REPORT OF THE
JOINT SUBCOMMITTEE STUDYING

The Flood Control Policy of the Commonwealth (HJR 113)

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 64

COMMONWEALTH OF VIRGINIA
RICHMOND
1989

MEMBERS OF THE JOINT SUBCOMMITTEE

William T. Wilson, Chairman

Benjamin J. Lambert III, Vice-chairman

A. Victor Thomas

W. Roscoe Reynolds

E. Hatcher Crenshaw, Jr.

J. Granger Macfarlane

Moody E. Stallings, Jr.

STAFF

Martin G. Farber, Research Associate

John T. Heard, Staff Attorney

John Branscome, Research Assistant

Cleola Wilkerson, Executive Secretary

Marcia A. Melton, Executive Secretary

Special appreciation is extended to the staff of the Division of Soil and Water Conservation for their assistance.

The Report of the Joint Subcommittee Studying the Flood Control Policy of the Commonwealth (HJR 113)

To: The Honorable Gerald L. Baliles,
Governor of Virginia,
and
The General Assembly of Virginia

I. Introduction

The 1988 Session of the General Assembly passed House Joint Resolution 113 establishing a joint subcommittee to study the flood control policies of the Commonwealth. The subcommittee was requested to: (i) examine the effects of certain activities that increase flooding in the Commonwealth, (ii) evaluate the state's flood damage reduction policy and (iii) determine the effectiveness of the strategies for dealing with flood problems. The subcommittee consisted of the following members: Delegate William T. Wilson (Chairman), Senator Benjamin J. Lambert III (Vice-chairman), Delegate A. Victor Thomas, Delegate W. Roscoe Reynolds, Delegate E. Hatcher Crenshaw, Jr., Senator J. Granger Macfarlane, and Senator Moody E. Stallings, Jr.

II. Major Floods in Virginia

Average precipitation across Virginia is fairly evenly distributed with no pronounced wet or dry season. Depending on the location, the average rainfall is between forty to forty-four inches per year. Intense flood-producing storms are usually the result of rainfall resulting from tropical storms. Despite evenly distributed and moderate rainfall, Virginia has a long history of flood problems, with the most destructive events occurring in the Roanoke, James and Potomac River Basins. These areas share common characteristics: all begin in steep valleys of the eastern Appalachian Mountains; flow through gaps in the Blue Ridge mountains, gathering velocity as they move southeastly across the terrains of the Piedmont Plateau and experience a series of rapids and waterfalls at the fall line. The Potomac and James Rivers form wide navigable estuaries beyond the fall line that flow into the Chesapeake Bay, while the Roanoke River enters the Albemarle Sound in North Carolina.

Virginia has experienced four major floods. In March 1936, torrential rains caused substantial damage to agricultural areas. Industrial plants, commercial establishments and residential areas in sixteen counties and towns also sustained enormous monetary loses. Richmond experienced about forty percent of the total flood loses followed by Buena Vista and Lynchburg. The total damage was estimated to be $2.9 million.

In August 1969, Hurricane Camille produced record rainfalls in the James River Basin. The storm claimed 152 lives in Virginia. Rapidly rising streams and land slides disrupted communication lines and damaged roads, preventing those living downstream from being alerted in time to

take any actions which might have mitigated some of the storm's effects. Twenty counties and two cities received flood damages in excess of $109 million. Rockbridge County, which includes Buena Vista, was the hardest hit, with damages estimated at $21.6 million, followed by Nelson County with damages totalling $21 million.

Tropical Storm Agnes moved through Virginia in June 1972, producing intense and widespread rainfall over half of the James River Basin. In addition to damage to homes, businesses, and industries, many water facilities which provided potable water or disposal of waste were flooded, creating severe health problems. In Virginia, twenty-two counties and six cities sustained flood damage in excess of $91.8 million. Richmond was the hardest hit jurisdiction, with over $37 million in flood damage. Until the 1985 flood, Agnes was the most severe flood in the Roanoke area. Field surveys reported nearly 400 homes were damaged and losses totaled $11.3 million.

The remnants of hurricane Juan, combined with a deepening low pressure storm, caused a devastating flood in November 1985 in the mid-Atlantic states. In Virginia up to eighteen inches of precipitation was reported. Record-breaking flooding occurred in the headwaters of the Roanoke, James and Potomac River Basins. Tidal flooding also occurred in the Potomac and Chesapeake Bay estuaries due in large measure to the northeastern high pressure system which caused intensive winds to move up the estuaries.

Following a request from Governor Robb, the President declared portions of Virginia disaster areas. These areas, which included forty counties and twelve cities, sustained losses that exceeded $750 million. The Roanoke-Salem area was severely hit by what was classified as a 130-year

flood. At Roanoke the river basin rose seven feet between 11:00 a.m. and noon, and nearly eighteen feet in six hours. Had this event taken place during the evening hours, casualties would have been much higher. Flood waters rose so quickly in Roanoke that there was little time for evacuation. The downstream commercial district was flooded up to eight feet. Businesses lost major inventories and many residents lost all of their personal belongings. As a result of the flood, some businesses in the area have closed permanently. Mobile homes in parks along the river broke their tie down anchors and were transported downstream by the force of the floodwater. The Environmental Protection Agency and other agencies were called in to clean up between 1200 and 1500 fifty-five-gallon drums that were carried from manufacturing plants by the storm. Response teams using boats and helicopters rescued people from rooftops.

In the Lynchburg area, the James River flood elevations exceeded the previous record stage by seven feet. Approximately $8 million of tobacco stored in warehouses was lost. Dangerous situations occurred involving the potential spontaneous combustion of wet tobacco, potential flooding of stored cyanide, and potential release of industrial chemicals upstream of the water supply intake.

Several smaller communities in the western part of the state suffered severe damage. A common problem in these areas was rapid flooding from surrounding steep hills. Normally dry hollows carried large amounts of debris, taking out bridges and leaving channels filled with rocks.

Richmond's flood was said to be a forty-year event. Several blocks of commercial and industrial buildings adjacent to the James River were damaged; however, flood-proofing measures were evident at some of the structures and the city was successful in protecting its waste-water treatment and water supply plants.

III. Subcommittee Deliberations

In its study of Virginia's flood control policies, the subcommittee sought to assess (i) the current state and federal flood protection policies and programs, (ii) the extent of coordination among those state and federal agencies with responsibility for flood protection, (iii) the role of the state in providing financial assistance for flood control projects and (iv) the management of stormwater runoff as an element of a comprehensive flood control program. During the course of its deliberations, which included four business meetings and a public hearing, the subcommittee received testimony from local, state, and federal officials, representatives of the forestry industry, and environmental groups.

A. Current state flood protection programs

The subcommittee began its deliberations with a review of Virginia's current flood protection policies and programs. Mr. Roland Geddes, Director of the Division of Soil and Water Conservation (DSWC) within the Department of Conservation and Historic Resources (DCHR), explained that flood protection is the responsibility of a number of state agencies. In an attempt to enhance Virginia's planning and response to floods, responsibility for coordination of Virginia's flood control programs was transferred in 1987 from the State Water Control Board to the DCHR. Under the Flood Damage Reduction Act (§ 10.1-600 et seq.) and the Governor's Memorandum entitled "Flood Plan Management Program for State Agencies," the Department is authorized to:

1. Collect and distribute information relating to flooding and flood plain management;

2. Coordinate local, state and federal flood plain management activities to the greatest extent practicable;

3. Assist localities in their management of flood plain activities;

4. Ensure that the management of flood plains will preserve their capacity to carry and discharge a 100-year flood; and

5. Establish guidelines which will meet minimum requirements of the National Flood Insurance Program.

In addition to the Flood Reduction Act the DCHR also has responsibility for administering the following flood prevention programs.

• Dam Safety Act (§ 10.1-604 et seq.). This act grants the DCHR (by board action) authority to develop, promulgate and enforce regulations as necessary to ensure that impounding structures are constructed, operated and maintained in a safe and proper manner. It also provides a mechanism through administrative or legal procedures to eliminate any threat to life or property posed by an unsafe dam presenting imminent danger to the public. The Virginia Soil and Water Conservation Board (assisted by the Director and dam safety staff) is also authorized to maintain and inventory of all dams of significant size in the Commonwealth. Currently the state regulates 650 dams: seventy five of which are listed as high hazard (i.e. likely loss of life if dam is breached); 150 are medium hazard (unlikely loss of life but extensive damage to property); and 425 low hazard (damage only to woodlands and pasture).

• Watershed Improvements Districts Act (§ 10.1-614 et seq.). This act authorizes soil and water conservation districts to establish a small watershed improvement district, if it is determined that soil and water conservation or water management is promoted by the construction of improvements: check erosion, provide drainage, collect sediment, or stabilize the runoff or surface water. By establishing such a district residents can levy certain taxes on those within the district and establish their won flood protection program. Currently there is one such district in the state, at Lake Barcroft in Fairfax County.

• Virginia Conservation, Small Watersheds Flood Control and Area Development Fund (§ 10.1-636 et seq.). This act authorizes the Virginia Soil and Water Conservation Board, with the concurrence of the State Treasurer, to provide loans to localities and authorities for water storage. The primary intent is to assist localities in funding the additional costs of construction for additional wet pool storage in a flood control dam for water supply. An example is the Switzer Dam in Rockingham County that augments the water supply for the City of Harrisonburg. The amount of the loan cannot exceed

$500,000. Currently, $766,000 has been allocated, with $160,000 still available at 6% interest.

• Stream Restoration Assistance Program (§10.1-650 et seq.). This program was statutorily established to restore, stabilize and protect the natural streams in the Commonwealth. Its purpose is to assist communities and private property owners with repairs to storm damaged stream and creek banks not covered by a declared disaster (federal or state). However, no funding has ever been appropriated for implementation.

• National Flood Insurance Program. This federal program, coordinated at the state level by DSWC, enables property owners through their local governments to purchase federal insurance. It is available only in those localities which have adopted adequate flood plain management regulations for flood prone areas. The DSWC has the responsibility of making periodic site visits to assure that no construction is occurring in the flood plain. If the locality is not enforcing these regulations the community could lose its right to participate in the program. Currently, 250 of the 285 communities in the state participate in this insurance program.

• Public Beach Conservation and Development Act (§ 10.1-705 et seq.). This act authorizes the DCHR to provide the necessary restoration and technical assistance service to protect the shoreline and preserve the beaches of the Commonwealth. The Shoreline Erosion Advisory Service offers technical assistance to landowners on ways to prevent shoreline erosion using such methods as planting vegetation on the shoreline and installing protective measures such as rip-rap and revetments.

• Erosion and Sediment Control Law (§ 10.1-560 et seq.). This law was created to limit the erosion of land and sedimentation received by streams in the Commonwealth when vegetation is removed as a result of land disturbing construction practices. The law provides exemption for some land disturbance but basically requires a developer to prepare a conservation (E&S) plan subject to review and approval by the locality. State projects not exempted are reviewed and approved by the Department of Conservation and Historic Resources. Enforcement of the law is provided at the local level for private, commercial or industrial land disturbing activities. The DCHR makes periodic review of local programs and enforces the law as applied to state projects. The law includes minimal stormwater management regulations and criteria to protect stream channels from erosion (two-year storm). However, it does not directly address local flooding issues.

While the DCHR has primary responsibility for administering the state's current flood protection programs, such agencies as the Department of Emergency Services, the Department of Forestry, and the Department of Transportation play essential roles in mitigating the effects of flooding.

For instance, the Department of Emergency Services develops a flood hazard mitigation plan which focuses primarily on activities to be undertaken in response to flooding. The agency also directs the Integrated Flood Observing and Warning System (IFLOWS). This program is administered in conjunction with the National Weather Service, and targets those local jurisdictions located in a high risk flood prone area. It is a fully automated early warning system, consisting of radio reporting rain gages, VHF radio and the state police microwave system. Although the current system is operational only in the mountains west of Roanoke, it is anticipated that the IFLOWS program coverage will soon be extended to the entire Roanoke Valley.

The Virginia Department of Forestry, which is responsible for overseeing the forest management activity of private landowners, has recognized that forests can be part of the solution and not a contributor to the problem, with the implementation of appropriate practices. Forestry officials informed the subcommittee that the primary effect on flooding that could occur from foresting practices results from extensive soil disturbance. They emphasized that the major problem is runoff from the roads, skid trails, and stream crossings. In an effort to reduce soil erosion and nonpoint source pollution, the forestry community is taking major steps statewide to institute best management practices in harvesting. Because the federal Water Quality Act of 1987 requires new assessments and management plans by agencies responsible for nonpoint source pollution, the Department of Forestry will engage in an effort to manage those areas adjacent to the stream where forestry activities could affect the amount of water runoff, siltation or sedimentation which flows into the stream.

Staff of the Department of Transportation's environmental section described their approach to controlling runoff through the use of such practices as seeding and reseeding, planting appropriate vegetation and improving drainage along rights-of-way and at construction sites. The subcommittee was informed that the practices which have been adopted ostensibly meet all current state and federal standards for 100-year floods.

The Department of Housing and Community Development administers the Statewide Building Code, which includes requirements for flood proofing facilities in flood prone areas. The Department has developed model ordinances which contain flood plain zoning provisions. Currently most of the technical assistance for local zoning ordinances is provided by regional planning district commissions.

At the local level the Code of Virginia provides broad authority for counties, cities and towns to develop and implement flood protection programs. Section 15.1-31 allows localities to construct dams, levees, seawalls or other structures or devices to prevent flooding. Other provisions of Title 15.1 authorize the adoption of zoning ordinances to facilitate flood protection and to preserve flood plains (§§ 15.1-486 et seq.). Sections of the tax code (Title 58.1) allow localities to provide for special assessments on property which has water inundation easements. Finally, localities also have the power of eminent domain for watershed projects.

B. Federal Flood Control Projects and Cost Sharing

In Virginia, the financing of flood control projects has been historically a responsibility shared by a locality and the federal government. The U.S. Army Corps of Engineers and the U.S. Soil

Conservation Service (SCS) of the U.S. Department of Agriculture have to a great extent provided the technical and financial assistance for Virginia's flood control projects. Representatives of each of these agencies described the operation of their program and detailed the anticipated flood control needs of the Commonwealth. Col. J.J. Thomas, Chief, Norfolk District of the U.S. Army Corps of Engineers, noted the importance of flood control to the Commonwealth, pointing out that over the last sixteen years Virginia has averaged $55 million annually in flood damage. Col. Thomas noted that the Corps has become the federal government's primary water resources development management agency. It has attempted to improve navigation, reduce flood damage, control beach erosion, generate hydropower, supply water to cities and industry, and manage recreation programs.

In 1986 the Corps' approach to flood control changed with the passage of the Water Resources Development Act. The Act mandates that the Corps enter into a partnership with its customers (i.e. local government) early in the planning process by sharing in the study costs. The Act limits federal dollars in the civil works program to those projects for which local governments have made a commitment to share the costs.

The first of the two-phase study system (reconnaissance phase) is still entirely financed by the federal government. The reconnaissance phase takes approximately twelve months to complete. Existing data is gathered and analyzed. The result of this effort is the presentation of several plans and the development of a detailed cost estimate to accomplish the second phase. Before the feasibility phase can begin, the reconnaissance phase must demonstrate that there is at least one

economically feasible alternative. In addition, a study cost-sharing agreement must be negotiated and signed between the Corps and the local sponsor.

The more detailed feasibility phase is "cost shared" with nonfederal sponsors (local governments) on a 50/50 basis. The nonfederal share can consist of up to one-half in-kind contributions, such as services, technical studies or other products. When the feasibility phase is completed it is forwarded to the Corps for review. Once approved by the Corps, it is then sent to Congress for final approval. Thus, financial cooperation begins early in the study process and continues through project construction. Local governments are now being required to pay as a minimum twenty-five percent of the actual construction costs, including credit for land value, easements, rights-of-way and relocations. The maximum percentage would depend on the value of the land, easements, rights-of-way, and relocations.

The costs of the Corps' flood projects planned for Virginia are estimated to be $275,250,000, of which $51 million will be the required local matching share (See Appendix A for description of Corps projects). Col. Thomas suggested that Virginia should join other east coast states in recognizing the financial burden being placed on local governments and institute a policy which provides state financial assistance to localities. He mentioned the City of Buena Vista, which has experienced repeated flooding, as one locality especially in need of state participation in the financing of flood control projects. The 1969 flood caused more than $43 million in damages to the Buena Vista area, and the 1985 flood resulted in damages of $55 million. As a result of the later

flood the Corps is currently performing a study to design a protection plan. If the required $8 million in nonfederal match is to be met for construction of the $50 million flood wall and levee, state assistance will be necessary. Col. Thomas emphasized that the shifting of responsibility for financing flood control projects from the federal government to the state has placed an additional burden on localities, many of which, without receiving state assistance, have been forced to terminate their flood control projects before even completing the feasibility study phase.

The subcommittee also received testimony from Mr. George Norris, State Conservationist with the SCS, who described his agency's role in providing flood protection for the residents of Virginia. His agency administers three prevention programs: the Small Watershed Protection Program, the River Basin Program, and the Resource Conservation and Development Program. All projects have to be initiated at the local level and require financial commitments from the local government. The unique aspect of these programs is that all structures and works of improvement resulting from these projects remain in the ownership of the local government.

There are two laws under which the Small Watershed Protection Program has been carried out. The Watershed Protection and Flood Prevention Act of 1954 (PL-566) authorizes the Secretary of Agriculture to help local entities plan and carry out works of improvement for flood prevention and agriculturally related aspects of water use and conservation in watershed located outside the Upper Potomac watershed, which do not exceed 250,000 acres. The assistance provided includes (i) continuing investigations and surveys, (ii) developing a watershed protection plan and engineering plan for needed structural measures, (iii) determining the economic feasibility

of the proposed plan, (iv) entering into agreements with local organizations for the installation of planned works of improvement and their operation and maintenance, and (v) providing financial and other assistance to the sponsoring local entity.

The Flood Control Act of 1944 (PL-534) authorized eleven watersheds across the nation for the construction of flood prevention structures and watershed projects. In Virginia, PL-534 funds have been expended for flood prevention projects within the Upper Potomac watershed. Two of these projects remain active today (Lower and Upper North River Watersheds in the Counties of Augusta and Rockingham).

During the past 35 years, 24 small watershed projects have been completed in Virginia and 126 flood prevention dams have been constructed under these two programs. The beneficial effects in terms of damage reduction have been estimated to be $250 million. This figure does not reflect the additional benefits in the number of the lives saved, reduced interruption of services, and increased recreational opportunities.

The River Basin Program authorizes the Secretary of Agriculture, in cooperation with other federal, state and local agencies, to survey watersheds of rivers and other waterways as a basis for the development of coordinated programs. In Virginia the program has served to identify upstream areas which could benefit from flood prevention and watershed protection projects. There have been seven cooperative river basin studies in Virginia, with one of the seven still active (Southwest Virginia River Basin). Authorization is also provided under this program for flood plain management studies. These are carried out as a cooperative effort with

state and local units of government. In order to have such a study conducted, the DSWC must enter into a joint agreement with SCS to establish objectives, coordinate activities, outline responsibilities and commit the resources to conduct the study. The purposes of these studies are to define the flood plain, identify potential flood loses, and help the sponsors develop a flood plain management program which would minimize the loss of life and property from future flooding. Since 1977, thirty-two management studies have been completed. They have been used by the local governments to make land use planning decisions and to develop land use regulations.

The Resource Conservation Development Program authorizes SCS and other U.S. Department of Agriculture agencies to provide technical and financial assistance in approved areas. There are two such areas in Virginia; one on the Eastern Shore and the other consists of eleven counties and three cities in southwest Virginia. Since 1975 these have been the only two projects implemented under this program (Surry school project in Bland County and the Mt. Rogers school project in Grayson County). Both involved construction of dikes to prevent flooding of school grounds and buildings.

The funding of all of these programs in Virginia has steadily declined since the early 1970's. Watershed planning funds have been cut and new planning starts have been limited due to the lack of funds. Funds for ongoing SCS projects have been reduced to the degree that there is a backlog of flood prevention dams awaiting construction and watershed protection projects are only being partially funded. In fiscal year 1988, Virginia received only $2 million for the construction of a flood

prevention dam and $585,000 for eight watershed protection projects. According to SCS, there are $37,991,000 in flood control projects programmed for construction which will require approximately $7.7 million in nonfederal matching funds (Appendix B). This, of course, assumes that the federal government will provide its share of the costs which at this time is problematic. Mr. Norris, in his testimony before the subcommittee: reaffirmed what Col. Thomas had emphasized to the subcommittee, that in light of reduced federal funding the state should become an active participation in the SCS program by providing much needed financial assistance to help localities in meeting their share of the nonfederal match.

C. Stormwater management

While the exposure of soil during land disturbing activities is usually temporary, the effects of stormwater runoff will be permanent. Urban development converts porous soil that can absorb rainfall into impervious rooftops, sidewalks, parking lots, roads and highways. Where rainfall once was absorbed into the soil it now flows across the ground surface to drainage structures or natural streams. Since much less water can be absorbed into the soil after development, more water becomes surface runoff. The amount of water a nearby stream conveys may be significantly increased by this additional surface flow. While the change in land cover has little effect on the flow elevations of major floods, such changes do result in increased incidents of localized flooding and further degradation of water quality, even from the smaller storms.

The subcommittee, realizing that the kinds of programs and policies which address major floods are not appropriate solutions to localized

flooding and nonpoint source pollution, devoted much of its time to analyzing various legislative approaches which place certain constraints on those activities that modify natural drainage patterns. The subcommittee received extensive testimony from local as well as state officials that a stormwater management program is essential if Virginia is to protect the integrity of its stream channels and control the amount of nonpoint pollution carried by surface runoff into the state's waters.

The subcommittee reached consensus on a proposal for stormwater legislation which would authorize localities to administer stormwater management programs (Appendix C). The legislation is permissive, allowing the locality an option as the whether they should implement such a program. If the locality assumes such authority the local program is required to meet certain minimum state standards and specifications promulgated by the Department of Conservation and Historic Resources. The regulations will require that a local program maintain "after development runoff, as nearly as possible as the pre-development runoff characteristics." In addition the draft legislation would:

- Require a stormwater management plan for construction projects of a certain size to be submitted before development;
- Prohibit the issuing of a building permit until approval of the plan;
- Impose penalties for those who proceed with development without plan approval;
- Allow localities to require a security bond;
- Provide for the recovery of administrative costs for the review of plans (not to exceed $1000);
- Allow localities to adopt more stringent regulations than those promulgated by the Department of Conservation and Historic Resources;

•Allow a locality to impose a broad system of service charges similar to those impose by other utilities. This would enable local governments to finance the costs of constructing the necessary stormwater control facilities. The extent of an individual's service bill would depend on how much he contributes to the runoff.

The legislation also requires those state agencies which undertake land clearing or development activities to submit a stormwater management plan to the DSWC for approval. Certain agencies, such as the Virginia Department of Transportation (VDOT), will have to annually submit their stormwater management standards and specifications for review. The subcommittee is concerned with the possible environmental impact of the anticipated 5,000 highway construction projects. In light of the testimony of DSWC officials that (i) a similar procedure is currently required for highway projects under the Erosion and Sediment Control Program and (ii) the costs of receiving and certifying an individual's plan for each highway project would exceed $1.1 million, the subcommittee felt the annual submission of a general procedures manual by VDOT, combined with periodic on-site monitoring of these projects by DSWC, will provide the needed assurance that acceptable management practices are being followed. If this procedure is found to be ineffective in providing the necessary environmental protection, then consideration should be given to amending the legislation in the future to require a specific stormwater management plan for each highway project.

In order to administer such a program a stormwater management section would have to be created within DSWC to provide technical assistance, training, research, coordination, and periodic evaluations and reviews of local programs as called for under the legislation. It will require the hiring of six additional staff persons and an estimated budget of $298,765.

IV. Findings and Recommendations

Recommendation: 1. That the Commonwealth enhance its efforts to coordinate the flood control activities of the state, federal and local governments through the development of a state flood protection plan which will detail the roles and responsibilities of the various governmental bodies in carrying out the Commonwealth's flood control policies.

The subcommittee finds that the protection of Virginia's citizens and their property from the effects of flooding is a responsibility of all levels of government-local, state and federal. Current flood control activities are spread across a variety of governmental agencies with little coordination taking place. Testimony from federal officials indicated that the absence of designated individual or agency at the state level has hampered the implementation of flood control projects in Virginia. Placing the responsibility for coordination of all flood control activities statutorily within the DCHR will not only provide a means for informing all interested parties in the state of the status of various flood control projects, but will also ensure a more comprehensive response to flood control issues whether they be local, interjurisdictional or statewide. The subcommittee suggests that one means to promote coordination among agencies would be the development of a comprehensive state flood prevention and control plan. Such a plan would (i) describe the roles and responsibilities of those agencies administering flood control programs, (ii) inventory flood prone areas, (iii) calculate the costs of damages due

to flooding, (iv) develop effective flood control strategies and (v) collect and distribute information relating to flooding and flood plain management (Appendix D).

Recommendation: 2. That the Commonwealth establish the Flood Prevention and Protection Assistance Fund to provide financial assistance to local governments for the nonfederal share of the costs for flood control projects.

Currently, financing flood control projects is a responsibility shared by the federal government and Virginia's localities, with the state providing little financial assistance. The subcommittee received testimony from officials of the U.S. Army Corps of Engineers and the U.S. Soil and Conservation Service which indicated that the federal funds available for local flood control projects would decline significantly and local governments will have to assume a greater role in financing these projects.

This has led many states to reassess their role in aiding localities in protecting their citizens from the effects of flooding. The subcommittee reviewed the flood control policies of the states of Maryland, New Jersey, New York, Pennsylvania and North Carolina. Each of these states provides some form of financial assistance for flood control activities. Maryland and New Jersey provide financing for the local shares of "structural" and "nonstructural" protection projects. In 1980, Maryland appropriated $7.5 million to initiate a state flood protection program. Since then the legislature has been providing approximately $2 million annually with a total expenditure to date of $21 million. Two million dollars has been allocated for planning and technical studies and $19 million for nonstructural purposes such as buying people out so they could move out of the high flood risk area. To receive these funds, a locality

would have to provide a portion of the local share of the costs and develop a flood management plan.

New Jersey's comprehensive flood protection program began in 1978 with a bond issue which raised $25 million. Three million dollars was used "up front" for planning and the preparation of flood zone maps, and $22 million was appropriated for thirty-four different capital improvement flood control projects. Much of the $22 million went to assisting localities in meeting the required local cost sharing match for Corps of Engineers' projects. New Jersey is currently considering a real estate titling tax which could provide $40 million annually for flood control, shore protection, and natural resource restoration.

New York provides state funds as a part of the nonfederal cost share required by the Corps of Engineers. Because of the change in the federal law which requires a greater local match the legislature has undertaken a study of the statewide needs and possible alternative sources of funding. Pennsylvania funds its flood control projects independently through special legislation. The state will conduct a feasibility study if the locality agrees to become the sponsor. The state will also assume responsibility for design of the project after it has been approved for funding by the legislature. North Carolina contributes up to one-half of the nonfederal share for the feasibility study and two-thirds of the local share for the construction. One and one half million dollars has been appropriated over the biennium to support the cost-share.

According to information presented to the subcommittee, in Virginia the nonfederal cost share for Corps of Engineers projects will total approximately $51 million and the local share for Soil Conservation Service

projects programmed for construction will be approximately $7.7 million. This is a financial burden in many instances beyond the financial capability of many local governments. Virginia, like other states, should institute a financial assistance policy which recognizes that the state has a role to play in protecting its citizens from the damages resulting from floods. Therefore, the subcommittee recommends that the General Assembly enact legislation creating a Flood Prevention and Protection Assistance Fund to finance up to fifty percent of the local share of federal flood control projects or studies (Appendix E). Loans would be provided for a period not to exceed twenty years, at an annual rate of interest of three percent. Further, the subcommittee recommends that $5 million in general funds be appropriated this year by the General Assembly to assist in the financing of local flood control projects and that additional monies be allocated in succeeding bienniums to finance these projects.

Recommendation: 3. That the General Assembly provide $491,115 for the initial year of operation of a flood control and stormwater management program within the Department of Conservation and Historic Resources.

In 1987 the primary responsibility for administration and coordination of the state's flood control programs was transferred from the State Water Control Board to the Department of Conservation and Historic Resources. According to testimony received by the subcommittee, the DCHR was allocated $600 but received no additional personnel to carry out these responsibilities. If the state is to effectively carry out its flood control policies, provide needed coordination between local state and federal programs, as well as assume responsibility for administration of a stormwater management program, additional staff and financial support must

be provided. The subcommittee endorses an appropriation of $491,115 to finance a new flood control and stormwater management unit of ten people who will be responsible for technical assistance, testimony, research, coordination and periodic reviews of state and local flood control and stormwater management programs (Appendix F).

Recommendation: 4. That the General Assembly recognize the need to arrest the deterioration of existing waterways by reducing stream channel erosion, nonpoint source pollution and local flooding and enact legislation which authorizes local governments and agencies of the Commonwealth to develop stormwater management programs.

Development activity such as the construction of housing, factories, plants and office buildings results in increasing the amount of impervious land cover. Where rainwater had previously, to a large extent, drained into the soil, it is now forced to flow across ground surface into streams. Increased flooding results from the accumulation of stormwater runoff collected and conveyed via streams and rivers of a drainage basin. If a stream flow is intense enough to cause flooding in the upper portion of a small watershed, the situation downstream will intensify as flood flows will tend to converge on top of other flood flows. Areas originally outside the flood hazard zone become exposed to the potential risks of downstream flooding. This problem is further complicated as the stormwater also washes off nonpoint source pollutants from impermeable land which ultimately affect the water quality of Virginia's rivers and streams.

Virginia's current program for managing urban stormwater is a fragmented approach involving several types of controls administered by a

number of agencies and authorized by a variety of laws, none of which deal specifically with stormwater management. The state's role in urban stormwater management consists primarily of five areas of activities: water quality management programs of the State Water Control Board; the Erosion and Sediment Control Law (ESCL) and the Virginia Flood Damage Reduction Act, both administered by the Department of Conservation and Historic Resources; financial assistance for best management practices; and the Chesapeake Bay Preservation Act. The state's involvement in land use controls is greatest under the ESCL but this program is primarily aimed at land disturbing activities. State government up to now has exercised little direct control over urban stormwater discharge. This conclusion is supported by a report prepared by a private consulting firm for the Division of Soil and Water Conservation, which had been requested by the 1986 General Assembly to study the effectiveness of Virginia's Erosion and Sediment Control Law (ESCL). The study found that, in the absence of a separate comprehensive stormwater management program, "the relevant constraints in Virginia consist primarily of water quality controls originally focusing on point source waste discharges and controls over the development and use of land."

At the local level there is no enabling legislation which specifically authorizes local governments to regulate land use activities in order to protect water quality and management of stormwater runoff. As the study points out, much of the enabling legislation (i.e. local erosion and sediment control programs, comprehensive plans, zoning and subdivision regulation) was adopted prior to concern for stormwater management, raising questions as to whether such protection was an objective.

During its deliberations the subcommittee received testimony from local officials identifying stormwater management as a problem and indicating the need for enabling legislation to authorize local governments to administer stormwater programs. The seriousness and extent of the problem was revealed in the DSWC contracted study in which 99 percent of the municipal respondents surveyed, 83 percent of the state agency personnel and all of the citizen/environmental groups considered stormwater related problems "important" or serious and widespread.

The subcommittee is convinced of the importance of recognizing the relationship between stormwater runoff, localized flooding and nonpoint source pollution, and finds that existing state and local programs have resulted in little protection of adjacent waterways from stormwater runoff. A more effective approach for the management of stormwater will require closer coordination between the state and local governments, with the state developing minimum standards for the implementation of local option stormwater management programs (Appendix C).

Respectively submitted,

William T. Wilson

Benjamin J. Lambert III

A. Victor Thomas

W. Roscoe Reynolds

E. Hatcher Crenshaw, Jr.

J. Granger Macfarlane

Moody E. Stallings, Jr.

APPENDIX A

Corps of Engineers Project Requiring a Non-Federal Cost-Share

Project Description	Federal	Non-Federal	Total
Buena Vista -Flood Protection:			
Feasibility Study Project	100%		
Construction(floodwall and levee)	$50,000,000	$8,000,000	$58,000,000
Upper James River Basin Study:			
Reconnaissance Study	$250,000	0	$250,000
Feasibility Study	$500,000	$500,000	$1,000,000
City Waynesboro - Flood Protection:			
Reconnaissance Study	100%		
Feasibility Study	$500,000	$500,000	$1,000,000
Town of Grundy - Flood Protection:			
Feasibility Study	100%		
Estimated Construction Cost (Redevelop Central Business District in a flood-safe manner complimented by traditional floodproofing and a flood plain warning system)	$39,000,000	$24,000,000	$63,000,000
Haysi Flood Control Study:			
Feasibility Study	100%		
Estimated Construction Cost (Flood Control Dam)	$115,000,000	$6,000,000 KY $3,000,000	$121,000,000
City of Roanoke - Flood Protection:			
Feasibility Study	100%		
Estimated Construction Cost (Flood walls and levees)	$ 19,000,000	$ 12,000,000	$ 31,000,000
TOTAL	$ 224,250,000	$ 51,000,000 KY 3,000,000	$ 275,250,000

NORFOLK DISTRICT

Atlantic Coast:

Flood Plain Management (FPM) - Two floodplain information reports have been completed for: Coastal Flooding, Virginia Beach; Coastal Flooding, Town of Wachapreague.

Chesapeake Bay:

Tangier Island - Shoreline Protection Project consists of 5700 ft. of stone rip-rap seawall on west coast of Tangier Island at an estimated cost of $4,130,000. Non-federal cost-share - $1,500,000 (state).

Flood Plain Management - Floodplain information reports have been completed for following areas:

Cape Charles
Chesapeake
Hampton
Norfolk
Poquoson
Portsmouth Coastal areas

Chowan River Basin:

Flood Plain Management - Floodplain information reports have been completed for the following areas:

Emporia, Merherrin River
Southampton County, Nottaway River
Sussex County, Nottaway River

James River Basin:

Flood Control - Buena Vista - Flood levee/wall project is currently in the feasibility phase. The study was initiated in the mid-70's but later was classified inactive due to lack of local support. The November 1985 flood prompted the Corps to re-evaluate the flooding problem in Buena Vista. Estimated non-federal costshare for planning (feasibility) is 0. Feasibility report by Corps is scheduled for completion in 1989. Project costs estimated to be $25 million to $50 million. Non-federal cost-share $4 million to $8 million.

Flood Protection - City of Richmond

Positive flood protection will be provided to the Shockoe Creek Area on the north bank of the James River and Southside Industrial Commercial Complex including the sewage treatment plant. The project will consist of 4,000 feet of concrete wall on the northside of the river and 2,000 feet of concrete wall and

8,000 feet of earth levee on the southside of the river including flood proofing measures for the sewage treatment plant. Construction of the project is ongoing. Total construction cost is $100,000,000. Non-federal cost-share is estimated to be $25,000,000. Planning cost was approximately $4,000,000. Part of this was cost-shared by the city. Began construction November 5, 1988. Construction to be completed September, 1993.

Flood Protection - Richmond Filtration Plant

Project will consist of raising concrete walls on three sides of the plant to provide flood protection to an 11 acre area. Plans for the project were completed in 1982. Currently in deferred stages because flood protection of the local water supply system is viewed to be outside the responsibility of the Corps. Project has not been programmed for construction because of this. However, construction cost is estimated to be $5,000,000. Non-federal cost-share is 0%.

Flood Control- Town of Scottsville

A flood wall/levee was approved for construction in 1985. The project consists of a combination concrete wall and earth levee and is currently under construction at an estimated cost of $3,086,000. No cost-share required.

Flood Control - Town of Buchanan

A reconnaissance phase study was initiated in May, 1987. A negative result was found. This study was 100% funded by Corps at a cost of $20,000.

Flood Control, City of Covington

The study is investigating solutions to flood problems in the City of Covington. The flood of November 1985 caused $17 million in damage to the city. The reconnaissance phase was completed in 1988 at an estimated cost of $20,000 (100% funded by Corps).

Upper James River Basin Study (Lynchburg and Upper James)

Reconnaissance study is estimated to cost $250,000. However a support letter from the state is required for this study to proceed. One year is required for the study. Feasibility study is estimated to cost $1,000,000 and requires a 50% non-federal cost-share. However, 50% of the non-federal cost-share can be "in-kind services" furnished by the state. Study priorities will be for flood control dams and local protection projects.

Flood Plain Management

Flood plain management reports have been completed for the areas as follows:

Albemarle County - James River
Albemarle County - Kingsland Creek
Eagle Rock - James River
Chickahominy River
Gillies Creek
Tuckahoe Creek and James River

North Run
Upham Brook
Richmond, James River
Jackson River, Covington, Alleghany County

Rappahannock River Basin

Flood Control Management

Flood plain information reports were made in the following areas:

Rappahannock River - Fredericksburg, Spotsylvania, Stafford County

York River Basin

Flood Plain Management

Flood plain information reports have been completed for the following areas:

Hanover County - Beaverdam Creek
Hanover County - Mechump Cree
Hanover County - Pamunkey River
Hanover County - Totopotomy Creek
Hanover County - Crump Creek
Hanover County - Little River
Hanover County - North and South Anna River
Hanover County - Stoney Run Creek

BALTIMORE DISTRICT

Potomac River Basin

Flood Protection - City of Waynesboro

As a result of severe flooding in November 1985, the Corps initiated a limited reconnaissance study of flood problems in the Upper Potomac River Basin above Harper's Ferry in February 1986. The study recommended a reconnaissance level investigation be conducted for a local flood protection project at Waynesboro. The study is not funded at this time. A reconnaissance study (100% by Corps) is planned for 1989. A feasibility study (if reconnaissance study is positive) will begin in 1990 at an estimated cost of $1,000,000 requiring a 50% non-federal cost-share.

Flood Plain Management

Flood plain information reports have been provided for:

Four Mile Run - City of Alexandria and Arlington County
Shenandoah River - Millwood, Clark County
Neabsco Creek and Cow Branch
Dale City - Prince William County
Little Creek - Triangle, Prince Willliam County

HUNTINGTON DISTRICT

Big Sandy River Basin

Flood Control - Town of Grundy

Planning studies are currently underway for the Town of Grundy, situated on the Levisa Fork. The studies include the formulation and evaluation of the most cost-effective and socially acceptable flood damage reduction plan to provide flood protection under Corps guidelines.

The most cost-effective plan evaluated to date includes redevelopment of the communitie's central business district in a flood-safe manner, complemented with traditional floodproofing and flood plain evaluation measures for the remaining flood prone community. Cost to provide the study is 100% by Corps. Estimated cost of construction is $63,000,000. Non-federal cost-share is estimated to be $24,000,000.

Haysi Flood Control Study

Haysi dam and lake has been studied and a project proposed to benefit Kentucky, primarily and Virginia The cost for construction of this project is estimated at $121,000,000. Non-federal cost-share is $6,000,000. This would be shared by Kentucky and Virginia. The cost-share is low due to applying the Corps "ability to pay" policy for the depressed areas of Buchanan and Dickerson Counties.

Flood Plain Management

Flood plain information reports were prepared for seven areas of the Kanawah New River Basin:

Reed Creek - Wytheville to Max Meadows
Peak Creek - Pulaski
Huntington Camp Creek - Bastian, Bland County
Wolf Creek - Boxley to Narrows in Giles County
Bluestone River - Bluefield
Montgomery and Pulaski Counties
Giles County

WILMINGTON DISTRICT

Roanoke River Basin

City of Roanoke Flood Protection - Project will consist of channel improvement with flood walls and levees on the Roanoke River. Total cost of construction is estimated at $31,000,000. Non-federal cost-share is estimated at $12,000,000.

Flood Protection Projects

Reconnaissance studies are planned (100% funded by Corps) for:

Tinker's Creek
Lick Run
Glede Run
Dry Branch
Mason Creek
Blackberry Creek

Flood Plain Management

Flood plain information reports have been completed for 16 areas of the Roanoke River Basin:

Danville, Dan River
Henry County, Smith Rivers, Martinsville to state line
Martinsville, Henry County, Smith River
Montgomery County, South Fork, Roanoke River
Roanoke, Back Creek
Roanoke, Glade Creek
Roanoke, Lick Run and Peters Creek
Roanoke, Mason Creek
Roanoke, Mudluk Creek
Roanoke, Tinker - Carvin Creek
Roanoke Co. Upper Mason Creek
South Boston, Dan River
Stuart, Patrick County
Roanoke, Murray Run, Trout Run
Boones Mill, Maggodee Creek

NASHVILLE DISTRICT

No ongoing projects

APPENDIX B

SOIL CONSERVATION SERVICE PL-566 & PL-534
VIRGINIA WATER RESOURCE FLOOD CONTROL PROJECTS
COST ESTIMATE AND SCHEDULE

SITE NAME	PLAN STAGE	CONSTRUCTION COSTS SCS-COSTS	CONSTRUCTION COSTS LOCAL-COSTS	PROJECT ADMINISTRATION SCS-COSTS	PROJECT ADMINISTRATION LOCAL-COSTS	LANDRIGHTS COSTS (LOCAL)	LOCAL DESIGN COSTS	CONSTR
PL-566								
BUSH RIVER # 12	Pre-des	$ 750,000	$ 750,000	$ 150,000	$ 8,000	$ 777,000	$ 105,000	1992
BUSH RIVER # 5	Constr	800,000		125,000	10,000	482		1991
BUSH RIVER # 4	Constr	1,000,000		150,000	10,000	606		1993
BUSH RIVER # 3	Constr	800,000		150,000	10,000	414		1994
BUSH RIVER # 6	Constr	1,000,000		150,000	10,000	268		1994
BUSH RIVER #	Constr	1,000,000		125,000	10,000	330		1990
BUFFALO RIVER # 1B	Pre-des	4,000,000	1,200,000	200,000	11,000	175,000	100,000	1996
CEDAR RUN # 3	Constr	1,600,000	500,000	150,000	20,000	25,000	50,000	1990
CEDAR RUN # 6	Pre-des	2,500,000	400,000	200,000	20,000	750,000		1992
CEDAR RUN # 1A	Pre-des	2,500,000		200,000	20,000	500,000		1995
GREAT CREEK # 6	Constr	1,700,000	160,000	100,000	20,000	160,000	30,000	1989
POHICK # 10	Pre-des	1,500,000		150,000	20,000	100,000		1990
SLATE RIVER # 7	Constr	800,000		125,000	5,000	1,000		1991
SLATE RIVER # 4	Pre-des	800,000		125,000	5,000	50,000		1994
SLATE RIVER # 10	Constr	800,000		125,000	5,000	2,000		1994
WATKINS BRANCH	Pre-des	2,100,000		150,000	10,000	300,000		1993
PL-534								
LOWER NORTH 31A	Pre-des	2,000,000		200,000	20,000	75,000	100,000	1991
LOWER NORTH DIKE	Pre-des	440,000		100,000	20,000	100,000		1990
UPPER NORTH # 59	Pre-des	1,500,000	500,000	60,000	20,000	500,000		1992
TOTAL		$27,590,000	$ 3,510,000	$ 2,735,000	$254,000	$ 3,517,100	$ 385,000	

D 1/16/89 Farber C 1/19/89 wms

APPENDIX C

SENATE BILL NO. ..... HOUSE BILL NO. .....

A BILL to amend the Code of Virginia by adding in Chapter 6 of Title 10.1 an article numbered 1.1, consisting of sections numbered 10.1-603.1 through 10.1-603.16, relating to stormwater management programs.

Be it enacted by the General Assembly of Virginia:

1. That the Code of Virginia is amended by adding in Chapter 6 of Title 10.1 an article numbered 1.1, consisting of sections numbered 10.1-603.1 through 10.1-603.16, as follows:

Article 1.1.

Stormwater Management.

§ 10.1-603.1. Cooperative state-local program.--The General Assembly has determined that the lands and waters of the Commonwealth are great natural resources; that as a result of intensive land development and other land use conversions, degradation of these resources frequently occurs in the form of water pollution, stream channel erosion, depletion of groundwater resources, and more frequent localized flooding; that these impacts adversely affect fish, aquatic life, recreation, shipping, property values and other uses of lands and waters; that existing authorities under the Code of Virginia do not adequately address all of the existing impacts. Therefore, the General Assembly finds it in the public interest to enable the establishment of stormwater management programs.

§ 10.1-603.2. Definitions.--As used in this article, unless the

context requires a different meaning:

"Applicant" means any person submitting a stormwater management plan for approval.

"Department" means the Department of Conservation and Historic Resources.

"Flooding" means a volume of water which is too great to be confined within the banks or walls of the stream, water body or conveyance system and which overflows onto adjacent lands, causing or threatening damage.

"Land development" or "land development project" means a man-made change to the land surface that potentially changes its runoff characteristics.

"Local stormwater management program" or "local program" means a statement of the various methods employed by a locality to manage the runoff from land development projects and may include such items as local ordinances, policies and guidelines, technical materials, inspection, enforcement, and evaluation.

"Nonpoint source pollution" means pollution whose sources cannot be pinpointed but rather is washed from the land surface in a diffuse manner by stormwater runoff.

"Runoff" means that portion of precipitation that is discharged across the land surface or through conveyances to one or more waterways.

"Stormwater management plan" or "plan" means a document containing material for describing how existing runoff characteristics will be maintained by a land development project.

"Subdivision" means the same as defined in § 15.1-465 of the Code of Virginia.

§ 10.1-603.3. Counties, cities and towns may by ordinance establish stormwater management programs as a local option.--Each locality is authorized to establish a local stormwater management program which shall include, but is not limited to, the following:

1. Consistency with regulations promulgated in accordance with provisions of this article;

2. Provisions for long-term responsibility for and maintenance of stormwater management control devices and other techniques specified to manage the quality and quantity of runoff; and

3. Provisions for the integration of locally adopted stormwater management programs with local erosion and sediment control, flood insurance, flood plain management and other programs requiring compliance prior to authorizing construction in order to make the submission and approval of plans, issuance of permits, payment of fees, and coordination of inspection and enforcement activities more convenient and efficient both for the local governments and those responsible for compliance with the programs.

§ 10.1-603.4. Development of regulations.--The Department is authorized to promulgate regulations which specify minimum technical criteria and administrative procedures for stormwater management programs in Virginia. In order to inhibit the deterioration of existing waters and waterways, the regulations shall:

1. Require that state and local programs maintain after-development runoff, as nearly as possible, as the pre-development runoff characteristics;

2. Establish minimum design criteria for measures to control nonpoint source pollution and localized flooding, and incorporate the stormwater management regulations promulgated pursuant to the Virginia

Erosion and Sediment Control Law (§ 10.1-560 et seq.) as they relate to the prevention of stream channel erosion. These criteria shall be periodically modified as required in order to reflect current engineering methods;

3. Require the provision of long-term responsibility for and maintenance of stormwater management control devices and other techniques specified to manage the quality and quantity of runoff; and

4. Require as a minimum the inclusion in local programs of certain administrative procedures which include, but are not limited to, specifying the time period within which a local government which has adopted a stormwater management program must grant written approval of a plan, the conditions under which approval shall be granted, the procedures for communicating disapproval, the conditions under which an approved plan may be changed and requirements for inspection of approved projects.

§ 10.1-603.5. State agency projects.--A. After January 1, 1991, a state agency may not undertake any land clearing, soil movement, or construction activity involving soil movement or land development unless the agency has submitted and obtained approval of a stormwater management plan from the Department. In lieu of such a plan, the agency may annually submit stormwater management standards and specifications.

B. Notwithstanding the provisions of this article, all state agencies shall comply with the stormwater management provisions of the Erosion and Sediment Control Law and related regulations. The Department shall perform random site inspections to assure compliance with this article, the Erosion and Sediment Control Law and regulations promulgated thereunder.

C. The Department shall have sixty days in which to comment on the stormwater management plan, and its recommendations shall be binding on the state agency or the private business hired by the state agency. Individual approval of separate projects is not necessary when annually approved standards and specifications have been approved.

As on-site changes occur, the state agency shall submit changes in the stormwater management plan to the Department.

The state agency responsible for the land-disturbing activity shall ensure compliance with the approved plan or specifications.

§ 10.1-603.6. Involvement of the Department with local programs.--A. The Department shall provide technical assistance, training, research, and coordination in stormwater management technology to the local governments consistent with the purposes of this article.

B. The Department is authorized to review the plan for any project with real or potential interjurisdictional impacts upon the request of one of the involved localities to determine that the plan is consistent with the provisions of this article. Any such review shall be completed and a report submitted to each locality involved within ninety days of such request.

§ 10.1-603.7. Authorization for more stringent regulations.--Localities are authorized to adopt more stringent stormwater management regulations than those necessary to ensure compliance with the Department's minimum regulations, with the exception of regulations related to plan approval, provided that the more stringent regulations are based upon the findings of local comprehensive watershed management studies and that prior to adopting

more stringent regulations a public hearing is held after giving due notice.

§ 10.1-603.8. Regulated activities; submission and approval of a control plan; exemptions.--A. Except as provided in § 10.1-603.5, after the adoption of a local ordinance, a person shall not develop any land for residential, commercial, industrial, or institutional use in that locality until he has submitted a stormwater management plan to the locality that has jurisdiction and has obtained approval of the plan from that locality. The plan may include appropriate maps, mathematical calculations, detail drawings and a listing of all major decisions to assure that the entire unit or units of land will be so treated to achieve the objectives of the local program.

B. Notwithstanding any other provisions of this article, the following activities are exempt:

1. Permitted surface or deep mining operations and projects conducted under the provisions of Title 45.1 of the Code of Virginia;

2. Tilling, planting or harvesting of agricultural, horticultural, or forest crops;

3. Single-family residences separately built and not part of a subdivision, including additions or modifications to existing single-family detached residential structures; and

4. Land development projects that disturb less than one acre of land area; however, the governing body of a locality which has adopted a stormwater management program may reduce this exception to a smaller area of disturbed land or qualify the conditions under which this exception shall apply.

§ 10.1-603.9. Approved plan required for issuance of grading, building, or other permits; security for performance.--A. No grading,

building or other permit shall be issued for a property unless a stormwater management plan has been approved that is consistent with the local program and this article and unless the applicant has certified that all land clearing, construction, land development and drainage will be done according to the approved plan.

B. Prior to issuance of any permit, the locality may also require an applicant to submit a reasonable performance bond with surety, cash escrow, letter of credit, any combination thereof, or such other legal arrangement acceptable to the locality, to ensure that measures could be taken by the locality at the applicant's expense should he fail, after proper notice, within the time specified to initiate or maintain appropriate actions which may be required of him by the approved stormwater management plan as a result of his land-development project. If the locality takes such action upon such failure by the permittee, the agency may collect from the permittee for the difference should the amount of the reasonable cost of such action exceed the amount of the security held. Within sixty days of the completion of the requirements of the approved stormwater management plan, such bond, cash escrow, letter of credit or other legal arrangement, or the unexpended or unobligated portion thereof, shall be refunded to the applicant or terminated. These requirements are in addition to all other provisions of law relating to the issuance of such permits and are not intended to otherwise affect the requirements for such permits.

§ 10.1-603.10. Recovery of administrative costs.--Any locality which administers a stormwater management program may charge applicants a reasonable fee to defray the cost of program administration, including costs associated with plan review, issuance

of permits, periodic inspection for compliance with approved plans, and necessary enforcement, provided that charges for such costs are not made under any other law, ordinance or program. The fee shall not exceed an amount commensurate with the services rendered and expenses incurred or $1,000, whichever is less.

§ 10.1-603.11. Authorization for assessment of service charges.--A system of service charges may be enacted by any locality which administers a stormwater management program authorized under this article to periodically assess the residents of the locality a reasonable fee based upon their contributions to stormwater runoff, provided that prior to adopting such a system a public hearing is held after giving due notice. Revenues from such service charges shall be applied to achieving the objectives of the local stormwater management program, including but not limited to providing staff to manage the program, purchasing land for construction of regional stormwater control facilities, and providing long-term maintenance and monitoring of stormwater control devices.

§ 10.1-603.12. Monitoring, reports and inspections.--A. The plan-approving authority or, if a permit is issued in connection with land-disturbing activities which involve the issuance of a grading, building, or other permit, the permit-issuing authority (i) shall provide for periodic inspections of the installation of stormwater management measures and (ii) may require monitoring and reports from the person responsible for carrying out the plan, to ensure compliance with the approved plan and to determine whether the measures required in the plan provide effective stormwater management. The owner, occupier or operator shall be given notice of the inspection and an opportunity to accompany the inspectors. If the permit-issuing

authority or plan-approving authority determines that there is a failure to comply with the plan, notice shall be served upon the permittee or person responsible for carrying out the plan by registered or certified mail to the address specified in the permit application or in the plan certification, or by delivery at the site of the development activities to the agent or employee supervising such activities. Where the plan-approving authority serves notice, a copy of the notice shall also be sent to the issuer of the permit. The notice shall specify the measures needed to comply with the plan and shall specify the time within which such measures shall be completed. Upon failure to comply within the time specified, the permit may be revoked and the permittee or person responsible for carrying out the plan shall be deemed to be in violation of this article and upon conviction shall be subject to the penalties provided by § 10.1-603.15.

B. Notwithstanding subsection A of this section, the following may be applied:

1. Where a county, city, or town administers the local control program and the permit-issuing authority and the plan-approving authority are not within the same local government department, the locality may designate one department to inspect, monitor, report and ensure compliance.

2. Where a permit-issuing authority has been established, and such authority is not vested in an employee or officer of local government but in the commissioner of revenue or some other person, the locality shall exercise the responsibilities of the permit-issuing authority with respect to monitoring, reports, inspections, and enforcement unless such responsibilities are transferred as provided

for in this section.

§ 10.1-603.13. Department to review local and state agency programs.--A. The Department shall periodically conduct a comprehensive review and evaluation of the effectiveness of each local government's and state agency's stormwater management program. The review shall include an assessment of the extent to which the program has reduced nonpoint source pollution and mitigated the detrimental effects of localized flooding. A summary of these reviews and evaluations shall be submitted annually to the General Assembly.

B. If, after such a review and evaluation, a local government is found to have a program which does not comply with the provisions of this article or regulations promulgated thereunder, the Department may issue an order requiring that necessary corrective action be taken within a reasonably prescribed time. If the locality fails to comply with the Department's order within the time specified, the Department may suspend the locality's authority to charge service fees under § 10.1-503.11.

§ 10.1-603.14. Appeals of decisions of counties, cities or towns.--A. An appeal from a decision of a locality concerning an application for approval or disapproval of a stormwater management plan may be taken by the applicant, or any aggrieved party authorized by law, within thirty days after the rendering of such a decision of the locality, to the circuit court of the jurisdiction in which the land development project is located.

B. Judicial review shall be on the record previously established and shall otherwise be in accordance with the provisions of the Administrative Process Act (§ 9-6.14:1 et seq.).

§ 10.1-603.15. Penalties, injunctions and other legal

actions.--Any person who violates any provision of a local ordinance or program adopted pursuant to the authority of this article shall be guilty of a Class 1 misdemeanor. Each day of violation constitutes a separate offense. Such a local ordinance may also include the following sanctions:

1. A locality operating its own program may apply to the circuit court in any jurisdiction wherein the land lies to enjoin a violation or a threatened violation of the provisions of this article or of the local ordinance without the necessity of showing that an adequate remedy at law does not exist.

2. Without limiting the remedies which may be obtained in this section, a locality operating its own program may bring a civil action against any person for violation of any ordinance or any condition of a permit, or any provision of a local program adopted pursuant to this article. The action may seek the imposition of a civil penalty of not more than $2,000 against the person. Each day of violation constitutes a separate offense.

3. With the consent of any person who has violated or failed, neglected or refused to obey any ordinance or any condition of a permit or any provision of a local program adopted pursuant to this article, the administrator of the local program may provide, in an order issued by the administrator against such person, for the payment of civil charges for violations in specific sums, not to exceed the limit specified in subdivision 2 of this section. Such civil charges shall be instead of any appropriate civil penalty which could be imposed under subdivision 2.

§ 10.1-603.16. Cooperation with federal and state agencies.--Localities operating their own programs and the Department

are authorized to cooperate and enter into agreements with any federa.
or state agency in connection with plans for stormwater management.

#

D 1/7/89 Farber C 1/10/89 ngh

APPENDIX D

SENATE BILL NO. ..... HOUSE BILL NO. .....

A BILL to amend and reenact §§ 10.1-600, 10.1-602 and 10.1-603 of the Code of Virginia and to amend the Code of Virginia by adding in Chapter 6 of Title 10.1 an article numbered 6, consisting of sections numbered 10.1-658 and 10.1-659, and to repeal § 10.1-601 of the Code of Virginia, relating to flood protection.

Be it enacted by the General Assembly of Virginia:

1. That §§ 10.1-600, 10.1-602 and 10.1-603 of the Code of Virginia are amended and that the Code of Virginia is amended by adding in Chapter 6 of Title 10.1 an article numbered 6, consisting of sections numbered 10.1-658 and 10.1-659 as follows:

§ 10.1-600. Definitions.--As used in this article, unless the context requires a different meaning:

"Emergency flood insurance program" or "emergency program" means the Emergency Program of the Federal Insurance Administration which provides subsidized flood insurance for potential flood victims, applicable to both new and existing structures, pending completion of applicable actuarial rates which is a prerequisite for eligibility to participate in the regular program.

"Flood hazard area" means those areas susceptible to flooding.

"Flood plain" or "flood-prone areas" means those areas adjoining a river, stream, water course, ocean, bay or lake which are likely to be covered by floodwaters.

"Flood plain management regulations" means zoning ordinances, subdivision regulations, the building code, health regulations,

special purpose ordinances such as flood plain ordinances, grading ordinances or erosion control ordinances, and other rules, regulations and ordinances which may affect flood plain uses. The term describes such legally enforceable regulations, in any combination thereof, which provide standards for the control of the use and occupancy of flood-prone areas.

"Hundred year flood" means a flood of that level which on the average will have a one percent chance of being equaled or exceeded in any given year at designated locations.

"Locality" means a county, city, or town.

"National flood insurance program" means the program established by the United States Congress under provisions of the National Flood Insurance Act of 1968, as amended, and as expanded in the Flood Disaster Protection Act of 1973, designed to provide flood insurance at rates made affordable through federal subsidy.

"Nonfederal cost" means the flood protection project costs provided by sources other than the federal government.

"Regular flood insurance program" means a program of insurance under the national flood insurance program, for which the Federal Insurance Administrator has issued a flood insurance rate map and applicable actuarial rates, and under which new construction will not be eligible for flood insurance except at the applicable actuarial rates.

§ 10.1-602. Powers and duties of Department.--The Department shall:

1. ~~Collect and distribute information relating to flooding and flood plain management~~ Develop a flood protection plan for the Commonwealth. This plan shall include:

a. An inventory of flood-prone areas;

b. An inventory of flood protection studies;

c. A record of flood damages;

d. Strategies to prevent or mitigate flood damage; and

e. The collection and distribution of information relating to flooding and flood plain management.

~~2. Coordinate local, state and federal flood plain management activities to the greatest extent practicable, and encourage the United States Army Corps of Engineers, the United States Soil Conservation Service, the United States Geological Survey, the Tennessee Valley Authority, and the United States Federal Emergency Management Agency to make~~ Serve as the coordinator of all flood protection programs and activities in the Commonwealth, including the coordination of federal flood protection programs administered by the United States Army Corps of Engineers, the United States Department of Agriculture, the Federal Emergency Management Agency, the United States Geological Survey, the Tennessee Valley Authority, other federal agencies and local governments.

3. Make available flood and flood damage reduction data to localities for planning purposes, in order to assure necessary local participation in the planning process and in the selection of desirable alternatives which will fulfill the intent of this article. This shall include the development of a data base to include (i) all flood protection projects implemented by federal agencies, and (ii) the estimated value of property damaged by major floods.

~~3.~~ 4. Assist localities in their management of flood plain activities in cooperation with the Department of Housing and Community Development.

~~4.~~ 5. Carry out the provisions of this article in a manner which will ensure that the management of flood plains will preserve the capacity of the flood plain to carry and discharge a hundred year flood.

~~5.~~ 6. Make, in cooperation with localities, periodic inspections to determine the effectiveness of local flood plain management programs, including an evaluation of the enforcement of and compliance with local flood plain management ordinances, rules and regulations.

~~6.~~ 7. Coordinate with the United States Federal Emergency Management Agency to ensure current knowledge of the identification of flood-prone communities and of the status of applications made by localities to participate in the National Flood Insurance Program.

~~7.~~ 8. Establish guidelines which will meet minimum requirements of the National Flood Insurance Program in furtherance of the policy of the Commonwealth to assure that all citizens living in flood-prone areas may have the opportunity to indemnify themselves from flood losses through the purchase of flood insurance under the regular flood insurance program of the National Flood Insurance Act of 1968 as amended.

9. Subject to the provisions of the Appropriations Act, provide financial and technical assistance to localities in an amount not to exceed fifty percent of the nonfederal costs of flood protection projects.

§ 10.1-603. State agency compliance.--All agencies and departments of the Commonwealth shall comply ~~, when and wherever possible,~~ with the flood plain regulations established pursuant to this article when planning for facilities in flood plains.

Article 6.

Comprehensive Flood Control Program.

§ 10.1-658. State interest in flood control--A. The General Assembly declares that storm events cause recurrent flooding of Virginia's land resources and result in the loss of life, damage to property, unsafe and unsanitary conditions and the disruption of commerce and government services, placing at risk the health, safety and welfare of those citizens living in flood-prone areas of the Commonwealth. Flood waters disregard jurisdictional boundaries, and the public interest requires the management of flood-prone areas in a manner which prevents injuries to persons, damage to property and pollution of state waters.

The General Assembly, therefore, supports and encourages those measures which prevent, mitigate and alleviate the effects of stormwater surges and flooding, and declares that the expenditure of public funds and any obligations incurred in the development of flood control and other civil works projects, the benefits of which may accrue to any county, municipality or region in the Commonwealth, are necessary expenses of local and state government.

§ 10.1-659. Flood protection programs; coordination.--The provisions of this chapter shall be coordinated with federal, state and local flood prevention and water quality programs to minimize loss of life, property damage and negative impacts on the environment. This program coordination shall include but not be limited to the following: flood prevention, flood plain management, small watershed protection, dam safety, soil conservation, stormwater management and erosion and sediment control programs of the Department of Conservation and Historic Resources; the construction activities of

the Department of Transportation which result in hydrologic modification of rivers, streams and flood plains, the water quality and other water management programs of the State Water Control Board; forested watershed management programs of the Department of Forestry; the statewide building code and other land use control programs of the Department of Housing and Community Development; local planning assistance programs of the Council on the Environment; the habitat management programs of the Virginia Marine Resources Commission; the hazard mitigation planning and disaster response programs of the Department of Emergency Services; the fish habitat protection programs of the Department of Game and Inland Fisheries; the mineral extraction regulatory program of the Department of Mines, Minerals and Energy; the flood plain restrictions of the Department of Waste Management; the Chesapeake Bay Preservation Area criteria and local government assistance programs of the Chesapeake Bay Local Assistance Board. The Department shall also coordinate and cooperate with localities in rendering assistance to such localities in their efforts to comply with the planning, subdivision of land and zoning provisions of Chapter 11 (§ 15.1-427 et seq.) of Title 15.1 of the Code of Virginia. The Department shall cooperate with other public and private agencies having flood plain management programs, and shall coordinate its responsibilities under this article and any other law. These activites shall constitute the Commonwealth's flood prevention and protection program.

2. That § 10.1-601 of the Code of Virginia is repealed.

#

D 1/6/89 Farber C 1/16/89 ngh

APPENDIX E

SENATE BILL NO. ..... HOUSE BILL NO. .....

A BILL to amend the Code of Virginia by adding in Chapter 6 of Title 10.1 an article numbered 1.1, consisting of sections numbered 10.1-603.1 through 10.1-603.8, creating the Flood Prevention and Protection Assistance Fund.

Be it enacted by the General Assembly of Virginia:

1. That the Code of Virginia is amended by adding in Chapter 6 of Title 10.1 an article numbered 1.1, consisting of sections numbered 10.1-603.1 through 10.1-603.8, as follows:

Article 1.1.

Flood Prevention and Protection Assistance Fund.

§ 10.1-603.1. Definitions.--As used in this article unless the context requires a different meaning:

"Board" means the Virginia Soil and Water Conservation Board.

"Department" means the Department of Conservation and Historic Resources.

"Flood prevention or protection" means the construction of dams, levees, flood walls, channel improvements or diversions, local flood proofing, evacuation of flood-prone areas or land use controls which reduce or mitigate damage from flooding.

"Flood prevention or protection studies" means hydraulic and hydrologic studies of flood plains with historic and predicted floods, the assessment of flood risk and the development of strategies to prevent or mitigate damage from flooding.

"Fund" or "revolving fund" means the Flood Prevention and Protection Assistance Fund.

"Local public body" means any city, county, town, water authority, service authority or special taxing district.

§ 10.1-603.2. Flood Prevention and Protection Assistance Fund established.--The Flood Prevention and Protection Assistance Fund is hereby established. The Fund shall consist of any moneys appropriated by the General Assembly and funds returned by localities in the form of interest and repayment of loan principal. Any moneys remaining in the Fund at the end of the biennium including any appropriated funds and all principal interest accrued, interest and payments shall not revert to the general fund.

§ 10.1-603.3. Administration of the Fund.--The Board shall be responsible for the administration of the Fund and shall direct the distribution of grants or loans from the Fund to particular local public bodies. The Board is authorized to promulgate regulations for the proper administration of the Fund. Such regulations may include, but are not limited to, the establishment of amounts, interest rates, repayment terms, consideration of the fiscal stability of the particular local public body applying and all other criteria for awarding of grants or loans.

§ 10.1-603.4. Purposes for which Fund is to be used.--The Board is authorized to make grants or loans to any city, county, town, water authority, service authority or taxing district for the purpose of assisting local sponsors in providing required matching funds for flood prevention or protection, or for flood prevention or protection studies conducted by agencies of the federal government. No grant shall exceed fifty percent of the amount of funds to be provided by

the local sponsor.

§ 10.1-603.5. Condition for making loans or grants.--A. The Board may authorize a loan or grant under the provisions of § 10.1-603.4 only when the following conditions exist:

1. An application for the loan or grant has been submitted by the applicant in the manner and form specified by the Board, setting forth the amount of the loan or grant requested, and the use to which the loan or grant will be applied. The application shall describe in detail (i) the area to be studied or protected, including the population and the value of property to be protected, historic flooding data and hydrologic studies projecting flood frequency; (ii) the estimated cost-benefit ratio of the project; (iii) the ability of the locality to provide its share of the cost of the federal flood control study or project; and (iv) the administration of local flood plain management regulations.

2. The local public body agrees and furnishes assurance, satisfactory to the Board, that it will satisfactorily maintain any structure financed, in whole or in part, through the loans or grants provided under this article.

3. The purpose for which the loan or grant is sought is one described in § 10.1-603.4.

4. If the requested loan or grant is sought to acquire land, the Board shall require satisfactory evidence prior to acting on the request that the local public body will acquire the land if the loan or grant is made.

B. In addition to the condition for making loans established under this article, the Board may require of a local public body such covenants and conditions as the Board deems necessary or expedient to

further the purpose of the loan.

C. The Board may consent to and approve any modification in the terms of any loan to any local public body subject to the regulations promulgated.

§ 10.1-603.6. Period of loan; interest rate; loan shall constitute a lien.--Any loan made pursuant to § 10.1-603.4 shall be made for a period not to exceed twenty years and shall bear interest at the rate of three percent annually. Payment of interest and principal shall be made to the State Treasurer and credited to the revolving fund, and evidence of debt taken for such loan shall be deposited with the State Treasurer and kept by him. Whenever a loan is made in accordance with the provisions of this article, a lien is hereby created against any real or personal property acquired with loan proceeds. Prepayment of the principal of any such loan, in whole or in part, may be made by the borrower without penalty; however, the borrower shall be liable for interest accrued on the principal at the time of prepayment.

§ 10.1-603.7. Recovery of money due to Fund.--If a borrower defaults on any payment due the State Treasurer pursuant to § 10.1-603.6 or on any other obligation incurred pursuant to the provisions of this article, the amounts owed to the Fund by the borrower may be recovered by the State Comptroller, transferring to the Fund the amount of the payment due to the Fund from the distribution of state funds to which the defaulting borrower may be entitled pursuant to any state law, or any money which is to be paid into the Fund may be recoverable with interest by the Commonwealth, in the name of the Board, on motion in the Circuit Court of the City of Richmond. The Attorney General shall institute and prosecute such

proceedings after a request for such action has been made by the Board.

§ 10.1-603.8. Record of application for grants or loans and action taken.--A record of each application for a grant or loan pursuant to § 10.1-603.4 and the action taken thereon shall be open to public inspection at the office of the Department and shall be presented to the Governor and members of the legislature prior to budgetary sessions of the General Assembly.

#

APPENDIX F

DEPARTMENT OF CONSERVATION AND HISTORIC RESOURCES

PROPOSED FLOOD CONTROL BUDGET FOR 1989-90 for HJR 113

POSITIONS				
GRADE	CLASS	#	89-90	TOT 89-90
5	OFF SVC SPEC	1	$13,881	$13,880
7	ENV TECH	1	$16,586	$16,585
13	ENV ENG SEN	2	$28,310	$56,620
	TOTAL SALARY			$87,085
	BENEFITS			
1111	RETIREMENT 12.510%			$10,895
1112	SOC SECURITY 7.510%			$6,540
1114	GP INS 1.008%			$880
1115	HOSPITALIZA $1,270			$12,700
1123	SALARY			$87,085
TOTAL PERSONAL SERVICES				$118,100

SUPPORT COSTS/POSITION	1989-90
RICHMOND PROF POSITIONS	$9,950
CLERICAL POSITIONS	$4,400
EQUIPMENT	$10,000
RICHMOND PROF POS-3	$29,850
CLERICAL-1	$4,400
EQUIPMENT-4	$40,000
TOTAL COSTS	$192,350

PERSONNEL SUMMARY
2 STAFF ENGINEERS
1 ENGINEERING TECHNICIAN
1 SECRETARY-RICHMOND

DEPARTMENT OF CONSERVATION AND HISTORIC RESOURCES

PROPOSED STORMWATER MANAGEMENT BUDGET FOR 1989-90

POSITIONS GRADE	CLASS	#	89-90	TOT 89-90
5	OFF SVC SPEC	1	$13,881	$13,880
11	ENV SPC SEN-FLD	4	$23,688	$94,750
13	ENV ENG SEN	1	$28,310	$28,310
	TOTAL SALARY			$136,940
	BENEFITS			
1111	RETIREMENT	12.510%		$17,130
1112	SOC SECURITY	7.510%		$10,285
1114	GP INS	1.008%		$1,380
1115	HOSPITALIZA	$1,270		$12,700
1123	SALARY			$136,940
TOTAL PERSONAL SERVICES				$178,435

SUPPORT COSTS/POSITION	1989-90
FIELD PROF POSITIONS	$11,495
RICHMOND PROF POSITIONS	$9,950
CLERICAL POSITIONS	$4,400
EQUIPMENT	$10,000
FIELD PROF POS-4	$45,980
RICHMOND PROF POS-1	$9,950
CLERICAL-1	$4,400
EQUIPMENT-6	$60,000
TOTAL COSTS	$298,765

PERSONNEL SUMMARY
1 MANAGER
1 SECRETARY-RICHMOND
4 LOCAL SPECIALISTS