

**FINAL Study Plan**  
**for the**  
**2013 Biological and Water Quality Survey**  
**of the**  
**Stillwater River Basin**

Darke, Miami and Montgomery Counties, Ohio

June 4, 2013

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## Background

The Stillwater River was last surveyed in 1999. Widespread organic and nutrient enrichment was documented, and resulted in non-attainment of the EWH use on of the Stillwater mainstem upstream from Versailles, the WWH use in the vicinity of Ansonia, as well as non-attainment of the MWH use in several channelized tributaries, notably the Swamp Creek subcatchment and Painter Creek. The primary source of organic matter and nutrients originated from land-applied manure, especially in the northern quarter of the basin. Organic enrichment and aquatic life impairment was associated with municipal wastewater systems in Ansonia, Arcanum, Bradford and Greenville. On-site sewerage was noted as a source of organic enrichment to Greenville Creek in the vicinity of Gettysburg. Sanitary and storm sewers have been completely separated in Ansonia (North Fork and Stillwater mainstem) and Arcanum (Painter Creek), and are near completion in Bradford (Harris Creek and Ballinger Run).

## Sentinel Sites

To aid in the development of a TMDL model(s), sentinel sites have been established at 15 locations (Table 1). At each sentinel site, samples are collected monthly beginning prior to the more encompassing survey that starts on June 15th. The purpose of the sentinel sites is to establish a baseline of water chemistry values under varying flow conditions. Stream stage is to be measured to the nearest hundredth of a foot as given by the water line against a designated bridge piling or abutment. Sampling events at sentinel sites should cover the range of stream flow from the 10th to 90th percentiles.

## Aquatic Life Use Designations

The Stillwater catchment was intensively surveyed in 1999. Consequently, most streams with drainage areas greater than 3 square miles, or with permanent flow have been designated based on field data. Two small streams in the most downstream HUC (050800011406), however, have not been designated, and are added to the plan for field verification, and are noted in Table 1 as having no existing aquatic life use.

## NPDES Permitted Facilities

Apart from the aforementioned CSO issues, municipal wastewater was associated with impairment in The Stillwater River (Englewood WWTP; organic enrichment), Greenville Creek (Greenville WWTP; organic and nutrient enrichment), Dismal Creek (Union City; organic enrichment) and Swamp Creek (Versailles WWTP; organic enrichment). In the latter case, the enrichment noted downstream from the plant was largely due to AFOs located upstream. Recent sampling on the Stillwater in the vicinity of Englewood shows the river has returned to full attainment following removal of Englewood Dam. The Dayton International Airport discharges to Mill Creek (050800011405). The 1999 survey documented toxicity from deicing compounds that should no longer be an issue, but follow-up monitoring is obviously warranted. Table 2 lists specific NPDES permitted facilities being evaluated by this survey and includes summary information about each of those dischargers.

## Animal Feeding Operations

Numerous AFOs are located in the northern flank of the basin, and were the major source of organic enrichment causing impairment in the headwaters of the Stillwater mainstem, the North Fork, and Swamp Creek. Nutrient over-enrichment, axiomatically, was also a cause of impairment in Swamp Creek and the headwaters of the Stillwater.

## On-site Sewerage

Organic enrichment from home treatment systems was a source of impairment to Brush Creek (050800011401), Indian Creek (050800011201), the headwaters of Mud Creek (050800011101), and several other small tributaries (as noted in the 1999 TSD). Follow-up monitoring including bacteria sampling is indicated at those locations.

## Nutrient Enrichment

Samples to assess nutrient enrichment are indicated in Table 1 (Sample code N) and coincide with automated data loggers (sample code A). Essential parameters include benthic chlorophyll, 24-hr. D.O. regime, nitrogen (TKN, NO<sub>x</sub>, NH<sub>3</sub>), phosphorous (TP & DP-2 passes), alkalinity, pH and temperature. At large river sites, sestonic chlorophyll and BOD<sub>5</sub> are also requested.

Table 1. Study locations and planned sampling for the 2013 Stillwater River survey. Sample codes are as follows: F-fish; M - macroinvertebrate (q - qualitative); C - water chemistry (o - organic scan, b - BOD5 [Parameter 310]); A - automated data logger (1 - one deployment, L-lower priority if resource limited); N - chlorophyll (s - sestonic+benthic); S - sediment (1 - 1x); B - bacteria; T - fish tissue. Shaded station numbers and river miles are reference sites. Stations with asterisks are sentinel sites.

STATION	RM	Samples	NAME	ISSUE	DA
<b>14-200-000 Stillwater River</b>					
203707	65.00	F,M <sub>q</sub> ,C	STILLWATER R. SW OF LIGHTSVILLE, UPST YOUNG RD, UPST TRIB.	AFOs	6.6
H07K07	63.83	F,M <sub>q</sub> ,A <sub>1L</sub> ,C,N	STILLWATER R. S OF LIGHTSVILLE @ COLETOWN-LIGHTSVILLE RD.	AFOs	13.4
H07P07*	62.97	F,M,A,C,N,B	STILLWATER R. DST. SOUTH FORK @ ST. RT. 49	AFOs	28.3
H07S35	61.80	F,M,C <sub>o</sub> ,B,S	STILLWATER R. NW OF ANSONIA @ ZUMBRUM RD.	AFOs	29.2
H07G08	58.97	F,M,A <sub>1</sub> ,C,N	STILLWATER R. @ ANSONIA WATER TREATMENT PLANT		51.0
H07G09	57.90	F,M,A <sub>1</sub> ,C,N	STILLWATER R. JUST DST. N. FK. STILLWATER R.	Ansonia WWTP	71.1
203706	54.40	F,M,C	STILLWATER R. UPST BOYD CREEK, UPST UNION CITY RD.	Ansonia WWTP	81.0
H07K04	52.36	F,M,C <sub>o</sub> ,S	STILLWATER R. E OF BEAMSVILLE @ STEFFEN RD.		98.0
H07K03	51.25	F,M,C <sub>o</sub> ,S	STILLWATER R. SE OF BEAMSVILLE @ SCHROEDER RD.		100.0
H07S29*	50.23	F,M,A,C,N,B	STILLWATER R. AT BEAMSVILLE @ BEAMSVILLE-WEBSTER RD.		107.0
203705	47.80	F,M,C <sub>o</sub> ,S	STILLWATER R. S OF DARKE COUNTY AIRPORT @ ST. RT. 121	Ust Swamp Cr.	114.0
H07S31	44.17	F,M,A <sub>1</sub> ,C,N	STILLWATER R. AT WEBSTER @ BARNES RD.	Dst Swamp Cr.	182.0
H07K02	41.30	F,M,A <sub>1L</sub> ,C <sub>o</sub> ,N,S	STILLWATER R. N OF BRADFORD @ VERSAILLES SOUTHEASTERN RD.		187.0
H07K01	37.76	F,M,C <sub>o</sub> ,S,T	STILLWATER R. NE OF BRADFORD @ ST. RT. 185		191.0
H07G07*	33.50	F,M,A,C <sub>ob</sub> ,N,B,S <sub>1</sub>	STILLWATER R. NEAR COVINGTON @ COVINGTON-BRADFORD RD.		233.0
301690	32.20	C,B	COVINGTON WWTP OUTFALL TO STILLWATER R.	effluent	437.0
H06K03	31.20	F,M,C	STILLWATER R 1.0 MI DST COVINGTON WWTP, 0.9 MI DST BRIDGE ST	Dst Covington WWTP	439.0
H06P03*	27.86	F,M,A,C <sub>b</sub> ,N <sub>s</sub> ,B,S <sub>1</sub> ,T	STILLWATER R. NEAR PLEASANT HILL @ LAUVER RD.		503.0
302239	26.88	C,B	PLEASANT HILL WWTP FINAL EFFLUENT	effluent	
H06P05	25.12	F,M,C	STILLWATER R. S OF PLEASANT HILL @ PENNY RD.	Dst Pleasant Hill STP	511.0
H06G04	21.50	F,M,C <sub>o</sub> ,B,S,T	STILLWATER R. UPST. LUDLOW CREEK @ HORSESHOE BEND RD.		528.0
H06P09	17.45	F,M,A,C <sub>ob</sub> ,N <sub>s</sub> ,B,S	STILLWATER R. AT WEST MILTON @ ST. RT. 571		602.0
H06W10	0.11	C,B	WEST MILTON WWTP OUTFALL TO TRIB. TO STILLWATER R. (16.57)	effluent	
H06W11	16.23	F,M,A,C <sub>b</sub> ,N <sub>s</sub> ,B	STILLWATER R. DST. WEST MILTON WWTP	West Milton WWTP	605.0
H06W14	0.45	C,B	UNION WWTP OUTFALL TO TRIB. TO STILLWATER R. (11.74)	effluent	
H06S11	11.39	F,M,A,C <sub>b</sub> ,N <sub>s</sub> ,B	STILLWATER R. NEAR UNION @ MARTINDALE RD.	Union WWTP	645.0
600110*	8.94	F,M,A,C <sub>b</sub> ,N <sub>s</sub> ,B,S <sub>1</sub> ,T	STILLWATER R. @ ENGLEWOOD DAM		650.0
H06S16	8.86	C,B	ENGLEWOOD WWTP 001 OUTFALL TO STILLWATER R.	effluent	650.0

STATION	RM	Samples	NAME	ISSUE	DA
H06P20	7.49	F,M,C	STILLWATER R DST ENGLEWOOD @ I-70	Englewood WWTP	653.0
<b>14-200-000 Stillwater River - Continued</b>					
H06W30	5.78	F,M,A,C <sub>b</sub> ,N <sub>s</sub> ,B,T	STILLWATER R. AT IRVINGTON @ DOG LEG RD.	Englewood WWTP - far field	660.0
H06K01	1.50	F,M,A,C <sub>b</sub> ,N <sub>s</sub> ,B	STILLWATER R. AT DAYTON @ SIEBENTHALER RD.		674.0
<b>14-200-014</b>					
302259	0.39	F, M <sub>q</sub>	Trib to Stillwater (2.29) at Mill Road	ALU	3.3
<b>14-200-015</b>					
302258	1.00	F, M <sub>q</sub>	Trib to Stillwater (4.84) at Meeker Road	ALU	3.2
<b>14-201-000</b>					
H06G08	0.60	F,M <sub>q</sub> ,C,B	PIGEYE CREEK @ ST. RT. 48	On-site sewerage	5.8
<b>14-202-000</b>					
203712	1.20	F,M <sub>q</sub> ,C	MILL CREEK @ KESSLER-FREDERICK PIKE	Dayton Airport	5.5
<b>14-203-000 Brush Creek</b>					
H06S13	2.35	F,M <sub>q</sub> ,C,B	BRUSH CREEK N OF FREDERICK @ FREDERICK RD.		5.9
H06G02	0.12	F,M,C <sub>o</sub> ,B,S	BRUSH CREEK @ FREDERICK-GARLAND RD.		16.9
<b>14-204-000</b>					
H06K08	0.46	F,M <sub>q</sub> ,C,B	JONES RUN S OF WEST MILTON @ ST. RT. 48	Sewer line	2.5
<b>14-207-000</b>					
H06G01	0.92	F,M <sub>q</sub> ,C	CANYON RUN SW OF PLEASANT HILL @ RANGE LINE RD.		4.6
<b>14-208-000 Painter Creek</b>					
H06S06	16.20	C,B	PAINTER CREEK AT ARCANUM, ADJ. INVESTER PARK	Sewer Separation	4.4
H06W05	14.64	F,M <sub>q</sub> ,C	PAINTER CREEK NEAR ARCANUM @ ALBRIGHT RD.	Dst Lagoon WWTP	6.7
H06S03	9.61	F,M,A <sub>1</sub> ,C,N	PAINTER CREEK NW OF TOWN OF PAINTER CREEK @ ST. RT. 571		25.0
H06G06	3.50	F,M,A <sub>1</sub> ,C,N	PAINTER CREEK UPST. L. PAINTER CREEK		32.5
H06S01*	0.25	F,M,A,C,N,B	PAINTER CREEK NEAR MOUTH @ OWENS RD.		47.5
H06W02	0.43	C,B	ARCANUM WWTP LAGOON OUTLET LEAKAGE TO SYCAMORE DITCH	effluent	0.7

STATION	RM	Samples	NAME	ISSUE	DA
<b>14-209-000 Little Painter Creek</b>					
H06K15	1.20	F,M <sub>q</sub> ,C	L. PAINTER CREEK @ PATTY-CIRCLE HILL RD.		10.7
<b>14-209-001 Heller Ditch</b>					
203720	0.10	F,M <sub>q</sub> ,C	HELLER DITCH AT UNION CORNERS, ADJ. GETTYSBURG-PITTSBURG RD.		2.6
<b>14-210-000 Ludlow Creek</b>					
H06K16	6.40	F,M,C	LUDLOW CREEK S OF LAURA @ WRIGHT RD.		26.0
H06P11*	2.33	F,M,A,C <sub>b</sub> ,B,S <sub>1</sub> ,T,N	LUDLOW CR NEAR LUDLOW FALLS DST BRUSH CREEK @ DAVIS RD		62.3
<b>14-210-001</b>					
203715	0.40	F,M <sub>q</sub> ,C	TRIB. TO LUDLOW CREEK (11.80) NEAR PITTSBURG @ OAKES RD.	Pittsburg WWTP	6.9
<b>14-211-000 Brush Creek</b>					
H06P21	7.07	F,M <sub>q</sub> ,C	BRUSH CREEK NEAR PHILLIPSBURG @ COUNTY LINE RD.	On-site sewerage	4.4
H06P22	0.45	F,M,C,B	BRUSH CREEK W OF LUDLOW FALLS @ ELLERMAN RD.		23.0
<b>14-218-000 Harris Creek</b>					
203721	3.80	F,M <sub>q</sub> ,A <sub>1L</sub> ,C,N	HARRIS CREEK @ BRADFORD-BLOOMER RD.		10.1
H07S04	0.90	F,M,A <sub>1L</sub> ,C,N,B	HARRIS CREEK NW OF COVINGTON @ RANGELINE RD.	Bradford WWTP far-field	17.7
<b>14-219-000 Ballinger Run</b>					
H07S09	1.40	F,M <sub>q</sub> ,C,B	BALLINGER RUN UPST. BRADFORD WWTP LAGOON		4.9
H07W08	0.58	F,M <sub>q</sub> ,A <sub>1L</sub> ,C,N	BALLINGER RUN DST BRADFORD WWTP @ BRADFORD-BLOOMER RD	Dst Bradford WWTP	5.8
<b>14-220-000 Greenville Creek</b>					
H07S27	34.48	F,M,C <sub>o</sub> ,B,S	GREENVILLE CREEK AT OHIO/INDIANA BORDER @ STATE LINE RD.		20.2
H07K27*	30.24	F,M,A <sub>1L</sub> ,C <sub>b</sub> ,B,S <sub>1</sub> ,N	GREENVILLE CREEK UPT DISMAL CREEK @ PALESTINE-UNION CITY RD		26.4
H07S26	28.88	F,M,C,S	GREENVILLE CREEK AT SHARPS CROSSING @ FISHER RD.		69.0
H07S30	26.50	F,M,C <sub>o</sub> ,S,T	GREENVILLE CREEK AT COLETOWN @ WAGNER RD.		72.0
H07K25	23.08	C	GREENVILLE CREEK W OF GREENVILLE @ DALY RD.		105.0
H07S25*	22.35	F,M,A,C <sub>b</sub> ,N,B,S <sub>1</sub>	GREENVILLE CREEK UPST. GREENVILLE @ OLD WTP INTAKE		106.0
H07S24	19.55	F,M,C	GREENVILLE CREEK AT OHIO STREET	UST WWTP	139.0

STATION	RM	Samples	NAME	ISSUE	DA
H07W13	19.35	C,B	GREENVILLE WWTP OUTFALL TO GREENVILLE CREEK		140.0
<b>14-220-000 Greenville Creek - Continued</b>					
H07W17*	18.33	F,M,A,C <sub>b</sub> ,N,B,S <sub>1</sub> ,T	GREENVILLE CREEK E OF GREENVILLE @ JAYSVILLE-ST. JOHNS RD.		142.0
H07S21	16.22	F,M,A <sub>1</sub> ,C,N,B	GREENVILLE CREEK E OF GREENVILLE @ WILLIS RD.	On-site sewerage	153.0
H07K19	10.87	F,M,A <sub>1L</sub> ,C,N	GREENVILLE CREEK AT GETTYSBURG @ MILL RD.	On-site sewerage	184.0
H07S17*	6.10	F,M,A,C <sub>b</sub> ,N,B,S <sub>1</sub>	GREENVILLE CREEK S OF BRADFORD @ ST. RT. 721		193.0
H07K16	3.74	F,M,C	GREENVILLE CREEK SE OF BRADFORD @ CROFT MILL RD.	On-site sewerage	196.0
600060	1.46	F,M,C <sub>o</sub> ,B,S,T	GREENVILLE CREEK NEAR COVINGTON @ RANGE LINE RD.		199.0
<b>14-221-000 McQuay Ditch</b>					
H07K30	1.56	F,M <sub>q</sub> ,C	MCQUAY DITCH SW OF GETTYSBURG @ MILLER RD.		2.2
<b>14-225-000 Bridge Creek</b>					
H07P03	0.27	F,M <sub>q</sub> ,C,B	BRIDGE CREEK NEAR GREENVILLE @ JAYSVILLE-ST. JOHNS RD.		10.0
<b>14-226-000 Mud Creek</b>					
H07G16	7.51	C	MUD CREEK SW OF FORT JEFFERSON @ VIETOR RD.	On-site sewerage	3.1
H07S37	4.66	F,M,C	MUD CREEK S OF GREENVILLE @ BYRKET RD.		17.7
H07K32	2.13	F,M,C	MUD CREEK NEAR GREENVILLE @ BISHOP RD.		26.0
H07S36	0.06	F,M,C,B	MUD CREEK AT GREENVILLE @ ST. RT. 502		29.5
<b>14-227-000</b>					
302240	0.05	C	PRAIRIE OUTLET AT MOUTH (DST OLD RR)	On-site sewerage	4.7
<b>14-228-000 W. Branch Greenville Creek</b>					
203728	7.40	F,M <sub>q</sub> ,C	W. BR. GREENVILLE CREEK SE OF PALESTINE @ BYRKET RD.		10.7
H07G06	0.30	F,M,C,B	W. BR. GREENVILLE CREEK W OF GREENVILLE @ HELLER RD.		25.9
<b>14-229-000 Spring Branch</b>					
H07K50	0.25	F,M <sub>q</sub> ,C	SPRING BRANCH E OF PALESTINE @ CLARKS STATION RD.		4.6
<b>14-230-000 Kraut Creek</b>					
H07K35	4.38	F,M <sub>q</sub> ,C	KRAUT CREEK AT NASHVILLE @ NASHVILLE RD.		10.2
H07G05	0.60	F,M,C,B	KRAUT CREEK NEAR UNION CITY @ BICKEL RD.		21.9

STATION	RM	Samples	NAME	ISSUE	DA
<b>14-231-000</b>					
203731	0.80	F,M <sub>q</sub> ,C	N. FK. KRAUT CREEK @ WILDCAT RD.		5.6
<b>14-232-000 Dismal Creek</b>					
H07K38	4.71	C,B	DISMAL CREEK UPST. UNION CITY @ STATE LINE RD.		9.8
203732	3.80	F,M,C	DISMAL CREEK DST. UNION WWTP @ WORTH RD.		12.4
H07K37	1.80	F,M,C	DISMAL CREEK SE OF UNION CITY @ HILL GROVE-SOUTHERN RD.		16.5
H07G04*	0.10	F,M,A,C <sub>b</sub> ,B,S <sub>1</sub> ,N	DISMAL CREEK SE OF UNION CITY @ PALESTINE-UNION CITY RD.		19.3
<b>14-234-000</b>					
H07K39	0.39	F,M,C,B	TROTTERS CREEK N OF COVINGTON @ PERRY RD.		16.1
<b>14-235-000 Swamp Creek</b>					
H07S40*	8.85	F,M <sub>q</sub> ,A,C <sub>b</sub> ,N,B,S <sub>1</sub>	SWAMP CREEK @ VERSAILLES-YORKSHIRE RD.		11.6
203735	6.50	F,M,A <sub>1</sub> ,C,N	SWAMP CREEK N OF VERSAILLES @ PITTSBARGER RD.		23.6
H07S02	4.43	F,M,C <sub>o</sub> ,S	SWAMP CREEK N OF VERSAILLES @ LONG RD.	Ust Versailles WWTP	28.0
H07S01	2.30	F,M,A <sub>1L</sub> ,C,N	SWAMP CREEK UPST. VERSAILLES WWTP, ADJ. JAMISON RD.	Ust Versailles WWTP	58.0
H07W31	2.12	C,B	VERSAILLES WWTP OUTFALL TO SWAMP CREEK		58.0
H07W04	1.58	F,M,C,N	SWAMP CREEK SW OF VERSAILLES @ ST. RT. 121	Versailles WWTP far-field	58.5
H07P06*	0.28	F,M,A <sub>1</sub> ,C <sub>b</sub> ,N,B,S <sub>1</sub>	SWAMP CREEK NEAR VERSAILLES @ MARTZ RD.		63.0
<b>14-235-001</b>					
H07G12	0.45	F,M <sub>q</sub> ,C	TRIB. TO SWAMP CREEK (3.54) @ ST. RT. 47		7.4
<b>14-236-000 Indian Creek</b>					
203738	5.20	F,M <sub>q</sub> ,C	INDIAN CREEK @ BROWN RD.		10.1
H07S28	1.93	F,M,C	INDIAN CREEK NW OF VERSAILLES @ CONOVER RD.	On-site sewerage	17.0
H07S03	0.50	F,M,C,B	INDIAN CREEK NEAR VERSAILLES @ ST. RT. 47	On-site sewerage	19.7
<b>14-200-008</b>					
H07G10	1.20	F,M <sub>q</sub> ,C	TRIB. TO STILLWATER R. (51.02) UPST. OLIVER RD.		5.6
<b>14-237-000 Boyd Creek</b>					
203739	3.50	F,M <sub>q</sub> ,C	BOYD CREEK @ HORATIO-HARRIS CREEK RD.		2.0
H07G03	0.81	F,M <sub>q</sub> ,C,B	BOYD CREEK SW OF BEAMSVILLE @ WOODINGTON RD.		13.1

STATION	RM	Samples	NAME	ISSUE	DA
<b>14-237-002</b>					
203740	0.50	F,M <sub>q</sub> ,C	TRIB. TO BOYD CREEK (2.67) @ HORATIO-HARRIS CREEK RD.		3.5
<b>14-238-000 N. Fork Stillwater</b>					
H07S34	7.56	F,M <sub>q</sub> ,C	N. FK. STILLWATER R. NW OF ROSSBURG @ RHYNARD-FINK RD.		4.1
203742*	4.40	F,M <sub>q</sub> ,A,C <sub>b</sub> ,N,B,S <sub>1</sub>	N. FK. STILLWATER R. S OF ROSSBURG @ BROCK-COSMOS RD.		10.9
H07S15	0.39	F,M,A <sub>1</sub> ,C,N	N. FK. STILLWATER R. UPST. ANSONIA WWTP @ ST. RT. 118		18.7
H07E01	0.25	C,B	ANSONIA WWTP LAGOON OUTFALL TO N. FK. STILLWATER R.		18.8
<b>14-238-001</b>					
H07K47	0.15	F,M <sub>q</sub> ,C	SYCAMORE DITCH S OF ROSSBURG @ ST. RT. 118		5.0
<b>14-239-000</b>					
H07K48	0.72	F,M <sub>q</sub> ,C	WOODINGTON RUN W OF ANSONIA @ ELROY-ANSONIA RD.		11.2
<b>14-240-000 S. Fork Stillwater</b>					
203744	5.50	F,M <sub>q</sub> ,C	S. FK. STILLWATER R. @ YOUNG RD.		3.6
H07G01	0.40	F,M <sub>q</sub> ,C,B	S. FK. STILLWATER R. @ WASHINGTON RD.		13.8
<b>14-240-001</b>					
H07K49	1.56	F,M <sub>q</sub> ,C	TRIB. TO S. FK. STILLWATER R. (0.94) @ YOUNG RD.		3.7

Sample Totals

Fish	Macroinvertebrates		Water Chemistry	Bacteria	Sediment	Tissue
Passes	Qual	Quant	Conventional (660 samples)	265	42	9
150	37	61	BOD5(108 samples)			

Organic Scans for 608, 525.2, and 515 (30 samples)

Sondes  
 19 sites x 2 deployments  
 16 sites x 1 deployment

Chlorophyll  
 36 sites  
 29 - benthic (35 filters)  
 7 - benthic + sestonic (2 sestonic passes + 1 benthic = 29 filters)



Table 2. NPDES dischargers covered by the 2013 Integrated Biological and Water Quality Survey of the Stillwater River basin.

NPDES	Facility	ADF	DESIGN_INF	Stream
1PD00005	Greenville WWTP	2.203	3.500	Greenville Creek
1PD00001	City of Englewood WWTP	1.437	2.500	Stillwater River
1PB00026	Pleasant Hill WWTP	0.888	0.200	Stillwater River
1PC00011	West Milton WWTP	0.750	1.200	Stillwater River
1PB00033	Versailles Wastewater Treatment Plant	0.624	0.750	Swamp Creek
1PB00031	Union City WWTP	0.490	0.400	Gray Branch
1PB00013	Village of Covington WWTP	0.387	0.750	Stillwater River
1PB00005	Ansonia WWTP	0.384	0.350	Stillwater River
1PB00000	Arcanum Wastewater Treatment Plant	0.239	0.400	Painter Creek
1PB00008	Bradford Wastewater Treatment Plant	0.147	0.480	Ballinger Run
1PA00030	Village of Pitsburg WWTP	0.085	0.085	Storm Tile to Ludlow Creek
1PG00090	Darke County Commissioners - Rolin Acres	0.030	0.024	Boyd Creek
1II00029	Dayton International Airport Terminal			Mill Creek

#### Study Contacts

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Nonpoint issues: Hubert Trimble 937-285-6444

Point source issues: Joe Reynolds 937-285-6097

TMDL liaison: Beth Risley 614-728-2384

Modeler: Josh Griffin 614-644-2874

Darke County Sheriff

937-548-3399

Miami County Sheriff

(937) 440-3965

Montgomery County Sheriff

(937) 225-4357

#### County Game Protectors

Darke Jeff Wenning

(937) 372-5639 X5208

Miami Jasmine Grossnickle

(937) 372-5639 X5215

Montgomery Trent Weaver

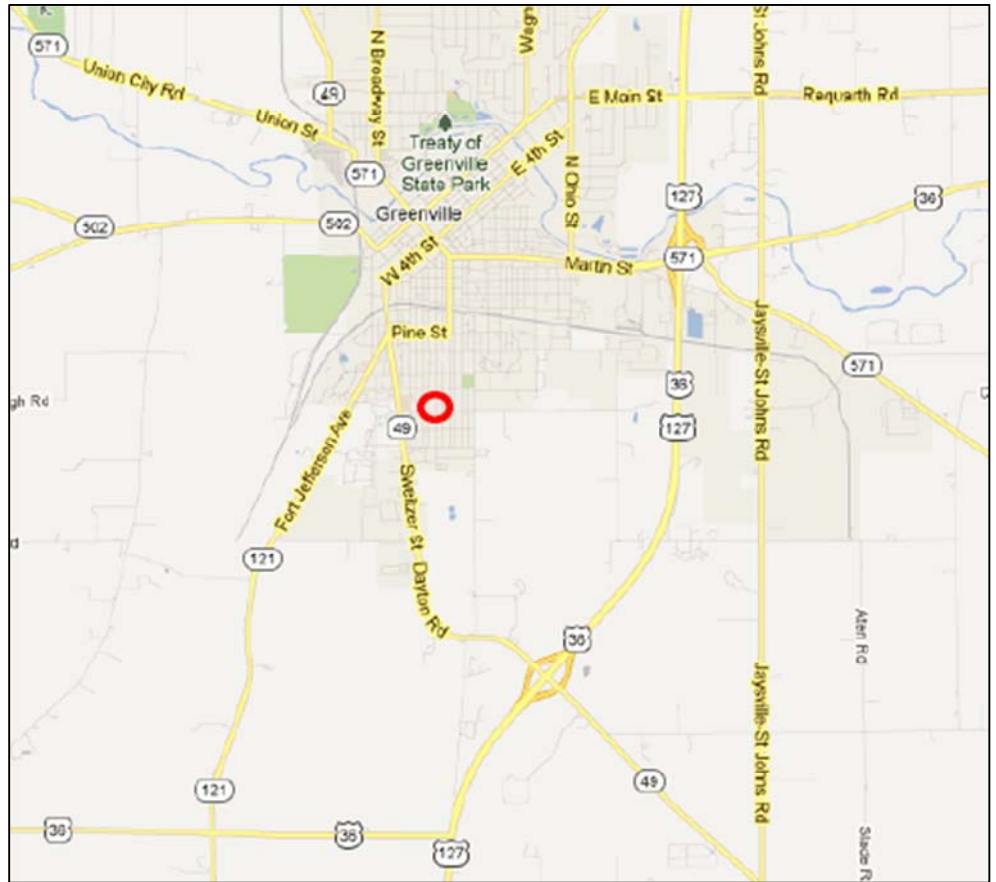
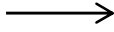
(937) 372-5639 X5211

Hospitals/Emergency Rooms

Wayne Hospital  
835 Sweitzer Street  
Greenville, OH 45331-1077  
Phone 937.548.1141

Union Township Life Squad Inc  
4960 Davis Rd, West Milton, OH  
(937) 698-8857

Arcanum Rescue  
202 Main St, Gordon, OH  
(937) 692-6225



### *Quality Objectives and Criteria*

#### **Ohio EPA Manuals**

All biological, chemical, data processing, and data analysis methods and procedures adhere to those specified in the Surface Water Field Sampling Manual for water column chemistry, bacteria and flows (Ohio EPA 2013a), Biological Criteria for the Protection of Aquatic Life, Volumes II - III (Ohio EPA 1987, 1989a, 1989b, 2013b, 2013c), and The Qualitative Habitat Evaluation Index (QHEI); Rationale, Methods, and Application (Ohio EPA 1989c, 2006a) for habitat assessment.

#### **Use Attainment**

Attainment/non-attainment of aquatic life uses will be determined by using biological criteria codified in Ohio Administrative Code (OAC) 3745-1-07, Table 7-17. Numerical biological criteria are based on multimetric biological indices including the Index of Biotic Integrity (IBI) and modified Index of Well-Being (MIwb), indices measuring the response of the fish community, and the Invertebrate Community Index (ICI), which indicates the response of the macroinvertebrate community.

Performance expectations for the tiered aquatic life uses (Warmwater Habitat [WWH], Exceptional Warmwater Habitat [EWH], and Modified Warmwater Habitat [MWH] were developed using the regional reference site approach (Hughes et al. 1986; Omernik 1987). This fits the practical definition of biological integrity as the biological performance of the natural habitats within a region (Karr and Dudley 1981). Attainment of an aquatic life use is FULL if all three indices (or those available) meet the applicable criteria, PARTIAL if at least one of the indices did not attain and performance did not fall below the fair category, and NON if all indices either fail to attain or any index indicates poor or very poor performance.

#### **Fish Community**

Fish will be sampled at each sampling location using pulsed DC headwater, wading, or boat electrofishing methods depending on watershed size at each sampling zone. Sites with drainage areas greater than 20 mi<sup>2</sup> or at reference site locations will be sampled twice during the sampling index period. Fish are processed in the field which includes identifying each individual to species, counting individuals at all sites, weighing individuals at wading and boat sites, and recording any external abnormalities. The resulting information will be used to compute an Index of Biotic Integrity (IBI) and, when applicable, the Modified Index of well-being (MIwb) (Karr 1981, Yoder and Smith 1999, Ohio EPA 1989a). Because the methods are standardized, precision and bias (e.g., gear selectivity) are constant and therefore the results are comparable between samples. Also, Ohio EPA has established numeric biological criteria for fish populations in Ohio by which samples collected in this study will be evaluated. The numeric biological criteria for fish populations in Ohio were established using the same standardized methodology as employed in this study. IBI scores obtained from different samplers at the same, relatively pollution-free sites within and between years is four IBI points (~8%).

#### **Macroinvertebrate Community**

Macroinvertebrates will be collected from artificial substrates and/or natural stream habitats. Artificial substrate collections will be collected at all sites with greater than 20 mi<sup>2</sup> drainage areas or at reference site locations. This sample provides quantitative data and consists of a composite sample of five modified Hester-Dendy multiple-plate artificial substrate samplers colonized for six weeks. Qualitative sampling will be conducted at all sampling locations. This sampling effort consists of an inventory of all observed macroinvertebrate taxa from the natural stream habitats at each site with no attempt to quantify populations other than notations on the predominance of specific taxa or taxa groups within

major macrohabitat types (e.g., riffle, run, pool, margin). The resulting information will be used to calculate Invertebrate Community Index (ICI) scores (Ohio EPA 1989a, Deshon 1995) or make narrative assessments of community condition. Because the method is standardized, precision and bias (e.g., gear selectivity) are constant and therefore the results are comparable between samples. Also, Ohio EPA has established numeric biological criteria for macroinvertebrate populations in Ohio by which samples collected in this study will be evaluated. The numeric biological criteria for macroinvertebrate populations in Ohio were established using the same standardized methodology as employed in this study. ICI scores obtained from the same, relatively pollution-free sites within and between years is four ICI points (~7%).

### **Habitat Quality**

The physical habitat quality of stream sampling locations will be assessed using the Qualitative Habitat Evaluation Index [(QHEI) Ohio EPA 1989c, Rankin 1995, Ohio EPA 2006a]. The QHEI results in a numeric score of overall habitat quality, and is based on a qualitative, visual assessment of the functional aspects of stream macrohabitats (e.g., amount and type of cover, substrate quality and condition, riparian quality and width, siltation, channel morphology, etc.). QHEI scores from hundreds of segments around the state have indicated that values higher than 60 are generally conducive to the establishment of warmwater faunas while those which score in excess of 75-80 often typify habitat conditions which have the ability to support exceptional faunas. Precision, defined here as the reproducibility of QHEI scores between different observers at the same sampling location, is heightened by annual training, and is typically several QHEI points (< 5%).

### **Surface Water Quality**

Surface water grab samples will be collected and preserved using appropriate methods, as outlined in Surface Water Field Sampling Manual for water column chemistry, bacteria and flows (Ohio EPA 2013a) and delivered to the Ohio EPA Division of Environmental Services lab for analyses. DataSonde® automated data loggers will be deployed at select locations to evaluate diel measurements of dissolved oxygen, pH, temperature, and conductivity. Pollutants to be tested and their analytical methods are listed in the table of chemical/physical parameters (Appendix Table A1).

### **Sediment Quality**

One set of sediment samples will be collected at each of the specified stations in Table 1, using procedures outlined in the Ohio EPA Sediment Sampling Guide and Methodologies, 3<sup>rd</sup> edition (Ohio EPA 2012a). Fine grained multi-incremental sediment samples will be collected in the upper four inches of bottom material using either clean stainless steel scoops or dredges. Samples will be homogenized and split into 500 ml amber glass jars with Teflon lined lids for organic compound testing and 250 ml HPDE containers for metals testing. They will then be secured inside coolers with wet ice and delivered to the Ohio EPA Division of Environmental Services for analysis. Pollutants to be tested and their analytical methods are listed in the table of chemical/physical parameters (Appendix B2).

### **Fish Tissue Contamination**

The collection, field processing, and short-term storage of fish tissue samples adhere to the methods and protocols specified in the agency's current fish tissue guidance manual (Ohio EPA 2012b). Pollutants to be tested and their analytical methods are listed in the table of chemical/physical parameters (Appendix B2).

**Chlorophyll a**

Benthic chlorophyll a concentrations are to be measured from epilithic periphyton communities by scraping a known area (~3.35 cm<sup>2</sup>) from each of ten to twenty (usually fifteen) large gravel to cobble size rocks from a glide-riffle-run complex at sites identified as “nutrient sites” in Table 1. Methodology follows that discussed in detail in Moulton et al. (2002), Scrimgeour and Chambers (2000), Cattaneo et al. (1997), and Lohman et al. (1992). Only rocks that are undisturbed, as determined by a distinct, bi-colored appearance between the exposed surface and the side facing the stream bed, are to be collected. Samples are to be collected at least once per site from late July to early September a minimum of 10 days following any significant rainfall to minimize effects from scouring (Biggs 2000, Lohman and others 1992). Large gravel (> 7.5 cm diameter) to cobble sized substrates are chosen to minimize potential spatial variation within the stream reach (Cattaneo and others 1997). Rock scrapings are combined and blended with a hand blender. A 5 ml aliquot is drawn from the slurry and filtered on Whatman® GF/C 1.2 micron glass fiber filters in the field, and either placed on ice for daytrips or frozen on dry ice for overnight trips. Water column chlorophyll samples will also be collected at sites designated Large River nutrient sites (>500mi<sup>2</sup>) by filtering a known quantity of river water on Whatman® GF/C 1.2 micron glass fiber filters in the field, and similarly either placed on ice for daytrips or frozen on dry ice for overnight trips. Additionally, an estimate of light availability at a site is to be expressed by the degree of open arc between the canopy tops of opposing banks. A clinometer reading made from the middle of the stream channel will measure the angle to the canopy top of opposite banks at three locations within the sampling reach. The sum of the two measured angles at each point estimate are subtracted from 180, and averaged for the three observation points to yield what is hereafter referred to as canopy cover.

Chlorophyll concentrations on filters will be estimated by using the EPA Method 445.0 (USEPA 1997). Precision of the method, as relative standard deviation (RSD) is given in Method 445.0 as typically between 25 - 30 percent. The estimated detection limit for the fluorometric method ranges from 50 picograms per ml (5x10<sup>-7</sup> mg/l) as quoted by the manufacturer to 0.1 mg/l for a pooled estimated detection limit [USEPA 1997 (p-EDL)]. Due to the large dilutions required to analyze these solutions, the fluorometric p-EDLs are unrealistically high compared to what is achievable by a single lab. Typical single lab EDLs can easily be 1000 fold lower than the p-EDL reported here (USEPA 1997). The range of benthic chlorophyll a concentrations anticipated for the streams in this study is estimated to range from 10 to 300 mg/m<sup>2</sup>; 10 mg/m<sup>2</sup> has a volumetric equivalent of 0.157 mg/l, assuming 15.7 cm<sup>2</sup> of surface is scraped and placed in a one liter of water.

Chlorophyll a samples can be biased by contamination, and interference from pheophytin a. The acidification method will be used to correct for the presence of pheophytin. The degree of bias from contamination will be assess by preparing one field blank at every 10th sampling location location for both periphyton and water column samples. Field blanks will be prepared using the same equipment as samples following sample collection. Laboratory blanks will be prepared and run at the end of batch run of samples, and will document the degree of error introduced during lab handling. Bias may also occur due to differences in sample handling in the field, and to measure it, sample splits will done every 10th site. Accuracy of the fluorometric method will be assessed by using standards, and by comparing results from sample splits run by Ohio EPA and the USGS National Laboratory in Denver, Colorado.

The methods described here are similar to those use in a number of similar studies (Biggs 2000; Cattaneo et al. 1997; Lohman et al. 1992), and therefore, the results should be comparable.

**Water, Sediment, and Fish Tissue Laboratory Analysis**

The Quality Assurance Section in the Ohio EPA Division of Environmental Services is responsible for assuring that laboratory data is valid, accurate and precise. The Quality Assurance Section provides the Manual of Laboratory Standard Operating Procedures, Volumes I, II and III (Ohio EPA 2002), and the Quality Assurance Plan (2006b) that detail procedures for laboratory analysis and quality control. Procedures adhere to USEPA approved methods and are followed by Ohio EPA staff performing analytical analyses. Data quality objectives for water, sediment, and tissue chemistry parameters by class (e.g., volatile organic compounds, metals, wet chemistry) are described in Ohio EPA 1991. The analytical method used and the method reporting limit for each water column and fish tissue parameter of interest in this study are given in Appendix 1A. Appendix 2B lists Effective Quantification Limits (EQL) for sediment chemistry parameters.

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Appendix 1A

Ohio EPA

Department of Environmental Services

Method Reporting Limits - Water Chemistry/Fish Tissue

# OhioEPA Division of Environmental Services

## Method Reporting Limits

Analysis Group: DEMAND

Parameter ELIMS Metod	Method Reference	Storet Number	Reporting Limits
<b>% Solids</b>		<b>P70318</b>	
% Solids	SM 2540G	Percent solids --- Sediment Inorganic	0 %
<b>BOD_ULT</b>		<b>P319</b>	
BOD-ULT	OEPA 310.2	BOD, Ultimate	2 mg/L
<b>BOD20</b>		<b>P324</b>	
BOD-20	OEPA 310.2	BOD, 20 DAY	2 mg/L
<b>BOD5</b>		<b>P310</b>	
BOD-5	SM 5210B	BOD, 5 DAY	2 mg/L
<b>CBOD_ULT</b>		<b>P192</b>	
CBOD-ULT	OEPA 310.2	CBOD, Ultimate Carbonaceous	2 mg/L
<b>CBOD20</b>		<b>P80087</b>	
CBOD-20	OEPA 310.2	CBOD, 20 Day Carbonaceous	2 mg/L
<b>CBOD5</b>		<b>P80082</b>	
CBOD-5	SM 5210B	CBOD, 5 Day Carbonaceous	2 mg/L
<b>Conductivity</b>		<b>P95</b>	
Conductivity	SM 2510B	Conductivity	1 umhos/cm
<b>Flashpoint</b>		<b>P74030</b>	
Flashpoint	USEPA 1010	Flashpoint in degrees Celsius	0 Celsius
<b>Oil &amp; Grease</b>		<b>P556</b>	
Oil&Grease	USEPA 1664	Oil And Grease	2 mg/L
<b>pH</b>		<b>P403</b>	
pH	USEPA 150.1	pH --- Water Matrix	0 s.u.
<b>TOC</b>		<b>P680</b>	
TOC	SM 5310B	Total Organic Carbon -- Water Matrix	2 mg/L
<b>Total Dissolved Solids</b>		<b>P70300</b>	
Solids_Diss	SM 2540C	Solids, Dissolved (Total Filtrable Resi	10 mg/L
<b>Total Solids</b>		<b>P500</b>	
Solids_Tot	SM 2540D	Solids, Total (Total Residue) --- Wate	10 mg/L
<b>Total Suspended Solids</b>		<b>P530</b>	
Solids_Susp	SM 2540B	Solids, Suspended (Total Nonfiltrable	5 mg/L
<b>Total Volatile Solids</b>		<b>Unknown</b>	
SoL_Tot_Vol_(WAT)	OEPA 170.2	Solids, Total Volatile --- Water Matrix	10 mg/L
SoL_Tot_Vol_DW	OEPA 170.2	Solids, Total Volatile --- Drinking Wat	10 mg/L

# OhioEPA Division of Environmental Services

## Method Reporting Limits

Analysis Group: NUTRIENTS

Parameter ELIMS Metod	Method Reference	Storet Number	Reporting Limits
<b>Acidity</b>		<b>P70508</b>	
Acidity	USEPA 305.1	Acidity As CaCO3, Water	5 mg/L
<b>Alkalinity</b>		<b>P410</b>	
Alkalinity	USEPA 305.1	Alkalinity As CaCO3, Water	5 mg/L
<b>Ammonia</b>		<b>P610</b>	
NO3-NH3	USEPA 353.2	Ammonia / Nitrate&Nitrite, Water	0.05 mg/L
<b>Bicarbonate</b>		<b>P0440</b>	
Carb_Bicarb	SM 2320B	Carbonate / Bicarbonate, Water	5 mg/L
<b>Carbonate</b>		<b>P445</b>	
Carb_Bicarb	SM 2320B	Carbonate / Bicarbonate, Water	5 mg/L
<b>Chloride</b>		<b>P940</b>	
Chloride	USEPA 325.1	Chloride, Water	5 mg/L
<b>COD</b>		<b>P340</b>	
COD	SM 5220D	COD, Water	10 mg/L
<b>Cyanide, Free</b>		<b>P718</b>	
Cyanide_Free	SM 4500-CNI	Cyanide, Free	5 ug/L
<b>Cyanide, Total</b>		<b>P720</b>	
Cyanide_Total	USEPA 335.4	Cyanide, Total, Water	10 ug/L
<b>Fluoride</b>		<b>P951</b>	
Fluoride	SM 4500-FC	Fluoride, Water	0.2 mg/L
<b>Hexavalent Chromium</b>		<b>P1220</b>	
CR+6	SM 3500-CRD	Hexavalent Chromium, Water	10 ug/L
<b>Nitrate+nitrite</b>		<b>P630</b>	
NO3-NH3	USEPA 353.2	Ammonia / Nitrate&Nitrite, Water	0.1 mg/L
<b>Nitrite</b>		<b>P615</b>	
Nitrite	USEPA 353.2	Nitrite, Water	0.02 mg/L
<b>Phenolics</b>		<b>P32730</b>	
Phenolics	USEPA 420.2	Phenolics, Water	10 ug/L
Phenolics_MD	USEPA 420.1	Phenolics, Manual Distillation, Water	10 ug/L
<b>Specific Gravity</b>		<b>Unknown</b>	
Spec_Grav	OEPA 140.1	Specific gravity, Water	0 g/ml
<b>Sulfate</b>		<b>P945</b>	
Sulfate	USEPA 375.2	Sulfate, Water	5 mg/L
<b>TKN</b>		<b>P625</b>	
TKN-TP	USEPA 365.4	TKN / TP, Water	0.2 mg/L
<b>Total Phosphorous, dissolved</b>		<b>P666</b>	
Phosph_diss	USEPA 365.4	Phosphorus, Dissolved, Water	0.05 mg/L
<b>Total Phosphorous, Dissolved LL</b>		<b>P666</b>	
LL_Phosph_diss	USEPA 365.4	Low Level Phosphorous, Dissolved, V	10 ug/L
<b>Total Phosphorous, Low Level</b>		<b>P665</b>	
LL_Phos	USEPA 365.4	Low Level Phosphorous, Total, Water	10 ug/L
<b>Total Phosphorus</b>		<b>P665</b>	
Phosphorous	USEPA 365.4	Phosphorous, Total, Water	0.05 mg/L
TKN-TP	USEPA 365.4	TKN / TP, Water	0.05 mg/L

**Method Reporting Limits**

**Analysis Group:** METALS

<b>Parameter ELIMS Metod</b>	<b>Method Reference</b>	<b>Storet Number</b>	<b>Reporting Limits</b>
<b>Aluminum</b>			
		<b>P1105</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	200 ug/L
ICP_FSHC	USEPA 200.7	ICP, Fish Consumption	4 mg/kg
<b>Antimony</b>			
		<b>P1097</b>	
Antimony_(WAT)	SM 3113B	GFAA, Water	2 ug/L
Antimony_FSHC	SM 3113B	GFAA, Fish Consumption	0.04 mg/kg
<b>Arsenic</b>			
		<b>P1002</b>	
Arsenic_(WAT)	SM 3113B	GFAA, Water	2 ug/L
SIMAA_(WAT)	SM 3113B	GFAA, Water	2 ug/L
Arsenic_FSHC	SM3113B	GFAA, Fish Consumption	0.04 mg/kg
SIMAA_FSHC	SM 3113B	GFAA, Fish Consumption	0.04 mg/kg
<b>Barium</b>			
		<b>P1007</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	15 ug/L
ICP_FSHC	USEPA 200.7	ICP, Fish Consumption	0.3 mg/kg
<b>Beryllium</b>			
		<b>P1012</b>	
Beryllium_(WAT)	SM 3113B	GFAA, Water	0.2 ug/L
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	5 ug/L
Beryllium_FSHC	SM 3113B	GFAA, Fish Consumption	0.004 mg/kg
<b>Cadmium</b>			
		<b>P1027</b>	
Cadmium_(WAT)	SM 3113B	GFAA, Water	0.2 ug/L
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	5 ug/L
SIMAA_(WAT)	SM 3113B	GFAA, Water	0.2 ug/L
Cadmium_FSHC	SM 3113B	GFAA, Fish Consumption	0.004 mg/kg
SIMAA_FSHC	SM 3113B	GFAA, Fish Consumption	0.004 mg/kg
<b>Calcium</b>			
		<b>P916</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	2 mg/L
ICP_FSHC	USEPA 200.7	ICP, Fish Consumption	40000 mg/kg
<b>Chromium</b>			
		<b>P1034</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	30 ug/L
ICP_FSHC	USEPA 200.7	ICP, Fish Consumption	0.6 mg/kg
<b>Cobalt</b>			
		<b>P1037</b>	
Cobalt_(WAT)	SM 3113B	GFAA, Water	5 ug/L
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	50 ug/L
Cobalt_FSHC	SM 3113B	GFAA, Fish Consumption	0.1 mg/kg
<b>Copper</b>			
		<b>P1042</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	10 ug/L
ICP_FSHC	USEPA 200.7	ICP, Fish Consumption	0.2 mg/kg
<b>Copper, Low Level</b>			
		<b>P1042</b>	
Copper_LL_(WAT)	SM 3113B	GFAA, Water	2 ug/L
<b>Hardness, Total</b>			
		<b>P900</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	0 mg/L
<b>Iron</b>			
		<b>P1045</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	50 ug/L
ICP_FSHC	USEPA 200.7	ICP, Fish Consumption	1 mg/kg
<b>Lead</b>			
		<b>P1051</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	40 ug/L
Lead_(WAT)	SM 3113B	GFAA, Water	2 ug/L
SIMAA_(WAT)	SM 3113B	GFAA, Water	2 ug/L
ICP_FSHC	USEPA 200.7	ICP, Fish Consumption	0.8 mg/kg

**OhioEPA** Division of Environmental Services**Method Reporting Limits**

Analysis Group: METALS

Parameter ELIMS Metod	Method Reference	Storet Number	Reporting Limits
<b>Lead</b>			
		<b>P1051</b>	
Lead_FSHC	SM 3113B	GFAA, Fish Consumption	0.04 mg/kg
SIMAA_FSHC	SM 3113B	GFAA, Fish Consumption	0.04 mg/kg
<b>Magnesium</b>			
		<b>P927</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	1 mg/L
ICP_FSHC	USEPA 200.7	ICP, Fish Consumption	20000 mg/kg
<b>Manganese</b>			
		<b>P1055</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	10 ug/L
ICP_FSHC	USEPA 200.7	ICP, Fish Consumption	0.2 mg/kg
<b>Mercury</b>			
		<b>P71900</b>	
Mercury_(WAT)	USEPA 245.1	Mercury, Water	0.2 ug/L
Mercury_FSHC	USEPA 245.1	Mercury, Fish Consumption	0.024 mg/kg
<b>Nickel</b>			
		<b>P1067</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	40 ug/L
ICP_FSHC	USEPA 200.7	ICP, Fish Consumption	0.8 mg/kg
<b>Potassium</b>			
		<b>P937</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	2 mg/L
ICP_FSHC	USEPA 200.7	ICP, Fish Consumption	40000 mg/kg
<b>Selenium</b>			
		<b>P1147</b>	
Selenium_(WAT)	SM 3113B	GFAA, Water	2 ug/L
SIMAA_(WAT)	SM 3113B	GFAA, Water	2 ug/L
Selenium_FSHC	SM 3113B	GFAA, Fish Consumption	0.04 mg/kg
SIMAA_FSHC	SM 3113B	GFAA, Fish Consumption	0.04 mg/kg
<b>Silver</b>			
		<b>P1077</b>	
Silver_(WAT)	SM 3113B	GFAA, Water	0.5 ug/L
Silver_FSHC	SM 3113B	GFAA, Fish Consumption	0.01 mg/kg
<b>Sodium</b>			
		<b>P929</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	5 mg/L
ICP_FSHC	USEPA 200.7	ICP, Fish Consumption	100000 mg/kg
<b>Strontium</b>			
		<b>P1082</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	30 ug/L
ICP_FSHC	USEPA 200.7	ICP, Fish Consumption	0.6 mg/kg
<b>Thallium</b>			
		<b>P1059</b>	
Thallium_(WAT)	SM 3113B	GFAA, Water	2 ug/L
Thallium_FSHC	SM 3113B	GFAA, Fish Consumption	0.04 mg/kg
<b>Tin</b>			
		<b>P1102</b>	
Tin_(WAT)	SM 3113B	GFAA, Water	5 ug/L
Tin_FSHC	SM 3113B	GFAA, Fish Consumption	0.1 mg/kg
<b>Titanium</b>			
		<b>P01152</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	50 ug/L
<b>Vanadium</b>			
		<b>P1087</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	50 ug/L
<b>Zinc</b>			
		<b>P1092</b>	
ICP_(WAT)	USEPA 200.7	ICP, Water Matrix	10 ug/L
ICP_FSHC	USEPA 200.7	ICP, Fish Consumption	0.2 mg/kg

**OhioEPA** Division of Environmental Services  
**Method Reporting Limits** Analysis Groups: VOC

ELIMS Metod Parameter	Method Reference	CAS Number	Reporting Limit
<b>624_(WAT)</b>	<b>USEPA 624</b>	<b>VOC (Purgeable Organics), Water</b>	
Benzene		000071-43-2	0.5 ug/L
Bromobenzene		000108-86-1	0.5 ug/L
Bromochloromethane		000074-97-5	0.5 ug/L
Bromodichloromethane		000075-27-4	0.5 ug/L
Bromoform		000075-25-2	0.5 ug/L
Bromomethane		000074-83-9	0.5 ug/L
n-Butylbenzene		000104-51-8	0.5 ug/L
sec-Butylbenzene		000135-98-8	0.5 ug/L
tert-Butylbenzene		000098-06-6	0.5 ug/L
Carbon tetrachloride		000056-23-5	0.5 ug/L
Chlorobenzene		000108-90-7	0.5 ug/L
Chloroethane		000075-00-3	0.5 ug/L
Chloroform		000067-66-3	0.5 ug/L
Chloromethane		000074-87-3	0.5 ug/L
2-Chlorotoluene		000095-49-8	0.5 ug/L
4-Chlorotoluene		000106-43-4	0.5 ug/L
Dibromochloromethane		000124-48-1	0.5 ug/L
1,2-Dibromo-3-chloropropane		000096-12-8	0.5 ug/L
1,2-Dibromoethane		000106-93-4	0.5 ug/L
Dibromomethane		000074-95-3	0.5 ug/L
1,2-Dichlorobenzene		000095-50-1	0.5 ug/L
1,3-Dichlorobenzene		000541-73-1	0.5 ug/L
1,4-Dichlorobenzene		000106-46-7	0.5 ug/L
Dichlorodifluoromethane		000075-71-8	0.5 ug/L
1,1-Dichloroethane		000075-34-3	0.5 ug/L
1,2-Dichloroethane		000107-06-2	0.5 ug/L
1,1-Dichloroethene		000075-35-4	0.5 ug/L
cis-1,2-Dichloroethene		000156-59-2	0.5 ug/L
trans-1,2-Dichloroethene		000156-60-5	0.5 ug/L
1,2-Dichloropropane		000078-87-5	0.5 ug/L
1,3-Dichloropropane		000142-28-9	0.5 ug/L
2,2-Dichloropropane		000594-20-7	0.5 ug/L
1,1-Dichloropropene		000563-58-6	0.5 ug/L
cis-1,3-Dichloropropene		010061-01-5	0.5 ug/L
trans-1,3-Dichloropropene		010061-02-6	0.5 ug/L
Ethylbenzene		000100-41-4	0.5 ug/L
Hexachlorobutadiene		000087-68-3	0.5 ug/L
Isopropylbenzene		000098-82-8	0.5 ug/L
4-Isopropyltoluene		000099-87-6	0.5 ug/L
Methylene chloride		000075-09-2	0.5 ug/L
Naphthalene		000091-20-3	0.5 ug/L
n-Propylbenzene		000103-65-1	0.5 ug/L
Styrene		000100-42-5	0.5 ug/L
1,1,1,2-Tetrachloroethane		000630-20-6	0.5 ug/L
1,1,2,2-Tetrachloroethane		000079-34-5	0.5 ug/L
Tetrachloroethene		000127-18-4	0.5 ug/L
Toluene		000108-88-3	0.5 ug/L
1,2,3-Trichlorobenzene		000087-61-6	0.5 ug/L
1,2,4-Trichlorobenzene		000120-82-1	0.5 ug/L
1,1,1-Trichloroethane		000071-55-6	0.5 ug/L
1,1,2-Trichloroethane		000079-00-5	0.5 ug/L
Trichloroethene		000079-01-6	0.5 ug/L
Trichlorofluoromethane		000075-69-4	0.5 ug/L

**OhioEPA** Division of Environmental Services  
**Method Reporting Limits** Analysis Groups: VOC

ELIMS Metod Parameter	Method Reference	CAS Number	Reporting Limit
<b>624_(WAT)</b>	<b>USEPA 624</b>	<b>VOC (Purgeable Organics), Water</b>	
1,2,3-Trichloropropane		000096-18-4	0.5 ug/L
1,2,4-Trimethylbenzene		000095-63-6	0.5 ug/L
1,3,5-Trimethylbenzene		000108-67-8	0.5 ug/L
Vinyl chloride		000075-01-4	0.5 ug/L
o-Xylene		000095-47-6	0.5 ug/L
Total m&p-xylenes		000108-38-3	0.5 ug/L
<b>8260_(WAT)</b>	<b>USEPA 8260B</b>	<b>VOC (Purgeable Organics), Water</b>	
Acetone		000067-64-1	5 ug/L
Benzene		000071-43-2	0.5 ug/L
Bromobenzene		000108-86-1	0.5 ug/L
Bromochloromethane		000074-97-5	0.5 ug/L
Bromodichloromethane		000075-27-4	0.5 ug/L
Bromoform		000075-25-2	0.5 ug/L
Bromomethane		000074-83-9	0.5 ug/L
2-Butanone		000078-93-3	1 ug/L
n-Butylbenzene		000104-51-8	0.5 ug/L
sec-Butylbenzene		000135-98-8	0.5 ug/L
tert-Butylbenzene		000098-06-6	0.5 ug/L
Carbon disulfide		000075-15-0	1 ug/L
Carbon tetrachloride		000056-23-5	0.5 ug/L
Chlorobenzene		000108-90-7	0.5 ug/L
Chloroethane		000075-00-3	0.5 ug/L
Chloroform		000067-66-3	0.5 ug/L
Chloromethane		000074-87-3	0.5 ug/L
2-Chlorotoluene		000095-49-8	0.5 ug/L
4-Chlorotoluene		000106-43-4	0.5 ug/L
Dibromochloromethane		000124-48-1	0.5 ug/L
1,2-Dibromo-3-chloropropane		000096-12-8	0.5 ug/L
1,2-Dibromoethane		000106-93-4	0.5 ug/L
Dibromomethane		000074-95-3	0.5 ug/L
1,2-Dichlorobenzene		000095-50-1	0.5 ug/L
1,3-Dichlorobenzene		000541-73-1	0.5 ug/L
1,4-Dichlorobenzene		000106-46-7	0.5 ug/L
Dichlorodifluoromethane		000075-71-8	0.5 ug/L
1,1-Dichloroethane		000075-34-3	0.5 ug/L
1,2-Dichloroethane		000107-06-2	0.5 ug/L
1,1-Dichloroethene		000075-35-4	0.5 ug/L
cis-1,2-Dichloroethene		000156-59-2	0.5 ug/L
trans-1,2-Dichloroethene		000156-60-5	0.5 ug/L
1,2-Dichloropropane		000078-87-5	0.5 ug/L
1,3-Dichloropropane		000142-28-9	0.5 ug/L
2,2-Dichloropropane		000594-20-7	0.5 ug/L
1,1-Dichloropropene		000563-58-6	0.5 ug/L
cis-1,3-Dichloropropene		010061-01-5	0.5 ug/L
trans-1,3-Dichloropropene		010061-02-6	0.5 ug/L
Ethylbenzene		000100-41-4	0.5 ug/L
Hexachlorobutadiene		000087-68-3	0.5 ug/L
2-Hexanone		000591-78-6	1 ug/L
Isopropylbenzene		000098-82-8	0.5 ug/L
4-Isopropyltoluene		000099-87-6	0.5 ug/L
Methylene chloride		000075-09-2	0.5 ug/L
4-Methyl-2-pentanone		000108-10-1	1 ug/L



**Method Reporting Limits**

Analysis Groups: VOC

<b>ELIMS Metod Parameter</b>	<b>Method Reference</b>	<b>CAS Number</b>	<b>Reporting Limit</b>
<b>8260_(WAT)</b>	<b>USEPA 8260B</b>	<b>VOC (Purgeable Organics), Water</b>	
Naphthalene		000091-20-3	0.5 ug/L
n-Propylbenzene		000103-65-1	0.5 ug/L
Styrene		000100-42-5	0.5 ug/L
1,1,1,2-Tetrachloroethane		000630-20-6	0.5 ug/L
1,1,2,2-Tetrachloroethane		000079-34-5	0.5 ug/L
Tetrachloroethene		000127-18-4	0.5 ug/L
Toluene		000108-88-3	0.5 ug/L
1,2,3-Trichlorobenzene		000087-61-6	0.5 ug/L
1,2,4-Trichlorobenzene		000120-82-1	0.5 ug/L
1,1,1-Trichloroethane		000071-55-6	0.5 ug/L
1,1,2-Trichloroethane		000079-00-5	0.5 ug/L
Trichloroethene		000079-01-6	0.5 ug/L
Trichlorofluoromethane		000075-69-4	0.5 ug/L
1,2,3-Trichloropropane		000096-18-4	0.5 ug/L
1,2,4-Trimethylbenzene		000095-63-6	0.5 ug/L
1,3,5-Trimethylbenzene		000108-67-8	0.5 ug/L
Vinyl chloride		000075-01-4	0.5 ug/L
o-Xylene		000095-47-6	0.5 ug/L
Total m&p-xylenes		000108-38-3	0.5 ug/L

## Method Reporting Limits

Analysis Groups: BNA

ELIMS Metod Parameter	Method Reference	CAS Number	Reporting Limit
520.2_FSHC	OEPA 520.2	Semi-Volatile Organics, Consumption Tissue	
Acenaphthene		000083-32-9	1 mg/kg
Acenaphthylene		000208-96-8	1 mg/kg
Anthracene		000120-12-7	0.4 mg/kg
Benzo[a]anthracene		000056-55-3	0.4 mg/kg
Benzo[a]pyrene		000050-32-8	0.4 mg/kg
Benzo[b]fluoranthene		000205-99-2	0.4 mg/kg
Benzo[g,h,i]perylene		000191-24-2	0.4 mg/kg
Benzo[k]fluoranthene		000207-08-9	0.4 mg/kg
bis(2-Chloroethoxy)methane		000111-91-1	1 mg/kg
bis(2-Chloroethyl)ether		000111-44-4	0.4 mg/kg
bis(2-Chloroisopropyl)ether		000108-60-1	0.4 mg/kg
bis(2-Ethylhexyl)phthalate		000117-81-7	2 mg/kg
4-Bromophenyl-phenylether		000101-55-3	1 mg/kg
Butylbenzylphthalate		000085-68-7	0.4 mg/kg
4-Chloro-3-methylphenol		000059-50-7	2 mg/kg
2-Chloronaphthalene		000091-58-7	1 mg/kg
2-Chlorophenol		000095-57-8	0.4 mg/kg
4-Chlorophenyl-phenylether		007005-72-3	0.4 mg/kg
Chrysene		000218-01-9	0.4 mg/kg
Di-n-butylphthalate		000084-74-2	1 mg/kg
Di-n-octylphthalate		000117-84-0	0.4 mg/kg
Dibenz[a,h]anthracene		000053-70-3	0.4 mg/kg
1,3-Dichlorobenzene		000541-73-1	0.4 mg/kg
1,4-Dichlorobenzene		000106-46-7	0.4 mg/kg
1,2-Dichlorobenzene		000095-50-1	0.4 mg/kg
2,4-Dichlorophenol		000120-83-2	0.4 mg/kg
Diethylphthalate		000084-66-2	1 mg/kg
2,4-Dimethylphenol		000105-67-9	2 mg/kg
Dimethylphthalate		000131-11-3	1 mg/kg
4,6-Dinitro-2-methylphenol		000534-52-1	1 mg/kg
2,4-Dinitrophenol		000051-28-5	4 mg/kg
2,6-Dinitrotoluene		000606-20-2	0.4 mg/kg
2,4-Dinitrotoluene		000121-14-2	0.4 mg/kg
Fluoranthene		000206-44-0	0.4 mg/kg
Fluorene		000086-73-7	0.4 mg/kg
Hexachlorobenzene		000118-74-1	0.4 mg/kg
Hexachlorobutadiene		000087-68-3	0.4 mg/kg
Hexachlorocyclopentadiene		000077-47-4	0.4 mg/kg
Hexachloroethane		000067-72-1	1 mg/kg
Indeno[1,2,3-cd]pyrene		000193-39-5	0.4 mg/kg
Isophorone		000078-59-1	0.4 mg/kg
N-Nitroso-di-n-propylamine		000621-64-7	0.4 mg/kg
N-Nitrosodiphenylamine		000086-30-6	1 mg/kg
Naphthalene		000091-20-3	0.4 mg/kg
Nitrobenzene		000098-95-3	0.4 mg/kg
2-Nitrophenol		000088-75-5	0.4 mg/kg
4-Nitrophenol		000100-02-7	4 mg/kg
Pentachlorophenol		000087-86-5	2 mg/kg
Phenanthrene		000085-01-8	0.4 mg/kg
Phenol		000108-95-2	0.4 mg/kg
Pyrene		000129-00-0	0.4 mg/kg
1,2,4-Trichlorobenzene		000120-82-1	0.4 mg/kg
2,4,6-Trichlorophenol		000088-06-2	1 mg/kg

**Method Reporting Limits**

Analysis Groups: BNA

ELIMS Metod Parameter	Method Reference	CAS Number	Reporting Limit
<b>525.2_(WAT)</b>	<b>USEPA 525.2</b>	<b>Herbicides, Water</b>	
Acetochlor		034256-82-1	0.2 ug/L
Alachlor		015972-60-8	0.2 ug/L
Atrazine		001912-24-9	0.2 ug/L
Benzo[a]pyrene		000050-32-8	0.5 ug/L
bis(2-Ethylhexyl)adipate		000103-23-1	0.5 ug/L
bis(2-Ethylhexyl)phthalate		000117-81-7	0.5 ug/L
Butachlor		023184-66-9	0.2 ug/L
Cyanazine		021725-46-2	0.2 ug/L
Metolachlor		051218-45-2	0.2 ug/L
Metribuzin		021087-64-9	0.2 ug/L
Pentachlorophenol		000087-86-5	5 ug/L
Propachlor		001918-16-7	0.2 ug/L
Simazine		000122-34-9	0.2 ug/L
<b>625_(WAT)</b>	<b>USEPA 625</b>	<b>Base Neutral/Acids, Water</b>	
Acenaphthene		000083-32-9	5 ug/L
Acenaphthylene		000208-96-8	5 ug/L
Anthracene		000120-12-7	2 ug/L
Benzo[a]anthracene		000056-55-3	2 ug/L
Benzo[a]pyrene		000050-32-8	2 ug/L
Benzo[b]fluoranthene		000205-99-2	2 ug/L
Benzo[g,h,i]perylene		000191-24-2	2 ug/L
Benzo[k]fluoranthene		000207-08-9	2 ug/L
bis(2-Chloroethoxy)methane		000111-91-1	5 ug/L
bis(2-Chloroethyl)ether		000111-44-4	2 ug/L
bis(2-Chloroisopropyl)ether		000108-60-1	2 ug/L
bis(2-Ethylhexyl)phthalate		000117-81-7	10 ug/L
4-Bromophenyl-phenylether		000101-55-3	5 ug/L
Butylbenzylphthalate		000085-68-7	2 ug/L
4-Chloro-3-methylphenol		000059-50-7	10 ug/L
2-Chloronaphthalene		000091-58-7	5 ug/L
2-Chlorophenol		000095-57-8	2 ug/L
4-Chlorophenyl-phenylether		007005-72-3	2 ug/L
Chrysene		000218-01-9	2 ug/L
Di-n-butylphthalate		000084-74-2	5 ug/L
Di-n-octylphthalate		000117-84-0	2 ug/L
Dibenz[a,h]anthracene		000053-70-3	2 ug/L
1,3-Dichlorobenzene		000541-73-1	2 ug/L
1,4-Dichlorobenzene		000106-46-7	2 ug/L
1,2-Dichlorobenzene		000095-50-1	2 ug/L
2,4-Dichlorophenol		000120-83-2	2 ug/L
Diethylphthalate		000084-66-2	5 ug/L
2,4-Dimethylphenol		000105-67-9	10 ug/L
Dimethylphthalate		000131-11-3	5 ug/L
4,6-Dinitro-2-methylphenol		000534-52-1	5 ug/L
2,4-Dinitrophenol		000051-28-5	20 ug/L
2,6-Dinitrotoluene		000606-20-2	2 ug/L
2,4-Dinitrotoluene		000121-14-2	2 ug/L
Fluoranthene		000206-44-0	2 ug/L
Fluorene		000086-73-7	2 ug/L
Hexachlorobenzene		000118-74-1	2 ug/L
Hexachlorobutadiene		000087-68-3	2 ug/L
Hexachlorocyclopentadiene		000077-47-4	2 ug/L

**OhioEPA** Division of Environmental Services  
**Method Reporting Limits** Analysis Groups: BNA

ELIMS Metod Parameter	Method Reference	CAS Number	Reporting Limit
<b>625_(WAT)</b>	<b>USEPA 625</b>	<b>Base Neutral/Acids, Water</b>	
Hexachloroethane		000067-72-1	5 ug/L
Indeno[1,2,3-cd]pyrene		000193-39-5	2 ug/L
Isophorone		000078-59-1	2 ug/L
N-Nitroso-di-n-propylamine		000621-64-7	2 ug/L
N-Nitrosodiphenylamine		000086-30-6	5 ug/L
Naphthalene		000091-20-3	2 ug/L
Nitrobenzene		000098-95-3	2 ug/L
2-Nitrophenol		000088-75-5	2 ug/L
4-Nitrophenol		000100-02-7	20 ug/L
Pentachlorophenol		000087-86-5	10 ug/L
Phenanthrene		000085-01-8	2 ug/L
Phenol		000108-95-2	2 ug/L
Pyrene		000129-00-0	2 ug/L
1,2,4-Trichlorobenzene		000120-82-1	2 ug/L
2,4,6-Trichlorophenol		000088-06-2	5 ug/L
<b>8270_(WAT)</b>	<b>USEPA 8270</b>	<b>Base Neutral/Acids, Water</b>	
Acenaphthene		000083-32-9	2 ug/L
Acenaphthylene		000208-96-8	2 ug/L
Acetophenone		000098-86-2	2 ug/L
2-Acetylaminofluorene		000053-96-3	2 ug/L
4-Aminobiphenyl		000092-67-1	2 ug/L
Aniline		000062-53-3	2 ug/L
Anthracene		000120-12-7	2 ug/L
Benz[a]anthracene		000056-55-3	2 ug/L
Benzo[a]pyrene		000050-32-8	2 ug/L
Benzo[b]fluoranthene		000205-99-2	2 ug/L
Benzo[g,h,i]perylene		000191-24-2	2 ug/L
Benzo[k]fluoranthene		000207-08-9	2 ug/L
Benzyl alcohol		000100-51-6	2 ug/L
bis(2-Chloroethoxy)methane		000111-91-1	2 ug/L
bis(2-Chloroethyl)ether		000111-44-4	2 ug/L
bis(2-Chloroisopropyl)ether		000108-60-1	2 ug/L
bis(2-Ethylhexyl)phthalate		000117-81-7	2 ug/L
4-Bromophenyl-phenylether		000101-55-3	2 ug/L
Butylbenzylphthalate		000085-68-7	2 ug/L
4-Chloro-3-methylphenol		000059-50-7	2 ug/L
4-Chloroaniline		000106-47-8	2 ug/L
2-Chloronaphthalene		000091-58-7	2 ug/L
2-Chlorophenol		000095-57-8	2 ug/L
4-Chlorophenyl-phenylether		007005-72-3	2 ug/L
Chrysene		000218-01-9	2 ug/L
Di-n-butylphthalate		000084-74-2	2 ug/L
Di-n-octylphthalate		000117-84-0	2 ug/L
Dibenz[a,h]anthracene		000053-70-3	2 ug/L
Dibenzofuran		000132-64-9	2 ug/L
1,3-Dichlorobenzene		000541-73-1	2 ug/L
1,4-Dichlorobenzene		000106-46-7	2 ug/L
1,2-Dichlorobenzene		000095-50-1	2 ug/L
3,3'-Dichlorobenzidine		000091-94-1	2 ug/L
2,6-Dichlorophenol		000087-65-0	2 ug/L
2,4-Dichlorophenol		000120-83-2	2 ug/L
Diethylphthalate		000084-66-2	2 ug/L

## Method Reporting Limits

Analysis Groups: BNA

ELIMS Metod Parameter	Method Reference	CAS Number	Reporting Limit
<b>8270_(WAT)</b>	<b>USEPA 8270</b>	<b>Base Neutral/Acids, Water</b>	
p-Dimethylaminoazobenzene		000060-11-7	2 ug/L
7,12-Dimethylbenz[a]anthracene		000057-97-6	2 ug/L
3,3'-Dimethylbenzidine		000119-93-7	2 ug/L
2,4-Dimethylphenol		000105-67-9	2 ug/L
Dimethylphthalate		000131-11-3	2 ug/L
4,6-Dinitro-2-methylphenol		000534-52-1	2 ug/L
1,3-Dinitrobenzene		000099-65-0	2 ug/L
2,4-Dinitrophenol		000051-28-5	2 ug/L
2,6-Dinitrotoluene		000606-20-2	2 ug/L
2,4-Dinitrotoluene		000121-14-2	2 ug/L
Dinoseb		000088-85-7	2 ug/L
Diphenylamine		000122-39-4	2 ug/L
Ethyl methanesulfonate		000062-50-0	2 ug/L
Fluoranthene		000206-44-0	2 ug/L
Fluorene		000086-73-7	2 ug/L
Hexachlorobenzene		000118-74-1	2 ug/L
Hexachlorobutadiene		000087-68-3	2 ug/L
Hexachlorocyclopentadiene		000077-47-4	2 ug/L
Hexachloroethane		000067-72-1	2 ug/L
Hexachloropropene		001888-71-7	2 ug/L
Indeno[1,2,3-cd]pyrene		000193-39-5	2 ug/L
Isophorone		000078-59-1	2 ug/L
Methyl methanesulfonate		000066-27-3	2 ug/L
3-Methylcholanthrene		000056-49-5	2 ug/L
2-Methylnaphthalene		000091-57-6	2 ug/L
3&4-Methylphenol		000106-44-5	2 ug/L
2-Methylphenol		000095-48-7	2 ug/L
N-Nitroso-di-n-butylamine		000924-16-3	2 ug/L
N-Nitroso-di-n-propylamine		000621-64-7	2 ug/L
N-Nitrosomorpholine		000059-89-2	2 ug/L
N-Nitrosopiperidine		000100-75-4	2 ug/L
N-Nitrosopyrrolidine		000930-55-2	2 ug/L
Naphthalene		000091-20-3	2 ug/L
1,4-Naphthoquinone		000130-15-4	2 ug/L
1-Naphthylamine		000134-32-7	2 ug/L
2-Naphthylamine		000091-59-8	2 ug/L
5-Nitro-o-toluidine		000099-55-8	2 ug/L
2-Nitroaniline		000088-74-4	2 ug/L
3-Nitroaniline		000099-09-2	2 ug/L
4-Nitroaniline		000100-01-6	2 ug/L
Nitrobenzene		000098-95-3	2 ug/L
4-Nitrophenol		000100-02-7	2 ug/L
2-Nitrophenol		000088-75-5	2 ug/L
Pentachlorobenzene		000608-93-5	2 ug/L
Pentachlorophenol		000087-86-5	2 ug/L
Phenacetin		000062-44-2	2 ug/L
Phenanthrene		000085-01-8	2 ug/L
Phenol		000108-95-2	2 ug/L
2-Picoline		000109-06-8	2 ug/L
Pronamide		023950-58-5	2 ug/L
Pyrene		000129-00-0	2 ug/L
Safrole		000094-59-7	2 ug/L
1,2,4,5-Tetrachlorobenzene		000095-94-3	2 ug/L

**OhioEPA** Division of Environmental Services  
**Method Reporting Limits** Analysis Groups: BNA

ELIMS Metod Parameter	Method Reference	CAS Number	Reporting Limit
<b>8270_(WAT)</b>	<b>USEPA 8270</b>	<b>Base Neutral/Acids, Water</b>	
2,3,4,6-Tetrachlorophenol		000058-90-2	2 ug/L
o-Toluidine		000095-53-4	2 ug/L
1,2,4-Trichlorobenzene		000120-82-1	2 ug/L
2,4,6-Trichlorophenol		000088-06-2	2 ug/L
2,4,5-Trichlorophenol		000095-95-4	2 ug/L
<b>SAS-305_(WAT)</b>	<b>OEPA NEW</b>	<b>SAS-305, Water</b>	
o-Isopropyl-1,1-diphenylethane		191044-60-7	0.1 ug/L
m-Isopropyl-1,1-diphenylethane		191044-59-4	0.1 ug/L
p-Isopropyl-1,1-diphenylethane		002320-06-01	0.1 ug/L
p-Isopropyl-1,2-diphenylethane		038842-20-5	0.1 ug/L
SAS-305		N/A	0.3 ug/L
<b>SAS-305_FSHC</b>	<b>OEPA NEW</b>	<b>SAS-305, Consumption Fish Tissue</b>	
o-Isopropyl-1,1-diphenylethane		191044-60-7	0.04 mg/kg
m-Isopropyl-1,1-diphenylethane		191044-59-4	0.04 mg/kg
p-Isopropyl-1,1-diphenylethane		002320-06-01	0.04 mg/kg
p-Isopropyl-1,2-diphenylethane		038842-20-5	0.04 mg/kg
SAS-305		N/A	0.16 mg/kg
<b>SAS-310_(WAT)</b>	<b>OEPA 510.1</b>	<b>SAS-310, Water</b>	
o-sec-Butyl diphenylmethane		101646-63-3	0.1 ug/L
m-sec-Butyl diphenylmethane		101646-63-3	0.1 ug/L
p-sec-Butyl diphenylmethane		101646-63-3	0.1 ug/L
o-sec-Butyl 1,1-diphenylethane		101646-62-2	0.1 ug/L
m-sec-Butyl 1,1-diphenylethane		101646-62-2	0.1 ug/L
p-sec-Butyl 1,1-diphenylethane		101646-62-2	0.1 ug/L
o-sec-Butyl 1,2-diphenylethane		142828-65-7	0.1 ug/L
m-sec-Butyl 1,2-diphenylethane		142828-65-7	0.1 ug/L
p-sec-Butyl 1,2-diphenylethane		142828-65-7	0.1 ug/L
SAS-310		N/A	0.9 ug/L
<b>SAS-310_FSHC</b>	<b>OEPA 581.18</b>	<b>SAS-310, Consumption FishTissue</b>	
o-sec-Butyl diphenylmethane		101646-63-3	0.04 mg/kg
m-sec-Butyl diphenylmethane		101646-63-3	0.04 mg/kg
p-sec-Butyl diphenylmethane		101646-63-3	0.04 mg/kg
o-sec-Butyl 1,1-diphenylethane		101646-62-2	0.04 mg/kg
m-sec-Butyl 1,1-diphenylethane		101646-62-2	0.04 mg/kg
p-sec-Butyl 1,1-diphenylethane		101646-62-2	0.04 mg/kg
o-sec-Butyl 1,2-diphenylethane		142828-65-7	0.04 mg/kg
m-sec-Butyl 1,2-diphenylethane		142828-65-7	0.04 mg/kg
p-sec-Butyl 1,2-diphenylethane		142828-65-7	0.04 mg/kg
SAS-310		N/A	0.36 mg/kg

**OhioEPA** Division of Environmental Services  
**Method Reporting Limits** Analysis Groups: PEST

ELIMS Metod Parameter	Method Reference	CAS Number	Reporting Limit
<b>504_(WAT)</b>	<b>USEPA 504.1</b>	<b>EDB, DBCP, 123TCP, Water</b>	
1,2-Dibromoethane		000106-93-4	0.02 ug/L
1,2-Dibromo-3-chloropropane		000096-12-8	0.02 ug/L
<b>515_(WAT)</b>	<b>USEPA 515.1</b>	<b>Chlorinated Acid Herbicides, Water</b>	
Dalapon		000075-99-0	0.08 ug/L
Dicamba		001918-00-9	0.08 ug/L
Dinoseb		000088-85-7	0.08 ug/L
Acifluorfen		050594-66-6	0.08 ug/L
2,4-D		000094-75-7	0.08 ug/L
2,4,5-TP		000093-72-1	0.08 ug/L
Pentachlorophenol		000087-86-5	0.04 ug/L
Picloram		001918-02-1	0.08 ug/L
<b>608_(WAT)</b>	<b>USEPA 608</b>	<b>Organochlorine Pesticides &amp; PCBs, Water</b>	
Aldrin		000309-00-2	0.002 ug/L
a-BHC		000319-84-6	0.002 ug/L
b-BHC		000319-85-7	0.002 ug/L
d-BHC		000319-86-8	0.002 ug/L
γ-BHC		000058-89-9	0.002 ug/L
4,4'-DDD		000072-54-8	0.006 ug/L
4,4'-DDE		000072-55-9	0.002 ug/L
4,4'-DDT		000050-29-3	0.006 ug/L
Dieldrin		000060-57-1	0.002 ug/L
Endosulfan I		000959-98-8	0.002 ug/L
Endosulfan II		033213-65-9	0.002 ug/L
Endosulfan sulfate		001031-07-8	0.02 ug/L
Endrin		000072-20-8	0.002 ug/L
Endrin aldehyde		007421-93-4	0.006 ug/L
Heptachlor		000076-44-8	0.002 ug/L
Heptachlor epoxide		001024-57-3	0.002 ug/L
Methoxychlor		000072-43-5	0.01 ug/L
Mirex		002385-85-5	0.01 ug/L
Hexachlorobenzene		000118-74-1	0.002 ug/L
Chlordane		000057-74-9	0.2 ug/L
Toxaphene		008001-35-2	0.2 ug/L
PCB-1016		012674-11-2	0.1 ug/L
PCB-1221		011104-28-2	0.1 ug/L
PCB-1232		011141-16-5	0.1 ug/L
PCB-1242		053469-21-9	0.1 ug/L
PCB-1248		012672-29-6	0.1 ug/L
PCB-1254		011097-69-1	0.1 ug/L
PCB-1260		011096-82-5	0.1 ug/L
<b>8080_(WAT)</b>	<b>USEPA 8081A</b>	<b>Organochlorine Pesticides &amp; PCBs, Water</b>	
Aldrin		000309-00-2	0.002 ug/L
a-BHC		000319-84-6	0.002 ug/L
b-BHC		000319-85-7	0.002 ug/L
d-BHC		000319-86-8	0.002 ug/L
γ-BHC		000058-89-9	0.002 ug/L
4,4'-DDD		000072-54-8	0.006 ug/L
4,4'-DDE		000072-55-9	0.002 ug/L
4,4'-DDT		000050-29-3	0.006 ug/L
Dieldrin		000060-57-1	0.002 ug/L
Endosulfan I		000959-98-8	0.002 ug/L

## Method Reporting Limits

Analysis Groups: PEST

ELIMS Metod Parameter	Method Reference	CAS Number	Reporting Limit
<b>8080_(WAT)</b>	<b>USEPA 8081A</b>	<b>Organochlorine Pesticides &amp; PCBs, Water</b>	
Endosulfan II		033213-65-9	0.002 ug/L
Endosulfan sulfate		001031-07-8	0.02 ug/L
Endrin		000072-20-8	0.002 ug/L
Endrin aldehyde		007421-93-4	0.006 ug/L
Heptachlor		000076-44-8	0.002 ug/L
Heptachlor epoxide		001024-57-3	0.002 ug/L
Methoxychlor		000072-43-5	0.01 ug/L
Mirex		002385-85-5	0.01 ug/L
Hexachlorobenzene		000118-74-1	0.002 ug/L
Chlordane		000057-74-9	0.2 ug/L
Toxaphene		008001-35-2	0.1 ug/L
PCB-1016		012674-11-2	0.1 ug/L
PCB-1221		011104-28-2	0.1 ug/L
PCB-1232		011141-16-5	0.1 ug/L
PCB-1242		053469-21-9	0.1 ug/L
PCB-1248		012672-29-6	0.1 ug/L
PCB-1254		011097-69-1	0.1 ug/L
PCB-1260		011096-82-5	0.1 ug/L
<b>8080_FSHC</b>	<b>OEPA 590.1</b>	<b>Organochlorine Pesticides &amp; PCBs, Tissue Matrix, Consumption Program</b>	
Aldrin		000309-00-2	10 ug/kg
a-BHC		000319-84-6	10 ug/kg
b-BHC		000319-85-7	10 ug/kg
d-BHC		000319-86-8	10 ug/kg
γ-BHC		000058-89-9	10 ug/kg
4,4'-DDD		000072-54-8	10 ug/kg
4,4'-DDE		000072-55-9	10 ug/kg
4,4'-DDT		000050-29-3	10 ug/kg
Dieldrin		000060-57-1	10 ug/kg
Endosulfan I		000959-98-8	10 ug/kg
Endosulfan II		033213-65-9	10 ug/kg
Endosulfan sulfate		001031-07-8	10 ug/kg
Endrin		000072-20-8	10 ug/kg
Heptachlor		000076-44-8	10 ug/kg
Heptachlor epoxide		001024-57-3	10 ug/kg
Methoxychlor		000072-43-5	10 ug/kg
Mirex		002385-85-5	10 ug/kg
Hexachlorobenzene		000118-74-1	10 ug/kg
Alpha-Chlordane		005103-71-9	10 ug/kg
Gamma-Chlordane		005103-74-2	10 ug/kg
Oxychlordane		027304-13-8	10 ug/kg
cis-Nonachlor		005103-73-1	10 ug/kg
trans-Nonachlor		039765-80-5	10 ug/kg
Toxaphene		008001-35-2	20 ug/kg
PCB-1016		012674-11-2	50 ug/kg
PCB-1221		011104-28-2	50 ug/kg
PCB-1232		011141-16-5	50 ug/kg
PCB-1242		053469-21-9	50 ug/kg
PCB-1248		012672-29-6	50 ug/kg
PCB-1254		011097-69-1	50 ug/kg
PCB-1260		011096-82-5	50 ug/kg



Appendix 2B

Ohio EPA

Department of Environmental Services

Effective Quantification Limits - Sediment Chemistry

Appendix 2B

Ohio EPA Chemistry Laboratory (DES)

Part 1: Semi-Volatile (Base Neutral and Acid) Extractable Organic Chemicals - U.S. EPA Method 8270, OEPA 520.2

<u>PARAMETER</u>	<u>EQL (mg/kg)</u>
Acenaphthene	0.4
Acenaphthylene	0.4
Acenaphthene	0.4
2-Acetylaminofluorene	0.4
4-Aminobiphenyl	2
Aniline	2
Anthracene	0.4
Benzo(B&K)Fluoranthene	0.4
Benzo-A-Pyrene	0.4
Benzo(Gh)Perylene	0.4
Benzyl Alcohol	0.4
Benz(A)Anthracene	0.4
Bis(2-Chloroethoxy)Methane	0.4
Bis(2-Chloroethyl)Ether	0.4
Bis(2-Chloroisopropyl)Ether	0.4
Bis(2-ethylhexyl)Phthalate	0.4
4-Bromophenyl Phenyl Ether	0.4
Butylbenzyl Phthalate	0.4
4-Chloroaniline	0.4
2-Chloronaphthalene	0.4
2-Chlorophenol	0.4
4-Chlorophenyl Phenyl Ether	0.4
4-Chloro-3-Methyl Phenol	0.4
Chrysene	0.4
Dibenzofuran	0.4
Dibenz(A,H)Anthracene	0.4
1,2-Dichlorobenzene	0.4
1,3-Dichlorobenzene	0.4
1,4-Dichlorobenzene	0.4
3,3-Dichlorobenzidine	2
2,4-Dichlorophenol	0.4
2,6-Dichlorophenol	0.4
Diethyl Phthalate	0.4
7,12-Dimethyl Benz(A)Anthracene	2
3,3-Dimethyl Benzidine	2

Part 1: Continued

<u>PARAMETER</u>	<u>EQL (mg/kg)</u>
Dimethyl Phthalate	0.4
P-Dimethylaminoazobenzene	0.4
2,4-Dimethylphenol	0.4
1,3-Dinitrobenzene	0.4
2,4-Dinitrotoluene	2
2,6-Dinitrotoluene	0.4
Dinoseb	0.4
Diphenylamine	0.4
Di-N-Butyl Phthalate	0.4
Di-N-Octyl Phthalate	0.4
Ethyl Methanesulfonate	0.4
Fluoranthene	0.4
Fluorene	0.4
Hexachlorobenzene	0.4
Hexachlorobutadiene	0.4
Hexachlorocyclopentadiene	0.4
Hexachloroethane	0.4
Hexachloropropane	0.4
Indeno(1,2,3-Cd)Pyrene	0.4
Isophorone	0.4
Safrole	0.4
Methyl Methanesulfonate	0.4
3-Methylcholanthrene	0.4
2-Methylnaphthalene	0.4
2-Methylphenol	0.4
3&4 Methylphenol	0.4
2-Methyl-4,6-Dinitrophenol	0.4
Naphthalene	0.4
1,4-Naphthoquinone	0.4
1-Naphthylamine	0.4
2-Naphthylamine	0.4
2-Nitroaniline	0.4
3-Nitroaniline	0.4
4-Nitroaniline	0.4
Nitrobenzene	0.4
2-Nitrophenol	0.4
4-Nitrophenol	0.4
N-Nitrosodi-N-Butyl Amine	2
N-Nitrosomorpholine	0.4
N-Nitrosopyrrolidine	0.4
N-Nitroso-N-Propylamine	0.4

Part 1: Continued

<u>PARAMETER</u>	<u>EQL (mg/kg)</u>
5-Nitro-O-Toluidine	0.4
Pentachlorobenzene	0.4
Pentachlorophenol	0.4
Phenacetin	0.4
Phenanthrene	0.4
Phenol	0.4
2-Picoline	0.4
Pronamide	0.4
Pyrene	0.4
1,2,4,5-Tetrachlorobenzene	0.4
2,3,4,6-Tetrachlorophenol	0.4
O-Toluidine	2
1,2,4-Trichlorobenzene	0.4
2,4,5-Trichlorophenol	0.4
2,4,6-Trichlorophenol	0.4

Part 2: Organochlorine Pesticides - U.S. EPA Methods 608 and 8080; OEPA 590.1

<u>PARAMETER</u>	<u>EQL (ug/kg)</u>
Aldrin	4
a-BHC	4
b-BHC	4
y-BHC	4
d-BHC	4
Chlordane, Total	NA
Cis-Chlordane	4
Trans-Chlordane	4
Cis-Nonachlor	4
Trans-Nonachlor	4
Oxychlordane	4
4,4'-DDD	4
4,4'-DDE	4
4,4'-DDT	4
Dieldrin	4
Endosulfan I	4
Endosulfan II	4
Endosulfan Sulfate	4
Endrin	4
Endrin Aldehyde	4
Heptachlor	4
Heptachlor Epoxide	4
Hexachlorobenzene	4
Methoxychlor	4
Mirex	4

Part 3: Polychlorinated Biphenyl (PCB) - U.S. EPA Methods 608 and 8080; OEPA 590.1

<u>PARAMETER</u>	<u>EQL (ug/kg)</u>
PCB 1016	20
PCB 1221	20
PCB 1232	20
PCB 1242	20
PCB 1248	20
PCB 1254	20
PCB 1260	20

Part 4: Metals - U.S. EPA Method 245.2; OEPA 438.1

<u>PARAMETER</u>	<u>EQL (ug/gm)</u>
T-Hg	0.048