



Final Regulation Agency Background Document

Approving authority name	State Water Control Board
Virginia Administrative Code (VAC) citation	9 VAC 25-720
Regulation title	<u>Water Quality Management Planning Regulation</u>
Action title	Amendments to Water Quality Management Planning Regulation - <i>Total Nitrogen and Total Phosphorus Annual Waste Load Allocations for Certain Dischargers within the James and York Basins</i>
Document preparation date	November 18, 2005

This information is required for executive branch review and the Virginia Registrar of Regulations, pursuant to the Virginia Administrative Process Act (APA), Executive Orders 21 (2002) and 58 (1999), and the *Virginia Register Form, Style, and Procedure Manual*.

Brief summary

Please provide a brief summary (no more than 2 short paragraphs) of the proposed new regulation, proposed amendments to the existing regulation, or the regulation proposed to be repealed. Alert the reader to all substantive matters or changes. If applicable, generally describe the existing regulation. Also, please include a brief description of changes to the regulation from publication of the proposed regulation to the final regulation.

The subject matter of the rulemaking is to revise the Water Quality Management Planning Regulation (9 VAC 25-720), to establish total nitrogen and total phosphorus annual waste load allocations for certain dischargers within the James and York Basins.

At their June 28, 2005 meeting, the Board adopted two amended regulations: (1) Regulation for Nutrient Enriched Waters and Dischargers Within the Chesapeake Bay Watershed (9 VAC 25-40); and (2) Water Quality Management Planning Regulation (9 VAC 25-720), and suspended the effective date to allow time for another 30-day public comment period.

At their September 27, 2005 meeting, the Board adopted final nutrient waste load allocations for certain dischargers in the Potomac, Rappahannock, and Eastern Shore Basins. Final waste load allocations for total nitrogen and total phosphorus in the York and James Basins were deferred at that time, to be finalized at the November 21, 2005 Board meeting.

That action has now been taken, with revisions to the waste load allocations first adopted in June 2005 for the James and York Basins as appropriate, taking into account:

- a. Design flow of the facilities.
- b. Use of stringent nutrient removal treatment.
- c. Water quality modeling results that simulated various options for nutrient control levels and the resulting compliance with proposed and adopted tidal water quality standards.

This action completes the overall rulemaking to amend the Water Quality Management Planning Regulation by adding provisions for point source nutrient discharge control, initiated through a Notice of Intended Regulatory Action published on January 26, 2004.

Statement of final agency action

Please provide a statement of the final action taken by the agency including (1) the date the action was taken, (2) the name of the agency taking the action, and (3) the title of the regulation.

At their November 21, 2005 meeting, the State Water Control Board heard the following recommendations by staff of the Department of Environmental Quality:

1. Adopt the amendments to the **Water Quality Management Planning Regulation**, 9 VAC 25-720, Sections 720-60 (James Basin) and 720-120 (York Basin) as proposed today.
2. Authorize the Director to receive any petition requesting amendment of the adopted nitrogen or phosphorus waste load allocations on the Board's behalf.
3. Authorize the Director, upon completion of the public comment period on the petition, to proceed to initiate a rulemaking on any petition received.

The motion to accept the staff recommendations was accepted unanimously.

Legal basis

Please identify the state and/or federal legal authority to promulgate this proposed regulation, including (1) the most relevant law and/or regulation, including Code of Virginia citation and General Assembly chapter numbers, if applicable, and (2) promulgating entity, i.e., agency, board, or person. Describe the legal authority and the extent to which the authority is mandatory or discretionary.

State mandate in the Code of Virginia, §62.1-44.15, is the source of legal authority identified to promulgate these amendments. The promulgating entity is the State Water Control Board.

The scope and purpose of the State Water Control Law is to protect and to restore the quality of state waters, to safeguard the clean waters from pollution, to prevent and to reduce pollution and to promote water conservation. The State Water Control Law (Code of Virginia) at §62.1-44.15(10) mandates the Board to adopt such regulations as it deems necessary to enforce the general water quality management program of the Board in all or part of the Commonwealth. In addition, §62.1-44.15(14) requires the Board to establish requirements for the treatment of sewage, industrial wastes and other wastes that are consistent with the purposes of this chapter. The specific effluent limits needed to meet the water quality goals are discretionary.

The correlation between the proposed regulatory action and the legal authority identified above is that the amendments being considered are modifications of the current requirements for the treatment of wastewater that will contribute to the attainment of the Virginia Water Quality Standards.

Action on this regulatory package has been completed by the Office of Attorney General, and the Board's authority to adopt these point source nutrient discharge regulations has been certified.

State Water Control Law (Code of Virginia) web site:
<http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+62.1-44.15>

Purpose

Please explain the need for the new or amended regulation. Describe the rationale or justification of the proposed regulatory action. Detail the specific reasons it is essential to protect the health, safety or welfare of citizens. Discuss the goals of the proposal and the problems the proposal is intended to solve.

The purpose of this rulemaking is to protect State waters by adopting regulations that are technically correct, necessary and reasonable. The effect of this regulatory action is to establish permit limitations for two nutrients – total nitrogen and total phosphorus -- for certain dischargers within the James and York Basins, which lie in Virginia's portion of the Chesapeake Bay watershed. Resulting permit limitations will be expressed principally as annual waste load allocations, and also as technology-based annual average concentrations where appropriate and authorized. These actions are needed because nutrients discharged from wastewater treatment plants contribute to the overall, excessive loading of nitrogen and phosphorus to the Chesapeake Bay and its tributaries. These nutrients have been identified as pollutants contributing to adverse impacts on large portions of the Bay and its tidal rivers, which are included in the list of impaired waters required under §303(d) of the Clean Water Act and §62.1-44.19:5 of the Code of Virginia. Waters not meeting standards will require development of a Total Maximum Daily Load (TMDL), also required under the same sections of federal and state law. In May 1999, EPA Region III included most of Virginia's portion of the Chesapeake Bay and extensive sections of several tidal tributaries on Virginia's impaired waters list. The *Chesapeake 2000 Agreement* commits Virginia to the goal of removing the Chesapeake Bay and its tidal tributaries from the list of impaired waters by 2010. Thus, the development of a TMDL for the entire Chesapeake Bay is not being scheduled until 2010, anticipating that the Chesapeake Bay Program partners can cooperatively achieve water quality standards by that time making a Bay wide TMDL unnecessary. These regulatory actions will help to meet the goals of the *Chesapeake 2000 Agreement*.

Under a separate rulemaking, amendments to the Virginia Water Quality Standards Regulation [9 VAC 25-260] have been made that update numerical and narrative criteria to protect designated uses of the Chesapeake Bay and its tidal rivers from the impacts of excessive nutrient and sediment loads. That rulemaking includes new and revised use designations for the Chesapeake Bay and its tidal tributaries. Adoption of Bay-specific criteria and uses was necessary to define the most accurate water quality goals for reducing the inputs of nitrogen, phosphorus and sediment and for subsequent TMDL development. Achievement of the point source effluent limitations governed by the proposed regulations will aid in compliance with the new tidal water quality standards and are reasonably expected to contribute to the attainment or maintenance of such water quality.

Substance

Please identify and explain the new substantive provisions, the substantive changes to existing sections, or both where appropriate. A more detailed discussion is required under the "All changes made in this regulatory action" section.

Water Quality Management Planning Regulation; 9 VAC 25-720: The revisions made to the June 28, 2005 amended regulation are applicable to only the nutrient waste load allocation tables for the James Basin (Section 720-60) and the York Basin (720-120). At their September 27, 2005 meeting, the Board adopted final nutrient waste load allocations for certain dischargers in the Potomac, Rappahannock, and Eastern Shore Basins. Final waste load allocations for total nitrogen and total phosphorus have now been assigned for the listed dischargers in the James and York Basins, taking into account:

- d. Design flow of the facilities.
- e. Use of stringent nutrient removal treatment.
- f. Water quality modeling results that simulated various options for nutrient control levels and the resulting compliance with proposed and adopted tidal water quality standards.

This action completes the overall rulemaking to amend the Water Quality Management Planning Regulation by adding provisions for point source nutrient discharge control, initiated through a Notice of Intended Regulatory Action published on January 26, 2004.

Issues

Please identify the issues associated with the proposed regulatory action, including:

- 1) the primary advantages and disadvantages to the public, such as individual private citizens or businesses, of implementing the new or amended provisions;*
 - 2) the primary advantages and disadvantages to the agency or the Commonwealth; and*
 - 3) other pertinent matters of interest to the regulated community, government officials, and the public.*
- If there are no disadvantages to the public or the Commonwealth, please indicate.*

The public will benefit, as these amendments will result in the discharge of reduced amounts of nitrogen and phosphorus from wastewater treatment plants in the James and York Basins. This, in turn, will aid in the restoration of water quality in the Chesapeake Bay and its tributary rivers, and assist in meeting the water quality standards necessary for protection of the living resources that inhabit the Bay.

One disadvantage that the public may perceive is that these actions only address a portion of the nutrient loads to the Bay and its tributaries -- that being the point source discharges. Unless a comparable level of effort is applied to reduce the nonpoint source inputs (runoff from agricultural, urban/suburban, and forested lands, septic systems, and air deposition), which are largely unregulated, the Commonwealth will be unable to achieve the load reductions necessary to meet the revised water quality standards. The needed nonpoint source controls are detailed in Virginia's Tributary Strategies for Nutrient and Sediment Reduction, released in early 2005 by the Secretary of Natural Resources. Wastewater treatment plant owners may see these proposals as too stringent, with the discharge limitations being difficult and expensive to meet. Long-term planning and capacity needs to serve future growth are also significant concerns that the facility owners have expressed, with the uncertainty of living under a "cap" on nutrient discharges. Other public groups, particularly citizen conservation organizations, may view the absence of strict technology-based concentration limitations as too lax, since they have advocated uniform treatment requirements based on use of current limits of available technology.

One advantage to the Commonwealth is that adoption of these amendments will fulfill a directive from Governor Warner to DEQ, given at the December 2003 Chesapeake Bay Program Executive Council meeting, calling for regulations authorizing numerical, technology-based nutrient limitations in permits for Bay dischargers. The proposals are also consistent with a draft permitting policy for Chesapeake Bay dischargers announced by EPA Region 3 in January 2005 ("NPDES Permitting Approach for Discharges of Nutrients in the Chesapeake Bay Watershed"), which describes a consistent basin-wide method to issue permits that include measurable and enforceable nitrogen and phosphorus limits. Although not

formally a regulation, EPA intends to use this approach to monitor states' progress in placing appropriate limits in permits and will closely review the nutrient reduction requirements in those permits submitted for approval. These proposals will provide the regulatory basis for including nutrient effluent limits within the VPDES permits of the affected dischargers. There is no disadvantage to the agency or the Commonwealth that will result from the adoption of these amendments.

Changes made since the June 2005 "Adopted-Suspended" stage

Please describe all changes made to the text of the proposed regulation since the publication of the regulations adopted by the State Water Control Board on June 28, 2005, with the effective date suspended to allow for another 30-day comment period. For the Registrar's office, please put an asterisk next to any substantive changes.

Water Quality Management Plan Regulation; 9 VAC 25-720:

Section number	Requirement at proposed stage	What has changed	Rationale for change
720-60. James Basin – C.	Nitrogen and phosphorus waste load allocations to restore the Chesapeake Bay and its tidal rivers.	Annual waste load allocation figures for most of the listed facilities.	There have been modifications in the basis for calculating annual waste load allocations, including combinations of: <ul style="list-style-type: none"> • Revised design flow figures. • Use of stringent nutrient removal treatment. • Water quality modeling results that simulated various options for nutrient control levels and the resulting compliance with proposed and adopted tidal water quality standards.
720-120. York Basin – C.	Nitrogen and phosphorus waste load allocations to restore the Chesapeake Bay and its tidal rivers.	Annual waste load allocation figures for most of the listed facilities.	There have been modifications in the basis for calculating annual waste load allocations, including combinations of: <ul style="list-style-type: none"> • Revised design flow figures. • Use of stringent nutrient removal treatment. • Water quality modeling results that simulated various options for nutrient control levels and the resulting compliance with proposed and adopted tidal water quality standards.

Public comment

Two comment periods are covered in this section. The first was a re-opened public comment period on the Water Quality Management Planning Regulation (9 VAC 25-720) from July 25 – August 24, 2005, and

the second was a public review of additional water quality modeling scenario results, made available from October 18 – November 1, 2005. A summary of comments and agency response follows.

A. Water Quality Management Planning Regulation (9 VAC 25-720)

1. **Comment:** Five dischargers in the York basin and ten dischargers in the James basin requested increased nutrient load allocations, the major reasons being a claim that they will have expanded treatment facilities in operation by 2010, or less stringent treatment levels can be required and still achieve the State's water quality restoration goals.

Response: *Establishing nutrient load allocations has been based, in part, on the design capacity of the wastewater treatment facility that is certified for operation by 2010. Several owners requested additional nutrient load allocations due to claims their facilities will be expanded by that date. After staff review of the information submitted by these owners, some were judged to have provided reasonable assurance that their treatment facility would be certified to operate at the expanded flow by 2010. In these cases, the higher allocation was included in the regulation, usually with a footnote in the river basin table that stated the allocation would revert to the amount based on their existing design flow if the expanded facilities were not on-line by 2010.*

For dischargers that did not receive a requested higher allocation, staff believes some assurance has been provided that an increase in allocation will be considered in the future should their facility be expanded and operational by 2010. At the September 21, 2005 meeting, the Board adopted a new section, 9 VAC 25-720-40.D., which recognizes that the Board may amend the regulation in the future to adjust individual nutrient load allocations for a number of reasons, including completion of a plant expansion as evidenced by issuance of a Certificate to Operate by December 31, 2010. The section also states that any adjustments to allocations must ensure water quality standards are maintained.

Based on staff review of requested waste load allocation (WLA) increases, figures in the Water Quality Management Planning Regulation either remain unchanged or have been revised as follows for facilities in the York and James Basins:

York

1. Caroline County Regional STP - WLAs currently based on 0.5 MGD design flow; request increase based on 3.0 MGD. *Caroline County claims the expanded plant will be in service by 2010, but no major milestones timeline (e.g., permit modification, preliminary engineering report [PER], plans and specifications, bidding, construction) was provided. Evidently a consultant has just begun work on a re-rating study, optimization of existing plant, and PER development. Design flow basis for WLAs remains unchanged, as project is still in very early planning stages with no reasonable assurance the expanded plant will be certified for operation by December 2010.*
2. Hanover Co.-Totopotomoy STP –WLAs currently based 5.0 MGD design flow; request increase based on 10.0 MGD. *Hanover constructed plant to include BNR technology and has incurred about 66% of cost (\$9.6 of \$14.6 million total) for expansion to 10 MGD. Hanover's Capital Improvement Program includes a schedule beginning in July 2008 for remaining work to bring full capacity to 10.0 MGD, and permit has a tier for 10 MGD level. Given substantial investment to-date in the expansion, the 10 MGD design flow was used in both of the recent water quality model runs, and results showed WLAs based on 10 MGD to be protective of water quality. Further, although WLAs will be based on 10 MGD, they will also be based on the more stringent nutrient treatment requirement of the two model runs (6.0 rather than 8.0 mg/l for TN, and 0.7 rather than 1.0 mg/l TP). Explanation of these relatively more stringent treatment requirements is contained in the following section on the James and York Water Quality Modeling Results.*
3. Rapidan S.A.-Gordonsville STP: *Rapidan S.A. requested consideration for less stringent treatment requirements (8.0 mg/l TN rather than 4.0 mg/l; 1.0 mg/l TP rather than 0.3 mg/l) in the basis for their WLAs, and this comment is addressed in a section following on the James and York Water Quality Modeling Results.*
4. Smurfit-Stone: *23.0 MGD design flow figure used as basis for WLAs approved by the Board on June 28, 2005. In the first public comment period on regulation amendments, owner provided process and*

instrumentation diagrams to support claim for 26.0 MGD design capacity, and has restated this claim in re-opened comment period. Owner-furnished figures used for treatment works (in gallons per minute) were the maximum ratings for unit processes, which is an unlikely operating status to be sustained under normal production conditions ("normal" operation capacity of units totaled 18.4 MGD). Therefore, the design flow basis for WLAs remains 23.0 MGD, based on the preceding and several other factors:

- The facility's groundwater permit limits total withdrawal to 8.4 billion gallons/year (approximately 23.0 million gallons/day).
- Other discharge permit parameters (e.g., BOD5 limitations) are water quality based and more stringent than the applicable Federal Effluent Guidelines (that are production based). Thus, an increase in design flow would require a corresponding decrease in effluent concentrations to maintain regulatory loading caps for other pollutants, a capability the owner has not demonstrated in the materials provided.
- Facility is permitted as an industrial wastewater treatment plant; permit limitations and other technology-based WLAs are based on actual production rates and their associated flows. The existing bleach plant has a demonstrated capability to support 805 machine dried tons per day bleached Kraft pulp production (market plus paperboard). The permit was written to allow for this potential increase in production, and the facility has demonstrated that production rate without having an effluent discharge which exceeded the 22.21 MGD reported 30-day maximum flow.
- Use of 23.0 MGD as full production-based design flow is a significant percentage (about 89%) of the claimed maximum design flow (26.0 MGD), which is consistent with the approach used for other industrial dischargers.

Owner also requested consideration in the basis for their total phosphorus WLA for a less stringent treatment requirement (1.5 mg/l rather than 1.0 mg/l) to be consistent with the feasible treatment level at pulp/paper mills selected as equivalent to enhanced nutrient reduction at POTWs. This comment is addressed in a section following on the James and York Water Quality Modeling Results.

James

1. Buena Vista STP – WLAs currently based 2.25 MGD; City requested increase based on 3.0 MGD. While permit reissued on 11/01/04 included a future design flow tier of 3.0 MGD, this does not determine the basis for WLA calculations, which is based on the design flow certified for operation by December 31, 2010. No major milestones timeline (e.g., permit modification, preliminary engineering report [PER], plans and specifications, bidding, construction) was provided. Design flow basis for WLAs remains unchanged, as no reasonable assurance has been documented that the expanded plant will be certified for operation by December 2010.
2. Georgia Pacific – WLAs currently based on 8.0 MGD design flow; requested increase based on 10.87 MGD. Owner provided design basis for the wastewater treatment system, which was established based on the proper functioning of the activated sludge treatment system. The limiting design flow is 10.87 MGD, and is based on the 90% point of the peak overflow rate for the secondary clarifier. Since owner has not claimed capacity based on maximum ratings for unit processes, WLAs have been revised based on 10.87 MGD.
3. South Central Wastewater Authority-Petersburg STP - WLAs currently based on 23.0 MGD; request increase based on 27.0 MGD. No major milestones timeline (e.g., permit modification, preliminary engineering report [PER], plans and specifications, bidding, construction) was provided. Design flow basis for WLAs remains unchanged, as no reasonable assurance has been documented that the expanded plant will be certified for operation by December 2010.
4. J.H. Miles, Inc. – WLAs currently set at TN = 158,826 lbs/yr; TP = 18,654 lbs/yr. Owner provided updated information on the evaluation of process changes and other cost-effective measures to reduce nutrient loads. A combination of holding discharge flow at current 0.35 MGD average (rather than using full design flow of 0.55 MGD), limiting production days (5 days/week average), substituting cleaning chemicals with less phosphate content, and reduction of marinate sent to waste treatment is projected to reduce the plant's annual TN and TP loads by 18 and 42 percent, respectively, over annual loads that could be discharged at full design flow and 7 days/week operation. Revised WLAs are TN = 153,500 lbs/yr; TP = 21,500 lbs/yr.

5. *Several facility owners (Chesterfield County, Town of Crewe, Hampton Roads Sanitation District, Hopewell Regional Wastewater Treatment Facility, City of Lexington, Lynchburg STP, Maury Service Authority, Rivanna Water and Sewer Authority) requested consideration for less stringent treatment requirements in the basis for WLAs at their plants, and this comment is addressed in a section following on the James and York Water Quality Modeling Results.*

2. **Comment:** Reserve waste load allocations for two York Basin non-significant dischargers that have, or are planned to go off-line based on current permitted capacity and total nitrogen and total phosphorus concentrations reflecting secondary treatment levels (no additional nutrient removal treatment); provide explicit allocations for non-significant plants in regulation. (Spotsylvania Co. Utilities)

Response: *The WQMP regulation only deals with allocations for Significant Dischargers. Non-Significant Dischargers are dealt with through the rulemaking now underway for the Watershed General Permit (WGP; authorized by the 2005 Nutrient Credit Exchange Program statute). The agency will consider means through the WGP process to not discourage regionalization, but also to recognize the need to maintain loading caps.*

B. James and York River Water Quality Modeling Results

Comment: during the re-opened public review period (July-August) for the WQMP Regulation, several dischargers in the York and James basins requested increased nutrient waste load allocations that would result from less stringent treatment requirements (higher effluent nitrogen or phosphorus concentrations), rather than increased design flow figures, generally as follows: Do not adopt James and York waste load allocations until after approval of final water quality standards for these basins; consider less stringent requirements that can achieve same environmental objectives; review additional modeling results simulating less stringent treatment and resulting water quality standards compliance before finalizing nutrient allocations.

(Chesterfield County, Town of Crewe, Hampton Roads Sanitation District, Hopewell Regional Wastewater Treatment Facility, City of Lexington, Lynchburg STP, Maury Service Authority, Rivanna Water and Sewer Authority, VAMWA)

Response: *The response to these comments was deferred at the Board's September 21, 2005 meeting. A key reason for deferring staff recommendations on the James and York nutrient waste load allocations was to allow time for the EPA-Chesapeake Bay Program Office to run additional water quality modeling scenarios that had been negotiated with the Virginia Association of Municipal Wastewater Agencies. These scenario runs simulated varying nutrient reduction levels at the wastewater treatment plants in the York and James basins, with an assessment of the resulting water quality conditions in terms of compliance with dissolved oxygen standards in the York, and proposed numeric chlorophyll criteria in the James.*

Two model scenarios were run, identified as "VATSJY1" and "VATSJY2" (VATS = Virginia Tributary Strategy; JY = James and York). Table 1 shows the nutrient removal levels for publicly owned treatment works (POTW) that were simulated, as follows:

Table 1. Annual average POTW point source total nitrogen (TN) and total phosphorus (TP) concentrations by basin and scenario.

Basin: Region	Scenario VATS JY1		Scenario VATS JY2	
	TN	TP	TN	TP
James River:				
Above Fall Line	6.0 mg/L	0.5 mg/L	6.0 mg/L	0.5 mg/L
Tidal Fresh	5.0 mg/L	0.5 mg/L	5.0 mg/L	0.5 mg/L
Lower Estuary	5.5 MPY	1.0 mg/L	6.9 MPY	1.0 mg/L
York River	6.0 mg/L	1.0 mg/L	8.0 mg/L	1.0 mg/L
Other basins	VATS or TS		VATS or TS	

Notes: NPS and sediments at VATS for James and York Rivers. James Lower Estuary nitrogen shown in million pounds per year (MPY).

After receiving the model results, DEQ staff drafted a set of management options that were shared and negotiated with POTW owners, industrial discharger representatives, citizen conservation organizations, and EPA. These management options also considered treatment levels that differed from those in the two scenarios above, with justification that included the expected water quality response, the reliability and cost-effectiveness of point source controls, consistency with policy decisions previously made in other Bay basins regarding use of stringent treatment, and achievement and maintenance of load caps committed to by the Chesapeake 2000 Agreement signatories.

In response to the October-November review period on the additional James and York water quality modeling runs, several commenters either endorsed a particular combination of treatment levels, or stated that the water quality conditions resulting from simulation of less stringent treatment requirements supported their requests for increased nutrient waste load allocations, as follows:

York Basin

1. Chesapeake Bay Foundation – “...fully supports the recommendations in the Management Options... (POTWs at 6 mg/L TN and 0.7 mg/L TP; 2 paper mills at 1.0 mg/L TP)...”
2. EPA Region 3 – “EPA supports the York River basin point source allocations as outlined in the Management Options ... allocations are supportive of Virginia’s adopted and proposed water quality standards ...allocations also ensure the entire burden of the required nutrient reductions does not fall on nonpoint sources...”
3. Hampton Roads Sanitation District – “...recommends that the POTW point source allocations be established at the conditions evaluated in VATS JY2 (TN=8 mg/l, TP=1.0 mg/l at design flows).”
4. Hanover County Utilities – “...nutrient allocations based on 6 to 8 mg/l and 1 mg/l of total nitrogen and total phosphorous respectively are appropriate based on the model results.”
5. Virginia Association of Municipal Wastewater Agencies – “...allocations for York River dischargers should be based on at least 8 mg/l total nitrogen and 1 mg/l total phosphorus because all of the desired water quality benefits are attained at these levels.”

The agency response to these comments, as well as the other York discharger requests for less stringent treatment requirements submitted during the July-August re-opened review period, has been addressed through the management options described above. Following is the recommended option, with justification for the treatment levels selected.

1. York Basin Nitrogen Waste Load Allocations: Base POTW allocations on TN = 6.0 mg/l; retain industrial treatment levels, equivalent to enhanced nitrogen reduction at POTWs, as approved in June 2005. Justification for this selected option:

- Significant nutrient reduction needed to address existing poor water quality as evidenced by non-attainment of dissolved oxygen criteria in the lower river - ranging from 21% to 34% (from initial 2006 assessment results).

- Consistent with approach of using stringent technology to protect water quality.
- Total York point source discharged nitrogen load in 2000 was ~1.2 million pounds per year (MPY). An allocation based on TN = 8 mg/l only keeps point source loading at that level. A POTW allocation based on TN = 6 mg/l will reduce the load to 1.0 MPY.
- Increases likelihood of achieving water quality standards since nutrient reduction by point sources is more reliable than implementing nonpoint source controls.

2. York Basin Phosphorus Waste Load Allocations: Base POTW allocations on TP = 0.7 mg/l and two paper mill allocations (*Bear Island Paper* [co-discharge with Doswell STP] and *Smurfit Stone*) on 1.0 mg/l; retain other industrial treatment levels, equivalent to enhanced phosphorus reduction at POTWs, as approved in June 2005. Justification for this selected option:

- The estimated total York point source phosphorus load delivered to tidal waters in 2000 was ~0.164 MPY. An allocation based on TP = 1.0 mg/l for the POTWs and 1.5 mg/l for the two paper mills would be ~0.233 MPY delivered, a 42% increase over 2000 loads.
- An allocation based on POTWs at 0.7 mg/l and the paper mills at 1.0 mg/l is ~0.166 MPY delivered, which essentially holds-the-line. This would be acceptable since it appears phosphorus does not significantly influence water quality in the lower portion of the river.
- When this allocation is added to the total phosphorus loads in the other Virginia river basins, the total phosphorus tributary strategy loads are within 1% of the 6.0 MPY Virginia allocation.
- At a minimum, allocations should be set so the basin-wide point source loads do not increase from year 2000 levels.

James Basin

1. Chesapeake Bay Foundation – “...fully supports the recommendations (as proposed in the DEQ staff correspondence referenced above)” [i.e., management options], “for... TN and TP allocations for POTWs above the fall line, TP allocations for POTWs in the Lower Estuary and phased reductions for TN allocations at POTWs in the Lower Estuary.”
2. EPA Region 3 – “EPA supports the James River basin point source allocations for the above fall line, tidal fresh segment and ...total nitrogen allocations for the lower estuary facilities as outlined in the Management Options The allocations are supportive of Virginia’s proposed chlorophyll a water quality criteria for the tidal James River and its tidal tributaries.”
3. Hampton Roads Sanitation District – “VATSJY2 loads are representative of anti-degradation levels.”...“There is no need to establish an allocation for the lower James River on the basis of BNR (i.e. 8 mg/l) as a minimum treatment level.”...“There is no present need to “phase in” a more stringent allocation than 6.9 MPY.”...“The attainment of existing interim State-wide nutrient allocation values is irrelevant.”
4. Hopewell Regional Wastewater Treatment Facility - supports the results of the water quality modeling for the tidal fresh James River, which confirms the previously approved total nitrogen WLA for HRWTF. Requests total phosphorus WLA increase based on 0.8 mg/l, rather than 0.5 mg/l, due to industrial nature of their wastewater and high cost to an already fiscally stressed municipality.
Response: Hopewell’s phosphorus WLA approved in June 2005 was based on an annual average concentration of 0.3 mg/l and full design flow of 50.0 MGD. In a section which follows, it is now recommended that dischargers in the James tidal fresh region have their phosphorus WLAs based on a less stringent concentration of 0.5 mg/l, which provides some relief to Hopewell. In addition, more cost-effective alternatives to on-site treatment could become available through the nutrient credit exchange program now being developed.
5. James River Association- “...urges the Board to exercise extreme caution in approving any increase to the waste load allocations based on the latest two model runs beyond the current approved allocations for the following reasons:”...“...prudent and preferable to provide some margin of safety in the pollution allocations...”, (point source controls are) “most effective approach to achieve water quality standards...”, and “consistency with pollution allocations for other Virginia waters.”
6. Lynchburg Utilities – Review of model results demonstrate that WLAs approved at SWCB’s 6/28/05 meeting were overly stringent and prove that higher point source WLAs will still achieve water quality standards. As a minimum, Lynchburg’s total nitrogen and phosphorus WLAs approved in June are justified.

7. Philip Morris USA – PMUSA’s nitrogen WLA approved in June 2005 was based on the portion of the discharge deemed to be bioavailable to aquatic life. Concerns have been raised by EPA Region 3 staff regarding the study design used by PMUSA and their consultants, and the validity of the conclusion that a significant portion of the TN discharged (dissolved organic-nitrogen, which makes up nearly 88% of the TN) is not bioavailable. Discussions have been held among PMUSA and their consultants, EPA, and DEQ staff to identify the additional information needed to further justify the claim about bioavailability, and PMUSA will follow up in an attempt to address the concerns raised, so that the provision in Section 9VAC25-720-40 B. can be utilized to reduce the regulated portion of their discharge to the amount approved in June (18,547 lbs/yr). For now, the TN allocation has been revised to 139,724 lbs/yr, which includes the dissolved organic-nitrogen. It should be noted that even this WLA represents a significant reduction in the discharged TN load since PMUSA began modifying their wastewater process in 2001 to achieve near limit-of-treatment removal of ammonia and oxidized nitrogen, two forms that are bioavailable. From 1999 to 2000, PMUSA’s average TN load was approximately 203,000 lbs/yr.
8. Richmond Utilities - Review of model results demonstrate that WLAs approved at SWCB’s 6/28/05 meeting were overly stringent and prove that higher point source WLAs will still achieve water quality standards. As a minimum, Richmond’s total nitrogen and phosphorus WLAs approved in June are justified. “The management options...cut point source allocations more than the modeling results warrant. It is strongly recommended that if the DEQ believes in a market driven approach to achieve potential early reductions and continuous decrease in nutrients in the James River watershed, interpretation of modeling results should meet with the goal of incremental changes and equity between PS and NPS.”
9. South Central Wastewater Authority – encouraged by modeling results which indicate SCWA’s total nitrogen and total phosphorus WLAs, based on management options (5 mg/l TN and 0.5 mg/l TP), at current and requested future design capacities of 23 MGD and 27 MGD, respectively, would meet the water quality standards.
10. Virginia Association of Municipal Wastewater Agencies – concur with WLAs resulting from treatment levels simulated in recent model runs for above-fall-line (6.0 mg/l TN; 0.5 mg/l TP) and tidal fresh dischargers (5.0 mg/l TN; 0.5 mg/l TP). Set lower estuary total nitrogen WLA at 6.9 million pounds per year (6.7 MPY for HRSD plants), for the reasons detailed in HRSD’s comment letter.

The agency response to these comments, as well as the other James discharger requests for less stringent treatment requirements submitted during the July-August re-opened review period, has been addressed through the management options described above. Following is the recommended option, with justification for the treatment levels selected.

1. Waste Load Allocations for James Above-Fall-Line and Tidal Fresh Regions: Base POTW allocations for above-fall-line region on TN = 6.0 mg/l and TP = 0.5 mg/l, and for the tidal fresh region on TN = 5.0 mg/l and TP = 0.5 mg/l. Justification for this selected option:

- Consistent with approach of using stringent technology to protect water quality.
- These allocations are predicted to achieve the proposed water quality chlorophyll summer criteria of 23 ug/l in the lower tidal fresh segment, and 22 ug/l in the oligohaline segment.

2. Waste Load Allocations for James Lower Estuary Region:

a. **Total Phosphorus** - Base POTW allocations in lower estuary on TP = 1 mg/l. Justification for this selected option:

- Higher salinity region is less responsive to changes in phosphorus levels.
- Minimum BNR nutrient removal level is acceptable.

b. **Total Nitrogen** – set total point source allocation in lower estuary at 6.15 million pounds per year (MPY), with 6.0 MPY allocated to HRSD facilities in aggregate. Justification for this selected option:

- Represents a significant reduction in TN load (~1.0 MPY) compared to current discharge levels.
- Contributes to restoration of SAV by improving water clarity and reducing algal growth on plant leaves.

- *Model predictions show some benefits for chlorophyll levels at the segment level under long-term hydrology conditions. Local water quality on shorter time scales should also be improved.*
- *Nutrient Credit Exchange Program allows an owner of multiple plants in the same river basin to receive aggregated waste load allocations.*

All changes made in this regulatory action

Please detail all changes that are being proposed and the consequences of the proposed changes. Detail new provisions and/or all changes to existing sections.

Water Quality Management Planning Regulation; 9 VAC 25-720:

Current section number	Proposed new section number, if applicable	Current requirement	Proposed change and rationale
9VAC25-720-60, and -120		Chesapeake Bay Watershed Basin Sections (James, and York)	<p>Existing regulatory text of paragraphs A. (Total maximum daily load [TMDLs]), and B. (Stream segment classifications, effluent limitations including water quality based effluent limitations, and waste load allocations) in each of the river basin sections remain unchanged.</p> <p>A new <u>paragraph C.</u> (<i>Nitrogen and Phosphorus Waste Load Allocations to Restore the Chesapeake Bay and its Tidal Rivers</i>) is added to each river basin section. A table is provided, presenting total nitrogen and total phosphorus waste load allocations for individual significant dischargers, and the sum total of the individual allocations for the listed facilities in the basin.</p>

Regulatory Flexibility Analysis

Please describe the agency’s analysis of alternative regulatory methods, consistent with health, safety, environmental, and economic welfare, that will accomplish the objectives of applicable law while minimizing the adverse impact on small business. Alternative regulatory methods include, at a minimum: 1) the establishment of less stringent compliance or reporting requirements; 2) the establishment of less stringent schedules or deadlines for compliance or reporting requirements; 3) the consolidation or simplification of compliance or reporting requirements; 4) the establishment of performance standards for small businesses to replace design or operational standards required in the proposed regulation; and 5) the exemption of small businesses from all or any part of the requirements contained in the proposed regulation.

The regulations for control of nutrient discharges from point sources in the Chesapeake Bay watershed are part of the Commonwealth’s comprehensive initiative to restore water quality and habitat in Virginia’s Bay waters. They will assist in achieving compliance with new tidal water quality standards that protect designated uses in the Bay and the tidal portions of its tributary rivers. Virginia has used a watershed-based approach in this restoration effort, combining nutrient and sediment reductions from both point sources and nonpoint sources. The point source component of the watershed-based approach assigns

total nitrogen and total phosphorus waste load allocations for significant nutrient dischargers, based on full design flow coupled with stringent nutrient reduction treatment. Alternative regulatory methods incorporated into this approach include:

- 1) The establishment of less stringent compliance or reporting requirements: an allowance is made in Section 9 VAC 25-40-70.B.4, whereby the Board may establish a technology-based standard and associated concentration limitation less stringent than the applicable standard specified in preceding sections. This would be based on a demonstration by an owner or operator that the specified standard is not technically or economically feasible for the affected facility or that the technology-based standard and associated concentration limitation would require the owner or operator to construct treatment facilities not otherwise necessary to comply with his waste load allocation without reliance on nutrient credit exchanges pursuant to the 2005 Nutrient Credit Exchange Program law, provided, however, the discharger must achieve an annual total nitrogen waste load allocation and an annual total phosphorus waste load allocation as required by the Water Quality Management Planning Regulation (9 VAC 25-720).

In addition, Section 9 VAC 25-40-70.C. specifies that the Board may approve an alternate compliance method to the technology-based effluent concentration limitations, by incorporating a provision into the VPDES permit of an Exemplary Environmental Enterprise ("E3") facility or an Extraordinary Environmental Enterprise ("E4") facility that allows suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system. The discharger would be required to operate the installed nutrient removal technologies at the treatment efficiency levels for which they were designed.

- 2) The establishment of less stringent schedules or deadlines for compliance or reporting requirements: The original proposals public-noticed for comment in February 2005 required significant dischargers to achieve compliance with the regulations within four years following reissuance or major modification of the VPDES permit, but in no case later than December 31, 2010. Non-significant dischargers were to have the discharge requirements placed in their reissued or modified VPDES permit after December 31, 2010, with compliance achieved within four years following that reissuance or major modification.

The proposal adopted by the Board in June 2005 did not include these schedules for compliance. Instead, a compliance schedule will be developed by the Board under another rulemaking, which involves a regulation for a Watershed General Permit that will cover all the significant dischargers in the Bay drainage area. This regulation was authorized by the 2005 Nutrient Credit Exchange law, and is anticipated to be released for public comment in early 2006.

- 3) The consolidation or simplification of compliance or reporting requirements: With the concurrence of the U.S. Environmental Protection Agency, the regulations for control of nutrient discharges from point sources in the Chesapeake Bay watershed are based on annual average concentration requirements (as opposed to weekly or monthly averages) and an annual reporting requirement for the discharged waste loads of total nitrogen and total phosphorus.
- 4) The establishment of performance standards for small businesses to replace design or operational standards required in the proposed regulation: In appropriate cases, industrial dischargers have been assigned waste load allocations that reflect "design flow" allowances for full production potential, proportional level-of-effort reduction compared to municipal plants, and unique wastewater qualities affecting 'treatability'. Allowances may also be made, upon acceptable demonstration to the Board, that a significant portion of an industry's discharged nutrient load is not 'bioavailable' to aquatic life, or that 'net' load limits should apply in order to address nutrients in intake water.
- 5) The exemption of small businesses from all or any part of the requirements contained in the proposed regulation: The regulations apply to significant dischargers of nutrients. There area

thresholds of 'equivalent loads' that may exclude or exempt small businesses from the requirements, depending on the magnitude of their annual discharged total nitrogen and total phosphorus loads, as follows: "Equivalent load" means 2,300 pounds per year of total nitrogen and 300 pounds per year of total phosphorus at a flow volume of 40,000 gallons per day; 5,700 pounds per year of total nitrogen and 760 pounds per year of total phosphorus at a flow volume of 100,000 gallons per day; and 28,500 pounds per year of total nitrogen and 3,800 pounds per year of total phosphorus at a flow volume of 500,000 gallons per day.

Family impact

Please assess the impact of the proposed regulatory action on the institution of the family and family stability including to what extent the regulatory action will: 1) strengthen or erode the authority and rights of parents in the education, nurturing, and supervision of their children; 2) encourage or discourage economic self-sufficiency, self-pride, and the assumption of responsibility for oneself, one's spouse, and one's children and/or elderly parents; 3) strengthen or erode the marital commitment; and 4) increase or decrease disposable family income.

The direct impact resulting from limitations on the discharge of total nitrogen and total phosphorus from wastewater treatment plants is for the protection of public health and safety. The adoption of these nutrient limitations will increase the cost of wastewater treatment at publicly owned treatment works, thereby increasing the user charges paid by residential and commercial customers, potentially decreasing the disposable family income.