Feedback on Recommendations of the BMP Expert Panel for Agricultural Ditch Management Practices

Thursday, November 21, 2019

Ray Bryant, USDA-ARS, Panel Chair

Chesapeake Bay Program
Science. Restoration. Partnership.

VIRGINIA TECH

Photos: Chesapeake Bay Program, https://flic.kr/ps/rYeEj

Panel Charge

- Formed to evaluate nitrogen, phosphorus and sediment reduction benefits of several management practices associated with agricultural ditches/drainage:
  - ✓ Blind Inlets
  - ✓ Denitrifying Bioreactors
  - ✓ Drainage water management
  - ✓ Phosphorus removal systems
  - ✓ Saturated buffers
  - ❑ Gypsum curtains
  - ❑ Two-stage ditches
  - ❑ Denitrifying curtains
  - ❑ Ditch dipouts (dredging)
  - ❑ Bioreactors that treat springs/seeps

Photo credit: Sabrina Klick, Univ. of Maryland Eastern Shore

Eligibility

- ✓ Blind Inlets
- ✓ Denitrifying Bioreactors
- ✓ Drainage water management
- ✓ Phosphorus removal systems
- ✓ Saturated buffers

Are these practices eligible throughout the watershed?

Yes, although these practices will be more commonly used on the Delmarva, they are not constrained and may still be applicable in other regions of the watershed. The report will be edited to clarify.

Photo credit: Sabrina Klick, Univ. of Maryland Eastern Shore

Applicability

- ✓ Blind Inlets
- ✓ Denitrifying Bioreactors
- ✓ Drainage water management
- ✓ Phosphorus removal systems
- ✓ Saturated buffers

Are these practices applicable only to row crops? Why would these practices not also be applicable in fields that include hay in rotation with crops, permanent hay or pasture?

The panel agrees and the default will be “AG” instead of “row crop.”

Photo credit: Sabrina Klick, Univ. of Maryland Eastern Shore

I. Summary of Recommendations

BMP	NRCS P Code	Reduction efficiency	Application	Credit duration
Blind inlets	620, 606	0% TN, 40% TP, 60% Sed.	Drained area (ac.)	5 Yr
Blind inlets w/ P-sorbing materials		0% TN, 50% TP, 60% Sed.	Drained area (ac.)	5 Yr
Denitrifying bioreactors	605	20% TN, 0% TP, 0% Sed.	Drained area (ac.)	10 Yr
WC Structures	587	0% TN, 0% TP, 0% Sed.	Drained area (ac.)	N/A
Drainage Water Management	554	30% TN, 0% TP, 0% Sed.	~~Drained area (ac.)~~ Effective drainage control area (ac.)	Annual
P removal systems	782	0% TN, 50% TP, 60% Sed.	Drained area (ac.)	4 yr
Saturated buffers	604	20% TN, 0% TP, 0% Sed.	Drained area (ac.)	10 Yr

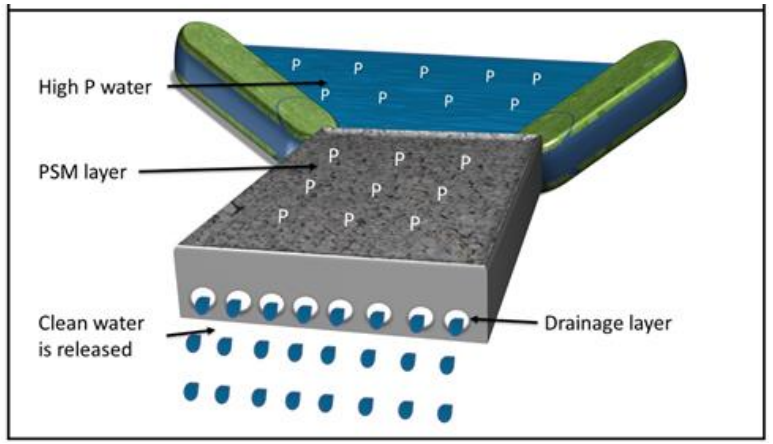
P removal structures, Denitrifying bioreactors and Blind inlets

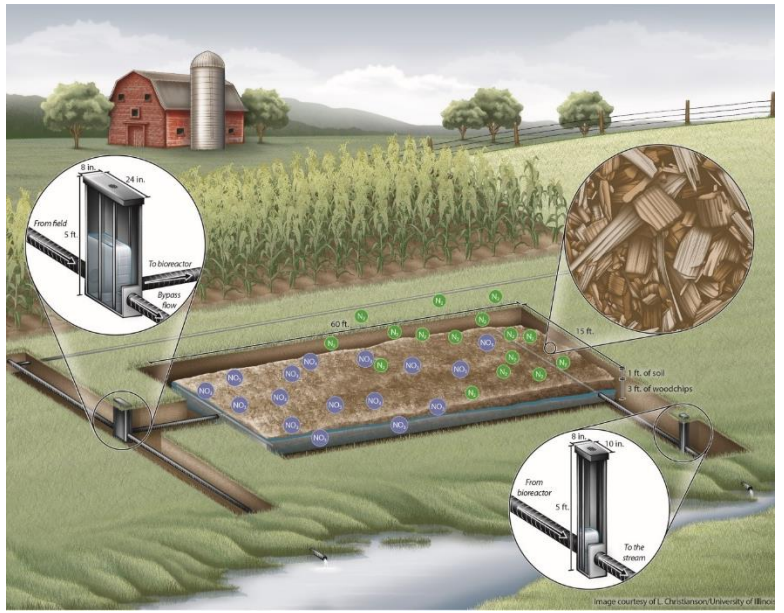
Reporting units

NRCS Practice Codes list number of practices as reportable units. How do we convert from number of units installed to acres treated?

States are encouraged to report acres treated per unit practice. If not reported, the Panel recommends

- one P removal structure receives a default value of five acres treated.
- one denitrifying bioreactor receives a default value of five acres treated.
- one blind inlet receives a default value of one acre treated.





Saturated Buffer reporting units

NRCS Practice Codes list linear feet of buffers as reportable units. How do we convert from linear feet to acres treated?

Acres treated by saturated buffers are the preferred reporting metric. If not reported, the Panel recommends

- converting linear feet to acres of buffer by assuming 30 ft buffer width; 30 times linear ft equals buffer area (ac.).
- the default value for acres treated is acres of buffer times 10. One acre of buffer treats 10 acres of ag land.

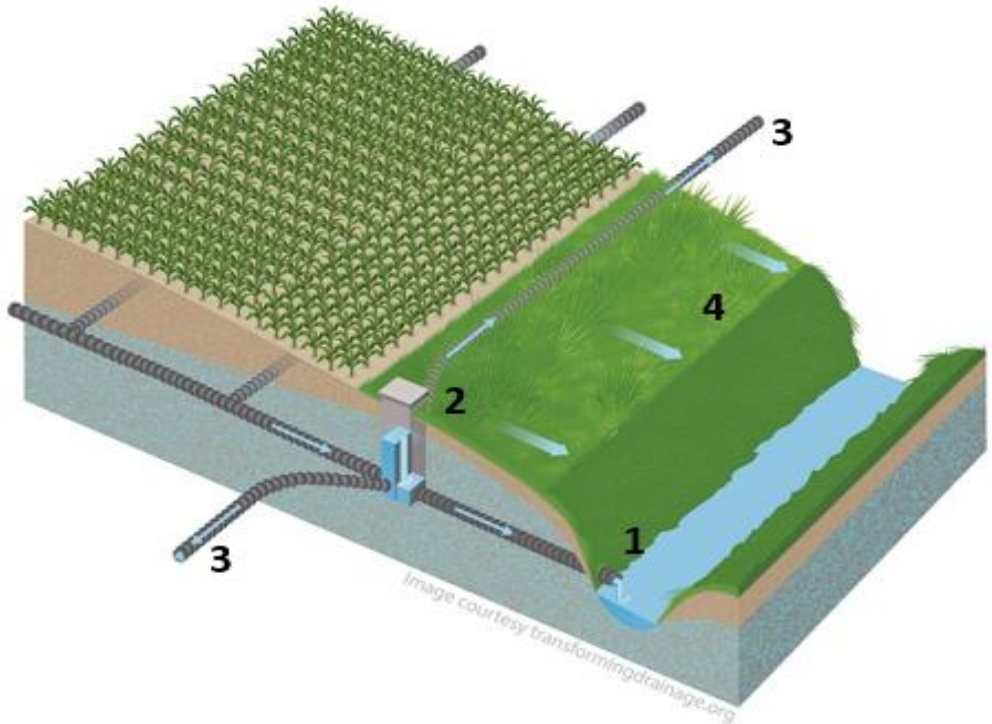


Figure 15 in report. Basic components of a saturated buffer: 1. tile outlet, 2. water control structure, 3. perforated distribution tile or pipe, and 4. riparian buffer with established perennial vegetation. Adapted from https://transformingdrainage.org/

Saturated Buffer

An edge-of-field practice that removes nitrate from tile drainage water before it enters ditch, stream, or other surface waters.

Is this practice "stackable" with existing buffers? Grass and Forest buffers? Narrow and full width buffers? Is there a minimum width? Does this practice replace/reduce the upland benefit of a buffer?

Riparian buffer practices are not ‘stackable’ because they each reduce loads from mutually exclusive acres within the model simulation.

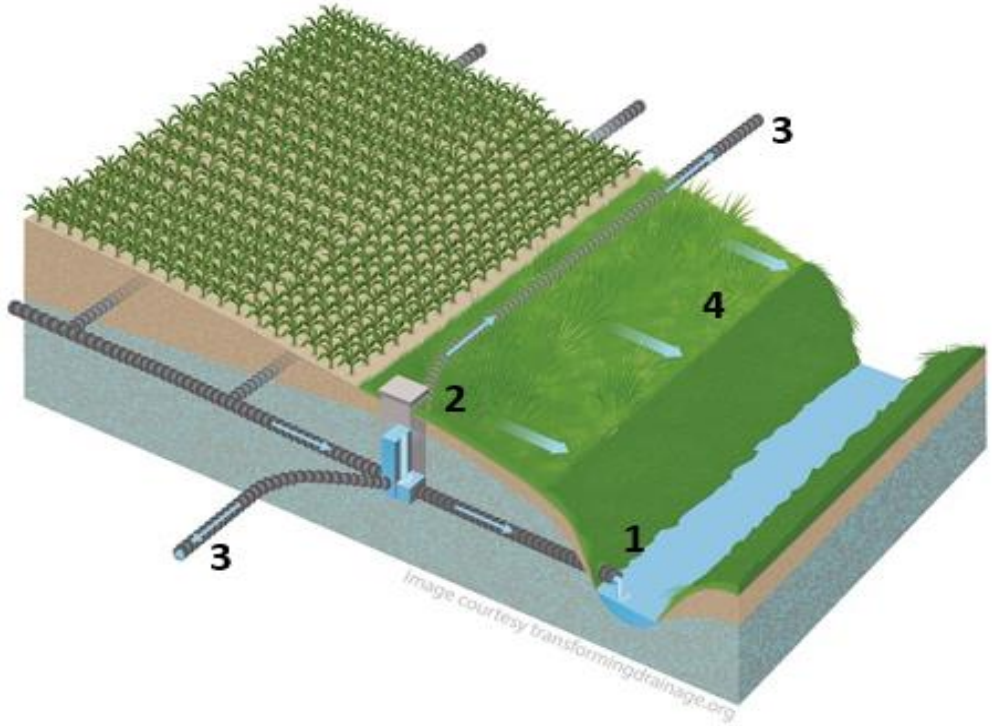


Figure 15 in report. Basic components of a saturated buffer: 1. tile outlet, 2. water control structure, 3. perforated distribution tile or pipe, and 4. riparian buffer with established perennial vegetation. Adapted from https://transformingdrainage.org/

Direct quantification and Spring bioreactors

Request that the expert panel include an option to directly quantify nitrogen (N) removal performance of denitrifying bioreactors by monitoring flow rates and N concentrations and allow the use of denitrifying bioreactors in other settings, including treatment of N rich emergent groundwater.

The Panel will consider recommending direct measurement of N removal where the “volume of treated flow” is known along with the inflow and outflow N concentration (Kg N removal/y). Potentially applicable to springs & ditches.

Timeline

- ~~Draft report released on September 4~~
- ~~"Roll-out" webcast hosted on September 18~~
- ~~Feedback requested by COB October 7~~
- Confirm panel stance and agreement for substantive changes in response to feedback. (in process)
- Share revised report and associated appendices (A, E) in advance of December AgWG; seek workgroup approval. (12/19 AgWG)
- WTWG approval and WQGIT approval to follow in early 2020. (TBD, at the *earliest*, both in January on 1/2 and 1/13 respectively)