

Testimony related to H. 35 and the Lake Champlain TMDL

House Natural Resources and Energy Committee

A Municipal Stormwater Perspective:

Burlington Stormwater Program

Stormwater Fee Calculation Methods

Stormwater Phosphorus Management Costs

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Wet-Weather Landscape in Burlington, VT

COMBINED SEWER

- 25% Combined Sewer (3 WWTPs)
 - 4 CSO outfalls
 - Wet weather events at Main WWTP
 - Pipe Capacity: combined sewer surcharge into basements or streets
- > 100 year old Sanitary and Combined Sewer infrastructure
- Lake Champlain Phosphorus TMDL (being revised, due in early 2015)
 - 0.8 mg/L → 0.2 mg/L P-limit reduction at 3 plants
 - 14% reduction in wet weather related P load



Wet-Weather Landscape in Burlington, VT

SEPARATE STORM SYSTEM

- 75% Separate
 - Second gen, Phase II MS-4 permit
 - 80+ separate SW outfalls
- Younger infrastructure generally, but much of Separate Storm Sewer System is corrugated metal (and rotting)
- Stormwater flow based TMDLs for 3 streams – Centennial, Englesby and Potash
- Lake Champlain Phosphorus TMDL
 - 25% reduction for Burlington Bay
 - 12% reduction for Main Lake (Winooski River)
- Bacteria TMDL for Englesby Brook

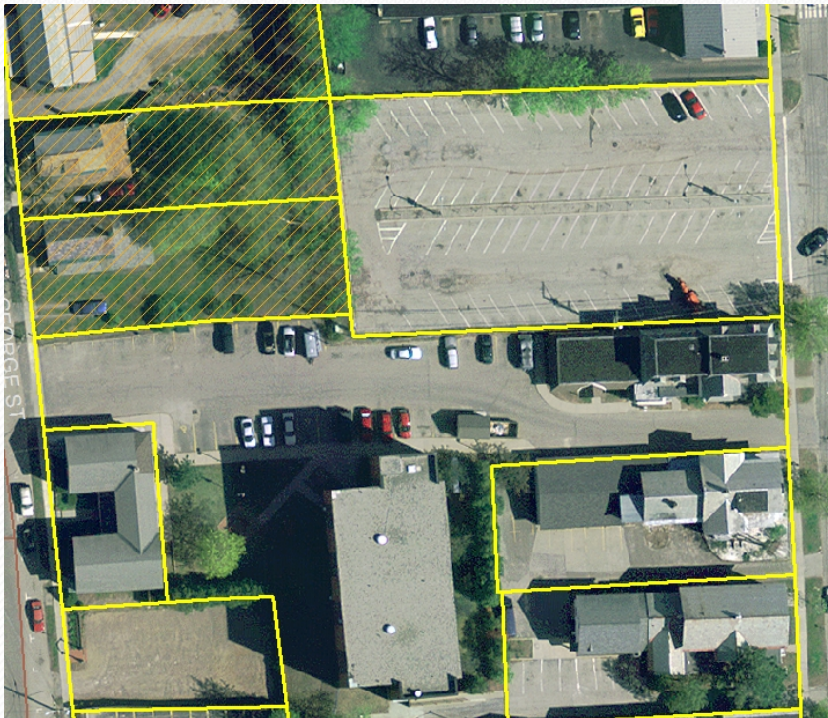


Stormwater Fees

FY 15 ISU Rate = \$1.687	# ISUs	Monthly Fee	Annual Fee
Single Family Home (Flat Fee)	2.67	\$ 4.50	\$ 54.00
Duplex (Flat Fee)	2.65	\$ 4.47	\$ 53.64
Triplex (Flat Fee)	3.06	\$ 5.16	\$ 61.92
Property types other than the above are DIRECTLY billed	as measured	depends on amount of impervious	depends on amount of impervious
eg. 10,000 sq. ft. commercial	10.0	\$ 16.87	\$ 202.44

- SW Utility started in 2009, fees charged on Water/Wastewater Bill
- \$5 million spent to date on stormwater operation, maintenance and management (MS4 and Combined Sewer)
 - ~\$325K of total on stormwater treatment (~\$96 K grant funded)
 - ~\$300K of total on mapping and planning activities (~\$178K grant funded)
- Additional \$1.1 million on Combined Sewer Overflow stormwater reductions (50 % ARRA forgiveness funded)

Impervious based billing



- Most equitable method, but time intensive depending on accuracy needed
- Impervious recognition algorithms not perfect, so QA/QC and manual delineations are important for directly billed customers

Burlington Stormwater Program

Main Functions:

- MS4 permit compliance (applied to the CSS areas also)
- Stormwater Management Planning and Implementation
- Stringent Project Review under Chapter 26 ordinance (MS4 and CSS)
 - Jurisdiction over > 400 s.f. of earth disturbance
 - All projects must submit an Erosion Prevention and Sediment Control Plan (to reduce construction site runoff)
 - Projects that are adding or redeveloping impervious must submit a stormwater management plan for their impervious
 - Residential properties must minimize “connected” impervious and receive technical assistance
 - Commercial properties must mitigate new impervious and mitigate redeveloped/existing impervious to the maximum extent practicable

Typical Burlington SW Practices



- Smaller treatment volumes than traditional practices due to lack of available open space
- Challenging to site, design and build due to existing utility conflicts
- Emphasis on green infrastructure to ensure maximum community benefit



Removing Phosphorus from SW

- How do you “remove” phosphorus from SW?
 - Absorb the flow
 - Treat the wash-off (the P that is in stormwater runoff) through filtration/adsorption
 - Slow down the flow to reduce the erosion that happens from excess SW runoff
- The only way to remove ALL of the P loading is to:
 - Remove the impervious surface
 - Infiltrate the stormwater (for 1 year, ~2” storm)
 - Direct the stormwater into the soils where it can soak in
- High capacity infiltration (sandy soils) is only possible in limited areas of Burlington
- Other treatment practices only get a fraction of the P, so a 25% P reduction means that you will likely have to mitigate > 25% of the impervious.

Estimating P removal Costs

1 ha = 2.47 acres

Structural Stormwater Control Practice	Proposed Phosphorus Load Reduction Rates for various Stormwater Control Practices based on Design Capacity					Unit capitol Costs for structural controls (site adj. factor of 1.4 & 35% contingencies =1.89)			Capitol cost per unit area for selected Water Quality Volume (WQV) \$/ha				
	Percent Reduction In Annual Phosphorus Load, %					Structural control base cost, \$/ft ²	site cost adj. factor includes 35% engineering and contingencies	adj. cost, \$/ft ²	Physical Storage Capacity of Control Structure - runoff depth from contributing impervious area, Inches				
	Physical Storage Capacity of Control Structure - runoff depth from contributing impervious area, inches												
	0.25 in	0.5 in	0.9 in	1.5 in	2 in	0.25 in	0.5 in	0.9 in	1.5 in	2 in			
Surface Infiltration Practices H SG A&B (1)	54%	77%	92%	98%	99%	\$ 4.0	1.89	\$ 7.6	\$ 16,953	\$ 33,906	\$ 61,031	\$ 101,719	\$ 135,625
Infiltration Trench (2) (Includes dry wells) HSG A&B	51%	77%	93%	98%	99%	\$ 8.0	1.89	\$ 15.1	\$ 33,906	\$ 67,813	\$ 122,063	\$ 203,438	\$ 271,250
Biofiltration with underdrains (3)	38%	59%	74%	84%	89%	\$ 10.0	1.89	\$ 18.9	\$ 42,383	\$ 84,766	\$ 152,578	\$ 254,297	\$ 339,063
Gravel Wetland (4)	30%	46%	59%	65%	66%	\$ 8.0	1.89	\$ 15.1	\$ 33,906	\$ 67,813	\$ 122,063	\$ 203,438	\$ 271,250
Wet Pond & constructed wetlands	n/a	42%	50%	56%	65%	\$ 3.0	1.89	\$ 5.7	n/a	\$ 25,430	\$ 45,773	\$ 76,289	\$ 101,719
Sand filters	n/a	42%	50%	56%	65%	\$ 8.0	1.89	\$ 15.1	n/a	\$ 67,813	\$ 122,063	\$ 203,438	n/a
Open channel/dry swale	n/a	n/a	34%	n/a	n/a	\$ 8.0	1.89	\$ 15.1	n/a	n/a	\$ 122,063	n/a	n/a
Extended Dry Detention Pond	n/a	n/a	19%	n/a	n/a	\$ 2.0	1.89	\$ 3.8	n/a	n/a	\$ 30,516	n/a	n/a

- From "Methodology for Developing Cost Efficiencies for Lake Champlain TMDL Phosphorus Control Measures: Stormwater BMP Component, Working draft prepared by EPA Region 1, February 18, 2014"
- Some studies (and professional judgment/experience) indicate that a site adjustment factor of 2-3 (vs. 1.4 as in table above) is necessary for more developed areas like Burlington.
- Green infrastructure programs such as Philly Water Department pay \$100k/acre for stormwater retrofits (\$247k/ha)
- Practices such as wet ponds are not feasible in an area with no remaining large open parcels to which stormwater can be directed



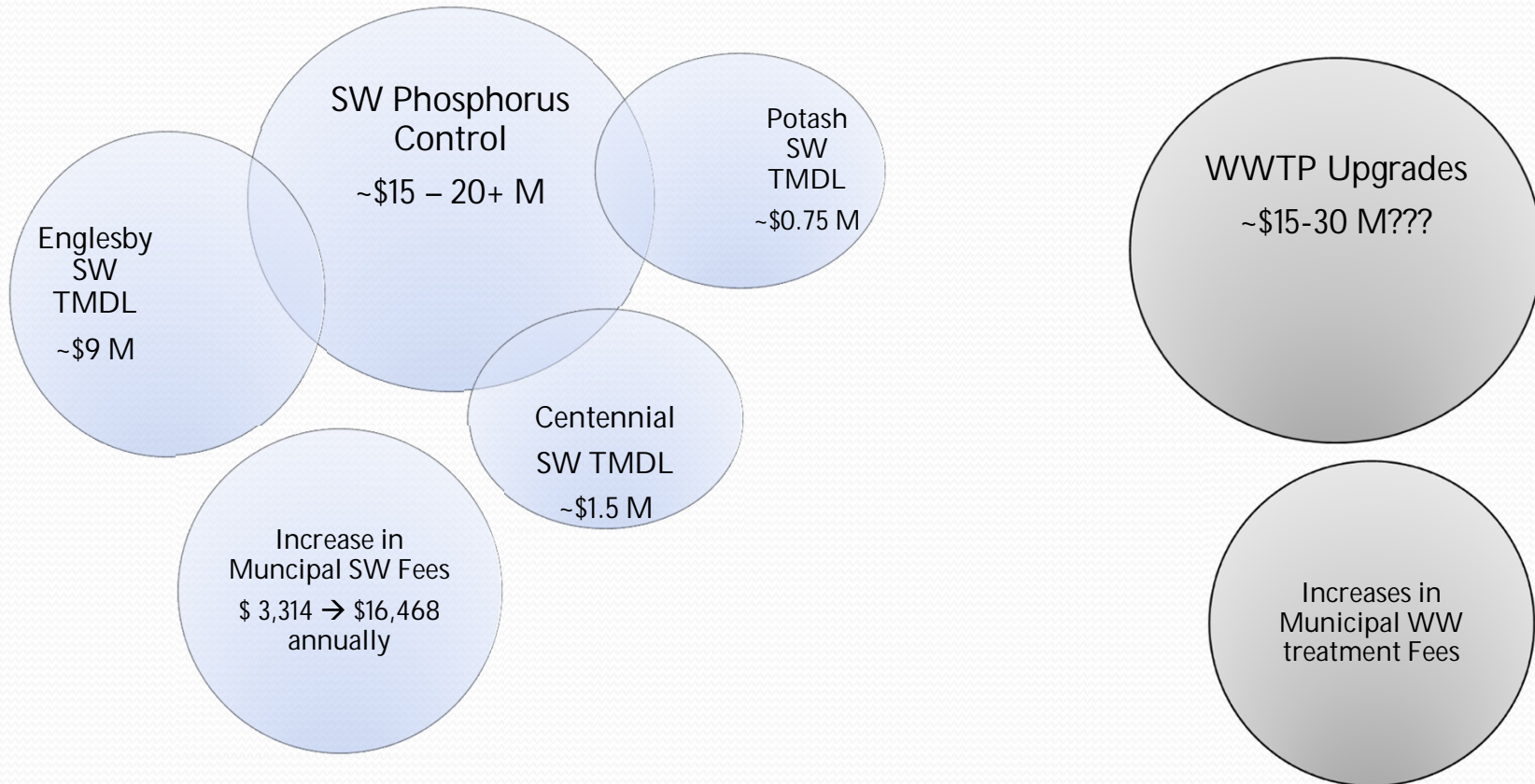
Possible SW Phosphorus Control \$ in Burlington

- Phosphorus loading from the equivalent of 278 impervious acres must be fully mitigated
 - Burlington Bay :950 impervious acres (25% = 237 ac)
 - Main Lake: 340 impervious acres (12% = 40 acres)
- But because of the challenges of not being able to always infiltrate, we will have to apply a suite of practices to the equivalent of more than 278 acres
 - One scenario using a suite of practices, including infiltration, bio filtration and residential stormwater management, as well as enhanced street sweeping shows that:
 - Runoff from 496 acres (38% of our total impervious) would need treatment
 - Capital cost estimates to meet TMDL target = \$15 -20+ million

Municipal Impact

Cost increases to rate payers (VT citizens)

\$40-\$60 million?
total impact



Costs passed on to renters (58% of Burlington population)
in an areas where rental costs are already challenging

Comments

- It is clear that all sectors (Ag, SW, WW) must make a contribution to cleaning up Lake Champlain
- The TMDL does spread out the loading reductions across various sectors and geographic areas based on what the modeling shows is feasible and effective
- But the COST is not spread out evenly AND
 - There is little funding assistance available to the MOST COSTLY of Phosphorus reduction efforts (WW and SW)

Comments

- A Statewide funding strategy must be implemented to offset the disparity in financial burden for these necessary, but unfortunately very costly, municipally based solutions.
- Maximum flexibility must be given to municipalities (and MS4 communities, in particular, which have other Clean Water Act obligations) to address load reductions
 - Compliance deadlines must be based on more comprehensive financial picture, such as that provided by integrated WW/SW planning which also addresses the need for re-investment into our aging infrastructure
 - All doors for funding must be kept open (don't limit WW Phosphorus abatement funding to 25%; we understand that allowing 100% funding doesn't mean that 100% funding will be available)
 - Trading must be allowed within sectors (SW \leftrightarrow SW) and across sectors (SW \leftrightarrow WW, AG \leftrightarrow WW etc.)