

1.0 INTRODUCTION

1.1 Spotsylvania County Water/Sewer Master Planning Process

The Spotsylvania County Comprehensive Plan is the primary planning document for County growth. The Public Facilities and Utilities elements of the Comprehensive Plan serve as a 5-year guidance document for upgrade and expansion of the County water and sewer systems, consistent with growth management policies developed by the Planning Commission and adopted by the Board of Supervisors. An April 13, 2000 Draft Comprehensive Plan was reviewed by the Planning Commission and presented to the Board of Supervisors on May 16, 2000. The 2000 Comprehensive Plan was approved by the Planning Commission in February 2001 and approved by the Spotsylvania County Board of Supervisors in February 2002.

As fundamental as the Comprehensive Plan is, it is only a guidance document; implementation requires consistent land use zoning, subdivision ordinances, a water and sewer master plan, and a Utilities Department Capital Improvement Program. This 2002 Water/Sewer Master Plan Revisions is intended to facilitate implementation of the 2000 Comprehensive Plan. To that end, the 2002 Water/Sewer Master Plan Revisions was prepared simultaneous with the 2000 Comprehensive Plan, with frequent coordination of the two documents by the Spotsylvania County Utilities and Planning Departments. Both documents were approved simultaneously in February 2002.

In May 1994, Spotsylvania County completed the first comprehensive master plan for water and sewer services in the County. The 1994 Water/Sewer Master Plan addressed primarily the sewer and water system deficiencies in the primary settlement area of Spotsylvania County. Additionally, two scenarios were provided for water and sewer service in the secondary settlement area; facilities discussed included a Ni River interceptor, a Po River interceptor, a Ni/Po wastewater treatment plant, and a Courthouse/Thornburg water main loop.

Since 1994, significant changes have taken place, both in Spotsylvania County growth and development and also in the technology used to plan, monitor and direct growth and development. These changes are reflected in the Comprehensive Plan and in this Water/Sewer Master Plan Revisions, and include:

- Eliminated the secondary settlement area and identified the Thornburg Development District. By defining the boundary of the Thornburg Development District, Spotsylvania County has committed to industrial growth and development from Massaponax to Thornburg along the Route 1/I95 corridor, where water and sewer services can be reasonably provided. Simultaneously Spotsylvania County has committed to discourage growth and development in the upper Ni River and Po River watersheds - the greater portion of the former secondary settlement area.
- Adopted the Courthouse Area Plan, defining three planning areas, the Historic Village Planning Area, the Village Transition Planning Area, and the Rural Planning Area, within the Spotsylvania Courthouse region. A revision to the Spotsylvania County Water/Sewer Master Plan for the Courthouse Area, dated March 1999, was prepared and approved by

Spotsylvania County. The Master Plan for the Courthouse Area defined the development of 5 sub-drainage basins within the Ni and Po drainage basins in the Courthouse Area. Also included in the Courthouse Area Master Plan revisions were the infrastructure improvements required to the wastewater collection system, a new regional sewage pump station to pump wastewater to the Massaponax Creek drainage basin, and infrastructure improvements to the water distribution system. With the incorporation of the new wastewater conveyance pump station and piping, the existing Wishner Wastewater Treatment Plant will be abandoned.

- Completed the County of Spotsylvania Residential Build-out Analysis. This analysis, prepared by the Spotsylvania County Planning Department, offers justification for a downward adjustment in development densities and residential household size, thus facilitating accuracy when projecting water and sewer demand for specific zoning classifications.
- Implemented a geographic information system (GIS) for Spotsylvania County for planimetric features, topography, property lines, land use and zoning, E911 addresses, and water and sewer system features. Comprehensive GIS mapping of these inter-related Spotsylvania County features is a very significant technology for planning, monitoring and directing growth and development. Use of GIS technology greatly facilitates accurate calculation of water and sewer demands for multiple, finite areas throughout the County. More importantly, a water and sewer master plan is no longer a once-every-five-years snapshot of the County; rather, it is now an electronic system for continuously monitoring the impacts of proposed growth and development on the water and sewer systems.

1.2 Purpose of this Report

This report summarizes and documents the objectives, procedures, and recommendations identified by the 2002 Water/Sewer Master Plan Revisions.

Objectives

The 2002 Water/Sewer Master Plan Revisions is intended to facilitate implementation of the Comprehensive Plan by identifying water and sewer system deficiencies which may impede intended Spotsylvania County growth over the next five years and by defining specific capital water and sewer projects that must be implemented to facilitate the intended growth.

Additionally, the 2002 Water/Sewer Master Plan Revisions is intended to facilitate implementation of a pro rata cost sharing program with developers to fund the water and sewer improvements.

The Water/Sewer Master Plan Revisions identifies all sanitary sewers 10” and larger, all sewage pumping stations required to accommodate build-out sewage flows in the primary settlement area and Thornburg Development District, and all water supply alternatives and distribution system improvements to support build-out demands throughout Spotsylvania County. In

addition, the infrastructure improvements recommended in the Water/Sewer Master Plan Revisions for Courthouse Area have been incorporated into the 2002 Water/Sewer Master Plan Revision.

Procedures

The 2002 water and sewer master planning process had five major phases. First, the Draft Comprehensive impacts on existing water and sewer systems were defined. The geographic boundaries of Spotsylvania County development areas – the primary settlement area and the Thornburg Development District – were delineated. Then, the developed areas were partitioned into major drainage areas and further partitioned into sub-basins to facilitate quantification of water and sewer demands. Within each sub-basin, build-out water demands were calculated, considering the acreage of currently developed and undeveloped parcels, zoning and land use, and water demand per acre or per residence for each land use category.

Second phase involved locating and sizing the water and sewer system infrastructure appropriate to support the build-out water demands in each sub-basin and assessing the adequacy of existing water and sewer infrastructure to meet the build-out demands. Identified infrastructure included water mains, storage tanks and booster stations, and sewer interceptors, trunk mains and pumping stations.

Consistent with Spotsylvania County Utilities Department policy, reliance on sewage pumping stations was minimized. Water distribution lines and 8” sewage collectors within the sub-basins were not addressed. However it is understood that sanitary sewage collection within a sub-basin will not require additional sewage pump stations and all new customers will be sewered by 8” sanitary sewers with gravity flow to the designated master plan gravity sewers.

Third phase involved development of planning level opinions of probable project cost for each identified improvement to water and sewer infrastructure determined to be inadequate to meet the build-out demands. By consultation with the Spotsylvania County Planning and Utilities Departments, the identified improvements were prioritized and the most critical projects incorporated into a recommended 5-Year Utilities Department Capital Improvements Plan.

Fourth phase of the master planning process related to water resource development and treatment and wastewater treatment facilities. Alternative additional water resources and additional water treatment capacity have been identified, evaluated and recommended. Opportunities to provide additional wastewater treatment capacity, by expansion of the existing FMC and/or Massaponax Wastewater Treatment Plants, were identified, evaluated and recommended.

The fifth phase involved coordinating the Master Plan recommendations with the Code of County of Spotsylvania, such that the Master Plan can be used to facilitate implementation of a pro rata cost sharing program with developers to fund the Master Plan recommendations. To this end, the Master Plan has defined improvement area boundaries, flow capacities, and a water and sewer improvements program and program costs for each improvement area.

Recommendations

Recommendations contained in this report include a long-range water resource planning guide, a 5-Year Utilities Department Capital Improvements Plan, accompanying schematic maps of the individual water and sewer projects, procedures for consolidation of wastewater treatment capacity, and procedures for financing and administering the master plan water and sewer infrastructure in Spotsylvania County.

1.3 Coordination with Spotsylvania County GIS System

In 1997 Spotsylvania County begin development of a Geographic Information System (GIS). Currently the GIS system uses ArcView 3.2 and Arc Info 8.02 and includes files with planimetric features (roads, buildings, waterways, etc), tax parcels, zoning boundaries, and E911 addresses. The GIS system includes water and sewer coverage utilizing with a customized utility viewing application. Attributed water features include tanks, valves, reservoirs, pipes and pumps. Attributed sewer features include manholes, mains, pump stations, oil/water separators, and pipes.

GIS data developed as part of the 2002 Water/Sewer Master Plan Revisions include new topographic images, drainage basin and sub-basin boundaries, boundaries for currently developed and undeveloped areas, water consumption data for each E911 address (integration of County E-911 and water billing address files), build-out analysis and water demands by sub-basin, and proposed sanitary sewer interceptor with junctions and pipe sizes. These GIS files support the 2002 Water/Sewer Master Plan Revisions process and will enable Spotsylvania County to more easily continue the water and sewer master planning process. Appendix H provides a listing of electronic files, including GIS files, which are included on a CD with the 2002 Water/Sewer Master Plan Revisions.