Wastewater BMP Verification Protocol

Version: Reformatted and revised draft in response to BMP Verification Review Panel's Recommendations, December 13th, 2013

A. Need for Verification and the CBP Process to define it

Over the past two years there have been numerous requests and commitments to improve the accountability of actions taken to install BMPs which prevent or reduce the loads of nutrients and sediment to Chesapeake Bay.

- The Citizens Advisory Committee has repeatedly called on the Partnership to provide for transparent and open verification of cost shared as well as non-cost shared best management practices tracked and reported by the watershed's seven jurisdictions.
- The President's Chesapeake Bay Executive Order Strategy committed the U.S. Department of Agricultural (USDA) and the U.S. Environmental Protection Agency (EPA) to develop and implement "mechanisms for tracking and reporting of voluntary conservation practices and other best management practices installed on agricultural lands" by July 2012.
- Within its Chesapeake Bay Independent Evaluation Report, the National Research Council's (NRC) panel put forth a series of five specific science-based conclusions focused on their finding that "accurate tracking of BMPs is of paramount importance because the CBP relies upon the resulting data to estimate current and future nutrient and sediment loads to the Bay."
- The 2010 Chesapeake Bay TMDL's Appendix S outlines the common elements from which EPA expects the watershed jurisdictions to develop and implement offset programs.

In response to these calls for improved BMP verification, the Water Quality Goal Implementation Team formed a BMP Verification Steering Committee, which tasked the six sector workgroups to develop narrative principles and guidance for the jurisdictions as they build and improve upon their existing verification programs. As a part of its purview, the Wastewater Treatment Workgroup (WWTWG) was instructed to address wastewater treatment facilities, combined sewer overflow areas, and advanced on-site treatment systems.

B. Key Verification Definitions

The following terms are defined to clarify issues related to wastewater BMP verification.

The National Pollutant Discharge Elimination System (NPDES) permit program, as authorized by the Clean Water Act (Section 402), controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however,

industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. In most cases, the NPDES permit program is administered by authorized states.[1]

Wastewater Treatment Facilities are municipal sewage treatment facilities and industrial facilities with direct discharges to waters of the United States. These facilities can be classified as *significant* or *non-significant* based on their treatment volume.

> *Significant facilities* are dischargers that are subject to NPDES permits for nutrient pollutants and meet one of the following criteria.
>
> - West Virginia, Delaware and New York - Facility treating domestic wastewater and the design flow is greater than or equal to 0.4 million gallons per day (MGD).
> - Pennsylvania - Facility treating domestic wastewater and discharging greater than or equal to 0.4 MGD.
> - Maryland - Facility treating domestic wastewater and the design flow is greater than or equal to 0.5 MGD.
> - Virginia - Facility treating domestic wastewater and the existing design flow is greater than or equal to 0.5 MGD west of the fall line or 0.1 MGD east of the fall line as well as all new facilities greater than 40,000 gallons per day (GPD) or facilities expanding by greater than 40,000 GPD as significant.
> - Industrial facilities with a nutrient load equivalent to 3,800 total phosphorus (TP) lbs/year or 27,000 total nitrogen (TN) lbs/year.
> - Any other municipal and industrial wastewater facilities identified within a jurisdictional tributary strategy.
>
> *Non-significant facilities* are municipal or industrial dischargers that do not meet the above criteria for significant facilities.

Combined Sewer Overflow (CSO) areas are communities or portions of communities with combined sewer systems that convey both stormwater and wastewater in the same underground system of drains and pipes. Combined sewer systems are designed to overflow occasionally and discharge excess untreated wastewater directly to nearby streams, rivers, or other water bodies.

> A *Long Term Control Plan* is a phased approach for control of combined sewer overflows that will ultimately result in compliance with the Clean Water Act requirements.

Septic systems are on-site systems that provide basic storage and treatment to a household's or a development's sewage and discharge into ground. Some septic systems are *Advanced On-Site Wastewater Treatment Systems* that provide additional nitrogen reduction beyond that of a conventional septic system.

Advanced On-Site Wastewater Treatment Systems can be a range of technologies that provide denitrification treatment and reduce nitrogen discharges from the systems.

[1] http://cfpub.epa.gov/npdes/

C. Background on Verification in the Wastewater Sector

Wastewater treatment facilities, including municipal sewage treatment facilities and industrial facilities, contributed 17.4 percent of the total nitrogen (TN) and 16.3 percent of the total phosphorus (TP) loads delivered to Chesapeake Bay tidal waters in 2011. Of these total nutrient loads from wastewater dischargers, the 468 *significant* facilities contributed 90 percent of nitrogen and 72 percent of phosphorus. The remaining 10 and 28 percent of the TN and TP loads, respectively, came from the estimated 5,215 *non-significant* facilities. In 1985, wastewater facilities accounted for 27.6 and 38 percent of the respective TN and TP loads to the Bay. By 2011, the total wastewater loads to the Bay were reduced 51% for TN and 70% for TP from 1985 levels. This significant decline in point source loads is one of the major success stories of Bay restoration and is the result of many factors, including the rigorous implementation of new technologies, the accountability of the NPDES permitting program, and reliable sources of funding.

In the Bay watershed, there are currently 50 reported active reported *combined sewer overflow* (CSO) communities. A total of 64 CSO areas have been tracked by the Chesapeake Bay Program, with 14 of them currently documented as eliminated. In 2011, based on modeling estimates, the remaining 50 CSO areas contributed 0.57 percent of the total nitrogen (TN) and 0.87 percent of the total phosphorus (TP) loads delivered to Chesapeake Bay tidal waters.

The Chesapeake Bay Program estimates that about 25 percent of the homes in the Chesapeake Bay watershed have *on-site treatment/septic systems* that provide basic treatment to household wastewater. Based on the Phase 5.3.2 Chesapeake Bay Watershed Model, these on-site treatment systems contributed approximately 8.3 million pounds or 3.4% of the total nitrogen load to the Bay in 2011.

The existing national and state regulatory systems for wastewater treatment facilities and CSOs meet or exceed the Chesapeake Bay Program Partnership's BMP Verification Principles through a rigorous system of permits, inspections, and monitoring requirements that ensure accountability, proper design, implementation, operation and maintenance. For on-site treatment systems, the recommended verification protocols are based on the best existing regulations and programs. Verification through existing regulatory programs will confirm if the upgraded wastewater facilities, CSOs, or on-site treatment systems are designed, installed, and maintained over time and meeting their assigned load reduction targets.

The workgroup's process to develop these verification principles and guidance was as follows:

1. Evaluate the existing verification/inspection programs among the seven Chesapeake Bay watershed jurisdictions;

2. Determine what needed to be improved to meet the Partnership's BMP Verification Principles; and

3. Develop principles and guidance based on the best existing BMP verification/inspection programs that met or exceeded the BMP Verification Principles for the jurisdictions' use as they build upon their existing verification elements.

At multiple points throughout the process, the workgroup has received and considered feedback from its members and interested parties, together with substantive input from the BMP Verification Committee, BMP Verification Review Panel, and CBPO staff.

D. Verification Principles and Guidance for Wastewater Treatment Facilities

All significant facilities have or will have nutrient permit limits and specific nutrient monitoring requirements in place under the Chesapeake Bay TMDL. These numeric nutrient limits will ensure that significant wastewater treatment facilities continue to provide the most reliably verified load reductions in the restoration effort.

The NPDES compliance system and monitoring requirements provides the most stringent verification for implementation of a facility upgrade. Some jurisdictions also have or will have individual nutrient permit limits or monitoring requirements on some of their non-significant facilities.

The wastewater load reduction goals in the Bay TMDL and jurisdictions' WIPs are only applied to significant facilities. There are currently no load reduction goals for non-significant facilities in any of the seven Chesapeake Bay watershed jurisdictions; there are only aggregate waste load allocations set at existing loads.

For non-significant wastewater facilities, the existing federal and state NPDES regulations and the discharge monitoring report (DMR) reporting system will provide sufficient verification. The DMRs will be used to report the load reductions from a non-significant facility that undergoes any upgrades or offsets new or expanding flows. Jurisdictions will annually track the universe of nutrient- and sediment-contributing non-significant wastewater discharging facilities against established inventories for aggregated wasteload allocations, reporting on loads using the various mechanisms described in jurisdictions' watershed implementation plans (WIPs). Jurisdictions will document and report any allocation redistribution or changes that result from trading or offsets.

The existing national regulations and delegated state NPDES permitting programs have very specific verification and inspection requirements for wastewater treatment facilities, which meet or exceed the Chesapeake Bay Program Partnership's BMP Verification Principles. The verification/inspection programs for all non-significant wastewater treatment facility upgrades will rely on the existing NPDES regulations and DMR reporting system.

Table 1 below provides a summary of the workgroup's recommended approach for the jurisdictions' wastewater treatment facilities.

TABLE 1 – Summary of recommended verification principles and guidance for Wastewater Treatment Facilities

	Significant Wastewater Treatment Facilities	***Non-Significant Wastewater Treatment Facilities***
Draft Principles and Guidance	Daily/weekly monitoring and monthly reporting of flows and loads via DMRs.	• The existing NPDES Discharge Monitoring Report (DMR) will be used to report the load reductions due to BMPs for non-significant

	In addition, (a) annual loading reports are also submitted where trading or general permit conditions apply to a facility, and; (b) annual WIP reporting also applies**.**	WWTPs that include upgrades and offsets of new or expanding nonsignificant plants. • Annually track the universe of nutrient- and sediment-contributing nonsignificant facilities against established inventories for grouped wasteload allocations, report loads using the various mechanisms described in jurisdiction WIPs and document any allocation redistribution or changes in reporting structure that result from trading, offsetting or assimilation by other facilities.
Applicable states	All.	All.
Comments	Use existing NPDES DMR and state WIP defined procedures. Document procedures in QAPP submitted to CBP.	Use existing NPDES DMR and state WIP defined procedures. Document procedures in QAPP submitted to CBP.

E. Verification Principles and Guidance for Combined Sewer Overflows (CSOs)

CSO Long Term Control Plans

Long-term Control Plans are required by the national CSO control policy to reduce overflows from CSO outfalls (59 FR 18688, April 19, 1994). The existing national regulations and delegated state NPDES permitting programs have very specific verification/inspection requirements for CSOs, which meet or exceed the Chesapeake Bay Program Partnership's BMP Verification Principles.

TABLE 2 – Summary of recommended verification principles and guidance for Combined Sewer Overflow Areas	
	Combined Sewer Overflows
Draft Principles and Guidance	• Construction Verification: properly designed, installed, and maintained by the certified service providers. • Post construction monitoring and inspection. • Existing compliance and enforcement procedures. • Tracking and reporting
Applicable states	All
Comments	Use existing CSO regulatory process

F. Verification Principles and Guidance for Advanced On-site Treatment Systems

There is no national regulation for on-site treatment systems. Existing state regulations or programs vary dramatically among the six Chesapeake Bay states, ranging from construction permits to more complex regulation through operating permits with inspection and monitoring requirements. The recommended verification principles and guidance were developed based on the best existing state regulations for on-site treatment system that meet or exceed the Chesapeake Bay Program Partnership's BMP Verification Principles.

Verification of on-site treatment systems only applies to nitrogen-reducing treatment systems, or *advanced on-site treatment systems* that are reported for load reduction credit not other septic systems that do not receive credit as a BMP. The jurisdictions that intend to seek nitrogen load reduction credit for installation, operation and maintenance of on-site treatment systems will need to adopt and implement the recommended protocols through their regulations (existing or upcoming) or management programs required for advanced on-site treatment systems. These on-site treatment system regulations or programs should have specific maintenance and inspection requirements tailored to specific on-site treatment systems.

Currently, Maryland[2] and Virginia[3] on-site treatment system regulations in place; Delaware[4] has a draft regulation that will become effective soon (Appendices A, B, and C). West Virginia is committed to meeting minimum verification requirements described above. The District of Columbia has no on-site treatment systems. Pennsylvania and New York currently do not plan to seek nitrogen load reduction credit for installation, operation, and maintenance of on-site treatment systems, so they will not need to document verification for these systems unless they wish to seek credit in the future.

Verification of advanced on-site systems will ensure proper installation and continued operation and maintenance of the systems. The specific requirements (e.g., inspection or sampling frequency) will be based on existing state regulations or will follow the below set of minimum elements for verification based on existing state programs:

- State or local authorities should verify, track and report proper installation and operation and maintenance of new on-site treatment systems. Verification may be through inspections performed by a certified design professional.

- The design and installation on-site treatment systems should be done and reported by the certified service providers and verified in the permitting processes.

- The maintenance and inspection of on-site BMP systems should be conducted and reported annually, or more frequently, by certified service providers and tracked by the

[2] Maryland Regulation of Water Supply, Sewage Disposal, and Solid Waste. Chapter 02 Sewage Disposal and Certain Water Systems for Homes and Other Establishments in the Counties of Maryland Where a Public Sewage System is Not Available Authority
http://www.dsd.state.md.us/comar/SubtitleSearch.aspx?search=26.04.02

[3] Virginia Regulations for Alternative On-Site Sewage Systems
http://lis.virginia.gov/000/reg/TOC12005.HTM#C0613

[4] Delaware Regulations Governing the Design, Installation, Operation of On-Site Wastewater Treatment and Disposal System (in draft)
http://www.dnrec.delaware.gov/wr/Information/GWDInfo/Documents/AmendedRegDraft2Clean1.pdf

authorities. For some low maintenance systems, such as enhanced conventional systems, the inspection frequency could be less than annual.[5]

- Tracking and reporting through the databases managed by state agencies.

Maryland and Virginia already have comprehensive regulations for advanced on-site systems; Delaware is currently developing regulations. Key verification elements of these three states' regulations are summarized in Table 3 below, along with management recommendations from the On-Site Wastewater Treatment Systems (OWTS) Expert panel. Table 3 relates the states' program elements with the principles and guidance described in the above section. For full details on the Delaware, Maryland, and Virginia programs, see Appendices A, B, and C, respectively.

TABLE 3 –Summary of Recommended Verification Principles and Guidance for Advanced On-site Treatment Systems	
State or local authorities should verify, track and report proper installation and O&M of on-site BMP systems.	*Reference* **Maryland**: COMAR 26.04.02.07 Best Available Technology (BAT) Systems **Virginia**: Sewage Handling and Disposal Regulations (SHDR), 12 VAC 5-610, and Regulations for Alternative Onsite Sewage Systems (AOSS Regulations), 12 VAC 5-613 **Delaware:** Regulations Governing The Design, Installation and Operation of On-site Wastewater Treatment and Disposal Systems. Forthcoming update for innovative and alternative (I/A) on-site wastewater treatment and disposal systems O&M Guideline.
The design and installation of on-site BMP systems should be performed and reported by the certified service providers and verified in the permitting process.	**Maryland**: See COMAR 26.04.02.07E-F **Virginia**: Confirmation of installation based on inspections by design professional. **Delaware**: All on-site BMP systems inspected by DNREC and system designer. Certificate of Satisfactory Completion is not issued until specific conditions and requirements are met.
The maintenance and inspection of on-site BMP systems should be conducted and reported annually by certified providers and tracked by the authorities. Inspection frequency could be lower for some technologies.	Inspection and O&M frequencies— **Maryland:** COMAR 26.04.02.07D. Once per year. **Virginia**: Once per year for advanced systems <1,000GPD. Retroactive and applies to all systems. **Delaware**: I/A systems less than or equal to 2,500 GPD. Systems permitted after 2/1/2007 inspected every 6 mos. by certified service provider. Systems installed prior to 2/1/2007 do not have to follow O&M requirements, and are inspected by DNREC every three years.

[5] The Chesapeake Bay Program Partnership's on-site treatment systems BMP expert panel will recommend inspection frequency by practice. Upon approval by the Partnership's Wastewater Treatment Workgroup and the Water Quality Goal Implementation Team, the final recommended inspection frequency will be ready for adopting by the states into their written verification procedures.

Tracking and reporting will be managed through databases managed by state agencies.	Delaware, Maryland, and Virginia each maintain their own database
OWTS Panel recommended O&M frequency, by technology	
Secondary treatment systems certified under NSF Standard 40 Class I or equivalent	Annual
Intermittent (Single Pass) Media Filters	Annual
Subsurface constructed wetlands/ vegetated submerged beds (VSB)	Annual. With monthly visual inspections of the VSB media, screens, berms, etc. to assess damage from muskrats or similar animals.
Recirculating media filters	Semiannual (twice/year)
Anne Arundel County integrated fixed-film activated sludge (IFAS)	Semiannual
Shallow placed, pressure dosed dispersal	Annual
Elevated sand mounds	Annual
Permeable reactive barriers	Annual

Verification of Septic Pumping BMP

OWTS Panel recommended to keep septic pumping as a BMP with 5% TN reduction rate for conventional septic systems that have no other BMPs, since other BMPs include a requirement for routine septic tank pumping. For any given system, this 5% credit should not be given more frequently than every 5 years, even though more frequent pumping for some systems may be appropriate for other reasons. Verification principles and guidance for advanced on-site treatment systems also apply to septic pumping BMP. Septic pumping should performed by licensed service providers. Reported septic pumping events should be tracked and documented by the State or local authorities.

Table 4. Overall Summary of Recommended Verification Protocols for Wastewater Treatment Facilities, CSOs and On-Site Treatment Systems

	Significant Wastewater Treatment Facilities	***Non-Significant Wastewater Treatment Facilities***	***Combined Sewer Overflows***	***On-Site Treatment Systems***
Draft Protocols	Daily/weekly monitoring and monthly reporting of flows and loads via DMRs. In addition, (a) annual loading reports are also submitted where trading or general permit conditions apply to a facility, and; (b) annual WIP reporting also applies**.**	• The existing NPDES Discharge Monitoring Report (DMR) will be used to report the load reductions due to non-sig wwtp BMPs that include upgrades and offsets of new or expanding nonsig plants. • Annually track the universe of nutrient- and sediment-contributing nonsignificant facilities against established inventories for grouped wasteload allocations, report loads using the various mechanisms described in jurisdiction WIPs and document any allocation redistribution or changes in reporting structure that result from trading, offsetting or assimilation by other facilities.	• Construction Verification: properly designed, installed, and maintained by the certified service providers. • Post construction monitoring and Inspection. • Existing compliance and enforcement procedures. • Tracking and reporting	State regulations on septic systems or following minimum requirements that were developed based on the existing or upcoming state regulations in DE, MD and VA. • State or local authorities should verify, track and report proper installation and O&M of on-site BMP systems. • The design and installation on-site BMP systems should be done and reported by the certified service providers and verified in the permitting processes. • The maintenance and inspection of on-site BMP systems should be conducted and reported annually by certified providers and tracked by the authorities. For some low maintenance systems, such as the enhanced conventional systems, the inspection frequency could be lower. The CBP on-site BMP expert panel will recommend the inspection frequency by practice, which will be available in April 2013. Upon approval from the WWTWG, the final recommended inspection frequency may be adopted by the states. • Tracking and reporting through the databases managed by state agencies.
State Applicable	All	All	All	DE, MD, VA and WV
Recommendations And Comments	Use existing NPDES DMR and state WIP defined procedures	Use existing NPDES DMR and state WIP defined procedures	Use existing CSO regulatory process	• DE, MD, VA and WV agreed to verify on-site BMP systems. PA and NY do not currently plan to seek credit for on-site BMP systems so do not have plans for verification. • Use existing or upcoming state regulations on on-site systems. • The expert panel may make recommendations for consideration by stakeholders regarding septic BMP inspection frequencies.

APPENDIX A

Summary of Delaware's regulatory program for onsite systems

Delaware has language in the on-site regulations allowing guidelines to be developed for Innovative/Alternative (I/A) systems by the Delaware Department of Natural Resources & Environmental Control which permittees must follow. Because of this language, the Department developed Operation and Maintenance (O&M) Guidelines for all I/A systems permitted after February 1st, 2007 (attached). Onsite BMP systems are part of the I/A system category. This guideline has been incorporated into DE regulation update and will become a regulation once the update has passed.

Systems permitted and installed prior to Feb 1st, 2007 do not have to follow the O&M requirement and are inspected by the Department every three years. This is tracked by an Access database at DNREC.

Systems permitted after Feb 1st 2007 fall under the O&M guidelines. BMP systems are inspected every 6 months by the service provider. Tracking of systems with O&M requirements is also done through an Access database.

All Onsite BMP systems are inspected by the Department and system designer when installation is complete and before the system has been covered and backfilled. A "Certificate of Satisfactory Completion" (COC) is not granted until: the installation has been found to be satisfactory by the Department and system designer (a DNREC licensed PE), a service contract for a minimum for two years has been submitted for the system, the manufacturer representative submits in writing, if not present at the time of inspection, that the installation has been performed correctly. A system cannot be put into use until a COC has been issued. The construction phase of all I/A system is tracked with a database accessible by the Ground Water Discharge Section.

Innovative and Alternative On-Site Wastewater Treatment and Disposal Systems

Operation & Maintenance Guideline

February 1, 2007

Purpose:

This guideline is intended for all Innovative and Alternative On-Site Wastewater Treatment and Disposal Systems ≤ 2,500 gallons per day.

Overview:

Innovative and Alternative (IA) on-site wastewater treatment and disposal systems are classified as anything other than conventional systems. These systems include but are not limited to advanced treatment units, peat biofilters, drip dispersal or a combination thereof. In order to ensure the proper operation and maintenance of IA systems, the Department of Natural Resources and Environmental Control (DNREC) requires the permittee, through permit conditions, to maintain service contracts with certified service providers for the life of the system.

Definition:

For the purpose of this guideline, a **certified service provider** shall be defined as the following:

1. An individual representative of a manufacturer/supplier who holds a DNREC Class E System Contractor or Class H System Inspector license; or,

2. A Class E System Contractor who is certified, through DNREC approved training, on the operation and maintenance of the advanced treatment unit or system; or,

3. A Class H System Inspector who has become certified through DNREC approved training on the operation and maintenance of the advanced treatment unit or system; or,

4. A Homeowner who has obtained DNREC individual homeowner service provider certification and has been certified through DNREC approved training on the operation and maintenance of the advanced treatment unit or system. The DNREC homeowner certification allows the homeowner to operate and maintain their IA system at their primary place of residence only.

Operation and Maintenance Guideline with Permit Conditions

1. Prior to the Ground Water Discharges Section (GWDS) of DNREC granting a Certificate of Completion, the permittee must enter into a service contract with a certified service provider initially, for a minimum of two (2) years starting at the onset of initial system operation. Specifically the service contract shall prescribe an Inspection Program and Homeowner Training Program as outlined below:

a. Inspection Program

The inspection program shall include the following: a schedule indicating inspection frequency; inspection objective(s); inspection details; necessary operation and maintenance activities; additional sampling if required; and record keeping requirements.

i. Inspection Frequency/Objective: The service contract must outline that the certified service provider is to inspect the system once every six (6) months, or otherwise as approved by the GWDS.

ii. Inspection Reports: The contract must outline that the certified service provider must document all inspections. Operation inspection reports shall indicate the following: date and time of the inspection; sampling and laboratory analysis results; operation and maintenance performed; repairs; an assessment indicating the current performance status of the entire treatment and disposal system; and any corrective actions that must be taken prior to the next inspection. All inspection reports shall be on forms approved by the GWDS.

b. Homeowner Training Program

The service contract must state that the certified service provider is required to meet with the homeowner during the first 6^{th} month inspection. The certified service provider is to educate the homeowner on the components of the system and on the proper operation and maintenance

requirements. At this time, the certified service provider shall provide the homeowner with an operation and maintenance manual.

2. Following the initial two (2) year period, the permittee is required to

maintain a service contract for the life of the system by either: renewing the existing contract annually, at a minimum, or by contracting with another certified service provider. The service contract must contain the inspection program requirements from 1(a) above.

3. The permittee must submit all inspection reports and updated contracts from the previous year by February 1st of each year to the GWDS. The GWDS will mail out reminders.

4. The GWDS reserves the right to collect and analyze samples to ensure proper treatment levels and system performance.

5. Right of Entry

The Secretary of the DNREC or his or her authorized representatives, in regulating water pollution or any other matter over which he or she has jurisdiction under 7 Del. C., Chapter 60, may for the purposes of inspection of on-site wastewater treatment and disposal system(s) installed and or to determine whether a violation exists under 7 Del. C., Chapter 60 or regulation enforceable by the Secretary of the DNREC, may enter, private or public property at reasonable times, upon given verbal notice, after the presentation of official identification to the owner, occupant, custodian or agent of the property,.

6. The GWDS may increase inspection frequencies as warranted. A notice outlining new frequencies and cause will be provided to the permittee prior to initiation.

7. Transferability

This permit is personal and may not be transferred without the prior written consent of the GWDS. Thirty days prior to the transfer of the real property, the owner shall obtain the written consent of the GWDS to transfer this permit to the new property owner. Transfer of the maintenance agreement must also be completed and approved prior to transfer. Failure to obtain such written consent may result in the revocation of this permit.

APPENDIX B

Overview of Maryland's processes and regulation in regards to best available technologies for removal of nitrogen (BAT)

- WWTWG protocol: State or local authorities should verify, track and report proper installation and O&M of on-site BMP systems.

- COMAR 26.04.02.07F. "Within 1 month of the completion of an installation, a person installing a BAT system shall report to the Department, or the Department's designee, in a manner acceptable to the Department, the address and date of completion of the BAT installation and the type of BAT installed."

- WWTWG protocol: The design and installation on-site BMP systems should be done and reported by the certified service providers and verified in the permitting processes.

- COMAR 26.04.02.07E "A person who has completed a course of study approved by the Department for the installation of BAT, and has a certification of qualification for installing BAT systems from the manufacturer, must be present on the property while a BAT unit is installed." The design of the BAT must be approved by MDE."

- WWTWG protocol: The maintenance and inspection of on-site BMP systems should be conducted and reported annually by certified providers and tracked by the authorities. For some low maintenance systems, such as the enhanced conventional systems, the inspection frequency could be lower. The CBP on-site BMP expert panel will recommend the inspection frequency by practice, which will be available in April 2013. Upon approval from the WWTWG, the final recommended inspection frequency may be adopted by the states.

COMAR 26.04.02.07D

D. Operation and Maintenance of BAT Systems.

(8) A BAT system shall be operated by and maintained by a certified service provider.

(2) The owner shall ensure that each BAT system is inspected and has necessary operation and maintenance performed by a certified service provider at a minimum of once per year.

(3) The Department shall maintain a list of certified service providers.

(4) Individuals may become certified upon completion of a course of study on operation and maintenance of BAT systems approved by the Department. The course of study must include instruction on how BAT systems function as well as elements on operation, maintenance, and repair of BAT systems.

(5) Certification as a service provider for BAT systems may be revoked at any time by the Department for violation of these regulations.

(6) The certified service provider shall report on inspection, operation, and maintenance activities to the Department, or the Department's designee, in a manner acceptable to the Department on a yearly basis prior to the yearly anniversary of the date of installation.

(7) The certified service provider must have a certificate of qualification from the manufacturer of the BAT system being serviced.

(8) A property owner may obtain certification as a service provider to maintain the property owner's system, subject to all the requirements of this regulation pertaining to operating and maintaining BAT systems."

- WWTWG protocol: Tracking and reporting through the databases managed by state agencies.

26.04.02.07D (6) "The certified service provider shall report on inspection, operation, and maintenance activities to the Department, or the Department's designee, in a manner acceptable to the Department on a yearly basis prior to the yearly anniversary of the date of installation."

COMAR 26.04.02.07F. "Within 1 month of the completion of an installation, a person installing a BAT system shall report to the Department, or the Department's designee, in a manner acceptable to the Department, the address and date of completion of the BAT installation and the type of BAT installed."

APPENDIX C

Summary of Virginia's regulatory program for onsite systems

The onsite program is regulated by two different regulations. The *Sewage Handling and Disposal Regulations* (SHDR), 12 VAC 5-610, and the *Regulations for Alternative Onsite Sewage Systems* (AOSS Regulations), 12 VAC 5-613. The regulations can be found at http://lis.virginia.gov/000/reg/TOC12005.HTM#C0610 and

http://lis.virginia.gov/000/reg/TOC12005.HTM#C0613 respectively.

The SHDR provide the administrative and procedural regulations along with prescriptive design criteria for conventional and some alternative systems. Mechanisms to ensure that systems are designed and constructed properly are found here. Those mechanisms include:

1. Submittal of a construction application with supporting soils work; site layout; verification of horizontal separation to wells, surface waters, shellfish, etc.; supporting calculations; and other pertinent design information.

2. Review of the application by environmental health specialists and, as needed, by staff engineers.

3. Confirmation of installation according to plans through completion statements based on inspections by the design professional.

The AOSS Regulations expand upon the design options for alternative systems using performance standards and require monitoring and operation and maintenance to verify compliance. All onsite BMPs are expected to be alternative systems and would be subject to the requirements of this regulation. For small systems (≤1,000 gpd), the following requirements apply:

1. The procedural requirements of the SHDR apply as described above.

2. An operation and maintenance manual is required.

3. At a minimum all AOSSs must be visited by a licensed operator at least once a year and a report submitted to VDH. Additional operator visits may be needed as described by the O&M manual.

4. Generally Approved treatment units (systems that have gone through 3rd party testing) have an initial sample collected within 180 days of startup and then every 5 years. Sampling is for BOD_5 and, if disinfection is in place, for total residual chlorine (TRC) or fecal coliform.

5. Non-generally Approved treatment units (systems that have not gone through 3rd party testing) have an initial sample collected within 180 days of startup and then semi annually for two years. If the mean of the samples complies with the given effluent limit, then the sampling is reduced to annually. Sample parameters are as in 4 above.

6. The annual inspection frequency is retroactive and applies to all AOSSs in Virginia. The sampling requirement only applies to systems constructed under the new regulation.

For large AOSSs, the requirements increase as the design flow increases. For large AOSSs, the following requirements apply:

1. The procedural requirements of the SHDR apply.
2. An operation and maintenance manual is required.
3. A renewable operating permit is required.
4. Sampling required in accordance with Table 3 below.
5. Operator attendance in accordance with Table 4 below for facilities over 1,000 gpd and up to 40,000 gpd.
6. For facilities with design flows >40,000 gpd, the frequency reverts to the same frequency for systems under the VPDES discharging permit program as found in 9 VAC 5-790. http://lis.virginia.gov/cgi-bin/legp604.exe?000+reg+9VAC25-790-300.
7. Reports required by 15th of month.

Table 3. Sampling and Monitoring for Large AOSSs

PLANT SIZE	>2.0 MGD	>1.0 - to 2.0 MGD	> 100,000 GPD to 1.0 MGD	> 40,000 GPD to 100,000 GPD	>10,000 GPD to 40,000 GPD	>1,000 GPD to 10,000 GPD
Flow	Totalizing, Indicating, & Recording	Totalizing, Indicating, & Recording	Totalizing, Indicating, & Recording	Totalizing, Indicating, & Recording	Measured	Measured or Estimate
BOD_5, TSS	24-HC* 1/day	24-HC 5 days/wk	8-HC 3 days/wk	4-HC 1 day/wk	Grab quarterly	Grab 1/yr
Total Nitrogen	24-HC weekly	24-HC weekly	8-HC monthly	4-HC quarterly	Grab quarterly	Grab 1/yr
TRC, End of Contact Tank**	Grab daily	Grab daily	Grab weekly	Grab weekly	Grab weekly	Grab 1/yr
Fecal Coliform***	Grab weekly	Grab weekly	Grab monthly	Grab monthly	Grab quarterly	Grab 1/yr

*HC – hourly, flow weighted composite samples

**if disinfection required and chlorine used

***if disinfection required and a disinfectant other than chlorine used

Table 4. Minimum Operator Visit Frequency for AOSSs up to 40,000 GPD

Avg. Daily Flow	Initial Visit	Regular visits following initial visit
≤1,000 GPD	Within 180 calendar days of the issuance of the operation permit	Every 12 months
>1,000 GPD to 10,000 GPD	First week of actual operation	Quarterly
>10,000 GPD to 40,000 GPD	First week of actual operation	Monthly

Therefore, the annual inspections for the small systems will verify that the system is operating according to its intended design and the BMP is functioning as designed. For the larger systems, monitoring will verify compliance with the required effluent limit.

Nitrogen limits will be effective December 7, 2013, for all new AOSS construction applications received after that date. For small systems, the requirement is for a 50% reduction in TN as compared to a conventional system. The AOSS Regulations reference approved BMPs as suitable for compliance, but the detail on acceptable BMPs is in development. Larger systems have more stringent TN limits and will utilize end of pipe (prior to application to soil) sampling for TN. Those limits are 20 mg/l TN for systems 10,000 gpd or less and 8 mg/l TN for larger systems. Additional removal through the soil dispersal field and then attenuation rates from the edge of drainfield to edge of stream will effectively reduce the input of TN from large systems to negligible.