Interim BMP: Saturated Buffer
Chesapeake Bay Program Phase 6.0 Modeling Tools

Agriculture Workgroup
Approved July 19, 2018

BMP Name: Saturated Buffer

BMP Definition: This BMP represents the edge-of-field treatment for tile-drained cropland areas through practices that reduce nitrogen pollutant loads by diverting tile-line flow to a subsurface, perforated distribution pipe used to divert and spread drainage system discharge to a vegetated area to increase soil saturation.

Measurement Names to be submitted: length and width of saturated buffer (submittable in NEIEN) *or* area of saturated buffer (submittable in NEIEN and CAST), all applicable CAST geographies

Model Simulation: Hydrologically connecting tile flow to an edge-of-field vegetated buffer encourages denitrification of nitrate-N in the tile water through the typical biological processes that occur in a soil environment that underlies perennial vegetation. Additionally, a portion of the nitrate-N in the tile water may be subject to uptake by the vegetation in the buffer. The tile flow from the field is directed through the subsoil of the buffer before exiting into a receiving water body, such as a ditch or stream. The Agricultural Ditch Management Expert Panel recommends an efficiency value of 20% for total nitrogen load per acre, to be used for planning purposes only. This value is a conservative estimate subject to change as the Expert Panel continues to formulate final recommendations for a larger suite of agricultural ditch management practices.

For planning purposes in CAST, states will enter area of saturated buffer in acres in a way consistent with the interim BMP definition. An acre of saturated buffer will convert an acre of applicable land use, such as row crops, to agricultural open space. The recommended assumption is that one acre of buffer area identified for planning treats ten upslope acres, reducing 20% of total nitrogen from those acres. The Agricultural Modeling Subcommittee (AMS) has defined the pounds of N per acre for cropland production based on available literature values. The AMS recommendations have been reviewed and approved by the Agriculture Workgroup (AgWG) for use in the Phase 6.0 modeling tools.

The Chesapeake Bay Program Office will create an interim BMP for Phase 6.0 that will be listed as "DRAFT" in the NEIEN Appendix. This will allow states to use the interim BMP for planning purposes, and to report subsequent implementation information to NEIEN. However, the interim BMP will not receive credit through annual progress reporting until the availability of a partnership approved BMP Expert Panel recommendation report.

References

Jaynes, D.B. and Isenhart. T.M. Reconnecting tile drainage to riparian buffer hydrology for enhanced nitrate removal. J. Environ. Qual. 43:631-638. 2014.

USDA NRCS. 2016. Conservation Practice Standard 604: Saturated Buffer. https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849 (accessed 12 Apr. 2018).

Agricultural Drainage Management Coalition. 2015. Demonstrate and Evaluate Saturated Buffers at Field Scale to Reduce Nitrates and Phosphorus from Subsurface Field Drainage Systems Final Report. NRCS CIG: Grant # 69-3A75-11-205. Dec 15, 2015.

Jaynes, D.B. and Isenhart. T.M. Performance of Saturated Riparian Buffers in Iowa, USA. J. Environ. Qual., (in review).