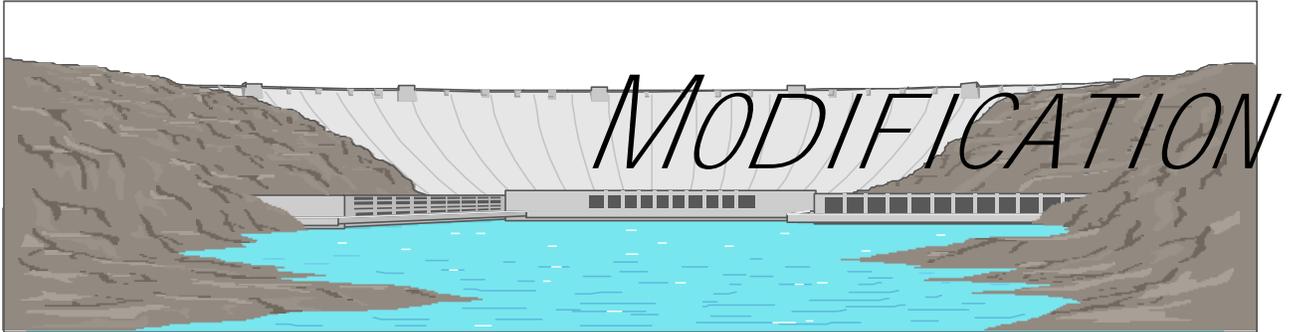


HYDROLOGIC



LONG-TERM GOAL (15-YEAR)

Adverse effects of hydrologic modifications on water quality throughout the Commonwealth of Virginia will be minimized by using proper design methodologies and best management practices (BMPs)

INTRODUCTION

Hydrologic modification is the alteration of stream flow by human activities. All hydrologic modifications, whether properly or improperly implemented, may result in nonpoint source (NPS) pollution to the waters of the Commonwealth of Virginia, impacting aquatic and riparian habitats.

Population growth and development may cause land use changes that result in hydrologic changes to the watersheds of Virginia. Channel modifications are sometimes needed to maintain navigable waterways and control flooding. Dam construction and operation is often necessary to store water for irrigation, recreation, flood control and to provide a source of drinking water. Yet, these activities can be nonpoint sources of pollution and adversely affect water quality and habitat if not

properly managed.

The principle NPS pollutant resulting from hydrologic modification is sediment. However, nutrients and toxics may also be associated with the sediment produced by these activities.

Watershed development and disturbances to riparian areas may result in:

- C increased streambank or shoreline erosion,
- C water quality degradation and
- C destruction of sensitive aquatic habitat.

In particular, channel modifications undertaken in streams or rivers to straighten, relocate or change the depth or width of a channel can alter

- C instream water temperature,
- C physical and chemical characteristics of bottom sediments,
- C rate and characteristics of sediment transport and deposition and

C flooding frequencies of downstream property. In addition, some channel modifications require maintenance dredging, which can diminish the suitability of aquatic and riparian habitat for fish and wildlife. While some adverse impacts associated with channel modification activities may be temporary, loss of habitat and the need for ongoing maintenance can have significant long-term consequences.

Siting, constructing and operating dams and impoundments can result in significant changes in the ecology of streams and rivers. The construction of dams may result in considerable increases in nonpoint source pollution such as increased sediment loading and chemical contaminants. Dam operation can produce changes in water temperature and water chemistry (pH and dissolved oxygen). In addition, dams and impoundments can disrupt the natural transport of sediment and can result in significant changes to instream flow.

AGENCY ROLES & RESPONSIBILITIES

Virginia Marine Resources Commission

Coastal Primary Sand Dunes Management
(Sec. 28.2-1400 through 28.2-1420 of the *Code of Virginia*)

Submerged Lands Management Program
(Sec. 28.2-1200 through 28.2-1213 of the *Code of Virginia*)

Tidal Wetlands Management Program
(Sec. 28.2-1300 through 28.2-1320 of the *Code of Virginia*)

VMRC administers the Submerged Lands, Tidal Wetlands and Coastal Primary Sand Dunes/Beaches programs and is charged with the review of all tidal wetlands and sand dune permit decisions of local wetlands boards. The Tidal Wetlands program applies throughout Tidewater, Virginia, and each Tidewater locality has the option of adopting the wetlands or dunes acts and forming a wetlands board to review applications for use or development of tidal wetlands or dunes. The Submerged Lands program applies state-wide to all state-owned submerged lands. Generally this would include waterways with flows greater than five cubic feet per second or drainage areas greater than five square miles.

Permits are issued through a joint permit review process involving local, state and federal agencies. Permits are reviewed based on compliance with statutory requirements, Wetlands Guidelines, Subaqueous Guidelines, Coastal Primary Sand Dunes/Reaches Guidelines and Mitigation/Compensation criteria as well as recommended Best Management Practices. Advisory assistance is provided by cooperating state and federal agencies. This includes comments from the Department of Environmental Quality, the Department of Conservation and Recreation, the Department of Health, the Department of Game and Inland Fisheries and environmental impact information included in the Virginia Institute of Marine Science Shoreline Permit Application report prepared for each project.

Department of Conservation and Recreation

The Department of Conservation and Recreation (DCR) is involved in several activities related to hydrologic modifications. The Dam Safety Program approves permits for new dam construction, inspects existing dams and provides technical assistance related to dam construction and maintenance. The Erosion and Sediment Control Program addresses control measures for the erosion and sediment producing activities of the construction industry. The Storm Water Management Program deals with control measures for the increased runoff associated with development. The Floodplain Management Program is responsible for the

administration of the National Flood Insurance Program and reviewing proposed development or growth in the floodplains. The Virginia Agricultural BMP Cost-Share Program provides financial assistance to eligible property owners to implement best management practices (BMP) to correct natural resource problems. The Shoreline and Streambank Erosion Advisory Service Program provides technical assistance to property owners in effective erosion control practices to minimize the effects of erosion processes on tidal and nontidal properties.

Chesapeake Bay Local Assistance Department

Pursuant to the Chesapeake Bay Preservation Act (CBPA) of 1988, the Chesapeake Bay Local Assistance Department (CBLAD) is tasked with assisting localities and state agencies to implement state regulations aimed at reducing pollution to the Chesapeake Bay and its tributaries, as well as the protection of sensitive environmental resources in areas of Tidewater, Virginia. The act and regulations are primarily administered through local ordinances which target certain areas, designated as Chesapeake Bay Preservation areas, consisting of Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). Within these areas, performance standards apply that ensure that land-use related impacts to water quality are minimized. The act requires state agencies to be consistent with local comprehensive plans, subdivision and zoning ordinances of Tidewater localities.

CBLAD assists participating local governments and state agencies in effectively implementing these local land-use regulations. In addition to commenting on site plans at a local government's request, CBLAD reviews state projects located within the locally designated Chesapeake Bay Preservation Areas for consistency with the local CBPA ordinances, as specified in §10.1-2114 of the CBPA. This ensures that the state will follow the local land use directives, when they are more stringent than the state's minimum water quality protection criteria.

CBLAD will review a local site plan at the request of a locality. The plan can be reviewed for a number of things, including the following: buffer encroachment,

erosion and sediment control, stormwater management, and comprehensive site assessments. The locality specifies the type of review being requested, and CBLAD reviews the plan accordingly. Plans are typically reviewed to determine how the local comprehensive plans, ordinances and zoning regulations will affect a proposed development project. CBLAD assists localities with technical guidance to ensure consistent implementation of the state and local standards by promoting a technically and scientifically valid approach to environmental regulation and water quality management. Upon request, CBLAD also reviews regional stormwater management programs, planned developments, rezoning requests and other development related documents. CBLAD's comments regarding local projects are considered as guidance and not requirements, since the localities maintain the authority to approve or deny approval for development projects.

CBLAD reviews site plans for state projects within Chesapeake Bay Preservation Areas. Agencies must submit documentation demonstrating that their projects comply with the provisions of the local CBPA requirements. CBLAD reviews these site plans for water quality issues, buffer encroachment issues, land planning issues, and resource protection, and coordinates these reviews with DCR for Erosion and Sediment Control and Stormwater Management. CBLAD often consults the affected localities for their advice and opinions regarding state projects to obtain guidance, ensure consistent implementation of local policy and foster a cooperative environment in which the local and state governing bodies work toward a common goal.

CBLAD's reviews of both state and local projects focus on proper and consistent implementation of local CBPA standards. Reviews for water quality impacts are based on pollution load calculations and the associated impacts to the adjacent aquatic system, and ultimately the bay. The design of BMPs for water quality enhancement, as described in this manual, is an integral part of ensuring compliance with local land use performance criteria. In addition to such structural measures, CBLAD's review considers non-structural measures which have a direct impact on water quality. The preservation of Resource Protection Area buffers, designation of reserve sewage disposal areas, evaluation of soil suitability, minimization of land disturbance and impervious cover, and impacts to existing vegetation are just a few of the "non-structural"

elements of site planning that CBLAD considers during its review process.

Department of Environmental Quality

The Department of Environmental Quality (DEQ) is empowered to issue Section 401 certifications for all discharges of dredge and fill material in the waters of the United States, which are defined as navigable or which have an average flow of greater than five cubic feet per second for all new impoundment projects and for channel modification projects in the commonwealth. The purpose of the certification is to ensure that the proposed projects comply with the applicable provisions of the Clean Water Act.

DEQ has also adopted a policy that channel management projects should be designed and operated in such a way as to minimize and preferably avoid short- and long-term adverse environmental effects. It is also DEQ policy that agricultural and urban channelization projects in natural watercourses should be limited in size to that which is essential for the protection of property and should be constructed and/or developed in a way that fish and wildlife and aesthetic values are protected.

DEQ policy regarding water storage reservoirs is that no project will be endorsed or approved unless accompanied by adequate plans and programs for safeguarding reservoir storage from loss through sedimentation from upstream erosion and shoreline erosion associated with the project. Any such plan and project shall have adequate legal and financial support. The use of the reservoir shoreline for all purposes shall be subject to local government controls that will protect the reservoir against pollution from runoff or discharge from point sources.

Three types of environmental permits are issued by VMRC; (1) subaqueous or bottom lands, (2) tidal wetlands, and (3) coastal primary sand dunes permits. VMRC's authority and responsibilities are derived from Subtitle III of Title 28.2 of the *Code of Virginia* and specifically regulate physical encroachment into these valuable resource areas.

The permit process relies on a single Virginia joint local/state/federal permit application. The review process for which this application was originally designed,

considers various local, state and federal statutes governing the disturbance or alteration of environmental resources. VMRC plays a central role as an information clearinghouse for all three levels of review. Applications receive independent, yet concurrent, review by local wetland boards, VMRC, DEQ and the U.S. Army Corps of Engineers.

Department of Game and Inland Fisheries

The Department of Game and Inland Fisheries (DGIF) manages the commonwealth's wildlife resources, excluding insects and salt water organisms. DGIF reviews and comments on DEQ, Virginia Marine Resources Commission (VMRC) and Virginia Department of Transportation (VDOT) permits related to hydrologic modifications and provides inputs to federal actions via the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq). Information provided by DGIF is important in minimizing effects on wildlife resources.

DGIF is also directly involved with hydrologic modifications. DGIF owns, operates and manages 27 public fishing lakes statewide. DGIF also actively manages fishery resources in most privately owned hydroelectric and publicly owned water facilities and DCR state park lakes. DGIF also provides technical assistance regarding streambank stabilization measures to property owners experiencing streambank erosion problems.

Virginia Department of Transportation

The Virginia Department of Transportation (VDOT) operates and maintains the commonwealth's highway system. To implement this responsibility, VDOT performs hydrologic modifications related to stream crossings and channel modifications. VDOT currently utilizes geomorphological design principles when implementing stream channel modifications and streambank protection measures for projects.

USDA Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) is involved in carrying out hydrologic modifications under

several programs. Projects are implemented using the authority of the Flood Control Act of 1944 (PL-534) and the Watershed Protection and Flood Prevention Act of 1954 (PL-566), and with the support of local sponsors, NRCS implements hydromodifications through direct methods, such as dams, and through indirect methods, such as land use changes. Where natural disasters have occurred, the Emergency Watershed Protection (EWP) program enables NRCS to make modifications to streams necessary to reestablish a functioning stream system. The Conservation Operations (CO-01) program provides technical assistance to individual landowners on practices such as streambank stabilization.

Tennessee Valley Authority

The Tennessee Valley Authority (TVA) is responsible for studying, testing and demonstrating methods for properly using, conserving and developing the natural resources of the Tennessee Valley, which includes southwestern Virginia. TVA has constructed projects for flood control, navigation, electric power, agricultural uses, recreation and streambank stabilization. TVA has extensive experience with BMPs for hydrologic modifications and supports the use of geomorphological design principles when designing and implementing projects.

ISSUE IDENTIFICATION & PROGRAM ASSESSMENT

Virginia has several programs to address nonpoint source pollution through the implementation of Best Management Practices (BMPs). During program development, Hydromodification Work Group members identified areas that require enhancement and improvement:

- C designers of BMPs need to use correct technical information for evaluation and design,
- C BMPs need to be properly installed and maintained,

- C technical information and specifications for BMPs needs to be made available in a more usable format for installers, contractors and inspectors, and
- C urbanization has changed flow patterns along drainage, resulting in the possible creation of additional stream miles that need to be identified and labeled as streams.

Virginia's commitment to the preservation and restoration of riparian buffers is supported by the Conservation Reserve Enhancement Program (CREP) and the *Riparian Buffer Implementation Plan* (Plan). The Plan has targeted 610 miles of riparian buffer restoration in the bay watershed by 2010 and CREP has targeted 30,500 acres (22,000 acres in the bay and 8,500 acres in the Southern Rivers) of riparian buffers and filter strips. While implementation of these measures provide tools for addressing streambank erosion and channel stability issues, structural measures are often needed to adequately address the problems. Therefore, streambank and channel restoration projects should be designed and constructed utilizing geomorphological design considerations through an overall watershed approach.

Virginia has many rivers, streams and creeks. These waterways provide recreational opportunities, drinking water and wildlife habitat. While almost all water bodies are identified on topographic maps, urbanization has changed flow patterns along drainage ways, which has resulted in the possible creation of additional stream miles throughout the commonwealth. Therefore, there is a need to develop a process for defining and identifying streams. The process should include identification of streams with channel stability problems, eroding streambanks and water quality or habitat problems associated with channelization.

Virginia's efforts to preserve and improve aquatic resources have focused mainly on nutrient and sediment reductions. This is evidenced by the nutrient reduction goals of the Chesapeake Bay Agreement and the BMP goals in the tributary strategies. The health of living resources is also dependent on water quantity. Therefore, minimum instream flow regulations should be part of the updated program.

Dredging and instream sand mining projects contribute to the economic viability of the commonwealth. Dredging maintains waterways for commercial shipping, recreational boating and national defense. Instream sand mining provides an economical source of raw materials needed for roads and building construction. However, these two practices may contribute to NPS pollution problems.

Department of Conservation and Recreation

Erosion and Sediment Control Law (Sec. 10.1-560, et seq. of the *Code of Virginia*)

Erosion and sediment control plans must utilize practices defined in the 1992 *Virginia Erosion and Sediment Control Handbook*. State sponsored projects are reviewed and approved by the Department of Conservation and Recreation (DCR). Private projects are reviewed and approved by the local government with DCR oversight. The Erosion and Sediment Control Law is applicable statewide.

This law requires an approved erosion and sediment control plan for land disturbing activity involving 10,000 or more square feet. A compliance inspection is performed during construction to ensure that the plan is followed. Pursuant to Standard 19 of the Virginia Erosion and Sediment Control Regulations, an adequate receiving channel is required. This requirement helps ensure that any required channel modifications do not induce down stream erosion.

Floodplain Management Program (Sec. 10.1-602, et seq. of the *Code of Virginia*)

All channel modifications require a local government permit for hydraulic evaluation. Channel relocations require state National Flood Insurance Program (NFIP) coordination and review. Drainage system maintenance and debris removal to maintain flood capacity are credible activities under the NFIP Community Rating System for participating localities that choose to require them.

Scenic Rivers Act (Sec. 10.1-400 through 10.1-418 of the *Code of Virginia*)

DCR reviews and makes recommendations to regulatory

agencies regarding all proposals for the use and development of water and land related resources or other uses which have the potential to change the character of a stream or waterway or destroy the scenic values of designated scenic rivers. Full consideration and evaluation of the river as a scenic resource will be given before channel modification proposals are approved.

The Scenic Rivers Act is applicable statewide to those water bodies designated as scenic rivers by an act of the Virginia General Assembly. Approximately 225 miles of Virginia waterways have been designated as scenic rivers.

Stormwater Management Act (Sec. 10.1-603.1, et seq. of the *Code of Virginia*)

A stormwater management plan is required for state sponsored projects. These plans are reviewed and approved by DCR. The Stormwater Management Program is optional for local governments. Where local programs exist, stormwater management plans for private projects are reviewed and approved by local government. Plans are required for projects that disturb one or more acres and which would affect storm water quantity and quality. Technical assistance regarding the Stormwater Management Law is available to participating localities through DCR.

Department of Environmental Quality

Virginia Water Protection Permit Act (Sec. 62.1-44.15.5 of the *Code of Virginia*)

The Virginia Water Protection Permit (VWPP) requires that an application be prepared for all channelization and channel modification projects. Permit applications are evaluated on a case-by-case basis for potential impacts to water quality. Channel modification projects projected to have minor, or insignificant, impacts to state waters and wetlands, and qualifying for nationwide or regional permits from the Corps of Engineers, may not require program review. Modeling of effects may be required as part of the project evaluation process if impacts are expected to be significant. Pre-construction sampling may be required to establish baseline water quality data. DEQ staff work with applicants to reduce or eliminate undesirable water quality and habitat effects

during the preapplication and application review process. BMPs may be required for project implementation. Seasonal restrictions may also be stated in the permit.

Department of Game and Inland Fisheries

Virginia Endangered Species Act (Sec. 29-230 through 29-237 of the *Code of Virginia*)

The Virginia Endangered Species Act prohibits actions that would harass or harm a state or federally listed endangered or threatened species, including significant habitat modifications or degradation, or other intentional or negligent acts or omissions that kill or injure wildlife by significantly impairing essential behavior patterns including breeding, feeding or sheltering. DGIF administers the Virginia Endangered Species Program and consults with regulatory agencies issuing permits which may affect endangered or threatened species. DGIF also assists in the investigation and prosecution of violations. Permits required for channelization and channel modification projects require consultation with DGIF to help ensure the protection of these resources.

Virginia Marine Resources Commission

Submerged Lands Management Program (Sec. 28-2-1200 through 28.2-1213 of the *Code of Virginia*)

VMRC administers the Submerged Lands Permitting Program throughout the state. In non-tidal areas this program includes waterways with flows greater than five cubic feet per second or drainage areas greater than five square miles.

Permits are issued through a joint permit review process involving local, state and federal agencies. Permits are reviewed based on compliance with statutory requirements and *Subaqueous Guidelines* as well as technical assistance provided by cooperating state and federal agencies. Technical assistance comments are received from DEQ, DCR, Department of Health (VDH), and DGIF. Impacts on water quality, water quantity, habitat and aquatic resources, as well as affects on adjacent properties, are considered during permit review. BMPs are included in permits when applicable, as are requirements for minimum flows and provisions

for continued fish passage. When applicable, permits can also require compliance with erosion and sediment control practices described in the *1992 Virginia Erosion and Sediment Control Handbook*.

OBJECTIVES (SHORT-TERM GOALS)

(For additional strategies, objectives, and tasks regarding implementation of hydromodification management measures in the coastal zone refer to Chapter XIII Coastal Nonpoint Source Pollution Control Program.)

Objective 1. Improve the design, implementation and maintenance of BMPs installed throughout the commonwealth

Objective 2. Strengthen and improve design standards, specifications and measures implemented for streambank restoration projects throughout the state

Objective 3. Identify streams throughout the commonwealth that have NPS pollution problems related to channelization, channel instability or streambank erosion

Objective 4. Develop and implement minimum instream flow regulations for all streams in Virginia

Objective 5. Identify dredging and instream sand mining projects throughout the state that may contribute to nonpoint source pollution

TABLES OF OBJECTIVES & STRATEGIES

OBJECTIVE 1			
<i>Improve the design, implementation and maintenance of BMPs installed throughout the commonwealth</i>			
STRATEGIES & RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
1.1 Establish a workgroup to review the available BMP information and handbooks and make recommendations on new BMPs and ways to improve existing BMPs for the development of new handbooks.	<ul style="list-style-type: none"> •DCR lead •DEQ •CBLAD •VDOT •VDACS •DGIF •VCE •SWCDs •VMRC 	2002	•General Fund
1.2 Publish revised and improved handbooks and put BMP handbook on DCR website.	•DCR	2003	•319 grant

<p>1.3 Develop and offer training classes on the design, implementation and maintenance of BMPs.</p>	<ul style="list-style-type: none"> •DCR to team with cooperating agencies (•DEQ •CBLAD •VDOT •VDACS •DGIF •VCE •SWCDs •VMRC) 	<p>2003 then annually</p>	<ul style="list-style-type: none"> •319 grant
<p>1.4 Establish a technical workgroup to spot check BMP implementation on a yearly basis.</p>	<ul style="list-style-type: none"> •DCR lead •DEQ •CBLAD •VDOT •VDACS •DGIF •VCE •SWCDs •VMRC 	<p>2000 then annually</p>	<ul style="list-style-type: none"> •General Fund

OBJECTIVE 2

Strengthen and improve design standards, specifications and measures implemented for streambank restoration projects throughout the state

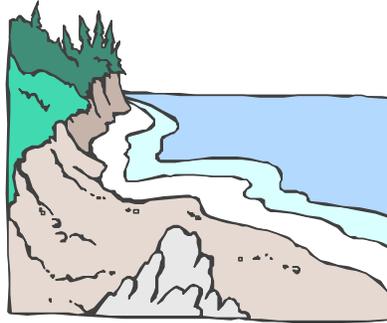
STRATEGIES & RELATED TASKS	AGENCIES & OTHERS	TARGET DATES	FUNDING SOURCES
2.1 Establish a Stream Management and Technical Design Workgroup (SMTDW) to review and make recommendations about technical design standards and specifications for streambank restoration practices.	<ul style="list-style-type: none"> •DCR •NPSAC •DEQ •CBLAD •VDOT •VCE •DGIF •SWCDs •NRCS •Corp of Engineers •VMRC (above compose the SMTDW) 	2000	•General Fund
2.2 Establish technical standards and procedures for reference reach development.	•DCR through the SMTDW	2001	•General Fund
2.3 Complete the development of reference reaches for use in streambank restoration design.	•DCR through the SMTDW	2002	•General Fund
2.4 Develop and offer training classes regarding streambank restoration techniques.	•DCR through the SMTDW	2002	•319 grant
2.5 Provide technical advice and project review assistance to designers or property owners implementing streambank protection projects.	•DCR through the SMTDW	2002	•General Fund
2.6 Develop technical information and guidance on the use and application of stream restoration techniques for water quality enhancement purposes. Include efficiencies or total effective removal equivalencies for sediments and nutrients.	•DCR through the SMTDW	2002	•General Fund

OBJECTIVE 3			
<i>Identify streams throughout the commonwealth that have nonpoint source pollution problems related to channelization, channel instability or streambank erosion</i>			
STRATEGIES & RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
3.1 Establish a workgroup (the Stream Management and Technical Design Workgroup may meet this need) to develop the definition of a stream and to identify all streams within the commonwealth.	<ul style="list-style-type: none"> •DCR •DEQ •SMTDW agencies 	2002	•319 grant
3.2 Identify sections of streams within the commonwealth contributing to nonpoint source pollution due to channelization, channel instability or streambank shoreline erosion.	<ul style="list-style-type: none"> •DCR •DEQ •VIMS •VMRC •COE •SWCDs •NRCS •DGIF •VDOT •VCE 	2005	•319 grant
3.3 Develop a stream classification system for use in the field in determining tributary streams affected by the CBPA.	<ul style="list-style-type: none"> •VIMS •DCR •CBLAD 	2003	•Bay grant

OBJECTIVE 4			
<i>Develop and implement minimum instream flow regulations for all streams in Virginia</i>			
STRATEGIES & RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
4.1 Establish a work group to review and make recommendations on how to strengthen all laws dealing with minimum instream flow conditions.	<ul style="list-style-type: none"> •DEQ-lead •DGIF •DCR •CBLAD •VDACS •VCE •VMRC •SWCDs 	2002	•General Fund

4.2 Establish minimum instream flow conditions for all streams in the commonwealth.	•DEQ	2005	•319 grant
OBJECTIVE 5			
<i>Identify dredging and instream sand mining projects throughout the state that may contribute to nonpoint source pollution</i>			
STRATEGIES & RELATED TASKS	AGENCIES & OTHERS	TARGET YEAR	FUNDING SOURCES
5.1 Identify and map the location of channel maintenance dredging projects and instream sand mining activities that may contribute to nonpoint source pollution.	•DEQ •VMRC •DGIF •DMME •DCR	2001	•319 grant
5.2 Establish a work group to identify nonpoint source pollution problems associated with the identified channel maintenance dredging projects and instream sand mining activities and to make recommendations on what BMPs should be implemented to address the problems.	•DEQ •VMRC •DGIF •DCR •VCE •DMME •SWCDs	2003	•General Fund
5.3 Incorporate work group recommendations into existing permitted projects when the permit is reissued or extended.	•DEQ •VMRC •DMME •DCR	2004	•N/A

*WORK GROUP MEMBERS & AGENCY/ORGANIZATION
REPRESENTED*



Hydromodification

Department of Conservation & Recreation Facilitator

Mr. Lee Hill

Nonpoint Source Planning and Grants Program Manager

Mr. Rick Hill

Mr. Harry Augustine
Department of Environmental Quality

Mr. Doug Beisch
Chesapeake Bay Local Assistance Department

Ms. Dawn Biggs
Reston Association

Mr. Corey Garyotis
Department of Conservation & Recreation

Mr. Darryl Glover
Department of Conservation & Recreation

Mr. Al Gregg
Department of Conservation & Recreation

Mr. Scott Hardaway
Virginia Institute of Marine Science

Ms. Alicia Ketchem
USDA Natural Resources Conservation Service

Dr. Albert Kuo
Virginia Institute of Marine Science

Mr. James Davis-Martin
Department of Conservation & Recreation

Mr. Larry Mohn
Department of Game & Inland Fisheries

Ms. Kary Phillips
Shenandoah Valley Pure Water 2000 Forum

Mr. Mark Slauter
Department of Conservation & Recreation

Ms. Catherine Tucker
Virginia Council of Trout Unlimited

Mr. Hugo Valverde
Hampton Roads PDC

Mr. Tony Watkinson
Virginia Marine Resources Commission

Mr. Stuart Wilson
Department of Conservation & Recreation

Mr. Richard C. Woody
Virginia Department of Transportation