

Figure 1. Sampling locations of foam and underlying bulk water.

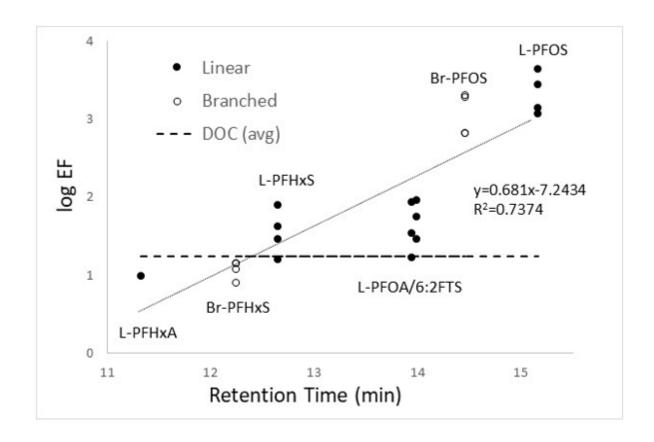


Figure 2. Log of enrichment factors ([Foam]/[Bulk]) plotted against chromatographic retention time. Linear isomers show higher enrichment than branched.

 Table 1. Exposure and hazard estimates for foam and bulk water.

	Exposure	e (ng/kg-day)	Hazard Ratio				
Age	Foam	Bulk Water	Foam	Bulk Water			
1 to <2	4.9 (70)	0.42 (3.0)	2.4 (35)	0.21 (1.5)			
2 to <3	4.7 (92)	0.41 (4.0)	2.4 (46)	0.21 (2.0)			
3 to <6	2.6 (47)	0.23 (2.0)	1.3 (23)	0.11 (1.0)			
6 to <11	1.8 (25)	0.15 (1.1)	0.88 (13)	0.08 (0.54)			
11 to <16	1.1(22)	0.10 (0.96)	0.57 (11)	0.05 (0.48)			
16 to <21	0.68 (12)	0.06 (0.53)	0.34 (6.1)	0.03 (0.26)			
21+	0.51 (9.5)	0.04 (0.41)	0.26 (4.7)	0.02 (0.21)			

Table 2. Concentrations of PFAS and dissolved organic carbon (DOC) in both foam and bulk water.

Sample ID	DOC	PFHxA	PFOA	PFNA	PFDA	PFUnD A	PFHxS	PFHpS	PFOS	PFNS	PFEtC HxS	FHxSA	EtFOSA A	SPr- FHxS A°	5:3 FTC A	6:2 FTS	8:2 FTS
Rt (min)		11.33	13.99	15.23	16.36	17.34	12.65	13.95	15.16	16.30	13.75	14.67	17.42	15.11	13.03	13.94	16.37
Foam 1	250,000,000	<loq< td=""><td>840</td><td>340</td><td>260</td><td>250</td><td>1,200</td><td>610</td><td>32,000</td><td><loq< td=""><td>340</td><td>950</td><td><loq< td=""><td>ND</td><td>ND</td><td>830</td><td><loq< td=""></loq<></td></loq<></td></loq<></td></loq<>	840	340	260	250	1,200	610	32,000	<loq< td=""><td>340</td><td>950</td><td><loq< td=""><td>ND</td><td>ND</td><td>830</td><td><loq< td=""></loq<></td></loq<></td></loq<>	340	950	<loq< td=""><td>ND</td><td>ND</td><td>830</td><td><loq< td=""></loq<></td></loq<>	ND	ND	830	<loq< td=""></loq<>
Foam 2	240,000,000	140 (0:100)	(8:92) 1200 (7:93)	(9:91) 850 (7:93)	(5:95) 630 (5:95)	(8:92) 510 (9:91)	(7:93) 2,000 (6:94)	(13: 87) 2,300 (12:88)	(41:59) 97,000 (49:51)	130 (70:30)	730	(30:70) 1,000 (29:71)	<loq< td=""><td>ND</td><td>ND</td><td>1300</td><td>100</td></loq<>	ND	ND	1300	100
Foam 3	330,000,000	<loq< td=""><td>1300 (7:93)</td><td>1500 (7:93)</td><td>960 (6:94)</td><td>660 (10:90)</td><td>1,700 (6:94)</td><td>2,800 (10:90)</td><td>68,000 (46:54)</td><td>130 (72:28)</td><td>560</td><td>1,100 (28:72)</td><td>130 (16:84)</td><td>ND</td><td>ND</td><td>1000</td><td><loq< td=""></loq<></td></loq<>	1300 (7:93)	1500 (7:93)	960 (6:94)	660 (10:90)	1,700 (6:94)	2,800 (10:90)	68,000 (46:54)	130 (72:28)	560	1,100 (28:72)	130 (16:84)	ND	ND	1000	<loq< td=""></loq<>
Foam 4	240,000,000	<loq< td=""><td>530</td><td>320</td><td>290</td><td>260</td><td>890</td><td>690</td><td>49,000</td><td><loq< td=""><td>220</td><td>690</td><td><loq< td=""><td>140</td><td>ND</td><td>770</td><td>130</td></loq<></td></loq<></td></loq<>	530	320	290	260	890	690	49,000	<loq< td=""><td>220</td><td>690</td><td><loq< td=""><td>140</td><td>ND</td><td>770</td><td>130</td></loq<></td></loq<>	220	690	<loq< td=""><td>140</td><td>ND</td><td>770</td><td>130</td></loq<>	140	ND	770	130
Foam 5	260,000,000	ND	(6:94) 280 (10:90)	(6:94) 380 (11:89)	(5:95) 420 (12:88)	(8:92) 410 (9:91)	(7:93) 330 (14:86)	(12:88) 160 (13:87)	(41:59) 32,000 (49:51)	<l0q< td=""><td><loq< td=""><td>(36:64) <loq< td=""><td>100 (21:79)</td><td><loq< td=""><td>ND</td><td><lo Q</lo </td><td><loq< td=""></loq<></td></loq<></td></loq<></td></loq<></td></l0q<>	<loq< td=""><td>(36:64) <loq< td=""><td>100 (21:79)</td><td><loq< td=""><td>ND</td><td><lo Q</lo </td><td><loq< td=""></loq<></td></loq<></td></loq<></td></loq<>	(36:64) <loq< td=""><td>100 (21:79)</td><td><loq< td=""><td>ND</td><td><lo Q</lo </td><td><loq< td=""></loq<></td></loq<></td></loq<>	100 (21:79)	<loq< td=""><td>ND</td><td><lo Q</lo </td><td><loq< td=""></loq<></td></loq<>	ND	<lo Q</lo 	<loq< td=""></loq<>
Foam 6	250,000,000	ND	ND	<loq< td=""><td><loq< td=""><td>110</td><td><loq< td=""><td>ND</td><td>2,300</td><td><loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td>190</td><td>NĎ</td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<></td></loq<></td></loq<></td></loq<></td></loq<>	<loq< td=""><td>110</td><td><loq< td=""><td>ND</td><td>2,300</td><td><loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td>190</td><td>NĎ</td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<></td></loq<></td></loq<></td></loq<>	110	<loq< td=""><td>ND</td><td>2,300</td><td><loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td>190</td><td>NĎ</td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<></td></loq<></td></loq<>	ND	2,300	<loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td>190</td><td>NĎ</td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<></td></loq<>	<loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td>190</td><td>NĎ</td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<>	<loq< td=""><td><loq< td=""><td><loq< td=""><td>190</td><td>NĎ</td><td>ND</td></loq<></td></loq<></td></loq<>	<loq< td=""><td><loq< td=""><td>190</td><td>NĎ</td><td>ND</td></loq<></td></loq<>	<loq< td=""><td>190</td><td>NĎ</td><td>ND</td></loq<>	190	NĎ	ND
Foam 7	230,000,000	ND	ND	ND	<loq< td=""><td>(6:94) <loq< td=""><td><loq< td=""><td>ND</td><td>(43: 57) 2,300 (40:60)</td><td><l0q< td=""><td><l0q< td=""><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<></td></l0q<></td></l0q<></td></loq<></td></loq<></td></loq<>	(6:94) <loq< td=""><td><loq< td=""><td>ND</td><td>(43: 57) 2,300 (40:60)</td><td><l0q< td=""><td><l0q< td=""><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<></td></l0q<></td></l0q<></td></loq<></td></loq<>	<loq< td=""><td>ND</td><td>(43: 57) 2,300 (40:60)</td><td><l0q< td=""><td><l0q< td=""><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<></td></l0q<></td></l0q<></td></loq<>	ND	(43: 57) 2,300 (40:60)	<l0q< td=""><td><l0q< td=""><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<></td></l0q<></td></l0q<>	<l0q< td=""><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<></td></l0q<>	<loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<>	<loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<>	ND	ND	ND	ND
Foam 8	210,000,000	ND	ND	<loq< td=""><td><loq< td=""><td>190</td><td><loq< td=""><td>ND</td><td>3,700</td><td><loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<></td></loq<></td></loq<></td></loq<>	<loq< td=""><td>190</td><td><loq< td=""><td>ND</td><td>3,700</td><td><loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<></td></loq<></td></loq<>	190	<loq< td=""><td>ND</td><td>3,700</td><td><loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<></td></loq<>	ND	3,700	<loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<>	<loq< td=""><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<></td></loq<>	<loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<>	<loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<>	ND	ND	ND	ND
Back- ground	d	ND	<loq< td=""><td>130</td><td>420</td><td>(7:93) 340 (16:84)</td><td>ND</td><td>ND</td><td>(40:60) 1500 (34:66)</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<>	130	420	(7:93) 340 (16:84)	ND	ND	(40:60) 1500 (34:66)	ND	ND	ND	ND	ND	ND	ND	ND
BW 1	12,000,000	13 (0:100)	15 (5:95)	<loq< td=""><td><l0q< td=""><td><l0q< td=""><td>46 (15:85)</td><td><loq< td=""><td>36 (56:44)</td><td>ND</td><td><loq< td=""><td><l0q< td=""><td>ND</td><td>ND</td><td>ND</td><td>24</td><td>ND</td></l0q<></td></loq<></td></loq<></td></l0q<></td></l0q<></td></loq<>	<l0q< td=""><td><l0q< td=""><td>46 (15:85)</td><td><loq< td=""><td>36 (56:44)</td><td>ND</td><td><loq< td=""><td><l0q< td=""><td>ND</td><td>ND</td><td>ND</td><td>24</td><td>ND</td></l0q<></td></loq<></td></loq<></td></l0q<></td></l0q<>	<l0q< td=""><td>46 (15:85)</td><td><loq< td=""><td>36 (56:44)</td><td>ND</td><td><loq< td=""><td><l0q< td=""><td>ND</td><td>ND</td><td>ND</td><td>24</td><td>ND</td></l0q<></td></loq<></td></loq<></td></l0q<>	46 (15:85)	<loq< td=""><td>36 (56:44)</td><td>ND</td><td><loq< td=""><td><l0q< td=""><td>ND</td><td>ND</td><td>ND</td><td>24</td><td>ND</td></l0q<></td></loq<></td></loq<>	36 (56:44)	ND	<loq< td=""><td><l0q< td=""><td>ND</td><td>ND</td><td>ND</td><td>24</td><td>ND</td></l0q<></td></loq<>	<l0q< td=""><td>ND</td><td>ND</td><td>ND</td><td>24</td><td>ND</td></l0q<>	ND	ND	ND	24	ND
BW 2	16,000,000	14	13	<loq< td=""><td><loq< td=""><td><loq< td=""><td>52</td><td><loq< td=""><td>43</td><td>ND</td><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>15</td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<></td></loq<></td></loq<>	<loq< td=""><td><loq< td=""><td>52</td><td><loq< td=""><td>43</td><td>ND</td><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>15</td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<></td></loq<>	<loq< td=""><td>52</td><td><loq< td=""><td>43</td><td>ND</td><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>15</td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<>	52	<loq< td=""><td>43</td><td>ND</td><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>15</td><td>ND</td></loq<></td></loq<></td></loq<>	43	ND	<loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>15</td><td>ND</td></loq<></td></loq<>	<loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>15</td><td>ND</td></loq<>	ND	ND	ND	15	ND
BW 3	15,000,000	(0:100) <loq< td=""><td>(7:93) <loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td>(16:84) 27 (27:73)</td><td><loq< td=""><td>(59:41) 24 (65:35)</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td><lo Q</lo </td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<></td></loq<></td></loq<>	(7:93) <loq< td=""><td><loq< td=""><td><loq< td=""><td><loq< td=""><td>(16:84) 27 (27:73)</td><td><loq< td=""><td>(59:41) 24 (65:35)</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td><lo Q</lo </td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<></td></loq<>	<loq< td=""><td><loq< td=""><td><loq< td=""><td>(16:84) 27 (27:73)</td><td><loq< td=""><td>(59:41) 24 (65:35)</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td><lo Q</lo </td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<>	<loq< td=""><td><loq< td=""><td>(16:84) 27 (27:73)</td><td><loq< td=""><td>(59:41) 24 (65:35)</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td><lo Q</lo </td><td>ND</td></loq<></td></loq<></td></loq<>	<loq< td=""><td>(16:84) 27 (27:73)</td><td><loq< td=""><td>(59:41) 24 (65:35)</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td><lo Q</lo </td><td>ND</td></loq<></td></loq<>	(16:84) 27 (27:73)	<loq< td=""><td>(59:41) 24 (65:35)</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td><lo Q</lo </td><td>ND</td></loq<>	(59:41) 24 (65:35)	ND	ND	ND	ND	ND	ND	<lo Q</lo 	ND
BW 4	15,000,000	15 (0:100)	18 (6:94)	<loq< td=""><td><loq< td=""><td><l0q< td=""><td>59 (13:87)</td><td><loq< td=""><td>51 (60:40)</td><td>ND</td><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>45</td><td>ND</td></loq<></td></loq<></td></loq<></td></l0q<></td></loq<></td></loq<>	<loq< td=""><td><l0q< td=""><td>59 (13:87)</td><td><loq< td=""><td>51 (60:40)</td><td>ND</td><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>45</td><td>ND</td></loq<></td></loq<></td></loq<></td></l0q<></td></loq<>	<l0q< td=""><td>59 (13:87)</td><td><loq< td=""><td>51 (60:40)</td><td>ND</td><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>45</td><td>ND</td></loq<></td></loq<></td></loq<></td></l0q<>	59 (13:87)	<loq< td=""><td>51 (60:40)</td><td>ND</td><td><loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>45</td><td>ND</td></loq<></td></loq<></td></loq<>	51 (60:40)	ND	<loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>45</td><td>ND</td></loq<></td></loq<>	<loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>45</td><td>ND</td></loq<>	ND	ND	ND	45	ND
BW 5	21,000,000	<loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td><loq< td=""><td>ND</td><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<></td></loq<></td></loq<>	<loq< td=""><td>ND</td><td>ND</td><td>ND</td><td><loq< td=""><td>ND</td><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<></td></loq<>	ND	ND	ND	<loq< td=""><td>ND</td><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<>	ND	<loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<>	ND	ND	ND	ND	ND	ND	ND	ND
BW 6	14,000,000	ND	<loq< td=""><td>ND</td><td>ND</td><td>ND</td><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<>	ND	ND	ND	<loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<>	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BW 7	14,000,000	ND	<loq< td=""><td>ND</td><td>ND</td><td>ND</td><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<>	ND	ND	ND	<loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<>	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BW 8	15,000,000	<loq< td=""><td><loq< td=""><td>ND</td><td>ND</td><td>ND</td><td><loq< td=""><td>ND</td><td>13</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<></td></loq<>	<loq< td=""><td>ND</td><td>ND</td><td>ND</td><td><loq< td=""><td>ND</td><td>13</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<></td></loq<>	ND	ND	ND	<loq< td=""><td>ND</td><td>13</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<>	ND	13	ND	ND	ND	ND	ND	ND	ND	ND
Back- ground	d	ND	<loq< td=""><td>ND</td><td>ND</td><td>ND</td><td>17 (0:100)</td><td>ND</td><td>(55:45) 28 (67:33)</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td><td>ND</td></loq<>	ND	ND	ND	17 (0:100)	ND	(55:45) 28 (67:33)	ND	ND	ND	ND	ND	ND	ND	ND

^aLOQ for each analyte and matrix is found in Table S7. ^bND was defined as below the limit of detection (LOD) which was defined as 1/3 LOQ. ^cAnalyte found in suspect list at confidence level of 2. ^dNo sample was available for DOC analysis.