

**UNNAMED TRIBUTARY TO TOHICKON CREEK
(BOG RUN)**

BUCKS COUNTY

**WATER QUALITY STANDARDS REVIEW
STREAM EVALUATION REPORT**

**Segment: Basin
Stream Code: 03181
Drainage List: E**

**WATER QUALITY MONITORING SECTION
WATER QUALITY DIVISION
BUREAU OF CLEAN WATER
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

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2024

INTRODUCTION

The Department of Environmental Protection (DEP) conducted an evaluation of the Unnamed Tributary (UNT) to Tohickon Creek, locally known as Bog Run, basin in response to a National Pollutant Discharge Elimination System (NPDES) permit (PA0594121) renewal for the Rockhill Quarry (aka Hanson Quarry) located within the UNT to Tohickon Creek basin. The UNT to Tohickon Creek basin is currently designated Trout Stocking, Migratory Fishes (TSF, MF). Components of this evaluation include discrete physicochemical data collection and a review of the exceptional ecological significance qualification.

The stream redesignation process begins with an evaluation of the “existing uses” and the “designated uses” of a stream. “Existing uses” are water uses actually attained in the waterbody. Existing uses are protected through permit or approval actions taken by the DEP. “Designated uses” are water uses identified in regulations that protect a waterbody. Candidates for stream redesignation may be identified by the DEP based on routine waterbody investigations or based on requests initiated by other agencies or from the general public through a rulemaking petition to the Environmental Quality Board (EQB).

GENERAL WATERSHED DESCRIPTION

The UNT to Tohickon Creek is a second order tributary to Tohickon Creek located at River Mile 21.60. The UNT to Tohickon Creek basin is located in Richland, East Rockhill, West Rockhill and Haycock townships, Bucks County. The basin has a drainage area of approximately 4.88 square miles and consists of 4.73 stream miles. The land cover within the basin consists of deciduous forest (70%), woody wetlands (9%), developed open space (8%) and pasture/hayfields (7%) (Dewitz 2019). Within the UNT to Tohickon Creek basin is the Quakertown Swamp, a 400-acre wetland that encompasses most of the riparian corridor. The Rockhill Quarry had a single NPDES permit and was one of nine NPDES permits within the basin. Currently, the Rockhill Quarry is inactive. Active NPDES permits include and five sewage permits.

WATER QUALITY

Discrete Physicochemical

Discrete physicochemical data were at a single station located near the mouth once in 2015 and again in 2020 (Table 1, Figure 1). The total iron result (2,130 ug/L) from the 2020 sample exceeds the water quality criterion (1,500 ug/L) in 25 Pa. Code § 93.7 and is more elevated than the 2015 result (672 ug/L). In addition, other concentrations of parameters indicate some degree of anthropogenic influence is occurring within the basin. Additional physicochemical data collection efforts were completed in 2021. These efforts started in July 2021 and ended in December 2021 (Table 2). Total iron concentrations were higher than the water quality criterion (1,500 ug/L) in 25 Pa. Code § 93.7 during the July 2021 sampling events; all other samples iron concentrations were below the criterion.

Table 1. Discrete Physicochemical Data – UNT to Tohickon Creek , 2015 and 2020.

	PARAMETER	UNITS	2015	2020
METALS AND IONS	ALUMINUM D	ug/L	-	<15.0
	ALUMINUM T	ug/L	462.0	117.0
	BARIUM T	ug/L	-	19.0
	BORON T	ug/L	-	<200.0
	BROMIDE	ug/L	-	40.66
	CADMIUM D	ug/L	<0.2	<0.2
	CALCIUM T	mg/L	12.3	24.9
	CHLORIDE	mg/L	39.3	29.63
	COPPER D	ug/L	-	<4.0
	COPPER T	ug/L	<10	<4.0
	IRON D	ug/L	-	<100.0
	IRON T	ug/L	672.0	2130.0
	LEAD D	ug/L	-	<1.0
	LEAD T	ug/L	1.09	<1.0
	LITHIUM D	ug/L	-	<25.0
	LITHIUM T	ug/L	-	<25.0
	MAGNESIUM T	mg/L	5.787	12.1
	MANGANESE D	ug/L	-	503.0
	MANGANESE T	ug/L	46.0	528.0
	MERCURY T	ug/L	<0.2	
	NICKEL D	ug/L	-	<50.0
	NICKEL T	ug/L	<50.0	<50.0
	POTASSIUM T	mg/L	-	1.38
	SELENIUM T	ug/L	-	<7.0
	SODIUM T	mg/L	-	10.7
	STRONTIUM T	ug/L	-	88.0
	SULFATE T	mg/L	11.47	13.11
	ZINC D	ug/L	-	<30.0
	ZINC T	ug/L	<10.0	<30.0
NUTRIENTS	AMMONIA D	mg/L	-	0.074
	AMMONIA T	mg/L	<0.02	0.08
	NITROGEN D	mg/L	-	0.64
	NITROGEN T	mg/L	0.34	0.69
	NITRATE & NITRITE D	mg/L	-	0.13
	NITRATE & NITRITE T	mg/L	-	0.13
	ORTHO PHOSPHORUS D	mg/L	-	0.033
	ORTHO PHOSPHORUS T	mg/L	-	0.07
	PHOSPHORUS D	mg/L	-	0.031
	PHOSPHORUS T	mg/L	0.026	0.13
PHYSICAL/OTHER	ALKALINITY	mg/L	32.4	81.0
	CBOD	mg/L	2	-
	COD	mg/L	23.7	-
	HARDNESS	mg/L	55.0	112.0
	OSMOTIC PRES	mosm	-	3.0
	pH	pH units	6.96	7.3
	SPECIFIC COND	µS/cm ^c	213.0	299.0
	TOC	mg/L	-	7.22
	TSS	mg/L	16.0	6.0
	TDS	mg/L	144.0	194.0

"<" indicate concentrations below the reporting limit.

"-" indicate parameter was not tested

Table 2. Discrete Physicochemical Data – UNT to Tohickon Creek, 2021.

	PARAMETER	UNITS	2021				
			7/14	7/23	8/23	11/23	12/21
METALS AND IONS	ALUMINUM D	ug/l	20.4	<15	48.4	<15	<15
	ALUMINUM T	ug/l	242	117	301	111	163
	BARIUM T	ug/l	15	19	14	12	<10
	BORON T	ug/l	<200	<200	<200	<200	<200
	BROMIDE T low-level	ug/l	32.3	40.66	<25	40.71	42.46
	CADMIUM D	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2
	CALCIUM T	mg/l	19.88	24.9	11.4	22.5	27.67
	CHLORIDE T	mg/l	25.18	29.63	16.18	31.86	37.56
	COPPER D	ug/l	<4	<4	<4	<4	<4
	COPPER T	ug/l	<4	<4	<4	<4	<4
	IRON D	ug/l	710	<100	506	352	198
	IRON T	ug/l	1547	2130	1150	971	1087
	LEAD D	ug/l	<1	<1	<1	<1	<1
	LEAD T	ug/l	<1	<1	1.59	<1	<1
	LITHIUM D	ug/l	<25	<25	<25	<25	<25
	LITHIUM T	ug/l	<25	<25	<25	<25	<25
	MAGNESIUM T	mg/l	8.82	12.1	5.15	11.4	13.89
	MANGANESE D	ug/l	57	503	16	79	115
	MANGANESE T	ug/l	84	528	21	83	117
	NICKEL D	ug/l	<50	<50	<50	<50	<50
	NICKEL T	ug/l	<50	<50	<50	<50	<50
	POTASSIUM T	mg/l	1.18	1.38	1.55	1.62	1.26
	SELENIUM D	ug/l	-	-	-	<4	<4
	SELENIUM LOW D	ug/l	<4	-	<4	-	-
	SELENIUM T	ug/l	<4	<7	<4	<4	<4
	SODIUM T	mg/l	13.67	10.7	9.24	12.4	13.7
	STRONTIUM T	ug/l	70	88	42	72	86
	SULFATE T	mg/l	3.97	13.11	6.89	8.99	11.24
	ZINC D	ug/l	<30	<30	<30	<30	<30
	ZINC T	ug/l	<30	<30	<30	<30	<30
NUTRIENTS	AMMONIA-N D	mg/l	0.035	0.074	0.021	0.02	<0.02
	AMMONIA-N T	mg/l	0.03	0.08	0.02	0.02	<0.02
	NITROGEN D	mg/l	0.707	0.64	0.718	0.41	0.329
	NITROGEN T	mg/l	0.71	0.69	0.77	0.37	0.35
	NITRATE & NITRITE D	mg/l	0.06	0.13	<0.05	0.07	0.08
	NITRATE & NITRITE T	mg/l	0.05	0.13	<0.05	0.06	0.07
	ORTHO PHOSPHORUS D	mg/l	0.05	0.033	0.043	0.024	0.016
	ORTHO PHOSPHORUS T	mg/l	0.065	0.07	0.051	0.031	0.024
	PHOSPHORUS D	mg/l	0.059	0.031	0.063	0.022	0.014
	PHOSPHORUS T	mg/l	0.107	0.13	0.097	0.04	0.037
PHYSICAL/OTHER	ALKALINITY	mg/l	71.8	81	39	74.8	92.4
	HARDNESS T (Calculated)	mg/l	86	112	50	103	126
	OSMOTIC PRESSURE	mosm/kg	2	3	NA	4	4
	pH	pH units	7.6	7.3	7.2	7.2	7.4
	SPECIFIC COND	umhos/cm	223	299	144.8	267	320
	TOC	mg/l	10.89	7.22	13.56	5.28	4.35
	TDS	mg/l	170	194	140	164	196
	TSS	mg/l	6	6	<5	<20	<20

"<" indicate concentrations below the reporting limit.

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SURFACE WATERS OF EXCEPTIONAL ECOLOGICAL SIGNIFICANCE

The DEP reviewed information gathered for the Pennsylvania Natural Heritage Program and reported in the Bucks County Natural Heritage Inventory. The Bucks County Natural Heritage Inventory identified an area with statewide ecological significance that is based upon the importance, rarity and uniqueness of the areas' endemic ecological community types. The area, Quakertown Swamp (Figure 1), contains a Bottomland Oak – Hardwood Palustrine Forest Community (The Nature Conservancy 2011), which is a rare and endemic community type hydrologically connected to riverine surface water and therefore, is water quality dependent.

Bottomland oak – hardwood palustrine forest occurs on poorly drained land along the stream valley. It is characterized by white ash (*Fraxinus americana*), green ash (*Fraxinus pennsylvanica*), shagbark hickory (*Carya ovata*), red maple (*Acer rubrum*), American elm (*Ulmus americana*), basswood (*Tilia americana*), swamp white oak (*Quercus bicolor*), pin oak (*Quercus palustris*), and blackgum (*Nyssa sylvatica*). It serves as important habitat for wood frogs (*Rana sylvatica*), spotted salamander (*Ambystoma maculatum*), marbled salamander (*Ambystoma opacum*) and Jefferson salamander (*Ambystoma jeffersonianum*) and provides an important buffer for sediment and other pollution from neighboring development (The Nature Conservancy 2011 and Zimmerman et al. 2012). This palustrine community has a NatureServe state rank of S2, which indicates that it is imperiled in the state because of rarity or some factor(s), making it vulnerable to extirpation (Master et al. 2012 and The Nature Conservancy 2011). The presence of this plant community dependent on water quality or hydrology, its ecological and hydrological importance and rarity in Pennsylvania satisfies the exceptional ecological significance criterion at § 93.4b(b)(2)¹.

PUBLIC NOTICE AND REQUEST FOR TECHNICAL DATA

Evaluation Notice

The DEP provided public notice of this evaluation and requested any technical data from the general public on the DEP website and through publication in the *Pennsylvania Bulletin* on November 2, 2019 (49 Pa.B. 6626). In addition, Bucks County Conservation District, Bucks County, East Rockhill Township, West Rockhill Township and Richland Township were notified of the redesignation evaluation in a letter dated October 31, 2019. In response to the public notice, The Pennsylvania Campaign for Clean Water and the Delaware Riverkeeper Network offered general support for the evaluation and offered additional information to be considered as part of the evaluation.

Final Draft Notice, Comments and Response

Once the final draft report was completed it was made available to affected municipalities, County Planning Commissions, County Conservation Districts, Delaware RiverKeeper Network, Trout Unlimited, the Pennsylvania Game Commission, and the Department of Conservation and Natural Resources in a letter dated October 23, 2021 with a public comment period ending 30-days later. In addition, the DEP provided public notice of the draft report comment period on the DEP's website and in the *Pennsylvania Bulletin* on October 23, 2021 (51 Pa.B. 6704).

All comments received were in support of the redesignation recommendations in the draft report. Comments were received from the PFBC, Heritage Conservancy, PennFuture, East Rockhill Township, Delaware RiverKeeper Network, Pennsylvania Campaign for Clean Water, Pennsylvania Chapter of Native Fish Coalition, and 276 citizens. All comments and data received throughout the public participation opportunities were considered in the evaluation and recommendations.

RECOMMENDATION

The DEP recommends that the UNT to Tohickon Creek (Bog Run) basin be redesignated from Trout Stocking, Migratory Fishes (TSF, MF) to Exceptional Value Waters, Migratory Fishes (EV, MF) based on 25 Pa. Code § 93.4b(b)(2)¹ (exceptional ecological significance).

This recommendation adds 4.73 stream miles with the designation of EV to Chapter 93.

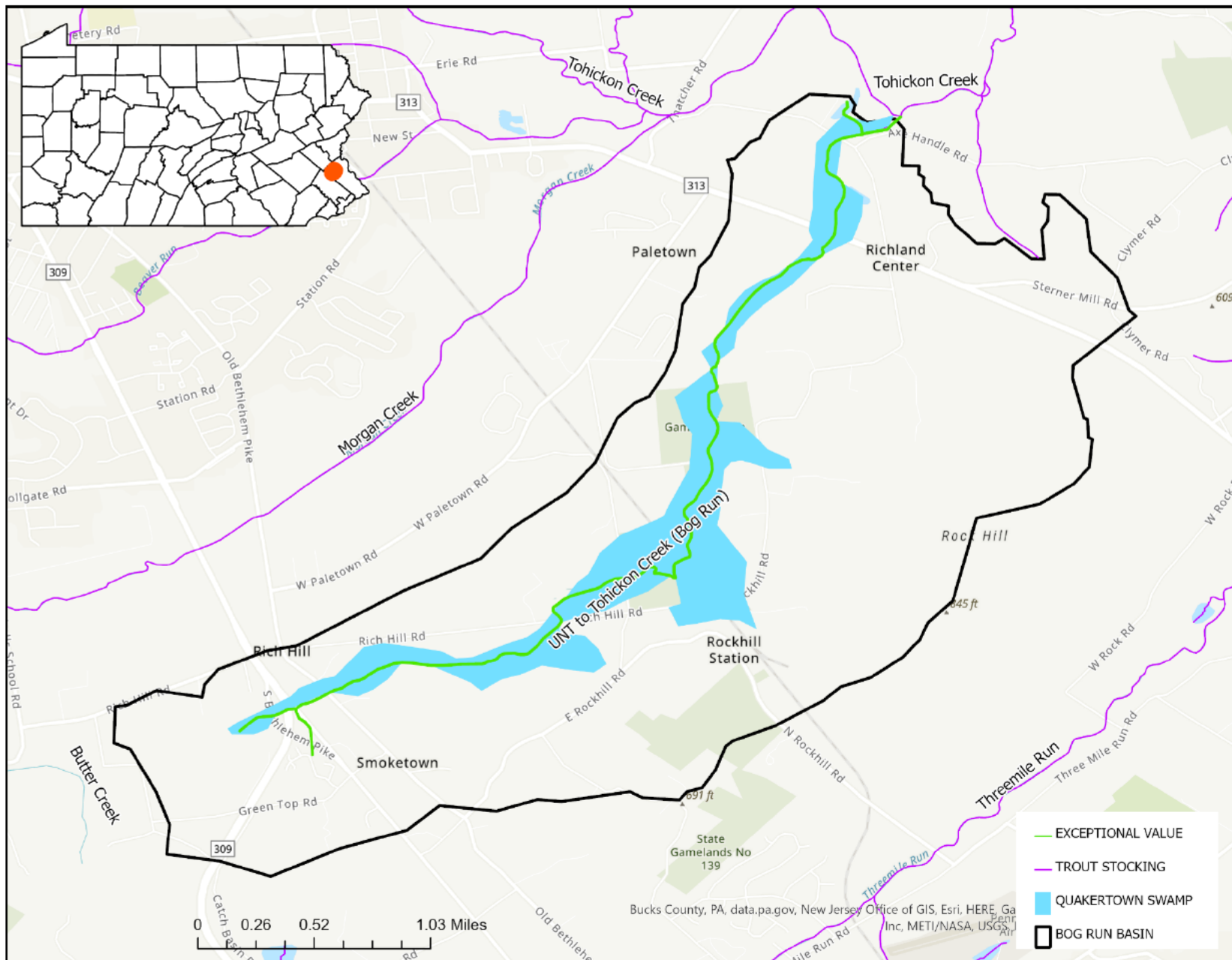


Figure 1. UNT to Tohickon Creek Basin Redesignation Recommendation.

LITERATURE CITED

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