

CHAPTER 6

WATER QUALITY PROTECTION PLAN

INTRODUCTION

The purpose of this chapter is to define a broad set of policies for the City of Hopewell which promote the objectives of the City and the Commonwealth of Virginia to preserve the quality of waters of the Chesapeake Bay and related State waters within the City. Referred to here as the **Water Quality Protection Plan**, this chapter has been prepared to comply with Section 10.1-2109 of the Virginia Code which in part states:

Counties, cities, and towns in Tidewater Virginia shall incorporate protection of the quality of State waters into each locality's comprehensive plan consistent with the provisions of this chapter.

Under the powers of that code section, the Chesapeake Bay Local Assistance Board was authorized to prepare regulations which provided guidelines to localities for preparing plans for the protection of the quality of State waters. Among the provisions of those guidelines, which are published in the Local Assistance Manual, are five objectives of such plans. They state, “*in conjunction with other State water quality programs, local programs shall encourage and promote:*

- *Protection of existing high quality state waters and restoration of all other State waters to a condition or quality that will permit all reasonable public uses and will support the propagation and growth of all aquatic life, including game fish, that might reasonably be expected to inhabit them*
- *Safeguarding the clean waters of the Commonwealth from pollution*
- *Prevention of any increase in pollution*
- *Reduction of existing pollution, and*
- *Promotion of water resource conservation in order to provide for the health, safety, and welfare of the present and future citizens of the Commonwealth.”*

This chapter is designed to further these objectives within the framework of the physical conditions identified in Chapter 1. It extends and supplements the Comprehensive Plan beyond its conventional physical development focus to include provisions designed to preserve the qualities of State waters. The City Council recognizes that there may be situations where the requirement of one element of the Comprehensive Plan appears to duplicate, overlap, or even supersede another plan element. When addressing a specific planning issue, the City Council and the Planning Commission will give appropriate consideration to all applicable elements of the Comprehensive Plan as if it were a single volume.

Policies are organized below around the following topics:

- A. Physical Factors that Influence or Constrain Development
- B. Protection of the City's Potable Water Supply
- C. Shoreline Preservation
- D. Access to State Waters
- E. Potential Conflict Between the Land Use Plan and the Water Quality Protection Plan

Through the following policies, the elected leaders of the City of Hopewell will promote those laws, policies, and regulations promulgated by the State and Federal governments, which are designed to enhance the quality of water entering the Chesapeake Bay through tributaries located within the City.

A. Physical Factors that Constrain or Influence Development

1. Topographic Restraints

Topographic restraints result from, among other things, slopes that are 15% or greater. The City has more than 890 acres where the land has a slope of 15% or greater. Slopes of this angle of steepness require special engineering techniques to ensure the stability of the foundation of any built structures and so are often the last areas developed, if they are developed at all.

2. Existing Development Constraints.

Existing development presents unique constraints and opportunities to land-locked cities such as Hopewell. In communities that have an adequate supply of vacant land to develop, it is common for existing development to attract similar development. It is also unlikely that, in those localities, once a use is established for an area it will be removed and replaced with another use. However, in localities such as Hopewell, where vacant land is scarce, existing development provides opportunities for redevelopment that may entail changing the community characteristics of the area where the development is located. The constraint becomes one of cost; it is more costly to redevelop than it is to build on a vacant site.

Policies for development in areas within or near existing development are as follows:

- (a) Commercial and other high-intensity uses are encouraged to develop within or near those areas of Hopewell defined as Regional Trade Centers, Community Trade Centers, or Neighborhood Trade Centers.
 - i. Any redevelopment that raises the intensity of use will be required to consider such measures as storm water reduction techniques, the use of pervious surfaces for paving, and open-space and cluster designs that help preserve green space.
 - ii. Mixed-use developments are encouraged to reduce trip generation.
 - iii. Increased density within existing infrastructure is encouraged to reduce the development of environmentally-sensitive areas.
- (b) Residential development is encouraged as in-fill among existing residential neighborhoods.

3. Chesapeake Bay Protected Areas

The definition of the areas that make-up the Chesapeake Bay protected areas includes many of the environmental constraints listed in Chapter One. The Resource Protection Area (RPA) includes tidal wetlands, tidal shores, non-tidal wetlands connected to tidal wetlands by surface flow, and a 100-foot vegetated buffer located

adjacent to one of the above types of areas and along both sides of any tributary stream. The Resource Management Area (RMA) includes the 100-year floodplain, streamside steep slopes, and any non-tidal wetlands not included in the RPA. Uses in the RPA are limited to redevelopment of existing development, water-related uses such as breakwaters or boathouses, or passive recreational uses. In the RMA, any use that is permitted under the City's zoning ordinance is permitted, provided all development meets performance criteria set forth in the Chesapeake Bay Act Regulations. General policies for these areas are as follows:

- (a) The 100-year floodplain, the RPA, and the RMA shall be identified on proposed plats or development plans.
- (b) Point sources of pollution are not to be established in the 100-year floodplain, or designed so that they may increase the incidence of pollution in floodprone areas.
- (c) The boundaries of the RPA and RMA will continue to be refined as further engineering studies are done.
- (d) The performance standards of the Chesapeake Bay Ordinance will continue to be administered.

4. Poor Structural Qualities of Soils

There are several structural qualities of soils that can create difficulties for development. Most important among these is the shrink-swell factor. A soil with a high shrink-swell quality will require special engineering to ensure that foundations do not crack or warp. There are more than 900 acres of soils in Hopewell that have a high shrink-swell quality.

- (a) Each development site in areas known to include high or moderate shrink-swell soils must be carefully examined and may require engineering reports to demonstrate that soils under the building site can support the intended structure.
- (b) Special engineering may be required if the building sites show a large amount of high shrink-swell soil.

Another soil quality that needs to be examined is how well a soil drains. This is how fast moisture drains through the soil into the underground aquifers. Most of the soil in Hopewell is well-drained. There are only approximately 886 acres of land classified as being poorly drained. There are no soils that are classified as excessively well-drained.

- (a) On soils known to include poor drainage, steps must be taken to prevent pollution from running off into state waters.

Erodibility of the soil is another soil structure quality that needs to be considered. Hopewell has more than 1,650 acres of soil that is classified as highly erodible. More than half of this acreage can be attributed to steep slopes. Most of these soils are situated along the streambeds and riverbeds in the City and are therefore included in the Chesapeake Bay Resource Management Area (RMA). The RMA designation gives the City some measure of control over the development among these soils.

- (a) The few highly erodible soils that are not included in the RMA should be mapped and included with this designation.

Run-off potential of the soil is a fourth soil quality that needs to be considered with regards to development or redevelopment. Run-off potential is the quality of the soil that allows water and other liquids to quickly infiltrate the surface of the soil. Hopewell has very few acres of soil (~89) that can be classified as having good run-off potential, meaning that precipitation will be readily absorbed into the soil. Meanwhile it has more than 4,800 acres of soil classified as having severe run-off potential. This factor, combined with the amount of impervious cover, can add to the pollutants entering state waters.

- (a) New development and redevelopment will work to limit destruction or coverage of those soils that have good run-off potential.
- (b) New development and redevelopment will reduce the amount of impervious cover.

5. Constraints caused by Significant Historical Resources

There are three sites in the City of Hopewell that are on the National Register of Historic Places and the Virginia Landmarks Register. Additional sites throughout the City may be identified through a VDHR historical survey. General City policies for these areas are:

- (a) No development shall be permitted that modifies or disturbs, or intends to modify or disturb, a known historic landmark.
- (b) No development shall be permitted that modifies or disturbs, or intends to modify or disturb, a suspected historic landmark without a VDHR survey first being completed on the affected property.

B. Protection of the City's Water Supply

In Hopewell, drinking water is obtained from the Appomattox River by the Virginia American Water Company, from a pumping station near the confluence of the Appomattox and James Rivers. The company, one of the largest privately owned water utilities in the US, supplies water to Hopewell, Fort Lee and the suburban areas in Prince George County. Their treatment plant has a current capacity of 33 million gallons per day (mgd). The average total water production is 21 mgd. Eighty-five percent of the water processed is consumed by the industries of Hopewell. There are currently over 8,500 connections to the system.

The Appomattox River is one of the longest and least developed rivers in Virginia. This river is vulnerable to pollution from a number of sources, leaking underground steel tanks, run-off of pesticides and fertilizers from residential areas, and industrial waste. The primary water quality protection strategy for Hopewell is to prevent pollution from entering this important watershed and the Chesapeake Bay. Another concern that is unique to Hopewell is the fact that the fresh water intake plant for the City is about 500 yards downstream from the City-owned City Marina. This could be potentially hazardous if there is an environmental incident at the Marina.

1. Protection of Watershed Areas.

- (a) Any development or use of the land shall be done in such a way as to preserve the integrity of the existing watershed. Drainage facilities may not be designed to change the course of water from one watershed to another.
- (b) Sites intended for new development shall be designed in such a way that their post-development performance meets the criteria set forth by CBLAB and other State agencies in the following areas:
 - Soil erosion and sedimentation
 - Rainwater infiltration
 - Nutrients used
 - Indigenous vegetation
- (c) Enforcement of RPA and RMA regulations designed to filter runoff through buffers and to manage development so as to minimize stormwater runoff is to be continued.
- (d) New development will be constructed in such a way as to minimize non-point sources of pollution.
- (e) Hazard mitigation regulations and techniques will be put in place at City Marina to help prevent any pollution from entering the Appomattox River at the Marina.
- (f) In the event of a pollutant discharge, the Virginia American Water Company, the Virginia Department of Environmental Quality and the Virginia Department of Health will be contacted to ensure that the intake plant was not contaminated.

2. Surface and Ground Water Protection

- (a) Non-point pollution sources will be reduced through monitoring of sites that produce such pollution.
- (b) Point sources of pollution will be managed by upgrading of facilities and strict controls on the establishment of new point sources. Specific policies for point sources are:
 - i. Existing underground storage tanks will be replaced immediately upon finding any sign of leakage. New and replacement tanks shall be constructed of materials sufficient to protect against leakage. The City will cooperate with the DEQ in locating and instigating the replacement of defective underground storage tanks.

- ii. When major facilities are constructed, they shall be designed and constructed with appropriate devices to assure they will not create a hazard to the underground water supply, watersheds, or environmentally-sensitive areas.
- iii. Known sources of pollution with emissions in excess of permissible levels are to be upgraded or replaced to bring any point source pollution deficiencies into compliance.
- iv. New commercial/industrial development will be constructed to produce no net increase in pollutants to air or water; storm water discharge; chemical contaminants of any type; or any other conditions that will be detrimental to State waters.

3. Water Conservation

The City supports the Chesapeake Bay Local Assistance Board's objectives for water conservation as expressed in the Local Assistance Manual, with the intent of "*promoting water resource conservation in order to provide for the health, safety and welfare of the present and future citizens of the City.*" To further this objective, the City establishes the following policies.

- (a) New buildings including additions to existing buildings that involve new plumbing fixtures are to use water conservation measures that include such devices as low-flow showerheads and low-flow toilets.
- (b) New industrial uses that require large amounts of water will be required to have in place a water conservation plan that meets the guidelines of the Chesapeake Bay Act.
- (c) The City will provide, through flyers, news releases, and other means of publicity, information to homeowners, builders and developers on how to reduce water usage.

C. Shoreline Preservation

There is no significant shoreline erosion around Hopewell. The area experiencing the most erosion is City Point. Though no studies have been completed*, observation

* The Virginia Institute of Marine Science is in the process of studying erosion along the James River. Their report is due out in 2002.

suggests that the steep banks around this point are eroding. Other areas of the City are experiencing some shoreline erosion though it is slight. While most of the erosion is due to natural forces of wind and tide, some is also due to human activity such as improper land use and boating. There are actions that the city and individuals can take to mitigate or delay the effects of shoreline erosion. Some general policies include:

1. Vegetation as an alternative to man-made structures should be supported as erosion prevention mechanisms. (A list of plants suitable for brackish or estuarine systems is given in Chapter IV of CBLAD's Local Assistance Manual—p. VI-65.)
2. All new shoreline development must have a Shoreline Protective Plan detailing the steps being taken to control erosion. Wherever possible, vegetative approaches are to be preferred over man-made structures.
3. Tidal marsh areas are to be protected and expanded through enforcement of wetlands regulations and through the addition of wetlands to the inventory as they are delineated in detail as part of the review process.

D. Access to State Waters

Improved recreational access to State waters, especially the Chesapeake Bay, is a favored policy of the State of Virginia and a part of the guidelines of CBLAD. A study of shoreline access is presented in the Chesapeake Bay Area Public Access Plan which covers all of the states that border on the Chesapeake Bay and the Bay's major tributaries. While it is one State policy to improve public access to State waters, it is another policy to ensure that those access areas do not become non-point sources of pollution. General policies concerning public access to State waters include:

1. The City of Hopewell will cooperate with the State in the use of the City Marina to ensure the site is well maintained and properly used in ways that will not increase pollutants entering State waters.
2. The City will prepare a plan to increase the number of public recreational access points in the City.
3. It is the policy of the City that the siting criteria for Marinas and Community Facilities for Boat Mooring set out by the Virginia Marine Resources Commission in 1988 applies within the City (Reference: Chapter VI, Table 6-7, Local Assistance Manual.)

E. Potential Conflict between the Land Use Plan and the Water Quality Protection Plan

1. Conflict Issues

The major focus of potential conflicts between land use and water quality protection lies in those areas where population is concentrated or likely to get concentrated, or where land is used for intensive purposes. Since Hopewell is a land-locked city, it is most likely that conflict will arise as areas of the City are redeveloped.

Redevelopment will probably cause an increase in the intensity of land use for that particular property and could change the fabric of the surrounding area which could lead to more intensive uses for surrounding sites as well. While care has been taken in the Land Use Plan to protect sensitive environmental areas, conflicts may arise between designated land use policies and the protection of water quality. Among specific areas more subject to potential conflicts, and the possible causes of such conflicts, are the following:

- (a) As land is developed to more intensive uses, particularly those uses that increase the quantity of impervious surfaces, disturbs existing protective vegetation, or increases the amount of storm water run-off, measures need to be established that work to improve the quality of water that reaches state waters. Such measures would be implemented at the time building permits or other required permits are issued.
- (b) Use of modern land planning techniques as a means of preserving open space will minimize the impact of residential development on the environment and on State waters. Such techniques may include: planned unit development, cluster subdivisions with open space preservation, historic landmarks preservation, density zoning, and the like. The objective in using these techniques is to permit a similar level of development as would normally be permitted but to improve the efficiency of land utilization.
- (c) Development of land that abuts tidal waters increases the probability of shoreline erosion as well as diminishing the amount of protective marshlands and wetlands. This potential conflict is addressed by a strategy that discourages the use of property in a way that is detrimental to water quality both in open creeks and rivers and in the aquifers. This strategy includes: greater setbacks from shorelines which have experienced serious erosion, and installation of erosion control structures or plantings that have a demonstrated ability to decrease shoreline erosion.

2. Policies Designed to Resolve Conflict.

(a) Industrial Areas

- i. Expansion of existing industry will require a Water Quality Protection Plan from the company to be put in place before expansion begins. Elements of this plan will include greater use of pervious surfaces, establishment or reestablishment of buffers where they do not exist or have been disturbed by natural or other forces, and water conservation.
- ii. Good stormwater practices that reduce pollutants which otherwise could reach the Chesapeake Bay or its tributaries will be emphasized.

(b) Commercial Areas

- i. Intensification of commercial uses will require a Storm Water Mitigation Plan to minimize run-off of pollutants.
- ii. Establishment of new commercial uses will require a Water Quality Protection Plan similar to that required of industry. Emphasized in this plan should be use of vegetation that requires less water, use of porous surfaces for parking lot construction, and water conservation.

(c) Residential Areas

- i. Land Use Planning Innovations – The City promotes and encourages the use of land use planning innovations and advances in technology to achieve the objectives of the comprehensive plan and relieve the potential conflict between development and need to protect the water quality. Among the policies designed to achieve this purpose are the following: Encourage developers to create mixed-use developments and the use of planned unit development, cluster zoning, and other open-space preservation concepts to promote the efficient use of land and preservation of natural resources.
- ii. Redevelopment of residential areas that increase density will require a Storm Water Mitigation Plan.
- iii. A Water Conservation packet will be mailed to each household with suggestions for decreasing the amount of water used by the household.