

Tributary Strategy - just for Chesapeake Bay Reg.

Doc. 1

For runoff reduction (RR) BMPs, the EP was assumed to be equal to the runoff removal volume. For stormwater treatment (ST) BMPs, the EP was assumed to be the design volume.

NTM aggregated the BMPs by 1) watershed, 2) municipality, and 3) BMP type (e.g. RR or ST). The total land area (categorized as low, medium, and high density) draining to all BMPs in an aggregated area and the average rainfall capture from all BMPs in the aggregated area were entered in GWLF-E. The sum of ST and RR reductions for each aggregated area was credited to the respective municipality and watershed to arrive at a reduced baseload for each municipality/watershed combination. Data supporting NTM's baseload computations, including the BMP aggregation data, are provided in Appendix C.

In addition to the BMP reductions modeled in *MapShed*, sediment removed by the in-stream sediment trap on Walnut Spring (a tributary to Slab Cabin Run) was subtracted from the Slab Cabin Run total. Records maintained by Borough of State College Department of Public Works, between 2014 and 2017, indicate that on average 64,882 lb./yr. of sediment is removed annually. This amount was subtracted from the load computed with *MapShed* (GWLF-E).

Existing TSS, TN, and TP baseloads for Beaver Branch, Buffalo Run, Spring Creek, and Slab Cabin Run are provided in Table 5, below. It is noted that Beaver Branch is not an impaired stream, but a portion of Ferguson Township's planning area drains to it. Therefore, the Chesapeake Bay Appendix D nutrient and siltation requirements must be met for this stream. It is also noted that the computed loads from the model outputs for Big Hollow, Cedar Run, and the Spring Creek main stem were summed to represent Spring Creek. The total loads presented in Table 5 are apportioned by municipality in tables located in Appendix D.3.

Table 5. Existing Planning Area Loads to Each Watershed = modeled # just incl. stormwater not groundwater

Basin	Existing Sediment Load (lb./yr.)	Required Sediment Reduction (lb./yr.)	Existing Nitrogen Load (lb./yr.)	Required Nitrogen Reduction (lb./yr.)	Existing Phosphorus Load (lb./yr.)	Required Phosphorus Reduction (lb./yr.)
Beaver Branch	100,703	10,070	1,309	39	63	3
Slab Cabin Run	1,344,394	134,439	16,165	485	830	42
Spring Creek	1,028,340	102,834	13,741	412	569	28
Buffalo Run	329,245	32,925	7,059	212	218	11
Total:	2,802,682	280,268	38,274	1,148	1,680	84

E. BMPS TO ACHIEVE THE MINIMUM REQUIRED POLLUTANT LOAD REDUCTION

BMPs evaluated for pollutant load reduction include 1) stream restoration, 2) basin retrofits, and 3) street sweeping. With the exception of street sweeping, the locations of evaluated BMPs are illustrated in Figure 2. The PA DEP recommends that BMP effectiveness values published in PA DEP document 3800-PM-BWC0100m or Chesapeake Bay Program expert panel reports be consulted to compute BMP treatment capacity in pounds per year (lb./yr.).

TMDLs are in the permits + must be met by law

based on modeling but data is in reports

Table 1. MS4 Impaired Waters Requirements

Municipality/ NPDES ID	Description	Chesapeake Bay Nutrients/ Siltation	Spring Creek	Slab Cabin Run	**Logan Branch	Buffalo Run
College Township PAI134803	Impairment	Appendix D - Nutrients Siltation (4a)	Appendix E - Organic Enrichment/Low DO***; Siltation (5)	Appendix E - Siltation	Appendix E - Organic Enrichment/Low DO*** (5) Appendix C - PCB (5)* no required reduction this period	
	Reduction necessary to address impairment	10% sediment 3% TN 5% TP	10% sediment 5% TP	10% sediment	5% TP reduction	
Ferguson Township PAI134805	Impairment	Appendix D - Nutrients Siltation (4a)	Appendix E - Organic Enrichment/Low DO***; Siltation (5)	Appendix E - Siltation		
	Reduction necessary to address impairment	10% sediment 3% TN 5% TP	10% sediment 5% TP	10% sediment		
Harris Township PAI134801	Impairment	Appendix D - Nutrients Siltation (4a)	Appendix E - Organic Enrichment/Low DO***; Siltation (5)			
	Reduction necessary to address impairment	10% sediment 3% TN 5% TP	10% sediment 5% TP			
Patton Township PSI134802	Impairment	Appendix D - Nutrients Siltation (4a)	Appendix E - Organic Enrichment/Low DO*** (5)			Appendix E - Siltation
	Reduction necessary to address impairment	10% sediment 3% TN 5% TP	10% sediment 5% TP			10% sediment
Penn State (Main Campus) PAI134807	Impairment	Appendix D - Nutrients Siltation (4a)	Appendix E - Organic Enrichment/Low DO***; Siltation (5)	Appendix E - Siltation		
	Reduction necessary to address impairment	10% sediment 3% TN 5% TP	10% sediment 5% TP	10% sediment		
Borough of State College PAI134804	Impairment	Appendix D - Nutrients Siltation (4a)	Appendix E - Organic Enrichment/Low DO***; Siltation (5)	Appendix E - Siltation		
	Reduction necessary to address impairment	10% sediment 3% TN 5% TP	10% sediment 5% TP	10% sediment		

(Transcribed from the PA Department of Environmental Protection (PA DEP) MS4 requirements table, as accessed from <http://www.dep.state.pa.us/MS4/index.html> on May 3, 2017.)

* In accordance with the PA DEP PAG-13 Program, pollution control program for Appendix C priority organic compounds, including polychlorinated biphenyls (PCBs), must be implemented upon permit coverage. The first step of this program is to inventory suspected sources of priority organics by 2020.

** Logan Branch is listed as an impaired water in College Township, however, the Township does not have any regulated MS4 facilities (e.g. roads, pipes, ditches, swales) that drain to Logan Branch.

*** Industrial Source (Bellefonte Fish Hatchery) located more than 5 stream miles downstream of the closest regulated outfall in Ferguson Township, Harris Township, Patton Township, Penn State, and the Borough of State College.

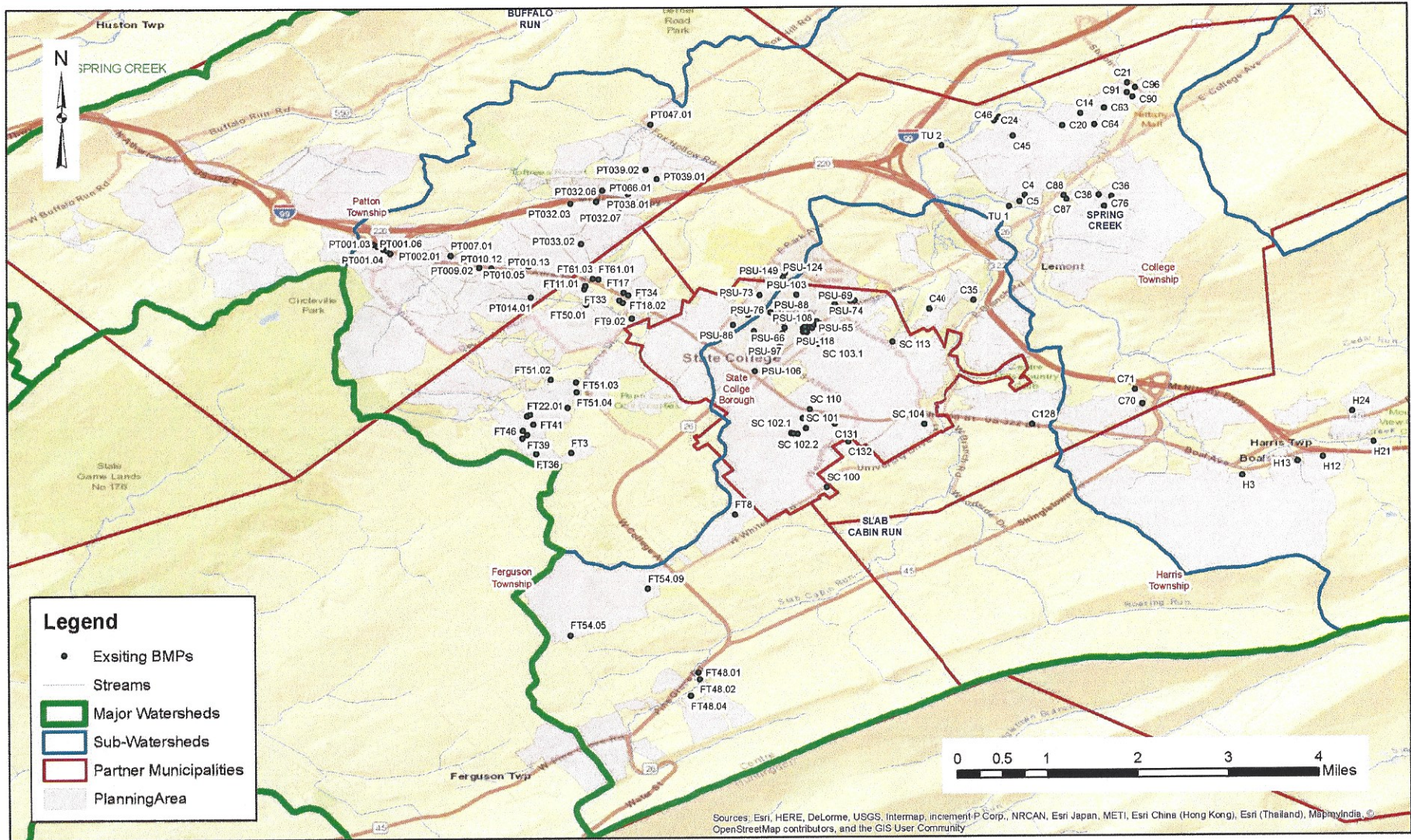


Figure 5. Structural BMPs Used for Pollution Load Reduction Credit

map I

already in
system +
have credits
for

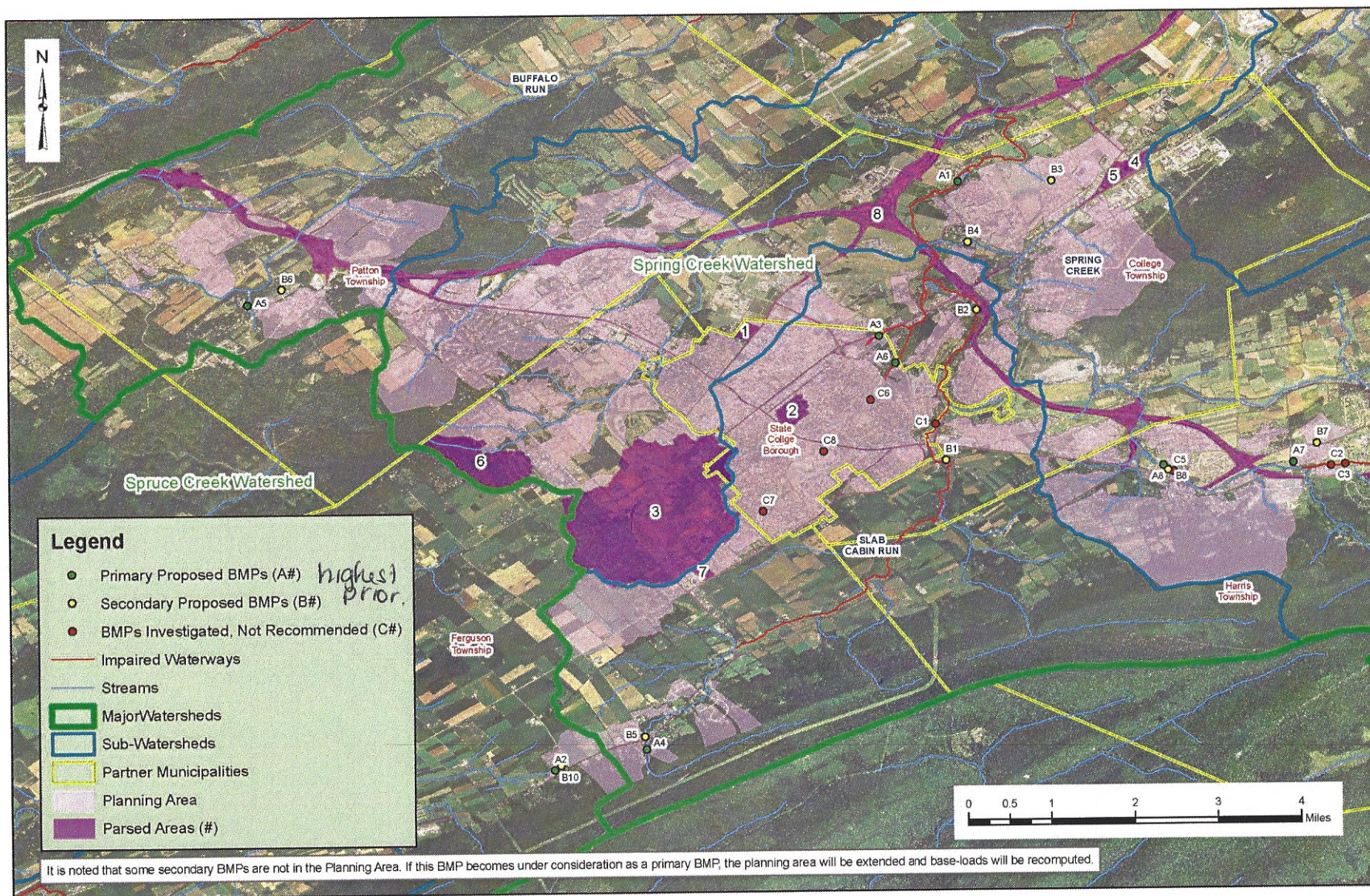


Figure 2. Planning Area Map

SCWC can suggest but not enforce their suggestions (eg secondary etc), in the same way DEP can enforce this map by law