

SECTION 6 URBAN/SUBURBAN STORMWATER

6.1. Current Programs and Capacity

Erosion and Sediment Control Program

The Virginia Erosion and Sediment Control (ESC) Law requires that any person engaging in a land-disturbing activity larger than 10,000 square feet, except activities exempt from the law, is required to submit an erosion and sediment control plan for review and approval prior to beginning the activities. Cities, towns and counties are authorized by the Virginia Soil and Water Conservation Board to operate local ESC programs. These local programs may implement a threshold of less than 10,000 square feet for land-disturbing activity. Once the plan is approved, it is the responsibility of the owner to ensure its implementation.

The ESC law mandates that local ESC programs handle administration, plan review and approval, project inspection and enforcement responsibilities on private and municipal development projects. The ESC law mandates that DCR has responsibility for overseeing local government programs. This oversight responsibility includes an evaluation of the consistency of local government implementation with minimum standards of effectiveness as required by the regulations. DCR performs reviews of all local ESC programs every five years, requiring the local program to operate consistently with the state program in the four component areas of administration, plan review, inspection and enforcement. DCR is also mandated to inspect and enforce state agency and utility company annual plan projects.

In addition, DCR operates a training and certification program issuing certificates of competence, required for local ESC program personnel and for any person who is in charge of and responsible for an individual land-disturbing activity. DCR has developed and maintains an Erosion and Sediment Control Handbook which contains conservation standards to guide the development and implementation of ESC plans.

Code reference: Erosion and Sediment Control Law §10.1-560 et seq; *Code of Virginia*; Erosion and Sediment Control Regulations 4VAC50-30; Erosion and Sediment Control Certification Regulations 4VAC50-50

Industrial Stormwater

The industrial stormwater VPDES permits control the discharge of storm water runoff to surface waters from industrial operations in 29 industrial sectors. These permits require that facilities within a particular industrial subcategory meet standardized permit conditions and monitoring requirements. All permittees must develop a storm water pollution prevention plan (SWPPP), which must identify potential sources of storm water pollution from the industrial site, and describe and ensure the implementation of management practices to reduce the pollutants in storm water discharges. Industrial stormwater permits are issued and administered by DEQ.

MS4 Permit Program

Stormwater runoff is often collected and discharged through MS4s. MS4s are conveyances, including road drainage systems, municipal streets, catch basins, curbs, gutters, ditches,

manmade channels and storm drains designed to collect and convey stormwater, which are owned or operated by a federal, state or local government entity. MS4s are not systems that are part of a "publicly owned treatment works system" (sewage collection, transportation and treatment) or part of a combined sewer (a system designed to carry both sanitary wastes and stormwater to the sanitary sewer treatment plant). Privately owned and operated drainage systems also are not considered MS4s.

Discharges from MS4s are regulated under the Virginia Stormwater Management Act and the Clean Water Act as point source discharges and administered by DCR. MS4 regulations were developed and implemented in two phases. Implementation of the first phase began in the early 1990s and required that operators of MS4s serving populations of greater than 100,000 people (per the 1990 census) apply for and obtain a permit to discharge stormwater from their outfalls.

Stormwater discharges from Phase I municipal separate storm sewer systems are authorized under individual Virginia Stormwater Management Program (VSMP) permits. Under these permits, the MS4 owner/operator must implement a collective series of programs to reduce the discharge of pollutants from the given storm sewer system to the maximum extent practicable in a manner that protects the water quality of nearby streams, rivers, wetlands and bays.

The programs must include elements to:

- Operate and maintain structural stormwater controls
- Control discharges from areas of development and significant redevelopment
- Operate and maintain public streets, roads and highways
- Identify, monitor and control discharges from municipal waste treatment, storage or disposal facilities
- Control pollutants related to application of pesticides, herbicides and fertilizers
- Implement an inspection program to enforce ordinances, which prohibit illicit connections and illegal dumping into the MS4
- Screen the MS4 for illicit connections and illegal dumping
- Implement standard investigative procedures to identify and terminate sources of illicit connections or discharges
- Prevent, contain and respond to spills that may discharge into the MS4
- Limit the infiltration of sanitary seepage into the MS4
- Identify, monitor and control discharges from municipal landfills; hazardous waste treatment, storage, disposal and recovery facilities; facilities subject to EPCRA Title III, Section 313; and any other industrial or commercial discharge the permittee determines to be contributing a substantial pollutant loading to the MS4
- Control pollutants in construction site runoff
- Conduct public education on stormwater

Virginia has eleven (11) Phase I MS4 localities. The localities are the cities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, and Virginia Beach and the counties of Arlington, Chesterfield, Fairfax, Henrico, and Prince William.

The second phase of MS4 regulations became effective March 23, 2003, and requires that operators of small MS4s in "urbanized areas" (as defined by the U.S. Census Bureau's latest decennial census) obtain permit coverage for stormwater discharges.

Small MS4s include storm sewer systems operated by cities, counties, towns, federal facilities such as military bases, Veteran's Affairs hospitals and research facilities, Department of Defense facilities and parkways, and state facilities such as VDOT, community colleges and public universities. Discharges from small MS4s are regulated under the general permit for the Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems.

Under that permit, small MS4s must develop, implement and enforce a program that includes the following "six minimum control measures":

- Public education and outreach on stormwater impacts
- Public involvement and participation
- Illicit discharge detection and elimination
- Construction site stormwater runoff control
- Post-construction stormwater management in new development and redevelopment
- Pollution prevention/good housekeeping for municipal operations

Similar to the Phase 1 programs, small MS4 programs must be designed and implemented to control the discharge of pollutants from their storm sewer system to the maximum extent practicable in a manner that protects the water quality in nearby streams, rivers, wetlands and bays.

Given the wide variability of the amount of pollutants in stormwater at any given time and the difficulty in determining their actual impacts on water quality, MS4 permits are based on an iterative BMP strategy. This strategy, which is consistent with EPA's Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, takes an iterative approach to reducing pollutants in stormwater. For MS4s, the operator selects and implements BMPs to reduce the pollutant load in the stormwater. These BMPs can be programmatic, such as ordinances, inspections, and educational activities, or project-oriented, such as street sweeping, detention ponds, retention ponds and constructed wetlands.

Once implemented, BMPs are evaluated by the MS4 for effectiveness and efficiency in reducing pollutants in stormwater as well as appropriateness for the specific MS4. When necessary, refinements or modifications are made to how the BMP is implemented. There are many parameters that an MS4 operator can use to evaluate a particular BMP. As the MS4 regulations are water quality based, the effectiveness of the BMP to reduce pollutants in the stormwater discharge must be included.

Virginia has approximately 100 permitted MS4s (11 Phase I and 89 Phase II). An interesting note is that one MS4 system may discharge into another MS4 system or multiple MS4s may discharge into the same waterbody.

Code Reference:

§10.1-603.2 et. seq. Code of Virginia

Construction General Permit

Owners or operators of construction activities disturbing one acre or more or for areas covered by the Chesapeake Bay Preservation Act 2,500 square feet or more, must apply for and obtain coverage under the General Permit for Discharges of stormwater from construction activities. The construction general permit requires best management practices to be implemented that address the quantity and quality of stormwater runoff from the land disturbing activity.

Projects receiving coverage under the construction general permit must develop and implement a site specific stormwater pollution prevention plan (SWPPP). The SWPPP must be developed prior to obtaining construction general permit coverage. The SWPPP outlines the steps and techniques the operator will take to comply with the terms and conditions of the permit, including water quality and quantity requirements that are consistent with the VSMP permit regulations to reduce pollutants in the stormwater runoff from the construction site. The SWPPP also specifies all potential pollutant sources that could enter stormwater leaving the construction site and covers methods used to reduce pollutants in stormwater runoff during and after construction. A complete list of SWPPP requirements is contained in the permit. The major components of the SWPPP are:

- A cover or title page that has the project name and location, operators name and contact information, and SWPPP contacts
- A list of parties responsible for implementing each pollution control measure in the SWPPP including contact information
- A site and activity description, including the function of the project, area to be disturbed, potential pollutant sources, schedule of grading and nearest receiving waters
- A site map indicating drainage patterns, location of structural and nonstructural pollution controls measures identified in the SWPPP, surface waters, stormwater discharges to surface water, locations of off-site support activities (e.g. borrow area, disposal area, concrete or asphalt batch plants, equipment or material storage areas) covered by the SWPPP, location of sanitary waste facilities, and location of potential pollutant sources such as fuel, fertilizer and chemical storage
- Erosion and sediment control (ESC) practices with design calculations (this may be fulfilled by referencing an approved state or local ESC plan)
- A description of post development stormwater management (SWM) measures, including design calculations, to be installed (this may be fulfilled by referencing an approved state or local SWM plan)
- Description and schedule of procedures to maintain controls

- Written records of site inspections performed by a professional engineer or DCR-certified responsible land disturber, inspector or combined administrator, and the follow-up maintenance that is required and performed.

Code Reference:

§10.1-603.2 et. seq. Code of Virginia

Nutrient Management Training and Certification Program

This program is operated to train and certify persons who prepare nutrient management plans. To be eligible for certification, an individual must meet education and experience requirements, achieve a passing score on both a core and practical examination and maintain the required continuing education requirements.

Agriculture and turf and landscape certifications are offered. Individuals certified to develop nutrient management plans are required to develop plans consistent with promulgated technical criteria and must provide summary reports to DCR annually. Planners from both categories must use criteria applicable to the specific plan they are writing.

Planners must use the Virginia Nutrient Management Training and Certification regulations and the Virginia Nutrient Management Standards and Criteria, Revised October 2005. In 2005, Standards and Criteria was expanded to give planners additional information needed to write all the components of a nutrient management plan to meet the regulations. In support of the turf and landscape category, the turf recommendations section was expanded to include detailed recommendations for golf courses, athletic fields, and sod production.

There are currently 360 certified Virginia Nutrient Management Planners. There are 295 planners in the agriculture category, 31 in the turf and landscape planner category and 34 which have both agriculture and turf and landscape categories. The turf and landscape category has been in place for less than one year, so it is quickly expanding with strong support from the turfgrass industry.

Certified planners are subject to random inspections of plans prepared to check compliance with promulgated plan criteria. Certificates may be revoked if plans do not meet the criteria contained in the Nutrient Management Training and Certification Regulations (4 VAC-5-15-10 et. seq.)

Code Reference:

§10.1-104.2 Code of Virginia, Regulation 4 VAC 5-15-10 et. seq.

Stormwater Management Program

The Virginia Stormwater Management Act and the Virginia Stormwater Management Program (VSMP) Permit Regulations were developed to protect citizens, property and natural resources from unmanaged stormwater runoff. The act and VSMP provide requirements for the implementation of stormwater management best management practices to address water quality and the quantity of runoff, the components for a local stormwater management program, the conditions required for the permitting of qualifying land disturbance activities and the permitting of the operation and maintenance of a qualifying municipal separate storm sewer system. In

addition, the act and VSMP provide the ability to manage the quantity and quality of stormwater runoff on a regional or watershed basis.

Code Reference:

§10.1-603.2 et. seq. Code of Virginia

Chesapeake Bay Preservation Act and Regulations

The Virginia General Assembly enacted the Chesapeake Bay Preservation Act in 1988. It is an important element of Virginia's multifaceted response to the Chesapeake Bay Agreements. The Bay Act established a cooperative relationship between the Commonwealth and local governments aimed at reducing and preventing nonpoint source pollution through resource-sensitive land use. At the heart of the Bay Act is the concept that land can be used and developed in ways that minimize negative impacts on water quality. The land use provisions of the act work in concert with the various construction and post construction programs, such as stormwater management and erosion and sediment control, to address all sources of water quality degradation in a comprehensive manner.

Each locality within Virginia's coastal zone must adopt a program that is consistent with Bay Act regulations and ensures that the use and development of land in Chesapeake Bay Preservation Areas is accomplished in a manner that protects the quality of state waters. Elements of this required program include:

- A map delineating Chesapeake Bay Preservation Areas
- Adoption of performance criteria for the use, development and redevelopment of land
- A Comprehensive plan that incorporates water quality protection
- A zoning ordinance that incorporates specific measures to protect water quality
- Subdivision ordinances provisions that protect water quality
- A compliant erosion and sediment control program; and
- An adequate plan of development review process

The lands that make up Chesapeake Bay Preservation Areas (CBPAs) are those that have the potential to affect water quality most directly. CBPAs include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). Sensitive features such as tidal wetlands, tidal shores, and connected and contiguous nontidal wetlands are included in RPAs as are a 100 foot buffer adjacent to these features and perennial streams. The 100' RPA buffer is required to remain in its natural vegetated condition, ideally containing three trophic layers of vegetation. The regulations specify that the RPA buffer is deemed to achieve a 75 percent reduction in sediments and a 40 percent reduction in nutrients. RMAs are designated contiguous to the entire inland boundary of the RPA and must include floodplains, highly erodible soils, highly permeable soils and nontidal wetlands not included in the RPA.

Within RPAs no land disturbance is permitted (to include the clearing of vegetation) unless specifically exempted within the regulations. Within both RPAs and RMAs localities must

enforce performance criteria that protect water quality. For example, within an RPA and RMA, the threshold for erosion and sediment control requirements is lowered from 10,000 to 2,500 square feet. In addition, there are currently requirements for no-net increase in stormwater pollutant loadings from new development and a 10 percent reduction in stormwater loadings from redevelopment. Best management practices must have maintenance agreements. Septic systems within CBPAs must be pumped out every five years. The regulations also require that the site design criteria of minimizing land disturbance and impervious cover, and preserving indigenous vegetation, be incorporated into the local development review process.

The regulations also require local governments to include in their comprehensive plans clear local land use policies protective of water quality based on an analysis of physical constraints to development, existing and potential sources of water pollution and shoreline and streambank erosion, among other items.

Code Reference:

§10.1-2101 et. seq. Code of Virginia

Virginia Land Use Authorities and Requirements - Title 15.2 –Chapter 22 - Planning, Subdivision of Land and Zoning

Chapter 22 of title 15.2 et. seq. of the Code of Virginia requires localities to adopt zoning and subdivision ordinances and to develop comprehensive plans. This provision is intended to ensure that local governments, through these mechanisms, improve public health, safety, and welfare of its citizens. Therefore some of these provisions provide authorities to local governments to protect water quality.

Comprehensive Plan Requirements

Section 15.2-2223 of Chapter 22 requires local governments to prepare comprehensive plans for the physical development of the territory within their jurisdictions. The plans are to be general in nature and are to “show the locality's long-range recommendations for the general development of the territory covered by the plan.”

One of the new mandatory elements required to be included in comprehensive plans is the designation of Urban Development Areas (UDAs). Such areas are to be designated as appropriate for higher density development due to proximity to transportation facilities and the availability of a public water and sewer system. There are no provisions in the code specifying that all or most development is to occur within the designated UDAs, nor is there any requirement that areas outside of the designated UDAs must be less intense or preserved for conservation purposes. UDAs are to be designated in localities with a population of greater than 130,000. Within the UDAs development is to occur at a density of at least eight single-family residences, 12 townhouses, or 24 apartments, condominium units per developable acre and a floor area ratio of at least 0.8 per acre for commercial development.

There are provisions within this section of the state code that call for surveys and studies addressing water quality but there are currently no mandatory provisions calling for recommendations to provide water quality protection. However, the Chesapeake Bay Preservation Act and its implementing regulations provides statutory requirement and authority

for local governments to incorporate specific analyses, policies and implementing measures for the protection of water quality in areas of the Commonwealth encompassed by the act.

Zoning

Section 15.2-2280 et. seq. establishes that any locality may, by ordinance, classify the area under its jurisdiction into zoning districts. Within these established zoning districts, localities are authorized to regulate the use of land, buildings, and other premises for agricultural business, industrial, residential, flood plain and other uses those districts.

Section 15.2-2283 of this section of the code further provides that zoning ordinances are to be for the general purpose of promoting the health, safety or general welfare of the public. The only provisions authorizing localities to address water quality include:

- To provide for the preservation of agricultural and forestal lands and other lands of significance for the protection of the natural environment
- Reasonable provisions, not inconsistent with applicable state water quality standards, to protect surface water and ground water

Section 15.2-2286.1 identifies that localities with a 10 percent growth rate from the next to last decennial census years shall include special provisions in their zoning or subdivision ordinances for the clustering of single-family dwellings and the preservation of open space.

Virginia Water Facilities Revolving Fund

Loans may be made from the Virginia Water Facilities Revolving Fund, at the State Water Control Board's discretion, to a local government for construction of facilities or structures or implementation of best management practices that reduce or prevent pollution of state waters caused by stormwater runoff from impervious surfaces. DEQ will prioritize loan applications based upon several criteria, including projects that reduce a pollutant to an impaired water body.

Code reference:

§ 62.1-229.4. Loans for stormwater runoff control best management practices; Code of Virginia

6.2. Accounting for Growth

It is projected that the vast majority of future growth in Virginia will result from the development of agricultural and forest lands into residential and commercial urban uses. To account for this growth in urban land, Virginia will use a multi-tiered approach. Tier 1 involves the use of load balancing between the pre-development land use and the post-development land use augmented as necessary by offsets for development projects that are not able to meet the pre-development load levels through on-site measures. Tier 2 involves identifying, promoting and requiring, through regulatory mechanisms, if needed, land use practices that minimize development's impact on water quality, particularly in local streams.

The Tier 1 load balancing approach uses the allocation loads for forest, cropland, pasture and hay land uses in the Chesapeake Bay Program's Phase 5.3 Watershed Model to calculate the average pollutant loads from a generic pre-development acre based on the mix of projected land to be developed for Virginia's Chesapeake Bay watershed. Each new development project would be required to meet these pre-development loads upon completion of the project through a combination of site planning, BMPs and, if necessary, offsets. Because the calculation of the generic pre-development acre is based on the allocation loads, the post-development load will produce a no net increase from the average forest cropland, pasture and hay loads after treatment with the suite of agricultural and forest BMPs as previously identified in this WIP. The opportunity to create additional reductions beyond those required, and market them through the Nutrient Credit Exchange Program, will provide an additional incentive for treatment. Virginia recognizes the ideal approach would be to calculate the load balance equation on a segment-shed scale. However, this approach is considered overly cumbersome to administer and presents potential inequities across the state. Growth will be tracked at the Bay watershed scale.

In the event that offsets are warranted, efforts will be made to encourage installation of the offset practices as close to the impacting growth area as possible. This will be required in cases where local waterbody impairments exist. It will also provide some level of local water quality protection and minimize the complexities associated with the geographic differences in nutrient delivery and associated offset reduction calculations. All offset practices will be perpetual with adequate assurances for maintenance and sustainability prior to completion of the project generating the load to be offset. The concept of establishing a "perpetual funding" source for offsets is being evaluated.

While this approach accounts for growth in a manner that is consistent with EPA guidance, it may not provide adequate protection for local streams. Observed local water quality data, experience in the field and a substantial body of scientific evidence, compiled in numerous studies throughout the bay watershed, demonstrate that increases in impervious cover, which will be experienced with a conversion from agricultural and forest to urban land use, results in degradation of local stream ecosystems and water quality. Principally, this degradation is the result of increased stream flow (volume, duration and frequency) causing the banks and bed of the stream to become unstable and erode.

This issue of the volume and velocity of runoff will be addressed through the proposed water quantity criteria in the draft stormwater management regulations. Reduction in impervious cover on a programmatic level, however, can only be achieved through changes in local land use ordinances. There are some local ordinances that require higher levels of impervious cover through parking and road width requirements that are in excess of industry or Virginia Department of Transportation standards. As such, additional actions to better manage growth (comprehensive planning that provides greater water quality protection, subdivision, zoning and other land use and development ordinances) are necessary to minimize the impacts of growth on local waters. These actions will be identified with additional clarity in the Phase 2 WIPs.

The Tier 2 element of Virginia's mechanism for accounting for growth will allow for an accounting of existing programs and practices on the ground that are currently either inadequately tracked or not tracked at all. More significantly, the initiative will allow the state, during the WIP Phase II process, to build upon existing programs and practices rather than

creating whole new programs. Some of the existing practices that are either not being adequately accounted for or not accounted for at all, which are being undertaken in conjunction with the Chesapeake Bay Preservation Act and the MS4 permitting program include:

- Stormwater management practices required to be installed and adequately maintained
- Resource Protection Area buffer restoration projects
- Agricultural practices that have been used in support of permitted agricultural encroachments into the Resource Protection Area, including nutrient management and soil erosion control practices
- Forest conservation achieved through the required maintenance of RPA buffers
- MS4 Education and outreach programs regarding fertilizer use, pet wastes, storm drain stenciling, etc.
- Illicit discharge identification and elimination
- Storm sewer outfall screening
- Both structural and non-structural - “living shorelines” - shoreline management practices

The Chesapeake Bay Preservation Act, which applies to 84 localities within the Tidewater region of Virginia, mandates that local subdivision ordinances, zoning ordinances and comprehensive plans contain measures to protect waters of the state. A significant portion of Virginia’s growth is expected to occur in the Tidewater region. Some of the specific land use practices that are currently being implemented by the Bay Act localities include stormwater management practices that minimize the pollutant loads resulting from new development and redevelopment, required BMP maintenance, 100 foot buffers along waterways, and erosion and sediment controls for smaller construction projects among other policies which reduce the impact of growth on water quality.

Virginia is promulgating new stormwater management regulations that are expected to achieve the requirements of the TMDL for new development. A 2010 action by the General Assembly directs that the stormwater regulations be promulgated after the final Chesapeake Bay TMDL is published. This will enable revision of the allowable discharge concentration value for phosphorus, and possibly nitrogen and sediment depending upon which pollutant (N, P or Sediment) is expected to be most restrictive for new development based on the TMDL allocations.

Additionally, the General Permit for Discharges of Stormwater from Construction Activities will be revised soon after finalization of the Bay TMDL to incorporate reference to the resulting waste load allocations and the above-growth provisions. The general permit will also be revised to incorporate the effluent limit guidelines mandated by the federal stormwater regulations. The enhanced water quality and quantity requirements of the general permit will assist in reducing the loads due to growth.

Waste loads for future growth for new or expanding facilities with industrial stormwater discharges can not exceed the nutrient and sediment loadings that were discharged prior to the land being developed for the industrial activity. This approach will result in no net increase of

stormwater nutrient and sediment waste load as a result of the new or expanding industrial activity.

6.3. Gap Analysis

Significant progress has been achieved to date through a variety of programs detailed in Section 8.1 and specific initiatives. Much remains to be done in order to achieve the reductions necessary to meet 2017 and 2025 allocation loads.

6.4. Strategy to Fill Gaps

The bay TMDL will establish a baseline for sediment and nutrient loads that must be met to restore the bay and its tributaries. The sediment and nutrient loads related to urban development can be addressed through the stormwater management, urban nutrient management, and erosion and sediment control programs as well as the suggested expansion of the nutrient credit exchange program suggest in section 1 of this document.

A critical question must be resolved. That is, which BMP efficiency -- Bay model or state regulatory program -- should be used to model future credits for load calculation and reductions? While it is understood that the established model BMP efficiency ensures Bay-wide consistency, individual state regulatory programs will be the means for complying with the TMDL. The efficiency differences between the model and state regulatory program will greatly impact segment-shed response and compliance in meeting the local load and wasteload allocations. While the state program may show that the load and wasteload have been met with the state BMP efficiency, the model may show noncompliance with the segment-shed load and wasteload allocation. Therefore, model and state program BMP efficiencies must be evaluated and if necessary made consistent by the end of the 2013 milestone period.

The existing Erosion and Sediment Control Law and regulations and Chesapeake Bay Preservation Act regulations address sediment and stormwater quantity issues related to land disturbing activities. The statewide threshold for land disturbance is greater than or equal to 10,000 square feet, except in areas covered by the Chesapeake Bay Preservation Act where the minimum disturbance is greater than or equal to 2,500 square feet.

In addition, the law has exceptions for agricultural and forestry activities. One action to improve compliance with the program is to strengthen the agricultural and forestry exceptions in the law (Section 10.1-560.7) by requiring compliance with an agricultural activity conservation plan, or resource management plan, developed and approved by the soil and water conservation district and a forest management plan developed by a professional forester for the timber harvesting activity. The implementation of these requirements would solve the localities' problem of having persons skirting the erosion and sediment control provisions by temporarily converting forest land to agricultural uses just prior to development.

Consistent with the Chesapeake Bay Preservation Act, 84 localities within the Tidewater region of Virginia are currently administering local stormwater management requirements.

The new statewide DCR stormwater management regulations, when implemented, should address the sediment and nutrient loads and stormwater quantity issues with new development and redevelopment over the entire bay watershed. Moreover, Senate Bill 395 enacted during the 2010 session of the Virginia General Assembly establishes that the stormwater regulations will become effective within 280 days of the Chesapeake Bay TMDL being established or by December 1, 2011. The new regulations will impact qualifying new and redeveloped land disturbing projects equal to or greater than one acre, except in areas covered by the Chesapeake Bay Preservation Act where the minimum disturbance is greater than or equal to 2,500 square feet. For redevelopment, 20 percent required phosphorus and associated nitrogen and sediment reduction is anticipated to be incorporated within the Virginia Stormwater Management Regulations. Runoff reduction is one means to achieve this goal.

The new stormwater regulations will not address sediment and nutrient loads associated with existing development, nor does the existing Chesapeake Bay Preservation Act. To fill this gap, new requirements, as well as financial incentives for stormwater BMPs is needed. In addition, the new stormwater regulations are expected to require a 20% reduction in phosphorus loads for areas undergoing redevelopment.

Existing regulatory authority allows for localities to establish stormwater utility fees, service districts, or pro-rata fee programs to address sediment and nutrient loads associated with stormwater runoff pursuant to Section 15.2 et. seq. of the Code of Virginia. The fees, if collected, can be used to finance stormwater management projects to address the quality and quantity of stormwater runoff.

The creation of a state administered stormwater management BMP cost share program could be developed in coordination with a funding mechanism to implement water quality and quantity BMPs. The funds would be made available to BMP owners, private and public, on a competitive basis. Projects funded through the fees would be required to quantify the sediment and nutrient reductions to meet the bay TMDL. The cost share percentage could vary based on the reductions provided by the BMP. For example, a project reducing the load or wasteload from the identified area by 60 percent could be potentially eligible for higher percentage cost-share rate than a project reducing load by 20 percent.

House Bill 1221 enacted by the 2010 Virginia General Assembly allows for loans to be made to a local government from the Virginia Water Facilities Revolving Loan Fund for the purpose of constructing facilities or structures or implementing other best management practices that reduce or prevent pollution of state waters caused by stormwater runoff from impervious surfaces.

Section 10.1-603.7 of the Stormwater Management Act authorizes localities to adopt a more stringent stormwater management ordinance to ensure compliance with the act and attendant regulations. This section also provides guidance under which conditions a locality can adopt a more stringent ordinance. So, localities have the opportunity to develop stricter ordinances requiring the installation of BMPs in existing urban areas, in addition to more stringent criteria for water quality and quantity control to meet the allotted loads and wasteloads for the segment shed.

Stricter local ordinances should be considered to prohibit improper disposal of yard waste, grass clippings, and leaf litter to prevent these sources of nutrients from entering storm drains and drainage ways. Virginia requests that the Chesapeake Bay Program establish a BMP efficiency to account for ordinances that keep materials such as grass clippings and yard wastes out of storm drains and drainage ways. It is likely that localities will consider such ordinances given increased MS4 permit expectations and if appropriate new Chesapeake Bay Program BMPs are developed.

Urban nutrient management represents a cost-effective approach to reduce nutrient loss from land use. Virginia intends to maximize the implementation of urban nutrient management through a combination of actions. Implementation of nutrient management plans is already required by the Code of Virginia on all state owned lands receiving nutrients. Several companies are stepping up to voluntarily reduce the potential for excessive fertilizer run off. For example, Scotts Miracle Gro Company has agreed to eliminate phosphorus in fertilizers for established lawns by 2012. Scotts represents over 50% of the homeowner applied fertilizer market. During 2011, DCR will evaluate the level of voluntary implementation of various nutrient management practices and nutrient management plans. Where the practices show the probability of achieving 90% compliance on a voluntary basis, the practice level would remain voluntary and DCR would continue to track its status. For those practices that do not show a likelihood of 90% compliance by 2017, then DCR will request legislation to:

- Collect and report annual fertilizer applications by lawn care operators through the Voluntary Water Quality Agreements with DCR. Reports would summarize such applications by county/city annually
- Require all municipal / county owned nonagricultural lands receiving nutrients to develop, implement and maintain nutrient management plans
- Requiring nutrient management plans to be implemented on all private and publicly owned golf courses
- Place sales restrictions on do-it-yourself non-agricultural lawn and turf fertilizers to:
 - Ban phosphorus (unless homeowner or property owner is establishing a new lawn, or reestablishing an older lawn; or provides a soil test showing need for phosphorus based fertilizer)
 - Effect time of year use restrictions
 - Consider requiring a significant percentage of slow-release nitrogen
- Prohibit the use of nitrogen containing deicers on paved surfaces
- Require proper storage and disposal of non-agricultural fertilizers by retailers to prevent nutrient losses to ground and surface waters

On developed land the implementation of additional BMPs will be necessary to meet the allocated pollutant reductions. Between 2011 and 2025, additional BMPs will be necessary using practices beyond urban nutrient management. Implementation of this requirement will be costly, necessitating state and local funding through stormwater utilities, service districts or other mechanisms. Actions to achieve these reductions will be pursued through future permits and other means including the Nutrient Credit Exchange Program.

The Phase II WIP process will involve development of local load targets for unregulated stormwater and waste load allocations for regulated stormwater. These local targets will provide the framework to allow local government flexibility, while ensuring accountability, to achieve equivalent levels of reductions through means other than installation of stormwater BMPs or potentially through trading among sectors, including, but not limited to the Nutrient Credit Exchange.

The Commonwealth will utilize MS4 permits to assure BMP implementation on existing developed lands to achieve nutrient and sediment reductions equivalent to Level 2 (L2) scoping run reductions by 2025 for state and local MS4 operators. Level 2 implementation equates to an average reduction of 9 percent of nitrogen loads, 16 percent of phosphorus loads and 20% of sediment loads from impervious regulated acres and 6 percent of nitrogen loads, 7.25 percent of phosphorus loads and 8.75 percent sediment loads beyond 2009 progress loads and beyond urban nutrient management reductions for pervious regulated acreage.

Table 6-4.1 provides examples of practices that may achieve the Level 2 load reductions based on Virginia watershed urban land uses listed. The specific practices utilized in the table are for demonstration purposes. Any mix of practices including those not identified in the table to meet the equivalent reduction levels would be acceptable.

Table 6-4.1 Urban / Suburban Stormwater Scoping Scenario Level 2 Effective Net Reductions Using Phase 5.3 Land Loads

Existing Non-federal Urban Lands

Land Use Category	Practice Description	Level 2 Practice % Coverage	Effective Net Reduction Prorated Over Entire Land Use Category Acreage		
			N	P	Sediment
Impervious Urban High and Low Intensity	Impervious Cover Reduction	7.5%	0%	5%	6%
	Filtration Practices	7.5%	3%	4%	6%
	Infiltration Practices	8.0%	6%	7%	8%
	Total		9%	16%	20%
Pervious Urban High and Low Intensity	Impervious Cover Reduction	-			
	Filtration Practices	5%	2%	3%	4%
	Infiltration Practices	5%	4%	4.25%	4.75%
	Total		6%	7.25%	8.75%

Nutrient Reduction Efficiencies:

Impervious Cover Reduction: 2% N, 65% P, 85% Sediment (based on differences in Phase 5.3 Watershed Model no BMP loads for pervious/impervious average Virginia loads)

Filtration Practices: 40% N, 60% P, 85% Sediment

Infiltration Practices: 80% N, 85% P, 95% Sediment

MS4 permits will provide flexibility in implementation of the specific management technologies employed to meet the required reductions, while stipulating standards and/or objectives. MS4 operators will be able to adjust the levels of reduction between pervious and impervious land uses within their service area, provided the total pollutant load reduction is met. For example, an MS4 could implement a 5% nitrogen load reduction on impervious land uses by implementing a reduction strategy sufficiently greater than 6% nitrogen load reduction on pervious land uses provided the total loads from both land uses are met. In addition, as a means to meet the pollutant reductions, it is anticipated that some permittees may consider incentives such as the Water Quality Improvement Fund and tax credits to encourage additional reductions to the L2 Level where additional reductions are required.

The Commonwealth will utilize enforceable MS4 permit language requiring MS4 operators to develop, implement and maintain Chesapeake Bay TMDL Action Plans (Action Plans)

consistent with the WIP. MS4 operators will be given three full permit cycles (15 years) to implement the necessary reductions to meet the L2 implementation levels for non-federal MS4s and L3 implementation levels for federal MS4s. Baseline efforts for all MS4s will be based upon 2009 progress loads. The baseline effort will be expected to be continued with an expectation of an additional 5% reduction of loads for existing developed lands to be met by the end of the first permit cycle. In addition, MS4 operators will be required to implement urban nutrient management plans on all lands owned and operated by the MS4 operator during the first five-year permit cycle. MS4 operators will also be required to implement the revised stormwater management regulations for new and redevelopment projects by July 1, 2014.

During the first permit cycle, MS4 operators will develop a phased Chesapeake Bay TMDL Action Plan. The plan will include a review of the baseline program and include an outline of the means and methods that will be utilized to meet the L2 level for state and local MS4s and L3 for federal MS4s. The MS4 operator will also review its authorities and adopt and modify the necessary ordinances as well as develop its resources in order to implement the necessary reductions, e.g., develop design protocols, operation and maintenance programs, site plan review criteria, inspection standards, and tracking systems. As a part of reapplication for the second cycle of permit coverage, the MS4 operator will provide a schedule of implementation of the means and methods to implement sufficient reductions to reach 35% of the L2 reductions for state and local MS4s and L3 for federal MS4s. As a part of reapplication for the third cycle of permit coverage, the MS4 operator will provide a schedule of implementation of the means and methods to implement sufficient reductions to reach the remaining L2 reductions for state and local MS4s and L3 for federal MS4s by the end of the third permit cycle.

The Commonwealth will utilize MS4 permits to assure BMP implementation on existing developed regulated federal lands to achieve nutrient and sediment reductions equivalent to Level 3 scoping run reductions by 2025. Level 3 implementation equates to an average reduction of 18 percent of nitrogen loads, 32 percent of phosphorus loads and 40 percent of sediment loads from impervious regulated acres and 12 percent of nitrogen loads, 14.50 percent of phosphorus loads and 17.5 percent of sediment loads beyond urban nutrient management reductions for pervious regulated acreage.

To provide reasonable assurance for the attainment of Level 3 pollutant reductions for regulated and unregulated lands, the Commonwealth cites the following content from the President's Executive Order 13508, Strategy for Protecting and Restoring the Chesapeake Bay Watershed, May 12, 2010: "Waste load and load allocations and reduction plans for individual federal facilities and installations will be set following one of two general approaches: a) states would establish explicit load reduction expectations for individual federal facilities as part of the WIP process; or b) based on broad load reduction goals established by the state, individual federal facilities/installations would develop Federal Facility Implementation Plans that would demonstrate to the state how the facility proposes to achieve needed load reductions. In either case, the states and the District would ultimately decide what loading reductions to propose for federal facilities in its WIP."

Consistent with Presidential Executive Order 13508 and the Energy Independence and Security Act the Commonwealth will expect that all federal facilities control the discharge of pollutants in

stormwater to the maximum extent practicable and any more stringent requirements necessary to meet water quality requirements of the Federal Water Pollution Control Act. Pursuant to federal guidance, 40 C.F.R. section 122.26(d)(2) and 40 C.F.R. section 122.34(b)(5), new and redeveloped federal facilities will be required to manage post construction stormwater to preserve and restore site hydrology and implement BMPs necessary to control the discharge of pollutants in stormwater to the maximum extent practicable and any more stringent requirements necessary to meet water quality requirements of the Federal Water Pollution Control Act and attain water quality standards.

Table 6-4.2 provides examples of practices that may achieve the Level 3 load reductions based on Virginia watershed urban land uses listed. The specific practices utilized in the table are for demonstration purposes. Any mix of practices including those not identified in the table to meet the equivalent reduction levels would be acceptable.

Table 6-4.2 Urban / Suburban Stormwater Scoping Scenario Level 3 Effective Net Reductions Using Phase 5.3 Land Loads

Existing Federal Urban Lands

Land Use Category	Practice Description	Level 3 Practice % Coverage	Effective Net Reduction Prorated Over Entire Land Use Category Acreage		
			N	P	Sediment
Impervious Urban High and Low Intensity	Impervious Cover Reduction	15%	0%	10%	13%
	Filtration Practices	15%	6%	9.0%	13%
	Infiltration Practices	15%	12%	13%	14%
	Total		18%	32%	40%
Pervious Urban High and Low Intensity	Impervious Cover Reduction	-			
	Filtration Practices	10%	4%	6%	8%
	Infiltration Practices	10%	8%	8.5%	9.5%
	Total		12%	14.5%	17.5%

Nutrient Reduction Efficiencies:

Impervious Cover Reduction: 2% N, 65% P, 85% Sediment (based on differences in Phase 5.3 Watershed Model no BMP loads for pervious/impervious average Virginia loads)

Filtration Practices: 40% N, 60% P, 85% Sediment

Infiltration Practices: 80% N, 85% P, 95% Sediment

6.5. Contingencies

Collectively, the stormwater management programs and actions set forth in this implementation plan represent a significant step forward in managing urban sources of nutrients and sediments. Additional actions that could be employed if allocations are not met could include, but are not limited to the following:

- Consider reducing allowable post development loads further on new development through stormwater management requirements that call for post construction stormwater to preserve and restore site hydrology and implement BMPs necessary to control the discharge of pollutants in stormwater to the maximum extent practicable and any more stringent requirements necessary to meet water quality standards;

- Consider requiring new post development loads to be lower than the transferred load allocation from the average load allocations of the collection of previous land uses prior to development;
- Consider modifying redevelopment criteria to require a level of phosphorus reduction and associated nitrogen and sediment greater than the 20% reduction discussed in Section 7.4;
- Consider establishing impervious cover limits or open space requirements that preserve and restore site hydrology or implement BMPs necessary to control the discharge of pollutants in stormwater to achieve an equivalent level;
- Establish requirements for enhanced vegetation and plantings within required open space and pervious areas to boost function of pervious areas.

6.6. Tracking and Reporting Protocols

One of the missing elements in capturing this sector's contribution has been inconsistent or, in most cases, lack of reporting of the installed practices. A Stormwater Management Enterprise Web site is being proposed as a management tool for the new stormwater management regulations. When the regulations are adopted and implemented, the enterprise website will track project information including: location, size of site, disturbed area, BMPs and area of treatment, date of plan reviews and approvals, inspection and enforcement documentation, permit issuance date, project termination and fees paid. The implementation of the stormwater enterprise website will allow the locality to enter data into the tracking database and allow DCR to consolidate locality data for submission to EPA. The data will be reported and entered on the segment basis for the calculation of reductions within the segment-shed.

DCR is developing the enterprise website to digitally track and report urban/suburban BMPs installed by localities. Funding has been identified to launch phase 1 of the website. Data collected through this website will be provided in a digital format that can be uploaded to NEIEN. Currently, the MS4 localities must report installed BMPs as a condition of their permit, and rather than rely on a paper exercise, the direct input from the localities could greatly improve the contribution of this sector. Modifications to regulations will be necessary to ensure that all localities inventory and report the specific locations and descriptions both existing and newly installed BMPs.