Fitzgerald Environmental Associates, LLC.

Applied Watershed Science & Ecology

MEMORANDUM

To: Town of Milton and Chittenden County Regional Planning Commission

From: Evelyn Boardman, Joe Bartlett, CFM and Evan P. Fitzgerald, CPESC/CFM

Re: Summary of GIS-based Road Stormwater Disconnection Evaluation Method

Date: September 30, 2019

We performed a GIS-based screening of town road segments in Milton to identify areas that could meet the criteria for stormwater disconnection as described by the Vermont Stormwater Treatment Standards (VTDEC, 2017) for Disconnection to Filter Strips and Vegetated Buffers (4.2.3). In areas meeting disconnection requirements, runoff from impervious surfaces is treated via sheet flow over a vegetated flow path. The required flow path length is determined by the hydrologic soil group (an indicator of soil infiltration capacity) and land slope (Figure 1).

We used the hydrologic connectivity road segment geometry available from VCGI as a base layer for evaluating stormwater disconnection on the +/- 100-meter road segments. There are 1,810 town road segments in Milton. We sampled the road surface elevation and generated 35, 50, 65, and 85-foot buffers on each side of the road (3,620 road segment halves) for evaluating stormwater disconnection criteria (Figure 2). We made a conservative assumption that road segments at intersections are not suitable for disconnection.

First, the GIS process evaluates the hydrologic soil group (hydrogroup) and slope of the roadside. This determines the buffer width needed to meet the disconnection criteria. Next, the process evaluates whether the buffer area is lower than the road and at least 80% vegetated with grass/shrubs and trees as mapped in the draft version of the high-resolution land cover data from the UVM Spatial Analysis Laboratory (2019).

We performed a field validation exercise after the first round of screening. We found several segments where high slope areas were present at stream crossings but taking the average slope of the buffer washed out these areas and numerous segments where a high shoulder area, sidewalk or swale intercepted flow. Based on these observations, we tightened up the evaluation criteria for slope and elevation so that the mean slope plus one standard deviation in the buffer area was used to evaluate whether the buffer slope was less than 8% or 8-15% and the mean elevation plus one standard deviation in the buffer area was used to evaluate whether the roadside was lower than the road. These criteria helped eliminate areas at stream crossings, roads with swales, and roads with sidewalks that were getting flagged as disconnected in the original screening.

We identified 201 (6%) of road segment halves in Milton as potentially meeting disconnection criteria. Overall, we feel the result of this screening is a conservative estimate for the number of road segments in Milton where stormwater is treated by an infiltrative vegetated buffer. One limitation of the GIS-based screening is that the Stormwater Treatment Standards also require a non-erosive transition between the road edge and vegetated buffer. This could not be evaluated remotely.

The Town Road and ROW load in Milton is approximately 812 pounds of phosphorus (P) per year. Divided by 1,810 segments, the load associated with each road segment is approximately 0.45 pounds of P. The 201 road segment halves represent a load of 44 pounds of P per year that could potentially be removed from the Town load or be counted towards as P-reduction through stormwater treatment.

The attached map shows the initial screening results for the Route 7 corridor and surrounding neighborhoods around the Town center.
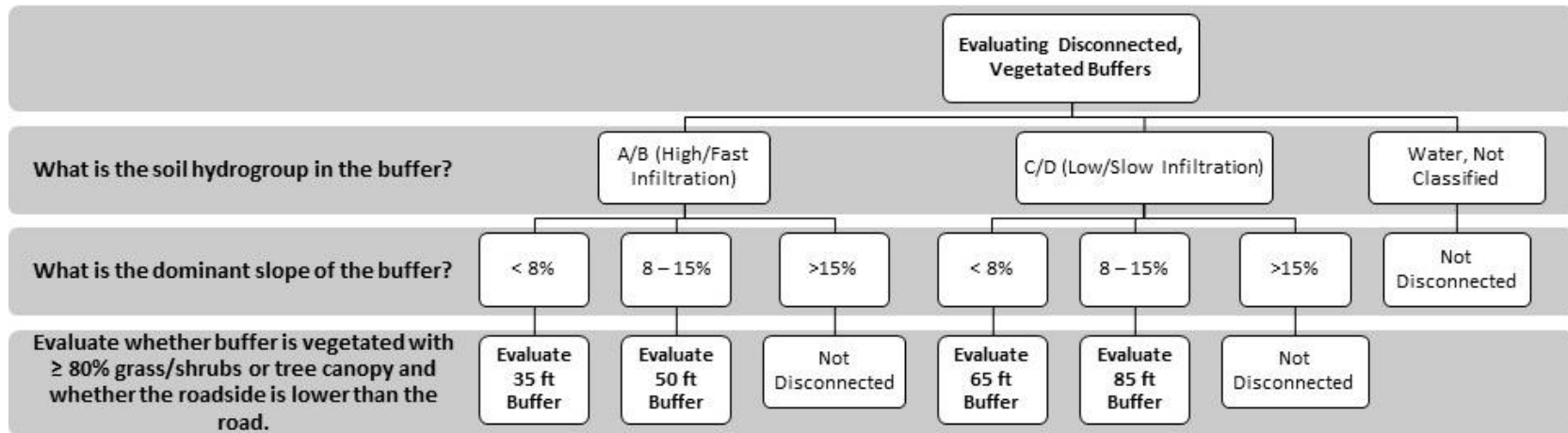
Fitzgerald
Environmental

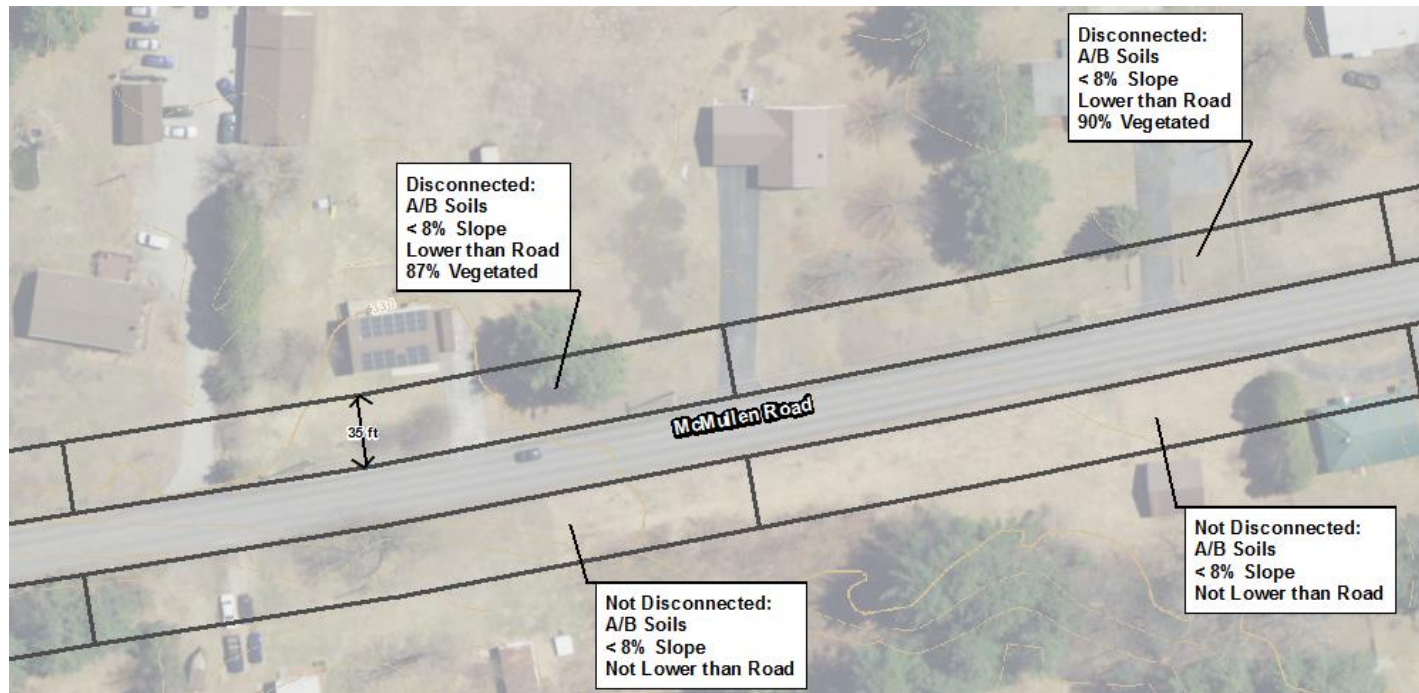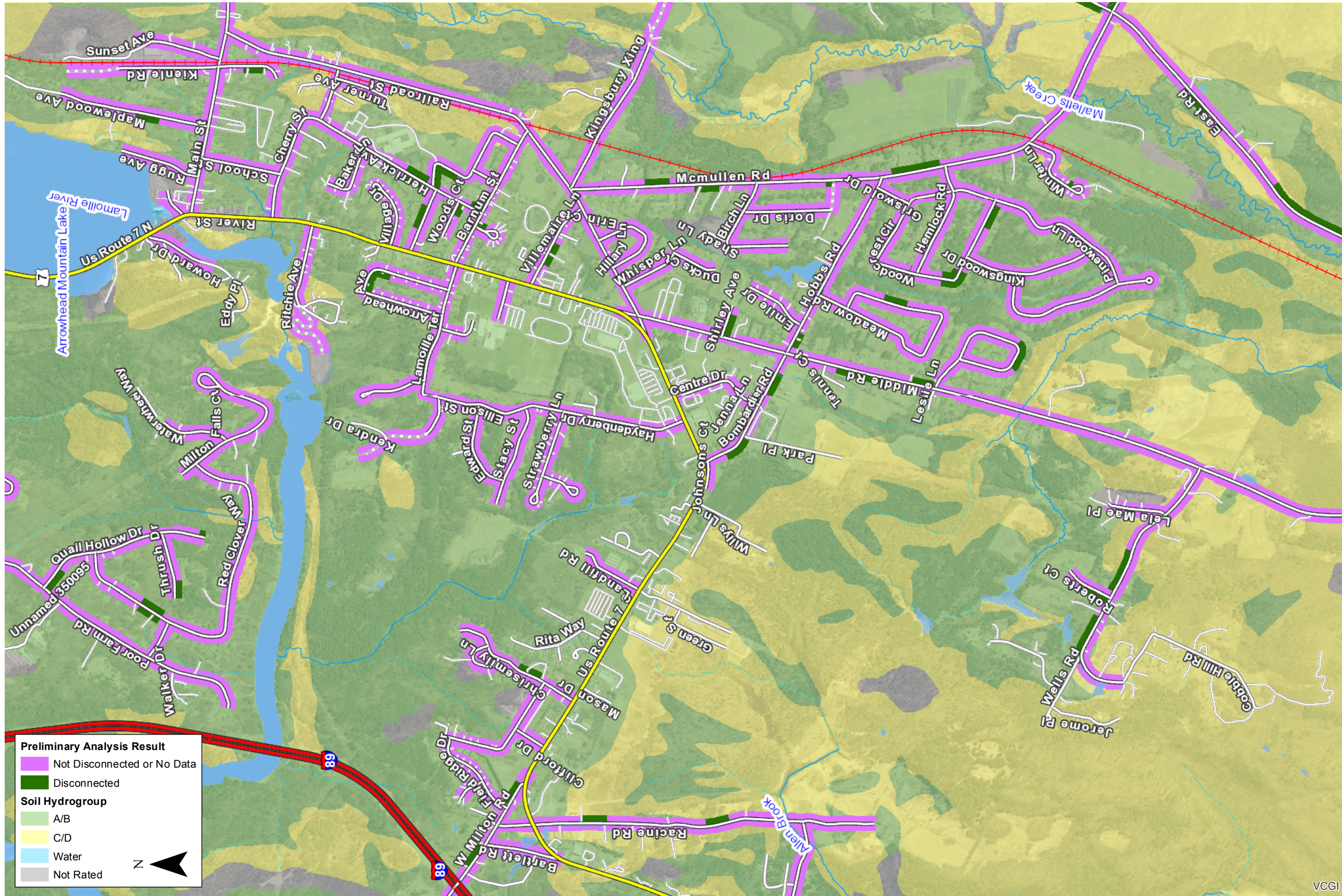**Figure 1:** Basis for GIS-based screening of town road segments in Milton for stormwater disconnection.

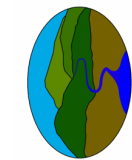**Figure 2:** Results of GIS-based screening for two 100-meter road segments of McMullen Road.

Fitzgerald
Environmental

Milton
Preliminary GIS-Mapped Disconnected Road Segments

Preliminary Analysis Result
- Not Disconnected or No Data
- Disconnected

Soil Hydrogroup
- A/B
- C/D
- Water
- Not Rated

Fitzgerald Environmental Associates, LLC.

18 Severance Green, Suite 203
Colchester, VT 05446
Tel: 802.876.7778
www.fitzgeraldenvironmental.com

Notes

Map By: EHB
Scale: 1" = 0.25 miles
Date: September 18, 2019

SHEET 1
SHEET NO.