

**LITTLE SEWICKLEY CREEK
ALLEGHENY COUNTY**

**WATER QUALITY STANDARDS REVIEW
STREAM REDESIGNATION EVALUATION REPORT**

**Segment: Basin
Stream Code: 36657
Drainage List W**

**WATER QUALITY MONITORING SECTION (MAB)
DIVISION OF WATER QUALITY STANDARDS
BUREAU OF CLEAN WATER
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

February 2016

INTRODUCTION

The Department of Environmental Protection (Department) conducted an evaluation of the Little Sewickley Creek basin for redesignation in response to a petition submitted to the Environmental Quality Board (EQB) by Duquesne University's Center for Environmental Research and Education dated October 1, 2012. The EQB accepted the petition for further study on November 20, 2012 and notice of a stream redesignation evaluation was published in the PA Bulletin on March 9, 2013. The petition requests the Little Sewickley Creek basin from its source to its mouth be redesignated to Exceptional Value (EV). The Little Sewickley Creek basin is currently designated High Quality-Trout Stocking (HQ-TSF). Department staff conducted an aquatic life use survey of the Little Sewickley Creek basin on March 12-13, 2013.

GENERAL WATERSHED DESCRIPTION

Little Sewickley Creek is a relatively small, cool and shallow first-order tributary to the Ohio River at river mile 27.14. Little Sewickley drains portions of Leet Township; and the Boroughs of Leetsdale, Edgeworth, Bell Acres, Sewickley Heights, Sewickley Hills, and Franklin Park in Allegheny County. The Little Sewickley basin drains 9.6 square miles and 18.59 stream miles (Figure 1). Little Sewickley Creek is located on the Ambridge and Emsworth 7.5-minute series USGS quadrangle maps. Land use consists of 14% low density residential and is 69.6% forested, with the rest of the land use consisting of pasture or crop lands.

WATER QUALITY AND USES

Surface Water

No long-term water quality data were available from the Little Sewickley Creek basin that would allow a direct comparison to water quality criteria. The Department collected chemical and biological data from the Little Sewickley study area during site visits on March 12-13, 2013. There are a total of 22 NPDES permits within the petitioned basin. Of the 22 permits 10 of them are stormwater and 6 are sewage treatment plants (STPs). At the time of sampling, three of the Bell Acres Municipal Authority STPs that discharge into the Little Sewickley basin were in a state of disrepair and have had routine overflows and violations of effluent limits. On July 5, 2012 the Department approved an Act 537 sewage plan to pump sewage to Leetsdale Municipal Authority STP. (K. Hallaron, personal communication, October 19, 2012) Additionally, on September 21, 2012 the Department issued a compliance order to Quaker Valley Recreation Association and Quaker Valley School District for failing to implement or maintain erosion and sediment control best management practices at their Legacy Fields at Bouchard Family Park construction site. Failure to implement or maintain erosion and sediment controls had the potential to lead to sediment pollution to an unnamed tributary to Little Sewickley Creek.

Water Chemistry

A single water chemistry grab sample was collected from one location (5LSC), the farthest downstream location within the petitioned basin. Field chemistry data was collected from five sampling locations. Field chemistry and grab sample data indicate elevated specific conductance throughout the basin and elevated total dissolved solids (TDS) at 5LCS, due in part to elevated Chloride (110.9 MG/L) and Strontium (167 UG/L) (Table 2). No recent precipitation events had occurred prior to sampling, thus indicating that elevated dissolved solids and other constituents could be from point source discharges or other unpermitted discharges.

Aquatic Biota

The indigenous aquatic community is an excellent indicator of long-term water quality conditions and is used as a measure of water quality. Department staff collected habitat and benthic macroinvertebrate data at five Little Sewickley Creek basin locations and from one station on the EV references station UNT to North Fork Dunkard Fork Creek (UNT to NFDF) on March 13, 2013 (Table 1, Figure 1)

Habitat. Instream habitat was assessed at each station within the petitioned basin and at the UNT to NFDF reference station. The habitat evaluation consists of rating twelve habitat parameters to derive an overall station habitat score. The habitat scores for the five Little Sewickley Creek basin stations ranged from 165 to 209, reflecting sub-optimal to optimal habitat conditions (Table 3). All stations, except 2UNTLSC, had reduced scores associated with sediment deposition.

Benthos. Benthic samples were collected from five stations in the Little Sewickley Creek basin and from UNT to NFDF Creek on March 12-13, 2013. All of the benthic macroinvertebrate samples collected followed the Department's antidegradation sampling methodology, which is a modification of EPA's Rapid Bioassessment Protocols (Plafkin, et al. 1989; Barbour et al. 1999). Taxonomic diversity was poor at all sampling sites in the Little Sewickley Creek basin (Table 4). All five samples were dominated by pollution tolerant and facultative macroinvertebrates. Due to the poor macroinvertebrate diversity and high number of pollution tolerant taxa, Little Sewickley Creek will be listed in the Pennsylvania Integrated Water Quality Monitoring and Assessment Report as impaired for the aquatic life use.

BIOLOGICAL USE QUALIFICATIONS

The biological use qualifying criteria applied to Little Sewickley Creek was the DEP integrated benthic macroinvertebrate scoring test described at 25 Pa. Code §93.4b(b)(1)(v). Selected benthic macroinvertebrate community metrics from the petitioned basin (Table 5) were compared to those from a reference stream with a comparable drainage area. All stations were compared with a reference station collected on an unnamed riffle-run tributary to North Fork Dunkard Fork in Greene

County (Table 5). The station on UNT to NFDF has served as an EV reference stream in several other Departmental surveys. The comparisons were done using the following metrics that were selected as being indicative of community health: taxa richness; modified EPT index; modified Hilsenhoff Biotic Index; percent dominant taxa; and percent modified mayflies.

Based on these five metrics, candidate stations had Biological Condition Scores (BCS) that ranged from 1% (4UNTLSC) to 45% (5LSC) (Table 4). As a result, these candidate stations do not meet the 92% comparison standard required to qualify as Exceptional Value Waters (§93.4b (b)(1)(v)).

PUBLIC RESPONSE AND PARTICIPATION SUMMARY

The Department provided public notice of this designation evaluation and requested any technical data from the general public through publication in the Pennsylvania Bulletin on March 9, 2013 (43 Pa.B. 1373). In addition, all townships and boroughs were notified of the redesignation evaluation in a letter dated March 1, 2013 and a notice of intent to assess was published in the Pittsburg Post-Gazette on March 21, 2013.

Final Draft Notice, Comments and Response. Once the final draft report was completed, it was made available to the petitioner, all municipalities, County Planning Commissions, County Conservation Districts and other State Agencies with effected streams on December 15, 2015 with an initial public comment period ending 30-days later. Six comment letters were received, all acknowledging the issues contributing to the impairment of the Little Sewickley basin.

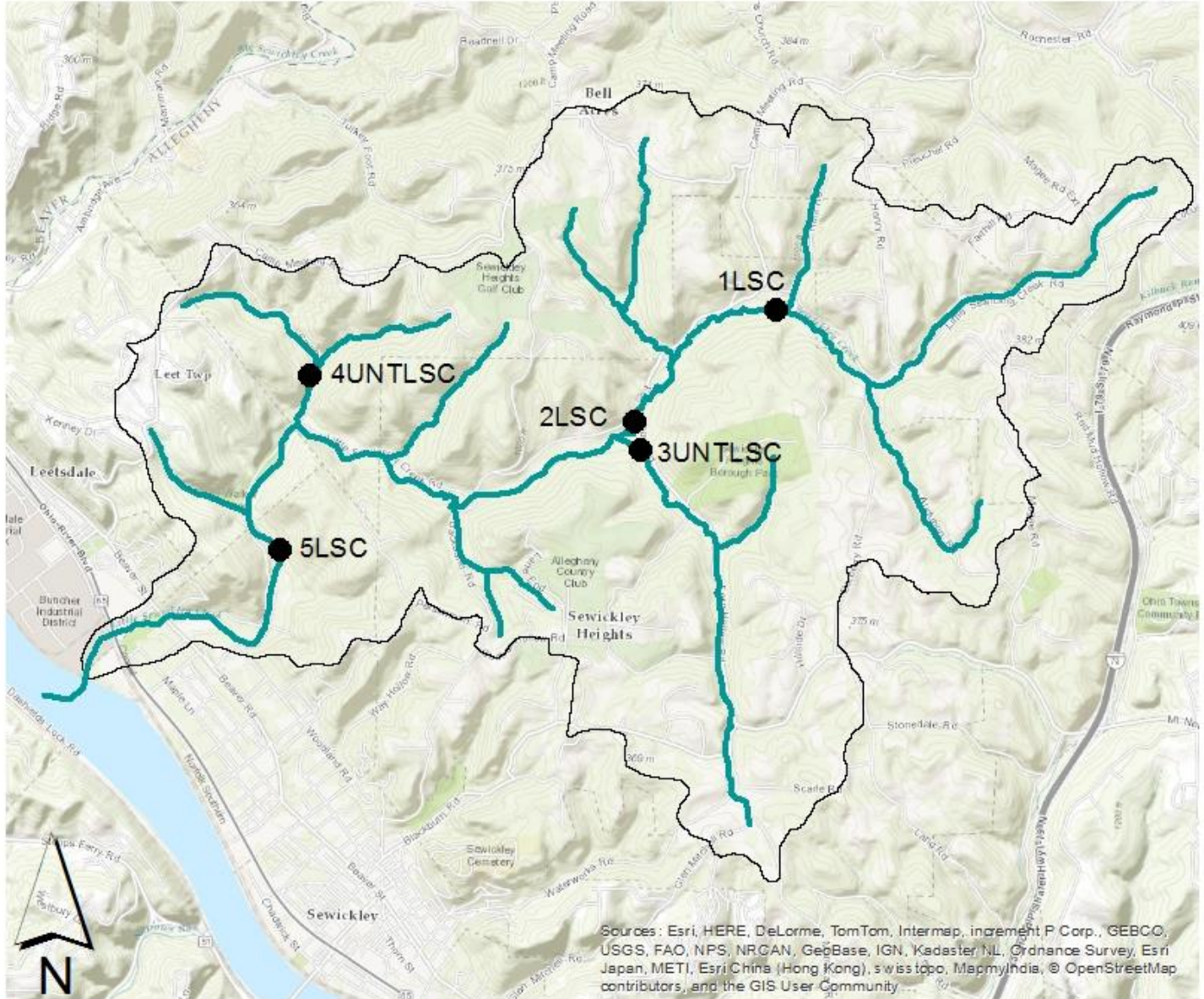
RECOMMENDATION

Based on applicable regulatory definitions and requirements of § 93.4b, the Department does not recommend the Little Sewickley Creek basin, from its source to mouth, be designated in Chapter 93 as Exceptional Value (EV) and shall retain its High Quality-Trout Stocking (HQ-TSF) designated use. This recommendation is based on biological condition not scoring greater than 92% of the reference station score (§93.4b(b)(1)(v)). Additionally, due to the poor macroinvertebrate diversity and high number of pollution tolerant taxa, the Little Sewickley Creek basin will be listed in the Pennsylvania Integrated Water Quality Monitoring and Assessment Report as impaired for the aquatic life use.

REFERENCES

- Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water; Washington, D.C.
- Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross, and R.M. Hughes. 1989. Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish. U.S. Environmental Protection Agency, Office of Water Regulation and Standards, Washington, D.C. EPA 440-4-89-001.

FIGURE 1 STATION LOCATIONS LITTLE SEWICKLEY CREEK ALLEGHENY COUNTY



Designated Use Streams

— High Quality - Trout Stocking

Petitioned Area



Station Locations



TABLE 1
STATION LOCATION
LITTLE SEWICKLEY CREEK, ALLEGHENY COUNTY
UNT TO NORTH FORK DUNKARD FORK CREEK, GREENE COUNTY (REFERENCE)
March 12-13, 2013

<u>STATION</u>	<u>LOCATION</u>	<u>COORDINATES</u>
1LSC	Little Sewickley Creek	40.580425, -80.147535
2LSC	Little Sewickley Creek above UNT to Little Sewickley Creek	40.572813, -80.159082
3UNTLSC	UNT to Little Sewickley Creek	40.570509, -80.158246
4UNTLSC	UNT to Little Sewickley Creek	40.573714, -80.188022
5LSC	Little Sewickley Creek along Woodland Rd Extended	40.561922, -80.190487
UNT to NFDF	UNT to North Fork Dunkard Fork at Ryerson State Park	39.882217, -80.440598

TABLE 2
WATER CHEMISTRY
LITTLE SEWICKLEY CREEK, ALLEGHENY COUNTY
March 12-13, 2013

FIELD PARAMETER	1LSC	2LSC	3UNTLSC	4UNTLSC	5LSC
pH	48	44	48	56	44
SPECIFIC CONDUCTANCE (uS/cm)	563	-	564	655	571.5
DISSOLVED O ² (mg/L)	14.37	-	14.23	14.2	14.41
TEMPERATURE (°C)	6.1	-	5.6	5.8	6
LAB PARAMETER	1LSC	2LSC	3UNTLSC	4UNTLSC	5LSC
ACIDITY	-	-	-	-	-63.40 MG/L
ALKALINITY	-	-	-	-	70.4 MG/L
ALUMINUM, DISSOLVED	-	-	-	-	<200.0 UG/L
ALUMINUM, TOTAL	-	-	-	-	32.600 UG/L
AMMONIA TOTAL AS NITROGEN	-	-	-	-	<.02 MG/L
ARSENIC, DISSOLVED	-	-	-	-	<3.0 UG/L
ARSENIC, TOTAL	-	-	-	-	<3.0 UG/L
BARIUM, TOTAL	-	-	-	-	46.000 UG/L
BROMIDE	-	-	-	-	<0.2 MG/L
CADMIUM, DISSOLVED	-	-	-	-	<.20 UG/L
CADMIUM, TOTAL	-	-	-	-	<0.2 UG/L
CALCIUM, TOTAL	-	-	-	-	38.200 MG/L
CHLORIDE, TOTAL	-	-	-	-	110.9 MG/L
CHROMIUM, TOTAL	-	-	-	-	<50 UG/L
COPPER, DISSOLVED	-	-	-	-	<4 UG/L
COPPER, TOTAL	-	-	-	-	<4 UG/L
HARDNESS TOTAL (CALCULATED)	-	-	-	-	136 MG/L
IRON, DISSOLVED	-	-	-	-	<20 UG/L
IRON, TOTAL	-	-	-	-	37.000 UG/L
LEAD, DISSOLVED	-	-	-	-	<1.0 UG/L
LEAD, TOTAL	-	-	-	-	<1.0 UG/L
MAGNESIUM, TOTAL	-	-	-	-	9.860 MG/L
MANGANESE, TOTAL	-	-	-	-	11.000 UG/L
MOLYBDENUM, TOTAL	-	-	-	-	<70 UG/L
NICKEL, DISSOLVED	-	-	-	-	<4.0 UG/L
NICKEL, TOTAL	-	-	-	-	<4.0 UG/L
NITRATE AS NITROGEN	-	-	-	-	0.93 MG/L
NITRITE NITROGEN, TOTAL	-	-	-	-	<.01 MG/L
PH, LAB (ELECTROMETRIC)	-	-	-	-	8.0 pH units
PHOSPHORUS, TOTAL AS P	-	-	-	-	<.01 MG/L
SPECIFIC CONDUCTANCE	-	-	-	-	566.00 umhos/cm
STRONTIUM, TOTAL	-	-	-	-	167.000 UG/L
SULFATE TOTAL	-	-	-	-	37.3 MG/L
TOTAL DISSOLVED SOLIDS	-	-	-	-	336 MG/L
TOTAL SUSPENDED SOLIDS	-	-	-	-	<5 MG/L
ZINC, DISSOLVED	-	-	-	-	<5.0 UG/L
ZINC, TOTAL	-	-	-	-	5.800 UG/L

TABLE 3
HABITAT ASSESSMENT SUMMARY
LITTLE SEWICKLEY CREEK, ALLEGHENY COUNTY
UNT TO NORTH FORK DUNKARD FORK, GREENE COUNTY (REFERENCE)
March 12-13, 2013

PARAMETER	Scoring Range	1LSC	2UNTLSC	3UNTLSC	4LSC	5LSC	UNT to NDFD
1. instream cover	0-20	17	18	18	10	12	15
2. epifaunal substrate	0-20	14	17	16	14	18	16
3. embeddedness	0-20	16	15	17	15	13	18
4. velocity/depth	0-20	17	16	14	11	15	14
5. channel alterations	0-20	18	19	18	16	19	18
6. sediment deposition	0-20	11	16	10	10	12	19
7. riffle frequency	0-20	13	17	13	14	18	19
8. channel flow status	0-20	19	19	19	19	20	20
9. bank condition	0-20	15	15	10	10	14	17
10. bank vegetative protection	0-20	15	18	18	18	20	17
11. grazing/disruptive pressures	0-20	18	19	20	16	19	20
12. riparian vegetation zone width	0-20	14	20	20	12	20	20
Total Score	0-240	187	209	193	165	200	213
Rating ¹		SUB-OPT	OPT	OPT	SUB-OPT	OPT	OPT

¹ - OPT = Optimal (192 - 140)
SUB-OPT = (132-180)

TABLE 4
SEMI-QUANTITATIVE BENTHIC MACROINVERTEBRATE DATA
LITTLE SEWICKLEY CREEK, ALLEGHENY COUNTY
UNT TO NORTH FORK DUNKARD FORK, GREENE COUNTY (REFERENCE)
March 12-13, 2013

ORDER	GENUS (or lowest level taxonomic ID)	5LSC	4UNTLSC	3UNTLSC	2LSC	1LSC	UNT to NFDF
Ephemeroptera	<i>Ameletus</i>						13
	<i>Baetis</i>	4		7	1	5	1
	<i>Dipheter</i>						4
	<i>Epeorus</i>	2	1	1			53
	<i>Ephemerella</i>	7		102	5	5	28
	<i>Eurylophella</i>	2				1	
	<i>Paraleptophlebia</i>						1
Odonata	<i>Stylogomphus</i>						1
Plecoptera	<i>Strophopteryx</i>						3
	<i>Taenionema</i>	4		7	7	1	
	<i>Amphinemura</i>	2		6	3	5	12
	<i>Ostrocerca</i>						2
	<i>Prostoia</i>	7		6	9	4	
	<i>Leuctra</i>						1
	<i>Acroneuria</i>						1
	<i>Isoperla</i>						4
	<i>Alloperla</i>	1					
	<i>Haploperla</i>						21
	<i>Sweltsa</i>						9
Megaloptera	<i>Nigronia</i>						1
Trichoptera	<i>Chimarra</i>	6				4	
	<i>Dolophilodes</i>	1	2				
	<i>Wormaldia</i>						8
	<i>Polycentropus</i>	1				1	
	<i>Diplectrona</i>	7	19	6	2	1	28
	<i>Ceratopsyche</i>	2		3	1	2	1
	<i>Cheumatopsyche</i>	30	4	2	16	7	
	<i>Hydropsyche</i>	1			5		
	<i>Rhyacophila</i>						1
	<i>Neophylax</i>			2	2		10
Coleoptera	<i>Optioservus</i>	2	5	1	4	6	6
	<i>Stenelmis</i>				1		
Diptera	<i>Clinocera</i>	8		2	3	3	
	<i>Tipula</i>	1	18		1		5
	<i>Antocha</i>	3					

TABLE 4
SEMI-QUANTITATIVE BENTHIC MACROINVERTEBRATE DATA
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UNT TO NORTH FORK DUNKARD FORK, GREENE COUNTY (REFERENCE)
March 12-13, 2013

ORDER	GENUS (or lowest level taxonomic ID)	5LSC	4UNTLSC	3UNTLSC	2LSC	1LSC	UNT to NDFD
	<i>Hexatoma</i>						3
	<i>Limnophila</i>		1				1
	<i>Prosimulium</i>	5	13	19	79	84	7
	<i>Simulium</i>		6	1			
	<i>Chironomidae</i>	70	163	43	73	85	9
Basommatophora	<i>Ancylidae</i>	1			1		
	<i>Oligochaeta</i>	1	1				4
Amphipoda	<i>Gammarus</i>	2	2	1			
Decapoda	<i>Cambarus</i>						1
Trombidiformes	<i>Hydracarina</i>					1	
	Total # Organisms	171	235	209	215	215	239
	Total Taxa Richness	25	12	16	18	16	29

TABLE 5
RBP METRIC COMPARISON
LITTLE SEWICKLEY CREEK, ALLEGHENY CREEK
UNT TO NORTH FORK DUNKARD FORK, GREENE COUNTY (REFERENCE)
March 12-13, 2013

METRIC	STATIONS					REFERENCE
	1LSC	2LSC	3UNTLSC	4UNTLSC	5LSC	UNT to NFDF
TAXA RICHNESS	16	18	16	12	25	29
Cand/Ref (%)	55	62	55	41	86	
Biol. Cond. Score	0	1	0	0	8	8
MOD. EPT INDEX	8	7	8	3	11	16
Cand/Ref (%)	50	44	50	19	69	
Biol. Cond. Score	1	0	1	0	5	8
MOD. HBI	4.02	3.98	2.63	5.08	4.83	1.36
Cand-Ref	2.66	2.62	1.27	3.72	3.47	
Biol. Cond. Score	0	0	1	0	0	8
% DOMINANT TAXA	39.53	36.74	48.8	71.54	40.94	22.18
Cand-Ref	17.35	14.56	26.62	49.36	18.76	
Biol. Cond. Score	3	8	0	0	3	8
% MOD. MAYFLIES	2.79	2.33	49.28	0.4	6.43	39.75
Ref-Cand	36.96	37.42	-9.53	39.35	33.32	
Biol. Cond. Score	1	1	8	1	2	8
TOTAL BIOLOGICAL CONDITION SCORE	5	10	10	1	18	40
% COMPARABILITY TO REFERENCE	13	25	25	3	45	