

Supplemental Information

**Indoor Air Concentrations of Quartz Fiber Filter-Collected Ionic PFAS and Emissions to Outdoor Air:  
Findings from the IPA Campaign**

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## SECTION S1: HOME AND PARTICIPANT DETAILS

Home characteristics such as building age, renovations, flooring type, rugs/carpets, and occupancy were collected at the beginning of the campaign and then again at the end of the campaign. During active air sampling participants were provided with daily activity checklists to record the duration and frequency of cooking appliance use, cleaning products/location, heating and cooling behavior, and laundry. At the end of the 6-day sampling period, participants completed an activity survey to record more detailed information about activities that occurred during the sampling week. Additional details are provided elsewhere.<sup>1</sup>

**Table S1.** Cooking appliance use per sampling week (6-days; Week 1, 2, and 3). Home 82 left the campaign after 1-month and thus only has 1 sampling week.

Home	Week	Stove	Oven	Microwave	Toaster	Water Kettle
65	1	7	1	7	0	0
	2	7	0	19	8	3
	3	14	0	12	0	3
18	1	7	2	14	6	0
	2	7	0	5	7	0
	3	8	5	14	13	0
78	1	2	2	5	2	0
	2	1	0	11	0	0
	3	2	5	13	3	2
30	1	10	2	3	0	4
	2	8	2	7	0	8
	3	8	4	11	0	12
50	1	1	1	9	3	0
	2	6	0	4	2	3
	3	7	0	11	0	4
43	1	9	5	10	2	6
	2	10	2	10	6	4
	3	16	7	10	6	18
35	1	7	2	4	0	2
	2	8	5	4	0	3
	3	11	1	2	0	5
10	1	10	4	2	9	0
	2	5	3	3	6	7
	3	1	4	1	10	2
59	1	10	1	5	0	3
	2	4	0	17	0	7
	3	6	2	19	0	8
1	1	5	2	3	0	7
	2	5	3	14	0	11
	3	3	1	8	3	6
82	1	7	0	4	4	0

**Table S2.** Home characteristics collected from the home surveys regarding the age of the building, number of occupants, flooring type, stove type, stove exhaust and frequency of use, whether the home had a fireplace, and an estimate of the ACH.

Home ID	Year Built	No. Occupants	Main Living Area Floor	Stove Type	Stove Exhaust, Venting Location, and Frequency of Use	Fireplace	ACH, estimate mean $\pm$ std. dev. ( $\text{h}^{-1}$ )
65	1987	3	Hardwood, rugs	Electric smooth top	Y - Indoors; Never	Y	0.25 $\pm$ 0.05
18	1993	2	Carpet, linoleum	Gas	Y - Indoors: Occasionally	Y	0.47 $\pm$ 0.31
78	1945	2	Vinyl, rugs	Electric smooth top	Y - Indoors: Occasionally	N	0.40 $\pm$ 0.25
30	1962	2	Hardwood, rugs	Electric smooth top	N	N	0.44 $\pm$ 0.05
82	2017	1	Laminate, rugs	Gas	Y - Outdoors: Always	Y	0.77
50	1954	2	Hardwood, rugs	Electric coil	Y - Outdoors: Occasionally	Y	0.38 $\pm$ 0.04
43	1920	2	Laminate, rugs	Electric smooth top	Y - Outdoors: Often	N	0.19 $\pm$ 0.06
35	1920	2	Laminate, rugs	Electric smooth top	Y - Indoors: Occasionally	N	0.58 $\pm$ 0.25
10	1985	2	Bamboo, rugs	Gas	Y - Outdoors: Occasionally	Y	0.50 $\pm$ 0.15
59	2002	4	Hardwood, rugs	Gas	Y - Outdoors: Occasionally	Y	0.24 $\pm$ 0.04
01	1999	1	Hardwood, rugs	Electric smooth top	Y - Indoors: Occasionally	Y	0.21 $\pm$ 0.02

## SECTION S2: ANALYTICAL AND QUALITY CONTROL

### IONIC PFAS

**Table S3.** Targeted PFAS, acronyms/abbreviations, chemical formula, CAS number, and associated mass labelled PFAS standard used for quantification.

PFAS Acronym	Compound	Formula	CAS#	Mass-Labelled ( <sup>13</sup> C) PFAS Standard
<b>Perfluorocarboxylic Acids (PFCAs) (n = 13)</b>				
PFBA	Perfluoro-n-butanoic acid	C <sub>4</sub> HF <sub>7</sub> O <sub>2</sub>	375-22-4	<sup>13</sup> C <sub>4</sub> -PFBA
PFPeA	Perfluoro-n-pentanoic acid	C <sub>5</sub> HF <sub>9</sub> O <sub>2</sub>	2706-90-3	<sup>13</sup> C <sub>5</sub> -PFPeA
PFHxA	Perfluoro-n-hexanoic acid	C <sub>6</sub> HF <sub>11</sub> O <sub>2</sub>	307-24-4	<sup>13</sup> C <sub>5</sub> -PFHxA
PFHpA	Perfluoro-n-heptanoic acid	C <sub>7</sub> HF <sub>13</sub> O <sub>2</sub>	375-85-9	<sup>13</sup> C <sub>4</sub> -PFHpA
PFOA	Perfluoro-n-octanoic acid	C <sub>8</sub> HF <sub>15</sub> O <sub>2</sub>	335-67-1	<sup>13</sup> C <sub>8</sub> -PFOA
PFNA	Perfluoro-n-nonanoic acid	C <sub>9</sub> HF <sub>19</sub> O <sub>2</sub>	375-95-1	<sup>13</sup> C <sub>9</sub> -PFNA
PFDA	Perfluoro-n-decanoic acid	C <sub>10</sub> HF <sub>21</sub> O <sub>2</sub>	335-76-2	<sup>13</sup> C <sub>6</sub> -PFDA
PFUnA	Perfluoro-n-undecanoic acid	C <sub>11</sub> HF <sub>21</sub> O <sub>2</sub>	2058-94-8	<sup>13</sup> C <sub>7</sub> -PFUnA
PFDoA	Perfluoro-n-dodecanoic acid	C <sub>12</sub> HF <sub>23</sub> O <sub>2</sub>	307-55-1	<sup>13</sup> C <sub>2</sub> -PFDoA
PFTTrA	Perfluoro-n-tridecanoic acid	C <sub>13</sub> HF <sub>25</sub> O <sub>2</sub>	72629-94-8	<sup>13</sup> C <sub>2</sub> -PFTTrA
PFTA	Perfluoro-n-tetradecanoic acid	C <sub>14</sub> HF <sub>27</sub> O <sub>2</sub>	376-06-7	<sup>13</sup> C <sub>2</sub> -PFTA
PFHxDA	Perfluoro-n-hexadecanoic acid	C <sub>16</sub> HF <sub>31</sub> O <sub>2</sub>	67905-19-5	<sup>13</sup> C <sub>2</sub> -PFTA
PFODA	Perfluoro-n-octadecanoic acid	C <sub>18</sub> HF <sub>35</sub> O <sub>2</sub>	16517-11-6	<sup>13</sup> C <sub>2</sub> -PFTA
<b>Perfluorosulfonic Acids (PFSAs) (n = 8)</b>				
L-PFBS	Potassium perfluoro-1-butanesulfonate	C <sub>4</sub> HF <sub>9</sub> O <sub>3</sub> S	375-73-5	<sup>13</sup> C <sub>3</sub> -PFBS
L-PFPeS	Sodium perfluoro-1-pentanesulfonate	C <sub>5</sub> HF <sub>11</sub> O <sub>3</sub> S	2706-91-4	<sup>13</sup> C <sub>3</sub> -PFBS
L-PFHxS	Sodium perfluoro-1-hexanesulfonate	C <sub>6</sub> HF <sub>13</sub> O <sub>3</sub> S	355-46-4	<sup>13</sup> C <sub>3</sub> -PFHxS
L-PFHpS	Sodium perfluoro-1-heptanesulfonate	C <sub>7</sub> HF <sub>15</sub> O <sub>3</sub> S	375-92-8	<sup>13</sup> C <sub>3</sub> -PFHxS
L-PFOS	Sodium perfluoro-1-octanesulfonate	C <sub>8</sub> HF <sub>19</sub> O <sub>3</sub> S	1763-23-1	<sup>13</sup> C <sub>8</sub> -PFOS
L-PFNS	Sodium perfluoro-1-nonanesulfonate	C <sub>9</sub> HF <sub>19</sub> O <sub>3</sub> S	68259-12-1	<sup>13</sup> C <sub>8</sub> -PFOS
L-PFDS	Sodium perfluoro-1-decanesulfonate	C <sub>10</sub> HF <sub>21</sub> O <sub>3</sub> S	335-77-3	<sup>13</sup> C <sub>8</sub> -PFOS
L-PFDoS	Sodium perfluoro-1-dodecanesulfonate	C <sub>12</sub> HF <sub>25</sub> O <sub>3</sub> S	79780-39-5	<sup>13</sup> C <sub>8</sub> -PFOS
<b>Emerging and Polyfluoroalkyl Phosphate Esters (PAPs) (n = 5)</b>				
GenX	Hexafluoropropylene oxide-dimer acid	C <sub>6</sub> HF <sub>11</sub> O <sub>3</sub>	13252-13-6	<sup>13</sup> C <sub>3</sub> -PFPrOPrA
6:2 monoPAP	Sodium 1H,1H,2H,2H-perfluorooctyl phosphate	C <sub>8</sub> H <sub>4</sub> F <sub>13</sub> O <sub>4</sub> PNa <sub>2</sub>	57678-01-0	<sup>13</sup> C <sub>2</sub> <sup>12</sup> C <sub>6</sub> H <sub>4</sub> F <sub>17</sub> O <sub>4</sub> PNa <sub>2</sub>
8:2 monoPAP	Sodium 1H,1H,2H,2H-perfluorodecyl phosphate	C <sub>10</sub> H <sub>4</sub> F <sub>17</sub> O <sub>4</sub> PNa <sub>2</sub>	57678-03-2	<sup>13</sup> C <sub>2</sub> <sup>12</sup> C <sub>8</sub> H <sub>4</sub> F <sub>17</sub> O <sub>4</sub> PNa <sub>2</sub>
6:2 diPAP	Sodium bis(1H,1H,2H,2H-perfluorooctyl) phosphate	C <sub>16</sub> H <sub>8</sub> F <sub>26</sub> O <sub>4</sub> PNa	57677-95-9	<sup>13</sup> C <sub>4</sub> <sup>12</sup> C <sub>12</sub> H <sub>8</sub> F <sub>26</sub> O <sub>4</sub> PNa
8:2 diPAP	Sodium bis(1H,1H,2H,2H-perfluorodecyl) phosphate	C <sub>20</sub> H <sub>8</sub> F <sub>34</sub> O <sub>4</sub> PNa	114519-85-6	<sup>13</sup> C <sub>4</sub> <sup>12</sup> C <sub>16</sub> H <sub>8</sub> F <sub>34</sub> O <sub>4</sub> PNa

**Table S4.** Mono- and diPAP ion quantification parameters for UHPLC-ESIMS/MS. For ion quantification parameters of PFCAs, PFSAs, and GenX see Zhou et al. (2022)<sup>2</sup>. Mass transitions marked with a “\*” were used for quantification.

Analyte	Mass Transitions	Decluster Potential (DP, volts)	Collision Energy (CE, volts)
6:2 monoPAP	443 -> 79	-40	-75
<sup>13</sup> C <sub>2</sub> 6:2monoPAP	445 -> 79	-40	-75
8:2 monoPAP	543 -> 79	-45	-85
<sup>13</sup> C <sub>2</sub> 8:2monoPAP	545 -> 79	-45	-90
6:2 diPAP	789 -> 443*	-65	-27
	789 -> 97	-65	-65
<sup>13</sup> C <sub>4</sub> 6:2 diPAP	793 -> 445	-65	-27
8:2 diPAP	989 -> 543*	-80	-33
	989 -> 97	-80	-75
<sup>13</sup> C <sub>4</sub> 8:2 diPAP	993 -> 97	-80	-75

**Table S5.** Average recoveries (standard deviation;  $\sigma$ ) for 37 mm quartz fiber filters (N = 5) were calculated by spiking each filter with 10  $\mu\text{L}$  of 100  $\text{ng mL}^{-1}$  analyte standard. Filters were extracted identically to samples and evaporated to 25  $\mu\text{L}$ . Then 75  $\mu\text{L}$  of water was added for a final volume of 100  $\mu\text{L}$ . Recovery was calculated by dividing the concentration from each filter by the expected concentration (10  $\text{ng mL}^{-1}$ ).

Analyte	Mean Recovery (%)	$\sigma$ (%)
Perfluorocarboxylic Acids (PFCAs)		
PFBA	96	1.1
PFPeA	103	0.7
PFHxA	108	0.92
PFHpA	112	1.53
PFOA	116	1.54
PFNA	106	1.14
PFDA	97	1.1
PFUnA	96	1.11
PFDoA	80	1.17
PFTTrA	100	1.21
PFTA	126	1.32
PFHxDA	78	0.50
PFODA	25	1.4
Perfluorosulfonic Acids (PFSAs)		
L-PFBS	102	2.06
L-PFPeS	101	1.44
L-PFHxS	95	2.41
L-PFHpS	94	1.21
L-PFOS	85	1.19
L-PFNS	82	0.66
L-PFDS	78	0.62
L-PFDoS	119	1.76
Emerging and Polyfluoroalkyl Phosphate Esters (PAPs)		
GenX	106	0.92
6:2 monoPAP	173	3.64
8:2 monoPAP	138	2.29
6:2 diPAP	83	1.44
8:2 diPAP	177	2.75

**Table S6.** Analytical Detection Limits (ADL) were calculated by following EPA methods and running the lowest calibration standard (0.2 ng mL<sup>-1</sup> or 1 ng mL<sup>-1</sup>) seven times in succession. The ADL is the standard deviation ( $\sigma$ ) of the seven runs multiplied by the Student's t-value for a single-tailed 99<sup>th</sup> percentile *t* statistic (3.143). To express the ADL in air concentration (pg PFAS compound per m<sup>-3</sup> of air), we used the average volume of air collected during the IPA Campaign (91.1 m<sup>-3</sup>).

PFAS	ADL (ng mL <sup>-1</sup> )	ADL (pg m <sup>-3</sup> )
Perfluorocarboxylic Acids (PFCAs)		
PFBA	0.03	0.03
PFPeA	0.02	0.02
PFHxA	0.02	0.02
PFHpA	0.03	0.03
PFOA	0.04	0.05
PFNA	0.03	0.03
PFDA	0.02	0.02
PFUnA	0.04	0.04
PFDoA	0.08	0.08
PFTTrA*	0.48	0.53
PFTA*	0.30	0.33
PFHxDA*	0.70	0.77
PFODA*	0.51	0.56
Perfluorosulfonic Acids (PFSAs)		
L-PFBS	0.04	0.04
L-PFPeS	0.12	0.13
L-PFHxS	0.07	0.08
L-PFHpS	0.10	0.11
L-PFOS	0.06	0.07
L-PFNS	0.04	0.04
L-PFDS	0.12	0.13
L-PFDoS*	0.42	0.46
Emerging and Polyfluoroalkyl Phosphate Esters (PAPs)		
GenX	0.47	0.52
6:2 monoPAP*	0.59	0.77
8:2 monoPAP*	0.70	0.81
6:2 diPAP*	0.70	0.65
8:2 diPAP*	0.74	0.77

\*indicates that ADL was calculated using 1 ng mL<sup>-1</sup> calibration standard.

**Table S7.** Analytical Precision for each ionic PFAS collected on QFF was expressed as a pooled coefficient of variation (CV) of duplicate analyses (n = 10 duplicate pairs). For each PFAS compound, analytical precision was calculated by dividing the pooled standard deviation ( $\sigma_{\text{pooled}}$ ) by the mean of all duplicate

analyses. For paired data,  $\sigma_{\text{pooled}} = \sqrt{\sum d_i^2 / 2n}$  where d is the difference between paired, i, values, and n is the number of pairs.

PFAS	Analytical Precision (CV) [%]
PFBA	20.3
PFPeA	n.a.
PFBS	0.3
PFHxA	12.6
GenX	n.a.
PFPeS	7.8
PFHpA	4.6
PFHxS	n.a.
PFOA	6.4
PFHpS	25.8
PFNA	8.9
PFOS	7.3
PFDA	4.8
PFNS	4.8
PFUnA	2.1
PFDS	n.a.
PFDoA	14.5
PFTTrA	1.7
PFDoS	n.a.
PFTA	16.8
PFHxDA	16.5
PFODA*	35.2
6:2 diPAP	84.9
8:2 diPAP	203.6
6:2 monoPAP	n.a.
8:2 monoPAP	n.a.

\*The analytical precision of PFODA was calculated with an 0.2 ng mL<sup>-1</sup> calibration standard because PFODA was not detected in repeated samples.

**Table S8.** Reported concentrations are mean field blank subtracted if significantly greater than 0 ( $p < 0.05$ ), so the field measurement detection limit (FDL) is  $3\sigma$  of the field blanks. The MDL is the larger of the FDL or ADL. MDLs for PFAS expressed as ADL are denoted with \* and n.d. indicates PFAS was not detected in sample.

PFAS	Average Field Blank ( $\mu\text{g m}^{-3}$ ), $\bar{x}$	FDL ( $\mu\text{g m}^{-3}$ ), $3*\sigma_{\bar{x}}$	Max Field Blank ( $\mu\text{g m}^{-3}$ )	MDL ( $\mu\text{g m}^{-3}$ )
PFBA	0.11	0.5	0.54	0.5
PFPeA	0.01	0.1	0.09	0.1
PFBS	0.02	0.1	0.10	0.1
PFHxA	0.11	0.2	0.24	0.2
GenX	0.15	0.6	0.67	0.6
PFPeS	0.01	0.1	0.11	0.13*
PFHpA	0.04	0.1	0.09	0.12*
PFHxS	n.d.	n.d.	n.d.	0.08*
PFOA	0.01	0.04	0.04	0.05*
PFHpS	0.56	2	2.09	2.49
PFNA	0.10	1.3	2.32	1.3
PFOS	0.02	0.1	0.10	0.1
PFDA	0.02	0.1	0.08	0.1
PFNS	n.d.	n.d.	0.08	0.04*
PFUnA	n.d.	n.d.	0.07	0.04*
PFDS	n.d.	0.1	0.12	0.13*
PFDoA	0.04	0.4	0.31	0.4
PFTrA	0.03	0.2	0.31	0.53*
PFDoS	n.d.	n.d.	n.d.	0.46*
PFTA	0.06	0.3	0.37	0.33*
PFHxDA	0.03	0.1	0.65	0.77*
PFODA	0.04	0.2	0.53	0.56*
6:2 diPAP	0.06	0.5	0.80	0.65*
8:2 diPAP	0.12	1.4	2.53	1.4
6:2 monoPAP	0.18	1.1	1.78	1.1
8:2 monoPAP	0.18	1.8	2.51	1.8

## ION CHROMATOGRAPHY

PTFE filters were extracted in 2 mL of MilliQ water twice for a final volume of 4 mL. Extracts were filtered through 0.2  $\mu\text{m}$  nylon syringe filters and then analyzed via IC. In addition to field blanks, method blanks were made by following the same extraction procedure without a filter substrate while lab blanks were extracted PTFE filters stored in the lab. Eleven anions and six cations were targeted using a Dionex ICS-300 and Aquion system, respectively (Table S7). Cation analysis was done in isocratic mode at a flow rate of 0.5 mL  $\text{min}^{-1}$  with 20 mM methane sulfonic acid (MSA) as the eluent. Anions were analyzed at 0.4 mL  $\text{min}^{-1}$  with an 85 mM potassium hydroxide (KOH) gradient (Table S8). Extraction efficiency for all detected ions ranged from 77.2 – 100% (Table S9). Analytical precision ranged from 0.9 to 11.8% (Table S10) and method detection limits ( $3\sigma$  of mean field blanks; Table S11) ranged from 0.01  $\mu\text{M}$  for potassium to 5.7  $\mu\text{M}$  for formate. After every 10 samples, a calibration standard, sample, and solvent blank were run to assess instrument precision and carry-over effects. Each sample run also included at least 3 method blanks, 3 lab blanks, and 3 solvent blanks.

**Table S9.** Dionex ICS-3000 and Aquion suppressor and columns. Cation analysis with the Aquion was in isocratic mode at a flow rate of 0.5 mL  $\text{min}^{-1}$  and 20 mM methane sulfonic acid (MSA) eluent with the current set at 30 mA.

	Dionex ICS-3000		Aquion	
	Name	Dimensions	Name	Dimensions
Suppressor	ASRS	2 mm	CERS	4 mm
Guard Column	Dionex IonPac AG11-HC	2x50 mm	Dionex IonPac CG12A, 5 $\mu\text{m}$	3x30 mm
Analytical Column	Dionex IonPac AS11-HC	2x250 mm	Dionex IonPac CS12A, 5 $\mu\text{m}$	3x150 mm

**Table S10.** Dionex ICS-3000 gradient at 0.4 mL  $\text{min}^{-1}$  with an 85 mM potassium hydroxide (KOH) eluent.

Time (min)	Concentration (mM)	Gradient
0	1	5
0	1	5
5	6.18	7
34.3	12.04	5
37.3	12.04	5
48	44.3	5
48.1	1	5
53	1	5

**Table S11.** Mean (N = 10) extraction efficiency and standard deviation ( $\sigma$ ) of ions in water from PTFE filters. A random selection of 10 samples were extracted a third time and that 3<sup>rd</sup> extract concentration was divided by the sum of the three extractions to determine extraction efficiency. Malonate, maleate, formate, pyruvate, bromide, and lithium were not detected in any samples, so extraction efficiency is not reported here.

Compound	Mean Extraction Efficiency (%)	$\sigma$ (%)
Sodium	100	-
Ammonium	97.3	4.8
Potassium	98.9	1.8
Magnesium	77.2	24.7
Calcium	86.6	20.1
Acetate	86.6	17.1
Chloride	99.4	1.1
MSA	77.3	19.8
Nitrate	100	-
Sulfate	100	-
Oxalic Acid	100	-

**Table S12.** Analytical Precision (CV) for detected anions and cations collected onto PTFE filters was expressed as a pooled coefficient of variation (CV) of duplicate analyses (n = 10 duplicate pairs). For each ion, analytical precision was calculated by dividing the pooled standard deviation ( $\sigma_{\text{pooled}}$ ) by the mean of

all duplicate analyses. For paired data,  $\sigma_{\text{pooled}} = \sqrt{\sum d_i^2 / 2n}$  where d is the difference between paired, i, values, and n is the number of pairs.

Ion	Analytical Precision (CV) [%]
Acetate	7.7
Formate	3.3
Pyruvic Acid	11.8
Chloride	4.3
Nitrate	5.5
Sulfate	4.7
Oxalic Acid	3.2
Sodium	0.87
Ammonium	4.8
Potassium	5.8

**Table S13.** Mean field blank concentrations for ions and the MDLs were calculated as  $3\sigma$  because sample concentrations were all mean field blank subtracted. Field blank concentrations were all above lab, method, and DI water blanks. Air concentrations for each ion are calculated using the mean ( $\sigma$ ) flow rate  $11.8 (1.5) \text{ m}^3$  of both the pDR ( $1.52 \text{ L min}^{-1}$ ) and GRIMM ( $1.2 \text{ L min}^{-1}$ ) for each sampling period.

<b>Ion</b>	<b>Concentration (<math>\mu\text{M}</math>)</b>	<b>MDL, <math>3\sigma</math> (<math>\mu\text{M}</math>)</b>	<b>MDL (<math>\mu\text{g m}^{-3}</math>)</b>
Acetate	0.33	0.25	0.7
Formate	3.5	5.7	12.4
Pyruvic Acid	0.12	0.22	0.9
Chloride	2.2	2.7	4.5
Nitrate	1.7	0.85	2.5
Sulfate	2.2	0.53	2.4
Oxalic Acid	0.53	0.38	1.6
Sodium	7.8	2.1	2.3
Ammonium	0.06	0.46	0.39
Potassium	0.04	0.02	0.04
		<b>Avg Volume (<math>\text{m}^3</math>)</b>	<b><math>\sigma_v</math></b>
	<b>pDR</b>	13.2	0.3
	<b>GRIMM</b>	10.2	0.2

## SECTION S3: SAMPLE AND BLANK COLLECTION DETAILS

### MSP - QUARTZ FIBER FILTERS

Field blanks were loaded into filter cassettes, one for PFAS and one for OC/EC, loaded into the MSP inlet heads, and then removed and stored in a zip-lock bag. QFFs were loaded into MSP inlet heads and stored in zip-lock bags at 4°C in the lab the day before being deployed. Field blanks were stored with the inlet heads. Inlet heads and field blanks were transported to the field in sealed zip-lock bags. Field blanks were exposed to home air for 2 min., placed back into the sealed zip-lock bag, and left by the sampling equipment in the home for the 6-day sampling period. At the end of the sampling period, MSP filter assemblies were placed in zip-lock bags and transported at 4°C to the lab. Filters were removed in the lab and stored in pre-baked aluminum foil lined petri dishes in zip-lock bags at -20°C until extraction. Field blanks were handled and stored identically to samples.

### REAL-TIME PM SAMPLING – PTFE FILTERS

Either a DataRAM pDR-1500 Aerosol Monitor (ThermoFisher Scientific, Waltham, MA) or GRIMM Optical Particle Counter (DURAG GROUP, Hamburg, Germany) was deployed in the field concurrently with the MSPs. The pDR (2.5 µm cut-point) was loaded with a 37 mm PTFE (Pall Laboratory, Port Washington, NY, USA) and the GRIMM OPC (total suspended particles; TSP) contained a 47 mm PTFE filter (DURAG GROUP, Hamburg, Germany). Field blanks were transported to the field in zip-lock bags and exposed to home air for 2 minutes before being sealed in the zip-lock and left by the sampling equipment for the sampling period. Samples and field blanks were handled and stored identically. All samples and 10 field blanks were analyzed for anions (acetate, formate, pyruvate, chloride, bromide, nitrate, malonate, maleate, sulfate, and oxalate) and cations (potassium, ammonium, sodium, calcium, and magnesium) using ion chromatography (IC).

### OC/EC

QFF-collected OC and EC were measured using thermal-optical transmittance<sup>3</sup> with a Model 4L Lab OC-EC Aerosol Analyzer (Sunset Laboratory Inc, Tigard, Oregon) using the NIOSH-870 protocol. During the analysis, a 1.5 cm<sup>2</sup> punch of the QFF is placed into the analyzer oven and purged with helium (He). The oven undergoes a stepped temperature ramp to 870°C to volatilize organic carbon on the filter. Elemental carbon is then combusted after the oven is cooled to 550°C, the carrier gas is changed to 2% oxygen in He, and the temperature is ramped to 860°C. The transmittance through the filter is used to correct for any EC formed by pyrolysis of OC during analysis. In the final step of the analysis, a certified 5% methane (CH<sub>4</sub>) in He standard is injected for quantification. All evolved carbon is converted to CO<sub>2</sub> and then CH<sub>4</sub> and measured using a flame ionization detector (FID). The NIOSH870 temperature protocol<sup>4</sup> was used for analysis of all blanks and samples. Every sample run began and ended with a lab blank and sucrose standard to assess instrument performance. Additionally, 17% of samples (n = 5) were analyzed in duplicate to assess analytical precision, which was 1.2% for OC and 7.4% for EC. The MDL (greater of FDL and instrument specifications) for OC was 0.34 µg-C m<sup>-3</sup> and 0.02 µg-C m<sup>-3</sup> for EC. For indoor samples, particulate OC was calculated as OC on the front QFF minus OC on the backup QFF.

## IONS, AEROSOL LIQUID WATER CONTENT, AND PH

Particles collected on Teflon filters with real-time PM monitors were extracted twice in 2 mL of Milli-Q water, filtered (nylon, 13mm diameter, 0.22  $\mu\text{m}$  pore size, VWR, Radnor, PA), and then analyzed for anions and cations on a Dionex ICS-3000 and Aquion Ion Chromatography (IC) System, respectively (ThermoScientific, Waltham, MA). LWC was calculated using Model III from E-AIM with inputs of moles of ammonium ( $\text{NH}_4^+$ ), sodium ( $\text{Na}^+$ ), sulfate ( $\text{SO}_4^{2-}$ ), nitrate ( $\text{NO}_3^-$ ), and chloride ( $\text{Cl}^-$ ) from IC measurements and using hydroxide ( $\text{OH}^-$ ) and hydrogen ion ( $\text{H}^+$ ) to ensure the sum of charges on the cations and anions were in balance. Temperature was fixed at 298.15K and each home's average RH during the sampling period was used. For each ion, 27% of samples ( $n = 8$ ) were repeated to assess analytical precision. All detected ions (formate, chloride, nitrate, sulfate, oxalate, sodium, ammonium, and potassium) except acetate (95%) and pyruvate (12%) had an analytical precision between 0.9% – 5.8%. Only nitrate, sulfate, sodium, and potassium were used in the calculation of LWC with E-AIM III.

pH was calculated according to Weschler and Nazaroff (2020) by the following equation:

$$\text{pH} = \log(\text{LWC}) - \log(\text{PSA})$$

where LWC is in  $\mu\text{g}$  of particle-associated water per  $\text{m}^3$  of air (from above) and PSA, particle strong acidity, is in  $\text{nmol}$  of  $\text{H}^+$  per  $\text{m}^3$  of air<sup>5</sup>. E-AIM III reported the estimated concentration of aerosol LWC based on the inorganic ion inputs, temperature, and RH. PSA was estimated by determining the concentration of  $\text{H}^+$  by balancing the sum of charges on the cations and anions.

## SECTION S4: CALCULATIONS AND STATISTICAL ANALYSIS METHODS

### EMISSIONS CALCULATIONS

Penetration (P) is the fraction of the particle mass that passes through the building envelope with the outdoor to indoor transport of aerosol.<sup>6</sup> It is assumed that the fraction of the particle mass that penetrates through the building envelope with indoor to outdoor transport is the same. And thus, (1 – P) is the fraction of the particle mass that is lost to the building envelope with outdoor to indoor transport, or with indoor to outdoor transport.

With outdoor to indoor transport, particles that penetrate indoors and particles that are lost in the building envelope are both lost to the outdoor air. As such, the overall mass flux lost to outdoor air due to removal by a home equals the particle mass flux that infiltrates (penetrates) into the home ( $P C_{out} \lambda V_{Home}$ ) plus the particle mass flux that deposits in the building envelope on the way in  $(1-P) C_{out} \lambda V_{Home}$ .

$$\begin{aligned} \text{Mass flux removed by the home} &= P C_{out} \lambda V_{Home} + (1-P) C_{out} \lambda V_{Home} \\ &= C_{out} \lambda V_{Home} \end{aligned} \quad (\text{Eqn S1})$$

With indoor to outdoor transport, only particles that penetrate to the outdoor environment from the home are considered “emitted by the home.” The overall mass flux emitted to the outdoor environment from the home equals the particle mass flux that exfiltrates from the home.

$$\text{Mass flux emitted by the home} = P C_{in} \lambda V_{Home} \quad (\text{Eqn S2})$$

Thus, the net emission rate (net impact of the home) is given as the mass flux emitted by the home (Eqn S2) minus the mass flux removed by the home (Eqn S1):

$$\begin{aligned} &= P C_{in} \lambda V_{Home} - C_{out} \lambda V_{Home} \\ &= (P C_{in} - C_{out}) \lambda V_{Home} \end{aligned}$$

Where P is the penetration factor, or the fraction of the particle mass (i.e., PM<sub>2.5</sub>) that passes through the building envelope through infiltration or exfiltration (dimensionless), C<sub>in</sub> is the indoor PFAS concentration (measured in the IPA Campaign in pg m<sup>-3</sup>), C<sub>out</sub> is the outdoor PFAS concentration (measured directly outside of IPA Campaign homes in pg m<sup>-3</sup> or, as an alternative set to zero), λ is the air change rate (h<sup>-1</sup>), and V<sub>Home</sub> is the home volume (m<sup>3</sup>).

### STATISTICAL ANALYSIS

Data were checked for normality with the Shapiro-Wilk test. Front and backup filter PFAS concentrations were compared using a one-sided Wilcoxon Signed Rank Test. Kendall’s τ and Spearman’s ρ correlation analyses were conducted to investigate associations between individual PFAS and subclasses with auxiliary measurements. Both are non-parametric but Kendall’s τ is a better estimate for smaller sample sizes (N < 30) because Spearman’s ρ deviates more as the sample size decreases<sup>7</sup>. However, Spearman’s ρ is more commonly reported so it was also calculated for comparison. Stepwise multiple linear regression

(MLR) was used to investigate associations of PFAS and concurrent measurements from each home. Within and across home variability indoors and outdoors for  $\Sigma$ PFAS,  $\Sigma$ PFCAs,  $\Sigma$ PFSAs, and  $\Sigma$ PAPs concentrations were calculated (see Table S25) as pooled Coefficients of Variation (CV; %). Specifically, for each PFAS subclass, within home variability (WHV) was determined by calculating  $\sigma_i^2$  for the 3 home  $i$  measurements, pooling across homes to obtain the pooled  $\sigma^2$ , and dividing the pooled  $\sigma$  by the mean of all sample concentrations from all homes for that subclass. Across home variability (AHV) was calculated by grouping samples into seasons (Fall, Winter, Summer) and calculating  $\sigma_{pooled}$  across the 3 groups (seasons). Homes 1 and 35 were not included in either analysis due to incomplete sample sets.

### COEFFICIENT OF VARIATION (CV)

Coefficients of variation (CV) for  $\Sigma$ PFAS,  $\Sigma$ PFCAs,  $\Sigma$ PFSAs, and  $\Sigma$ PAPs were calculated to assess variability within homes and across homes for indoor front and outdoor filters. The  $\sigma$  for each PFAS subclass in each season was calculated and then pooled across seasons with the equation below:

$$\sigma_{pooled} = \sqrt{\frac{\sum [(n_i - 1) \times \sigma_i^2]}{\sum (n_i) - N}}$$

Where  $n_i$  is the number of measurements in the group,  $\sigma_i$  is the standard deviation of the group, and  $N$  is the total number of groups (seasons) that are pooled ( $N = 3$ ). The AHV is then the pooled coefficient of variation (CV, %) based on  $\sigma_{pooled}$

$$CV = \frac{\sigma_{pooled}}{\bar{X}} * 100\%$$

Where  $\bar{X}$  is the mean of all sample concentrations across all seasons and all homes.

The within home variability (WHV, %) was calculated similarly to AHV using the pooled coefficient of variation, but where the groups were defined as the samples from each home ( $N = 8$ ).

### MULTIPLE LINEAR REGRESSION

Results of statistical analyses used to investigate associations between auxiliary measurements (indoor and outdoor T, indoor and outdoor RH, particulate OC, EC, nitrate, sulfate, LWC, pH, and ACH) and log transformed PFAS subclasses ( $\Sigma$ PFAS,  $\Sigma$ PFCAs,  $\Sigma$ PFSAs,  $\Sigma$ PAPs,  $\Sigma$ Short PFCAs, and  $\Sigma$ Long PFCAs), including stepwise MLR and Kendall's  $\tau$  and Spearman's  $\rho$  rank correlations, are presented in Section S10 (Tables S26-S29). Stepwise (both direction) multiple linear regression was conducted in RStudio meaning that the model starts without any predictors/variables and adds one at a time (forward selection). As each new predictor is added, variables included in the model are removed (backward selection) if they no longer contribute to the model in a meaningful way.

## SECTION S5: IONIC PFAS CONCENTRATIONS

**Table S14.** Summary statistics of indoor front filter collected ionic PFAS where values have been mean field blank subtracted. n.d. indicates non-detect and values with a “<” in front indicate that that PFAS was detected but at concentrations below the MDL. Concentrations below the MDL were not adjusted. We acknowledge that there is uncertainty around the true value, however, the instrument-reported concentration represents our best estimate of sample concentrations. FDL is the field method detection limit, taken to be  $3\sigma$  of the field blanks. MDLs marked with a “\*” indicate that the ADL was used as the MDL instead of the FDL. Air concentrations were calculated using the mean( $\sigma$ ) sampling volume 91.1 m<sup>3</sup>(6.2 m<sup>3</sup>).

	Mean (pg m <sup>-3</sup> )	Median (pg m <sup>-3</sup> )	Min (pg m <sup>-3</sup> )	Max (pg m <sup>-3</sup> )	DF (%)	MDL (pg m <sup>-3</sup> )	Mean Field Blank (pg m <sup>-3</sup> )
PFBA	12.2	3.6	n.d.	118.8	66.7	0.5	0.11
PFPeA	<0.1	<0.1	n.d.	0.6	10	0.1	0.01
PFBS	<0.1	<0.1	n.d.	0.3	6.7	0.1	0.02
PFHxA	0.7	0.7	n.d.	2.1	80	0.2	0.11
GenX	1.7	<0.6	n.d.	14.5	33.3	0.6	0.15
PFPeS	<0.13	<0.13	n.d.	0.3	6.7	0.13*	0.01
PFHpA	0.2	0.2	n.d.	0.6	66.7	0.12*	0.03
PFHxS	<0.08	<0.08	n.d.	0.9	3.3	0.08*	n.d.
PFOA	0.8	0.5	n.d.	3.1	80	0.05*	0.01
PFHpS	<2.49	<2.49	n.d.	3.6	13.3	2.49	0.56
PFNA	0.1	<1.3	n.d.	1.4	20	1.3	0.1
PFOS	0.9	0.5	n.d.	2.8	80	0.1	0.02
PFDA	0.1	<0.1	n.d.	0.8	30	0.1	0.02
PFNS	<0.04	<0.04	n.d.	0.6	6.7	0.04*	n.d.
PFUnA	<0.04	<0.04	n.d.	0.2	10	0.04*	n.d.
PFDS	n.d.	n.d.	n.d.	n.d.	0	0.13*	n.d.
PFDoA	0.1	<0.4	n.d.	1.6	23.3	0.4	0.04
PFTTrA	0.1	<0.53	n.d.	0.9	13.3	0.53*	0.03
PFDoS	n.d.	n.d.	n.d.	n.d.	0	0.46*	n.d.
PFTA	0.2	<0.33	n.d.	1.9	26.7	0.33*	0.06
PFHxDA	0.2	<0.77	n.d.	3.9	6.7	0.77*	0.01
PFODA	0.1	<0.56	n.d.	1.6	23.3	0.56*	0.05
6:2 diPAP	2.4	0.7	n.d.	11.9	56.7	0.65*	0.06
8:2 diPAP	0.2	<1.4	n.d.	3.7	10	1.4	0.12
6:2 monoPAP	0.9	<1.1	n.d.	23.4	6.7	1.1	0.19
8:2 monoPAP	n.d.	n.d.	n.d.	n.d.	0	1.8	0.18

**Table S15.** Summary statistics of indoor backup filter collected ionic PFAS where values have been mean field blank subtracted. n.d. indicates non-detect and values with a “<” in front indicate that that PFAS was detected but at concentrations below the MDL. Concentrations below the MDL were not adjusted. We acknowledge that there is uncertainty around the true value, however, the instrument-reported concentration represents our best estimate of sample concentrations. FDL is the field method detection limit, taken to be  $3\sigma$  of the field blanks. MDLs marked with a “\*” indicate that the ADL was used instead of the FDL. Air concentrations were calculated using the average sample volume 91.1 m<sup>3</sup>.

	Mean (pg m <sup>-3</sup> )	Median (pg m <sup>-3</sup> )	Min (pg m <sup>-3</sup> )	Max (pg m <sup>-3</sup> )	DF (%)	MDL (pg m <sup>-3</sup> )	Mean Field Blank (pg m <sup>-3</sup> )
PFBA	0.1	<0.5	n.d.	1.1	13.3	0.5	0.11
PFPeA	<0.1	<0.1	n.d.	0.2	16.7	0.1	0.01
PFBS	<0.1	<0.1	n.d.	0.1	3.3	0.1	0.02
PFHxA	0.1	<0.2	n.d.	0.7	33.3	0.2	0.11
GenX	<0.6	<0.6	n.d.	<0.6	3.3	0.6	0.15
PFPeS	n.d.	n.d.	n.d.	n.d.	0	0.13*	0.01
PFHpA	0.1	<0.12	n.d.	0.8	13.3	0.12*	0.03
PFHxS	<0.08	<0.08	n.d.	0.1	3.3	0.08*	n.d.
PFOA	0.3	0.2	n.d.	1.3	83.3	0.05*	0.01
PFHpS	0.2	<2.49	n.d.	2.8	10	2.49	0.56
PFNA	<1.3	<1.3	n.d.	1.4	3.3	1.3	0.1
PFOS	0.2	0.1	n.d.	1.3	60	0.1	0.02
PFDA	<0.1	<0.1	n.d.	0.4	13.3	0.1	0.02
PFNS	<0.04	<0.04	n.d.	0.6	3.3	0.04*	n.d.
PFUnA	n.d.	n.d.	n.d.	n.d.	0	0.04*	n.d.
PFDS	n.d.	n.d.	n.d.	n.d.	0	0.13*	n.d.
PFDoA	<0.2	<0.2	n.d.	0.2	3.3	0.4	0.04
PFTrA	<0.53	<0.53	n.d.	0.2	3.3	0.53*	0.03
PFDoS	n.d.	n.d.	n.d.	n.d.	0	0.46*	n.d.
PFTA	n.d.	n.d.	n.d.	n.d.	0	0.33*	0.06
PFHxDA	n.d.	n.d.	n.d.	n.d.	0	0.77*	0.01
PFODA	<0.56	<0.56	n.d.	1.3	3.3	0.56*	0.05
6:2 diPAP	<0.65	<0.65	n.d.	0.9	3.3	0.65*	0.06
8:2 diPAP	n.d.	n.d.	n.d.	n.d.	0	1.4	0.12
6:2 monoPAP	<1.1	<1.1	n.d.	1.3	3.3	1.1	0.19
8:2 monoPAP	<1.8	<1.8	n.d.	0.7	3.3	1.8	0.18

**Table S16.** Summary statistics of outdoor filter collected ionic PFAS where values have been mean field blank subtracted. n.d. indicates non-detect and values with a “<” in front indicate that that PFAS was detected but at concentrations below the MDL. Concentrations below the MDL were not adjusted. We acknowledge that there is uncertainty around the true value, however, the instrument-reported concentration represents our best estimate of sample concentrations. FDL is the field method detection limit, taken to be  $3\sigma$  of the field blanks. MDLs marked with a “\*” indicate that the ADL was used instead of the FDL. Air concentrations were calculated using the average sample volume 91.1 m<sup>3</sup>.

	Mean (pg m <sup>-3</sup> )	Median (pg m <sup>-3</sup> )	Min (pg m <sup>-3</sup> )	Max (pg m <sup>-3</sup> )	DF (%)	MDL (pg m <sup>-3</sup> )	Mean Field Blank (pg m <sup>-3</sup> )
PFBA	3.2	2.8	n.d.	13.6	66.7	0.5	0.11
PFPeA	n.d.	n.d.	n.d.	n.d.	0	0.1	0.01
PFBS	n.d.	n.d.	n.d.	n.d.	0	0.1	0.02
PFHxA	2	1.8	n.d.	6.7	96.7	0.2	0.11
GenX	1.4	<0.6	n.d.	10.8	23.3	0.6	0.15
PFPeS	0.1	<0.13	n.d.	0.7	13.3	0.13*	0.01
PFHpA	0.7	<0.12	n.d.	3.5	50	0.12*	0.03
PFHxS	n.d.	n.d.	n.d.	0.8	3.3	0.08*	n.d.
PFOA	0.3	<0.05	n.d.	2.5	36.7	0.05*	0.01
PFHpS	n.d.	n.d.	n.d.	n.d.	0	2.49	0.56
PFNA	<1.3	<1.3	n.d.	0.9	3.3	1.3	0.1
PFOS	0.4	0.3	n.d.	3.9	66.7	0.1	0.02
PFDA	<0.1	<0.1	n.d.	0.7	6.7	0.1	0.02
PFNS	<0.04	<0.04	n.d.	0.1	3.3	0.04*	n.d.
PFUnA	n.d.	n.d.	n.d.	n.d.	0	0.04*	n.d.
PFDS	n.d.	n.d.	n.d.	n.d.	0	0.13*	n.d.
PFDoA	n.d.	n.d.	n.d.	n.d.	0	0.4	0.04
PFTTrA	n.d.	n.d.	n.d.	n.d.	0	0.53*	0.03
PFDoS	n.d.	n.d.	n.d.	n.d.	0	0.46*	n.d.
PFTA	0.1	<0.33	n.d.	1.5	6.7	0.33*	0.06
PFHxDA	0.2	<0.77	n.d.	4	6.7	0.77*	0.01
PFODA	0.1	<0.56	n.d.	3	6.7	0.56*	0.05
6:2 diPAP	0.3	<0.65	n.d.	3.2	26.7	0.65*	0.06
8:2 diPAP	0.1	<1.4	n.d.	2.5	6.7	1.4	0.12
6:2 monoPAP	n.d.	n.d.	n.d.	n.d.	0	1.1	0.19
8:2 monoPAP	n.d.	n.d.	n.d.	n.d.	0	1.8	0.18

**Table S17.** PM<sub>2.5</sub> indoor front filter-collected PFCA concentrations (pg m<sup>-3</sup>) for each home during each sampling week. Values in bold are above the MDL and n.d. indicates the compound was not detected. Home 35, Week 2 is not included due to a sampler malfunction during deployment. Concentrations are recovery corrected but not field blank subtracted.

Home ID	Week	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnA	PFDoA	PFTrA	PFTA	PFHxDA	PFODA
65	1	<b>1.11</b>	<b>0.21</b>	<b>2.21</b>	<b>0.53</b>	<b>1.58</b>	0.60	<b>0.58</b>	<b>0.08</b>	<b>0.31</b>	0.24	0.23	<b>3.91</b>	n.d.
	2	<b>1.03</b>	n.d.	<b>1.69</b>	<b>0.38</b>	<b>1.12</b>	0.17	<b>0.44</b>	<b>0.14</b>	<b>0.39</b>	0.24	0.20	<b>3.36</b>	<b>3.99</b>
	3	<b>3.90</b>	n.d.	<b>0.54</b>	<b>0.19</b>	<b>0.40</b>	0.09	<b>0.20</b>	n.d.	0.05	n.d.	0.01	n.d.	<b>3.97</b>
18	1	<b>6.73</b>	<b>0.45</b>	<b>1.30</b>	<b>0.68</b>	<b>3.09</b>	0.52	n.d.	n.d.	<b>0.34</b>	<b>0.88</b>	0.13	n.d.	n.d.
	2	<b>5.60</b>	n.d.	<b>1.48</b>	<b>0.60</b>	<b>2.18</b>	0.30	n.d.	n.d.	0.22	n.d.	<b>0.56</b>	n.d.	n.d.
	3	<b>5.15</b>	n.d.	<b>0.58</b>	<b>0.67</b>	<b>1.95</b>	n.d.	n.d.	<b>0.23</b>	<b>1.67</b>	n.d.	<b>0.60</b>	n.d.	n.d.
78	1	<b>2.06</b>	n.d.											
	2	0.16	n.d.	<b>0.54</b>	<b>0.22</b>	<b>0.32</b>	n.d.	<b>0.76</b>						
	3	0.58	n.d.	<b>0.84</b>	<b>0.46</b>	<b>0.64</b>	0.10	<b>0.20</b>	n.d.	0.02	n.d.	0.08	n.d.	<b>1.42</b>
30	1	<b>11.52</b>	n.d.	<b>1.36</b>	<b>0.45</b>	<b>2.33</b>	0.34	<b>0.81</b>	n.d.	<b>0.38</b>	n.d.	<b>0.30</b>	n.d.	n.d.
	2	<b>4.70</b>	<b>0.64</b>	n.d.	n.d.	n.d.	<b>1.50</b>	n.d.	n.d.	n.d.	<b>0.27</b>	n.d.	0.26	n.d.
	3	<b>3.44</b>	n.d.	<b>1.19</b>	<b>0.47</b>	<b>1.17</b>	n.d.	<b>0.56</b>	n.d.	<b>0.26</b>	n.d.	n.d.	n.d.	n.d.
50	1	<b>13.43</b>	n.d.	n.d.	<b>0.31</b>	<b>1.57</b>	n.d.	n.d.	n.d.	0.07	n.d.	0.24	n.d.	n.d.
	2	<b>16.55</b>	n.d.	<b>1.43</b>	<b>0.31</b>	<b>0.73</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.06	n.d.	n.d.
	3	<b>5.07</b>	n.d.	<b>1.64</b>	<b>0.43</b>	<b>1.55</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.12	n.d.	n.d.
43	1	<b>118.93</b>	n.d.	n.d.	<b>0.14</b>	<b>0.22</b>	n.d.	n.d.	n.d.	<b>0.27</b>	n.d.	0.15	n.d.	n.d.
	2	<b>50.14</b>	n.d.	<b>0.88</b>	n.d.	0.16	n.d.	n.d.						
	3	<b>1.41</b>	n.d.	<b>0.90</b>	<b>0.45</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	<b>0.38</b>	n.d.	n.d.
35	1	<b>8.53</b>	n.d.	<b>0.30</b>	<b>0.23</b>	<b>0.24</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.22	n.d.	n.d.
	2	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	<b>82.04</b>	n.d.	<b>0.62</b>	n.d.	0.34	n.d.	n.d.						
1	1	n.d.	n.d.	<b>0.75</b>	<b>0.13</b>	<b>0.49</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.27	n.d.	n.d.
	2	<b>10.50</b>	n.d.	<b>0.58</b>	<b>0.19</b>	<b>0.86</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.12	n.d.	n.d.
	3	<b>15.12</b>	n.d.	<b>0.96</b>	<b>0.34</b>	<b>0.58</b>	n.d.	n.d.	n.d.	n.d.	n.d.	<b>0.38</b>	n.d.	n.d.
10	1	n.d.	n.d.	<b>1.04</b>	<b>0.64</b>	<b>0.32</b>	n.d.	n.d.	n.d.	n.d.	n.d.	<b>1.99</b>	n.d.	n.d.
	2	n.d.	n.d.	<b>0.77</b>	n.d.	<b>0.86</b>	n.d.	n.d.	n.d.	n.d.	n.d.	<b>0.80</b>	n.d.	n.d.
	3	n.d.	n.d.	<b>0.94</b>	n.d.	<b>0.52</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.16	n.d.	n.d.
59	1	n.d.	n.d.	0.19	n.d.	<b>0.42</b>	n.d.	<b>0.27</b>	n.d.	n.d.	n.d.	<b>0.33</b>	n.d.	n.d.
	2	n.d.	n.d.	<b>0.72</b>	n.d.	<b>0.23</b>	n.d.	<b>0.41</b>	n.d.	n.d.	n.d.	0.06	n.d.	n.d.
	3	n.d.	n.d.	<b>0.39</b>	n.d.	<b>1.24</b>	n.d.	<b>0.22</b>	n.d.	n.d.	n.d.	0.06	n.d.	n.d.
DF (%)		67	10	80	67	80	20	30	10	23	13	27	6.7	13
MDL*		0.50	0.1	0.2	0.12	0.05	1.3	0.1	0.04	0.4	0.53	0.3	0.77	0.56
$\bar{x}$ Field Blank		0.11	0.01	0.11	0.03	0.01	0.1	0.02	n.d.	0.04	0.03	0.06	0.01	0.05
$\sigma$ Field Blank		0.16	0.02	0.07	0.03	0.01	0.42	0.03	n.d.	0.07	0.07	0.09	0.12	0.12
Recovery (%)		96	103	108	112	116	106	97	96	80	100	126	78	25

**Table S18.** PM<sub>2.5</sub> Indoor front filter PFASs, GenX, and PAP concentrations (µg m<sup>-3</sup>). Values in bold are above the MDL and n.d. is not detected. Home 35, Week 2 is not included due to a sampler malfunction. Concentrations are recovery corrected but not field blank subtracted.

Home ID	Week	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFNS	PFDS	PFDoS	GenX	6:2 diPAP	8:2 diPAP	6:2 monoPAP	8:2 monoPAP
65	1	n.d.	n.d.	n.d.	1.71	<b>0.37</b>	n.d.	n.d.	n.d.	n.d.	<b>4.77</b>	n.d.	n.d.	n.d.
	2	n.d.	<b>0.27</b>	n.d.	1.83	<b>0.45</b>	<b>0.22</b>	n.d.	n.d.	n.d.	<b>3.29</b>	0.07	n.d.	n.d.
	3	n.d.	n.d.	n.d.	1.17	<b>0.51</b>	n.d.	n.d.	n.d.	n.d.	<b>0.93</b>	n.d.	<b>23.63</b>	n.d.
18	1	n.d.	n.d.	n.d.	n.d.	<b>2.01</b>	n.d.	n.d.	n.d.	<b>2.09</b>	<b>0.80</b>	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	n.d.	<b>2.56</b>	n.d.	n.d.	n.d.	n.d.	0.58	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	n.d.	<b>1.34</b>	n.d.	n.d.	n.d.	n.d.	<b>0.79</b>	n.d.	n.d.	n.d.
78	1	n.d.	n.d.	n.d.	0.23	<b>2.54</b>	n.d.	n.d.	n.d.	n.d.	0.26	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	<b>2.90</b>	<b>1.65</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	3	<b>0.32</b>	<b>0.13</b>	n.d.	2.02	<b>0.82</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
30	1	n.d.	n.d.	n.d.	1.57	0.00	n.d.	n.d.	n.d.	n.d.	<b>3.92</b>	n.d.	n.d.	n.d.
	2	<b>0.14</b>	n.d.	<b>0.92</b>	<b>2.69</b>	<b>0.20</b>	<b>0.63</b>	0.01	n.d.	<b>1.41</b>	n.d.	<b>1.78</b>	n.d.	n.d.
	3	0.06	n.d.	n.d.	2.00	<b>0.86</b>	n.d.	n.d.	n.d.	n.d.	<b>1.10</b>	n.d.	<b>2.61</b>	n.d.
50	1	n.d.	n.d.	n.d.	n.d.	<b>0.35</b>	n.d.	n.d.	n.d.	<b>0.73</b>	0.48	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	0.74	<b>0.59</b>	n.d.	n.d.	n.d.	<b>3.32</b>	<b>2.73</b>	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	0.82	<b>0.56</b>	n.d.	n.d.	n.d.	<b>4.67</b>	<b>0.71</b>	n.d.	n.d.	n.d.
43	1	0.08	n.d.	n.d.	0.49	<b>0.69</b>	n.d.	n.d.	n.d.	<b>14.68</b>	n.d.	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	0.63	<b>2.16</b>	n.d.	n.d.	n.d.	<b>8.30</b>	n.d.	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	0.24	<b>0.55</b>	n.d.	n.d.	n.d.	<b>13.35</b>	<b>9.76</b>	n.d.	n.d.	n.d.
35	1	n.d.	n.d.	n.d.	<b>4.11</b>	<b>0.52</b>	n.d.	n.d.	n.d.	<b>6.09</b>	n.d.	n.d.	n.d.	n.d.
	2	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	n.d.	n.d.	n.d.	2.44	n.d.	n.d.	n.d.	n.d.	<b>6.52</b>	n.d.	n.d.	n.d.	n.d.
1	1	0.06	n.d.	n.d.	1.20	n.d.	n.d.	n.d.	n.d.	<b>2.96</b>	<b>7.47</b>	n.d.	n.d.	n.d.
	2	0.05	n.d.	n.d.	0.88	n.d.	n.d.	n.d.	n.d.	n.d.	<b>1.82</b>	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	1.35	<b>0.44</b>	n.d.	n.d.	n.d.	<b>5.03</b>	<b>12.00</b>	n.d.	n.d.	n.d.
10	1	n.d.	n.d.	n.d.	<b>3.15</b>	<b>2.71</b>	n.d.	n.d.	n.d.	n.d.	<b>4.62</b>	<b>3.81</b>	n.d.	n.d.
	2	n.d.	n.d.	n.d.	0.33	n.d.	n.d.	n.d.	n.d.	n.d.	<b>11.41</b>	<b>1.65</b>	n.d.	n.d.
	3	n.d.	n.d.	n.d.	0.38	<b>2.84</b>	n.d.	n.d.	n.d.	n.d.	<b>5.30</b>	0.80	n.d.	n.d.
59	1	n.d.	n.d.	n.d.	0.20	<b>0.59</b>	n.d.	n.d.	n.d.	n.d.	0.50	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	0.96	<b>0.52</b>	n.d.	n.d.	n.d.	n.d.	<b>2.34</b>	0.07	n.d.	n.d.
	3	n.d.	n.d.	n.d.	0.42	<b>1.14</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.03	n.d.	n.d.
DF (%)		10	7	3	13.3	80	7	0	0	33	56.7	10	7	0
MDL		0.1	0.13	0.08	2.49	0.1	0.04	0.13	0.46	0.6	0.65	1.4	1.1	1.8
x̄ <sub>Field Blank</sub>		0.02	0.01	n.d.	0.56	0.02	4.1E-3	4.0E-3	-	0.15	0.07	0.12	0.18	0.18
σ <sub>Field Blank</sub>		0.03	0.03	n.d.	0.64	0.03	0.02	0.02	-	0.18	0.16	0.46	0.37	0.6
Recovery (%)		102	101	95	94	85	82	78	119	106	176	138	83	177

**Table S19.** Indoor backup Filter PFCA filter collected PM<sub>2.5</sub> concentrations (pg m<sup>-3</sup>). Values in bold are above the MDL and n.d. indicates the compound was not detected. Home 35, Week 2 is not included due to a sampler malfunction during deployment. Concentrations are recovery corrected but not field blank subtracted.

Home ID	Week	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnA	PFDoA	PFTra	PFTA	PFHxDA	PFODA
65	1	0.55	n.d.	<b>0.48</b>	0.04	<b>0.16</b>	n.d.	<b>0.16</b>	n.d.	0.17	0.14	0.19	0.68	n.d.
	2	<b>0.59</b>	n.d.	<b>0.38</b>	0.04	<b>0.29</b>	n.d.	<b>0.11</b>	n.d.	n.d.	0.11	0.07	n.d.	0.43
	3	0.43	0.03	0.30	0.01	<b>0.08</b>	0.03	0.11	n.d.	0.04	0.12	n.d.	n.d.	0.22
18	1	0.30	n.d.	0.28	n.d.	<b>0.27</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	2	0.53	n.d.	<b>0.40</b>	n.d.	<b>0.22</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	3	<b>1.24</b>	n.d.	<b>0.37</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.01	n.d.	<b>1.31</b>
78	1	0.16	n.d.	0.18	n.d.	n.d.	n.d.	n.d.	n.d.	0.04	n.d.	n.d.	n.d.	n.d.
	2	0.41	n.d.	0.26	n.d.	<b>0.10</b>	n.d.	n.d.	n.d.	0.14	n.d.	n.d.	n.d.	n.d.
	3	0.24	n.d.	0.29	n.d.	<b>0.12</b>	n.d.	0.07	n.d.	0.01	n.d.	0.02	n.d.	n.d.
30	1	0.20	n.d.	<b>0.48</b>	0.07	<b>1.00</b>	n.d.	<b>0.45</b>	n.d.	0.20	n.d.	0.07	n.d.	n.d.
	2	<b>1.11</b>	0.02	n.d.	n.d.	n.d.	<b>1.51</b>	0.00	n.d.	n.d.	<b>0.26</b>	n.d.	0.14	n.d.
	3	<b>1.00</b>	n.d.	<b>0.40</b>	0.07	<b>0.68</b>	n.d.	<b>0.38</b>	n.d.	<b>0.27</b>	n.d.	0.05	n.d.	n.d.
50	1	0.16	n.d.	0.02	0.06	<b>0.21</b>	n.d.	n.d.	n.d.	0.02	n.d.	0.15	n.d.	n.d.
	2	0.32	<b>0.15</b>	0.27	<b>0.19</b>	<b>0.38</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.11	n.d.	n.d.
	3	0.24	0.04	0.10	0.08	<b>0.18</b>	n.d.	n.d.	n.d.	0.07	n.d.	0.07	n.d.	n.d.
43	1	n.d.	<b>0.11</b>	0.25	0.11	<b>0.19</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.01	n.d.	n.d.
	2	0.27	<b>0.13</b>	0.29	n.d.	n.d.	n.d.	n.d.	n.d.	0.02	n.d.	0.09	n.d.	n.d.
	3	0.38	<b>0.23</b>	<b>0.33</b>	<b>0.21</b>	<b>0.73</b>	n.d.	n.d.	n.d.	0.03	n.d.	0.04	n.d.	n.d.
35	1	n.d.	n.d.	0.26	0.08	<b>0.10</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.05	n.d.	n.d.
	2	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	0.36	<b>0.15</b>	0.32	n.d.	<b>0.30</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.07	n.d.	n.d.
1	1	0.12	0.03	0.28	0.08	<b>0.07</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.00	n.d.	n.d.
	2	0.06	0.05	0.14	0.08	<b>0.16</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.13	n.d.	n.d.
	3	0.12	n.d.	0.12	0.09	<b>0.37</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.08	n.d.	n.d.
10	1	n.d.	n.d.	<b>0.38</b>	0.09	<b>0.05</b>	n.d.	0.04	n.d.	n.d.	n.d.	0.07	n.d.	n.d.
	2	n.d.	n.d.	0.31	0.12	<b>0.16</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.04	n.d.	n.d.
	3	n.d.	n.d.	<b>0.82</b>	<b>0.85</b>	<b>1.19</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
59	1	n.d.	n.d.	0.14	0.08	<b>0.12</b>	n.d.	0.02	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	2	n.d.	n.d.	0.16	0.07	<b>0.11</b>	n.d.	0.01	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	3	n.d.	n.d.	<b>0.85</b>	<b>0.57</b>	<b>1.30</b>	n.d.	0.07	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
<b>DF (%)</b>		13.3	16.7	33.3	13.3	83.3	3.3	13.3	0	3.3	3.3	0	0	3.3
<b>MDL*</b>		0.50	0.1	0.2	0.12	0.05	1.3	0.1	0.04	0.4	0.53	0.3	0.77	0.56
$\bar{x}_{\text{Field Blank}}$		0.11	0.01	0.11	0.03	0.01	0.1	0.02	n.d.	0.04	0.03	0.06	0.01	0.05
$\sigma_{\text{Field Blank}}$		0.16	0.02	0.07	0.03	0.01	0.42	0.03	n.d.	0.07	0.07	0.09	0.12	0.12
<b>Recovery (%)</b>		96	103	108	112	116	106	97	96	80	100	126	78	25

**Table S20.** Indoor backup filter PFSA, GenX, and PAP concentrations (pg m<sup>-3</sup>). Values in bold are above the MDL and n.d. is not detected. Home 35, Week 2 is not included due to a sampler malfunction. Concentrations are recovery corrected but not field blank subtracted.

Home ID	Week	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFNS	PFDS	PFDoS	GenX	6:2 diPAP	8:2 diPAP	6:2 monoPAP	8:2 monoPAP
65	1	n.d.	n.d.	n.d.	n.d.	<b>0.17</b>	n.d.	n.d.	n.d.	n.d.	0.04	n.d.	n.d.	n.d.
	2	n.d.	0.09	n.d.	n.d.	<b>0.27</b>	n.d.	n.d.	n.d.	0.05	n.d.	n.d.	n.d.	n.d.
	3	n.d.	0.15	n.d.	n.d.	0.05	n.d.	n.d.	n.d.	<b>0.20</b>	n.d.	n.d.	0.86	n.d.
18	1	n.d.	n.d.	n.d.	n.d.	<b>0.21</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	n.d.	<b>0.40</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	n.d.	<b>0.38</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
78	1	n.d.	n.d.	n.d.	1.62	<b>1.30</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	2	0.08	n.d.	n.d.	<b>2.59</b>	<b>0.36</b>	n.d.	n.d.	n.d.	0.06	n.d.	0.05	n.d.	n.d.
	3	0.08	0.10	n.d.	<b>3.36</b>	<b>0.38</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.35	n.d.	n.d.
30	1	0.09	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.08	n.d.	n.d.	n.d.	n.d.
	2	<b>0.15</b>	n.d.	<b>0.10</b>	n.d.	n.d.	<b>0.56</b>	n.d.	n.d.	0.56	n.d.	n.d.	n.d.	<b>0.92</b>
	3	0.09	n.d.	n.d.	n.d.	<b>0.60</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	<b>1.48</b>	n.d.
50	1	n.d.	n.d.	n.d.	n.d.	<b>0.22</b>	n.d.	n.d.	n.d.	0.05	n.d.	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	1.67	<b>0.16</b>	n.d.	n.d.	n.d.	0.24	n.d.	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	1.83	<b>0.14</b>	n.d.	n.d.	n.d.	0.44	<b>0.97</b>	n.d.	n.d.	n.d.
43	1	0.07	n.d.	n.d.	1.51	<b>0.39</b>	n.d.	n.d.	n.d.	0.25	n.d.	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	1.42	<b>0.14</b>	n.d.	n.d.	n.d.	0.08	n.d.	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	1.77	<b>0.14</b>	n.d.	n.d.	n.d.	0.48	n.d.	n.d.	n.d.	n.d.
35	1	n.d.	n.d.	n.d.	<b>2.38</b>	<b>0.21</b>	n.d.	n.d.	n.d.	0.04	n.d.	n.d.	n.d.	n.d.
	2	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	n.d.	n.d.	n.d.	1.41	n.d.	n.d.	n.d.	n.d.	0.33	n.d.	n.d.	n.d.	n.d.
1	1	0.04	n.d.	n.d.	1.26	n.d.	n.d.	n.d.	n.d.	0.40	n.d.	n.d.	n.d.	n.d.
	2	0.04	n.d.	n.d.	2.28	n.d.	n.d.	n.d.	n.d.	0.51	n.d.	n.d.	n.d.	n.d.
	3	0.09	n.d.	n.d.	1.33	0.10	n.d.	n.d.	n.d.	0.24	n.d.	n.d.	n.d.	n.d.
10	1	n.d.	n.d.	n.d.	1.68	<b>0.12</b>	n.d.	n.d.	n.d.	0.00	n.d.	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	0.90	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	0.82	0.02	n.d.	n.d.	n.d.	0.70	n.d.	n.d.	n.d.	n.d.
59	1	n.d.	n.d.	n.d.	0.55	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	0.75	0.06	n.d.	n.d.	n.d.	0.22	0.00	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	0.40	0.08	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
<b>DF (%)</b>		3.3	0	3.3	10	60	3.3	0	0	3.3	3.3	0	3.3	3.3
<b>MDL*</b>		0.1	0.13	0.08	2.49	0.1	0.04	0.13	0.46	0.6	0.65	1.4	1.1	1.8
$\bar{x}$ Field Blank		0.02	0.01	n.d.	0.56	0.02	4.1E-3	4.0E-3	-	0.15	0.07	0.12	0.18	0.18
$\sigma$ Field Blank		0.03	0.03	n.d.	0.64	0.03	0.02	0.02	-	0.18	0.16	0.46	0.37	0.6
<b>Recovery (%)</b>		102	101	95	94	85	82	78	119	106	176	138	83	177

**Table S21.** Outdoor PFCA concentrations on PM<sub>2.5</sub> filters (pg m<sup>-3</sup>) are reported for all homes and sampling weeks. Values in bold are above the MDL and n.d. is not detected. Home 35, Week 2 is not included due to a sampler malfunction. Concentrations are recovery corrected but not field blank subtracted.

Home ID	Week	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnA	PFDoA	PFTrA	PFTA	PFHxDA	PFODA
65	1	<b>3.89</b>	n.d.	<b>2.61</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.03	<b>4.04</b>	n.d.
	2	<b>1.88</b>	n.d.	<b>1.45</b>	n.d.	<b>0.26</b>	n.d.	<b>0.11</b>	n.d.	0.03	0.11	0.00	<b>1.01</b>	<b>3.06</b>
	3	<b>2.70</b>	n.d.	<b>1.21</b>	<b>0.26</b>	<b>0.76</b>	n.d.	0.09	n.d.	0.04	n.d.	n.d.	n.d.	<b>1.39</b>
18	1	<b>3.62</b>	n.d.	<b>2.48</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	<b>0.35</b>	n.d.	n.d.
	2	<b>5.72</b>	n.d.	<b>1.83</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.22	n.d.	n.d.	n.d.
	3	<b>4.70</b>	n.d.	<b>1.27</b>	<b>0.46</b>	<b>0.55</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
78	1	<b>3.08</b>	n.d.	<b>1.44</b>	<b>0.66</b>	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	2	<b>13.69</b>	n.d.	<b>1.92</b>	<b>2.36</b>	0.00	n.d.	n.d.	n.d.	n.d.	n.d.	0.30	n.d.	0.32
	3	<b>5.12</b>	n.d.	<b>1.62</b>	<b>1.45</b>	<b>0.76</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.13	n.d.	0.10
30	1	<b>5.45</b>	n.d.	<b>1.58</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	2	<b>7.15</b>	n.d.	n.d.	n.d.	n.d.	<b>0.99</b>	<b>0.76</b>	n.d.	n.d.	n.d.	n.d.	0.44	n.d.
	3	<b>2.69</b>	n.d.	<b>2.77</b>	<b>1.75</b>	<b>0.41</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
50	1	<b>8.16</b>	n.d.	<b>2.30</b>	<b>0.24</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	2	n.d.	n.d.	<b>3.69</b>	<b>1.94</b>	<b>2.52</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.13	n.d.	n.d.
	3	<b>4.67</b>	n.d.	<b>2.02</b>	<b>2.08</b>	<b>1.03</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
43	1	n.d.	n.d.	<b>1.09</b>	<b>0.22</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	2	<b>3.46</b>	n.d.	<b>5.98</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	3	<b>2.26</b>	n.d.	<b>1.99</b>	<b>2.76</b>	<b>0.60</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.15	n.d.	n.d.
35	1	<b>4.87</b>	n.d.	<b>1.89</b>	<b>1.79</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.05	n.d.	n.d.
	2	n.d.	n.d.	<b>6.85</b>	<b>3.52</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.07	n.d.	n.d.
	3	<b>2.36</b>	n.d.	<b>2.39</b>	<b>0.78</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.10	n.d.	n.d.
1	1	<b>1.48</b>	n.d.	<b>0.37</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	2	<b>3.49</b>	n.d.	<b>1.64</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.03	n.d.	n.d.
	3	<b>8.61</b>	n.d.	<b>3.42</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.15	n.d.	n.d.
10	1	n.d.	n.d.	<b>1.36</b>	<b>0.58</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	<b>1.53</b>	n.d.	n.d.
	2	n.d.	n.d.	<b>1.09</b>	n.d.	<b>0.73</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.31	n.d.	n.d.
	3	n.d.	n.d.	<b>2.60</b>	n.d.	<b>0.52</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
59	1	n.d.	n.d.	<b>1.44</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	2	n.d.	n.d.	<b>2.81</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.09	n.d.	n.d.
	3	n.d.	n.d.	<b>0.66</b>	n.d.	<b>0.28</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
DF (%)		66.7	0	97	50	37	3.3	6.7	0	0	0	6.7	6.7	6.7
MDL*		0.50	0.1	0.2	0.12	0.05	1.3	0.1	0.04	0.4	0.53	0.3	0.77	0.56
$\bar{x}$ Field Blank		0.11	0.01	0.11	0.03	0.01	0.1	0.02	n.d.	0.04	0.03	0.06	0.01	0.05
$\sigma$ Field Blank		0.16	0.02	0.07	0.03	0.01	0.42	0.03	n.d.	0.07	0.07	0.09	0.12	0.12
Recovery (%)		96	103	108	112	116	106	97	96	80	100	126	78	25

**Table S22.** Outdoor PFSA, GenX, and PAP concentrations on PM<sub>2.5</sub> filters (pg m<sup>-3</sup>). Values in bold are above the MDL and n.d. is not detected. Home 35, Week 2 is not included due to a sampler malfunction. Concentrations are recovery corrected but not field blank subtracted.

Home ID	Week	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFNS	PFDS	PFDoS	GenX	6:2 diPAP	8:2 diPAP	6:2 monoPAP	8:2 monoPAP
65	1	n.d.	n.d.	n.d.	n.d.	<b>0.86</b>	n.d.	n.d.	n.d.	n.d.	0.31	0.21	n.d.	n.d.
	2	n.d.	<b>0.12</b>	n.d.	n.d.	<b>0.22</b>	n.d.	n.d.	n.d.	n.d.	<b>1.11</b>	n.d.	n.d.	n.d.
	3	n.d.	<b>0.43</b>	n.d.	n.d.	<b>0.49</b>	n.d.	n.d.	n.d.	n.d.	0.02	n.d.	n.d.	n.d.
18	1	n.d.	n.d.	n.d.	n.d.	<b>1.13</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	n.d.	<b>0.45</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	n.d.	<b>0.49</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
78	1	n.d.	<b>0.73</b>	n.d.	1.85	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	2	n.d.	<b>0.62</b>	n.d.	1.63	<b>0.62</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	3	0.11	n.d.	n.d.	2.10	<b>0.21</b>	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
30	1	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	<b>1.10</b>	n.d.	n.d.	n.d.
	2	n.d.	n.d.	<b>0.80</b>	n.d.	0.06	<b>0.08</b>	n.d.	n.d.	1.16	n.d.	0.07	n.d.	n.d.
	3	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.11	0.19	n.d.	n.d.
50	1	n.d.	n.d.	n.d.	n.d.	<b>0.32</b>	n.d.	n.d.	n.d.	<b>1.94</b>	0.18	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	0.82	<b>3.88</b>	n.d.	n.d.	n.d.	<b>4.24</b>	<b>0.96</b>	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	1.47	<b>0.30</b>	n.d.	n.d.	n.d.	<b>5.81</b>	0.38	n.d.	n.d.	n.d.
43	1	n.d.	n.d.	n.d.	0.89	<b>0.36</b>	n.d.	n.d.	n.d.	<b>1.26</b>	<b>0.85</b>	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	0.40	<b>0.20</b>	n.d.	n.d.	n.d.	<b>8.37</b>	<b>0.66</b>	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	1.48	<b>0.24</b>	n.d.	n.d.	n.d.	n.d.	0.58	n.d.	n.d.	n.d.
35	1	n.d.	n.d.	n.d.	1.18	<b>0.40</b>	n.d.	n.d.	n.d.	n.d.	0.48	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	0.92	n.d.	n.d.	n.d.	n.d.	<b>10.94</b>	<b>1.70</b>	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	1.13	n.d.	n.d.	n.d.	n.d.	<b>3.19</b>	0.41	n.d.	n.d.	n.d.
1	1	n.d.	n.d.	n.d.	1.53	n.d.	n.d.	n.d.	n.d.	<b>3.37</b>	n.d.	n.d.	n.d.	n.d.
	2	n.d.	n.d.	n.d.	0.79	n.d.	n.d.	n.d.	n.d.	0.00	<b>1.26</b>	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	0.72	n.d.	n.d.	n.d.	n.d.	<b>9.65</b>	n.d.	n.d.	n.d.	n.d.
10	1	n.d.	n.d.	n.d.	0.37	<b>0.27</b>	n.d.	n.d.	n.d.	n.d.	<b>3.25</b>	<b>2.64</b>	n.d.	n.d.
	2	n.d.	n.d.	n.d.	0.61	n.d.	n.d.	n.d.	n.d.	n.d.	0.22	<b>1.55</b>	n.d.	n.d.
	3	n.d.	n.d.	n.d.	0.67	<b>0.35</b>	n.d.	n.d.	n.d.	n.d.	0.15	0.31	n.d.	n.d.
59	1	n.d.	n.d.	n.d.	0.83	<b>0.34</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.33	n.d.	n.d.
	2	n.d.	n.d.	n.d.	0.55	<b>0.85</b>	n.d.	n.d.	n.d.	n.d.	0.08	n.d.	n.d.	n.d.
	3	n.d.	n.d.	n.d.	0.49	<b>0.43</b>	n.d.	n.d.	n.d.	n.d.	n.d.	0.44	n.d.	n.d.
DF (%)	0	13.3	3.3	0	67	3.3	0	0	23.3	26.7	6.7	0	0	
MDL*	0.1	0.13	0.08	2.49	0.1	0.04	0.13	0.46	0.6	0.65	1.4	1.1	1.8	
$\bar{x}$ Field Blank	0.02	0.01	n.d.	0.56	0.02	4.1E-3	4.0E-3	-	0.15	0.07	0.12	0.18	0.18	
$\sigma$ Field Blank	0.03	0.03	n.d.	0.64	0.03	0.02	0.02	-	0.18	0.16	0.46	0.37	0.6	
Recovery (%)	102	101	95	94	85	82	78	119	106	176	138	83	177	

## SECTION S6: ESTIMATES OF EMISSIONS TO OUTDOORS

**Table S23.** Net QFF emission rate estimates for targeted and total ionic PFAS per home, within the Raleigh Metropolitan Area in North Carolina, and in the United States are reported below. Residential indoor concentrations are for front filter only. Estimates for net emission rates using the residential outdoor concentrations collected during the IPA Campaign provide a lower bound for home emissions because ambient concentrations near homes are likely influenced by home activities. As an upper bound, we estimated home emission rates using only the indoor front filter concentration because regional background concentrations for ionic PFAS in 2019 were low.<sup>8</sup> Of 34 targeted PFAS, only PFOS was measured above detection limits.

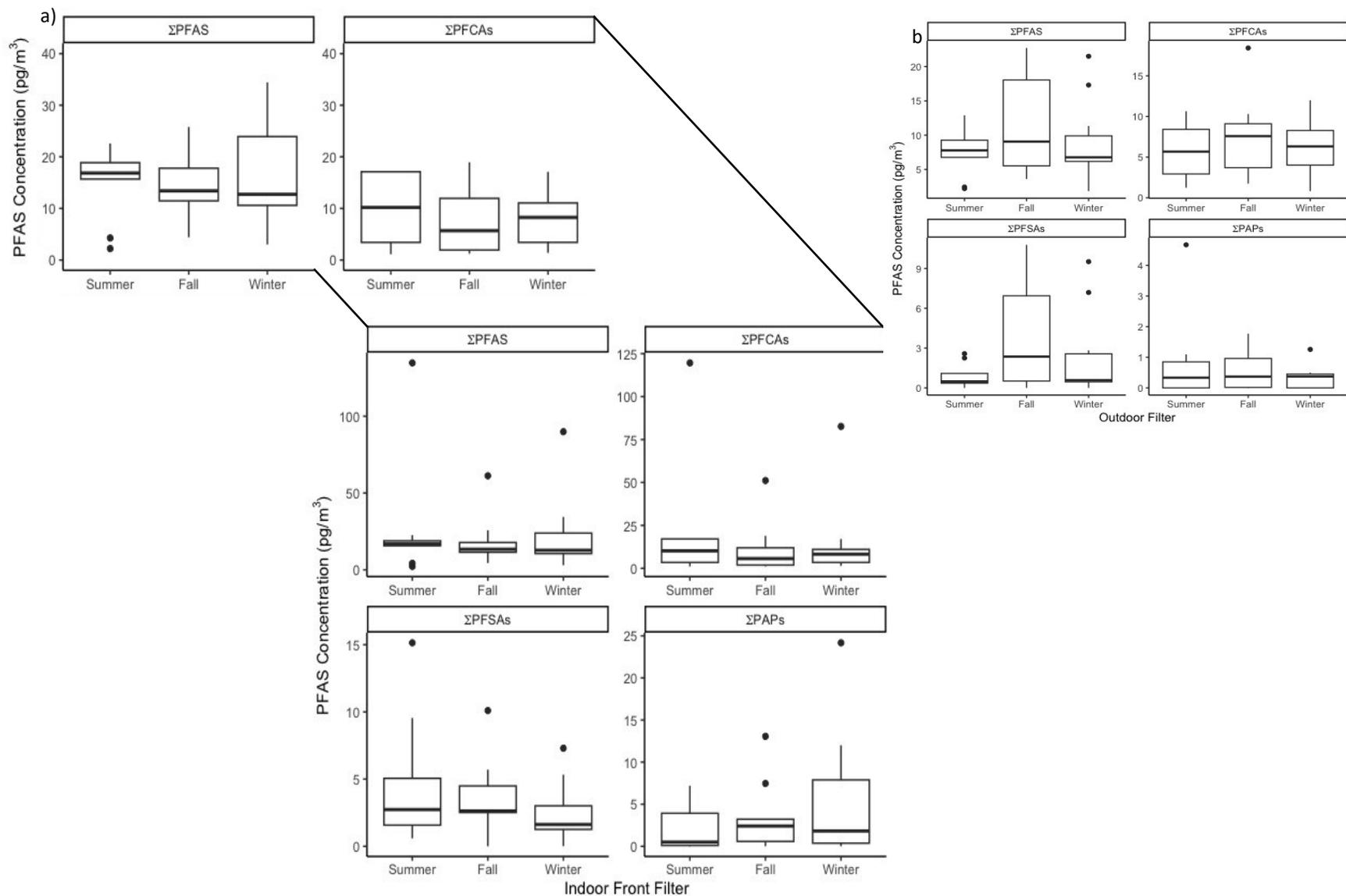
PFAS	Residential Indoor Front Filter - Residential Outdoor Filter						Residential Indoor Front Filter					
	Per Home		Raleigh Metro Area		US		Per Home		Raleigh Metro Area		US	
	Mean [ kg y <sup>-1</sup> ]	SD [kg y <sup>-1</sup> ]	Mean [ kg y <sup>-1</sup> ]	SD [kg y <sup>-1</sup> ]	Mean [ kg y <sup>-1</sup> ]	SD [kg y <sup>-1</sup> ]	Mean [ kg y <sup>-1</sup> ]	SD [kg y <sup>-1</sup> ]	Mean [ kg y <sup>-1</sup> ]	SD [kg y <sup>-1</sup> ]	Mean [ kg y <sup>-1</sup> ]	SD [kg y <sup>-1</sup> ]
6:2 diPAP	1.9E-09	3.4E-09	6.4E-04	1.1E-03	0.16	0.28	2.3E-09	3.6E-09	7.7E-04	1.2E-03	0.19	0.29
6:2 monoPAP	8.4E-10	4.1E-09	2.8E-04	1.4E-03	6.8E-02	0.33	8.4E-10	4.1E-09	2.8E-04	1.4E-03	6.8E-02	0.33
8:2 diPAP	1.1E-10	4.1E-10	3.5E-05	1.4E-04	8.6E-03	3.4E-02	3.4E-10	1.3E-09	1.1E-04	4.3E-04	2.8E-02	0.11
8:2 monoPAP	-	-	-	-	-	-	-	-	-	-	-	-
GenX	3.9E-10	3.7E-09	1.3E-04	1.2E-03	3.2E-02	0.3	1.5E-09	3.0E-09	5.0E-04	9.9E-04	0.12	0.24
PFBA	7.2E-09	2.3E-08	2.4E-03	7.8E-03	0.59	1.9	1.1E-08	2.3E-08	3.6E-03	7.6E-03	0.89	1.9
PFBS	1.3E-11	5.5E-11	4.5E-06	1.8E-05	1.1E-03	4.5E-03	1.3E-11	5.5E-11	4.5E-06	1.8E-05	1.1E-03	4.5E-03
PFDA	7.6E-11	2.6E-10	2.5E-05	8.6E-05	6.2E-03	2.1E-02	1.1E-10	2.0E-10	3.5E-05	6.6E-05	8.6E-03	1.6E-02
PFDoA	3.2E-10	1.4E-09	1.1E-04	4.7E-04	2.6E-02	0.12	3.2E-10	1.4E-09	1.1E-04	4.7E-04	2.6E-02	0.12
PFDoS	-	-	-	-	-	-	-	-	-	-	-	-
PFDS	-	-	-	-	-	-	-	-	-	-	-	-
PFHpA	-3.6E-10	9.5E-10	-1.2E-04	3.2E-04	-2.9E-02	7.7E-02	3.2E-10	5.8E-10	1.1E-04	1.9E-04	2.6E-02	4.7E-02
PFHpS	4.8E-10	1.5E-09	1.6E-04	4.9E-04	3.9E-02	0.12	4.8E-10	1.5E-09	1.6E-04	4.9E-04	3.9E-02	0.12
PFHxA	-1.3E-09	1.2E-09	-4.4E-04	3.9E-04	-0.11	9.5E-02	7.2E-10	6.5E-10	2.4E-04	2.2E-04	5.9E-02	5.3E-02
PFHxDA	2.8E-11	2.7E-10	9.2E-06	8.9E-05	2.3E-03	2.2E-02	1.8E-10	7.2E-10	6.1E-05	2.4E-04	1.5E-02	5.9E-02
PFHxS	9.4E-13	5.1E-12	3.1E-07	1.7E-06	7.7E-05	4.2E-04	3.0E-11	1.6E-10	1.0E-05	5.5E-05	2.4E-03	1.3E-02
PFNA	6.6E-11	1.6E-10	2.2E-05	5.3E-05	5.4E-03	1.3E-02	9.9E-11	2.8E-10	3.3E-05	9.4E-05	8.1E-03	2.3E-02
PFNS	2.2E-11	9.8E-11	7.3E-06	3.3E-05	1.8E-03	8.0E-03	2.5E-11	1.1E-10	8.2E-06	3.8E-05	2.0E-03	9.3E-03
PFOA	7.3E-10	1.5E-09	2.4E-04	5.0E-04	5.9E-02	0.12	1.1E-09	1.8E-09	3.6E-04	6.1E-04	8.7E-02	0.15
PFODA	1.4E-10	4.7E-10	4.7E-05	1.6E-04	1.2E-02	3.9E-02	2.6E-10	8.1E-10	8.5E-05	2.7E-04	2.1E-02	6.6E-02
PFOS	5.1E-10	1.3E-09	1.7E-04	4.3E-04	4.2E-02	0.1	9.7E-10	1.5E-09	3.2E-04	5.0E-04	7.9E-02	0.12
PFPeA	4.8E-11	1.6E-10	1.6E-05	5.4E-05	3.9E-03	1.3E-02	4.8E-11	1.6E-10	1.6E-05	5.4E-05	3.9E-03	1.3E-02
PFPeS	-2.2E-11	1.0E-10	-7.4E-06	3.4E-05	-1.8E-03	8.4E-03	9.1E-12	3.5E-11	3.0E-06	1.2E-05	7.4E-04	2.9E-03
PFTA	1.7E-10	5.2E-10	5.7E-05	1.7E-04	1.4E-02	4.2E-02	2.8E-10	7.9E-10	9.5E-05	2.6E-04	2.3E-02	6.5E-02
PFTrA	6.0E-11	2.4E-10	2.0E-05	7.8E-05	4.9E-03	1.9E-02	6.0E-11	2.4E-10	2.0E-05	7.8E-05	4.9E-03	1.9E-02
PFUnA	4.1E-11	2.0E-10	1.4E-05	6.6E-05	3.4E-03	1.6E-02	4.1E-11	2.0E-10	1.4E-05	6.6E-05	3.4E-03	1.6E-02

<b>Total PFAS</b>	1.1E-8	4.5E-8	3.89E-3	1.5E-2	0.94	3.7	2.1E-08	4.6E-08	7.0E-03	1.5E-02	1.7	3.7
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## SECTION S7: ACROSS AND WITHIN HOME VARIABILITY FOR PFAS

**Table S24.** Coefficients of variation (CV) for  $\Sigma$ PFAS,  $\Sigma$ PFCA,  $\Sigma$ PFSA, and  $\Sigma$ PAP were calculated (see Section S3) to assess variability within homes (WHV) and across homes (AHV) for indoor front and outdoor filters. Across home variability (AHV, %) was calculated by grouping samples to either Fall (October – December), Winter (January – April), or Summer (July – September). Because Home 01 was sampled once during the winter season (Jan 24 – 30<sup>th</sup>, 2022) and once in the spring season (April 25 – May 01, 2022) and not sampled during the Summer, it was excluded from the analysis. Similarly, Home 35 was excluded from the analysis due to sample malfunction leading to collection of only 2 samples. Therefore, 8 samples were collected during each of Fall, Summer, and Winter for a total of 24 samples.

<b>Subclass</b>	<b>Front Indoor WHV (%)</b>	<b>Front Indoor AHV (%)</b>	<b>Outdoor WHV (%)</b>	<b>Outdoor AHV (%)</b>
$\Sigma$ PFAS	142	134	58	60
$\Sigma$ PFCA	200	181	58	61
$\Sigma$ PFSA	121	102	138	140
$\Sigma$ PAP	177	156	178	174



**Figure S1.** No significant seasonal effect was found for  $\Sigma$ PFAS,  $\Sigma$ PFCAs,  $\Sigma$ PFASs, nor  $\Sigma$ PAPs for a) indoor front filters nor b) outdoor filters. Similar to AHV and WHV calculations (Table S16), the seasons were defined as follows: Fall (October – December), Winter (January – April), and Summer (July – September).

## SECTION S8: ARTIFACTS

### OC ASSOCIATED ARTIFACTS

It is well documented that QFFs are subject to positive (adsorption) and negative (volatilization) artifacts.<sup>9–11</sup> QFFs have a large surface area for gases to adsorb to. As air is pulled through an initially clean QFF, net adsorption of gaseous OC occurs throughout the QFF until the gas-phase and adsorbed-phase reach equilibrium (filter – air equilibrium partitioning). As gases approach equilibrium, gas breakthrough will occur. Note that changes in ambient concentrations alter the equilibrium, resulting in additional adsorption or volatilization of collected material as the particles and gases on the filter reestablish equilibrium with the gas phase. Thus, a QFF sample is weighted toward conditions at the end of the sampling period. Presumably, OC is in equilibrium between its gas and particle phases when particles are collected. However, volatilization of QFF-collected organics (both adsorbed gases and PM) can occur if the equilibrium is disturbed, for example if collected particles and gases are exposed to clean air as happens when gases are stripped in a denuder. Additionally, sampling with a high face velocity or a buildup of PM on the filter (high PM loading) can lead to a pressure drop across the filter. The reduced pressure in the depths of the filter effectively reduces gas phase concentrations there, creating a driving force for volatilization of collected organic material.

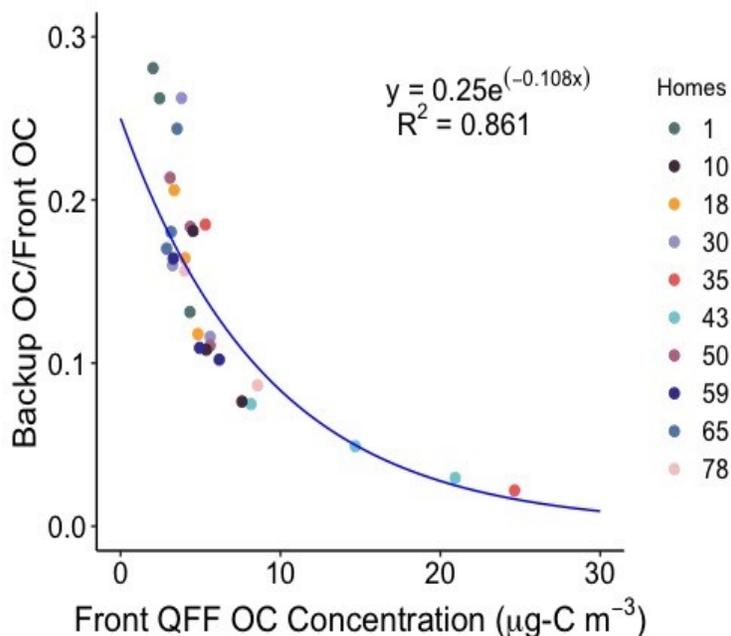
For OC under typical sampling conditions, adsorption is the dominant sampling artifact affecting particulate OC measurement on undenuded QFFs, based on studies involving ambient samples collected concurrently at differing face velocities (i.e., with two filters in series) and studies comparing denuder-based methods with undenuded QFFs.<sup>9,12</sup> Thus, uncorrected for adsorption, QFFs overestimate concentrations of particulate OC (including components like PFAS).<sup>9</sup> Backup QFFs (either behind Teflon or QFFs) are often used to estimate the amount of adsorbed organic vapors on the front QFF.<sup>9,11,13</sup> It should be recognized that if organic gases have not yet reached filter – air equilibrium on both front and back filters, the backup QFF will underestimate adsorption on the front filter. However, subtraction of QFF backup filter<sup>9</sup> OC concentrations from concurrently-collected QFF front filter concentration provides an improved estimate of particulate OC. Several studies have found that ambient ionic PFAS collected onto GFFs and/or QFFs are also subject to positive artifacts from gas-phase adsorption.<sup>14–17</sup>

There are two plausible reasons for the smaller IPA OC adsorption artifact compared to the Relationships of Indoor, Outdoor, and Personal Air (RIOPA) study. 1) Our sampling duration was 6 days, compared to the 2-day collection period for RIOPA. Although PM loading increases with sampling time, adsorbed vapor loading only increases until gas phase – adsorbed phase equilibrium is reached on the QFF, meaning that longer sampling times result in smaller fractional adsorption artifacts.<sup>9,18</sup> 2) The RIOPA study used a QFF behind a Teflon filter (TQ setup)<sup>17</sup> rather than behind a QFF (QQ setup; IPA study) to estimate adsorption on separately collected front QFFs (we used a QQ setup to avoid PFAS contamination and allow for OC/EC analysis). QFFs have higher surface areas than Teflon filters and it takes longer for gas phase organics to reach gas phase-adsorbed phase equilibrium with a front QFF than with a front Teflon filter. If equilibrium has not yet been achieved, the backup filter will be exposed to lower concentrations of the gas-phase organics and could underestimate adsorption on a concurrently collected front QFF.<sup>9,10</sup> Nevertheless, the

QFF front minus QFF backup provides our best estimate of particulate OC, recognizing it still may be an upper-bound.

## CONTRIBUTION OF ADSORBED VAPORS TO INDOOR FRONT FILTER CONCENTRATIONS: OC AND IONIC PFAS

Adsorption artifacts associated with OC (Figure S2) show good agreement with the literature in terms of magnitude and relationship.<sup>13</sup> As observed previously, OC was found on the backup filters even though the front filter is essentially 100% effective at collecting particles, demonstrating that organics present in the gas phase adsorb on QFFs as they are pulled through the filter. Also, the backup OC/front OC decreased with increased front filter loading, as previously observed,<sup>9,13</sup> presumably reflecting increased particulate OC on the front filter (Figure S2). For the conditions of our study, backup filter OC was nearly 11% of front filter OC at a front filter concentration of  $8 \mu\text{g-C m}^{-3}$ . At the same concentration, approximately 36% was attributed to adsorbed vapors in the RIOPA study,<sup>13</sup> more than double our value. The longer sampling duration in the IPA Campaign and placement of the backup QFF behind the front QFF



**Figure S2.** Backup/front filter ratio vs front filter concentration for OC. QFFs have a large surface area for gases to adsorb to. Presumably, OC is in equilibrium between its gas and particle phases when particles are collected. However, volatilization of QFF-collected organics (both adsorbed gases and PM) can also occur. The reduced pressure in the depths of the filter effectively reduces gas phase concentrations there, creating a driving force for volatilization of collected organic material.

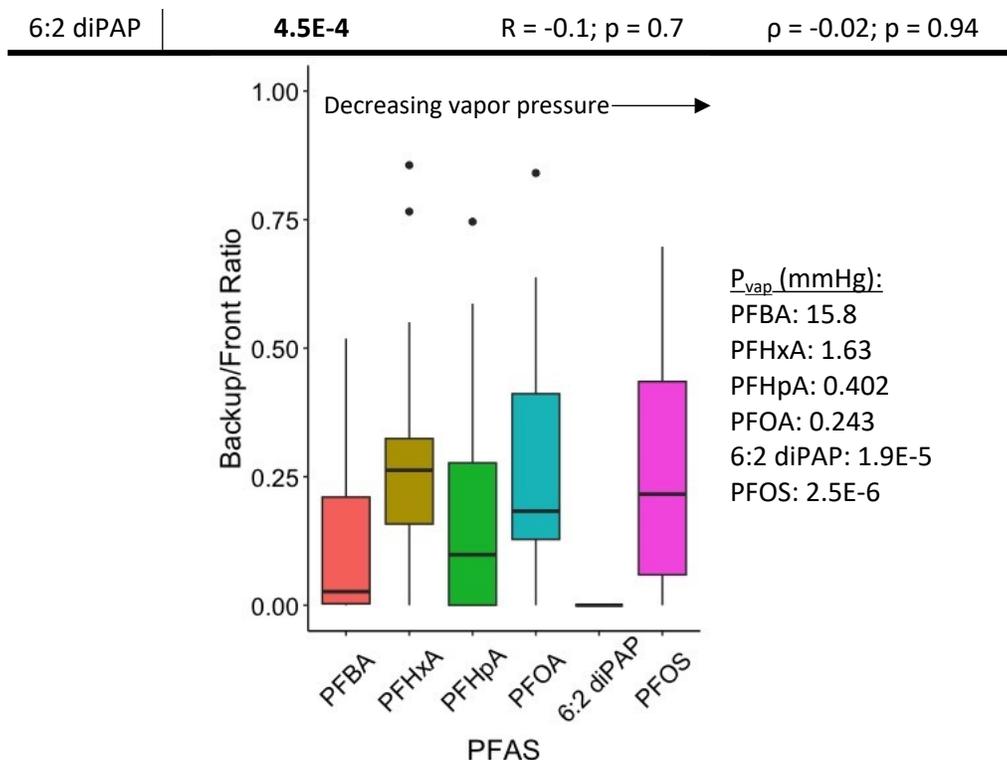
instead of behind a Teflon filter in a separate sampler (to avoid PFAS contamination) are plausible reasons for the difference in OC artifacts.

Although PFAAs have very low  $pK_a$  values<sup>19,20</sup> and dissociated (anionic) PFAAs have low vapor pressures and thus are not expected to partition to the gas phase,<sup>21,22</sup> PFAAs have been found in both the gas and particle phases in several studies,<sup>14,15,17</sup> highlighting the complexity of their fate and transport in the environment. Aerosols can be highly acidic and hygroscopic, with pH values as low as -1 and varying amounts of liquid water.<sup>23</sup> This may allow PFAAs to exist in their neutral form and, therefore, in the gas-phase.

For the six PFAS detected in over 50% of indoor front filter samples, front filter concentrations were significantly ( $p < 0.05$ ) greater than backup filter concentrations (Table S25; Figure S3) according to a paired, one-sided Wilcoxon Signed Rank Test (using only values above the MDL). For these six compounds, mean (median) backup to front filter ratios (Figure S4) were less than one (PFBA = 0.1 (0.03), PFHxA = 0.38 (0.25), PFHpA = 0.12 (0.1), PFOA = 0.39 (0.22), 6:2 diPAP = 0.08 (0.0)), PFOS = 0.25 (0.22). Higher concentrations on the front QFF compared to the backup have two possible explanations: 1) these PFAS were present in homes partially in the particle phase and/or 2) gas phase-adsorbed phase equilibrium had not yet been reached between the indoor air and the QFF after 6-days of sampling, resulting in lower backup filter loadings.

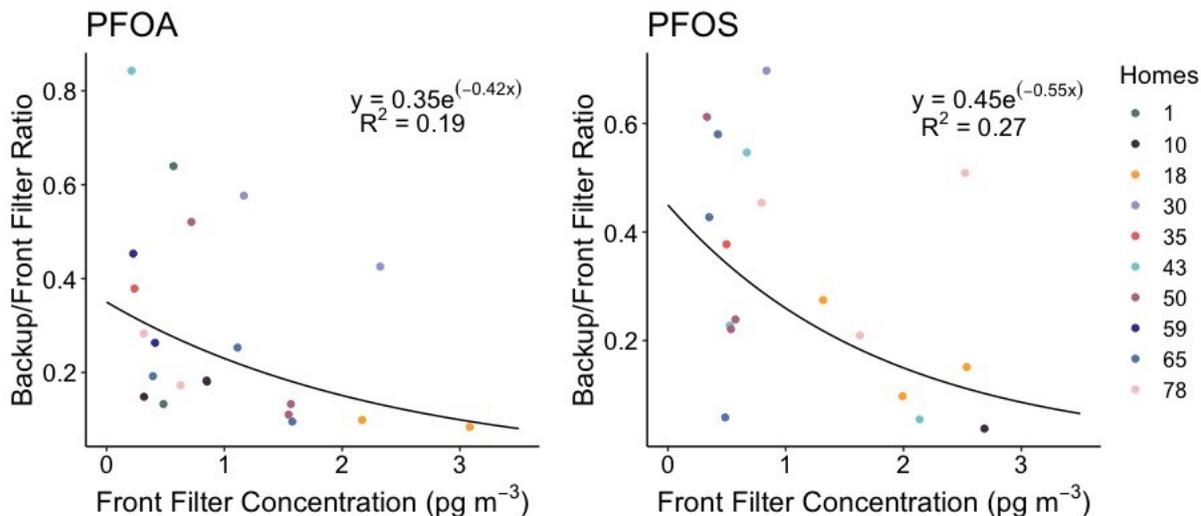
**Table S25.** Field blank subtracted front filter concentrations were compared to backup filter concentrations for PFAS detected in over 50% of both front and backup filters using a paired, one-sided Wilcoxon Signed Rank Test. All six PFAS concentrations on the front filters were significantly greater ( $p < 0.05$ ) than backup filter concentrations. Only PFOS had a significant, moderate linear correlation between the front and backup filters. Both PFOA and PFOS had a moderate and significant ( $p < 0.05$ ) non-linear association (Spearman's  $\rho$ ), while PFHxA had a moderate and significant non-linear association at a 90% confidence interval ( $p < 0.1$ ).

PFAS	Wilcoxon SRT p-value	Pearson's r	Spearman's $\rho$
PFBA	<b>8.4E-5</b>	$r = -0.13; p = 0.56$	$\rho = 0.27; p = 0.21$
PFHxA	<b>2.1E-5</b>	$r = 0.09; p = 0.68$	$\rho = 0.34; p = 0.09$
PFHpA	<b>1.9E-4</b>	$r = 0.16; p = 0.53$	$\rho = 0.17; p = 0.46$
PFOA	<b>1.3E-4</b>	$r = 0.26; p = 0.19$	<b><math>\rho = 0.46; p = 0.015</math></b>
PFOS	<b>1.4E-5</b>	<b><math>r = 0.4; p = 0.04</math></b>	<b><math>\rho = 0.50; p = 0.008</math></b>



**Figure S3.** Indoor field blank subtracted backup to front filter ratios for PFAS compounds with front filter DF > 50%. Front and backup filter pairs where the front filter concentration > MDL were included. Three data points with backup/front ratios > 1 are not shown. Vapor pressures ( $P_{vap}$ ) were obtained from the EPA CompTox Chemicals Dashboard v2.3.0, which predicts  $P_{vap}$  using OPERA 2.6.<sup>24</sup>

The non-linear decrease in the backup/front filter ratio with increasing front filter loading for PFOA and PFOS (Figure S4), as was observed for OC (Figure S2), suggests that PFOA and PFOS are present in both gas and particle phases in indoor air. A significant ( $p < 0.05$ ) and moderate, non-linear relationship was found between the front and backup filters for PFOA (Spearman's  $\rho = 0.46$ ) and PFOS ( $\rho = 0.5$ ), and the backup/front filter ratio decreased (non-linearly) with increasing front filter loading, although unlike OC, the association was weak ( $R^2_{PFOA} = 0.19$ ;  $R^2_{PFOS} = 0.27$ ). We know PFOA and PFOS are partially in the gas phase because they are present on the backup filter. If they were entirely in the gas phase, gas breakthrough would occur as gases approach filter-air equilibrium, and the backup/front filter ratio would approach one with increasing front filter loading. However, increased particulate air concentrations result in proportional increases in front filter loading only. Thus, if both particles and gases are present, the backup/front filter ratio will decrease with increased in front filter loading due to the increase in particulate PFAS on the front filter, as seen in Figure S4.



**Figure S4.** Backup/front filter ratio vs front filter concentration (field blank subtracted) for PFOA and PFOS. For PFOA, two outliers, where the backup concentration exceeded the front filter concentration (i.e., >100% percent adsorbed) were removed.

Ahrens et al.<sup>14,15</sup> investigated gas-particle partitioning of neutral and ionic PFAS using colocated annual diffusion denuders (~120 m<sup>3</sup> over 24 h). They used XAD-4 coated denuders (gas phase) followed by a filter pack consisting of a GFF (90 mm; particle phase) and two XAD-4 sorbent coated QFFs (sQFFs; 90 mm; “blow off” artifacts), as well as a high volume air sampler (HiVol; PS-1 type sampler; ~340 m<sup>3</sup>; 24 h) with a 102 mm GFF (particle phase) followed by a PUF/XAD-2/PUF sandwich (gas phase). No PFAS were detected on the denuder’s backup filters (sQFFs), suggesting that even when denuded (clean) air was pulled over filter-collected particles blow-off was negligible. Importantly, Ahrens et al.<sup>14</sup> found that while both denuder and HiVol yielded relatively similar total air PFAS concentrations (gas + particle), the HiVol GFF concentrations of PFCAs (C<sub>4</sub> – C<sub>12</sub>, C<sub>14</sub>) and PFSAs (C<sub>4</sub>, C<sub>6</sub>, C<sub>8</sub>, C<sub>10</sub>) were around 4 times higher than the particle phase concentrations measured by the denuder sampler (denuded GFF)<sup>15</sup>. Thus, the net artifact for collection of particulate PFAS on the HiVol GFF was adsorption, resulting in an overestimate of particulate PFAS. Arp and Goss<sup>17</sup> provided some compelling evidence that partitioning of PFAAs to QFFs could be, at least in part, irreversible. Therefore, we expect that positive (adsorption) artifacts also dominate for front QFFs in the IPA Campaign. Artifacts are dependent on sampling parameters (i.e., face velocity, exposed filter area) and environmental conditions. Our study had lower sampling face velocities compared to Ahrens et al.<sup>14,15</sup> The face velocity is calculated by dividing the volumetric flow rate by the exposed filter area.<sup>25</sup> The exposed area of a 37 mm QFF is 6.61 cm<sup>2</sup> (d = 2.9 cm) and the average volumetric flow rate is 173.3 cm<sup>3</sup> s<sup>-1</sup> (average flow rate during IPA Campaign; q = 10.4 L min<sup>-1</sup>), and the face velocity

is  $26.2 \text{ cm s}^{-1}$ . For Ahrens et al.<sup>14,15</sup> we estimated a face velocity (102 mm GFF;  $340 \text{ m}^3$ ; 24 h) of  $48 \text{ cm s}^{-1}$ , which is almost twice the IPA Campaign face velocity. Lower face velocities are less likely to create the type of pressure drop that can drive volatile losses. Thus, the front QFF in our study should be considered an upperbound for particulate PFAS and the backup filter provides a lowerbound estimate of adsorbed vapor on the front filter.

We hypothesized that backup/front filter ratios would be highest for medium vapor pressure PFAS in Figure S3. Recall, backup filters only collect adsorbed vapor. The highest vapor pressure compounds are expected to adsorb little, whereas the longest chain length<sup>17,15</sup> and lowest vapor pressure compounds might be entirely in the particle-phase, and thus collected entirely on the front filter. Recognizing first that there are large uncertainties in the vapor pressures of PFAS; 6:2 diPAP and PFOS have low predicted vapor pressures ( $P_{\text{vap}} = 2.5\text{E-}3 \text{ Pa}$ <sup>24,26</sup>;  $\text{MW} = 812.1 \text{ g mol}^{-1}$  and  $P_{\text{vap}} = 3.3\text{E-}4 \text{ Pa}$ ,  $\text{MW} = 500.1 \text{ g mol}^{-1}$ ,<sup>27</sup> respectively) and the vapor pressures of PFAA depend on their form. Thus, the deviation of PFOS from expectations in Figure S3 may occur because of vapor pressure uncertainties. 6:2 diPAP was detected on 57% of indoor front filters but on only 3% of backup filters, consistent with the expectation that it primarily exists in the particle phase. However, in contrast to our expectations, PFOS is found on both front and backup filters (median backup/front = 0.25), suggesting that it exists in part in the gas phase. The lower backup/front filter ratios for the highest vapor pressure compounds (PFBA, PFHpA) suggest that these compounds have not reached filter-adsorbed phase equilibrium on the front QFF and thus concentrations in the vicinity of the backup filter are reduced. Based on its carbon-chain length, we expect PFBA ( $\text{C}_4$ ;  $P_{\text{vap}} = 2.1 \text{ kPa}$ <sup>28</sup>) to be mostly in the gas phase. Thus, if both front and backup filters were in equilibrium, we would expect the backup/front filter ratio to be close to one, yet both PFBA and PFHpA ( $\text{C}_7$ ;  $P_{\text{vap}} = 688 \text{ Pa}$ <sup>29</sup>) were detected on 67% of front filters and only 13% of backup filters. This provides further evidence that at least some PFAS compounds have not reached gas phase-adsorbed phase partitioning equilibrium on the QFFs. Thus, the backup filter is likely an underestimate of adsorption on the front filter, and in cases where breakthrough to the backup filter was rare (i.e., 6:2 diPAP, PFHpA, PFBA) the front + backup likely provides an accurate assessment of the total gas + particle PFAS concentration.

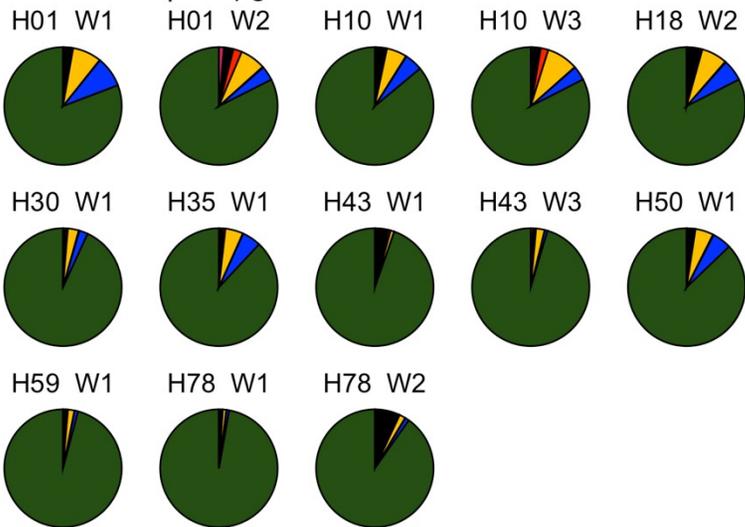
Ahrens et al.<sup>14</sup> reported that concentrations on high-vol backup GFF (PFBS, PFOS, PFNA, PFDA, PFDoA) were <15% of the front filter. The denuder sampler was specifically designed to collect gases separately from particles, while avoiding adsorption artifacts and measuring volatilization from particles. Denuder sampling provides the gold standard for gas-particle partitioning, as long as the collection of gases of interest in the denuder is 100% or the collection efficiency is known and accounted for and a backup

adsorbant is provided to collect any volatile losses from collected particles. At median indoor front filter concentrations of PFOA ( $0.58 \text{ pg m}^{-3}$ ) and PFOS ( $0.56 \text{ pg m}^{-3}$ ) from our study, the backup filter loading was 35% and 33% of the front filter loading, respectively. Note: because artifacts are dependent on sampling conditions (concentrations and sampling duration<sup>9</sup>), these values cannot be used to correct previously reported measurements.

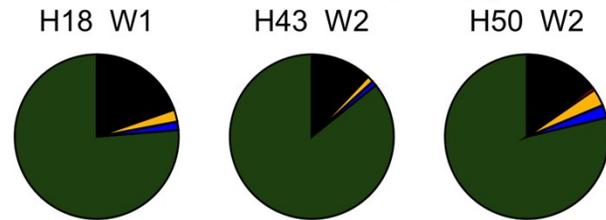
## SECTION S9: PM COMPOSITION

### PM<sub>2.5</sub> Composition ( $\mu\text{g m}^{-3}$ ) of Measured Species

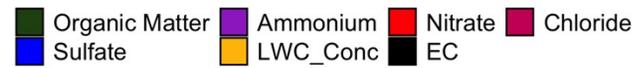
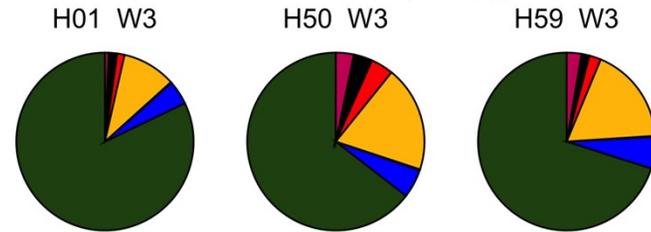
OM > 80% &  $\rho = 1 \mu\text{g m}^{-3}$



EC Enriched: EC > 10% &  $\rho = 1 \mu\text{g m}^{-3}$



LWC Enriched: LWC > 10% &  $\rho = 1 \mu\text{g/m}^3$



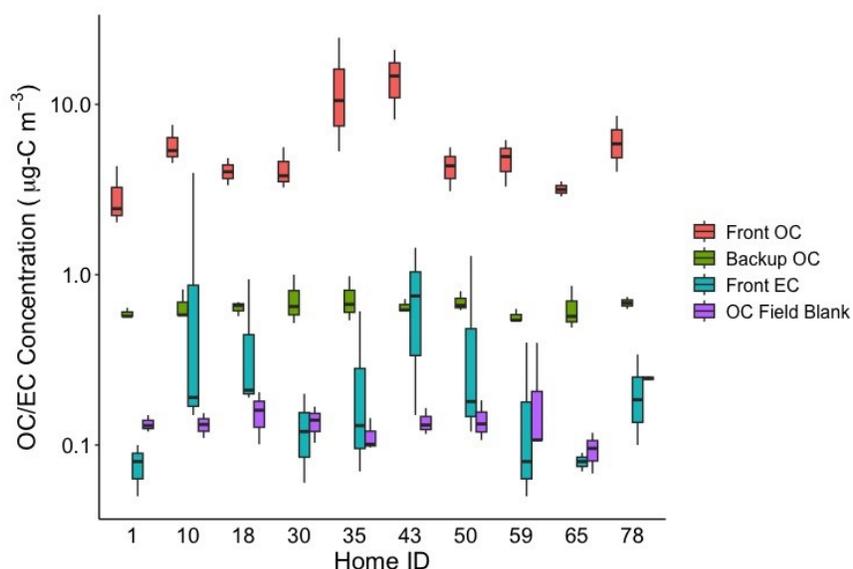
**Figure S5.** Measured indoor PM species composition. Shown are particulate OM (1.4 x particulate OC), nitrate, sulfate, elemental carbon (EC), ammonium, chloride, and aerosol liquid water content (LWC), which was calculated using E-AIM Model III. Particulate OC was calculated as OC on the front QFF minus OC on the backup QFF.

**Table S26.** Front and backup filter OC concentrations for each sampling period. Particulate OC was calculated by subtracting backup filter OC from the front filter concentrations. Organic Matter (OM) was calculated by multiplying the particulate OC concentrations by 1.4, an estimate of the average organic molecular weight per carbon weight.<sup>13,30</sup> pH was estimated using LWC and PSA (see Section S2).<sup>5</sup> Sample volume was calculated using the flow rate of the pDR (1.52 L min<sup>-1</sup>) or GRIMM OPC (1.2 L min<sup>-1</sup>) and the sampling duration at each home for each sampling week.

Home	Week	Front OC ( $\mu\text{g-C m}^{-3}$ )	Backup OC ( $\mu\text{-Cg m}^{-3}$ )	Estimated pH	Front Filter			Sulfate ( $\mu\text{g m}^{-3}$ )	Nitrate ( $\mu\text{g m}^{-3}$ )	LWC ( $\mu\text{g m}^{-3}$ )	Real Time V ( $\text{m}^3$ )
					Particulate OC ( $\mu\text{g-C m}^{-3}$ )	OM ( $\mu\text{g m}^{-3}$ )	EC ( $\mu\text{g-C m}^{-3}$ )				
65	1	3.53	0.86	-0.91	2.67	3.73	0.07	1.4E-01	2.3E-02	0.19	13.2
	2	2.88	0.49	-0.96	2.39	3.35	0.09	2.7E-01	4.6E-02	0.38	13.2
	3	3.16	0.57	-0.96	2.59	3.63	0.08	1.4E-01	4.1E-02	0.22	10.1
18	1	3.35	0.69	-0.96	2.66	3.72	0.94	7.6E-02	1.6E-02	0.11	13.2
	2	4.02	0.66	-1.00	3.36	4.70	0.21	3.4E-01	3.2E-02	0.40	12.7
	3	4.84	0.57	-0.99	4.27	5.98	0.19	2.2E-01	9.8E-02	0.56	10.8
78	1	8.57	0.74	-0.92	7.83	10.96	0.10	8.1E-02	2.2E-02	0.10	13.7
	2	4.02	0.63	-1.00	3.39	4.75	0.34	5.7E-02	1.8E-02	0.09	12.7
	3	NA	NA	-1.03	NA	NA	NA	1.1E+00	1.1E-01	2.97	9.9
30	1	5.60	0.65	-0.97	4.95	6.93	0.06	1.8E-01	3.5E-02	0.22	13.5
	2	3.25	0.52	-1.03	2.73	3.83	0.20	7.9E-03	1.6E-02	0.02	13.1
	3	3.81	1.00	-1.21	2.82	3.94	0.12	n.d.	4.3E-02	0.04	10.4
50	1	4.36	0.80	-1.01	3.56	4.98	0.12	3.0E-01	1.8E-02	0.28	13.6
	2	5.60	0.62	-1.06	4.97	6.96	1.29	2.2E-01	5.5E-02	0.29	13.0
	3	3.09	0.66	-1.03	2.43	3.40	0.18	2.7E-01	2.2E-01	0.99	10.2
43	1	14.68	0.72	-1.16	13.96	19.54	0.75	4.9E-03	1.3E-01	0.19	13.4
	2	8.15	0.61	-1.05	7.54	10.56	1.44	1.2E-01	4.0E-02	0.15	13.3
	3	20.93	0.62	-1.12	20.32	28.45	0.15	2.2E-01	1.2E-01	0.69	10.4
35	1	5.30	0.98	-1.12	4.32	6.05	0.07	3.6E-01	4.2E-02	0.33	13.4
	2	10.53	0.67	-0.97	9.86	13.81	0.61	4.1E-01	1.8E-01	1.21	9.8
	3	24.64	0.54	-0.91	24.10	33.75	0.13	2.6E-01	1.6E-01	1.65	10.2
1	1	2.03	0.57	-1.14	1.46	2.04	0.05	2.1E-01	1.4E-02	0.20	13.0
	2	2.44	0.64	-1.16	1.80	2.52	0.08	1.2E-01	7.4E-02	0.21	10.2
	3	4.34	0.57	-0.93	3.77	5.27	0.10	2.8E-01	8.8E-02	0.63	10.1
10	1	4.53	0.82	-1.05	3.71	5.20	0.15	3.0E-01	3.3E-02	0.33	12.7
	2	7.59	0.58	-0.98	7.00	9.80	3.96	6.7E-01	1.3E-01	1.03	10.4
	3	5.36	0.58	-1.00	4.78	6.69	0.19	3.2E-01	1.7E-01	0.69	10.2
59	1	6.17	0.63	-1.09	5.53	7.75	0.05	7.6E-02	4.1E-02	0.14	13.1
	2	4.94	0.54	-0.97	4.40	6.16	0.40	9.0E-02	9.8E-02	0.32	10.3
	3	3.29	0.54	-0.99	2.75	3.85	0.08	3.2E-01	1.2E-01	0.97	10.3
MDL ( $\mu\text{g m}^{-3}$ )		0.34	0.34	-	-	1.4	8.1E-5	2.4	2.5	-	-
Analytical Prec. (%)		-	-	-	-	-	-	4.7	5.5	-	-
Average V ( $\text{m}^3$ )		91.1	91.1	-	91.1	91.1	91.1	11.8	11.8	11.8	-

## COMPARISON TO RIOPA STUDY

Indoor PM composition during the IPA Campaign was similar to that measured during the Relationship of Indoor, Outdoor and Personal Air (RIOPA) study, where indoor and outdoor  $PM_{2.5}$  were sampled for 48 h in non-smoking residences in Los Angeles County, CA, Elizabeth, NJ, and Houston, TX<sup>13</sup> between 1999 and 2001. In both studies, indoor PM was dominated by OM. However, concentrations of indoor PM species were lower in the IPA Campaign. The mean IPA Campaign indoor particulate OM and EC concentrations were somewhat lower than during the RIOPA study (RIOPA: OM mean  $9.8 \mu\text{g m}^{-3}$ ; EC means  $0.6 - 1.2 \mu\text{g m}^{-3}$ ), and IPA Campaign sulfate was much lower than for the RIOPA study<sup>13</sup> (RIOPA sulfate means:  $3.0 - 4.4 \mu\text{g m}^{-3}$ ). Reductions in ambient (outdoor) sulfate concentrations over the 20+ years since the RIOPA study, as well as lower ACHs may explain the lower indoor concentrations found during the IPA Campaign. Outdoor air is the predominant source of indoor sulfate and ambient (outdoor) concentrations of sulfur dioxide (and sulfate) have decreased<sup>31,32</sup> in the Southeast US. Additionally, the median ACH in the RIOPA study<sup>33</sup> was  $0.71 \text{ h}^{-1}$ , whereas the median ACH was  $0.29 \text{ h}^{-1}$  (Table S13) in the IPA Campaign, suggesting



that outdoor-to-indoor transport of sulfate is lower for IPA homes.

**Figure S6** OC and EC concentrations (not blank or backup filter subtracted) at each home for the three sampling periods. EC was not detected on any field blanks. OC concentrations varied between the homes with a mean ( $\pm \sigma$ ) front filter OC concentration of  $6.2 \mu\text{g-C m}^{-3} \pm 5.2 \mu\text{g-C m}^{-3}$  and backup OC concentration of  $0.66 \mu\text{g-C m}^{-3} \pm 0.13 \mu\text{g-C m}^{-3}$ . Homes 43 and 35 had higher OC concentrations and higher variability compared to the other homes. EC concentrations were more variable both within and between homes, with a mean ( $\pm \sigma$ ) front filter EC concentration of  $0.41 \mu\text{g-C m}^{-3} \pm 0.79 \mu\text{g-C m}^{-3}$ .

## SECTION S10: REGRESSION RESULTS

**Table S27.** Kendall's  $\tau$  for  $\kappa_p$  ( $\text{m}^3 \mu\text{g}^{-1}$ ) of long and short chain PFCAs and long chain PFSAs. Short-chain PFSAs and the PAPs were excluded from statistical analysis because of their low detection frequency on the backup filter. Bolded values are significant at  $p < 0.05$ .

	$\kappa_p$ Long Chain PFCAs	$\kappa_p$ Short Chain PFCAs	$\kappa_p$ Long Chain PFSAs	Ammonium ( $\mu\text{g m}^{-3}$ )	Nitrate ( $\mu\text{g m}^{-3}$ )	Sulfate ( $\mu\text{g m}^{-3}$ )	Chloride ( $\mu\text{g m}^{-3}$ )	Nitrate/Sulfate	RH (%)	Indoor T ( $^{\circ}\text{C}$ )	OC ( $\mu\text{g m}^{-3}$ )	EC ( $\mu\text{g m}^{-3}$ )
$\kappa_p$ Short Chain PFCAs	-0.12											
$\kappa_p$ Long Chain PFSAs	0.39	0.30										
Ammonium ( $\mu\text{g m}^{-3}$ )	0.10	<b>-0.71</b>	-0.21									
Nitrate ( $\mu\text{g m}^{-3}$ )	<b>-0.69</b>	-0.27	-0.47	-0.04								
Sulfate ( $\mu\text{g m}^{-3}$ )	-0.04	<b>-0.67</b>	-0.43	0.71	0.25							
Chloride ( $\mu\text{g m}^{-3}$ )	-0.43	-0.41	-0.48	0.01	0.87	0.39						
Nitrate/Sulfate	-0.50	0.14	0.01	-0.54	0.57	-0.52	0.38					
RH (%)	-0.29	-0.20	-0.12	0.34	0.12	0.16	0.02	0.08				
Indoor T ( $^{\circ}\text{C}$ )	0.25	0.39	0.26	-0.17	-0.53	-0.21	-0.50	-0.41	-0.71			
OC ( $\mu\text{g m}^{-3}$ )	<b>-0.70</b>	<b>0.53</b>	-0.40	-0.25	0.27	-0.15	0.05	0.14	0.05	0.11		
EC ( $\mu\text{g m}^{-3}$ )	-0.07	<b>0.54</b>	<b>0.56</b>	-0.44	-0.12	-0.47	-0.26	0.27	0.17	-0.19	0.07	
ACH ( $\text{hr}^{-1}$ )	-0.11	-0.21	-0.20	-0.05	0.14	0.21	0.16	0.00	-0.10	-0.09	-0.15	-0.25

**Table S28.** Kendall’s  $\tau$  correlation coefficients for log transformed front filter indoor PFAS concentrations with Particulate OC (Front Filter OC – Backup Filter OC), EC, Sulfate, Nitrate, LWC, ACH, Indoor T, Indoor RH, Outdoor T, Outdoor RH, and pH. Bolded values are significant at either  $\alpha = 0.05$  or  $0.01$ , with associations significant at  $0.05$  noted with a “\*” and those significant at  $0.01$  noted with “\*\*”. Associations significant at  $\alpha = 0.1$  are italicized and noted with “#” Particulate OC, EC, sulfate, nitrate, LWC, and all  $\Sigma$ PFAS and subclasses have units of  $\mu\text{g m}^{-3}$ , ACH is reported as  $\text{hr}^{-1}$ , Temperature as  $^{\circ}\text{C}$ , and RH as %.

	Particulate OC	EC	Sulfate	Nitrate	LWC	ACH	Indoor T	Indoor RH	Outdoor T	Outdoor RH	pH	Log $\Sigma$ PFAS	Log $\Sigma$ PFCAs	Log $\Sigma$ PFASs	Log $\Sigma$ PAPs	Log $\Sigma$ Long PFCAs	Log $\Sigma$ Short PFCAs
Particulate OC																	
EC	0.39																
Sulfate	-0.09	-0.15															
Nitrate	0.36	0.24	<b>0.51*</b>														
LWC	0.08	0.02	<b>0.86**</b>	<b>0.80**</b>													
ACH	-0.02	-0.02	0.14	0.17	0.14												
Indoor T	-0.08	<i>-0.45#</i>	<i>-0.47#</i>	<b>-0.70**</b>	<b>-0.66**</b>	-0.25											
Indoor RH	-0.01	0.00	-0.31	<b>-0.62**</b>	<b>-0.51*</b>	-0.25	<b>0.49*</b>										
Outdoor T	-0.02	-0.34	-0.39	<b>-0.72**</b>	<b>-0.64**</b>	-0.18	<b>0.88**</b>	<b>0.68**</b>									
Outdoor RH	-0.16	-0.17	<b>-0.51*</b>	<b>-0.71**</b>	<b>-0.64**</b>	-0.30	<b>0.65**</b>	<b>0.72**</b>	<b>0.76**</b>								
pH	-0.27	-0.20	0.10	-0.21	0.07	-0.34	-0.03	0.16	0.08	0.26							
Log( $\Sigma$ PFAS)	0.04	0.01	-0.26	-0.12	-0.28	-0.07	0.14	-0.11	0.05	-0.05	-0.20						
Log( $\Sigma$ PFCAs)	0.00	0.11	-0.26	-0.07	-0.23	-0.03	0.05	-0.09	-0.02	-0.03	-0.23	<b>0.91**</b>					
Log( $\Sigma$ PFASs)	0.19	0.23	<b>-0.53*</b>	-0.39	<b>-0.59*</b>	0.02	0.30	0.28	0.34	0.29	-0.23	<b>0.51*</b>	<i>0.48#</i>				
Log( $\Sigma$ PAPs)	<i>-0.43#</i>	-0.29	0.32	0.14	0.32	-0.08	-0.34	<i>-0.45#</i>	<i>-0.47#</i>	<i>-0.44#</i>	0.16	-0.24	-0.37	<b>-0.59*</b>			
Log( $\Sigma$ Long PFCA)	<b>-0.80**</b>	-0.37	0.10	-0.25	-0.02	0.11	-0.04	-0.14	-0.10	0.02	0.29	-0.06	-0.01	<i>-0.42#</i>	<i>0.46#</i>		
Log( $\Sigma$ Short PFCA)	0.19	0.18	-0.25	0.02	-0.20	0.02	0.03	-0.13	-0.03	-0.10	-0.32	<b>0.89**</b>	<b>0.95**</b>	<b>0.54*</b>	<i>-0.45#</i>	-0.24	

**Table S29.** Kendall's  $\tau$  correlation matrix for log transformed PFAS concentrations and cooking appliance use in homes. During active air sampling weeks, participants filled out an activity checklist every day and marked down the number of times they used the stove, oven, microwave, toaster, or water kettle.  $\Sigma$ Cooking appliances is the total number of times in a sampling week that any of the cooking appliances were used in each home. Bolded values are significant at either  $\alpha = 0.05$  or  $0.01$ , with associations significant at  $0.05$  noted with a "\*" and those significant at  $0.01$  noted with "\*\*". Associations significant at  $\alpha = 0.1$  are marked with a "#" and italicized.

	Stove	Oven	Microwave	Toaster	Water Kettle	Log( $\Sigma$ PFAS)	Log( $\Sigma$ PFCAs)	Log( $\Sigma$ PFSAs)	Log( $\Sigma$ PAPs)	Log( $\Sigma$ Long PFCAs)	Log( $\Sigma$ Short PFCAs)	$\Sigma$ Cooking Appliances
Stove												
Oven	0.02											
Microwave	-0.26	-0.22										
Toaster	-0.34	0.22	-0.10									
Water Kettle	0.23	0.22	0.07	<b>-0.60*</b>								
Log( $\Sigma$ PFAS)	0.22	-0.43	-0.49	-0.14	-0.21							
Log( $\Sigma$ PFCAs)	0.09	-0.43	-0.27	-0.12	-0.28	<b>0.90*</b>						
Log( $\Sigma$ PFSAs)	0.03	-0.11	-0.47	-0.04	-0.33	<i>0.53#</i>	0.51					
Log( $\Sigma$ PAPs)	-0.05	-0.01	-0.14	0.05	0.17	-0.27	<i>-0.50#</i>	<b>-0.59*</b>				
Log( $\Sigma$ Long PFCAs)	-0.18	-0.33	0.36	0.20	-0.48	-0.15	-0.06	-0.44	0.26			
Log( $\Sigma$ Short PFCAs)	0.14	-0.33	-0.36	-0.16	-0.18	0.89	<b>0.95**</b>	<b>0.57*</b>	<i>-0.54#</i>	-0.27		
$\Sigma$ Cooking Appliances	0.19	0.31	<i>0.56#</i>	-0.05	<i>0.52#</i>	<i>-0.53#</i>	-0.48	<b>-0.58*</b>	0.12	0.03	-0.48	

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