To: Principal Staff Committee Members and Representatives
of Chesapeake Bay "Headwater" States

From: W. Tayloe Murphy, Jr., Chair
Chesapeake Bay Program Principals' Staff Committee

Subject: Summary of Decisions Regarding Nutrient and Sediment Load Allocations
and New Submerged Aquatic Vegetation (SAV) Restoration Goals

For the past twenty years, the Chesapeake Bay partners have been committed to achieving and maintaining water quality conditions necessary to support living resources throughout the Chesapeake Bay ecosystem. In the past month, Chesapeake Bay Program partners (Maryland, Virginia, Pennsylvania, the District of Columbia, the Environmental Protection Agency and the Chesapeake Bay Commission) have expanded our efforts by working with the headwater states of Delaware, West Virginia and New York to adopt new cap load allocations for nitrogen, phosphorus and sediment.

Using the best scientific information available, Bay Program partners have agreed to allocations that are intended to meet the needs of the plants and animals that call the Chesapeake home. The allocations will serve as a basis for each state's tributary strategies that, when completed by April 2004, will describe local implementation actions necessary to meet the *Chesapeake 2000* nutrient and sediment loading goals by 2010.

This memorandum summarizes the important, comprehensive agreements made by Bay watershed partners with regard to cap load allocations for nitrogen, phosphorus and sediments, as well as new baywide and local SAV restoration goals.

Nutrient Allocations

Excessive nutrients in the Chesapeake Bay and its tidal tributaries promote undesirable algal growth, and thereby, prohibit light from reaching underwater bay grasses (submerged aquatic vegetation or SAV) and depress the dissolved oxygen levels of the deeper waters of the Bay.

As a result, Bay watershed states and the District of Columbia, with the concurrence of EPA, agreed to cap annual nitrogen loads delivered to the Bay's tidal waters at 175 million pounds and annual phosphorus loads at 12.8 million pounds. It is estimated that these allocations will require a reduction, from 2000 levels, of nitrogen pollution by 110 million pounds and phosphorus pollution by 6.3 million pounds annually.

The partners agreed upon these load reductions based upon Bay Water Quality Model projections of

attainment of proposed water quality criteria for dissolved oxygen. The model projects these load reductions will eliminate the persistent summer anoxic conditions in the deep bottom waters of the Bay. Furthermore, these reductions are projected to eliminate excessive algae conditions (measured as chlorophyll *a*) throughout the Bay and its tidal tributaries.

The jurisdictions agreed to distribute the baywide cap load for nitrogen and phosphorus by major tributary basin (Table 1) and jurisdiction (Table 2). This distribution of responsibility for load reductions was based on three basic principles:

1. Tributary basins with the highest impact on Bay water quality would have the highest reductions of nutrients.
2. States without tidal waters – Pennsylvania, New York and West Virginia – would be provided some relief from Principle 1 since they do not benefit as directly from improved water quality in the Bay and its tidal tributaries.
3. Previous nutrient reductions would be credited towards achievement of the cap load allocations.

The nine major tributary basins were separated into three categories based upon their impact on water quality in the Bay. Each basin within a category was assigned the same percent reduction of anthropogenic load. Basins with the highest impact on tidal water quality were assigned the highest percentage reduction of anthropogenic load.

After applying the above calculations and Principle 2, New York, Pennsylvania and West Virginia allocations were set at "Tier 3" nutrient load levels. Additionally, allocations for Virginia's York and James River basins were set at previously established tributary strategy nutrient cap load levels since each basin has minimal impact on mainstem Bay water quality conditions, and their influence on tidal water quality is predominantly local.

These rules resulted in shortfalls to the baywide cap load allocation of 12 million pounds of nitrogen and 1 million pounds of phosphorus. EPA committed to pursue the Clear Skies initiative which is estimated to reduce the nitrogen load to Bay tidal waters by 8 million pounds per year. Bay watershed states agreed to take responsibility for the remaining 4 million pounds of nitrogen and 1 million pounds of phosphorus. The nutrient cap load allocations in tables 1 and 2 reflect these agreements.

The allocations for nitrogen and phosphorus were adopted with the concept of "nitrogen equivalents" and a commitment to explore how actions beyond traditional best management practices might help meet Bay restoration goals. A nitrogen equivalent is an action that results in the same water quality benefit as removing nitrogen. The Chesapeake Bay Program will evaluate how to account for tidal water quality benefits from continued and expanded living resource restoration, such as oysters and menhaden, to offset the reductions of watershed based nutrient and sediment loads. Seasonal fluctuations for biological nutrient removal implementation, nutrient reduction benefits from shoreline erosion reductions, implementation of enhanced nutrient removal at large wastewater treatment plants, and trade-offs between nitrogen and phosphorus will also be evaluated.

Baywide SAV Restoration Goal

To set new SAV restoration goals, scientists and resource managers from state and federal agencies agreed to use data from the single best year of observed SAV growth to estimate the historical long-term bay grass coverage in Chesapeake Bay. Data were collected from aerial photographs taken between 1938 and 2000. From 3-4 years in the 1938 -1964 period, and more than 20 years of data since 1978, new baywide SAV restoration goal acreage was determined by totaling the single best year acreage from each Chesapeake Bay Program segment.

The states have adopted 185,000 acres as the new baywide SAV restoration goal to be achieved by 2010 – consistent with the goals of *Chesapeake 2000*. The achievement of the baywide goal, as well as the local tributary basin and segment specific restoration goals summarized in Table 3, will be based on the single best year SAV acreage within the most recent three-year record of survey results. This new acreage goal has been added to the recently adopted strategy to accelerate the protection and restoration of SAV in the Chesapeake Bay; and Maryland and Virginia have agreed to develop an implementation plan for this strategy by April 2004.

Sediment Allocations

Sediments suspended in the water column reduce the amount of light available to support healthy and extensive SAV communities. With regards to the sediment allocations, the partners agreed that a primary reason for reducing sediment loads to the Bay is to provide suitable habitat for restoring SAV. The jurisdictions also agreed that nutrient load reductions are critical for SAV restoration as well as improving oxygen levels. As a result, the states linked the establishment of sediment cap load allocations to the proposed water clarity criteria and to the new SAV restoration goals.

Unlike nutrients - where loads from virtually all parts of the Bay watershed affect Bay mainstem water quality - impacts from sediments are predominantly seen at the local level. For this reason, local SAV acreage goals have been established and sediment allocations are targeted towards achieving those restoration goals.

The partners recognize that the current understanding of sediment sources and their impact on the Bay is not yet complete. We have only a basic understanding of land-based sediments that are carried into local waterways through stream bank erosion and runoff, but a more limited knowledge about near shore sediments that enter the Bay and its tidal rivers directly through shoreline erosion or shallow-water resuspension. Consequently, sediment allocations are currently focused on land-based sediment cap loads by major tributary basin (Table 1) and jurisdiction (Table 2).

Most land-based best management practices which reduce nonpoint sources of phosphorus will also reduce sediment runoff. Therefore, the jurisdictions agreed to land-based sediment allocations that represent the sediment loading likely to result from implementation management actions required to achieve the phosphorus cap load allocations.

The sediment allocation was set equal to the tier level for phosphorus allocation for each jurisdiction-basin. This is referred to as the 'phosphorus equivalent' land-based sediment reduction. If the 'phosphorus equivalent' land-based sediment reductions were found to be more than necessary to achieve the local SAV acreage goals, then the land-based sediment allocations were raised to that necessary to achieve the SAV goal. The tidal fresh Susquehanna Flats and tidal fresh Potomac River are two examples where this modified approach was applied. If, in the development of their tributary strategies, tributary teams conclude that the land-based sediment allocations need revisions, the tributary teams may identify an alternate land-based allocation working with all the jurisdictions within the effected basin. For example, a jurisdiction may select different nonpoint source management actions than those prescribed in the tier approach to reach the phosphorus goal; the jurisdiction may adjust the sediment goal accordingly so long as SAV restoration and protection is not compromised.

It is likely that reduction in nutrients and land-based sediments alone will not be sufficient to achieve the local SAV goals for many areas of the Bay. In these areas, tributary teams will be asked to further assess varied and innovative methods to achieve SAV re-growth. Such methods may include, but are not limited to SAV planting, offshore breakwaters, shore erosion controls, beach nourishment, establishment of oyster bars, and other actions as appropriate.

Support to State Tributary Strategies

The partners have agreed to complete their nutrient and sediment reduction strategies by April 2004. To assist in the development of tributary strategies, the Chesapeake Bay Program Office will provide an array of technical analyses, water quality and watershed modeling, cost-effectiveness and economic assessment support to the tributary strategy teams through the states.

The jurisdictions agreed that it is critical to work together to assure the aggregate of control actions recommended within the nutrient and sediment strategies yield the load reductions and the Bay and tidal tributary water quality improvements desired.

Reevaluation of the Allocations

The nutrient and sediment cap load allocations adopted by the jurisdictions are the best scientific estimates of what will be needed to attain proposed water quality criteria and tidal water designated uses described in guidance published by EPA. Over the next two years, Maryland, Virginia, Delaware and the District of Columbia will promulgate new water quality standards based on the guidance published by EPA.

Although the public process for adopting water quality standards varies among the states, each state's process will provide opportunities for considering and acquiring new information at the local level. States may choose to explore a number of issues during their adoption process, such as the economic impact of water quality standards and specific designated use boundaries.

While the allocations adopted at this time will provide the basis for tributary strategies, these allocations

may need to be adjusted to reflect final state water quality standards. Furthermore, planned Bay model refinements - directed towards estimating water quality benefits from filter feeding resources (e.g., oysters and menhaden) and better understanding the sources and effects of sediments - will increase our understanding of the relationship between nutrient and sediment reductions and living resource responses in the Bay. For these reasons, the states agreed to a reevaluation of these allocations no later than 2007.

As partners, the jurisdictions committed to correcting the nutrient and sediment related problems in the Bay and its tidal tributaries sufficiently to remove them from the list of impaired waters under the Clean Water Act. Although the states agreed to do their utmost to remove the Bay from the federal list of impaired waters by 2010, they recognize that it will be difficult to meet projected water quality standards in all parts of the Bay by that time. A key reason for this difficulty is that once nutrient reduction practices are installed, it may be years or even decades before the Bay benefits from these reductions. The jurisdictions intend to have programs in place and functioning by 2010 such that when fully implemented all parts of the Bay are expected to become eligible for delisting.

I would like to express my appreciation to all the partners in this effort for their hard work and commitment to restoration of the Chesapeake Bay. We have agreed to nutrient and sediment reductions which will result in profound improvements in the water quality, habitat and living resources of the Bay.

Attachments

Table 1. *4/25/03*
Chesapeake Bay Watershed Nitrogen, Phosphorus and Sediment Cap Load Allocations by Major Basin

Basin/Jurisdiction	Nitrogen Allocation (million pounds/year)	Phosphorus Allocation (million pounds/year)	Land-Based Sediment Allocation* (million tons/year)
SUSQUEHANNA			
PA	67.58	1.90	0.793
NY	12.58	0.59	0.131
MD	0.83	0.03	0.037
SUSQUEHANNA Total	80.99	2.52	0.962
EASTERN SHORE - MD			
MD	10.89	0.81	0.116
DE	2.88	0.30	0.042
PA	0.27	0.03	0.004
VA	0.06	0.01	0.001
EASTERN SHORE - MD Total	14.10	1.14	0.163
WESTERN SHORE			
MD	11.27	0.84	0.100
PA	0.02	0.00	0.001
WESTERN SHORE Total	11.29	0.84	0.100
PATUXENT			
MD	2.46	0.21	0.095
PATUXENT Total	2.46	0.21	0.095
POTOMAC			
VA	12.84	1.40	0.617
MD	11.81	1.04	0.364
WV	4.71	0.36	0.311
PA	4.02	0.33	0.197
DC	2.40	0.34	0.006
POTOMAC Total	35.78	3.48	1.494
RAPPAHANNOCK			
VA	5.24	0.62	0.288
RAPPAHANNOCK Total	5.24	0.62	0.288
YORK			
VA	5.70	0.48	0.103
YORK Total	5.70	0.48	0.103
JAMES			
VA	26.40	3.41	0.925
WV	0.03	0.01	0.010
JAMES Total	26.43	3.42	0.935
EASTERN SHORE - VA			
VA	1.16	0.08	0.008
EASTERN SHORE - VA Total	1.16	0.08	0.008
SUBTOTAL	183	12.8	4.15
CLEAR SKIES REDUCTION	-8		
BASIN-WIDE TOTAL	175	12.8	4.15

* These land-based sediment allocations will be assessed and, if necessary, revised by the tributary teams as part of a comprehensive strategy of management actions necessary to achieve the nutrient loading caps and local underwater bay grasses restoration goals.

Table 2. *4/25/03*
Chesapeake Bay Watershed Nitrogen, Phosphorus and Sediment Cap Load Allocations by Jurisdiction

Jurisdiction/Basin	Nitrogen Allocation (million pounds/year)	Phosphorus Allocation (million pounds/year)	Land-Based Sediment Allocation* (million tons/year)
PENNSYLVANIA			
Susquehanna	67.58	1.90	0.793
Potomac	4.02	0.33	0.197
Western Shore	0.02	0.00	0.001
Eastern Shore - MD	0.27	0.03	0.004
PA Total	71.90	2.26	0.995
MARYLAND			
Susquehanna	0.83	0.03	0.037
Patuxent	2.46	0.21	0.095
Potomac	11.81	1.04	0.364
Western Shore	11.27	0.84	0.100
Eastern Shore - MD	10.89	0.81	0.116
MD Total	37.25	2.92	0.712
VIRGINIA			
Potomac	12.84	1.40	0.617
Rappahannock	5.24	0.62	0.288
York	5.70	0.48	0.103
James	26.40	3.41	0.925
Eastern Shore - MD	0.06	0.01	0.001
Eastern Shore - VA	1.16	0.08	0.008
VA Total	51.40	6.00	1.941
DISTRICT OF COLUMBIA			
Potomac	2.40	0.34	0.006
DC Total	2.40	0.34	0.006
NEW YORK			
Susquehanna	12.58	0.59	0.131
NY Total	12.58	0.59	0.131
DELAWARE			
Eastern Shore - MD	2.88	0.30	0.042
DE Total	2.88	0.30	0.042
WEST VIRGINIA			
Potomac	4.71	0.36	0.311
James	0.03	0.01	0.010
WV Total	4.75	0.37	0.320
SUBTOTAL	183	12.8	4.15
CLEAR SKIES REDUCTION	-8		
BASIN-WIDE TOTAL	175	12.8	4.15

* These land-based sediment allocations will be assessed and, if necessary, revised by the tributary teams as part of a comprehensive strategy of management actions necessary to achieve the nutrient loading caps and local underwater bay grasses restoration goals.

Table 3. *4/25/03*

Chesapeake Bay Submerged Aquatic Vegetation (SAV) Restoration Goal Acreages by Chesapeake Bay Program Segment

Chesapeake Bay Program Segment Name	CBP Segment	SAV Restoration Goal (Acres)
Northern Chesapeake Bay	CB1TF	12,908
Upper Chesapeake Bay	CB2OH	302
Upper Central Chesapeake Bay	CB3MH	943
Middle Central Chesapeake Bay	CB4MH	2,511
Lower Central Chesapeake Bay	CB5MH	14,961
Western Lower Chesapeake Bay	CB6PH	980
Eastern Lower Chesapeake Bay	CB7PH	14,620
Mouth of the Chesapeake Bay	CB8PH	6
Bush River	BSHOH	158
Gunpowder River	GUNOH	2,254
Middle River	MIDOH	838
Back River	BACOH	0
Patapsco River	PATMH	298
Magothy River	MAGMH	545
Severn River	SEVMH	329
South River	SOUMH	459
Rhode River	RHDMH	48
West River	WSTMH	214
Upper Patuxent River	PAXTF	5
Western Branch (Patuxent River)	WBRTF	0
Middle Patuxent River	PAXOH	68
Lower Patuxent River	PAXMH	1,325
Upper Potomac River	POTTF	4,378
Piscataway Creek	PISTF	783
Mattawoman Creek	MATTF	276
Middle Potomac River	POTOH	3,721
Lower Potomac River	POTMH	10,173
Upper Rappahannock River	RPPTF	20
Middle Rappahannock River	RPPOH	0
Lower Rappahannock River	RPPMH	5,380
Corrotoman River	CRRMH	516
Piankatank River	PIAMH	3,256
Upper Mattaponi River	MPNTF	75
Lower Mattaponi River	MPNOH	0
Upper Pamunkey River	PMKTF	155
Lower Pamunkey River	PMKOH	0
Middle York River	YRKMH	176
Lower York River	YRKPH	2,272
Mobjack Bay	MOBPH	15,096
Upper James River	JMSTF	1,600
Appomattox River	APPTF	319
Middle James River	JMSOH	7
Chickahominy River	CHKOH	348
Lower James River	JMSMH	531
Mouth of the James River	JMSPH	604
Western Branch Elizabeth River	WBEMH	0
Southern Branch Elizabeth River	SBEMH	0
Eastern Branch Elizabeth River	EBEMH	0
Middle Elizabeth River	ELIMH	0
Lafayette River	LAFMH	0
Mouth of the Elizabeth River	ELIPH	0
Lynnhaven River	LYNPH	69
Northeast River	NORTF	88
C&D Canal	C&DOH	0
Bohemia River	BOHOH	97
Elk River	ELKOH	1,648
Sassafras River	SASOH	764
Upper Chester River	CHSTF	0
Middle Chester River	CHSOH	63
Lower Chester River	CHSMH	2,724
Eastern Bay	EASMH	6,108
Upper Choptank River	CHOTF	0
Middle Choptank River	CHOOH	63
Lower Choptank River	CHOMH2	1,499
Mouth of the Choptank River	CHOMH1	8,044
Little Choptank River	LCHMH	3,950
Honga River	HNGMH	7,686
Fishing Bay	FSBMH	193
Upper Nanticoke River	NANTF	0
Middle Nanticoke River	NANOH	3
Lower Nanticoke River	NANMH	3
Wicomico River	WICMH	3
Manokin River	MANMH	4,359
Big Annemessex River	BIGMH	2,014
Upper Pocomoke River	POCTF	0
Middle Pocomoke River	POCOH	0
Lower Pocomoke River	POCMH	4,092
Tangier Sound	TANMH	37,965
TOTAL		184,893

Table 4. *4/25/03* *Chesapeake Bay Submerged Aquatic Vegetation (SAV) Restoration Goal Acreages by Major Basin - Jurisdiction*	
Basin/Jurisdiction	**SAV Restoration Goal (Acres)**
SUSQUEHANNA	12,856
EASTERN SHORE - MD	76,193
WESTERN SHORE - MD	5,651
PATUXENT	1,420
POTOMAC	
VA	6,320
MD	12,747
DC	388
RAPPAHANNOCK	12,798
YORK	21,823
JAMES	3,483
EASTERN SHORE - VA	31,215
TOTAL	184,893