

Evidence of Air Dispersion: HFPO-DA and PFOA in Ohio and West Virginia Surface Water and Soil Near a Fluoropolymer Production Facility

Supporting Information

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Materials

Targeted PFAS – perfluorobutanoic acid (PFBA), perfluoropentanoic acid (PFPeA), perfluorohexanoic acid (PFHxA), perfluoroheptanoic acid (PFHpA), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), perfluorodecanoic acid (PFDA), perfluorobutane sulfonic acid (PFBS), perfluorohexane sulfonic acid (PFHxS), and perfluorooctane sulfonic acid (PFOS) – were purchased from Wellington Laboratories (Guelph, Ontario, Canada), and HFPO-DA was obtained from Synquest Laboratories (Alachua, FL). Isotopically labeled PFASs used for internal standards (IS) were obtained from Wellington Laboratories. Deionized (DI) water was generated in-house using a Barnstead EasyPure UV/UF lab water system (Dubuque, IA).

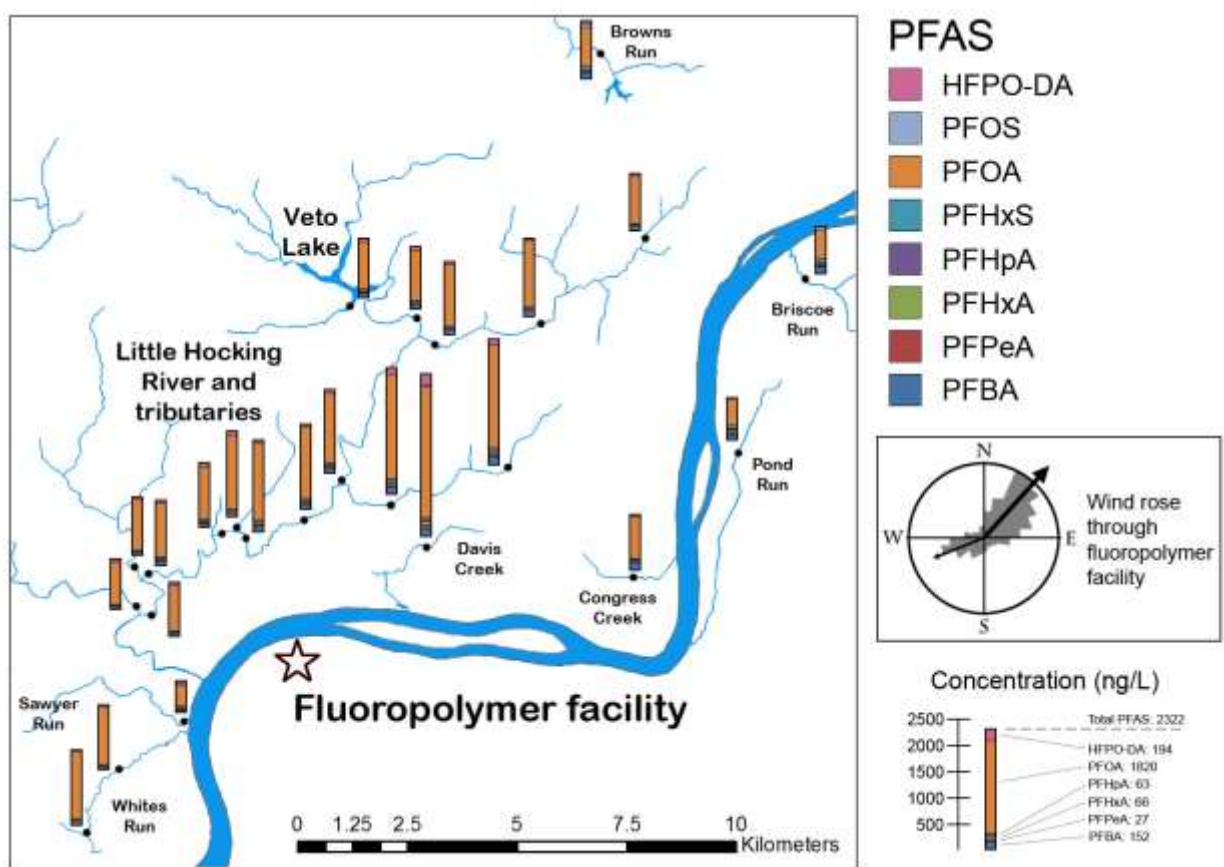


Figure S1. Sampling locations and PFAS concentrations in surface waters from the second sampling trip, July 12-13, 2016.

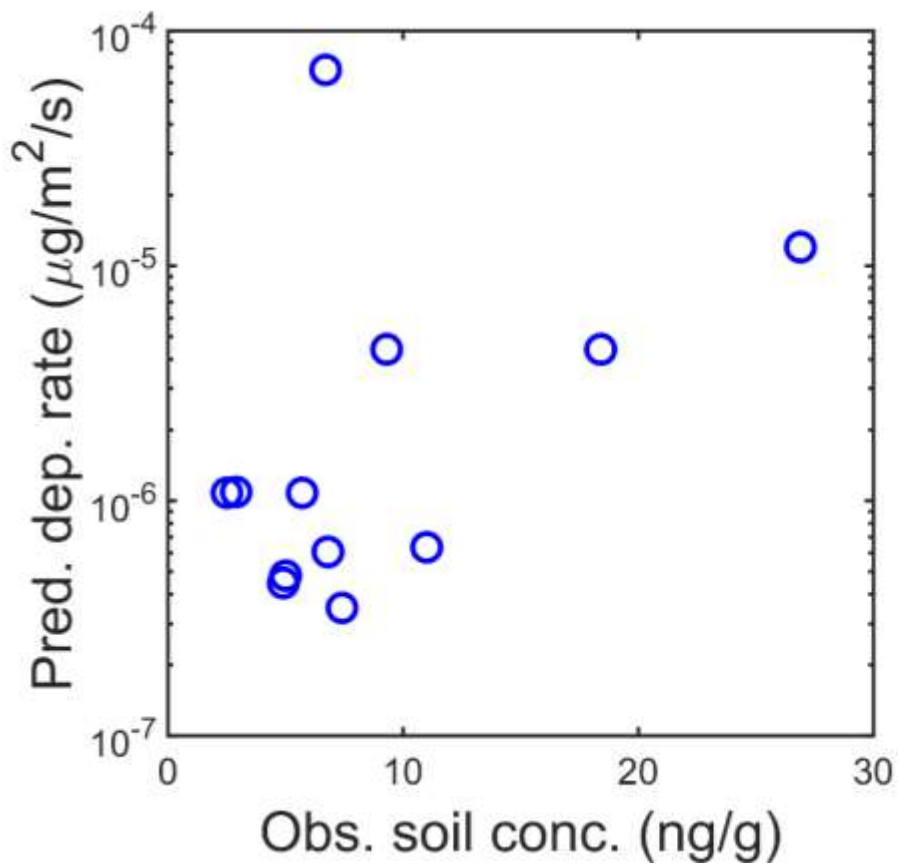


Figure S2. Predicted PFOA wet+dry deposition rates from CALPUFF model output and measured PFOA soil concentrations from 2016 and 2018 sampling trips. Predictions correspond to the exact locations of the soil samples. The value at [7 ng/g, $6 \times 10^{-5} \mu\text{g}/\text{m}^2/\text{s}$] is a suspected outlier (p -value of slope = 0.14 with this point, or <0.001 without).

Table S1. Method performance.

	Sample Trip #1				Sample Trip #2				Sample Trip #3			
	25 ng/L		100 ng/L		25 ng/L		100 ng/L		25 ng/L		100 ng/L	
	ng/L	% recovery	ng/L	% recovery	ng/L	% recovery	ng/L	% recovery	ng/L	% recovery	ng/L	% recovery
PFBA	27.4	110	92.0	92.0	13.3	53.3	96.2	96.2	34.8	139	101	101
PFPeA	27.5	110	92.3	92.3	13.0	52.1	104	104	37.1	149	106	106
PFBS	27.4	110	89.5	89.5	-	-	-	-	34.5	138	184	184
PFHxA	25.3	101	79.3	79.3	23.1	92.2	99.3	99.3	31.2	125	84.6	84.6
PFHpA	26.8	107	79.3	79.3	19.9	79.5	106	106	15.8	63.0	132	132
PFHxS	24.9	99.8	89.7	89.7	-	-	47.2	47.2	29.5	118	148	148
PFOA	24.4	97.5	91.3	91.3	17.4	69.7	94.7	94.7	16.8	67.1	129	129
PFNA	25.6	102	87.3	87.3	20.1	80.3	89.8	89.8	10.6	42.4	55.1	55.1
PFOS	25.5	102	88.3	88.3	20.4	81.6	97.7	97.7	25.5	102	109	109
PFDA	23.4	93.6	79.0	79.0	17.7	70.7	108	108	27.2	109	221	221
HFPO-DA	-	-	-	-	-	-	-	-	28.7	115	78.2	78.2

Table S2. Duplicate comparison.

Description	Date	PFOA			HFPO-DA		
		Sample #1 (ng/L)	Sample #2 (ng/L)	% difference	Sample #1 (ng/L)	Sample #2 (ng/L)	% difference
Lee Creek	6/6/16	50.9	65.3	24.8	*	*	-
Sawyer Run (Ohio River)	6/8/16	*	*	-	-	*	-
Vienna Island (Ohio River)	6/9/16	*	*	-	-	-	-
Little Hocking #4	7/12/16	1770	1220	36.8	86	37	79.7
Veto Lake	12/1/16	412	321	24.8	31.0	37.5	19.0
Mill Branch	12/2/16	480	636	28.0	81.0	116	35.5
Warren Elementary ¹	12/2/16	*	*	-	-	-	-
Williams Creek	12/3/16	55.5	65.1	15.9	*	10.7	-
Soil		Sample #1 (ng/g)	Sample #2 (ng/g)	% difference	Sample #1 (ng/g)	Sample #2 (ng/g)	% difference
Veto Road	12/2/16	*	*	-	-	-	-
Veto Lake	3/25/18	9.3	10.3	10.2	1.0	1.2	18.2

¹ Public water, Warren Community Water.

* Detected but below the LOQ of 10 ng/L for water or 1 ng/g for soil.

- Not detected.

Table S3. Measured PFAS surface water concentration results from the first sampling trip, June 6-9, 2016.

Description	PFBA ng/L	PFPeA ng/L	PFBS ng/L	PFHxA ng/L	PFHpA ng/L	PFHxS ng/L	PFOA ng/L	PFNA ng/L	PFOS ng/L	PFDA ng/L	HFPO- DA ng/L
Ohio River Samples											
Crab Creek	*	*	*	*	*	*	15.0	*	*	*	*
Lakin	*	*	*	*	*	*	13.4	*	*	*	*
Pomeroy	*	*	*	*	*	*	12.3	*	*	*	10.9
Brinker Run outflow	*	*	*	*	*	*	*	*	*	*	*
Foam in river	*	*	*	*	*	*	13.5	*	*	*	*
Letart	*	*	*	*	*	*	*	*	*	*	*
Lee Creek outflow	*	*	*	*	*	*	*	*	*	*	*
Upstream from Lee Creek	*	*	*	*	*	*	*	*	*	*	*
Tuppers Plains	*	*	*	*	*	*	*	*	*	*	10.0
Lubeck	*	*	*	*	*	*	*	-	*	*	-
Sawyer Run	*	*	*	*	*	*	*	*	*	*	-
Sawyer Run (dup.)	*	*	*	*	*	*	*	*	*	*	*
Belpre	*	*	*	*	*	*	*	*	*	*	-
Vienna Island	*	*	*	*	*	*	*	*	*	*	-
Vienna Island (dup.)	*	*	*	*	*	*	*	*	*	-	-
Marietta	*	*	*	*	*	*	*	*	*	*	-
Newport	10.9	*	*	*	*	*	*	*	*	*	-
Tributaries Near Known Landfills											
Brinker Run ¹	*	*	*	*	*	*	103	*	-	*	-
Lee Creek ²	*	*	*	*	*	*	50.9	*	*	*	*
Lee Creek ² (dup.)	*	*	*	*	*	*	65.3	*	*	*	*
Pine Run ²	*	*	*	*	*	*	189	*	*	*	*
Vaughts Run ³	27.1	16.7	*	19.8	33.8	*	1250	*	*	*	71.2
Other											
Little Kanawha River	*	*	*	*	*	*	22.6	*	*	*	-
E. Fork Little Hocking	10.4	15.5	*	14.6	24.0	*	463	*	*	*	59.4
W. Fork Little Hocking	*	*	*	*	*	*	209	*	-	*	*
Muskingum River	*	*	*	*	*	*	*	*	*	*	-

¹ Influenced by Letart Landfill. ² Influenced by Dry Run Landfill. ³ Influenced by Local Landfill.

* Detected but below the LOQ of 10 ng/L.

- Not detected.

Table S4. Measured PFAS surface water concentration results from the second sampling trip, July 12-13, 2016.

Description	PFBA ng/L	PFPeA ng/L	PFBS ng/L	PFHxA ng/L	PFHpA ng/L	PFHxS ng/L	PFOA ng/L	PFNA ng/L	PFOS ng/L	PFDA ng/L	HFPO- DA ng/L
Whites Run #1	36.0	-	-	26.8	32.2	-	1120	-	-	-	19.1
Whites Run #2	57.5	*	-	34.0	38.0	-	1290	-	-	-	22.7
Sawyer Run #1	31.8	10.1	-	13.9	*	-	421	-	10.4	-	39.2
West Fork LH	41.0	-	-	18.6	21.0	-	838	-	-	-	49.1
LH #1	50.5	*	-	20.3	19.2	-	902	-	*	-	53.1
Little West Branch	43.0	*	-	22.1	22.3	-	988	-	*	-	36.5
LH #2	86.3	16.0	-	32.8	23.7	-	1040	-	*	-	60.8
LH #3	74.2	12.0	-	30.4	19.5	-	1030	-	-	-	71.8
Long Brook	68.4	*	-	39.0	33.6	-	1430	-	-	-	84.3
LH #4	136	25.7	-	56.3	59.6	-	1770	-	*	-	86.2
LH #4 (dup.)	85.6	11.8	-	39.3	36.0	-	1220	-	*	-	36.8
LH #5	104	16.7	-	45.3	40.2	-	1390	-	*	-	41.5
Veto Lake	95.2	14.4	-	34.4	25.7	-	932	-	*	-	52.6
LH #6	91.8	15.2	-	40.1	42.4	-	1360	-	-	-	70.0
Mill Branch #1	134	19.9	-	71.3	65.9	-	2040	-	-	-	115
Davis Creek	203	43.1	-	95.0	93.7	-	2570	-	13.0	-	227
Mill Branch #2	151	22.0	-	71.7	72.9	-	2030	-	*	-	88.5
LH #7	91.0	*	-	30.1	36.2	-	987	-	*	-	56.8
E. Branch Tributary #1	90.9	*	-	39.1	32.2	-	1200	-	-	-	37.4
E. Branch Tributary #2	108	*	-	34.8	34.5	-	1290	-	-	-	44.2
E. Branch Tributary #3	80.9	-	-	22.3	19.2	-	962	-	-	-	24.8
Browns Run	106	*	-	26.1	18.8	78.4	781	-	71.9	-	30.4
Briscoe Run	118	28.7	-	35.8	30.5	79.0	566	-	58.3	-	-
Pond Run	90.0	65.7	-	43.2	17.8	64.5	496	-	22.1	-	-
Congress Creek	144	11.0	-	26.4	24.5	-	849	-	20.0	-	-

* Detected but below the LOQ of 10 ng/L.

- Not detected.

Table S5. Measured PFAS surface water concentration results from the third sampling trip, December 1-3, 2016.

Description	PFBA ng/L	PFPeA ng/L	PFBS ng/L	PFHxA ng/L	PFHpA ng/L	PFHxS ng/L	PFOA ng/L	PFNA ng/L	PFOS ng/L	PFDA ng/L	HFPO- DA ng/L
Little Hocking	19.9	10.6	*	17.3	35.9	*	1110	*	*	*	129
Long Brook	*	*	*	10.8	*	-	516	-	-	-	24.7
Veto Lake	15.9	*	*	11.3	10.4	*	412	*	-	-	31.0
Veto Lake (dup.)	10.1	*	*	*	11.1	-	321	*	*	-	37.5
Buffalo Run	*	*	-	*	-	-	157	*	*	-	12.9
S. Branch Wolf Creek #1	11.2	*	*	*	-	*	98.5	*	-	-	14.4
S. Branch Wolf Creek #2	*	*	*	*	*	-	135	-	-	-	*
S. Branch Wolf Creek #3	17.0	*	*	13.8	*	*	147	*	-	-	42.1
S. Branch Wolf Creek #4	*	*	-	*	*	-	151	*	-	-	*
W. Branch Wolf Creek	*	*	*	*	*	-	22.4	*	-	-	*
Coal Run	*	*	-	*	-	*	17.7	-	-	-	*
W. Branch Little Hocking #1	*	*	-	*	-	-	32.5	*	-	-	*
W. Branch Little Hocking #2	*	*	-	*	-	-	57.9	-	-	-	*
Big Run (OH)	*	*	*	*	11.4	-	969	*	*	-	16.8
Davis Creek	10.1	*	*	17.0	31.7	11.3	1310	*	10.7	-	137
Congress Creek	18.1	10.8	*	11.9	15.1	-	234	*	*	-	24.3
Mill Branch	12.6	*	*	16.0	*	-	480	*	-	-	81.0
Mill Branch (dup.)	12.1	*	*	14.4	14.4	-	636	*	-	-	116
East Branch tributary #1	*	*	*	*	*	-	876	*	-	-	16.5
East Branch tributary #2	*	*	*	*	*	*	293	*	-	-	*
Hanna Road creek	*	*	*	*	*	*	201	*	*	-	18.0
Browns Run	10.2	*	*	*	*	14.4	167	*	14.0	*	17.4
Halfway Run	*	*	*	*	*	*	96.0	24.2	*	*	*
Indian Run	*	*	*	*	-	*	56.3	*	-	-	*
Tupper Creek tributary	*	*	*	*	-	*	31.1	*	-	-	*
Rainbow Creek	*	*	-	*	-	-	42.1	*	-	-	*
Cat Creek	*	*	-	*	-	-	35.1	-	-	-	*
Duck Creek tributary #1	*	*	-	*	-	-	*	*	-	-	*
Duck Creek tributary #2	*	*	*	*	*	*	54.3	*	*	-	*
Sugar Creek	*	-	-	*	-	-	*	*	-	-	-
Eightmile Creek	*	*	*	*	-	*	14.1	*	*	-	*
Big Run (WV)	*	*	*	*	-	*	126	*	-	-	*
Little Eightmile Creek	*	-	-	*	-	-	*	-	-	-	-
Fifteenmile Creek	*	*	-	*	*	-	14.5	-	-	*	-
Wingett Run	*	-	-	*	-	-	*	-	-	-	-
Mill Run	*	*	*	*	-	*	32.5	*	*	-	*
Williams Creek	*	*	*	*	*	*	55.5	*	-	-	*
Williams Creek (dup.)	10.3	*	*	*	*	*	65.1	*	-	-	10.7
Briscoe Run	10.8	17.5	28.0	19.6	29.4	10.1	146	*	19.5	-	*
Pond Run	*	*	*	*	*	*	74.4	*	-	-	22.5

* Detected but below the LOQ of 10 ng/L.

- Not detected.

Table S6. Measured PFAS concentrations in drinking water samples from the three sampling trips. Each private well is located more than 27 kilometers from fluoropolymer production facility, in the direction of prevailing winds to the northeast.

Description	PFBA ng/L	PFPeA ng/L	PFBS ng/L	PFHxA ng/L	PFHpA ng/L	PFHxS ng/L	PFOA ng/L	PFNA ng/L	PFOS ng/L	PFDA ng/L	HFPO- DA ng/L
Washington Co. Library ¹	*	*	*	*	*	*	*	*	*	*	-
Little Hocking P.O. ²	-	-	-	-	-	-	-	-	-	-	-
Barlow Library ²	*	*	-	*	-	-	*	-	-	-	*
Watertown P.O. ²	*	*	-	*	-	-	*	*	*	-	-
Warren Elementary ³	*	*	*	*	-	*	*	*	*	-	-
Warren Elementary ³ (dup.)	*	*	*	*	-	-	*	*	-	-	-
Devola private well	*	*	*	*	-	*	28.0	*	-	-	-
Lowell private well	*	*	*	*	-	*	23.3	*	-	-	-

¹ City of Marietta. ² Little Hocking Water Association. ³ Warren Community Water.

* Detected but below the LOQ of 10 ng/L.

- Not detected.

Table S7. Measured PFAS soil concentration results from soil sampling trips (ng/g dry weight). Distance is measured from fluoropolymer production facility.

Year	Description	Distance (km)	PFBA ng/g	PFPeA ng/g	PFHxA ng/g	PFHpA ng/g	PFOA ng/g	PFNA ng/g	PFDA ng/g	HFPO- DA ng/g
2004	Little Hocking A		3.57	1.17	8.37	41.5	57.3	*	2.01	-
	Little Hocking B		3.29	*	18.1	104	66.2	*	3.34	-
	Little Hocking C		3.78	2.15	12.9	57.9	59.1	*	2.65	-
2016	Drag Strip Road	4.0	*	6.29	1.65	1.32	26.9	1.63	1.69	3.20
	Veto Lake	8.0	1.22	48.8	3.63	7.65	18.4	*	1.45	8.14
	Veto Road	13.0	-	-	-	-	*	-	*	-
	Veto Road (dup.)	13.0	*	-	-	*	*	-	*	-
	Strouds Run	15.3	*	9.99	*	*	5.70	*	*	*
	Lookout Park	24.0	1.01	-	-	*	2.52	*	*	-
	Archers Fork #1	35.3	*	-	*	*	6.77	*	*	-
	Archers Fork #2	48.1	*	-	*	*	4.96	*	*	-
2018	LHWA	1.3	3.52	14.3	3.06	3.10	6.68	1.92	1.32	3.09
	Veto Lake	8.0	*	3.66	*	*	9.30	*	*	1.00
	Veto Lake (dup.)	8.0	*	15.4	1.40	1.30	10.3	*	1.31	1.20
	Watertown	24.3	*	1.37	*	*	2.86	-	*	-
	Beverly	32.1	*	4.11	*	*	11.0	*	*	-
	L. Olive Green									
	Creek	39.9	*	3.18	*	*	4.88	*	*	-
	Reinersville	45.4	*	4.42	*	*	7.35	*	*	-

* Detected but below the LOQ of 1 ng/g.

- Not detected.

Table S8. Sample metadata from the first sampling trip, June 6-9, 2016.

No.	Description	Date	Time	Latitude	Longitude
01	Crab Creek	June 6, 2016	8:25 AM	38.76207	-82.20162
02	Lakin	June 6	10:04 AM	38.96797	-82.09248
03	Pomeroy	June 6	10:49 AM	39.02617	-82.03087
04	Brinker Run outflow	June 6	12:48 PM	38.91000	-81.91994
05	Foam in river	June 6	1:04 PM	38.90876	-81.92217
06	Brinker Run	June 6	1:15 PM	38.90851	-81.92284
07	Letart	June 6	2:28 PM	38.89235	-81.92825
08	Lee Creek outflow	June 6	4:48 PM	39.14891	-81.74234
09	Lee Creek	June 6	4:58 PM	39.15089	-81.73980
10	Lee Creek (dup.)	-	-	-	-
11	Upstream from Lee Creek	June 6	5:21 PM	39.15760	-81.74568
12	Pine Run	June 6	7:09 PM	39.18248	-81.70824
13	Tuppers Plains	June 8, 2016	8:47 AM	39.08101	-81.79697
14	Lubeck	June 8	11:31 AM	39.23388	-81.68987
15	Sawyer Run	June 8	12:45 PM	39.25474	-81.69424
16	Sawyer Run (dup.)	-	-	-	-
17	Vaughts Run	June 8	1:27 PM	39.23783	-81.66928
18	Belpre	June 8	2:38 PM	39.26714	-81.58015
19	Little Kanawha River	June 8	3:52 PM	39.24797	-81.52357
20	E. Fork Little Hocking	June 8	4:37 PM	39.27692	-81.70723
21	W. Fork Little Hocking	June 8	4:48 PM	39.27902	-81.71330
22	Vienna Island	June 9, 2016	8:00 AM	39.35587	-81.53681
23	Vienna Island (dup.)	-	-	-	-
24	Marietta	June 9	9:17 AM	39.39790	-81.47302
25	Newport	June 9	11:22 AM	39.39679	-81.20914
26	Washington Co. Library	June 9	12:26 PM	39.42426	-81.45776
27	Muskingum River	June 9	12:59 PM	39.43301	-81.47214

Table S9. Sample metadata from the second sampling trip, July 12-13, 2016.

No.	Description	Date	Time	Latitude	Longitude
01	Whites Run #1	July 12, 2016	9:17 AM	39.24466	-81.71711
02	Whites Run #2	July 12	9:39 AM	39.23133	-81.72577
03	Sawyer Run #1	July 12	10:22 AM	39.25447	-81.69927
04	Sawyer Run #1 (dup.)	-	-	-	-
05	Sawyer Run #2	July 12	10:49 AM	39.26103	-81.72844
06	West Fork LH	July 12	12:02 PM	39.27911	-81.71337
07	LH #1	July 12	12:20 PM	39.27691	-81.70724
08	Little West Branch	July 12	12:46 PM	39.28698	-81.71290
09	LH #2	July 12	12:59 PM	39.28558	-81.70922
10	LH #3	July 12	1:55 PM	39.29399	-81.68947
11	Long Brook	July 12	2:23 PM	39.29475	-81.68580
12	LH #4	July 12	2:50 PM	39.29283	-81.68298
13	LH #4 (dup.)	-	-	-	-
14	LH #5	July 12	4:30 PM	39.29639	-81.66705
15	Veto Lake	July 12	5:59 PM	39.34101	-81.65482
16	Little Hocking P. O.	July 13, 2016	4:17 PM	39.26155	-81.69953
17	LH #6	July 13	4:42 PM	39.30514	-81.65685
18	Mill Branch #1	July 13	4:52 PM	39.29965	-81.64342
19	Davis Creek	July 13	5:02 PM	39.29064	-81.63391
20	Davis Creek (dup.)	-	-	-	-
21	Mill Branch #2	July 13	5:22 PM	39.30770	-81.61228
22	LH #7	July 13	5:43 PM	39.33668	-81.63584
23	E. Branch Tributary #1	July 13	5:54 PM	39.33463	-81.63522
24	E. Branch Tributary #2	July 13	6:14 PM	39.33783	-81.60300
25	E. Branch Tributary #3	July 13	6:25 PM	39.35571	-81.57511
26	Browns Run	July 13	6:46 PM	39.39378	-81.58715
27	Briscoe Run	July 13	7:23 PM	39.34695	-81.53130
28	Pond Run	July 13	7:36 PM	39.31056	-81.54974
29	Congress Creek	July 13	7:57 PM	39.28463	-81.57816

Table S10. Sample metadata from the third sampling trip, December 1-3, 2016.

No.	Description	Date	Time	Latitude	Longitude
01	Little Hocking	December 1, 2016	8:58 AM	39.29453	-81.68806
02	Long Brook	December 1	9:16 AM	39.31497	-81.67335
03	Veto Lake	December 1	9:41 AM	39.34287	-81.65352
04	Veto Lake (dup.)	-	-	-	-
05	Buffalo Run	December 1	10:26 AM	39.36601	-81.65132
06	Barlow Library	December 1	10:59 AM	39.39548	-81.66668
07	S. Branch Wolf Creek #1	December 1	11:10 AM	39.40085	-81.66523
08	S. Branch Wolf Creek #2	December 1	11:57 AM	39.46452	-81.63381
09	Watertown P.O.	December 1	12:10 PM	39.46672	-81.63335
10	S. Branch Wolf Creek #3	December 1	12:27 PM	39.52470	-81.65861
11	S. Branch Wolf Creek #4	December 1	1:04 PM	39.42754	-81.70965
12	W. Branch Wolf Creek	December 1	1:34 PM	39.47943	-81.73095
13	Coal Run	December 1	2:09 PM	39.45974	-81.82304
14	W. Branch Little Hocking #1	December 1	2:59 PM	39.38334	-81.78522
15	W. Branch Little Hocking #2	December 1	3:32 PM	39.35959	-81.73612
16	Big Run (OH)	December 1	4:06 PM	39.30150	-81.72783
17	Davis Creek	December 1	4:26 PM	39.29057	-81.63395
18	Congress Creek	December 1	4:59 PM	39.28467	-81.57794
19	Mill Branch	December 2, 2016	7:54 AM	39.30763	-81.61226
20	Mill Branch (dup.)	-	-	-	-
21	East Branch tributary #1	December 2	8:19 AM	39.33774	-81.60314
22	East Branch tributary #2	December 2	8:45 AM	39.35566	-81.57512
23	Hanna Road creek	December 2	9:21 AM	39.38255	-81.50297
24	Warren Elementary	December 2	10:02 AM	39.39388	-81.55533
25	Warren Elementary (dup.)	-	-	-	-
26	Browns Run	December 2	10:21 AM	39.39375	-81.58713
27	Halfway Run	December 2	10:55 AM	39.42693	-81.57279
28	Indian Run	December 2	12:43 PM	39.43417	-81.47981
29	Devola private well	December 2	1:05 PM	39.46812	-81.46629
30	Tupper Creek tributary	December 2	1:15 PM	39.47305	-81.46418
31	Lowell private well	December 2	1:35 PM	39.52667	-81.50190
32	Rainbow Creek	December 2	2:00 PM	39.49830	-81.52533
33	Cat Creek	December 2	2:24 PM	39.54458	-81.51777
34	Duck Creek tributary #1	December 2	3:06 PM	39.52016	-81.41509
35	Duck Creek tributary #2	December 2	3:38 PM	39.42813	-81.41411
36	Sugar Creek	December 2	4:10 PM	39.46746	-81.39415
37	Eightmile Creek	December 2	4:36 PM	39.41497	-81.34840
38	Big Run (WV)	December 3, 2016	8:14 AM	39.33147	-81.47401
39	Little Eightmile Creek	December 3	8:49 AM	39.44720	-81.34073
40	Fifteenmile Creek	December 3	9:33 AM	39.49367	-81.29796
41	Wingett Run	December 3	10:03 AM	39.54626	-81.24157
42	Mill Run	December 3	10:48 AM	39.38375	-81.37831
43	Williams Creek	December 3	11:12 AM	39.39338	-81.44690
44	Williams Creek (dup.)	-	-	-	-
45	Briscoe Run	December 3	11:37 AM	39.34701	-81.53130
46	Pond Run	December 3	11:51 AM	39.31066	-81.54963

Table S11. Sample metadata for soil samples.

Description	Date	Time	Latitude	Longitude
Little Hocking A	2004			
Little Hocking B	2004			
Little Hocking C	2004			
Veto Lake	December 1, 2016	10:08 AM	39.34103	-81.65669
Strouds Run	December 1, 2016	2:43 PM	39.37151	-81.79150
Drag Strip Road	December 1, 2016	4:42 PM	39.29040	-81.63393
Veto Road	December 2, 2016	9:07 AM	39.34776	-81.55866
Veto Road (dup.)	-	-	-	-
Lookout Park	December 2, 2016	11:31 AM	39.41929	-81.47079
Archers Fork #1	December 3, 2016	9:10 AM	39.46487	-81.34868
Archers Fork #2	December 3, 2016	10:06 AM	39.54603	-81.24160
Reinersville	March 25, 2018	2:10 PM	39.67770	-81.65041
L. Olive Green Creek	March 25, 2018	2:37 PM	39.62830	-81.64319
Beverly	March 25, 2018	2:59 PM	39.55756	-81.64460
Watertown	March 25, 2018	5:51 PM	39.48623	-81.63364
Veto Lake	March 25, 2018	6:30 PM	39.34098	-81.65685
Veto Lake (dup.)	-	-	-	-
LHWA	March 25, 2018	6:55 PM	39.28067	-81.66475