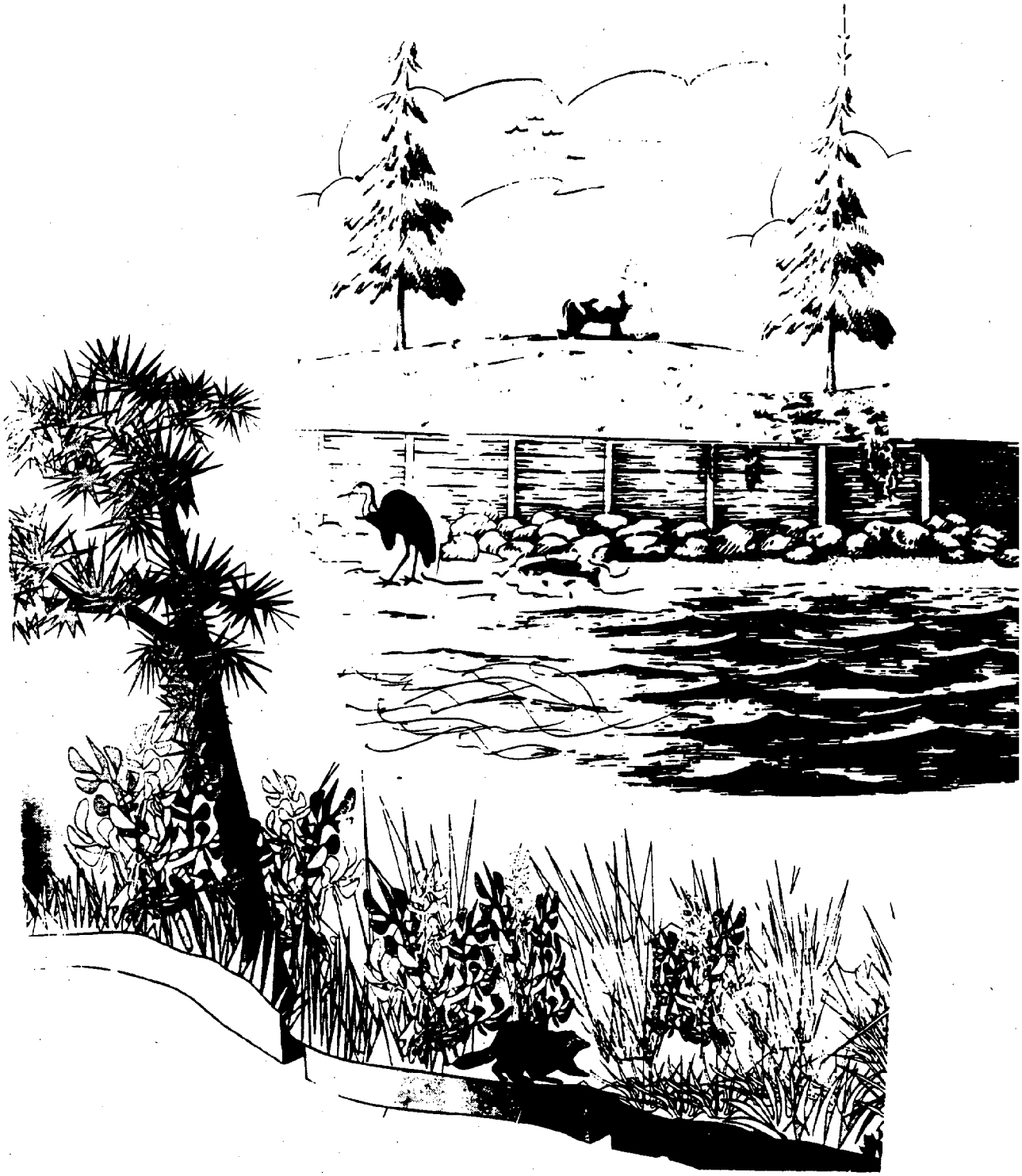
SHORELINE AREA MANAGEMENT PLAN

PHASE II



REPORT OF THE SHORELINE PLAN ADVISORY COMMITTEE

DECEMBER 6, 1989

SHORELINE AREA MANAGEMENT PLAN - PHASE II

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I. INTRODUCTION

The Shoreline Area Management Plan is divided into Phase I and Phase II. Phase I (completed in May, 1989) represented the framework of the Plan and contained an inventory of existing conditions; existing opportunities and constraints; and goals and objectives. Phase II represents the final development of the Plan and contains a management plan; development guidelines and policies; and recommendations for implementation.

This report represents Phase II and will expand on the framework developed in Phase I through developing a management plan that carries outs the goals and objectives of the Shoreline Plan.

Summary of Phase I

As mention in Phase I, the primary purpose of the Stafford County Shoreline Area Management Plan is to protect and enhance the wise use of shoreline area resources through the management of possible future growth and development. In order to accomplish this end, the following objectives must be carried out:

1. Inventory of present conditions - land use, land cover, shoreline conditions, wetlands, soils, ownership patterns, and other pertinent factors.

2. Identify existing and potential opportunities for shoreline protection, wetlands preservation, protection of scenic and historic resources, water quality enhancement, protection of plant and animal resources, and other related issues.

3. Develop goals and objectives for possible shoreline development and preservation.

4. Develop a management plan for the shoreline.

5. Develop guidelines for possible development on or near the shorelines.

6. Identify and recommend changes in the County's Zoning Subdivision and Wetlands Ordinances and other appropriate measures necessary to implement the plan.

The County has completed the first three objectives with the exception of additional mapping that will be needed to implement the Plan. Since May, 1989, the County in conjunction with Rogers, Golden, and Halpern (Consultants for the Plan) have been developing objectives four (4) through six (6). The sections that follow will address these objectives and set forth the steps necessary to accomplished the Plan's primary

purpose, the protection and enhancement of shoreline area resources.

II. SHORELINE MANAGEMENT

A primary objective of the Shoreline Area Management Plan is to manage possible future growth and development in a way that minimizes its effect on environmentally valuable shoreline resources. Growth and development that is not properly managed may cause erosion, sedimentation, and other forms of non-point source pollution which will have a negative impact on our shoreline area resources. This Plan is proposed to address and reduce the damaging effects of possible development in shoreline areas while achieving a balance between development and the protection of shoreline resources and water quality.

Presently the shoreline areas are relatively undeveloped; however, these areas have experienced development pressures due to their valuable scenic and aesthetic qualities and environmental resources which make them highly desirable environments for recreation, marinas, and various types of residential, commercial, and industrial development. These development pressures have heightened the County's need to ensure proper design, location, and construction of possible future development in shoreline areas to minimize its effect on environmentally valuable shoreline resources.

In July, 1988, the Board of Supervisors, adopted the Stafford County Land Use Plan which set forth overall goals and objectives and a plan for future land uses throughout the County. One of the underlying goals of the Land Use Plan is the protection of environmental resources. This is evident through the designation of resource protection and land management overlay areas throughout the County. The following excerpt from the Land Use Plan describes the resource protection and land management overlay areas:

> "**Resource Protection:** The Land Use Plan designates rivers, major runs, perennial streams, floodplains, wetlands, and steep slopes along these areas as conservation areas unsuitable for development. These areas encompass the most environmental sensitive areas and are limited naturally in their ability to support development. The development and/or filling of these areas can create adverse flooding effects on other properties. The Plan recommends that these areas remain as they are and that development density be shifted to other areas of a property." (Page 25)
>
> "**Land Management Overlay:** The Land Use Plan has designated in this land use overlay category environmentally sensitive areas which should be protected from the potentially detrimental effects of development through the enactment of Best Management Practices

(BMP's). The following natural resources are to be protected under this Land Use Overlay category: watersheds; groundwater recharge areas; severe slopes and areas with poor soils; floodplains, drainage basin runs, and perennial streams (as indicated on maps produced by the United States Geological Survey and National Ocean Survey at a scale of 1:24000); and waterfront and lakefronts." (Page 24-25)

The adopted Land Use Plan provides a solid foundation for carrying out the goals and objectives of the Shoreline Plan. The Shoreline Plan proposes to use existing resource protection and land management overlay areas as depicted in the Land Use Plan, as areas necessary to protect from development to preserve valuable shoreline resources and water quality. Additional areas, presently not included in these land use designations which are important for the protection of shoreline resources and water quality will need to be added.

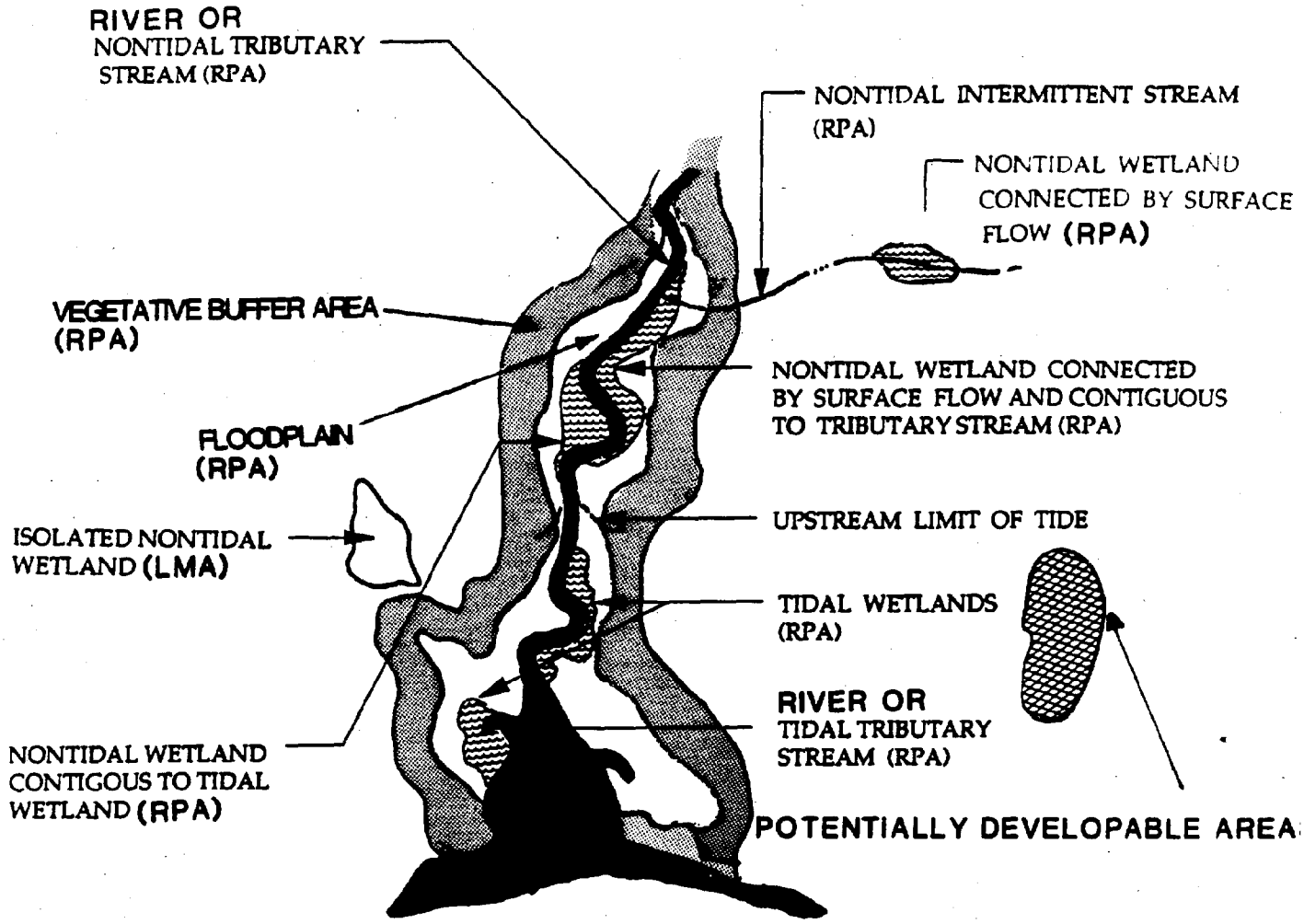
Shoreline Management Areas

The Shoreline Plan proposed to create a "Shoreline Management Area" which contains environmentally sensitive land features that are valuable environmental resources and play a vital role in preserving water quality (See Figure 1). The Shoreline Management Areas are separated into three distinct Areas; Resource Protection, Land Management, and Potentially Developable Areas.

Resource Protection Areas contain land features which must be protected, to the greatest extent possible, in their natural state. These Areas contain the vital land features that are the most sensitive to the negative effects of development and contain ecologically significant resources which play a significant role in maintaining environmental quality (e.g. Wetlands).

Land Management Areas are adjacent to Resource Protection Areas and contain environmentally sensitive land features which need to be protected from the potentially negative effects of development through sound environmental management. Development may occur in these Areas; however, it must meet specific performance standards designed to mitigated its detrimental impact on the environment.

Potentially Developable Areas are lands that are included in Resource Protection Areas and Land Management Areas which are already developed and public utilities are available. These Areas are delineated by a set of specific criteria. Areas that meet a majority of these criteria will be exempt from performance criteria. Any redevelopment in these Areas, removes them from exemption for the required performance criteria.



OTHER LAND MANAGEMENT FEATURES

HIGHLY ERODIBLE SOILS

HIGHLY PERMEABLE AREAS

STEEP/SEVERE SLOPES

LMA - LAND MANAGEMENT AREA

RPA - RESOURCE PROTECTION AREA

SHORELINE MANAGEMENT AREA

Figure #1

The following subsections will describe the land features contained within each of the Areas and list the land use activities which are allowed in Shoreline Management Areas.

Resource Protection Area

Resource Protection Areas are recommended to consist of sensitive lands near the shoreline which play a vital role in preserving Stafford County's water quality. The Resource Protection Area includes rivers, tidal shores, tidal wetlands, floodplains, tributary streams, buffer areas, and nontidal wetlands connected by an intermittent surface flow to a tributary stream or river.

In their natural condition, these lands features provide for removal, reduction, or assimilation of sediments, nutrients, and potentially harmful or toxic substances in runoff from entering the waters of Stafford County. Listed below is a description of the land categories in Stafford County's Resource Protection Area:

> Rivers and Creeks - These are natural streams of water of considerable volume and include the Rappahannock and Potomac Rivers, and Aquia, Accokeek, Chopowamsic, and Potomac Creeks.
>
> Tidal Shore - These are lands contiguous to a tidal body of water between the mean low water mark and the mean high water mark. This is a very sensitive land component since it is the last link in the non-point pollution pathway in tidal waters, and if disturbed it can act as a source of pollution to water bodies.
>
> Tidal Wetlands - These are vegetated and non-vegetated wetlands as defined in Section 62.1-13.2 of the Code of Virginia. Tidal wetlands are principally sensitive as receptors of non-point pollutants from land use activities. Disrupting tidal wetlands limits their abilities to filter erosion and other nonpoint pollutants from the surface water.
>
> Nontidal Wetlands - These are wetlands other than tidal wetlands that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Nontidal Wetlands are considered part of the Resource Protection Area only when they are connected to a river or a tributary stream by surface flow during any part of the year. Nontidal wetlands not connected by a surface flow during any part of the year will be part of the Land Management Areas.

Floodplains - These are any lands that would be inundated by flood water as a result of a storm event of a 100-year return interval as defined by the Federal Emergency Management Agency (FEMA). Floodplains are an important link in the pathways to surface water bodies.

Tributary Streams - These are any perennial streams that are depicted on the most recent U.S. Geological 7 1/2 minutes topographic quadrangle map (scale 1:24,000). Stafford County contains a significant number of these tributary streams.

Buffer Areas - These are one hundred (100) foot wide vegetated areas which make up the boundary of the Resource Protection Area. Buffer areas are to be retained if present and established where they do not not exist. In agricultural areas, buffers can be reduced if Best Management Practices are utilized.

Land Management Area

Land Management Areas include land features that if developed improperly, have a potential for polluting the waters of Stafford County and diminishing the functional value of the Resource Protection Area. Land Management Areas are to be provided contiguous to the entire inland boundary of the Resource Protection Areas and include the following land features: 1) highly erodible areas; 2) highly permeable areas; 3) steep/severe slopes, and 4) nontidal wetlands not in the Resource Protection Area.

Highly Erodible Soils - These are soils with an erodibility index (EI) greater than eight (8) as determined in the "Food Security Act Manual", August 1988 (This is a section of the United States Department of Agriculture's (USDA) "Field Office Technical Guide"). These soils, when disturbed, may cause severe erosion and sedimentation if Best Management Practices (e.g. detention ponds, silt fences, etc.) are not used.

Highly Permeable Areas - These are areas where soils have a permeability equal to or greater than six (6) inches of water movement per hour in any part of the soil profile to a depth of seventy two (72) inches as found in the "National Soils Handbook of 1983 (this is a section in the "Field Office Technical Guide" of the USDA). These soils must be protected to ensure the protection of the ground water recharge areas.

Steep Slopes/Severe Slopes - These are slopes which have a grade greater than ten (10) percent. When disturbed, these slopes are easily eroded; fertilizers and pesticides applied on slopes greater than ten (10) percent can easily be washed down into the waterways.

Nontidal Wetlands - These are wetlands that are not included in the Resource Protection Area because they are not connected to a river, creek, or tributary stream by a surface flow at any time during the year. These isolated wetlands are located throughout the County.

Potentially Developable Area

Potentially Developable Areas are lands within Stafford County's Resource Protection Area where development has already occurred and public utilities are available. These Potentially Developable Areas are recommended to overlay the Resource Protection Area or Land Management Area where two or more of the following exist:

1. The developed area contains greater than fifty (50) percent impervious surface;

2. The area is served by water and sewer by the adoption date of these regulations;

3. Where the predominant land use is residential, the housing density is equaled to or greater than four dwelling units per acre.

III. RECOMMENDED DEVELOPMENT GUIDELINES

In order to carry out the goals and objectives of the Shoreline Plan, guidelines need to be developed to lay the foundation for changes in existing County ordinances. The guidelines recommended in this Plan mainly deal with possible development that may occur in Shoreline Management Areas.

Development includes agricultural uses as well as residential, commercial, and industrial uses. Each of these land uses can be characterized by a set of activities which have the potential to release or generate non-point sources of water pollution. Some activities, such as clearing vegetation, occur during the construction phase of land development and are common to a wide range of land uses.

The concern of this Plan are activities that occur in Shoreline Management Areas. Recommended development guidelines will address existing activities presently allowed and those uses that are planned for in the Land Use Plan. The recommended guidelines will also address possible future changes in the Land Use Plan for Shoreline Management Areas.

Stafford County Land Use Plan

The Stafford County Land Use Plan (1988) represents a guide for the location and type of future land uses throughout the County. A majority of the Shoreline Management Areas are designated for either Resource Protection or rural-type

development (Agriculture, three acre lot residential) and are outside the designated Growth Area in the Land Use Plan.

These land use activities are somewhat compatible with Shoreline Management Areas as they, in most cases, do not produce the amount or type on non-point pollution sources as the more urban land use activities; however, these uses still need to be managed to ensure water quality throughout the County.

The Shoreline Management Areas included in the designated growth area of the Land Use Plan have existing and proposed land uses that need to be managed appropriately to maintain the the environmental quality of the Shoreline Management Areas.

Land Use Activities Allowed in Resource Protection Areas

Only certain land use activities are recommended to be permitted in Resource Protection Areas due to the importance of these areas for protection of shoreline resources and water quality. Below is a list of land use activities allowed under specific guidelines within land features of Resource Protection Areas:

River or Creeks, Tidal Shores, Tidal and Nontidal Wetlands, and Tributary Streams

- Any of the Water Dependent Uses listed below:

  1. Marinas;

  2. Docks;

  3. Intake and outfall structures of a power plants, sewage treatment plant, water treatment plants, and storm sewers;

  4. Public water-oriented recreation areas;

  5. Fisheries or marine resources facilities.

- Access Roads (See guidelines under nonpoint pollutants - creation of impervious surfaces)

- Vegetation Clearing (See guidelines under nonpoint pollutants - vegetation clearing)

Floodplain

- Crop and pasture land is allowed so long as a buffer area and or best management practices are utilized to assure that fertilizer and pesticides do not enter the adjoining water body.

- Vegetation Clearing (See guidelines under nonpoint pollutants - vegetation clearing)

- Construction of roads (See guidelines under nonpoint pollutants - creation of impervious surfaces)

- The construction of any type of structure is prohibited, unless a land owner suffers a hardship and all the buildable land is encompassed in the Resource Protection Area. In those instances a land owner may develop in the floodplain if the land general performance criteria developed for Shoreline Management Areas and Stafford County's Zoning Ordinance Regulations are followed.

Buffer Area

- In order to maintain the functional value of the buffer area, indigenous vegetation may be removed only to provide for reasonable sight lines, access paths general wood lot management, and best management practices.

- When application of the buffer area would result in a hardship to a landowner whose tract was recorded before the effective date of these regulations, a modification is recommended to be allowed in accordance with the following guidelines:

  a. Modification shall be minimal to achieve reasonable buildable areas.

  b. Where possible, an equal area to the area encroaching the buffer area will be established elsewhere on the lot.

  c. In no cases will the reduced buffer be less than 50 feet.

Overall Development Guidelines

The location and type of land use activities allowed in Shoreline Management Areas are those uses which are allowed with the existing zoning of the property provided that that use can meet the performance criteria set forth in this Plan. For example a property zoned for Industrial in a Shoreline Management Area, may be developed for a industrial use provided that certain performance criteria are met. These performance criteria are derived from development guidelines established for these uses.

Recommended development guidelines have been formulated for all land use activities that occur in Shoreline Management Areas. These guidelines are directly related to the following goals of the Shoreline Plan:

Goals

* **Direct Possible Growth so that Water Quality is Maintained and Improved in Tributaries of the Chesapeake Bay Within Stafford County.**

* **Maintain and Improve Water Quality in Tributaries to the Chesapeake Bay Wherever Development Occurs.**

* **Protect Sensitive and Valuable Natural Resource Before, During, and After Development.**

* **Protect and Maintain the Scenic Quality of the Shoreline Area.**

* **Protect Resource-Based Industries.**

* **Improve Land Management Practices to Reduce the Adverse Impacts of Development.**

Recommended Guidelines:

- Disturb no more land than is necessary to provide for the desired use or development.

- Preserve indigenous vegetation to the maximum extent possible during any type of construction.

- Utilizes Best Management Practices in all developments.

- Require a erosion and sediment control plan for land use activities that exceeding 2,500 square feet of land disturbance.

- Minimize the amount of impervious cover to be consistent with the use or development allowed.

- Require any land disturbing activity that exceeds an area of 2,500 square feet (including construction of all single family houses, septic tanks and drainfields) to comply with the requirements of Stafford County's Erosion and Sediment Control Ordinance.

- Require on-site sewage treatment systems to be pumped out every five years and provide a reserve sewage disposal site with the same capacity as the primary site.

- Recommend the development of a Regional Stormwater Management Plan for the County.

- Recommend agricultural activities to have a soil and water conservation plan.

Guidelines for Specific Land Use Activities

The activities listed below are the activities that would generate or release the most nonpoint pollutants in Stafford County. Any of the land activities listed below are recommended to follow the guidelines set forth in this section and the Overall Development Guidelines (listed above).

Cultivation/Tillage

Conventional cropping practices can leave disturbed soils exposed without vegetation for periods during which Stormwater can cause erosion and sedimentation.

- Prohibit these activities in tidal shores, tidal or non-tidal wetlands, steep slopes, or buffer area.

- Require Agricultural Conservation Plans approved by the Soil and Water Conservation District to specify the management techniques to be utilized for these activities in floodplain and highly permeable and erodible areas to assist in preventing the transmittal of pollutants to surface on groundwater.

Pasture

Pasture areas can be an asset to water quality if they are properly managed and maintained with a vegetated cover; however, where large numbers of animals are allowed in streams or on steep slopes, they can cause erosion and lower water quality.

- Allow pasture activities in buffer areas where pasture vegetation already exists.

- Require Agricultural Conservation Plans to indicate the techniques required for maintaining vegetation in the buffer area in a state which allows it to function as intended.

Dairies and Feedlots

Dairies and Feedlots involve high concentrations of animals, most often cattle, which produce large quantities of waste. They are often located on large expanses of either impervious surface or exposed soils. These operations can increase stormwater flows, and increase nutrients and sediment levels delivered to water bodies.

- Prohibit should be prohibited from all components except highly permeable and erodible areas.

- Regulate the concentration of animals in order to limit the animal concentrations and nutrient-rich runoff in highly permeable or erodible areas.

Fertilizers and Pesticides

Fertilizers and Pesticides applied in the wrong concentration, at the wrong time, or too close to water bodies, may result in pollution of water bodies and severely impact water quality. Improper storage and handling of these substances can also result in their release into water bodies with harmful effects to water quality.

- Prohibit these activities in tidal shore, tidal wetland, and non-tidal wetland areas.

- Limit the application of these substances in the floodplain to that absolutely necessary for agricultural activities. (Also use application techniques which will minimize the threat of water pollution).

- Limit the application of these substances in areas other than floodplains to amounts that are necessary to maintain a thick vegetative cover, but performed in a manner so that none leave the site.

Vegetation Clearing

The clearing of vegetation is needed for a variety of land uses. Land development includes clearing of vegetation in preparation for construction. Exposed soils are subject to erosion resulting in sedimentation of water bodies.

- Allow vegetated clearing only after the proper permits have been obtained (if necessary) from the either the Stafford County Wetlands Board, Virginia Marine Resources Commission (VMRC), and Army Corps of Engineers.

- Disturb no more land than is necessary to provide for the approved development or use.

- Preserve indigenous vegetation to the maximum extent possible consistent with use and development allowed.

- Allow clearing in highly permeable areas provided that the disturbed area is replanted as soon as possible.

- Require any vegetative clearing follow Best Management Practices to enhance the quality of stormwater runoff.

Soil Grading/Dredging and Filling

These activities are combined because they each involve disrupting areas of soil and sediment and exposing them to erosion. They each can lead to pollutants in water bodies, the disruption of habitat, and, where dredging is involved, the re-suspension of previously deposited nutrients and toxic materials.

- Permit dredging and filling only after the proper permits have been obtained (if necessary) from the either the Stafford County Wetlands Board, Virginia Marine Resources Commission (VMRC), and Army Corps of Engineers.

- Disturb no more land than is necessary to provide for the approved development or use.

- Prohibit these activities in tidal and non-tidal wetlands, slopes greater than twenty five (25) percent, and buffer area.

- Require dredging/filling to use appropriate BMPs.

Mining

The principal mining operations of direct concern to water quality are sand and gravel operations which recover materials along streams and rivers or from abandoned river terraces and benches. The sand and gravel are removed, sorted, and washed creating a potential for releasing large amounts of fine particles to surface waters.

- Prohibit mining from the tidal shore, tidal and nontidal wetland and buffer area components.

- Require mining to utilize appropriate BMPs to prevent the degradation of water quality.

- Require disturbed areas to be reclaimed so that they are permanently stabilized by grading and planting or seeding with indigenous vegetation.

- Regulate mining activities in highly permeable areas, such as sand gravel deposits, so that pollutants from machinery cannot be infiltrated into the groundwater.

- Require mining activities in highly erodible areas to use appropriate BMPs which will protect against off-site erosion.

Creation Of Impervious Surface

Most land development results in the creation of impervious surfaces such as rooftops, sidewalks, roads, and parking areas. These areas inhibit the infiltration of stormwater into the ground. Resulting increases in surface flows during storms erode soils and change stream profiles. Roads and parking areas accumulate toxic substances and nutrients which are carried by stormwater into water bodies.

- Minimize impervious cover needed for the uses or developments allowed.

- Limit the impervious surfaces to those absolutely required for the development (i.e. road lengths should be shortened and structure footprints kept as small as possible).

- Locate parking within the principal structure wherever possible; if outside, reduce the requirements for impervious surfaced parking lots.

- Require the use of pervious surfaces which accomplish improvements in water quality and perform the intended function of conventional impervious surfaces whenever possible.

- Allow structure footprints to be reduced by increasing the number of stories in the structure, provided that the structure height complies with the maximum allowed in that zone.

- Recommend clustering in developments to the extent possible.

- Prohibit impervious surfaces in the tidal or nontidal wetland, on steep slopes, or in buffer areas (unless a hardship exist).

- Allow minimal impervious surfaces in tidal shore areas where they are associated with water dependent uses.

- Design developments so that runoff from impervious surfaces in the floodplain to recharged close to where it occurs.

- Prohibit stormwater from contaminated surfaces to be directed for infiltration to highly permeable areas where it is determined that groundwater contamination could occur.

- Prevent runoff from impervious areas to be directed onto highly erodible areas where it can be avoided. If unavoidable, limit runoff to erodible areas to sheet flows onto vegetated areas.

On-site Wastewater Treatment

All types of individual, or community on-site wastewater treatment techniques can potentially impact water quality. Even well-designed, properly installed septic systems can release nutrients, primarily nitrates, to groundwater which makes its way to surface waters of streams and rivers.

- Require that on-site wastewater treatment facilities be designed to reduce their negative impact on water quality

Solid Waste Disposal

This activity is intended to include all types of solid waste disposal including but not limited to landfills. Surface water quality problems associated with solid waste disposal can occur directly and indirectly. Wastes discharged directly into water bodies (including wastes from ships and boats) have a negative impact on water quality if they contain nutrients, and toxic materials. Wastes disposed of on land can directly affect surface water quality if washed into water bodies or they can reach surface waters indirectly through groundwater.

- Prohibit solid wastes disposal in Shoreline Management Areas.

Toxic Substance Storage/Disposal

When toxic substances are released into the environment, they have the potential for degrading water quality. Normal usage of these materials involves releases into the environment. Mishandling these products during normal usage can damage environmentally sensitive areas. Areas where they are disposed of or stored are particularly vulnerable to releases due to the concentrations of materials involved.

- Prohibit toxic material storage and/or disposal in all Shoreline Management Areas.

IV. IMPLEMENTATION

This Section includes recommendation for changes in the County's ordinances and other appropriate measures necessary to implement the Plan.

The Consultants have submitted this Section; however, it needs to be rewritten by the staff to ensure consistency. This document was received this week, so the staff has not had time to rewrite the section. This section will be rewritten before the end of the month.

V. CONCLUSION

Phase II of the Shoreline Area Management Plan has included the establishment of Shoreline Management Areas; recommended development guidelines; and recommended changes in the County ordinances. The establishment of Shoreline Management Areas were developed from already established areas depicted in the Stafford County Land Use Plan (Resource Protection and Land Management Overlay Districts). Additional mapping will need to be carried out to ensure that all areas that are necessary to protect shoreline resources and water quality are included in Shoreline Management Areas.

Recommended development guidelines were formulated to carry out the goals and objectives of the Shoreline Plan. These guidelines address existing activities presently allowed and those uses planned for in the Land Use Plan and future amendments to it. Overall development guidelines were developed which applied to all land use activities throughout the Shoreline Management Areas. In addition, guidelines for specific land use activities which create non-point pollution were developed.

The development guidelines laid the foundation for recommendations for changes in existing County ordinances. The adoption of these changes within these ordinance will provide the "teeth" of the Plan and will implement the regulations necessary to protect and enhance the wise use of our shoreline area resources.

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