PINE CREEK
SCHUYLKILL COUNTY

WATER QUALITY STANDARDS REVIEW
STREAM REDESIGNATION EVALUATION

SEGMENT: BASIN

DRAINAGE LIST: F

STREAM CODE: 02269

WATER QUALITY MONITORING SECTION (DSB)
DIVISION OF WATER QUALITY STANDARDS
BUREAU OF WATER STANDARDS AND FACILITY REGULATION
DEPARTMENT OF ENVIRONMENTAL PROTECTION

June 2007

GENERAL WATERSHED DESCRIPTION

Pine Creek flows through Schuylkill County and is a tributary to the Little Schuylkill River in the Delaware River watershed (Figure 1). This basin covers an area of 7.96 square miles and contains 11.4 stream miles. It is located in Delano, Rush, and Ryan Townships, Schuylkill County. The Pine Creek basin currently has the protected water use designation of Cold Water Fishes (CWF). As a result of a petition submitted to the Environmental Quality Board October 5, 2001 by the Friends of Pine Creek, this basin was evaluated for redesignation as Exceptional Value Waters (EV). This report is based on a field survey conducted in January of 2002. See Figure 1 and Table 1 for station locations.

Land use in this basin is a mixture of residential, agriculture, and forest. Hosensock Creek a major tributary of Pine Creek has two small impoundments on it. The boroughs of Park Crest and East Mahanoy are located in this basin. State Route 54 is located in or near the flood plain of the lower third of Pine Creek.

WATER OUALITY AND USES

Surface Water:

No long-term water quality data were available to allow a direct comparison to water quality criteria. A grab sample was collected at Station 4PC near the mouth of Pine Creek during the January 2002 survey (Table 2). This sample indicated that water quality was generally good and comparable to the water chemistry data submitted by the petitioner. Since the instantaneous nature of grab samples precludes comparison to applicable water quality criteria, the indigenous aquatic community is a better indicator of long-term conditions and is used as a measure of ecological significance.

There are no surface water withdrawals for public water supply or NPDES permitted surface water discharges in the candidate basin.

Aquatic Biota:

Habitat assessments and biological samplings were conducted at 5 locations (4 candidate and 1 reference) during the January 2002 survey. The physical habitat assessments revealed that conditions at Stations 1PC, 4PC and Reference Station R1 scored in the Optimal range for benthic macroinvertebrates and fish (Table 3). Stations 2HC and 3PC scored in the Suboptimal range. Habitat scores for the Pine Creek stations ranged from 165 to 191. Lower scoring parameters included lack of an adequate riparian zone, channel alterations, and riffle frequency.

Benthic macroinvertebrate samples were collected using the Department's Antidegradation protocol (adapted from Plafkin's 1989 and Barbour's 1999 Rapid Bioassessment Protocols manuals). Taxonomic diversity was poor at Stations 1PC and 2HC. The upstream station is a headwater situation with a very small drainage area that can limit natural macroinvertebrate community diversity. The two downstream stations had better taxonomic diversity but were still dominated by taxa that are tolerant of organic pollution.

BIOLOGICAL USE QUALIFICATIONS

The biological use qualifying criteria applied to Pine Creek was the integrated benthic macroinvertebrate score test described at § 93.4b(a)(2)(i)(A) and § 93.4b(b)(1)(v). This score is calculated from the macroinvertebrate samples referenced above. Following the Department's Antidegradation protocol, a 200-count subsample was randomly selected from the total sample and enumerated (Table 4). Selected benthic macroinvertebrate community metrics were generated from these subsamples. Candidate station metrics were compared to Pine Creek (01701) a reference stream with a comparable drainage area (Table 5). This reference stream has a protected use designation of EV and is a tributary to Manatawny Creek located in Berks County. All sampling was conducted on the same day to minimize the effects of seasonal variation. This comparison was done using the following metrics which were selected as being indicative of community health: taxa richness; modified EPT index (total number of intolerant Ephemeroptera, Plecoptera, and Trichoptera taxa); modified Hilsenhoff Biotic Index; percent dominant taxon; and percent modified mayflies.

Based on these five metrics, none of the stations in the Pine Creek basin had biological condition scores greater than 83% of the reference station score and as a result do not qualify for either an EV or HQ-CWF use designation under the Department's regulatory criteria (§ 93.4b(b)(1)(v) and § 93.4b(a)(2)(i)(A)).

PUBLIC RESPONSE AND PARTICIPATION SUMMARY

The Department provided public notice of this redesignation evaluation and requested any technical data from the general public through publication in the Pennsylvania Bulletin on April 27, 2002 (32 Pa.B 2162). A similar notice was also published in the Pottsville Republican on April 26, 2002. In addition, Delano, Rush, and Ryan Townships along with the Schuylkill County Planning and Zoning Commission and the Northeastern Schuylkill Joint Municipal Authority, were all notified of the evaluation in a letter dated March 12, 2002.

In response to these notifications, the Rush Township Environmental Council submitted a report prepared by Skelly and Loy and excerpts from a second report prepared by Kimball and Associates, Inc. for the Schuylkill Conservation District. The Skelly and Loy report contained information on instream habitat, water chemistry, and the benthic macroinvertebrate community. Water chemistry data was collected in Fall 1998, Spring 1999, Spring 2000 and Fall 2000. Benthic macroinvertebrates were collected in the Spring of 1999 and 2000. An assessment of the instream and riparian habitat was conducted in the Fall of 2001. The second report contained data on two water chemistry parameters pH and CaCO3. These were listed as averages of four samples collected over the period December 1998 through October 2000.

The Pine Creek report and the original recommendation (June 2007) for no change to the Cold Water Fishes (CWF) designated use were made available to stakeholders and the public for public review and comment on DEP's web page. Local municipalities, the Schuylkill County Planning & Zoning Commission, and the Schuylkill Conservation District were notified of the web report avaailability by postal mail. No comments were received in response to this web posting.

RECOMMENDATIONS

Based on applicable regulatory definitions and requirements of § 93.4b, the Department recommends no change to the use designation of the Pine Creek basin.

REFERENCES

Plafkin, JL, MT Barbour, KD Porter, SK Gross, & RM Hughes. 1989. Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish. United States Environmental Protection Agency. EPA/444/4-89-001

Barbour, MT, J. Gerritsen, BT Snyder, and JB Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition. United States Environmental Protection Agency. EPA/841/B-99-002.

TABLE 1
STATION LOCATIONS
PINE CREEK
SCHUYLKILL COUNTIY

STATION	LOCATION
1PC	Unnamed Tributary to Pine Creek (02275); approximately 160 meters upstream of the mouth. Rush Township, Schuylkill County. Lat: 40 49 23 Long: 76 02 52 RM: 0.15
2HC	Hosensock Creek (02273); approximately 20 meters downstream of the SR054 crossing. Ryan Township, Schuylkill County. Lat: 40 48 52 Long: 76 02 42 RM: 0.12
3PC	Pine Creek; approximately 30 meters downstream of the SR054 bridge. Rush Township, Schuylkill County. Lat: 40 48 56 Long: 76 01 45 RM: 1.80
4PC	Pine Creek; approximately 230 meters upstream of the mouth Rush Township, Schuylkill County. Lat: 40 49 18 Long: 76 00 21 RM: 0.12
R1	Pine Creek (01701) approximately 30 meters upstream of the T848 bridge. Pike Township, Berks County Lat: 40 24 45 Long: 75 44 01 RM: 0.52

TABLE 2
WATER CHEMISTRY[1]
PINE CREEK
SCHUYLKILL COUNTY
JANUARY 29, 2002

STATION	4PC
Field Parameters	
Temp (°C)	4.7
pH	6.7
Laboratory Parameters	
pH	6.1
Alkalinity	30
Acidity	10.4
Hardness	41
T Diss. Sol.	< 2
Susp.Sol.	16
NH_3-N	<0.02
NO_2-N	0.12
NO_3-N	1.70
Total P	0.04
Ca	12
Mg	2.64
Cl	30
SO_4	<20
As*	< 4.0
As Diss	< 4.0
Cd*	< 0.2
Cd Diss	< 0.2
hex Cr*	<10
Cr*	<50
Cu*	< 4.0
Cu Diss	< 4.0
Fe*	90
Pb*	< 1.0
Pb Diss	< 1.0
Mn*	20
Ni*	< 4.0
Ni Diss	< 4.0
Zn*	8.1
Zn Diss	7.7
Al*	36
fecal coliforms	60

[1] - Except for pH & conductance and indicated otherwise, all values are total concentrations in mg/l

* - Total concentrations in µg/l

TABLE 3
HABITAT ASSESSMENT SUMMARY
PINE CREEK
SCHUYLKILL COUNTY
JANUARY 29, 2002

HABITAT PARAMETER	STATIONS[1]				
	1PC	2HC	3PC	4PC	R1
1. instream cover	17	14	15	18	17
2. epifaunal substrate	16	13	17	18	18
3. embeddedness	17	13	14	17	16
4. velocity/depth	12	12	15	14	15
5. channel alterations	17	10	16	12	16
6. sediment deposition	18	13	17	17	17
7. riffle frequency	15	12	13	18	17
8. channel flow status	14	16	14	15	12
9. bank condition	16	17	16	16	12
10. bank vegetation protection	17	18	17	17	14
11. grazing/disruptive pressures	18	16	18	17	17
12. riparian vegetation zone width	14	11	13	12	15
Total Score	191	165	185	191	186
Rating[2]	OPT	SUB	SUB	OPT	OPT

[1] Refer to Figure 1 and Table 1 for station locations.

[2] OPT = Optimal; SUB = Suboptimal

TABLE 4
SEMI QUANTITATIVE BENTHIC MACROINVERTEBRATE DATA
PINE CREEK
JANUARY 29, 2002

TAXA	STATION				
	1PC	2PC	3PC	4PC	R1
Ephemeroptera (mayflies)					
Baetidae; *Baetis*	1		1		4
Ephemerellidae; *Ephemerella*	3		3	4	28
Eurylophella	2	1	1		
Serratella			33	7	2
Heptageniidae; *Epeorus*	4				57
Rhithrogena					1
Stenonema		6	4	1	7
Isonychidae; *Isonychia*					1
Leptophlebiidae; *Paraleptophlebia*			1		7
Plecoptera (stoneflies)					
Capniidae; *Allocapnia*				4	1
Chloroperlidae; *Sweltsa*				1	
Nemouridae; *Amphinemura*	1				
Prostoia					23
Perlidae; *Acroneuria*			4	12	3
Pargnetina				3	2
Taeniopterygidae; *Taeniopteryx*		2	2		
Strophopteryx				2	16
Tricoptera (caddisflies)					
Glossosomatidae; *Glossosoma*					2
Hydropsychidae; *Cheumatopsyche*	3	10	3	6	10
Diplectrona	3		2		
Hydropsyche		14	17	29	12
Lepidostomatidae; *Lepidostoma*	1				
Limnephilidae; *Pycnopsyche*	1				
Philopotamidae; *Chimarra*			24	18	1
Dolophilodes	2				6
Polycentropidae; *Polycentropus*				3	1
Rhyacophilidae; *Rhyacophila*	10			1	8
Uenoidae; *Neophylax*		3	1	1	1
Diptera (true flies)					
Athericidae; *Atherix*					1
Empididae; *Clinocera*		1			
Simuliidae; *Prosimulium*	87	9	15	8	4
Simulium		56		1	
Tipulidae; *Antocha*				1	
Dicranota					3
Hexatoma					1
Tipula	1				
Ceratopogonidae; *Probezzia*	2				
Chironomidae	87	99	87	69	14

TABLE 4 CONTINUED

TAXA	STATION				
	1PC	2PC	3PC	4PC	R1
Megaloptera (dobson-, fishflies)					
Corydalidae; *Nigronia*		1	1	4	
Odonata (dragon-, damselflies)					
Gomphidae; *Lanthus*	4				
Stylogomphus				1	
Coleoptera (aquatic beetles)					
Elmidae; *Optioservus*		1		1	1
Oulimnius	4		2		1
Psephenidae; *Psephenus*			2	11	3
Non-Insect Taxa					
Cambaridae		1			
Asselidae; *Caecidotea*		2			
Oligochaeta		1	4	1	
Ancylidae; *Ferrissia*			1		
Number of individuals	216	207	208	189	221

TABLE 5
RBP METRIC COMPARISON
PINE CREEK, SCHUYLKILL COUNTY

METRIC	STATIONS				
	1PC	2HC	3PC	4PC	R1
1. TAXA RICHNESS	17	15	20	23	29
Cand/Ref (%)	59	52	69	79	xxx
Biol. Cond. Score	0	0	5	7	8
2. MOD. EPT INDEX	9	4	10	11	17
Cand/Ref (%)	53	24	59	65	xxx
Biol. Cond. Score	1	0	3	4	8
3. MOD. HBI	3.72	5.57	4.41	4.37	2.05
Cand-Ref	1.67	3.52	2.36	2.32	xxx
Biol. Cond. Score	0	0	0	0	8
4. % DOMINANT TAXA	40	48	42	36	26
Cand-Ref	14	22	16	10	xxx
Biol. Cond. Score	6	1	4	8	8
5. % MOD. MAYFLIES	4	3	20	6	47
Ref-Cand	43	44	27	41	xxx
Biol. Cond. Score	0	0	4	0	8
TOTAL BIOLOGICAL CONDITION SCORE	7	1	16	19	40
% COMPARABILITY TO REFERENCE	18	3	40	48	

FIGURE 1.
PINE CREEK