Calculation for Vegetated Buffer Storage Capacity

Project Name:_____
Date Submitted:_____
Property Address:_____

MSD Reviewer:_____
WM No._____

Development/Property Name:_____
GMP Number:_____
Design Firm:_____
Design Engineer:_____Telephone:_____Email:_____
KY PE No.:_____

Step A. Site Planning Recommendation

Define goals and primary function of Vegetated Buffer based on the Vegetated Buffers Step by Step Design Procedures beginning on page 18.5.15-5 as well as Table 18.5.15-A. Refer to these sections for design specifications as needed throughout the remainder of this calculation sheet.

Step B. Determine the Required Water Quality Volume Rain Event, RE_{WQV} in inches (Refer to Chapter 18.3, A minimum depth of 0.6 inches must be used):

_____ inches

Step C. Calculate the Required Water Quality Volume (WQV Required) of water to be removed by Vegetated Buffer

1. A = Contributing drainage area to infiltration practice: _____ ft^2
2. RE_{WQV} = Required WQ_V Rain Event in inches: _____ inches
3. I = Impervious cover of the contribution drainage area in percent: _____ %
   a. $R_V = 0.05 + 0.009\ (I)$ = _____
4. WQ_V Required = $(A/12)(RE_{WQV})(R_V)$ = _____ ft^3

Step D. Determine travel time through the filter strip (minutes)

1. L=length of buffer parallel to flowpath _____ ft
2. P=required WQ_V rain event _____ ft^3
3. S=slope of the filter strip along the flow path _____ ft/ft
4. n=Manning' roughness coefficient (Typical values range from 0.20 - 0.03) _____
5. $T=((3.34*L*n)/(P^{0.625}*S^{0.5}))^{1.25}$ (10 minute minimum) _____ minutes

Step E. Determine the Managed Water Quality Volume (MWQ_V)

1. Determine the GMP Management Capacity of the Vegetated Buffer in percent (Refer to table 18.3-C for percent) _____ %
2. MWQ_V = (1/100)(GMP Management Capacity in percent)(WQ_V Required) = _____ ft^3
3. Is all of the WQ_V Required managed or treated (i.e. is MWQ_V greater than or equal to WQ_V Required)? _____

   If No, adjust WQ_V Provided parameters to allow for greater storage capacity and/or proceed to Step F.

   If Yes, proceed to step H.

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Step F. Calculate the Required Remaining Water Quality Volume (RWQ_V)

1. Required $RWQ_V = 2(WQ_V \text{ Required} - MWQ_V) =$ _____ ft^3

Step G. Select Alternate GMPs to Treat RWQ_V. Examples may include:

Check all that apply. Include additional calculation sheets as necessary.

□ Green Wet Basin
□ Green Dry Basin
□ Catch Basin Inserts
□ Proprietary Water Quality Units
□ Other

1. How much additional WQ_V is removed by the Alternate GMPs? _____ ft^3
2. Does the Alternate GMP remove all the Required RWQV? _____
3. If Yes, proceed to step H.
   If No, alter existing GMPs or add new ones to provide adequate storage.

Step H. Complete O&M documentation.

Additional Calculations and Explanation (Required if design deviates from calculation sheet):

_____
_____
_____
_____