Supporting information for

Per- and polyfluoroalkyl substances and fluorine mass balance in cosmetic products from the Swedish market: Implications for environmental emissions and human exposure

Lara Schultes,*[a] Robin Vestergren,*[b] Kristina Volkova,[c] Emelie Westberg,[b] Therese Jacobson,[c] Jonathan P. Benskin*[a]

a Department of Environmental Science and Analytical Chemistry (ACES), Stockholm University, Stockholm, Sweden

b Swedish Environmental Research Institute (IVL), Stockholm, Sweden

c Swedish Society for Nature Conservation (SSNC), Stockholm, Sweden

*Corresponding authors:

Lara.Schultes@gmail.com

Robin.vestergren@ivl.se

Jon.Benskin@aces.su.se

Contents

Reagents and standards

Recovery standards $^{13}C_8$-PFOA (MS transition 421>376) and $^{13}C_8$-PFOS (MS transition 507>80) were purchased from Wellington (Ontario, Canada). For all other standards refer to Table S1. Fluoride standard (1000 mg/l) was obtained from Thermo Scientific. Certified reference material (BCR®-461) was obtained from Sigma-Aldrich. Solvents and reagents used for extraction and analytical procedures: Methanol (LiChrosolv®, Merck), acetonitrile (Chromasolv™, Honeywell), ammonium acetate (Merck), 1-methylpiperidine (Merck), sodium hydroxide (Sigma Aldrich), hydrochloric acid (37 %, VWR), acetic acid (Sigma Aldrich), MilliQ water (TOC = 3 ppb, conductivity = 18.2 MΩ; Millipore, Merck) and Supelclean™ ENVI-Carb™ SPE Bulk Packing (Supelco). Argon and oxygen gases were of purity grade 5.0.

Mass spectrometer settings

The mass spectrometer was operated with the following settings adapted from Gebbink et al.[1]: source temperature = 150 ˚C, desolvation temperature = 350 ˚C, capillary voltage = 3kV, cone gas (nitrogen) flow = 150 l/hr, desolvation gas (nitrogen) flow = 650 l/hr, nebuliser gas = 7 bar. Details on MS transitions can be found in table S1.

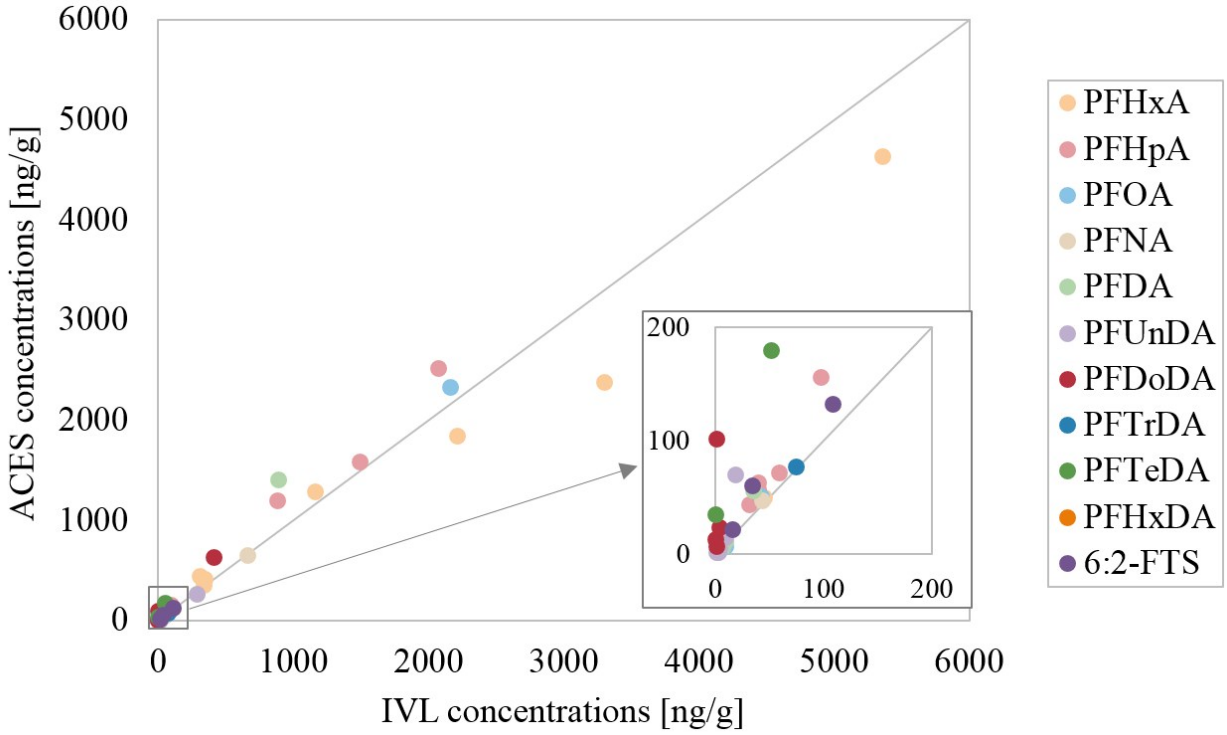

Figure S1. Inter-laboratory comparison of target PFASs analysis carried out at ACES and IVL. Overall correlation coefficient $r^2 = 0.9605$.

Table S1. Target compounds and internal standards, selected instrumental parameters for quantification by UPLC/MS/MS.

Abbreviation¤	Precursor Ion	Quantitative Product ion	Qualitative product ion	Internal standard	IS transition	Native standard used for quantification	Data quality*	Supplier#
PFBA	213	169	149	$^{13}C_4$-PFBA	217>172	PFBA	1	W
PFPeA	263	219	169	$^{13}C_5$-PFPeA	266>223	PFPeA	1	W
PFHxA	313	269	119	$^{13}C_2$-PFHxA	315>270	PFHxA	1	W
PFHpA	363	319	169	$^{13}C_4$-PFHpA	367>322	PFHpA	1	W
PFOA	413	169	369	$^{13}C_4$-PFOA	417>372	PFOA	1	W
PFNA	463	419	219	$^{13}C_5$-PFNA	468>423	PFNA	1	W
PFDA	513	469	269	$^{13}C_2$-PFDA	515>470	PFDA	1	W
PFUnDA	563	519	269	$^{13}C_2$-PFUnDA	565>520	PFUnDA	1	W
PFDoDA	613	569	169	$^{13}C_2$-PFDoDA	615>570	PFDoDA	1	W
PFTrDA	663	619	169	$^{13}C_2$-PFDoDA	615>570	PFDoDA	2	W
ADONA	377	251	85	$^{13}C_4$-PFOA	417>372	ADONA	2	W
9Cl-PF3ONS	531	351	83	$^{13}C_4$-PFOS	503>80	9Cl-PF3ONS	2	W
11Cl-PF3OUdS	631	451	83	$^{13}C_4$-PFOS	503>80	11Cl-PF3OUdS	2	W
PFBS	299	80	99	$^{18}O_2$-PFHxS	403>84	PFBS	2	W
PFHxS	399	80	99	$^{18}O_2$-PFHxS	403>84	PFHxS	1	W
PFHpS	449	80	99	$^{13}C_4$-PFOS	503>80	PFHxS	3	
PFOS	499	80	99	$^{13}C_4$-PFOS	503>80	PFOS	1	W
PFNS	549	80	99	$^{13}C_4$-PFOS	503>80	PFOS	3	
PFDS	599	80	99	$^{13}C_4$-PFOS	503>80	PFDS	2	W
PFUnDS	649	80	99	$^{13}C_4$-PFOS	503>80	PFDS	3	
FOSA	498	78	478	$^{13}C_8$-FOSA	506>78	FOSA	1	W
4:2 FTSA	327	307	81	$^{13}C_2$-6:2 FTSA	429>409	4:2 FTSA	2	W
6:2 FTSA	427	407	81	$^{13}C_2$-6:2 FTSA	429>409	6:2 FTSA	1	W
8:2 FTSA	527	507	81	$^{13}C_2$-6:2 FTSA	429>409	8:2 FTSA	2	W
FOSAA	556	498	419	D_3-MeFOSAA	573>419	FOSAA	2	W
4:2 monoPAP	343	97	323	$^{13}C_2$-6:2 monoPAP	445>97	4:2 monoPAP	2	D
6:2 monoPAP	443	97	423	$^{13}C_2$-6:2 monoPAP	445>97	6:2 monoPAP	1	W
8:2 monoPAP	543	97	523	$^{13}C_2$-8:2 monoPAP	545>97	8:2 monoPAP	1	W
10:2 monoPAP	643	97	623	$^{13}C_2$-8:2 monoPAP	545>97	10:2 monoPAP	2	C
4:2/4:2 diPAP	589	343	97	$^{13}C_4$-6:2/6:2 diPAP	793>445	4:2/4:2 diPAP	2	D
4:2/6:2 diPAP	689	443	343	$^{13}C_4$-6:2/6:2 diPAP	793>445	6:2/6:2 diPAP	3	
6:2/6:2 diPAP	789	443	97	$^{13}C_4$-6:2/6:2 diPAP	793>445	6:2/6:2 diPAP	1	W
6:2/8:2 diPAP	889	443	543	$^{13}C_4$-6:2/6:2 diPAP	793>445	6:2/8:2 diPAP	2	W
8:2/8:2 diPAP	989	543	97	$^{13}C_4$-8:2/8:2 diPAP	993>545	8:2/8:2 diPAP	1	W
6:2/10:2 diPAP	989	443	643	$^{13}C_4$-8:2/8:2 diPAP	993>545	8:2/8:2 diPAP	3	
8:2/10:2 diPAP	1089	543	643	$^{13}C_4$-8:2/8:2 diPAP	993>545	8:2/8:2 diPAP	3	
6:2/12:2 diPAP	1089	443	743	$^{13}C_4$-8:2/8:2 diPAP	993>545	8:2/8:2 diPAP	3	
8:2/12:2 diPAP	1189	543	743	$^{13}C_4$-8:2/8:2 diPAP	993>545	8:2/8:2 diPAP	3	
6:2/14:2 diPAP	1189	443	843	$^{13}C_4$-8:2/8:2 diPAP	993>545	8:2/8:2 diPAP	3	

¤ For full chemical names refer to Buck et al[2]

* 1 = native standard and exact matched mass labelled standard, 2 = native standard but no exact matched mass labelled standard, 3 = no native standard, no exact matched mass labelled standard

W = Wellington Laboratories (Guelph, ON, Canada), C = Chiron Chemicals (Hawthorn, VIC, Australia), D = Donated by Dr. Xenia Trier (National Food Institute, Denmark)

Table S2. Mobile phase gradient profile for PFSAs, PFCAs, FOSA, FOSAA, FTSAs and alternatives.

	LC Gradient Program		LC Flow Rate
Time [min]	**Mobile phase A [%][1]**	**Mobile Phase B [%][2]**	**[ml/min]**
0.0	90	10	0.40
0.5	90	10	0.40
5.0	20	80	0.40
5.1	0	100	0.40
6.6	0	100	0.40
8.0	0	100	0.55
10.0	90	10	0.40

[1] Mobile phase A: 90 % water and 10 % acetonitrile containing 2 mM ammonium acetate.
[2] Mobile phase B: 100 % acetonitrile containing 2 mM ammonium acetate.

Table S3. Mobile phase gradient program for PAPs.

	LC Gradient Program		LC Flow Rate
Time [min]	**Mobile phase A [%][1]**	**Mobile Phase B [%][2]**	**[ml/min]**
0.0	80	20	0.30
4.0	0	100	0.30
7.5	0	100	0.30
9.0	80	20	0.30

[1] Mobile phase A: 95 % water and 5 % methanol containing 2 mM ammonium acetate and 5 mM 1-methylpiperidine (1-MP).

[2] Mobile phase B: 5 % water, 75 % methanol and 20 % acetonitrile containing 2 mM ammonium acetate and 5 mM 1-methylpiperidine (1-MP).

Table S4. LC-MS/MS method accuracy as % recovery (spike recovery), method precision as % RSD (n = 3). Low fortification amount was 1 ng per analyte and sample, high fortification 48 ng.

	Low fortification		High fortification	
Analyte	% recovery	RSD	% recovery	RSD
PFBA	100	9%	90	7%
PFPeA	93	17%	86	6%
PFHxA	93	17%	92	11%
PFHpA	161	14%	162	11%
PFOA	97	11%	92	11%
PFNA	109	4%	98	3%
PFDA	99	17%	101	24%
PFUnDA	78	25%	85	4%
PFDoDA	87	8%	89	12%
PFTrDA	71	46%	47	7%
ADONA	114	31%	90	59%
9Cl-PF3ONS	280	27%	216	32%
11Cl-PF3OUdS	188	23%	186	34%
PFBS	101	16%	93	5%
PFHxS	92	17%	90	15%
PFOS	111	63%	112	32%
PFDS	83	26%	93	38%
FOSA	120	38%	94	17%
4:2 FTSA	142	22%	82	16%
6:2 FTSA	120	37%	77	13%
8:2 FTSA	124	49%	126	10%
FOSAA	29	57%	40	10%
4:2 monoPAP	-		80	14%
6:2 monoPAP	87	15%	72	9%
8:2 monoPAP	222	26%	119	37%
10:2 monoPAP	-		70	99%
6:2/6:2 diPAP	85	15%	102	17%
6:2/8:2 diPAP	59	21%	57	21%
8:2/8:2 diPAP	92	48%	186	65%

Table S5. Absolute recoveries of internal standards, determined by recovery standards M8PFOA and M8PFOS. Recoveries are given as averages from triplicate high and low spike experiments. n.d. = not determined.

Recovery standard	**M8PFOA**		**M8PFOS**	
Analyte	Average recovery (%)	RSD	Average recovery (%)	RSD
MPFBA	83%	11%	86%	21%
M3PFPeA	125%	16%	129%	25%
MPFHxA	109%	13%	113%	24%
MPFHpA	63%	10%	65%	20%
MPFHxS	109%	15%	111%	14%
MPFOA	104%	14%	106%	18%
MPFNA	105%	7%	108%	16%
MPFOS	80%	27%	80%	18%
MPFDA	53%	21%	54%	18%
MPFUnDA	85%	7%	88%	17%
MPFDoDA	52%	23%	53%	23%
M8FOSA	47%	27%	48%	24%
13C 6:2 monoPAP	150%	15%	173%	12%
13C 8:2 monoPAP	80%	27%	92%	29%
13C 6:2/6:2 diPAP	n.d.	n.d.	78%	39%
13C 8:2/8:2 diPAP	n.d.	n.d.	21%	118%

Table S6. CIC method accuracy as % recovery (spike recovery), method precision as % RSD (n = 3).

Sample	Fortification [µg]		Expected recovery [%]	Apparent recovery [%]	PFOS recovery*	RSD
	PFOS	NaF				
FOUN07	7.6		100	68	68	12%
FOUN07		5.0	0	-	-	-
FOUN07	7.6	5.0	50	36	72	14%
Blank	7.6		100	60	60	13%
Blank		5.0	0	-	-	-
Blank	7.6	5.0	50	38	76	16%

*PFOS recovery assuming no NaF was extracted.

Table S7. PFASs concentrations (ng/g) in cosmetic samples.

	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	6:2 FTS	8:2 FTS
LOD	*0.80*	*5.35*	*3.35*	*0.50*	*4.38*	*3.45*	*3.73*	*0.45*	*4.38*	*3.10*	*8.85*	*3.38*
CRE01	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
CRE02	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
CRE03	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
CRE04	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
CRE05	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
CRE06	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
CRE07	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
FOUN01	382	542	2380	1590	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	21.9	<3.38
FOUN02	437	178	1850	1200	2330	651	1410	269	634	77.6	132	156
FOUN03	609	699	4640	2520	8.38	<3.45	6.34	1.46	<4.38	<3.10	60.6	<3.38
FOUN04	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
FOUN05	93.8	69.6	1290	157	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
FOUN06	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
FOUN07	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
FOUN08	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
FOUN09	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
PEN01	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
POW01	51.0	41.0	50.2	72.0	50.8	47.2	56.2	70.1	102	103	<8.85	<3.38
POW02	<0.80	<5.35	<3.35	1.55	<4.38	<3.45	<3.73	1.96	<4.38	<3.10	<8.85	<3.38
POW03	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
POW04	5.18	<5.35	3.90	8.99	6.52	7.70	6.32	9.68	13.2	<3.10	<8.85	<3.38
POW05	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
POW06	38.0	33.3	418	57.3	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
POW07	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
POW08	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
POW09	66.3	34.8	358	44.0	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
POW10	4.78	<5.35	<3.35	5.15	<4.38	<3.45	<3.73	5.19	6.92	<3.10	<8.85	<3.38
POW11	8.57	6.00	8.13	15.4	7.46	10.7	11.4	14.9	23.6	11.2	<8.85	<3.38
POW12	84.9	52.8	447	63.5	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
SHAV01	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38
SHAV02	<0.80	<5.35	<3.35	<0.50	<4.38	<3.45	<3.73	<0.45	<4.38	<3.10	<8.85	<3.38

Table S8. PAPs concentrations (ng/g) in cosmetic samples; n.d. = not detected.

	4:2 monoPAP	6:2 monoPAP	8:2 monoPAP	10:2 monoPAP	4:2/4:2 diPAP	4:2/6:2 diPAP	6:2/6:2 diPAP	6:2/8:2 diPAP	8:2/8:2 diPAP	6:2/10:2 diPAP	8:2/10:2 diPAP	6:2/12:2 diPAP	8:2/12:2 diPAP
*LOD **	*70.3*	*3.75*	*10.0*	*188*	*70.0*	*10.3*	*10.3*	*188*	*190*	*190*	*190*	*190*	*190*
CRE01	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
CRE02	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
CRE03	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
CRE04	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
CRE05	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
CRE06	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
CRE07	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
FOUN01	847	55490	<10.0	*<188*	691	1380	255570	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
FOUN02	1640	50450	23450	24330	*<70.0*	202	63700	38330	11260	5180	891	473	21.6 *
FOUN03	562	61980	38.3	*<188*	799	1130	405450	682	*<190*	68.8 *	*<190*	*<190*	*<190*
FOUN04	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	11.2	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
FOUN05	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
FOUN06	<70.3	<3.75	22.2	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
FOUN07	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
FOUN08	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
FOUN09	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
PEN01	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
POW01	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
POW02	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
POW03	<70.3	<3.75	282	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
POW04	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
POW05	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
POW06	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
POW07	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
POW08	<70.3	<3.75	145	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
POW09	<70.3	26.6	<10.0	*<188*	*<70.0*	*<10.3*	27.0	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
POW10	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
POW11	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
POW12	<70.3	<3.75	26.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
SHAV01	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*
SHAV02	<70.3	<3.75	<10.0	*<188*	*<70.0*	*<10.3*	*<10.3*	*<188*	*<190*	*<190*	*<190*	*<190*	*<190*

***** Samples FOUN01, FOUN02 and FOUN03 were diluted 1:5 – 1:500 times for PAPs analysis (LOD refers to undiluted samples), therefore concentrations marked with asterisk are reported with lower concentrations than the LOD.

Table S9. C_{F_TF}, C_{F_EOF}, ΣC_{F_PFAS}, $C_{F\_extr.unknown}$ and $C_{F\_non\ extr.}$ concentrations (± standard deviation) in µg/g. n.d. = not detected.

sample	C_{F_TF} [µg/g]	C_{F_EOF} [µg/g]	ΣC_{F_PFAS} [µg/g]	C_{F_EOF} / C_{F_TF}	ΣC_{F_PFAS} / C_{F_EOF}	$C_{F\_extr.unknown}$ [µg/g]	$C_{F\_non\ extr.}$ [µg/g]
CRE01	11100±2000	<6.65	n.d.	0.0%	-	-	11098
CRE02	4790±862	<20.44	n.d.	0.0%	-	-	4789
CRE03	4040±728	<6.65	n.d.	0.0%	-	-	4043
CRE04	2720±490	<20.44	n.d.	0.0%	-	-	2723
CRE05	2490±447	11.1±0.44	n.d.	0.4%	0.0%	11.1	2473
CRE06	<91.1	31.9±1.27	n.d.	-	0.0%	31.9	-
CRE07*	<91.1	<1.02	n.d.	-	-	-	-
FOUN01	3120±562	1720±68.8	196	55.1%	11.4%	1524	1404
FOUN02	2900±522	1380±55.1	140	47.5%	10.2%	1237	1522
FOUN03	2570±463	1050±42.0	296	40.8%	28.2%	754	1520
FOUN04	2000±360	552±22.1	0.01	27.6%	0.0%	552	1449
FOUN05	1660±299	374±14.9	1.07	22.5%	0.3%	373	1289
FOUN06	450±81	5.12±0.20	0.01	1.1%	0.3%	5.10	445
FOUN07*	326±58.6	1.29±0.05	n.d.	0.4%	0.0%	1.29	324
FOUN08*	<91.1	5.98±0.24	n.d.	-	0.0%	5.98	-
FOUN09*	<91.1	30.2±1.21	n.d.	-	0.0%	30.2	-
PEN01	438±78.9	5.76±0.23	n.d.	1.3%	0.0%	5.76	433
POW01	19200±3456	<6.65	0.47	0.0%	-	-	19201
POW02	8870±1596	12.3±0.49	0.00	0.1%	0.0%	12.3	8854
POW03	4240±763	289±11.5	0.17	6.8%	0.1%	289	3948
POW04	3430±617	4.91±0.20	0.04	0.1%	0.9%	4.86	3424
POW05*	3330±600	0.83±0.03	n.d.	0.0%	0.0%	0.83	3333
POW06	3020±544	<6.65	0.36	0.0%	-	-	3024
POW07*	2600±467	<20.44	n.d.	0.0%	-	-	2596
POW08	2570±463	296±11.8	0.09	11.5%	0.0%	296	2278
POW09	2460±443	187±7.49	0.37	7.6%	0.2%	187	2276
POW10	1770±318	6.97±0.28	0.02	0.4%	0.2%	6.96	1758
POW11	1510±272	6.96±0.28	0.08	0.5%	1.2%	6.88	1502
POW12	547±98.4	35.3±1.41	0.44	6.5%	1.3%	34.8	511
SHAV01	837±151	<1.02	n.d.	0.0%	-	-	837
SHAV02*	<91.1	3.53±0.14	n.d.	-	0.0%	3.53	-

References

1 W. A. Gebbink, A. Glynn and U. Berger, *Environ. Pollut.*, 2015, **199**, 166–173.

2 R. C. Buck, J. Franklin, U. Berger, J. M. Conder, I. T. Cousins, P. De Voogt, A. A. Jensen, K. Kannan, S. A. Mabury and S. P. J. van Leeuwen, *Integr. Environ. Assess. Manag.*, 2011, **7**, 513–541.