Appendix G

Technical Requirements to Enter Advanced On-Site Wastewater Treatment Practices into Scenario Builder and the Phase 5.3.2 Watershed Model

Presented to WTWG for Review and Approval: April 8, 2014

Background: In June, 2013 the Water Quality Goal Implementation Team (WQGIT) agreed that each BMP expert panel would work with CBPO staff and the Watershed Technical Workgroup (WTWG) to develop a technical appendix for each expert panel report. The purpose of this technical appendix is to describe how the Onsite Wastewater Treatment Expert Panel's recommendations will be integrated into the modeling tools including NEIEN, Scenario Builder and the Watershed Model.

Q1. What are the efficiency reductions a jurisdiction can claim for the advanced on-site waste treatment systems (advanced septic systems) in the Phase 5.3.2 Watershed Model?

A1. The panel's recommendations include 20 distinct combinations of in situ and ex situ practices that reduce septic nitrogen loads beyond a conventional septic system. The information in the table below was taken from Table ES-1-3 in the expert panel report (p. 11). The qualifying technologies for each ex situ and in situ practice are described in Answer 2 below.

Table 1. Percent Nitrogen Reductions for New Septic System Treatment BMPs

NEIEN BMP Name	Scenario Builder BMP Name	Percent Nitrogen Reduction
Conventional with Shallow Pressure	Septic with Enhanced In Situ	38%
Conventional with Elevated Mount	Septic with Enhanced In Situ	38%
NSF 40	Secondary Treatment with conventional In Situ	20%
NSF 40 with Shallow Pressure	Secondary Treatment with Enhanced In Situ	50%
NSF 40 with Elevated Mound	Secondary Treatment with Enhanced In Situ	50%
IMF	Secondary Treatment with Conventional In Situ	20%
IMF with Shallow Pressure	Secondary Treatment with Enhanced In Situ	50%
IMF with Elevated Mound	Secondary Treatment with Enhanced In Situ	50%
Constructed Wetland	Secondary Treatment with conventional In Situ	20%
Constructed Wetland with Shallow Pressure	Secondary Treatment with Enhanced In Situ	50%

Constructed Wetland with Elevated Mound	Secondary Treatment with Enhanced In Situ	50%
RMF	50% Denitrification Unit with conventional In Situ	50%
RMF with Shallow Pressure	50% Denitrification Unit with Enhanced In Situ	69%
RMF with Elevated Mound	50% Denitrificaiton Unit with Enhanced In Situ	69%
IFAS	50% Dentrification Unit with conventional In Situ	50%
IFAS with Shallow Pressure	50% Denitrification Unit with Enhanced In Situ	69%
IFAS with Elevated Mound	50% Denitrification Unit with Enhanced In Situ	69%
Proprietary Ex Situ	50% Dentrification Unit with Conventional In Situ	50%
Proprietary Ex Situ with Shallow Pressure	50% Denitrification Unit with Enhanced In Situ	69%
Proprietary Ex Situ with Elevated Mound	50% Denitrification Unit with Enhanced InSitu	69%

Q2. What technologies qualify for the reductions listed in the table above?

A2. Qualifying technologies are listed below.

Secondary Treatment– Pre-treatment practices are those occurring prior to dispersing effluent into the soil treatment unit. Secondary ex situ systems include: certified, NFS 40 Class I or equivalent systems; intermittent media filters (IMF); and constructed wetlands (p. 29-30). Additional details about these systems are provided in the expert panel report.

50% Denitrification Units– Pre-treatment practices are those occurring prior to dispersing effluent into the soil treatment unit. 50% Denitrification ex situ systems include: recirculating media filters (RMF); Anne Arundel County Integrated Fixed-Film Activated Sludge (IFAS). Many proprietary treatment systems also exist that offer denitrification (p. 30). Additional details about these systems are provided in the expert panel report.

Enhanced In Situ – In situ processes are those occurring after ex situ treatment, within the soil treatment unit. These practices include shallow-placed, pressure-dosed dispersal units and elevated sand mounds (p. 31). Additional details about these systems are provided in the export panel report.

Q3. How do these new BMPs interact with the existing reductions for septic pumpouts and de-nitrification systems?

A3. The panel recommended that the 5% credit for septic pumpouts for conventional septic systems should remain within the modeling tools. The panel recommended this credit should only be reported once every five years for any given system, and the credit should only apply in the model for the year

reported. Additionally, the panel recommended septic pumpout credits should not be available for systems claiming a credit through a BMP above p. 29).

The septic de-nitrification BMP currently in the model will be replaced by the 17 new system types. Jurisdictions should no longer report the de-nitrification BMP for progress or planning purposes. Existing de-nitrification systems in the model will remain in the model until NEIEN data is updated by jurisdictions to reflect the type of ex situ and in situ practices being used. Septic pumpouts will still be available on historically reported systems with de-nitrification.

Q4. What do jurisdictions need to report in NEIEN in order to receive credit for the new onsite treatment practices in the modeling tools?

A4. Jurisdictions should report the NEIEN BMP names listed in Table 1 above, as well as the location of the systems and the date the systems were installed.

Q5. How will the reductions be applied to septic systems in the current modeling tools?

A5. The efficiency reductions listed in Table 1 above will be applied to conventional septic systems within the modeling tools. These reductions will result in lower edge-of-stream nitrogen loads from the modeled, conventional septic systems. Please note that each of the system types is mutually exclusive meaning that a jurisdiction should only report one practice type per septic system. Please also note that septic pumpouts and the current septic de-nitrification practices are also mutually exclusive with each of the system types and should not be reported in conjunction with these new BMPs.

Q6. In what order will Scenario Builder credit all of the septic BMPs?

A6. Table 2 below lists the unique Scenario Builder BMP names that will now be associated with septic systems, and places these names in the order in which Scenario Builder will credit the BMPs.

Table 2. Order of Credit for Septic System BMPs in Scenario Builder

Scenario Builder BMP Name	Percent Nitrogen Reduction
50% Denitrification Units with Enhanced In Situ	69%
Secondary Treatment with Enhanced In Situ	50%
50% Denitrification Units with conventional In Situ	50%
Secondary Treatment with conventional InSitu	20%
Septic with Enhanced In Situ	38%
Septic De-Nitrification (Existing)*	50%
Septic Pumpouts (Existing)*	5%

*The existing Septic Pumpout and Septic De-Nitrification BMPs cannot be submitted along with any of the new systems treatment practices described in this document.

Q7. The panel also discussed proprietary systems and permeable, reactive barriers. Will either of these types of systems receive credit in the modeling tools?

A7. The panel did not recommend a reduction efficiency for permeable, reactive barriers. The panel did not anticipate installation of a large number of permeable reactive barriers in the immediate future (p. 75).

The panel did recommend that proprietary, ex-situ systems with NSF Standard 245 certification or similar and field testing to verify performance , receive a default, 50% reduction in nitrogen (p. 27). To receive additional credit beyond the 50% reduction for a particular type of system not currently credited, jurisdictions must provide ongoing case by case results effluent tests These results must be reviewed and approved by the Wastewater Workgroup before higher reduction efficiencies are credited in the modeling tools.

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