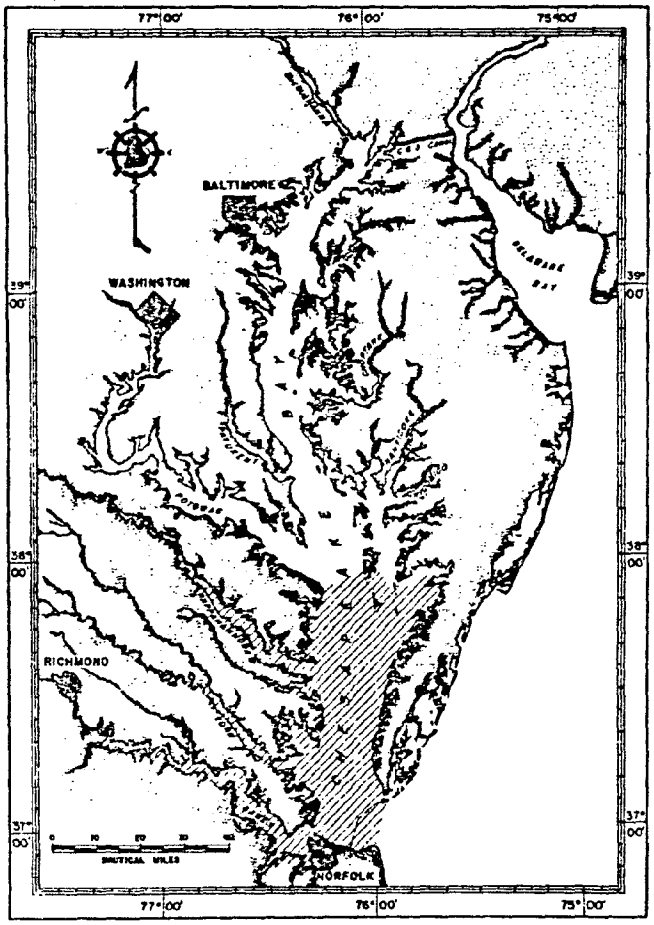
THE CITY OF FREDERICKSBURG

CHESAPEAKE BAY PROTECTION PROGRAM

COMPREHENSIVE PLAN ELEMENT



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PREPARED BY:
THE RAPPAHANNOCK AREA DEVELOPMENT COMISSION
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CITY OF FREDERICKSBURG
COMPREHENSIVE PLAN - BAY ELEMENT

I. INTRODUCTION

Plan Justification

The Chesapeake Bay has been a major focus and driving force in the development of Virginia. The Bay and its tributaries have over the years, provided a center for economic development for fisheries and/or shipping. As the Bay watershed developed, increased land disturbance to accommodate growth demands resulted in increases in sediment entering streams. These loadings are well beyond the natural loading rate. The sediments smother submerged aquatic vegetation, fish nursery areas and oyster beds. Increases in point source pollutants and stormwater runoff to the Bay system has degraded water quality to the point that the Bay can no longer support all the demands placed on it and remain "healthy".

The Commonwealth of Virginia adopted legislation developing a cooperative State/local program to improve the quality of the water that enters the Chesapeake Bay system. The Chesapeake Bay Preservation Act (The Act) and VR 173-02-01, "Chesapeake Bay Preservation Area Designation Management Regulation" (Regulation) approach to water quality improvement is through proper land use management. Section §10.1-2100 of the Act states that "A healthy State and local economy and a healthy Chesapeake Bay are integrally related, balanced economic development and water quality protection are not mutually exclusive". The protection of the public interest in the Chesapeake Bay, its tributaries and other State waters and the promotion of the general welfare of the people of the Commonwealth require that:

1. *the localities "of Tidewater Virginia incorporate general water quality protection measures into their comprehensive plans, zoning ordinances and subdivisions ordinances;" and*
2. *establish programs that "define and protect lands, hereinafter called Chesapeake Bay Preservation Areas, which if improperly developed may result in substantial damage to the water quality of the Chesapeake Bay and its tributaries" (Source - The Act-pg. 239)*

The regulations developed by the Chesapeake Bay Local Assistance Department, under the Chesapeake Bay Preservation Act, require local governments to develop local Chesapeake Bay protection programs. The purpose of the Chesapeake Bay preservation regulations..."is to protect and improve the water quality of the Chesapeake Bay, its tributaries and other State waters by minimizing the effects of human activity upon these waters and implementing the Act"(Source - Regulation pg. 1). The Chesapeake Bay Protection Regulation establishes criteria that localities within the defined Tidewater area shall use to identify and determine the location of the Chesapeake Bay Preservation Areas. These regulations also set forth the requirements and criteria that the local governments must incorporate into their comprehensive plans, zoning ordinances, and subdivision ordinances to protect the water quality of Virginia waters pursuant to §§10.1-2109 and 10.1-2111 of the Chesapeake Bay Preservation Act.

In accordance with Part II §2.1 of the Regulation, local governments must develop programs that working in conjunction with State water quality programs, encourage and promote: "(i) 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, which might reasonably be expected to inhabit them; (ii) safeguard the clean waters of the Commonwealth from pollution; (iii) prevention of any

increase in pollution, (iv) reduction of existing pollution, and (v) promotion of water resource conservation in order to provide for the health, safety and welfare of the present and future citizens of the Commonwealth". (Source - Regulation - pg.4)

As mandated by §2.2 of the State Bay Protection Regulation, local governments must adopt a program with the following elements:

1. *A delineation map of Chesapeake Bay Preservation Areas.*
2. *Comprehensive Plan or revisions to the existing plan which at a minimum incorporates the mandated Chesapeake Bay Protection Program.*
3. *Zoning, subdivision and erosion and sediment control ordinances that "incorporate measures to protect the quality of State waters in the Chesapeake Bay Preservation Areas" (Source Regulation - pg. 4) and meet the criteria set forth in Part IV of the State regulation.*

The Chesapeake Bay Preservation Areas are broken into two categories. These are Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). The Resource Protection Areas are considered to have "intrinsic water quality value due to the ecological and biological processes they perform or are sensitive to impacts which may cause significant degradation to the quality of State waters". (Source - Regulation - pg. 3) "In their natural condition, these lands provide for the removal, reduction, or assimilation of sediments, nutrients and potentially harmful or toxic substances in runoff entering the Bay and its tributaries, and minimize the adverse effects of human activities on State waters and aquatic resources" (Source - Regulation -pg. 5). In accordance with the Regulation these Protection Areas shall consist of those lands that are considered sensitive and are at or near the shoreline and possess intrinsic water quality value. As stated by the regulation, these areas shall be composed of the following land features:

"1. *Tidal wetlands;*
2. *Non-tidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary streams;*
3. *Tidal shores;*
4. *Other lands (authority given under part §3.2A of the State Bay Protection Regulations);*
5. *A buffer area not less than 100 feet in width located adjacent to and landward of the components one through four identified above, and along both sides of any tributary stream." (Source - Regulation pg. 5)*

In addition, every Resource Protection Area (RPA) must be accompanied by a Resource Management Area (RMA). These RMA lands if "improperly used or developed, have the potential for causing significant water quality degradation or may diminish the functional value of the Resource Protection Area" (Source - Regulation - pg.6). The RMA lands shall be designated contiguous to and landward of the designated RPA boundary. The RMAs must be of a size that provides significant water quality protection. When designating the Resource Management Area, the local government may consider for inclusion into these areas the following features:

"1. *Floodplains;*
2. *Highly erodible soils, including steep slopes;*
3. *Highly permeable soils;*
4. *Non-tidal wetlands not included in the Resource Protection Area;*
5. *Other lands under the provisions of subsection A of §3.3a of the regulation that are considered necessary to protect water quality" (Source - Regulation - pg. 6).*

A third area of designation which is an option for local governments is the designation of Intensely Developed Areas (IDAs). These are areas of concentrated development within the RPA. These areas must comply with the re-development criteria set forth in Part IV of the State's Bay Protection Regulation. Lands designated as IDAs may be exempt from the requirements for the establishment of a buffer area. However, "local government shall give consideration to implementing measures that would establish the buffer in these areas over time in order to maximize water quality protection, pollution removal and water resource conservation" (Source - Regulation - pg. 11).

Intensely Developed Areas may be designated in areas when at least one of the following conditions exist:

"1. Development has severely altered the natural state of the area [of the entire IDA] such that it has more than 50% impervious surfaces;
2. Public sewer and water is constructed and currently serves the area by the effective date. This condition does not include areas planned for public sewer and water;
3. Housing density is equal to or greater than four dwelling units per acres." (Source - Regulation - pg 6)

In accordance with the Chesapeake Bay Preservation Act, the information contained herein describes how the City's Chesapeake Bay Program was developed, justifies the designation of Chesapeake Bay Preservation Areas, and provides statements on the City's goals and policies regarding the implementation and management of the City's Chesapeake Bay Protection program.

Background

The City of Fredericksburg straddles the Fall Line where the Piedmont Plateau joins the Coastal Plain and the Rappahannock River changes from a non-tidal to a tidal river. The City, like many cities, grew as a port town and its location was strategic for the shipping and trading of products, crops, etc. The City of Fredericksburg continues its function as a growth center. Over the last decade the City has experienced a 24% population increase resulting in land use changes and urbanization of vacant City areas. This trend is expected to continue with planned mixed-use development within the newly annexed areas of the City.

The change of land use occurring State-wide, and to a large extent in the Chesapeake Bay watershed, is accompanied by increases in Nonpoint Source (NPS) pollution, point source discharges, stormwater runoff, and sediment loadings. These changes have negatively impacted the Bay and its tributaries. Impacts have been costly to the Commonwealth of Virginia, both in the loss or substantial reduction of economically important living resources; e.g. oysters and their habitats; and dollars spent on Bay Protection and Research. Millions of dollars have been spent to study how the Bay has been impacted, how to restore the Bay and how to implement the necessary studies and protection programs.

The Chesapeake Bay Act, adopted by the General Assembly in 1988, requires localities within "Tidewater Virginia" (as defined in the Bay Protection Act) to develop Chesapeake Bay protection programs that protect and improve water quality. The Bay program compliments many of the City's environmental management initiatives such as its stormwater management, wetland, erosion and sediment control and floodplain protection programs. The City recognizes the value of the Rappahannock River to the health of the Chesapeake Bay and to the City.

The City of Fredericksburg relies totally on the Rappahannock River for its drinking water. The River is also a focus of City recreational activities and aesthetic features. Therefore, it is the desire of the City of Fredericksburg to preserve the Rappahannock River and those natural features that protect the river; e.g forested buffers, wetlands, etc. Also, as part of the City's Bay protection program it is desirable to avoid impact on the Rappahannock River from improper use of various natural features; e.g. steep slopes, highly erodible soils, etc. Environmental protection and growth are not mutually exclusive and appropriate and necessary environmental protection can be successfully implemented as the City develops. Goals and objectives for the implementation of the City's Chesapeake Bay Protection Program are as follows:

Goals:

1. *To protect the natural environment (particularly the environment);*
2. *To promote water quality protection initiatives; and*
3. *To implement the State's Chesapeake Bay Protection mandates.*

Objectives: 1. *To require site plan identification of environmentally sensitive areas including Chesapeake Bay Protection Areas;*
2. *To avoid environmentally sensitive features to the maximum extent possible;*
3. *To minimize unavoidable environmental impacts; and*
4. *To promote responsible growth and development*

II. DESIGNATION OF CHESAPEAKE BAY PRESERVATION AREAS (CBPAs)

The City of Fredericksburg, in accordance with State regulation, has developed and implemented a Chesapeake Bay Protection Program. CBPAs are considered to have potentially significant influences on the water quality of area streams, the Rappahannock River and the Chesapeake Bay. The CBPAs must be classified as either Resource Protection Areas (RPAs) or Resource Management Areas (RMAs), each of which must be identified and mapped based on natural features.

Identification of CBPAs

The Chesapeake Bay Preservation Areas were identified and mapped using both table-top and field identification techniques. The first step was to examine the City's environmental characteristics based on existing map resources and City studies.

The City of Fredericksburg is approximately 10.5 square miles in area. The area annexed by the City in 1984, herein known as the new City area, can be characterized as having flat ridges with moderate to steep slopes. The coastal plain, the area east of I-95, is generally flat to gently rolling with low to moderate slopes and relatively broad flat areas. The elevation of the City is between 280 feet above sea level to less than 10 feet above sea level along the tidal portion of the Rappahannock River. The City is drained by a number of streams and the VEPCO Canal. Only one of the streams, Hazel Run, is classified as perennial thus falling into the Bay's classification as a tributary stream. These streams along with Smith Run and the VEPCO Canal are the primary water channels that carry

excess stormwater and runoff to the Rappahannock River.

The Chesapeake Bay Protection Regulation requires the use of tributary streams (i.e. perennial streams) in identifying the Chesapeake Bay Preservation Areas. Therefore, a strategy of dividing the City into significant watersheds was used to identify and map the City's Chesapeake Bay Protection areas. The City's Comprehensive Stormwater Management Facilities Plan (1989) identifies six major drainage basins. Theses sub-basins and the total area of the City making up these basins are as follows: Hazel Run (49%) (this includes Smith Run), Kenmore Flume (11%), Fall Quarry Run (7%), VEPCO Canal (8%), Deep Run (9%) and the Rappahannock River (16%).

Using the City stormwater management plan, 7.5 minute U.S.G.S. topographic maps and national wetlands inventory maps, a preliminary identification of RPA areas was conducted. These areas were "ground truthed" and verified. From existing maps and field data, RPA overlay maps were created for the City base map at a scale of 1":1000'. (See composite map in Appendix __ _).

The CBPAs as depicted in the composite map are comprised of RPA lands and RMA lands each of which can be further divided into specific environmentally significant lands. The Chesapeake Bay Protection Act is a water quality act that attempts to protect Tidewater Virginia waters through land use management. The Act and Virginia Chesapeake Bay Protection

Regulation recognize the importance of various land feature in water quality protection and the potential impact if disturbed or improperly developed.

Resource Protection Areas

Under the Chesapeake Bay Protection Regulation, Tidewater communities must, at a minimum, identify and locate all perennial streams as depicted on the most recent U.S.G.S. 7.5 minute topographic quadrangle map (solid blue line). These streams, known as tributary streams, are to serve as the base line from which the Resource Protection Areas are to be identified. Using the Fredericksburg Quadrangle (1984) and Salem Church Quadrangle (1978), the City has designated the Rappahannock River and Hazel Run as tributary streams. These tributaries are regulated by the State Water Control Board. Under the Chesapeake Bay Act, lands adjacent to these tributary streams are regulated by the Chesapeake Bay Local Assistance Department. These lands may significantly influence the water quality if disturbed.

Tributary streams are considered to be the most significant potential transporters of sediments, nutrients and pollutants to the Chesapeake Bay. Therefore, land use management along these designated tributary streams will occur in a manner that will reduce the levels of sediments, stormwater runoff, and nutrients entering the tributary streams. This may be accomplished through appropriate control measures such as BMPs, setbacks, erosion and sediment control practices, and avoidance; e.g., do not remove the naturally forested buffer area. (see Appendix)

The Resource Protection Areas must be defined from the shoreline of the Tributary Streams and must include:

1. *Tidal shoreline*
2. *Tidal wetlands*

3. *Non-tidal wetlands (connected by surface hydrology to tributary streams or tidal wetlands)*
4. *100 foot buffer (this buffer surrounds the landward edge of the RPA as defined by items 1-4).*

1. Tidal Shoreline Overlay

The tidal shoreline has been defined in accordance with §3.2 (b)(3) of the Chesapeake Bay Protection Regulation as the area between mean low water mark and 1.5 times mean high water. The City's designated tidal shoreline consists of tidal shorelines as identified on the National Oceanic and Atmospheric Administration (NOAA), Nautical Chart 12237. The NOAA maps only identify tidal shore along the Rappahannock River from the mouth to a point just above Scott's Island. The tidal river and the tidal shoreline extend to the Fall Line, the area where Route 1 crosses the Rappahannock River. The tidal shore line between Scotts Island and the Fall Line has been identified and mapped using the National Wetlands Inventory Map (Fredericksburg Quadrangle 1977) which identifies water with tidal influence, therefore, from these maps tidal shorelines may be identified and the 7.5 minute U.S.G.S. Topographic Quadrangle (1984).

One of the City's management goals is to avoid disturbance of tidal shorelines. Activities on tidal shorelines that may be approved by the City include water dependent activities, as permitted by the State regulations, and shoreline stabilization activities. (see Appendix)

2. Tidal Wetlands Overlay

Wetlands are known to function in many ways. They may provide habitat for plants and animals; control stormwater runoff; provide a point of nutrient and detrital (decayed plant matter) exchange that supports the food chain and protect water quality. Wetlands affect water quality in many ways, one of which is to remove sediments and nutrients.

As required by Section 3.2(b)(1) of the State's Bay Protection Regulation, the City has identified and mapped vegetated and non-vegetated wetlands at a Scale of 1" = 1000'. For the purposes of this program, and in accordance with section 62.1-13.2 of the Code of Virginia, as amended, vegetated tidal wetlands are "all that land lying between and contiguous to mean low water and an elevation above mean low water equal to the factor 1.5 times the mean tide range". The definition for tidal wetlands, noted in the same section of the code, provides an exhaustive list of vegetation that would qualify the tidal wetland as vegetated if any of the plants were established prior to July 1,1972. Using the Virginia Institute of Marine Sciences (VIMS) Spotsylvania and Caroline County Inventory (1979 and the NWI maps - Fredericksburg Quadrangle (1977) tidal wetlands were mapped. (See Appendix "A" for description of wetlands.)

These wetlands are considered to have high values in productivity; water fowl and wildlife use; e.g. fish spawning, nursery areas, etc. In addition, these wetlands are considered to have high values as erosion inhibitors and are valued as important components of natural shoreline stabilization. The VIMS Special Report No. 167 recommends that these types of wetlands should be preserved. All land development or wetland altering activities will be prohibited unless they are water dependent and within the planning design of the City.

Any activity will require appropriate permits. The preferred use alternative would be the avoidance of these wetlands, and if this is not possible then steps should be taken to minimize all potential impacts.

3. **RPA Non-Tidal Wetlands Overlay**

In addition to tidal wetlands, Section 3.2(B)(2) of the Chesapeake Bay Preservation Area Regulation requires that non-tidal wetlands connected by surface flow and contiguous to tidal wetlands and/or tributary streams must be designated and mapped as RPAs. The operational definition of the non-tidal wetlands is that promulgated In the Federal Clean Water Act 33 CFR 328.3(b) 1986. These wetlands are defined as:

> *"Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."*

The National Wetland Inventory maps of the Fredericksburg Quadrangle (1984), the Salem Church Quadrangle and site visits were used to identify the wetlands to be included as part of this RPA land. Other information used to support those non-tidal wetlands identified as RPA features includes the hydric soils maps prepared by the Information Support Systems Laboratory at Virginia Polytechnic Institute and State University (VPI) for CBLAD and the Virginia Department of Conservation and Recreation (VDCR). (See Appendix "A" for description.)

If development occurs near these lands, all steps must be taken to avoid wetlands and implement appropriate protection features; e.g., silt fencing, etc. If these wetlands cannot be avoided in regard to exempted activities (See Sections 4.2 (10) and 4.5 of VR 173-02-01 Chesapeake Bay Preservation Area Designation and Management Regulation) and water-dependent activities, appropriate permits must be obtained prior to disturbance. In addition, appropriate wetlands restoration and/or mitigation measures should be implemented as feasible.

4. **RPA Buffer**

As required by the State's Bay Protection Regulation the RPA must have a 100 foot buffer around its perimeter and is designed to protect the sensitive RPA lands. The 100-foot "Buffer" will be part of the RPA land.

Resource Management Areas

The Resource Management Areas (RMAs) are those lands that "if improperly used or developed, have a potential for causing significant water quality degradation or for diminishing the functional value of the Resource Protection Area" (Source - Regulation - pg.6). Within the RMAs, development is not prohibited. On the contrary, development may proceed, however, there are requirements for more responsible or cautious development practices within these areas. Examples of the more cautious development as it

pertains to RMA designation are as follows, a site development plan and erosion and sediment control plan must be developed and implemented for a land disturbance of 2,500 square feet or more. In addition, post development runoff should not increase. Requirement for development in the RMA lands may be found in Part IV of the Regulation and in the City's Chesapeake Bay Overlay Zoning Ordinance.

The lands that have been targeted for inclusion in the RMA are those that are sensitive to any disturbances especially removal of natural vegetation. These Preservation Areas include the following:

1. *Floodplains;*
2. *Highly permeable soils;*
3. *Highly erodible soils, including steep slopes;*
4. *Non-tidal wetlands not included in the Resource Protection Area.*
5. *Other Lands*

1. Floodplains

The City has adopted a Floodplain Overlay District. This district has been created to protect the portions of the City that are subject to periodic inundation due to floods. The purpose of the City's Floodplain Overlay District is to maintain community safety from floods; to protect against loss of life, health and property; to preserve and protect floodplains; and to require appropriate construction practices to minimize flood damage. Development in the floodway is typically prohibited since it could increase flood heights and potentially restrict the flood water's passage through the Rappahannock River. To reduce or eliminate human safety hazards and potentially adverse environmental impacts, the City prohibits any development within portions of the 100 year floodplain without the issuing a special use permit by the City Council.

2. Highly Permeable Soils

Soils transmit water both vertically and horizontally. Water in the soils eventually enters the ground water and/or the surface water. Highly permeable soils also do not allow for proper natural treatment of water before it enters the ground water and/or surface water. In accordance with the Chesapeake Bay Protection Regulation highly permeable soil are considered to have a "permeability equal to or greater than six inches of water movement per hour in any part of the soil profile to a depth of 72 inches" (Source - Regulation - pg. 2).

Within the "new City areas" much of the highly permeable soils lie near the Rappahannock River. In all the "highly permeable areas", mapped and not mapped (in the old City area), the development of infiltration BMPs and septic facilities should be avoided. Soils analysis should be performed to determine permeability and soil suitability for the desired use. In addition, pesticide and herbicide application or any chemical application in areas of high permeability could potentially contaminate the ground water or surface water and should be avoided.

3. Highly Erodible Soils and Steep Slopes

For the purpose of this plan and in conformance with the Regulation: VR 173-02-01 Chesapeake Bay Preservation Area Designation and Management Regulations "highly erodible soils are defined as soils

with an erodibility index (EI) (See Appendix "B") from sheet or rill erosion equal to or greater than eight". These soil types that are adjacent and/or contiguous to an existing RPA should be included in the RMA designation.

In the areas where a soil survey does not exist, a soils analysis would be desirable. Development is not prohibited in areas that meet the RMA criteria. Rather, the RMA designation will require that appropriate erosion and stormwater management controls be implemented and a site plan be submitted to the City if 2500 square feet or greater of land disturbance is proposed.

Slopes can greatly influence the magnitude of erosion and soil loss. For the purpose of the City's comprehensive planning and environmental protection goals, steep slopes in the CBPAs are considered to be greater than 15%. The 1981 Comprehensive Plan Update states that in areas with less than 5% slope there is little to no development problem. However, the 1981 Plan Update states that development on slopes between 5% and 15% becomes difficult and slopes over 15% are exceedingly difficult and may be generally not developable. Such steep and moderate slopes are located throughout the new City area. Due to the impacts associated with the disturbance of steep slopes, the City does not encourage development on slopes over 20%.

4. **RMA Non-tidal Wetlands**

The Chesapeake Bay Local Assistance Department Information Bulletin 6 (Appendix "B") and the Chesapeake Bay Regulation requires that wetlands as defined in the Federal Manual and located on and contiguous to perennial streams be identified as Resource Protection Areas. It is believed that these features are environmentally sensitive and crucial to water quality protection. The streams that are located on intermittent streams or are isolated may also serve a significant role in water quality protection.

Whether or not a wetland is contiguous to a perennial stream, intermittent stream or isolated, non-tidal wetlands often play a role in water quality protection; i.e. sediment and nutrient removal; critical habitats, ground water recharge and stormwater runoff peak shavings. The City is concerned with the cumulative impacts associated with the loss of the City's and State's non-tidal wetland features. To maximize the amount of the developable land the City has identified wetlands on intermittent streams or isolated wetlands as RMA features. These wetlands will be protected through the implementation of stricter erosion and sediment control and stormwater management requirements associated with the Chesapeake Bay Protection Regulation. In addition, the City discourages the use of land area that could be classified as a jurisdictional wetland under the Federal Manual (those wetlands that the U.S. Army Corps of Engineers regulate). Prior to any land disturbing activities in these wetland areas appropriate permits must be obtained from the U.S. Army Corps of Engineers and presented to the City. The City encourages that caution be taken and potential development be altered to avoid soils that have any aquatic regime (see Appendix "B").

5. **Other Lands RMA**

Although the City has designated Smith Run as an RMA area, this stream possesses the characteristics which may warrant its designation as a RPA. Using the Fredericksburg (1984) and Salem

Church (1978) U.S. Geological Survey 7.5 minute topographical maps, and site visits, the stream was determined to serve as a major conduit for water drainage and is potentially a significant transporter of pollutants from the City to Hazel Run. Smith Run and its unnamed tributary are approximately 2.5 miles long and drain a watershed of approximately 1090 acres. Although Smith Run and its tributary are only intermittent streams, they are responsible for draining approximately 1/6 of the City's total land area.

The lands which drain to Smith Run can be characterized typically as intensely developed, but its eastern and western boundaries are relatively undisturbed. In the City's 1989 Comprehensive Stormwater Management Facilities Plan, Smith Run is characterized as having high runoff due to relatively steep slopes (20%) and relatively impermeable soils. Through hydrological modeling projections indicate that peak flows could increase by 40 to 60 percent as a result of future development. Field investigations have confirmed that high stormwater runoff activities exist and is evident from sites with aggressive stream bank erosion.

The City considers Smith Run as a significant stream worthy of protection since it discharges to Hazel Run. The RADCO report "Rappahannock River Urban Nonpoint Source Pollution An Analysis of Potential Impact on Water Quality" (1986) has identified Hazel Run as one of the top three contributors of sediment and nonpoint source pollution to the Rappahannock River within the RADCO area. Also, the Fredericksburg Comprehensive Stormwater Management Facilities Plan (1989), identifies that Smith Run contributes 1/3 of Hazel Run's peak flow during a single storm event giving credence to the need to protect Smith Run and its tributary.

Based on the City's desire to protect Hazel Run and to manage stormwater runoff and flows to Hazel Run, the City of Fredericksburg has identified Smith Run as an RMA stream and a 250-foot area on either side of the stream has been designated an RMA. This provides for a total of 500 feet of RMA area around Smith Run. Within the RMA features of the Smith Run watershed, as with all RMA lands, land development activities may occur but development must incorporate BMP's and other appropriate water quality protection measures when projects are equal to or greater than 2500 square feet of land disturbance. In addition, the criteria established by the State Bay Protection Regulation must be met.

It is the City's intention, through the designation of Smith Run as a RMA, to reduce the amount of sediments and nutrients entering Hazel Run and the Rappahannock River. This designation is also designed to reduce erosive activities within the stream channel; to set land disturbing activities away from the stream, and to encourage the reduction of NPS pollutants in a non-structural manner. In addition to water quality protection and stormwater management, this type of management of Smith Run will hopefully provide a fairly continuous natural stream corridor through the City to the Rappahannock River.

As with the RPA classification, the City has the flexibility to include "other lands" into the RMA classification. The classification does not preclude development; rather, additional requirements for erosion and sediment control practices must be implemented with land disturbances of 2500 square feet or greater.

The Rappahannock River is the sole drinking supply for the City and is a focus of the local and regional residents' recreational

activities. The City is concerned about the sedimentation of the River and the environmental implications. (Sedimentation destroys oyster grounds, submerged aquatic vegetation vital to river fauna and water quality, breeding grounds, and impacts water quality due to contaminants attached to sediments.) The City is also concerned over the potential affect of River sedimentation on flood heights. For added precaution the City has designated a 250 foot RMA feature along each intermittent stream except Smith Run which is designated as an intermittent stream and given RMA status within the City. Development must occur in a responsible manner that maximizes the reduction of sediments and reduces erosion potential and stormwater runoff in the designated Chesapeake Bay Protection Areas.

Intensely Developed Areas (IDAs)

Under the State's Chesapeake Bay Protection Regulation, the City may designate Intensely Developed Areas as an overlay to the Chesapeake Bay Preservation Areas. This designation recognize that currently developed areas and infill sites with little natural environment exist within Chesapeake Bay Preservation Areas. Development within the infill sites and redevelopment in the RPA areas is more desirable than creating new development centers within the RPAs. The IDA provisions of the Regulation also recognizes that existing development in RPAs may eventually undergo redevelopment and the Regulation must be flexible to allow this to occur.

IDAs are applicable only in the Resource Protection Areas. The IDA overlay designates areas in the City that have concentrated development and industrial development in or near RPAs at the time of the City's program adoption date. The areas designated as IDAs shall comply with the performance criteria for redevelopment as identified in the City's Bay Protection ordinances and State Chesapeake Bay Regulation and may be exempted from the buffer requirements.

To designate an area as an IDA the City requires that one of the following conditions exist:

"A. Development has severely altered the natural state of the area such that it has more than 50% impervious surface;
B. Public sewer and water is constructed and currently serves the area by the effective date;
C. Housing density is equal to or greater than four dwelling units per acre." (Source-regulation - pg.6)

The City has designated two areas as IDAs. The first area is primarily the historic area and its boundaries are the Rappahannock River from Falls Run to the southeastern boundary of the City; Charles Street; the VEPCO canal, and Woodford Street. The second IDA is in and around industrial park areas, defined generally by Tyler Street, Summit Street and Lafayette Boulevard.

The IDA designations will permit development of these areas to continue. The City encourages that as much natural open area be incorporated into site plans and to the extent possible, impervious surfaces be minimized. When these areas are re-developed, the City encourages that a 100 foot RPA buffer to be established or, if

existing to some degree, to be expanded to the 100 foot distance where possible. Also, stormwater runoff must be reduced by 10% if no other treatment was previously used on site. In addition, the City encourages the use and implementation of landscaping to reduce the amount of impervious area.

III. LOCAL PLANNING CONSIDERATIONS

Non-Conforming Land Use

As a result of the development and implementation of the State's and City's Chesapeake Bay Protection program there are non-conforming uses within the City's Resource Protection Areas. Although these uses are in conformance with the underlying City zoning they may not in conformance with the requirements set forth in the City's Bay Protection Ordinances. The City encourages the continued use of these sites and implementation of environmental protection strategies when possible.

In terms of undeveloped parcels with vesting, the City will require the implementation of the 100 foot RPA buffer where possible and encourages that the land use design be such that it minimizes any environmental impacts; e.g., runoff, etc.

Infrastructure

"Water and Sewer"

Within the City nearly all residents and businesses are serviced by the City owned public water and wastewater utilities. Several homes along Fall Hill Avenue have septic and well and were annexed by the City in 1984. However, it is the City's general policy not to permit private water well and septic development.

As the City continues to grow and develop, water and sewer lines will be extended to the new growth areas. In the case of water and sewer line development, the potential for future RPA and RMA crossings exist. There are also existing RMA and RPA crossings in the older city area especially in the Hazel Run and Smith Run watersheds.

In the case of establishing new utility lines, the City will seek to minimize RPA crossings. Where these crossings cannot be avoided as little area as necessary will be disturbed. Appropriate erosion and sediment control practices will be implemented as required by VR 625-02-00 Erosion and Sediment Control Regulations, Sept 13, 1990.

For a comprehensive and detailed description of the City's water and sewer facilities refer to the following reports:

1. *"Comprehensive Water Facilities Plan - February 1989"*
2. *"Comprehensive Sewerage Facilities Plan - February 1989"*
3. *"Wastewater Treatment Plan - Upgrade and Expansion Preliminary Engineering Report - September 1989"*

Stormwater

Stormwater runoff is the primary mechanism for the transport of NPS pollution into the receiving waters. This water may carry petroleum products, various chemicals, biological oxygen demanding (BOD) substances, nutrients and sediments. These NPS pollutants (e.g., toxics, sediment, etc.) can impact the water quality making the water inhospitable to living organisms, destroy habitat areas and impact submerged aquatic vegetation. Also, the increase in stormwater runoff and subsequent increases in stream

flow can aggravate stream bank and/or channel erosion.

Although stormwater runoff is a natural process and a mechanism to renew nutrients and encourage detrital (organic material that serves as a food source) exchange to water bodies, the impacts are compounded when land use is altered from a natural state to agricultural, urban, etc. Nutrient levels and sediment concentration, for example, can be increased to concentrations above the natural loading to a point that receiving water cannot assimilate the additional pollutants. These loadings become harmful.

There are two basic approaches to stormwater runoff management. The first approach is to manage just for quantity. This approach does not consider water quality; rather, it just maintains natural runoff levels.

This management method does two things. First, it reduces peak flows and down stream hazards such as flooding. Second it reduces stream velocities preventing stream bank erosion. Stormwater management programs primarily controlling quantity have been implemented throughout the Chesapeake Bay watershed but water quality in the Bay has continued to decline.

The second approach is to manage for quality; i.e., phosphorous and sediment removal. A State water quality management target is a 40% reduction of phosphorous loadings to the Chesapeake Bay watershed. This may be achieved through the implementation of on-site and/or regional stormwater management programs that address quantity and quality reductions.

The City's Bay Protection program makes provisions to ensure that existing runoff from undisturbed areas maintains existing or better water quality characteristics. In areas of existing development, stormwater quality should be improved when the area is redeveloped. Not only will this program protect the City's water supply, this program will protect historical and recreational resources associated with the Rappahannock River.

General City guidance for stormwater management within the Chesapeake Bay Program areas is as follows:

1. *The stormwater plan for a proposed project*
   a. *Post development runoff must be less than or equal to pre development runoff.*
   b. *Local on-site private facilities may not be located in the first 50 feet of the RPA buffer and should be located outside of the total RPA buffer (in the RMA) if possible.*
   c. *If the on-site private facility is located in the land-ward 50 feet of the buffer the facilities performance standard should meet the level of treatment that would be provided by the impacted buffer plus the treatment necessary for the project.*

2. *Channel adequacy of stormwater discharge should be addressed and properly described.*

3. *A proper maintenance program should be developed and maintenance provided for the life of the stormwater facility.*

4. *In the case of a regional publicly owned stormwater management facility, the City will minimize the intrusion onto RPA land where possible. However, if the water quality goals can be better served and the facility can be shown to be water dependent then the City may place regional stormwater management structures onto RPA lands.*

5. *Minimize impervious surfaces.*

6. *Encourage that only the land area necessary for the proposed project be disturbed and as much of the natural area as possible be incorporated into the project landscape.*

"Roads"

The potential for soil loss, aggravated erosion and stormwater runoff increases with and during the development of roads. In addition, the water quality of road runoff may show higher concentrations of petroleum products, sulfur and nitrogen oxides, heavy metals, etc. These waters can enter local streams and degrade the stream's water quality. To minimize the impacts of road development and maintain road standards only roads meeting VDOT standards may cross the RPAs.

"Parks and Recreation"

The City of Fredericksburg looks to many of the City's natural areas and the Rappahannock River for recreation. The City recognizes the needs of local residents and encourages the development of adequate recreational facilities. Passive recreation facilities may be located in the RPAs and active recreation facilities may only be developed in the RMAs or in non-Chesapeake Bay Preservation Areas.

The City has actively protected its historical and environmental features and has taken steps to make these resources available and accessible to city residents and visitors. The City Office of Planning and Community Development has developed the "Civil War Sites Trail Plan". This plan makes many of the resources available to residents and minimizes potential environmental impacts. The proposed trails plan runs along or across many of the City's Civil War sites and RPA features. The City continues to encourage the implementation of this plan. Use of these areas for a network of bike and foot trails will allow reasonable public use with little environmental impacts. These trails will serve as a network of buffers along many of the RPAs without creating adverse public reaction due to the loss of the use of the land (see map)(insert trails map here). In addition, the establishment of a trails network will reduce the potential for environmental impact results from people walking through wooded areas forging their own trails. Such off trail activity can promote aggravated erosion, plant loss, animal loss, etc.

The lack of adequate access to the Rappahannock River could create adverse environmental consequences. There is potential for improper boat access points to be created through constant use of a site. If these sites are not properly developed, stream bank erosion could result and/or be aggravated. The City encourages the development of adequate river access facilities. The City has a public dock area known as "City Dock Park". Present on this site are two launching ramps, tie-up facilities and parking areas. This facility is owned by the Virginia Department of Game and Inland Fisheries and is located in a designated City RPA. There are few other areas in the City along the Rappahannock River that could be considered suitable for River access; however, expansion of the existing facility may be more desirable than the development of new facilities.

Within the City boundaries is the Rappahannock River Outdoors facility which is privately owned and operated. This facility, located along Fall Hill Avenue, provides river access to canoe and kayak users. Above the City in Spotsylvania County along River Road the Virginia Department of Game and Inland Fisheries has developed an input and outtake ramp and parking facility. The City is also a member of the Fredericksburg-Stafford Park Authority and therefore has access to the Rappahannock Beach

on River Road in Stafford. This facility has parking and provides river access for beach users and swimmers. The City does not foresee the need to develop additional points of river access in the near future.

For more information on City Parks and Recreation planning refer to:

1. *"Fredericksburg Visions: Bridging Past and Future" February 1991.*
2. *"Civil War Sites Trail Plans" July 24, 1991.*

IV. LAND USE

The City of Fredericksburg has been divided into seven planning areas. These areas have been identified based on location, topography, environmental consideration, similar character, definable and natural boundaries and future land use. The seven planning areas are discussed below and recommendations made for future land use in relation to the Bay Protection Act.

The 1987 Comprehensive Plan has addressed and described the preferred guidance for the development of this area. Unless otherwise stated in the Chesapeake Bay Comprehensive Plan element, the general guidance, policies and recommendations of the 1987 Plan update still apply.

1. Planning Area I

Planning Area I is located in the new area of the City west of I-95 and along the Rappahannock River, River Road and Fall Hill Avenue. A majority of this area is vacant and is made up of Chesapeake Bay Preservation areas; i.e. RPA and RMA. This planning area is characterized by highly erodible soils, moderate to steep slopes, highly permeable soils, the river floodplain and some wetland areas. In addition, this planning area drains to the Rappahannock River above the public water supply intake, where added pollution could have detrimental effect on the City's water supply.

Most of the area is vacant and open farm land or forested land. There is little infrastructure present to support growth at this time. The City, by its own nature, is a regional center for growth and development and this area presents a desirable landscape and river view for residents of the City. However, due to the terrain of this area development potential may be limited. In areas of steep slopes development should be limited to flat ridge tops. Slopes 20% and over should be avoided. Caution should be used on moderate slopes 10%-20% (develop map-red for over 20%, yellow for eroded areas).

It is the City's intent to protect the almost pristine nature of the areas next to the River and along the stream valleys of this area. If this portion of Area I is to be developed, it should be used for passive recreation or for a network of hiking and biking trails along the River. This system would implement the City's trails plan.

Due to the proximity to the River, steep slopes, active erosion, environmentally sensitive soils and the scenic rivers designation of the Rappahannock River the lands closest to the River and RPAs should have the following general land use residential density:

I.A,B,C. - single family residential, 1 unit/acre
Limits - soils, close proximity to River and RPA. No water and sewer is available.

I.D.a - single family residential, 1 unit/acre
Limits - slopes

I.D.b - suburban, 4 units/acre
Limits - slopes

I.E. - single family residential, 1 unit/acre
Limits - slopes

I.F.a - single family residential, 1 unit/acre
Limits - slopes, proximity to river

I.F.b - subdivision, 4 units/acre
Limits - intermittent stream network

I.F.c - attached, 4 -8 units/acres
Limits - intermittent stream network

Section I.G of the plan is surrounded by steep slopes and as identified in the 1987 land use plan the provisions of roads and water and sewer will be costly and difficult. Also, this area is surrounded by land that has been designated to remain in its natural state. To have access to area I.G. the surrounding lands would have to be disturbed. To protect the River and the designated natural area, section I.G. should be left to remain in its natural state, with the possible exception of large lot single family detached residential homes on greater than one-acre lots.

I.G. - Place in natural area category/large lot single family dwelling residential
Limits - slopes, road construction and sewer implementation difficult (1987 City Plan Up-date)

Sensitive Environmental Features

1. Butzner Flats - wetland and soils with aquatic regime (RPA & RMA)
2. Intermittent stream - Falls Quarry Run (RMA)
3. Steep slopes (RMA)
4. Highly permeable soils (RMA)
5. Hydric soils or those with aquatic characteristics (5, 23, 1B, 14C, 24 as classified in the SCS Soil Survey - 1985) (RMA)
6. Floodplain (RMA)

2. Planning Area II

The boundaries of Planning Area II are I-95 and Fall Hill Avenue proceeding west on Route 3 from the interchange to Greengate Avenue. The western boundaries are Greengate Avenue to Short Street and Fall Hill Avenue to I-95. This area contains the Sheraton Hotel and Conference Center, an eighteen-hole golf course and related hotel amenities. There is one section of older single family housing units along Fall Hill Avenue. Infrastructure in this area is limited, but the location of the I-95 interchange with this planning area creates a strong potential for intensive development. Interstate 95 and State Route 3 aid in defining the character of this planning area. Traffic noise and exhaust make this area less desirable for any residential development. RPA and RMA lands are associated with the head waters of Smith Run and Hazel Run (north) which are present in this planning area and is minimal in area. These two
tributaries are major drainage streams for the City and function as water collectors ultimately carrying runoff to the Rappahannock River.

These tributaries run through existing subdivisions; e.g., Westwood and Altoona. As Planning Area II develops, appropriate stormwater treatment, i.e. treatment for quantity and quality, should be provided. A majority of the soils in this planning area may provide limitations for construction due to wetness. Also many of the soils are weak and not suitable for road construction. If roads are to be developed proper road bases must be brought to the site.

Much of this planning area is maintained as an eighteen hole golf course, but some vacant developable land areas exist as well. **Based on the existing surrounding character and relatively flat terrain, the City is focusing more intensive employment land use in this area. Caution should be taken in regard to seasonal high water tables, wet soils, soils of low permeability and soils that are weak and not generally suited for road development. The RPA lands should be avoided in their entirety and the City encourages that any RMA areas be used as open space when possible.**

Sensitive Environmental Features:
1. Smith Run (RMA)
2. Hazel Run (north) (RPA with RMA)

3. Planning Area III

Planning Area III lies east of I-95 and extends nearly to the U.S. Route 1 Bypass. The old abandoned VCR railroad bed forms the southern boundary of Planning Area III. Moving north the planning area follows parallel to Route 1, then follows north Hazel Run and back to I-95. This land is currently forested and vacant, except for the historic "Idlewild" residence. No urban development has occurred here and little infrastructure is present. This is in part due to the area's inaccessibility. North Hazel and Hazel Run and associated tributaries traverse this planning area. Each of the tributaries are in deep drainage channels with steep slopes.

A majority of the soils present limitations for building development and road development due to high seasonal groundwater, perched water tables, wet soils, weak soils, and/or steep slopes. Due to soil limitations, detailed soil studies should be provided as part of any site plan review submission requirement.

Although, CBPAs make up a relatively small proportion of this planning area, areas outside of the CBPAs should implement appropriate erosion and sediment control and stormwater control facilities to protect the environmental quality of Hazel Run and to prevent aggravation of down stream flooding.

Sensitive Environmental Features:

1. Hazel Run and tributaries (RPA with RMA)
2. North Hazel Run (RPA with RMA)

4. Planning Area IV

Planning Area IV's boundaries are North Hazel Run, the east side of I-95 and William Street. This area is primarily developed. It is characterized by a mixture of land uses; i.e., Westwood and Greenbriar Shopping Centers, office buildings, apartments, strip commercial and single family residential. Much of the commercial space fronts on State Route 3. Sewer and water currently serves this area.

There are minimal RMA lands present and they are associated with the Smith Run stream valley which traverses the area. The tributary is surrounded by steep ridges and little to no development is present along the tributaries. Any land development opportunities in this planning area will entail infill development with the exception of a large 78-acre vacant parcel adjacent to I-95.

The Smith Run watershed, serving as a major drainage system for the City, is environmentally sensitive and appropriate erosion and sediment control should be implemented during development. Also, appropriate stormwater management, either in association with new development or re-development should be implemented to reduce the potential of flooding of the Smith Run basin and reduce stream bank erosion. In the RPA areas only water dependent activities may occur. To serve future growth and development, existing sewer and water lines will need to be extended along Smith Run.

In this planning area all slopes over 20% and areas identified as 20% slope with erosion should be avoided. Soils analyses should be done to determine if the soils are suitable for the proposed development.

Sensitive Environmental Features:
1. Smith Run and stream valley (RMA)

5. Planning Area V

Planning Area V is bound by I-95 and Falls Quarry Run to the east; Fall Hill Avenue to the south and the Rappahannock River to the north. As depicted by the CBPA maps, this area is comprised of highly erodible and permeable soils. As indicated in the 1985 soil survey this area has been mined. An abandoned quarry is located near the River within this planning area.

A majority of the existing land uses include townhouses and apartments making up the urban uses. These urban uses are found along Fall Hill Avenue. Land adjacent to these uses is vacant and forested, extending down to the river.

Much of this property drains to the Rappahannock River above the public water intake. Since this area currently has only a limited amount of development, its designation as a Chesapeake Bay Preservation Area will aid the City in developing stormwater and NPS quality controls that protect the River. Some of the Chesapeake Bay

Program looks to natural controls; i.e. leaving forested buffer areas around CBPA features. Due to soil limitations and close proximity to the River and RPA land areas planning subarea V.C. and VB should have the following land use.

V.B.a.	1 unit/acre
V.B.b.	2 units/acre
V.C.a.	1-2 units/acre
V.C.b.	2-4 units/acre

RPA lands, unless rights have been vested, may no longer be developed unless the proposed use is water dependent. Soils and environmental features should be identified and detailed on site plans.

Environmental features of concern:

1. Rappahannock River (RPA with adjacent RMA)
2. Falls Quarry Run (RMA)
3. unnamed tributary (RMA)
4. VEPCO Canal (RMA)
5. highly permeable soils (RMA)
6. highly erodible soils (RMA)
7. Floodplain (RMA)

6. Planning Area VI

This area is made up of the old City area to the east of I-95, along the Cowan Boulevard corridor. Planning Area VI's boundaries are Smith Run, Fall Hill Avenue (east of I-95) to the VEPCO canal, and Jefferson Davis Highway. A significant portion of this area has been developed as a high density residential and commercial retail area. Water and sewer lines are in place and are being upgraded. This upgrade will support the construction of major health care facilities (Mary Washington Replacement Hospital), as well as planned medium density residential and neighborhood/office support businesses. These development are to be located generally at the end of Cowan Boulevard and on the old Snowden Farm tract. A soil survey is not available for this area and the City encourages that a proper soils analysis be completed and submitted as part of the site plan application process for new development within this planning area.

The controlling environmental features are Smith Run (RMA), Canal Tributary (RMA feature) and the VEPCO Canal (RMA). **As this area grows and develops, appropriate environmental protection measures, notably BMP's, must be implemented. Erosion and sediment control should be implemented to reduce soil loss during construction and stormwater management controls should be incorporated into the development to protect the water quality of intermittent and tributary streams, including Smith Run. Stormwater management should include measures to protect water quality, prevent flooding and maintain stream channel stability.**

Sensitive Environment Features:
1. Canal Tributary (RMA)
2. VEPCO canal (RMA)
3. Smith Run (RMA)

7. Planning Area VII

This area encompasses all City lands east of U.S. Route 1. This City area is in part the historic district and the City's major residential and industrial areas. The majority of this area is managed by storm sewer and served by public water and wastewater. The City of Fredericksburg sees only a minimal potential for major new development within these "older" and established communities. Some infill development, redevelopment and rehabilitation of existing structures will continue to occur in these areas. Development activities within the historic district must follow the City's Historic District guidelines.

Development will occur mainly in infill areas. Development in the infill areas must be compatible with existing development and zoning. Proper stormwater control options should be implemented.

This part of the City does not have the benefit of a soil survey. Therefore, prior to development a soils analysis may be required and soil suitability determined.

Although in some cases existing development is very close to the River, the city has designated an extensive RMA that is land-ward of the RPA features bounded generally by Princess Anne Street. Also, there are RMAs associated with the VEPCO Canal and Hazel Run. This part of the City does have sensitive environmental features and should be considered in any development or redevelopment activity. Development on RPA Lands, unless water dependent or rights have been vested, will be considered in conflict with the City's Chesapeake Bay Protection Program.

Sensitive Environmental Features:

1. VEPCO Canal - (RMA)
2. Tidal Shore - (RPA)
3. Hazel Run - (RPA with RMA)
4. North Snowden Marsh - (RMA)
5. Snowden Pond - (RMA)
6. Gayles Pond - (RMA)
7. College Marsh - (RMA)
8. 100 yr Floodplain -(RMA)
9. Deep Run Tributary - (RMA only small portion)
10. Old Mill Park/Mill Race and Wetlands - (RPA with RMA)
11. Twin Lakes and other ponds - (RMA)

In this planning area the City has established some IDA areas based on existing water and sewer lines, and development. These IDAs are concentrated within developed areas as an overlay to designated RPA areas. Redevelopment standards apply for these areas. The City's wastewater treatment plant, currently undergoing a major expansion, is within Planning Area VII, adjacent to the River.

V. IMPLEMENTATION PROCEDURES FOR THE BAY PROTECTION PROGRAM

The implementation of the Chesapeake Bay Protection plan must satisfy the following basic requirements;

1. Implementation must assure that all new growth and development is in compliance with the City's Chesapeake Bay Plan and the State's laws and regulations concerning Bay protection;
2. Implementation must be flexible to respond to the economic needs of growth and development that is of a type, location and magnitude that will generate an excess of revenues over costs;
3. Implementation should encourage innovation in the preservation and conservation of environmental, Chesapeake Bay and historical resources; and
4. Implementation should be efficient and equitable;
5. Implements the intent of the Chesapeake Bay Preservation Act.

The principal vehicle for implementation of the comprehensive plan is the City's zoning ordinance. The zoning ordinance is designed to achieve the following specific objectives:

1. Encourage well-planned, phased development;
2. Provide for the preservation of land unsuitable for development;
3. Develop adequate and specific zoning regulations to implement the City's Chesapeake Bay Protection Program;
4. Provide for the use and management of Chesapeake Bay Preservation Areas.

Several different types of growth management ordinances and regulations are available, and may be necessary, to implement the goals set forth in the Chesapeake Bay Element to the Comprehensive Plan. Of these goals, one of the most important is the ability of the City to require contributions by developers to provide their proportionate share of the cost of providing adequate public facilities to support increased development. Regardless of the form which these ordinances and regulations take, the City insists that at least one of the following conditions exist to support new and increased development:

(a) Adequate public facilities are currently available to serve the proposed development, (i.e. available at the time the proposed development is occupied or otherwise requires public facilities services and may be achieved by developer commitments to provide the required facilities);
(b) The City Council commits, by resolution or other official act, to provide adequate public facilities to serve the proposed development (such commitment shall not necessarily include an appropriation of funds needed to provide such facilities); or
(c) The applicant voluntarily contributes a proportional share of the cost of adequate public facilities needed to serve the proposed development.

The City will continue to evaluate these different implementation tools, and will enact some combination of new subdivision, zoning, special use permit, site plan, landscaping plans and other planning and land use ordinances. In addition, the City will continue to use its traditional voluntary proffer system to implement the adequate public facilities provisions of the plan. Other implementation tools may include special overlay districts, special assessments for public improvements, utility availability fees, a capital improvements program, performance standards, site plan regulations, and a cultural resources inventory. All of these will be evaluated and brought together to make the contents of this plan a reality.

APPENDIX A. RESOURCE PROTECTION AREAS

Tidal Wetland Description

The City has _____ miles of tidal shoreline, but only about 1/4 acre of vegetated tidal wetlands. Fringe marsh (those found on the edge of water bodies) has been identified and recorded in the VIMS Special Report No. 167. These wetlands are described as being dominated by smartweed (Polygonum punctatum) and Walter's Millet (Echinochloa walteri). Under the VIMS Classification scheme this is a fresh water mixed community (Type XI). The Type XI wetland is typically characterized as

"a. 3-5 tons primary productivity (Plant growth) per acre per annum
b. high diversity of wildlife
c. high diversity of wildlife foods
d. often associated with fish spawning and nursery grounds
e. Ranks high as a sediment trap and nursery grounds." (VIM special report no. 167).

Non-Tidal Wetlands Description

There are two non-tidal wetland areas that meet the criteria to be included as RPA features. To the west of Snowden Pond is a wetland known as "Back Marsh". This wetland is a typical shrub scrub wetland with Cephalanthus occidentalis (button bush), and various emergent plants such as Eleocharis sp., Saururus cernuus (lizard tail), Juncus effuses (soft rush), etc. The wetland appears to have surface water present year round possibly fed by runoff, precipitation and natural springs. This wetland is connected via pipe culvert to the old VEPCO canal.

The City has also identified a wetland at Old Mill Park between the park entrance at Caroline Street and the power lines. This wetland is fed by stream, runoff and possibly ground water. The wetland vegetation is typically emergent with a dominance of Peltandra virginica (Arrow Arum), Saururus cernuus (lizard tail). These wetlands are connected directly to the Rappahannock River.

Due to the nature of the wetlands and the characteristic hydrology present, these wetlands would not be desirable sites for development and are more useful as protected features which may contribute to overall water quality protection. Therefore, the City has designated these as RPA features.

APPENDIX B. RESOURCE MANAGEMENT AREA

Example Erodibility Index Calculation

The erodibility index for soil loss is a result of the equation of RKLS/T. This equation is defined by the "Food Security Act Manual" of 1988 in the "Field Office Technical Guide", Department of Agriculture Soil Conservation Service. The equation is defined as follows:

K	=	soil susceptibility to water erosion in the surface layer
R	=	rainfall and runoff
LS	=	combined effects of slope length and steepness
T	=	soil loss tolerance.

To illustrate erosion potentials, James City County officials used commonly accepted practices to calculate erosion potential. It was determine that the expected natural erosion rates for a typical forested site would be approximately 200 lbs/ac/yr. If soil type 19b (Kempsville-Emporia fine sand 2%-7% slopes), was cleared from all vegetation, the expected soil loss from erosion was 64,000 lbs/acres/yr on a 5% slope 50 feet long or on a 3% slope 400 feet long (cited from the CBLAB RMA policy draft). This example illustrates how the removal of vegetation can magnify erosion losses and the influences of slope and length of slope. Highly erodible soils were identified using maps developed for the Chesapeake Bay Local Assistance Department by the Information Support Systems Laboratory at VPI.

The "older City areas" do not have a soil survey. For the "new City areas" soil information is available in the 1985 Spotsylvania Soil Survey. For description of the soil associations refer to Appendix "B".

Soil Association Description

"Dystrocrepts-Kempsville-Udults" - this occurs on the Coastal Plain uplands. These soils are somewhat excessively drained, well drained and moderately well drained soils with a dominating loamy or clay subsoil. These soils are used mainly as woodlands. Some areas are used for pasture and crop and some areas have been used for urban development in accordance with the 1985 Spotsylvania Soil Survey.

"Appling-Louisburg-Wedowee Association" - These soils are located in the Piedmont uplands and are deep and moderately deep well drained soils. They have dominantly clay or loamy subsoils. Most acreage is woodland with some used as crop and pasture.

In the old sections of the City as mentioned before, there are three dominant soil associations (cited from 1981 Comprehensive Plan):

"1. The Wickham, Altavista and Congaree Soils are the floodplain soils of the Rappahannock River and adjacent terraces". Outside the immediate floodplain these soils are for the most part deep, moderately well to well drained, medium to strongly acid and able to accommodate septic tans. These soils are located within the older parts of the City to the City line near Deep Run tributary.

"2. Beltsville Caroline and Suffell Association occurs in upland areas and is characterized by soils which are moderately deep, fairly well drained, medium to strongly acid and generally no suited for septic tanks."

"3. Sandy and Gravelly Sediments Association are found along the Fall Line. These soils are excessively drained, strongly acid, highly erodible and generally unsuited for urban land uses."

Potential Hydric Soils in the City of Fredericksburg

Colfax (14c), Cartecay (10), Abell (1B), Goldsboro (24) Aquults (5), fluvaquents (23); as identified in the Spotsylvania County SCS 1985 Soil Survey in the new City area. These soils have the potential of being hydric and careful site planning should be used with these soils. In addition all soils known as histosols (organic soils) except folists are hydric and caution should be taken to avoid these sites.

** Numbers refer to the soil identification numbers of the 1985 SCS soil survey.

APPENDIX C: CHESAPEAKE BAY PRESERVATION AREAS COMPOSITE MAP