Ohio EPA Surface Water Monitoring Program

Ohio EPA's Approach

- Multiple Indicators
  - Stressors
    - DMRs, fish kills, spills, habitat, land use
  - Exposure
    - chemical water quality
    - toxicity tests
    - sediment quality
    - fish tissue
  - Response
    - fish
    - macroinvertebrates

} Ohio EPA Biological Indicators

Ohio Environmental Protection Agency

Fish Communities

Boat

Wading

Headwaters

Ohio Environmental Protection Agency

Index of Biotic Integrity Components in Ohio

	Variable Measured	Type of Site
1.	Total Number of Species	H W B
2.	Number of Darter Species	H W
	Percent Round-bodied Suckers	B
3.	Number of Sunfish Species	W B
	Number of Headwater Species	H
4.	Number of Sucker Species	W B
	Number of Minnow Species	H
5.	Number of Intolerant Species	W B
	Number of Sensitive Species	H
6.	Percent of Tolerant Species	H W B
7.	Percent of Omnivorous Species	H W B
8.	Percent of Insectivorous Species	H W B
9.	Percent of Top Carnivores	W B
	Percent of Pioneering Species	H
10.	Number of Individuals	H W B
11.	Percent of Hybrids	W B
	Number of Simple Lithophilic Species	< H>
12.	Percent of DELT Anomalies	H W B

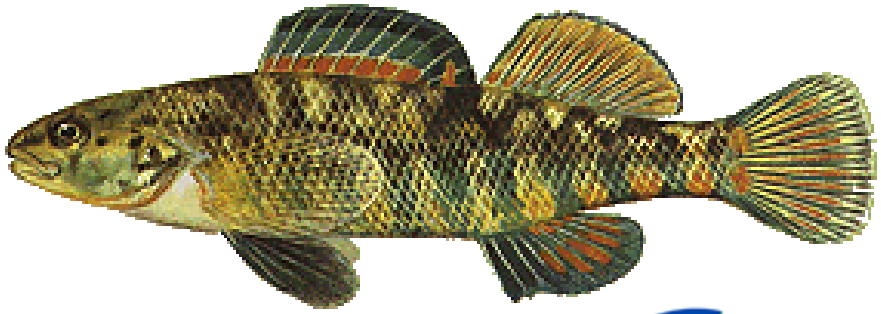
Type of Site:
H-Headwater
W-Wading
B-Boat

DELT-Deformities, eroded fins, lesions, and tumors

IBI criteria as taken from Ohio EPA 1987a

IBI scores can range from 12-60

Ohio Environmental Protection Agency



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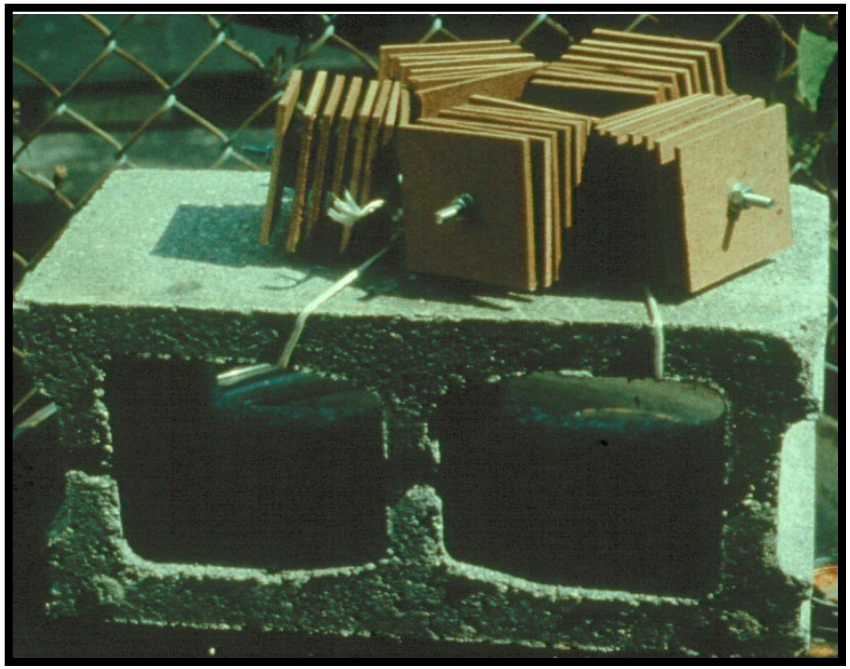
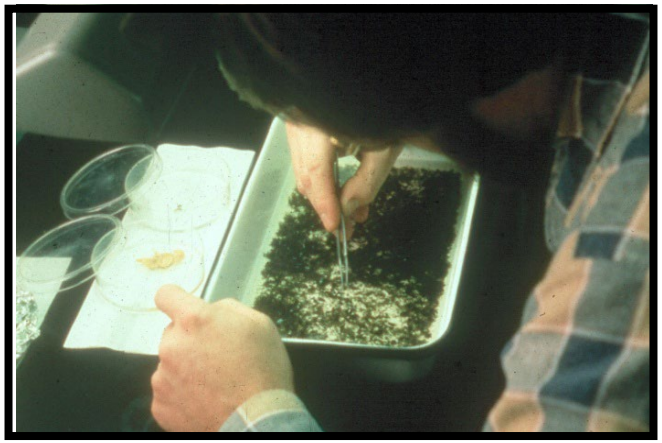
Macroinvertebrate Communities

Artificial Substrates





Qualitative Sample of Natural Substrates

Ohio Environmental Protection Agency

Invertebrate Community Index Components

- EPT- Ephemeroptera, Plecoptera, and Trichoptera (specific types of invertebrate taxa); ICI criteria as taken from Ohio EPA 1989

- **Total maximum ICI score of 60**

- **Total minimum ICI score of 0**

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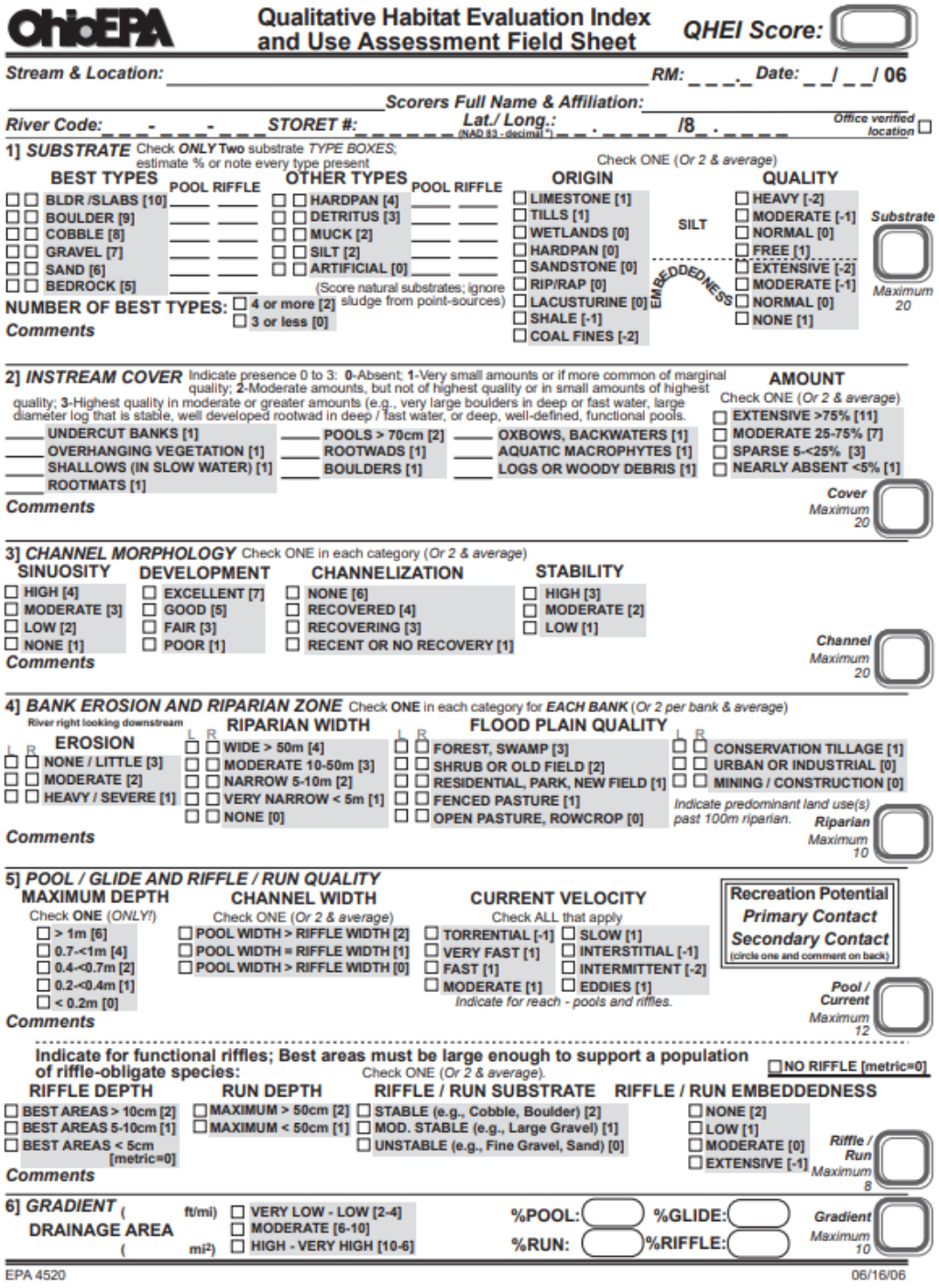
	Variable Measured
1.	Total Number of Taxa
2.	Total Number of Mayfly Taxa
3.	Total Number of Caddisfly Taxa
4.	Total Number of Dipteran Taxa
5.	Percent of Mayflies
6.	Percent of Caddisflies
7.	Percent of Tribe Tanutarsini Midges
8.	Percent of Other Dipterans and Non-insects
9.	Percent of Tolerant Organisms
10.	Total Number of EPT Taxa

Habitat Analysis

Ohio EPA developed the **Q**ualitative **H**abitat **E**valuation **I**ndex to evaluate physical attributes of streams. The maximum score is 100. Streams with a score greater than 60 are expected to have the physical habitat to support a healthy fish community.

Ohio Environmental Protection Agency



OhioEPA

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet — **QHEI Score:** ____

Stream & Location: _____ **RM:** _ _ _._ **Date:** _ _/ _ _/ 06

Scorers Full Name & Affiliation: _____

River Code: _ _ _ - _ _ _ - **STORET #:** _ _ _ _ _ _ **Lat./ Long.:** (NAD 83 - decimal °) _ _ . _ _ _ _ _ /8_ . _ _ _ _ _ Office verified location ☐

1] SUBSTRATE Check **ONLY Two** substrate *TYPE BOXES*; estimate % or note every type present

Check ONE (*Or 2 & average*)

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]	____	____	☐☐ HARDPAN [4]	____	____
☐☐ BOULDER [9]	____	____	☐☐ DETRITUS [3]	____	____
☐☐ COBBLE [8]	____	____	☐☐ MUCK [2]	____	____
☐☐ GRAVEL [7]	____	____	☐☐ SILT [2]	____	____
☐☐ SAND [6]	____	____	☐☐ ARTIFICIAL [0]	____	____
☐☐ BEDROCK [5]	____	____	(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☐ 3 or less [0]

ORIGIN	QUALITY	
☐ LIMESTONE [1]	SILT ☐ HEAVY [-2]	
☐ TILLS [1]	☐ MODERATE [-1]	
☐ WETLANDS [0]	☐ NORMAL [0]	
☐ HARDPAN [0]	☐ FREE [1]	
☐ SANDSTONE [0]	EMBEDDEDNESS ☐ EXTENSIVE [-2]	
☐ RIP/RAP [0]	☐ MODERATE [-1]	
☐ LACUSTURINE [0]	☐ NORMAL [0]	
☐ SHALE [-1]	☐ NONE [1]	
☐ COAL FINES [-2]		

Substrate ____ *Maximum 20*

Comments

2] INSTREAM COVER Indicate presence 0 to 3: **0**-Absent; **1**-Very small amounts or if more common of marginal quality; **2**-Moderate amounts, but not of highest quality or in small amounts of highest quality; **3**-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

____ UNDERCUT BANKS [1]	____ POOLS > 70cm [2]	____ OXBOWS, BACKWATERS [1]	**AMOUNT** Check ONE (*Or 2 & average*)
____ OVERHANGING VEGETATION [1]	____ ROOTWADS [1]	____ AQUATIC MACROPHYTES [1]	☐ EXTENSIVE >75% [11]
____ SHALLOWS (IN SLOW WATER) [1]	____ BOULDERS [1]	____ LOGS OR WOODY DEBRIS [1]	☐ MODERATE 25-75% [7]
____ ROOTMATS [1]			☐ SPARSE 5-<25% [3]
			☐ NEARLY ABSENT <5% [1]

Comments

Cover Maximum 20 ____

3] CHANNEL MORPHOLOGY Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☐ MODERATE [2]
☐ LOW [2]	☐ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVERY [1]	

Comments

Channel Maximum 20 ____

4] BANK EROSION AND RIPARIAN ZONE Check **ONE** in each category for ***EACH BANK*** (*Or 2 per bank & average*)

River right looking downstream

EROSION L R	RIPARIAN WIDTH L R	FLOOD PLAIN QUALITY L R	L R
☐☐ NONE / LITTLE [3]	☐☐ WIDE > 50m [4]	☐☐ FOREST, SWAMP [3]	☐☐ CONSERVATION TILLAGE [1]
☐☐ MODERATE [2]	☐☐ MODERATE 10-50m [3]	☐☐ SHRUB OR OLD FIELD [2]	☐☐ URBAN OR INDUSTRIAL [0]
☐☐ HEAVY / SEVERE [1]	☐☐ NARROW 5-10m [2]	☐☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐☐ MINING / CONSTRUCTION [0]
	☐☐ VERY NARROW < 5m [1]	☐☐ FENCED PASTURE [1]	
	☐☐ NONE [0]	☐☐ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian Maximum 10 ____

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY		Recreation Potential
Check **ONE** (*ONLY!*)	Check ONE (*Or 2 & average*)	Check ALL that apply		*Primary Contact*
☐ > 1m [6]	☐ POOL WIDTH > RIFFLE WIDTH [2]	☐ TORRENTIAL [-1]	☐ SLOW [1]	*Secondary Contact*
☐ 0.7-<1m [4]	☐ POOL WIDTH = RIFFLE WIDTH [1]	☐ VERY FAST [1]	☐ INTERSTITIAL [-1]	(circle one and comment on back)
☐ 0.4-<0.7m [2]	☐ POOL WIDTH > RIFFLE WIDTH [0]	☐ FAST [1]	☐ INTERMITTENT [-2]	
☐ 0.2-<0.4m [1]		☐ MODERATE [1]	☐ EDDIES [1]	
☐ < 0.2m [0]		*Indicate for reach - pools and riffles.*		

Comments

Pool / Current Maximum 12 ____

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10cm [1]	☐ MAXIMUM < 50cm [1]	☐ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☐ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run Maximum 8 ____

6] GRADIENT (ft/mi) **DRAINAGE AREA** (mi²)

☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

%POOL: ____ %GLIDE: ____ %RUN: ____ %RIFFLE: ____

Gradient Maximum 10 ____

EPA 4520 06/16/06

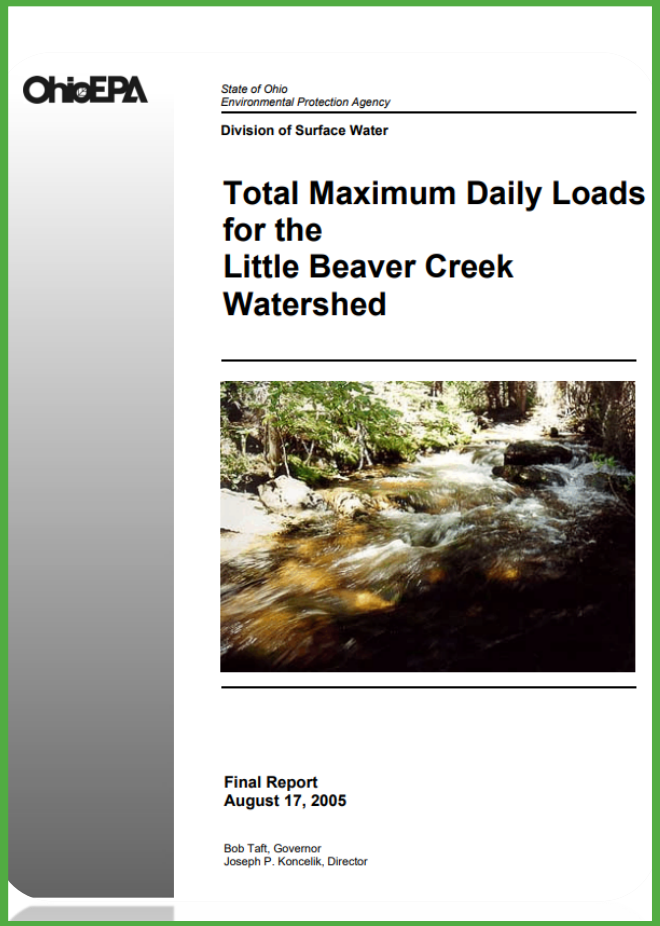
QHEI Field Sheet

Ohio Environmental Protection Agency

Little Beaver Creek Basin Results

Ohio EPA most recently sampled in 2022.

A water quality report will be prepared based on the results.



Comprehensive Water Quality Surveys in:

- 1985
- 1999
- 2022

Ohio Environmental Protection Agency

Biological Criteria

Ohio was the first state to adopt numeric biocriteria

Index		Modified warmwater habitat			Warmwater habitat	Exceptional warmwater habitat
Sampling site		Channel modif.	Mine affected	Impounded		
	Ecoregion[1]					
(A) Index of biotic integrity (fish)						
(1) Wading sites[2]						
	HELP	22			32	50
	IP	24			40	50
	EOLP	24			38	50
	WAP	24	24		44	50
	ECBP	24			40	50
(2) Boat sites[2]						
	HELP	20		22	34	48
	IP	24		30	38	48
	EOLP	24		30	40	48
	WAP	24	24	30	40	48
	ECBP	24		30	42	48
(3) Headwater sites[3]						
	HELP	20			28	50
	IP	24			40	50
	EOLP	24			40	50
	WAP	24	24		44	50
	ECBP	24			40	50
(B) Modified index of well being (fish)[4]						
(1) Wading sites[2]						
	HELP	5.6			7.3	9.4
	IP	6.2			8.1	9.4
	EOLP	6.2			7.9	9.4
	WAP	6.2	5.5		8.4	9.4
	ECBP	6.2			8.3	9.4
(2) Boat sites[2]						
	HELP	5.7		5.7	8.6	9.6
	IP	5.8		6.6	8.7	9.6
	EOLP	5.8		6.6	8.7	9.6
	WAP	5.8	5.4	6.6	8.6	9.6
	ECBP	5.8		6.6	8.5	9.6

Index		Modified warmwater habitat			Warmwater habitat	Exceptional warmwater habitat
Sampling site		Channel modif.	Mine affected	Impounded		
	Ecoregion[1]					
(C) Invertebrate community index (macroinvertebrates)						
(1) Artificial substrate samplers[2]						
	HELP	22			34	46
	IP	22			30	46
	EOLP	22			34	46
	WAP	22	30		36	46
	ECBP	22			36	46

Ohio Environmental Protection Agency

Little Beaver Creek Basin Results

Station Name	RM	DA	IBI	QHEI
LESLIE RUN AT NEGLEY @ ST. RT. 154	0.09	14.30	54	64.00
LESLIE RUN UPST EAST PALESTINE WWTP	3.30	10.80	44	56.00
BULL CREEK W OF NEGLEY, ADJ. ST. RT. 154	1.90	39.40	52	57.00
BULL CREEK SE OF NEW WATERFORD @ ST. RT. 46	6.05	15.10	50	74.30
BULL CREEK @ TWP. RD. 923	9.30	11.40	38	47.50
N. FK. L. BEAVER CREEK AT FREDERICKTOWN @ FREDERICKTOWN RD.	0.13	193.00	56	83.50
N. FK. L. BEAVER CREEK DST CONFL OF STATELINE CREEK	7.26	109.00	54	
N. FK. L. BEAVER CREEK @ OHIO/PA STATE LINE (NORTH CROSSING)	30.12	19.50	42	65.70
L. BEAVER CREEK NEAR EAST LIVERPOOL @ GRIMMS BRIDGE RD.	4.50	496.00	56	77.00
L. BEAVER CREEK NEAR FREDERICKTOWN @ ST. RT. 170	7.95	294.00	54	83.00
L. BEAVER CREEK @ STATE PARK PICNIC AREA	15.00	261.00	54	72.50

Upstream

Downstream

	RM
Sulfur Run enters Leslie Run	3.37
Leslie Run enters Bull Creek	0.84
Bull Creek enters NF LBC	6.07
NF LBC enters LBC	7.95

Ohio Environmental Protection Agency

Little Beaver Creek Basin Results

RIVER MILE Fish/Macro.	IBI	Mod. Iwb	ICI[a]	QHEI	Use Attainment Status[a]	Comments
North Fork Little Beaver Creek (1985)						
		Western Allegheny Plateau–WWH Use Designation				
7.6(W)/7.6R	45	7.3*	40	80.0	PARTIAL	Ust. Stateline Creek
7.3(W)/7.4	43ns	7.9ns	38	88.0	FULL	Dst Stateline Creek/Ust. Bull Creek
5.6(W)/5.6	42ns	8.3ns	34ns	79.0	FULL	Dst. Bull Cr./Carmel-Anchor Rd.
0.4(W)/0.1	37*	6.1*	44	75.5	PARTIAL	Near mouth @ Frederickstown
Brush Run (1999)						
		Erie Ontario Lake Plain- WWH Use Designation				
0.1(H)/0.4	50	NA	38	81.5	FULL	Near Mouth
Bull Creek (1999)						
		Erie Ontario Lake Plain- WWH Use Designation				
9.3(H)/9.3	34*	NA	VG	71.5	PARTIAL	Bull Creek Rd.
6.0(H)/6.0	52	NA	58	64.5	FULL	Dst. N. Waterford WWTP/SR 558
1.9(W)/1.9R	44	8.7	VG	59.5	FULL	Ust. Leslie Run/Pioneer Rd.
0.6(W)/0.5	52	9.2	34	63.5	FULL	Dst. Leslie Run/adj. SR 170
Bull Creek (1985)						
		Erie Ontario Lake Plain- WWH Use Designation				
1.9(W)/1.9R	38	8.0	E	85.0	FULL	Ust. Leslie Run/Pioneer Rd.
0.6(W)/0.6	38	8.4	F*	70.0	PARTIAL	Dst. Leslie Run/adj. SR 170
Leslie Run (1999)						
		Erie Ontario Lake Plain- WWH Use Designation				
4.1(H)/4.2	46	NA	VG	41.5	FULL	Kemple Rd.
3.3(H)/3.3	29*	NA	F*	44.5	**NON**	Dst. Roshel Trib./Ust. E. Palestine WWTP
1.9(H)/1.9	35*	NA	P*	49.5	**NON**	Dst. E. Palestine WWTP
0.2(H)/0.1	47	NA	26*	71.5	PARTIAL	Bye Rd.
Leslie Run (1985)						
		Erie Ontario Lake Plain- WWH Use Designation				
4.1(H)/4.1	36ns	NA	MG	60.0	FULL	Kemple Rd.
3.3(H)/3.3	16*	NA	VP*	60.0	**NON**	Dst. Roshel Trib./Ust. E. Palestine WWTP
1.9(H)/1.9	15*	NA	VP*	54.0	**NON**	Dst. E. Palestine WWTP
0.2(H)/0.2	33*	NA	P*	56.0	**NON**	Bye Rd.

Ohio Environmental Protection Agency

Little Beaver Creek Basin Results

Average of Value	Watershed	Leslie Run	
Ammonia	0.06	0.04	mg/L
Hardness, Total	278.93	288.89	mg/L
Iron	387.18	191.84	ug/L
Nitrate	2.60	3.16	mg/L
Total Dissolved Solids	504.51	463.37	mg/L
Total Phosphorous	0.07	0.09	mg/L

Ohio EPA 2022

Table 35-1. Statewide water quality criteria for the protection of aquatic life.
Page 1 of 2

Chemical	Form[1]	Units[2]	IMZM[3]	OMZM[3]	OMZA[3]
Ammonia-N (WWH)	T	mg/l	--	Table 35-2	Table 35-5
Ammonia-N (EWH)	T	mg/l	--	Table 35-3	Table 35-6
Ammonia-N (MWH)	T	mg/l	--	Table 35-2	Table 35-7
Ammonia-N (SSH[4])	T	mg/l	--	Table 35-4	a
Ammonia-N (CWH)	T	mg/l	--	Table 35-4	Table 35-8
Ammonia-N (LRW)	T	mg/l	--	Table 35-2	--

Ohio Environmental Protection Agency

Little Beaver Creek Basin Results

3745-1-35

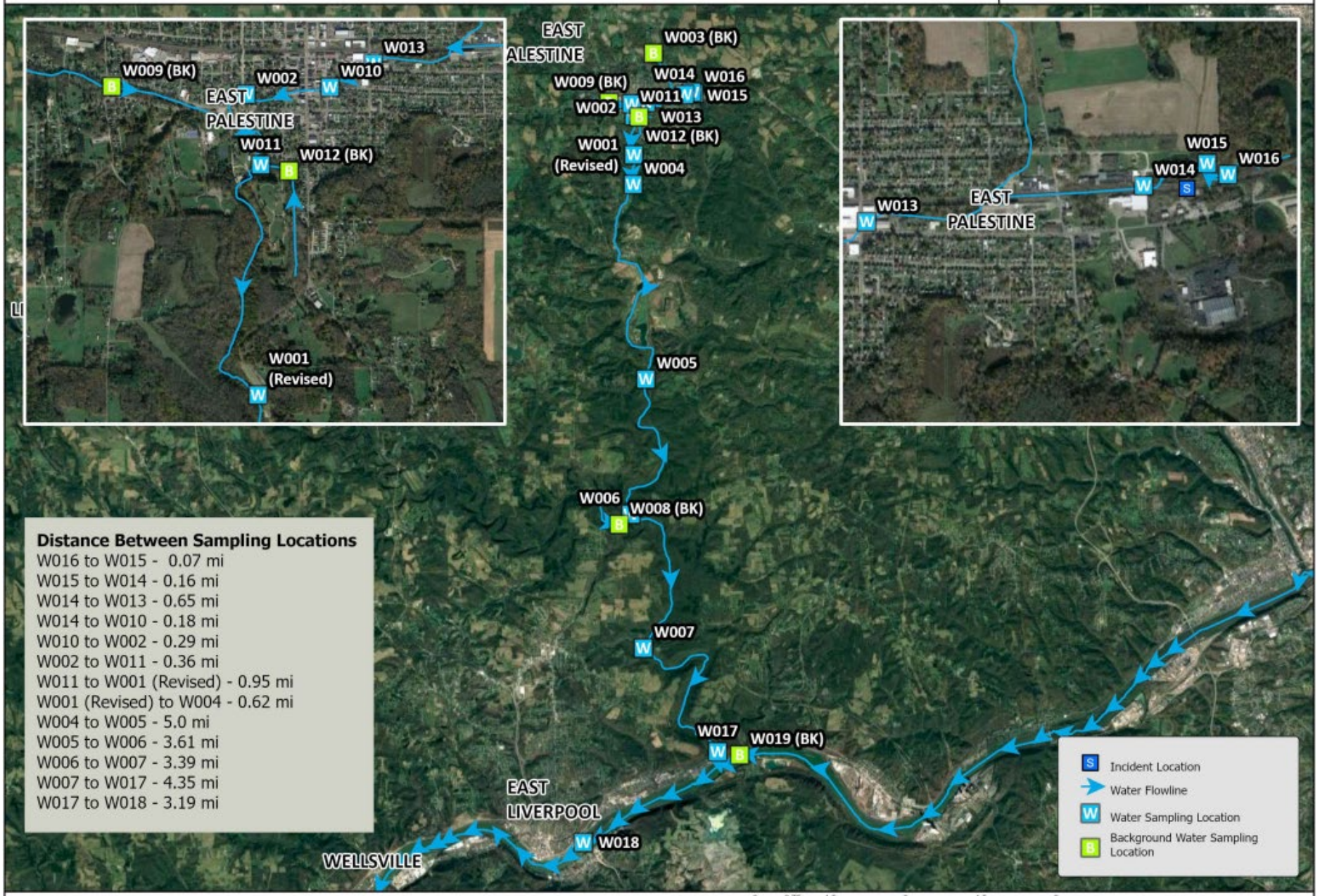
Table 35-3.
Exceptional warmwater habitat
outside mixing zone maximum total ammonia-nitrogen criteria (mg/l).

pH	6.5	6.7	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.8	9.0
Temp. (°C)																						
0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.6	10.9	9.3	7.8	6.6	5.2	4.2	3.3	2.6	2.1	1.7	1.1	0.7
1	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.4	10.7	9.1	7.7	6.5	5.2	4.1	3.3	2.6	2.1	1.7	1.1	0.7
2	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.2	10.6	9.0	7.6	6.4	5.1	4.1	3.2	2.6	2.1	1.6	1.1	0.7
3	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.1	10.4	8.9	7.5	6.3	5.0	4.0	3.2	2.5	2.0	1.6	1.1	0.7
4	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.9	10.3	8.8	7.4	6.2	5.0	4.0	3.2	2.5	2.0	1.6	1.0	0.7
5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.8	10.2	8.7	7.3	6.2	4.9	3.9	3.1	2.5	2.0	1.6	1.0	0.7
6	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.6	10.1	8.6	7.3	6.1	4.9	3.9	3.1	2.5	2.0	1.6	1.0	0.7
7	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.5	9.9	8.5	7.2	6.0	4.8	3.8	3.1	2.5	2.0	1.6	1.0	0.7
8	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.4	9.8	8.4	7.1	6.0	4.8	3.8	3.0	2.4	2.0	1.6	1.0	0.7
9	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.9	11.3	9.8	8.3	7.1	5.9	4.7	3.8	3.0	2.4	1.9	1.6	1.0	0.7
10	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.8	11.2	9.7	8.3	7.0	5.9	4.7	3.7	3.0	2.4	1.9	1.6	1.0	0.7
11	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.7	11.1	9.6	8.2	6.9	5.8	4.7	3.7	3.0	2.4	1.9	1.5	1.0	0.7
12	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.6	11.0	9.5	8.1	6.9	5.8	4.6	3.7	3.0	2.4	1.9	1.5	1.0	0.7
13	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.5	10.9	9.4	8.1	6.8	5.8	4.6	3.7	2.9	2.4	1.9	1.5	1.0	0.7
14	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.4	10.8	9.4	8.0	6.8	5.7	4.6	3.7	2.9	2.4	1.9	1.5	1.0	0.7
15	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.3	10.8	9.3	8.0	6.8	5.7	4.6	3.6	2.9	2.4	1.9	1.5	1.0	0.7
16	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.2	10.7	9.3	7.9	6.7	5.7	4.5	3.6	2.9	2.4	1.9	1.5	1.0	0.7
17	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.2	10.7	9.2	7.9	6.7	5.6	4.5	3.6	2.9	2.4	1.9	1.5	1.0	0.7
18	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.1	10.6	9.2	7.9	6.7	5.6	4.5	3.6	2.9	2.4	1.9	1.6	1.0	0.7
19	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.1	10.6	9.2	7.9	6.7	5.6	4.5	3.6	2.9	2.4	1.9	1.6	1.1	0.7
20	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	10.5	9.2	7.8	6.7	5.6	4.5	3.6	2.9	2.4	1.9	1.6	1.1	0.8
21	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	10.5	9.1	7.8	6.6	5.6	4.5	3.6	2.9	2.4	1.9	1.6	1.1	0.8
22	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	10.5	9.1	7.8	6.6	5.6	4.5	3.6	2.9	2.4	1.9	1.6	1.1	0.8
23	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.9	10.5	9.1	7.8	6.6	5.6	4.5	3.6	2.9	2.4	2.0	1.6	1.1	0.8
24	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.9	10.5	9.1	7.8	6.6	5.6	4.5	3.6	3.0	2.4	2.0	1.6	1.1	0.8
25	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.9	10.5	9.1	7.8	6.6	5.6	4.5	3.7	3.0	2.4	2.0	1.6	1.1	0.8
26	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.5	11.1	9.8	8.5	7.3	6.2	5.3	4.2	3.4	2.8	2.3	1.9	1.5	1.1	0.8
27	13.0	13.0	13.0	13.0	13.0	13.0	13.0	11.7	10.4	9.1	7.9	6.8	5.8	4.9	4.0	3.2	2.6	2.1	1.8	1.5	1.0	0.8
28	13.0	13.0	13.0	13.0	13.0	13.0	12.1	10.9	9.7	8.5	7.4	6.4	5.4	4.6	3.7	3.0	2.5	2.0	1.7	1.4	1.0	0.7
29	13.0	13.0	13.0	13.0	13.0	12.4	11.3	10.2	9.1	8.0	6.9	6.0	5.1	4.3	3.5	2.8	2.3	1.9	1.6	1.3	0.9	0.7
30	13.0	13.0	13.0	13.0	12.6	11.6	10.6	9.5	8.5	7.5	6.5	5.6	4.8	4.1	3.3	2.7	2.2	1.8	1.5	1.2	0.9	0.7

Surface Water Sampling Locations

Taggart Road Incident | Feb 11, 2023

Project: PROJ-024579
Client: Norfolk Southern
City: East Palestine, OH
County: Columbiana



Distance Between Sampling Locations

W016 to W015 - 0.07 mi
W015 to W014 - 0.16 mi
W014 to W013 - 0.65 mi
W014 to W010 - 0.18 mi
W010 to W002 - 0.29 mi
W002 to W011 - 0.36 mi
W011 to W001 (Revised) - 0.95 mi
W001 (Revised) to W004 - 0.62 mi
W004 to W005 - 5.0 mi
W005 to W006 - 3.61 mi
W006 to W007 - 3.39 mi
W007 to W017 - 4.35 mi
W017 to W018 - 3.19 mi

Projection: WGS 1984 UTM Zone 17N
Datum: WGS 1984
0 0.75 1.5 3 4.5 6 Miles
Updated at 2022-09-01 14:13

East Palestine Surface Water Results

Surface Water Sampling and Associated Information

This surface water sampling data is generated from daily surface water monitoring from 20 sampling locations. This water sampling begins at the derailment site in East Palestine and include streams flowing to the Ohio River. This data is analyzed at a certified laboratory, testing for what's known as volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and glycols. To ensure accuracy, the data undergoes Quality Assurance and Quality Control measures. The process is detailed; therefore, results may not be available for 4 to 6 days after the samples were collected.

We have launched this new interactive map to show you sampling results at each location.

Background samples are collected upstream to show that the detected chemicals are from the incident and not from an unrelated source upstream.

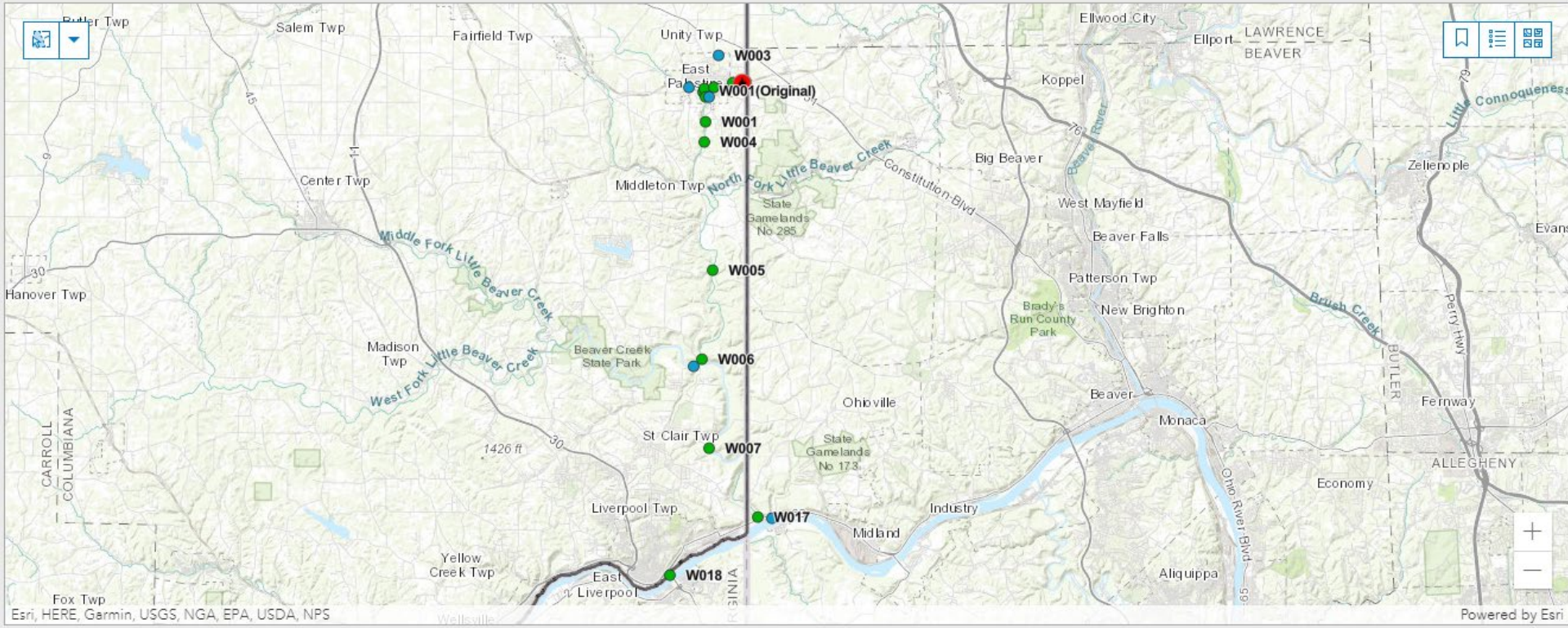
Some of the samples for 2/16 and background samples from 2/19 show elevated readings, likely a result of cross contamination either in the field or lab.

Despite declining levels of contaminants in surface water samples, prolonged exposure with the water or any human consumption of untreated surface water is strongly discouraged.

LAUNCH
View the interactive sampling map

Share this

East Palestine Surface Water Sampling

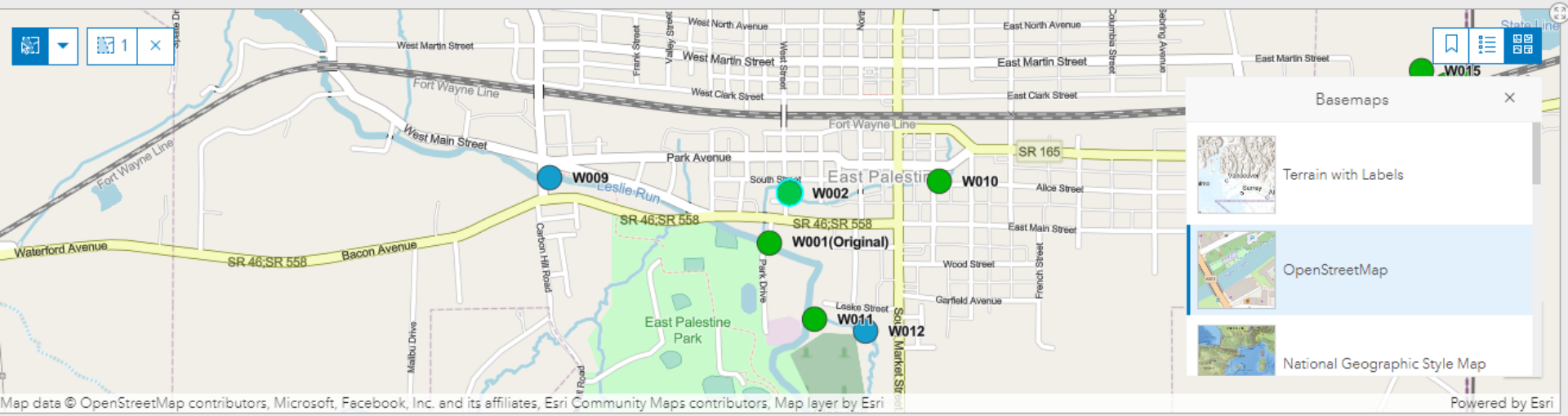


Click the icon on the map then select a sampling point (green or blue dot). Be sure to only select one point. Then, click on the arrows (mobile) or tabs (desktop) at the bottom of the screen to see the levels of each chemical at the selected site.

- Use bookmarks to view various map areas by clicking the icon.
- Display the map legend by clicking the icon.
- Change the basemap by clicking the icon.

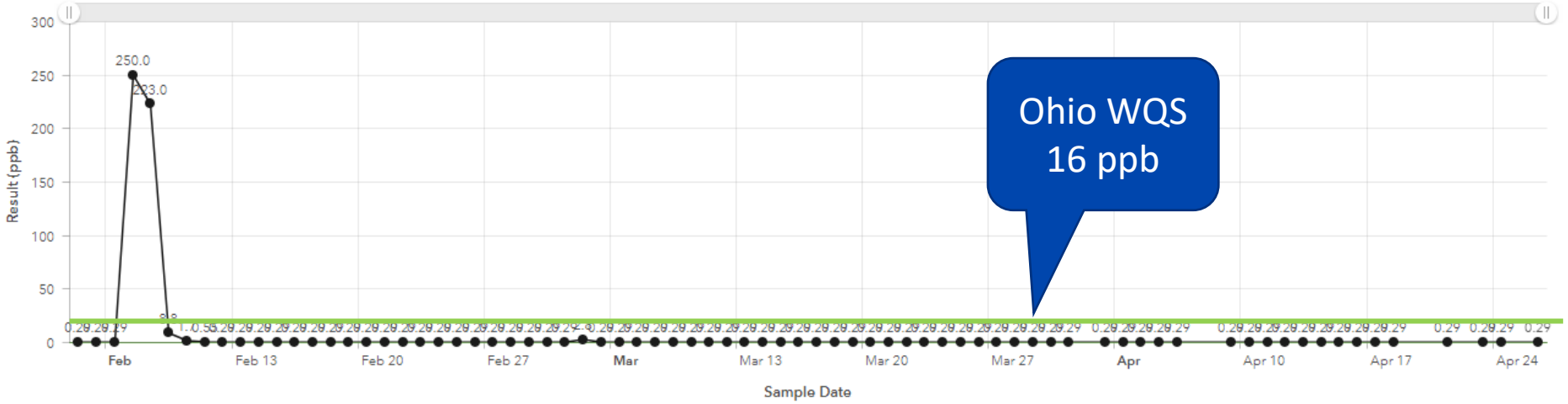
Ohio Environmental Protection Agency

East Palestine Surface Water Sampling



W002 - Sulphur Run at West 1st St.

Vinyl Chloride



Points that fall within the green area are at or below the method detection limit (0.29) and are considered non-detects. Some of the samples for 2/16 and background samples from 2/19 show elevated readings, likely a result of cross contamination either in the field or lab.

Intro | Vinyl Chloride | Butyl Acrylate | 2-ethylhexyl Acrylate | Benzene | 2-butoxyethanol | Polypropylene Glycol | Diproplylene Glycol | Diethylene Glycol | Methyl acrylate

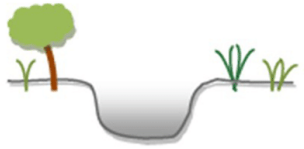
What is next?

- Sediment cleaning in Leslie Run
- Water Chemistry Sampling will continue
- Ecological sampling will be done in 2023
- Sediment sampling will continue

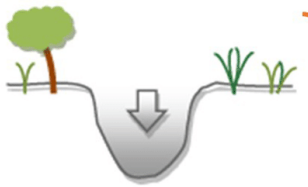
Questions?

Bill Zawiski
Water Quality Supervisor
bill.zawiski@epa.ohio.gov
330-963-1134

Ohio Environmental Protection Agency

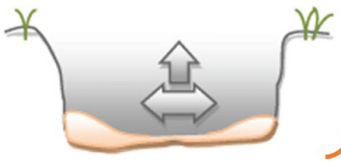


Stage1 – Equilibrium



Stage 2– Incision

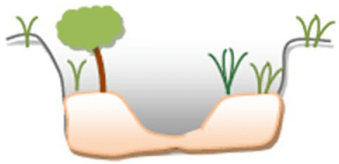
Stage 3 – Widening



Stage 4– Aggradation

Typical stages of suburban streams

A goal of hydrologic-based restoration is to facilitate a transition to Stage 5



Stage 5 – Equilibrium

Ohio Environmental Protection Agency