



## MEMORANDUM

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DATE: April 17, 2013

TO: Dan Albrecht; Megan Moir; Tom DiPietro; Jennifer Callahan and Craig DiGiammarino; Bill Nedde, Derick Read, Linda Seavey and Lani Ravin; and Jeff Padgett and Andrew Mills

FROM: Horsley Witten Group, Inc

RE: Centennial Brook Watershed: Candidate Retrofit Site Selection

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This memorandum provides a preliminary list of candidate retrofit sites to be evaluated in the field for retrofit potential to meet the flow reduction target of the Centennial Brook TMDL (Table 1). More information on this initial site selection and location is provided below. The MS4s should review this candidate site list and accompanying map and provide comments to HW by **Friday, April 26** regarding the following:

1. Do any sites on this list appear unsuitable based on your knowledge of the area (e.g., limited access, ownership, or unfavorable design constraints)? Should any of these be eliminated completely?
2. Of the existing stormwater facilities, are there any that you do not want us to evaluate for retrofit opportunities?
3. Are there any additional sites that you know of that warrant evaluation?
4. Will access to any of these sites require advanced coordination with site owners or facility managers (e.g., schools or private properties)? If so, can you provide contact information/assist in coordination?
5. Are you aware of any degraded sections of stream where a stream/wetland restoration project could potentially be coupled with additional storage of high flows (e.g., culverts, rights-of-way, or others)?
6. We are anticipating field work to be conducted on Thursday, May 16<sup>th</sup> and Friday, May 17<sup>th</sup>. We may also spend the morning of Wednesday, May 15<sup>th</sup> in the field in conjunction with our attendance at the NEIWPC conference. There will be two field teams, each consisting of at least one HW and TCE engineer. Are you interested in joining us during this time, or at any site in particular?

As a first cut, 22 candidate sites were selected based on a watershed mapping analysis (i.e., aerials, hydrology, South Burlington's wetland boundary, soils, stormwater drainage pipes and outfalls, 2-ft contours, parcels, existing BMPs and the most updated BMP drainage boundaries). Candidate sites were identified primarily in areas where no stormwater management is currently being provided; although, opportunities were also identified in the drainage area to pre-2002 facilities (M5 and M8) and in areas where Burlington's jurisdiction drains to UVM facilities.

All site locations are summarized in Table 1 and depicted on the attached watershed map. Many of the potential retrofit locations previously identified by South Burlington are included here.

Preliminary drainage boundaries were delineated to each candidate retrofit based on available contours, stormdrain mapping, and existing BMP drainage boundaries. The retrofits capturing the largest drainage areas are considered "primary." Sites that fall within the contributing drainage area to primary sites are considered "secondary." The secondary candidate sites were identified to supplement the larger, primary candidate practices, particularly if primary sites are not feasible. Isolated sites were also categorized as primary.

ANR's credit VTBMPDSS model was re-run using a hypothetical set of BMP sizing assumptions to "ballpark" how much flow reduction could be gained by implementing each primary candidate retrofit. As a starting point, we used the shortcut derived from the VT manual (Harrington, 1987) for extended detention of the 1-yr storm, which is managing 65% of the runoff from the 1-yr storm (calculated as impervious cover X rainfall X 0.65). This sizing rule of thumb assumes 100% of runoff from IC and 0% runoff from pervious areas, and may not perfectly reflect soil conditions in Centennial Brook. However, it is a good starting until we can confirm actual field conditions. We modeled each retrofit as either a detention basin or as an underground recharge chamber (URC) and, without going into too much detail, were able to generate just under 40% flow reduction. The TMDL target is 63% reduction, which includes the future growth factor.

The reduction obtained could likely be increased if existing facilities, secondary sites, or other (currently unidentified) locations are also retrofitted. Obviously, field investigations will be used to determine feasibility, advance concepts, and refine drainage boundaries and practice sizing.

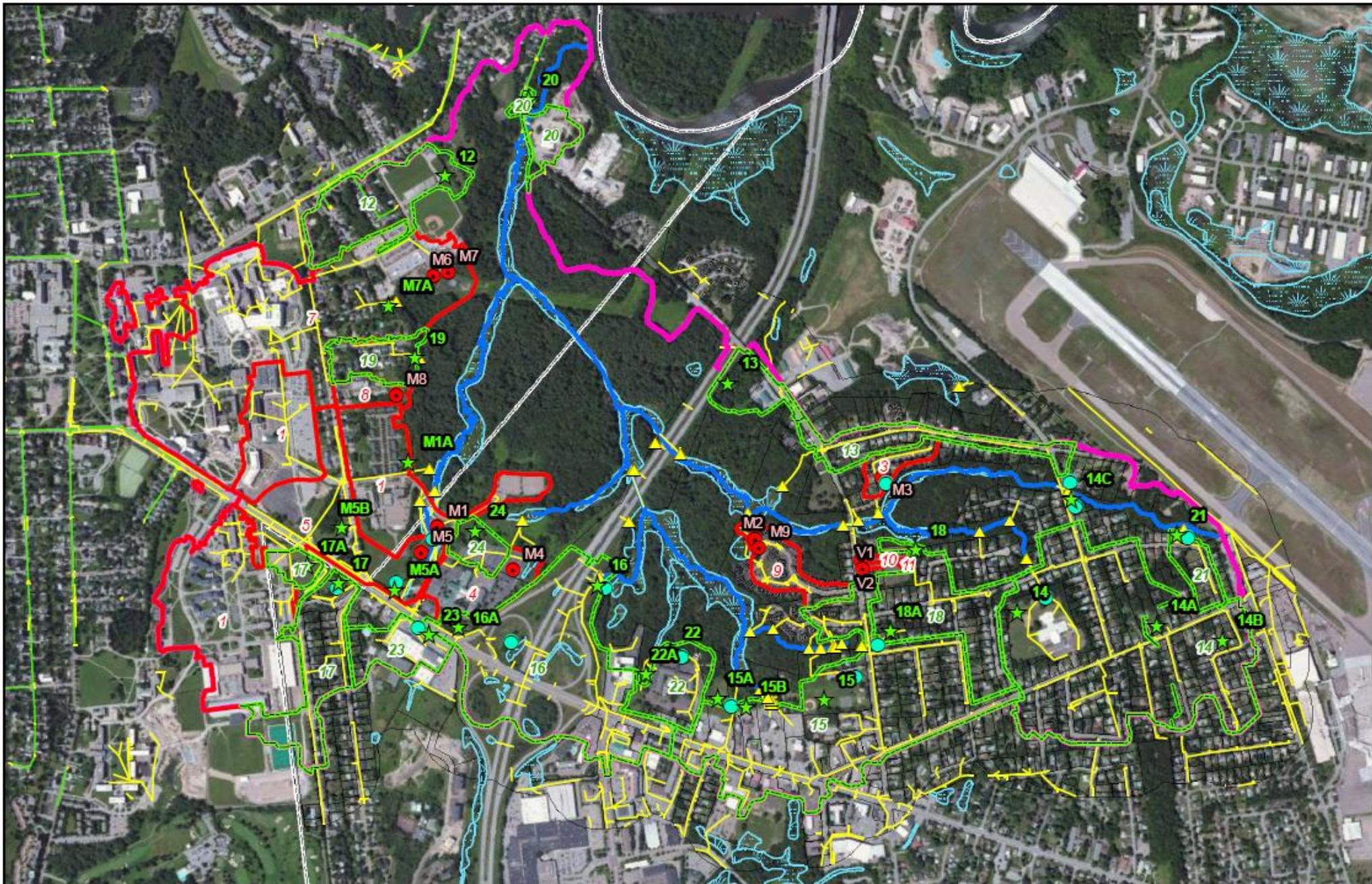
**Table 1. Candidate Retrofit Sites**

Site ID <sup>1</sup>	Locations	MS4	DA <sup>2</sup> (acres)	% Impervious	Type of Practice <sup>3</sup>	Category
12	Open area east of soccer field	UVM	18.7	29	URC (inf)	Primary
13	Odyssey Car Care / VT Taekwondo Academy	So. Bur.	16.9	40	Basin (inf)	Primary
14	Chamberlin School	So. Bur	77.7	31	URC (inf)	Primary
14A	White St./Pump Ln.	So. Bur	-	-	URC (inf)	Secondary
14B	Delaware/Maryland St.	So. Bur	-	-	URC (inf)	Secondary
14C	Airport Pkwy. culvert	So. Bur	-	-	URC (inf)	Secondary
15	Jaycee Park (S. Burlington)	So. Bur	64.0	50	URC (inf)	Primary
15A	Open area behind Starbucks/parking lot	So. Bur	-	-	Basin (inf)	Secondary
15B	Area behind Higher Ground/parking lot	So. Bur	-	-	Basin (inf)	Secondary
16	Hwy 89 ROW	VTrans	52.1	44	Basin	Primary
16A	Front of Sheraton	So. Bur	-	-	Basin	Secondary
17	Open area at Spear & Main St. (East)	UVM	20.5	28	Basin	Primary
17A	Open area at Spear & Main St. (West)	UVM	-	-	Basin	Secondary
18	Woods behind Clover St. (outfall?)	So. Bur	22.2	24	Basin	Primary
18A	Corner Patchen & Pine St.	So. Bur	-	-	Basin	Secondary
19	Bilodeau Court Condominium	Bur.	7.4	25	Basin	Primary
20	United Paving	Bur.	5.7	68	URC (inf)	Primary
21	Dumont Ave.	So. Bur	4.8	30	Basin	Primary
22	Behind Best Western/ Windjammer Inn	So. Bur	10.0	43	Basin	Primary
22A	Best Western parking lot (west)	So. Bur	-	-	Basin (inf)	Secondary
23	Petco/Staples	So. Bur	8.6	69	UC (det)	Primary
24	Back of Sheraton Hotel	So. Bur	4.3	51	Basin	Primary
M1A	Centennial Court	UVM	-	-	Drains to E. Campus Pond	Secondary
M5A	RT 2 road improve.BMP?	UVM	-	-	Drains to Main St. Pond	Secondary
M5B	Wind turbine area	UVM	-	-	Drains to Main St. Pond	Secondary
M7A	Case Pkwy. residential	Bur.	-	-	Drains to N. Campus Pond	Secondary
Total			312.8	39	-	-

<sup>1</sup> Sites 1-11 are the existing BMPs included in ANR's credit model and the two vegetated swales in Patchen Woods that are not currently included in the model.

<sup>2</sup> Initial drainage areas based on 2-ft contours and available stormwater drainage pipes mapping

<sup>3</sup> Practice type initially assigned based on a desktop analysis of soils, slope, and available space



**Legend** Bing Maps Aerial, ESRI

★ Candidate Retrofit Sites	▲ Outfalls	▭ Rev. Cent. Watershed
● Existing BMPs	— Combined Sewer	▭ Parcels
● Possible Projects (So. Bur.)	— Storm drains	▭ Town Boundary
▭ Cand. Retrofit Drainage Area	— Centennial Streams	▭ Wetlands (So. Bur.)
▭ Existing BMP Drainage Area		

N



1,200 Feet

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**Map 1. Candidate Retrofit Sites**