated 19 November 1980 (HOL.0001.0030.6698)
					Recipient, 'Daphnid Bioassay: CS-2151, Lot 3 (LR-64578)' dated 5 February 1981 (HOL.0001.0015.5042)
					Recipient, Technical Report Summary, 'Algal Assay: Bottle Test (AA:BT), Toxicity Testing FC-206C' dated 12 June 1981 (HOL.0001.0036.8586 at .8589)
					Recipient, Technical Report Summary, 'Algal Assay: Bottle Test (AA:BT), Toxicity Testing FC-206C dated 23 June 1981 (HOL.0001.0022.8805)
					Author, Letter to William Runyon of Andrews Airforce Base from E Reiner 'Disposal of Mil-spec AFFF Waste' dated 9 December 1981 (USA.1000.0001.1503)
					Recipient, Technical Report Summary 'Multi-Phase Exposure/Recovery Algal Assay Test Method' dated 16 December 1981 (HOL.0001.0008.3091 at .3094).
					Recipient, Technical Report Summary 'Multi-Phase Algal Assay Test Method' dated 30 December 1981 (HOL.0001.0015.0993 at .0996)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Author, internal correspondence ‘Mil-Spec AFFF BOD and COD testing’ dated 25 May 1982, attaching summary of BOD, Carbanaceous BOD and COD data on MIL-SPEC AFFF product (FC-203C) results obtained from external laboratories including Pace, Serco, Capsule, and Galbraith (HOL.0001.0024.5772) Author of ‘Fate of Fluorochemicals – Phase II’ (1983) (USA.1000.0001.0241) and reviewer recipient of studies referred to therein Author of ‘Questions and Answers on the Need for the Fate of Fluorochemicals Phase II study’ (1983) (HOL.0001.0008.1201) Author, Technical Report Summary ‘OECD Biodegradation Testing on FC-600 and FC-203’ dated 18 April 1983 (HOL.0001.0035.5369) Author, internal memorandum titled ‘Biodegradation tests’ dated 21 April 1983 (HOL.0001.0035.5369) Editor, Fate of Fluorochemicals – Phase II dated 20 May 1983 (HOL.0001.0009.9108) Recipient, internal correspondence regarding Fate of Fluorochemicals – Phase II dated 25 May 1983 (USA.1000.0001.0356) Author, Technical Report Summary ‘Repeat OECD Biodegradation Tests on FC-600 and FC-203’ dated 16 June 1983 (USA.0001.0018.0402)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, Technical Report Summary 'Aquatic Toxicity Testing: FC-600 (Belgium-AFFF) LR 9595 dated 21 July 1983 (HOL.0001.0018.9951 at .9954)
					Attendee, meeting in relation to the fate of fluorochemicals on 16 August 1983 (USA.1000.0001.0375)
					Author, internal memorandum titled 'Modified OECD Screening Test on FC-203, FC-203A, and FC-600' dated 9 July 1984 (HOL.0001.0020.1010)
					Author, Letter to Harry Torabi of US Army Corps of Engineers regarding the Disposal of Light Water Brand AFFF Agents dated 4 February 1987 (USA.1000.0001.1506)
					Recipient, Letter from Boots & Coots Fire Protective Equipment Inc dated 3 June 1988 (USA.1000.0001.0395)
					Author, internal correspondence, 'Results of Salmon Fry Bioassay on FC-2038' dated 28 December 1988 (HOL.0001.0021.8257 at .8260)
					Recipient, Internal correspondence regarding FC-129 Biodegradability dated 30 December 1988 (USA.0001.0018.0260)
					Recipient, internal correspondence dated 5 February 1992 regarding need for further studies and testing (USA.1000.0001.0437), also enclosing copy of internal memo 'Fate of Fluorochemicals

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Phase II' dated 25 May 1983 and 'Fate of Fluorochemicals - Phase II' (1983).
					Recipient, 3M internal correspondence regarding Fluorochemicals in the Environment dated 5 February 1992 (HOL.0001.0015.2327)
					Recipient, interoffice memorandum regarding a list of questions on several fluorochemical products dated 3 February 1994 (USA.1000.0001.0571)
					Author and Recipient, interoffice memorandum regarding Monitoring of Methyl Iodide in Air from FC-135, dated 4 February 1994 (USA.1000.0001.0571)
					Recipient, interoffice memorandum regarding a list of questions on several fluorochemical products, dated 11 February 1994 (USA.1000.0001.0571)
					Recipient, interoffice memorandum regarding FC-135 testing, dated 13 April 1994 (USA.1000.0001.0571)
					Author, interoffice memorandum regarding FC-135 testing recommendations, dated 15 April 1994 (USA.1000.0001.0571)
					Recipient, interoffice memorandum regarding FC-135 testing dated 19 April 1994 (USA.1000.0001.0571)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Author, interoffice memorandum regarding FC-135 testing dated 22 April 1994 (USA.1000.0001.0571) Author ‘Environmentally Relevant Properties of 3M Fluorochemicals’ (1998) (HOL.0001.0025.8775) Recipient, internal correspondence regarding Rich Purdy’s resignation dated 28 March 1999 (USA.1000.0001.0612)
Renner, R	At least 1998 to at least 2000		Public Relations and Corporate Communications (at least 2000)	Member, Exposure Assessment Team (from about 1998) Member, FC Core Team (from about 1998)	Recipient, Email ‘FC’s and Past Disposal Sites’ dated 1 September 1998 (USA.0001.0001.3217) Recipient, Email from M Santoro, ‘Cottage Grove Wells’ which refers to levels of PFOS and PFOA exceeding drinking water health advisory levels at Well No 5 at Cottage Grove, and that about 80% of the plant had been using bottled water for drinking since the mid-1980s, dated 3 July 2001 (USA.0001.0001.3798)
Ricker, D R	At least 1978 to at least 1983		Commercial Chemicals Division (at least 1978 to 1983) Speciality Adhesives & Chemicals Division Quality Assurance (unknown)	Fate of the Fluorochemicals Project member (from about 1978 to about 1983)	Author, 3M interoffice correspondence in relation to Toxicity Testing of FC-95, CC 7410-16 dated 16 October 1974 (HOL.0001.0035.2242) Recipient, internal memorandum ‘Fate of Fluorochemical Project Informational Meeting 24 February 1978’ dated 28 February 1978 (USA.1000.0007.0282) Recipient, Technical Report Summary ‘Fate of Fluorochemical Project – Aquatic Toxicity

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Studies: FM 3925' dated 8 January 1979 (HOL.0001.0001.2857 at .2865) Recipient, Technical Report Summary, 'Bioaccumulation of fluorochemicals in Tenn. River Fish' dated 22 May 1979 (USA.1000.0001.0194) Recipient, Technical Report Summary titled 'Photolysis of FM 3422 on Soil relating to Fate of Fluorochemicals' dated 10 December 1979 (HOL.0001.0010.1955) Recipient, Technical Report Summary titled 'Fluorochemicals in Tennessee River Fish relating to 78-2740', dated 28 December 1979 (HOL.0001.0001.0370 at .0375) Recipient, internal correspondence 'Effect of Biodegradation of Foaming of "Light Water" Products' dated 6 August 1980 regarding FC-203, FC-206 and FC-3017 (HOL.0001.0018.4870) Recipient, Letter to William Runyon of Andrews Airforce Base from E Reiner 'Disposal of Mil-spec AFFF Waste' dated 9 December 1981 (USA.1000.0001.1503) Recipient, internal correspondence 'Mil-Spec AFFF BOD and COD testing' attaching summary of BOD, Carbanaceous BOD and COD data on MIL-SPEC AFFF product (FC-203C) results obtained from external laboratories including Pace, Serco, Capsule, and Galbraith dated 25 May 1982 (HOL.0001.0024.5772)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, internal memorandum titled 'Biodegradation tests' dated 21 April 1983 (HOL.0001.0035.5369)
					Recipient, internal correspondence 'Fate of Fluorochemicals Phase II' dated 25 May 1983 (USA.1000.0001.0356), including copy of 'Fate of Fluorochemicals – Phase II' dated 1983 (USA.1000.0001.0241)
					Recipient, internal correspondence, 'Skin Absorption Studies on Surfactants' attaching final reports from Riker Safety Evaluation dated 26 September 1983 (HOL.0001.0014.5808)
					Recipient, internal memorandum 'Modified OECD Screening Test on FC-203, FC-203A, and FC-600' dated 9 July 1984 (HOL.0001.0020.1010)
					Recipient (copy), Letter to Harry Torabi of US Army Corps of Engineers 'Disposal of Light Water Brand AFFF Agents' dated 4 February 1987 (USA.1000.0001.1506)
					Recipient, internal correspondence, 'Results of Salmon Fry Bioassay on FC-2038' dated 28 December 1988 (HOL.0001.0021.8257 at .8260)
					Recipient/author, internal correspondence regarding FC-129 Biodegradability dated 30 December 1988 (USA.0001.0018.0260)
					Recipient, internal correspondence regarding need for further studies and testing dated

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					5 February 1992 (USA.1000.0001.0437) also enclosing copy of internal memo 'Fate of Fluorochemicals Phase II' dated 25 May 1983 and 'Fate of Fluorochemicals - Phase II' dated 1983 Recipient, 3M internal correspondence regarding Fluorochemicals in the Environment dated 5 February 1992 (HOL.0001.0015.2327)
Ridlehoover, A	At least 1984		Unknown	Unknown	Recipient, internal correspondence 'Organic Fluorine Levels' regarding fluorine measurements in worker's blood dated 31 August 1984 (USA.1000.0003.4531)
Roach, D	At least the early 1980s		Medical Department (1983)	Member, FC Study Committee (from about the early 1980s) Member, FC Tox Committee (from about 1981)	Recipient, internal correspondence regarding a telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239) Attendee, meeting of Fluorochemical Study Committee on 16 March 1983 and recipient of Minutes dated 8 April 1983 (USA.0001.0001.1343) Author, internal correspondence regarding Organic Fluorine Levels dated 31 August 1984 (USA.1000.0003.4531)
Rosenthal, A L	At least 1978		Unknown	Member, FC Tech Review Committee (from about 1978)	Attendee, Fluorochemicals Technical Review Committee Meeting on 12 April 1978 (USA.1000.0001.0135)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, Minutes of Meeting to discuss review of animal studies on 28 April 1978 (USA.1000.0003.3970) Attendee, Fluorochemicals Technical Review Committee Meeting on 4 May 1978 (USA.1000.0002.5219) Recipient, Minutes of Fluorochemicals Technical Review Committee Meeting dated 10 May 1978 (USA.1000.0002.5219) Recipient, Report titled ‘Absorption of FC-143-14C in Rats after a Single Oral Dose’ dated 28 December 1979 (HOL.0001.0002.5517) Recipient, Report titled ‘Extent and Route of Excretion and Tissue Distribution of Total Carbon-14 in Rats after a Single Intravenous Dose of FC-95-14-C’ dated 28 December 1979 (HOL.0001.0012.7859)
Sanchez, S	At least 1998		Unknown	Member, FC Working Group (from about 1998)	
Sanders, D	At least 1992 to at least 1998		Life Cycle Management (at least 1999)	Member, Exposure Assessment Team (from about 1998) Member, FC Core Team (from about 1998) Member, FC Working Group (from about 1998)	Attendee, meeting of the FC Core Issues Team on 14 May 1999, and recipient of Minutes dated 20 May 1999 (USA.0001.0001.3343) Attendee, EHS&R Working Group on 10 August 1999, and recipient of Minutes dated 31 August 1999 (USA.0001.0001.3416)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
				Member, FC Steering Committee (from about 1992)	
Santoro, M A	At least 1978 to at least 2005		Scientist, Environmental Engineering and Pollution Control (at least 1978) Manager, Environmental Engineering & Pollution Control (at least 1984) Environmental Operations Manager (at least 1996) Director, Environmental, Health, Safety & Regulator Affairs (at least 2003) Director, Health and Safety (at least 2005)	Member, Exposure Assessment Team (from about 1998) Member, FC Core Team (from about 1998) Member, Environmental Strategy Team (from about 2005)	Author, 'Minnesota Mining and Manufacturing Company's Hazardous Waste Program' (1978) <i>Environmental Health Perspectives</i> 27, pp 245-249 (HOL.0001.0059.0001) Recipient, Email 'FC's and Past Disposal Sites' dated 1 September 1998 (USA.0001.0001.3217) Attendee, Meeting of the FC Core Issues Team on 14 May 1999, and recipient of Minutes dated 20 May 1999 (USA.0001.0001.3343) Attendee, EHS&R Working Group on 10 August 1999, and recipient of Minutes dated 31 August 1999 (USA.0001.0001.3416) Recipient, internal correspondence 'Screening-Level Risk Assessment for Organofluorine Substances in Philippines Well Water' dated 25 July 2000 (USA.1000.0003.6255) Author, Email 'Cottage Grove Wells' which refers to levels of PFOS and PFOA exceeding drinking water health advisory levels at Well No 5 at Cottage Grove, and that about 80% of the plant had been using bottled water for drinking since the mid-1980s, dated 3 July 2001 (USA.0001.0001.3798)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
Scheuerman, T J	1976 to at least 1992		Assistant General Counsel (1976-1986) Associate General Counsel (1986 to at least 1992)	Fate of the Fluorochemicals Project member (from about 1978) Member, FC Tech Review Committee (from about 1978) Member, FC Study Committee (from about 1983)	Recipient, internal correspondence 'Fluorochemicals in Blood' dated 9 August 1977 (USA.0001.0018.0080) Recipient, Minutes of 'Fate of Fluorochemical Project Informational Meeting on 24 February 1978' dated 28 February 1978 (USA.1000.0007.0282) Recipient, Minutes of Fluorochemicals Technical Review Committee Meeting dated 12 April 1978 (USA.1000.0001.0135) Recipient, Minutes of Meeting to discuss review of animal studies on 28 April 1978 (USA.1000.0003.3970) Recipient, Minutes of Fluorochemicals Technical Review Committee Meeting dated 4 May 1978 (USA.1000.0002.5219). Attendee, on 8 May 1978 in relation to results of Animal Studies at I.R.D.C on 8 May 1978 as referred to in interoffice correspondence dated 10 May 1978 (HOL.0001.0009.3860) Attendee, meeting on 5 June 1978, as referred to in interoffice correspondence dated 1 June 1978 (USA.1000.0002.5151) Attendee, meeting in relation to fluorochemicals in blood on 22 May 1978 as referred to in interoffice correspondence dated 8 June 1978 (USA.0001.0001.0837)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Attendee, Meeting in relation to fluorochemicals in blood on 12 July 1978 as referred to in interoffice correspondence dated 26 May 1978 (USA.1000.0002.5149) Recipient, Phone Conversation Report regarding a telephone call between R Prokop and Eugene Berman Dupont 'Disclosure of Information on Levels of Fluorochemicals in Blood' dated 26 July 1979 (USA.1000.0001.0204) Recipient, internal correspondence regarding a telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239) Attendee, Meeting of Fluorochemical Study Committee on 16 March 1983 and recipient of Minutes dated 8 April 1983 (USA.0001.0001.1343)
Schwartz, C	At least 1998		Unknown	Member, Exposure Assessment Team (from about 1998) Member, FC Working Group (from about 1998)	
Scown, W (Bill)	Approximately 1971 to 1985		Marketing Manager, Commercial Chemicals Division (from about 1971 to about 1973)	Member, FC Tech Review Committee (from about 1978)	Recipient, internal correspondence regarding telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			National Sales Manager, Industrial Chemicals Products (from about 1973 to about 1981) Business Development Manager (1981 to about 1985) Commercial Chemicals Division Marketing (1983)	Member, FC Tox Committee (from about 1981) Member, FC Study Committee (from about 1983)	Attendee, Meeting on 16 March 1983 of Fluorochemical Study Committee and recipient of Minutes dated 8 April 1983 (USA.0001.0001.1343)
Sevareid, P L	At least 1981		Unknown		Recipient, internal correspondence regarding a telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239)
Short, A	At least 1998		Unknown	Member, Exposure Assessment Team (from about 1998)	
Sonstegard, D	At least 1984 to at least 1998		Sector Executive, Orthopaedic Products, Life Sciences Sector (1984- 1986) Executive, Research and Development, Life Sciences Sector (1986 – to at least 1992) Vice President, Environmental	Member, FC Core Team (from about 1998)	Recipient, internal correspondence regarding Rich Purdy's resignation dated 28 March 1999 (USA.1000.0001.0612) Attendee, Meeting of the FC Core Issues Team on 14 May 1999, and recipient of Minutes dated 20 May 1999 (USA.0001.0001.3343)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Technology and Safety (unknown)		
Sorenson, S	At least 1978 to at least 1983		Industrial Hygiene Services (1983)	Member, FC Tech Review Committee (from about 1978) Member, FC Study Committee (from about 1983) Member, FC Tech Advisory Committee (from about 1992) Member, FC Exposure Team (from about 1998)	Attendee, Fluorochemicals Technical Review Committee Meeting on 3 April 1978, and recipient of Minutes dated 4 May 1978 (USA.1000.0002.5219) Recipient, Minutes of Fluorochemicals Technical Review Committee Meeting dated 10 May 1978 (USA.1000.0002.5219) Author, 'Health status of plant workers exposed to fluorochemicals, a preliminary report' (1980), <i>American Industrial Hygiene Association Journal</i> 41, pp 584-589 (USA.1000.0016.6905) Recipient, internal correspondence regarding a telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239) Attendee, meeting of Fluorochemical Study Committee on 16 March 1983 and recipient of Minutes dated 8 April 1983 (USA.0001.0001.1343) Author and Recipient, interoffice memorandum regarding Monitoring of Methyl Iodide in Air from FC-135 dated 4 February 1994 (USA.1000.0001.0571)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, internal correspondence regarding Organic Fluorine Levels dated 31 August 1984 (USA.1000.0003.4531)
Stanek, D	At least 1992		Speciality Adhesives and Chemicals Division Analytical (at least 1992)	Member, FC Tech Advisory Committee (from about 1992)	
Sugg, J	At least 1983 to at least 1998		Industrial Hygiene Administration (at least 1983)	Member, EHS&R Working Group (from about 1998) Member, Exposure Assessment Team (from about 1998) Member, FC Exposure Team (from about 1998) Member, FC Working Group (from about 1998) Member, FC Study Committee (from about 1983) Member, FC Steering Committee	Attendee, meeting on 16 March 1983 of Fluorochemical Study Committee and recipient of Minutes dated 8 April 1983 (USA.0001.0001.1343) Attendee, Fluorochemicals Steering Committee Meeting on 21 July 1992, and recipient of Minutes dated 22 July 1992 (USA.0001.0002.8728) Attendee, EHS&R Working Group on 10 August 1999, and recipient of Minutes dated 31 August 1999 (USA.0001.0001.3416)
Theissen, D	At least 1992		Corporate Product Responsibility (at least 1992)	Member, FC Steering Committee (from 1992)	Attendee, Fluorochemicals Steering Committee Meeting on 21 July 1992, and recipient of Minutes dated 22 July 1992 (USA.0001.0002.8728)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
Thwaites, J A	At least 1964 to at least 1987	Director (1968-1987) Director - 3M Australia (1968-1972, 1975-1981)	Division Officer, International (1964-1965) Division Officer, International, Engineering and Manufacturing International Division (1966-1967) Group Vice President, Afro-Asian and Canadian Area (1968-1971) Group Vice President, Tape and Allied Product (1972-1973) Group Vice President, International (1974) President, International Operations (1975-1987) President, International Operations and Corporate Staff Services (1981-1987)		Attendee, Meeting of Directors where Dr R Adams of the Corporate Responsibility Committee reported on the results of further fluorochemical studies, on 12 May 1981 (HOL.0001.0007.8120)
Ting, S	At least 1992		Fluorochemical Technology Centre	Member, FC Steering Committee (from about 1992)	

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
Telfer, A K	1939 to 1973		Plant Manager at Copley Group Production Manager General Manager, Colour and Sulfuric Acid Division (from about 1952) General Manager, Chemical Division (1960) Vice President, Chemical Division (1960-1973)		Recipient, interoffice memorandum from Dr J T Ling (Environmental Engineering and Pollution Control, 3M) to various 3M personnel regarding Chemolite monthly water report with central analytical laboratory report No 3873 dated 3 November 1960 (USA.1000.0003.3605) Recipient, 3M interoffice memorandum titled 'Ecological Aspects of Fluorocarbons' dated 13 September 1971 (USA.1000.0001.0053)
Trepp, P	At least 1998		Unknown	Member, Exposure Assessment Team (from about 1998)	
Tronsen, W J	At least 1978		Unknown	Member, FC Tech Review Committee (from about 1978)	Attendee, Fluorochemicals Technical Review Committee Meeting on 4 May 1978 (USA.1000.0002.5219) Recipient, Minutes of Fluorochemicals Technical Review Committee Meeting dated 10 May 1978 (USA.1000.0002.5219)
Ubel, F	At least 1979 to at least 1988		Medical Department (1979-1986) Executive, Medical (1987-1988)	Member, FC Tech Review Committee (from about 1978)	Recipient, correspondence to Warf Institute in relation to eye and skin irritation testing, dated 24 October 1974 (HOL.0001.0035.2242) Recipient, 3M interoffice correspondence regarding reports on the primary skin irritation and eye irritation assessment conducted with FC-

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					95, dated 14 November 1974 (HOL.0001.0035.2242)
					Recipient, interoffice correspondence in relation to the determination and characterisation of trace fluorochemicals dated 26 August 1976 (USA.1000.0003.3862)
					Recipient, internal correspondence 'Fluorochemicals in Blood' dated 9 August 1977 (USA.0001.0018.0080)
					Recipient, interoffice correspondence in relation to fluorochemicals in blood dated 3 November 1977 (USA.1000.0003.3908)
					Attendee, Fluorochemicals Technical Review Committee Meeting on 12 April 1978 (USA.1000.0001.0135)
					Recipient, Minutes of Meeting to discuss review of animal studies on 28 April 1978 (USA.1000.0003.3970)
					Attendee, Fluorochemicals Technical Review Committee Meeting on 4 May 1978 (USA.1000.0002.5219)
					Attendee, meeting in relation to results of Animal Studies at I.R.D.C on 8 May 1978 as referred to in interoffice correspondence dated 10 May 1978 (HOL.0001.0009.3860)
					Attendee, Meeting in relation to fluorochemicals in blood on 12 July 1978, as referred to in

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					interoffice correspondence dated 26 May 1978 (USA.1000.0002.5149)
					Recipient, Minutes of Fluorochemicals Technical Review Committee Meeting dated 10 May 1978 (USA.1000.0002.5219)
					Attendee, meeting in relation to fluorochemicals in blood on 22 May 1978 as referred to in interoffice correspondence dated 8 June 1978 (USA.0001.0001.0837)
					Attendee, meeting on 5 June 1978, as referred to in interoffice correspondence dated 1 June 1978 (USA.1000.0002.5151)
					Recipient, interoffice correspondence in relation a meeting regarding fluorochemicals in blood on 28 July 1978 dated 7 August 1978 (USA.1000.0002.5212)
					Attendee, meeting regarding fluorochemicals in blood on 28 July 1978 as referred to in Minutes dated 23 August 1978 (USA.0001.0002.8725)
					Referred to in correspondence to Dr Harold Hodge of the School of Medicine at the University of California in relation to fluorochemical toxicity studies and meeting on 12 April 1979, dated 12 February 1979 (USA.1000.0002.5153)
					Attendee, meeting in relation to Fluorochemicals in Blood Program on 12 April 1979 as referred to in interoffice correspondence dated 26 April 1979 (USA.0001.0001.1000) and 7 June 1979 (USA.1000.0002.2809)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Attendee, meeting to review Fluorochemicals in Blood Program and to discuss future plans on 13 April 1979 (USA.1000.0001.1308) and recipient of Minutes dated 26 April 1979 (USA.1000.0001.1320) and 7 June 1979 (USA.1000.0001.1302) Recipient, Phone Conversation Report of telephone call between R Prokop and Eugene Berman Dupont on 26 July 1979 (USA.1000.0001.0204) Recipient, Report titled 'Absorption of FC-143-14C in Rats after a Single Oral Dose' dated 28 December 1979 (HOL.0001.0002.5517) Recipient, Report titled 'Extent and Route of Excretion and Tissue Distribution of Total Carbon-14 in Rats after a Single Intravenous Dose of FC-95-14-C' dated 28 December 1979 (HOL.0001.0012.7859) Recipient, internal correspondence regarding a telephone call between L.F Ludford and Karl Stark, a staff reporter at the Bucks County, Pennsylvania Courier Times dated 8 September 1981 (USA.1000.0001.0239) Recipient of Minutes of Meeting of Fluorochemical Study Committee dated 8 April 1983 (USA.0001.0001.1343) Recipient, internal correspondence 'Skin Absorption Studies on Surfactants' dated 26 September 1983 (HOL.0001.0014.5808)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Recipient, internal correspondence regarding Organic Fluorine Levels dated 31 August 1984 (USA.1000.0003.4531)
Walker, J	At least 1998 to at least 2004		Business Unit Executive, Speciality Materials Manufacturing, Speciality Materials Markets (from at least 2001 to 2004)	Member, FC Exposure Team (from about 1998) Member, FC Working Group (from about 1998)	
Welter, A N	At least 1977 to at least 1979		Environmental Lab, Environmental Engineering and Pollution Control	Fate of the Fluorochemicals Project member (from about 1977 to about 1979)	Recipient, Technical Report Summary 'Bioconcentration of FM 3422 in Bluegill Sunfish and In Channel Catfish' dated 17 May 1977 (USA.1000.0001.0096) Author, Technical Report Summary 'Aquatic Fate of A Fluorochemical: FM 3422' dated 14 October 1977 (USA.1000.0001.0096) Recipient, Minutes from Fate of Fluorochemical Project Informational Meeting on 24 February 1978, dated 28 February 1978 (USA.1000.0007.0282) Author, Technical Report Summary 'Fate of Fluorochemical Project – Aquatic Toxicity Studies: FM 3925' dated 8 January 1979 (HOL.0001.0001.2857 at .2865) Author, Technical Report Summary 'Final Comprehensive Report on FM 3422' dated 7 February 1979 (USA.1000.0001.0156)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
					Author, Technical Report Summary ‘Final Comprehensive Report: FC 95’ dated 15 March 1979 (USA.1000.0001.0169) Author, Technical Report Summary ‘Final Comprehensive Report: FC 143’ dated 23 March 1979 (USA.1000.0001.0181) Recipient, Technical Report Summary ‘Bioaccumulation of fluorochemicals in Tenn. River Fish’ dated 22 May 1979 (USA.1000.0001.0194) Recipient, Technical Report Summary titled ‘Photolysis of FM 3422 on Soil’ relating to Fate of Fluorochemicals dated 10 December 1979 (HOL.0001.0010.1955) Recipient, Technical Report Summary ‘Multi-Phase Exposure/Recovery Algal Assay Test Method’ dated 16 November 1981 (HOL.0001.0008.3091 at .3094) Recipient, Technical Report Summary ‘Multi-Phase Exposure/Recovery Algal Assay Test Method’ dated 16 December 1981 (HOL.0001.0008.3091 at .3094) Recipient, Technical Report Summary ‘Multi-Phase Algal Assay Test Method’ dated 30 December 1981 (HOL.0001.0015.0993 at .0996)
Wendling, L	At least 1992 to at least 2015		Executive, Performance Materials, Industrial	Member, FC Steering Committee (from about 1992)	Attendee, EHS&R Working Group on 10 August 1999, and recipient of Minutes dated 31 August 1999 (USA.0001.0001.3416)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Business (at least 2001 to 2002) Executive, Corporate Research (2003-2005)	Member, Exposure Assessment Team (from about 1998) Member, FC Core Team (from about 1998) Member, FC Working Group (from about 1998)	
Weppner, W	At least 1992 to 2000		Director, Environmental Health, Safety & Regulatory Affairs, Chemical Markets Group (from about 1998) Director, Environmental Health, Safety & Regulatory Affairs, Speciality Materials Markets (from about 2000)	Member, FC Steering Committee (from about 1992) Member, EHS&R Working Group (from about 1998) Member, Exposure Assessment Team (from about 1998) Member, FC Core Team (from about 1998) Member, FC Working Group (from about 1998)	Sponsor, terminated study 'PFOS And PFOAA Study in Goats' initiated 19 May 1992 (USA.0001.0002.9136) Attendee, Meeting of the FC Core Issues Team on 14 May 1999, and recipient of Minutes dated 20 May 1999 (USA.0001.0001.3343) Attendee, EHS&R Working Group on 10 August 1999, and recipient of Minutes dated 31 August 1999 (USA.0001.0001.3416) Author, Letter to Dr Charles Auer, US EPA dated 18 May 2000 enclosing information on PFOS and related compounds (USA.1000.0002.3163)
West, A	At least the early 1980s		Commercial Chemicals Lab (at least 1983)	Member, FC Study Committee (from about the early 1980s)	Attendee, meeting of Fluorochemical Study Committee on 16 March 1983 and recipient of Minutes dated 8 April 1983 (USA.0001.0001.1343)
Wolfe, R N	At least 1973 to 1980	Director, Board of Directors (1973-1980)	Group Vice President, Advertising Services and Protective Products (1973-1978)	Corporate Responsibility Committee (1975-1980) Executive Committee (1973-1980)	Attendee, Corporate Responsibility Committee presentations in February 1977 and November 1977 (USA.0001.0001.0695)

Table A, Part I

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
			Senior Vice President, Engineering and manufacturing (1979-1980)	Finance Committee (1976-1980)	
Zappa, J	At least 1998		Lawyer	Member, FC Working Group (from about 1998)	
Zeitz, A	At least 1998		Unknown	Member, Exposure Assessment Team (from about 1998) Member, FC Working Group (from about 1998)	
Zimmerman, R	At least 1998		Unknown	Member, Exposure Assessment Team (from about 1998) Member, FC Working Group (from about 1998)	
Zobel, L	At least 1992 to at least 2005		Staff Vice President and Medical Director, Medical Department (from about 1998) Occupational Health Physician Executive, Medical (at least 2000 to 2005)	Member, FC Steering Committee (from about 1992) Member, Exposure Assessment Team (from about 1998) Member, FC Core Team (from about 1998) Member, FC Working Group (from about 1998)	Attendee, Fluorochemicals Steering Committee Meeting on 21 July 1992, and recipient of Minutes dated 22 July 1992 (USA.0001.0002.8728) Attendee, meeting of the FC Core Issues Team on 14 May 1999, and recipient of Minutes dated 20 May 1999 (USA.0001.0001.3343) Attendee, EHS&R Working Group on 10 August 1999, and recipient of Minutes dated 31 August 1999 (USA.0001.0001.3416)

Name	Years at 3M	Director of 3M	Employee Positions or Roles at 3M	Fluorochemical Project or Committee Memberships	Reports or information authored, obtained or received
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Table A, Part II: Committees and Projects

Name	Ecological Aspects of Fluorocarbons Project	Fluorochemicals in Blood investigation	Fate of Fluorochemicals Project	FC Tech Review Committee	Corporate Responsibility Committee	FC Study Committee	FC Tox Committee	FC Steering Committee	FC Tech Advisory Committee	EHS&R Working Group	Exposure Assessment Team	FC Core Team	FC Exposure Team	FC Working Group
Adams, G L										Y - from about 1998	Y – from about 1998			Y - from about 1998
Adams, R					Y – from about 1975 to about 1985									
Ahlness, R L				Y – from about 1978										
Allison, J										Y - from about 1998		Y - from about 1998		Y - from about 1998
Bacon, D L			Y - from about 1978					Y - from about 1992		Y - from 1998	Y - from about 1998	Y - from about 1998		Y - from about 1998
Baratto, J														Y - from about 1998
Beach, S											Y - from about 1998			
Belisle, J			Y - from about 1978											
Boardman, T														Y - from about 1998
Bohon, R L			Y - from about 1978			Y - from about 1983								

Table A, Part II

Name	Ecological Aspects of Fluoro-carbons Project	Fluoro-chemicals in Blood investigation	Fate of Fluoro-chemicals Project	FC Tech Review Committee	Corporate Responsibility Committee	FC Study Committee	FC Tox Committee	FC Steering Committee	FC Tech Advisory Committee	EHS&R Working Group	Exposure Assessment Team	FC Core Team	FC Exposure Team	FC Working Group
Boyd, J								Y - from about 1992						Y - from about 1998
Burton, C								Y – from about 1992	Y - from about 1992	Y - from about 1998	Y - from about 1998			
Bryce, H M	Y - approx. 1971													
Butenhoff, J								Y – from about 1992		Y - from 1998	Y - from about 1998			Y - from about 1998
Case, M				Y - from about 1978		Y - from about 1983					Y - from about 1998			Y - from about 1998
Cove, L									Y - from about 1992					
Cowman, C									Y – from about 1992					
Davis, R			Y - from about 1978			Y - from about 1983	Y - from about 1981							
Dick, L											Y - from about 1998			
DiPasquale, T								Y - from about 1992				Y - from about 1998		Y - from about 1998
Dougherty, M											Y - from about 1998	Y - from about 1998		Y - from about 1998

Table A, Part II

Name	Ecological Aspects of Fluorocarbons Project	Fluorochemicals in Blood investigation	Fate of Fluorochemicals Project	FC Tech Review Committee	Corporate Responsibility Committee	FC Study Committee	FC Tox Committee	FC Steering Committee	FC Tech Advisory Committee	EHS&R Working Group	Exposure Assessment Team	FC Core Team	FC Exposure Team	FC Working Group
Dworak, D														Y - from about 1998
Falco, M												Y - from about 1998		
Favorite, J			Y - from about 1978											
Fenner, M														Y - from about 1998
Fischer, D			Y - from about 1978											
Gahlon, D												Y - from about 1998		
Garry, D											Y - from about 1998			Y - from about 1998
Gordon, S									Y - from about 1992					
Green, C			Y - from about 1978											
Gregory, J														Y - from about 1998
Griffith, F				Y - from about 1978			Y - from about 1981							
Guthrie, D R					Y - 1977									

Table A, Part II

Name	Ecological Aspects of Fluorocarbons Project	Fluorochemicals in Blood investigation	Fate of Fluorochemicals Project	FC Tech Review Committee	Corporate Responsibility Committee	FC Study Committee	FC Tox Committee	FC Steering Committee	FC Tech Advisory Committee	EHS&R Working Group	Exposure Assessment Team	FC Core Team	FC Exposure Team	FC Working Group
Hagen, D			Y - from about 1978											
Hakes, D											Y - from about 1998			
Hansen, P														Y - from about 1998
Harnetty, M														Y - from about 1998
Hohenstein, G														
Howell, R									Y - from about 1992					
Hunter, J											Y - from about 1998			
Ihlenfeld, J								Y - from about 1992						Y - from about 1998
Johnson, J (Jim)				Y - from about 1978		Y - as at 1983			Y - from about 1992					
Johnson, T											Y - from about 1998		Y - from about 1998	
Krall, J			Y - from about 1978											
Krogh, L							Y - from about 1981							
Kuhrmeyer, C A					Y - 1977									

Table A, Part II

Name	Ecological Aspects of Fluorocarbons Project	Fluorochemicals in Blood investigation	Fate of Fluorochemicals Project	FC Tech Review Committee	Corporate Responsibility Committee	FC Study Committee	FC Tox Committee	FC Steering Committee	FC Tech Advisory Committee	EHS&R Working Group	Exposure Assessment Team	FC Core Team	FC Exposure Team	FC Working Group
LaZerte, J (Don)			Y - from about 1978	Y - about 1978 onwards										
Logan, P													Y - from about 1998	
Lohmiller, L							Y - from about 1981							
Long, J E				Y - about 1978 onwards										
Looney, L														Y - from about 1998
Ludford, L							Y - from about 1981							
Magill, L			Y - from about 1978	Y - from about 1978					Y - from about 1992					
Mandel, J									Y - from about 1992	Y - from about 1998	Y - from about 1998		Y - from about 1998	Y - from about 1998
Marhevka, J									Y - from about 1992					
McCormick, W				Y - from about 1978		Y - from about the early 1980s								
McNamara, M											Y - from about 1998			
Mendel, A			Y - from about 1977 to about 1980											

Table A, Part II

Name	Ecological Aspects of Fluorocarbons Project	Fluorochemicals in Blood investigation	Fate of Fluorochemicals Project	FC Tech Review Committee	Corporate Responsibility Committee	FC Study Committee	FC Tox Committee	FC Steering Committee	FC Tech Advisory Committee	EHS&R Working Group	Exposure Assessment Team	FC Core Team	FC Exposure Team	FC Working Group
Millet, G												Y - from about 1998		
Moore, G											Y - from about 1998			
Mutsch, E				Y - from about 1978										
Myers, B											Y - from about 1998			
Nash, M										Y - from about 1998	Y - from about 1998			Y - from about 1998
Nelson, R				Y - from about 1978										
Nelson, W												Y - from about 1998		
Norberg, A						Y - from about the early 1980s								
Ober, R				Y - from about 1978										
Olsen, G											Y - from about 1998		Y - from about 1998	
Olson, C									Y - from about 1992					
Ordway Jr, J G					Y - 1977									
Palmquist, J														Y - from about 1998

Table A, Part II

Name	Ecological Aspects of Fluorocarbons Project	Fluorochemicals in Blood investigation	Fate of Fluorochemicals Project	FC Tech Review Committee	Corporate Responsibility Committee	FC Study Committee	FC Tox Committee	FC Steering Committee	FC Tech Advisory Committee	EHS&R Working Group	Exposure Assessment Team	FC Core Team	FC Exposure Team	FC Working Group
Paschke, R A (Bob)														
Pauly, D							Y - from about 1981							
Pearlson, W (Bill) H				Y - about 1978 onwards		Y - from early 1980s	Y - from about 1981							
Perkins, R									Y - from about 1992					
Pothapragada, V				Y - from about 1978					Y - from about 1992					
Povlaski, M											Y - from about 1998			Y - from about 1998
Prokop, R A			Y - from about 1978 to about 1983	Y - from about 1978			Y - from about 1981							
Purdy, R											Y - from about 1998			
Reagen, B											Y - from about 1998			
Reed, K												Y - from about 1998		
Reich, C												Y - from about 1998		Y - from about 1998

Table A, Part II

Name	Ecological Aspects of Fluorocarbons Project	Fluorochemicals in Blood investigation	Fate of Fluorochemicals Project	FC Tech Review Committee	Corporate Responsibility Committee	FC Study Committee	FC Tox Committee	FC Steering Committee	FC Tech Advisory Committee	EHS&R Working Group	Exposure Assessment Team	FC Core Team	FC Exposure Team	FC Working Group
Reichle, P						Y - from about the early 1980s	Y - from about 1981							
Reiner, E A			Y - from about 1978 to about 1983								Y - from about 1998			
Renner, R											Y - from about 1998	Y - from about 1998		
Ricker, D R			Y - from about 1978 to about 1983											
Roach, D						Y - from about the early 1980s	Y - from about 1981							
Rosenthal, A				Y - from about 1978										
Sanchez, S														Y - from about 1998
Sanders, D								Y - from about 1992			Y - from about 1998	Y - from about 1998		Y - from about 1998
Santoro, M											Y - from about 1998	Y - from about 1998		
Scheureman, T J			Y - from about 1978	Y - from about 1978		Y - from about 1983								

Table A, Part II

Name	Ecological Aspects of Fluorocarbons Project	Fluorochemicals in Blood investigation	Fate of Fluorochemicals Project	FC Tech Review Committee	Corporate Responsibility Committee	FC Study Committee	FC Tox Committee	FC Steering Committee	FC Tech Advisory Committee	EHS&R Working Group	Exposure Assessment Team	FC Core Team	FC Exposure Team	FC Working Group
Schwartz, C											Y - from about 1998			Y - from about 1998
Scown, W (Bill)				Y - from about 1978		Y - from about 1983	Y - from about 1981							
Short, A											Y - from about 1998			
Sonstegard, D												Y - from about 1998		
Sorenson, S				Y - from about 1978		Y - from about 1983			Y - from about 1992				Y - from about 1998	
Stanek, D									Y - from about 1992					
Sugg, J						Y - from about 1983		Y		Y - from about 1998	Y - from about 1998		Y - from about 1998	Y - from about 1998
Theissen, D								Y						
Ting, S								Y - from about 1992						
Trepp, P											Y - from about 1998			
Tronsen, W J				Y - from about 1978										
Ubel, F				Y - from about 1978										
Walker, J													Y - from about 1998	Y - from about 1998

Table A, Part II

Name	Ecological Aspects of Fluorocarbons Project	Fluorochemicals in Blood investigation	Fate of Fluorochemicals Project	FC Tech Review Committee	Corporate Responsibility Committee	FC Study Committee	FC Tox Committee	FC Steering Committee	FC Tech Advisory Committee	EHS&R Working Group	Exposure Assessment Team	FC Core Team	FC Exposure Team	FC Working Group
Welter, A N			Y - from about 1977 to about 1979											
Wendling, L								Y - from about 1992			Y - from about 1998	Y - from about 1998		Y - from about 1998
Weppner, W								Y - from about 1992		Y - from about 1998	Y - from about 1998	Y - from about 1998		Y - from about 1998
West, A						Y - from about the early 1980s								
Wolfe, R N					Y - 1977									
Zappa, J														Y - from about 1998
Zeitz, A											Y - from about 1998			Y - from about 1998
Zimmerman, R											Y - from about 1998			Y - from about 1998
Zobel, L								Y - from about 1992			Y - from about 1998	Y - from about 1998		Y - from about 1998

Table A, Part III: 3M Australia directors and associated roles of 3M or of its other international subsidiaries

Name	3M Australia role (Year(s))	Other 3M international subsidiary roles (Year(s))	3M roles (Year(s))
Altman, Laurie Anne	Director (2004-2007)	CEO, 3M New Zealand (at least 2003)	Plant Manager, Abrasive Manufacturing (1983) International Executive, Australia (2003-2005)
Baukol, Ronald Oliver	Director (1992-1995)	Executive Officer – 3M United Kingdom (1986-1987)	Group Vice President Pharmaceutical and Dental Products Group (1988-1989) Group Vice President, Medical Products Group (1990-1991) Vice President, Medical Products Group (1990-1991) Vice President, Asia Pacific (1991-1994) Vice President, Asia Pacific, Canada and Latin America (1994-1995) Executive Vice President, International Operations (1995-2001) Director (1997-2001)
Brydon, David John	Director (1967-1973)	Managing Director, 3M Brazil (1976-1980)	Marketing Director, Mineral Products Division (1974-1975) General Manager, Packaging System (1981-1982) Vice President, Packaging Systems (1982-1983)

Name	3M Australia role (Year(s))	Other 3M international subsidiary roles (Year(s))	3M roles (Year(s))
Buetow, Herbert	Director (1952-1962)		Director (1951-1967) Executive Vice President (1951-1952) President (1953-1962)
Burton, Raymond Roy	Director (1975-1977)		
Cattell, Athol Leonard	Director (1981-1989)		
Chapman, Bruce	Sales Director (1963-1966) Managing Director (1972-1987)	Managing Director, 3M Far East Operations (1967-1972)	Director (1987-1990) Chairman of Board (1988-1990)
Connolly, John Lawrence	Director (1952-1962)		Director (1951-1954) Secretary (1951-1956) General Counsel (1961-1963)
Doughty, Robert T	Director (2000-2004)		Executive, Australia and New Zealand (2001-2002) Executive, Commercial Graphics (2003-2005)
Duncan, Brian Raymond	Director (1967-1972)		
Edwards, Henry Gordon	Director (1962-1982)		

Name	3M Australia role (Year(s))	Other 3M international subsidiary roles (Year(s))	3M roles (Year(s))
Gastaldo, Antonio	Director (1995-1999)	Executive, Sumitomo 3M Limited (1990-1992)	Graphic Presentation Systems (1985-1986) Printing and Publishing Systems (1987-1989)
Gehrke, Leland Bruce	Director (1971-1975)	Managing Director, 3M United Kingdom (1967-1972)	Group Vice President, International (1972-1973) Director (1972-1975) Vice President, Finance (1974-1975)
Hammerly, Harry A	Director (1981-1983)		Vice President, Latin America (1979-1980) Vice President, Australia-Asia-Canada (1979-1980) Vice President, Finance (1982-1986) Executive Vice President, Europe (1987-1989) Executive Vice President, Industrial and Electronic Sector and Corporate Services (1989-1991) Director (1990-1996) Executive Vice President, International Operations and Corporate Services (1991-1994)

Name	3M Australia role (Year(s))	Other 3M international subsidiary roles (Year(s))	3M roles (Year(s))
			Executive Vice President, Life Sciences Sector and International Operations (1994) Executive Vice President, International Operations (1995)
Hanson, Douglas Rollen	Director (1984-1992)	Executive, 3M Italy (1982-1983)	Vice President, Australia-Asia-Canada (1984-1987) Vice President, Asia- Pacific/Canada (1988-1989) Vice President, Asia Pacific (1990) Vice President, Europe (1991-1992)
Hegg, George L	Director (1956, 1962-1996, 1972-1981)		
	3M		
			Division Subsidiary Officer – Australia, Asia (1971-1974) Division Subsidiary Officer – International (1975-1980) Vice President – Australia, Asia, Canada (1981-1982) Vice President, Chemical Products Group (1981-1982) Executive, Commercial Chemicals Division (1981-1982) Vice President, Memory Technologies Group (1983-1985)

Name	3M Australia role (Year(s))	Other 3M international subsidiary roles (Year(s))	3M roles (Year(s))
			Vice President, Strategic Planning Service (1986-1991)
Kindler, Eugene	Director (1966-1972)		Division and Domestic Subsidiary Officer, International (1964-1965) Division and Domestic Subsidiary Officer, International Administration (1966-1977)
Kosanke, Harold Berl	Managing Director (1963-1972)	Managing Director, 3M Italy (1960)	
Laskin, Harold Bruce	Director (1995-1998)		Executive, Hardgoods and Electronics Support (1989-1991) Executive, Automotive Engineered Systems (1992) Executive, Sourcing Operations (2001-2003)
Martin, Anthony John	Director (1999-2006)		
Mills, Noel Raymond	Director (1984-1999)		
Monteiro, Manuel James	Director (1981-1992)		Division Subsidiary Officer, International – Latin America (1971) Division Subsidiary Officer, International – Latin America (1972-1974)

Name	3M Australia role (Year(s))	Other 3M international subsidiary roles (Year(s))	3M roles (Year(s))
			Vice President, European Operations (1975-1980) Executive Vice President, International Operations (1981-1991) Director (1986-1991)
Neville, Joseph Michael	Director (1981-1994)		
Newman, Laurie Murray	Director (1999-2007)		
Novak, John Michael	Director (1997-1999)	3M New Zealand (at least 1974-1978)	
O'Donnell, Edward Larry	Director (1977-1997)		
Patterson, Maynard Harold	Director (1958-1971)	Managing Director, 3M Canada (1953-1955)	Group Vice President, International (1956-1971) Director (1965-1972)
Powell, David William	Director (1991-1995)	Executive, 3M New Zealand (1992) Managing Director, 3M France (1995-1996)	Executive, Photo Colour Systems (1985-1988) Executive, Consumer Video and Audio Products (1989-1990) Managing Director and CEO, Australia/New Zealand Region (1993-1995)

Name	3M Australia role (Year(s))	Other 3M international subsidiary roles (Year(s))	3M roles (Year(s))
			Division Vice President, Commercial Office Supply (1996) Division Vice President, Stationery and Office Supplies Division (1996-1999) Vice President, Marketing (1999-2003) Senior Vice President (2003)
Priebe, Richard Sherman	Director (1952-1968)		General Sales Manager (from at least 1961) Division Subsidiary Officer – International (1964-1965) Division Subsidiary Officer – Africa, Australia, Canada, Far Eastern Area (1966-1967) Vice President, Public Affairs (1968-1969) Division Subsidiary Officer – Marketing (1970-1974) Division Subsidiary Officer – Africa (1975-1978)
Ramey, Joseph F	Director (1983-1984)		Division Officer, Paper Products (1974-1976) Division Officer, Commercial Tape (1977-1980)

Name	3M Australia role (Year(s))	Other 3M international subsidiary roles (Year(s))	3M roles (Year(s))
			Vice President, Information Output and Communication Technologies (1981) Vice President, Australia, Asia, Canada (1982-1983) Vice President, Commercial Markets Group (1984-1987)
Ruane, Vincent Joseph	Director (1987-1991)		Vice President, Electro- Products (1973-1986) Executive Officer, Traffic Control Materials (1991)
Ryan, John Charles	Director (1974-1984)		
Sampair, Clarence Bernard	Director (1952-1966)		Vice President, International (1952-1965) Executive Vice President, Tape and Ribbon (1955-1965) Director (1955-1970)
Siefert, Philip Frank	Director (1959-1963)	Managing Director, 3M United Kingdom (approximately 1963)	Unknown role, 3M New York
Siegworth, William Harold	Director (1954-1963)		Unknown roles, 3M St Paul
Thwaites, James Arthur	Director (1968-1972)		Division Officer, International (1964-1965)

Name	3M Australia role (Year(s))	Other 3M international subsidiary roles (Year(s))	3M roles (Year(s))
			Division Officer, International, Engineering and Manufacturing International Division (1966-1967) Group Vice President, Afro-Asian and Canadian Area (1968-1971) Group Vice President, Tape and Allied Product (1972-1973) Director (1973-1987) Group Vice President, International (1974) President, International Operations (1975-1987) President, International Operations and Corporate Staff Services (1981-1987)
Wendeborn, Robert (Bob)	Managing Director (1997-2000)	Managing Director, 3M Greece, 3M Indonesia, 3M Singapore and 3M New Zealand	
Yucel, Edgar Kent	Director (1972-1981)		Subsidiary Officer, International Legal Affairs (1971-1975) Assistant General Counsel (1976-1978)

Table A, Part IV: Composition of the directors of 3M Australia

Year (total number of directors)	Solely associated with 3M Australia*	Also associated with 3M or other 3M international subsidiaries	Document reference
December 1962 (8)	Henry Gordon Edwards (1)	Herbert Paul Buetow, John Lawrence Connolly, Clarence Bernard Sampair, Maynard Harold Patterson, George Lennart Hegg, William Harold Siegworth, Philip Francis Seifert (7)	HOL.0001.0051.0715 at .0721
March 1963 (7)	Henry Gordon Edwards (1)	Bruce Edward Chapman, Clarence Bernard Sampair, Maynard Harold Patterson, Harold Berl Kosanke, George Lennart Hegg, William Harold Siegworth, (6)	HOL.0001.0051.0715 at .0724 Kosanke: roles in 3M UK, Italy and US mentioned in 'From MMM to 3M Australia' book at pdf page 5
September 1963 (7)	Henry Gordon Edwards (1)	Maynard Harold Patterson, Clarence Bernard Sampair, Richard Sherman Priebe, Harold Berl Kosanke, George Lennart Hegg, Bruce Edward Chapman (6)	HOL.0001.0051.0715 at .0730
February 1966 (7)	Henry Gordon Edwards (1)	Maynard Harold Patterson, Eugene Francis Kindler, Richard Sherman Priebe, Harold Berl Kosanke, George Lennart Hegg, Bruce Edward Chapman (6)	HOL.0001.0051.0715 at .0733
February 1967 (7)	Henry Gordon Edwards, Brian Raymond Duncan, (2)	David John Brydon, Harold Berl Kosanke, Maynard Harold Patterson, Eugene Francis Kindler, Richard Sherman Priebe (5)	HOL.0001.0051.0715 at .0739

Year (total number of directors)	Solely associated with 3M Australia*	Also associated with 3M or other 3M international subsidiaries	Document reference
December 1968 (7)	Henry Gordon Edwards, Brian Raymond Duncan, (2)	David John Brydon, Harold Berl Kosanke, Maynard Harold Patterson, Eugene Francis Kindler, James Arthur Thwaites (5)	HOL.0001.0051.0715 at .0742
January 1972 (7)	Henry Gordon Edwards, Brian Raymond Duncan, (2)	David John Brydon, Harold Berl Kosanke, Leland Bruce Gehrke, Eugene Francis Kindler, James Arthur Thwaites (5)	HOL.0001.0051.0715 at .0744
April 1972 (7)	Henry Gordon Edwards, Brian Raymond Duncan (2)	David John Brydon, Bruce Edward Chapman, Leland Bruce Gehrke, Eugene Francis Kindler, George Lennart Hegg (5)	HOL.0001.0051.0715 at .0745
January 1973 (6)	Henry Gordon Edwards, Brian Raymond Duncan (2)	David John Brydon, Bruce Edward Chapman, Leland Bruce Gehrke, George Lennart Hegg (4)	HOL.0001.0051.0715 at .0746
September 1974 (7)	Henry Gordon Edwards, Brian Raymond Duncan, John Charles Ryan (3)	Bruce Edward Chapman, Leland Bruce Gehrke, George Lennart Hegg, Edgar Kent Yucel (4)	HOL.0001.0051.0747
March 1975 (7)	Henry Gordon Edwards, Brian Raymond Duncan, John Charles Ryan (3)	Bruce Edward Chapman, George Lennart Hegg, Edgar Kent Yucel, James Arthur Thwaites (4)	HOL.0001.0051.0747 at .0749
July 1975 (7)	Henry Gordon Edwards, John Charles Ryan, Raymond Roy Burton (3)	Bruce Edward Chapman, George Lennart Hegg, Edgar Kent Yucel, James Arthur Thwaites (4)	HOL.0001.0051.0747 at .0750
May 1977 (8)	Henry Gordon Edwards, John Charles Ryan, Raymond Roy Burton, Edward Larry O'Donnell (4)	Bruce Edward Chapman, George Lennard Hegg, Edgar Kent Yucel, James Arthur Thwaites (4)	HOL.0001.0051.0747 at .0752

Year (total number of directors)	Solely associated with 3M Australia*	Also associated with 3M or other 3M international subsidiaries	Document reference
June 1979 (8)	Henry Gordon Edwards, John Charles Ryan, Edward Larry O'Donnell, Raymond Roy Burton (4)	Bruce Edward Chapman, George Lennard Hegg, Edgar Kent Yucel, James Arthur Thwaites (4)	HOL.0001.0051.0747 at .0754
January 1980 (7)	Henry Gordon Edwards, John Charles Ryan, Edward Larry O'Donnell (3)	Bruce Edward Chapman, George Lennard Hegg, Edgar Kent Yucel, James Arthur Thwaites (4)	HOL.0001.0051.0747 at .0755
May 1980 (7)	Henry Gordon Edwards, John Charles Ryan, Edward Larry O'Donnell (3)	Bruce Edward Chapman, George Lennard Hegg, Edgar Kent Yucel, James Arthur Thwaites (4)	HOL.0001.0051.0747 at .0756
January 1981 (9)	Henry Gordon Edwards, John Charles Ryan, Edward Larry O'Donnell, Athol Leonard Cattell, Joseph Michael Neville (5)	Bruce Edward Chapman, George Lennard Hegg, Edgar Kent Yucel, James Arthur Thwaites (4)	HOL.0001.0051.0747 at .0758
January 1982 (8)	John Charles Ryan, Edward Larry O'Donnell, Henry Gordon Edwards, Athol Leonard Cattell, Joseph Michael Neville (5)	Bruce Edward Chapman, Manuel James Monteiro, Harry Allan Hammerly (3)	HOL.0001.0051.0747 at .0757
August 1982 (7)	John Charles Ryan, Edward Larry O'Donnell, Athol Leonard Cattell, Joseph Michael Neville (4)	Bruce Edward Chapman, Manuel James Monteiro, Harry Allan Hammerly (3)	HOL.0001.0051.0747 at .0765
September 1983 (7)	John Charles Ryan, Edward Larry O'Donnell, Athol Leonard Cattell, Joseph Michael Neville (4)	Bruce Edward Chapman, Manuel James Monteiro, Joseph Frederick Ramey (3)	HOL.0001.0051.0747 at .0767

Year (total number of directors)	Solely associated with 3M Australia*	Also associated with 3M or other 3M international subsidiaries	Document reference
January 1984 (8)	John Charles Ryan, Edward Larry O'Donnell, Athol Leonard Cattell, Joseph Michael Neville, Noel Raymond Mills (5)	Bruce Edward Chapman, Manuel James Monteiro, Joseph Frederick Ramey (3)	HOL.0001.0051.0747 at .0768
October 1984 (8)	John Charles Ryan, Edward Larry O'Donnell, Athol Leonard Cattell, Joseph Michael Neville, Noel Raymond Mills (5)	Bruce Edward Chapman, Manuel James Monteiro, Douglas Rollen Hanson (3)	HOL.0001.0051.0747 at .0769
October 1985 (7)	Edward Larry O'Donnell, Athol Leonard Cattell, Joseph Michael Neville, Noel Raymond Mills (4)	Bruce Edward Chapman, Manuel James Monteiro, Douglas Rollen Hanson (3)	HOL.0001.0051.0779
October 1986 (7)	Edward Larry O'Donnell, Athol Leonard Cattell, Joseph Michael Neville, Noel Raymond Mills (4)	Bruce Edward Chapman, Manuel James Monteiro, Douglas Rollen Hanson (3)	HOL.0001.0051.0779
October 1987 (8)	Edward Larry O'Donnell, Athol Leonard Cattell, Joseph Michael Neville, Noel Raymond Mills (4)	Bruce Edward Chapman, Manuel James Monteiro, Douglas Rollen Hanson, Vincent Joseph Ruane (4)	HOL.0001.0051.0747 at .0770
August 1989 (8)	Edward Larry O'Donnell, Athol Leonard Cattell, Joseph Michael Neville, Noel Raymond Mills (4)	Bruce Edward Chapman, Manuel James Monteiro, Douglas Rollen Hanson, Vincent Joseph Ruane (4)	HOL.0001.0051.0747 at .0774

Year (total number of directors)	Solely associated with 3M Australia*	Also associated with 3M or other 3M international subsidiaries	Document reference
March 1990 (7)	Noel Raymond Mills Joseph Michael Neville, Edward Larry O'Donnell (3)	Bruce Edward Chapman, Manuel James Monteiro, Douglas Rollen Hanson, Vincent Joseph Ruane (4)	HOL.0001.0051.1921 at .1969. Ruane named as an Executive (3M Australia)
October 1991 (6)	Noel Raymond Mills, Joseph M Neville, Edward Larry O'Donnell (3)	David William Powell, Douglas R Hanson, Manuel J Monteiro (3)	HOL.0001.0051.0646 at .0651, .0648
February 1992 (6)	Noel Raymond Mills, Joseph Michael Neville, Edward Larry O'Donnell (3)	Manuel James Monteiro, Douglas Rollen Hanson, David William Powell (3)	HOL.0001.0051.0779
1993 (5)	Noel Raymond Mills, Joseph Michael Neville, Edward Larry O'Donnell (3)	Ronald Oliver Baukol, David William Powell (2)	HOL.0001.0051.0779
October 1994 (5)	Noel Raymond Mills, Joseph Michael Neville, Edward Larry O'Donnell (3)	Ronald Oliver Baukol, David William Powell (2)	HOL.0001.0051.0779
February 1995 (4)	Noel Raymond Mills, Edward Larry O'Donnell (2)	Ronald Oliver Baukol, David William Powell (2)	HOL.0001.0051.0779
May 1995 (5)	Noel Raymond Mills, Edward Larry O'Donnell (2)	Ronald Oliver Baukol, Harold Bruce Laskin, Antonio Gastaldo (3)	HOL.0001.0051.0779
1996 (4)	Noel Raymond Mills, Edward Larry O'Donnell (2)	Harold Bruce Laskin, Antonio Gastaldo (2)	HOL.0001.0051.0779

Year (total number of directors)	Solely associated with 3M Australia*	Also associated with 3M or other 3M international subsidiaries	Document reference
November 1997 (5)	Noel Raymond Mills, Edward Larry O'Donnell, (2)	Harold Bruce Laskin, Antonio Gastaldo, John Michael Novak (3)	HOL.0001.0051.0779
February 1998 (5)	Noel Raymond Mills (1)	Harold Bruce Laskin, Antonio Gastaldo, John Michael Novak, Robert Gregory Wendeborn (4)	HOL.0001.0051.0779
July 1999 (6)	Noel Raymond Mills, Anthony John Martin, Laurie Murray Newman (3)	Antonio Gastaldo, John Michael Novak, Robert Gregory Wendeborn (3)	HOL.0001.0051.0779
September 2000 (4)	Anthony John Martin, Laurie Murray Newman (2)	Robert Taylor Doughty, Robert Gregory Wendeborn (2)	HOL.0001.0051.0779
2001-2003 (3)	Anthony John Martin, Laurie Murray Newman (2)	Robert Taylor Doughty (1)	HOL.0001.0051.0779
January 2004 (4)	Anthony John Martin, Laurie Murray Newman (2)	Robert Taylor Doughty, Laurie Anne Altman (2)	HOL.0001.0051.0779
December 2005 (3)	Anthony John Martin, Laurie Murray Newman (2)	Laurie Anne Altman (1)	HOL.0001.0051.0779

*Based on presently available materials. Further changes may be made after discovery.

Table A, Part V: Table of 3M Annual Reports

Title	Year ending	Document reference
MMM Annual Report	31 December 1951	HOL.0001.0052.0028
MMM Annual Report	31 December 1952	HOL.0001.0052.0055
MMM Annual Report	31 December 1953	HOL.0001.0052.0084
MMM Annual Report	31 December 1954	HOL.0001.0056.0001
MMM Annual Report	31 December 1955	HOL.0001.0052.0117
MMM Annual Report	31 December 1956	HOL.0001.0052.0146
MMM Annual Report	31 December 1957	HOL.0001.0052.0174
MMM Annual Report	31 December 1958	HOL.0001.0056.0060
MMM Annual Report	31 December 1959	HOL.0001.0056.0032
MMM Annual Report	31 December 1960	HOL.0001.0056.0083
MMM Annual Report	31 December 1961	HOL.0001.0051.1266
3M Company Annual Report	31 December 1962	HOL.0001.0051.1293
3M Company Annual Report	31 December 1963	HOL.0001.0051.1321
3M Company Annual Report	31 December 1964	HOL.0001.0051.1365

Title	Year ending	Document reference
3M Company Annual Report	31 December 1965	HOL.0001.0051.1390
3M Company Annual Report	31 December 1966	HOL.0001.0051.1420
3M Company Annual Report	31 December 1967	HOL.0001.0051.1455
3M Company Annual Report	31 December 1968	HOL.0001.0051.1490
3M Company Annual Report	31 December 1969	HOL.0001.0051.1525
3M Company Annual Report	31 December 1970	HOL.0001.0051.1563
3M Company Annual Report	31 December 1971	HOL.0001.0051.1597
3M Company Annual Report	31 December 1972	HOL.0001.0051.1631
3M Company Annual Report	31 December 1973	HOL.0001.0051.1675
3M Company Annual Report	31 December 1974	HOL.0001.0051.1719
3M Company Annual Report	31 December 1975	HOL.0001.0051.0824
3M Company Annual Report	31 December 1976	HOL.0001.0051.0868
3M Company Annual Report	31 December 1977	HOL.0001.0051.0913
3M Company Annual Report	31 December 1978	HOL.0001.0051.0958
3M Company Annual Report	31 December 1979	HOL.0001.0051.1006

Title	Year ending	Document reference
3M Company Annual Report	31 December 1980	HOL.0001.0051.1058
3M Company Annual Report	31 December 1981	HOL.0001.0051.1110
3M Company Annual Report	31 December 1982	HOL.0001.0051.1162
3M Company Annual Report	31 December 1983	HOL.0001.0051.1214
3M Company Annual Report	31 December 1984	HOL.0001.0051.2082
3M Company Annual Report	31 December 1985	HOL.0001.0051.2136
3M Company Annual Report	31 December 1986	HOL.0001.0051.2187
3M Company Annual Report	31 December 1987	HOL.0001.0051.1762
3M Company Annual Report	31 December 1988	HOL.0001.0051.1815
3M Company Annual Report	31 December 1989	HOL.0001.0051.1868
3M Company Annual Report	31 December 1990	HOL.0001.0051.1921
3M Company Annual Report	31 December 1991	HOL.0001.0051.1976
3M Company Annual Report	31 December 1992	HOL.0001.0051.2029
3M Company Annual Report	31 December 1993	HOL.0001.0050.1326
3M Company Annual Report	31 December 1994	HOL.0001.0056.0110

Title	Year ending	Document reference
3M Company Annual Report	31 December 1995	HOL.0001.0050.1290
3M Company Annual Report	31 December 1996	HOL.0001.0050.1368
3M Company Annual Report	31 December 1997	HOL.0001.0050.1404
3M Company Annual Report	31 December 1998	HOL.0001.0050.1410
3M Company Annual Report	31 December 1999	HOL.0001.0050.2058
3M Company Annual Report	31 December 2000	HOL.0001.0050.2102
3M Company Annual Report	31 December 2001	HOL.0001.0050.1453
3M Company Annual Report	31 December 2002	HOL.0001.0050.1513
3M Company Annual Report	31 December 2003	HOL.0001.0050.1624
3M Company Annual Report	31 December 2004	HOL.0001.0050.1728
3M Company Annual Report	31 December 2005	HOL.0001.0050.1834

Certificate of lawyer

I Joanne Lisbeth Jary 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: 28 May 2026

A handwritten signature in black ink, appearing to read 'J. Jary', is written over a horizontal dotted line.

Signed by Joanne Jary
Lawyer for the Applicant