Sanitary Sewer
FOUNDATION DOCUMENT

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6-1 INTRODUCTION

Wastewater disposal is an important consideration of the planning process. As population increases, the need for additional sanitary sewer facilities and additional capacities increases. In the sanitary sewer sub-element, the wastewater discussed includes water from the kitchen and bathroom sinks, toilets, dishwashers, clothes washers, and bathtubs and showers. Each day, every person within Santa Rosa County produces an average of approximately 90 gallons of wastewater. The final destination may be either an on-site treatment disposal system (usually a septic tank), a private sewage treatment plant (generally located near the dwelling unit or other structure) or a regional treatment plant, which may be located many miles from the structure where wastewater is generated.

The purpose of the Sanitary Sewer Element is to provide information on the existing conditions of the County's sanitary sewer system. The Element will examine existing and potential deficiencies of the system as they relate to the health, safety and welfare of the population of the intended service area (both now and in the future). It will identify geographic service areas, operational responsibility, and the level of service of the facilities, and it will identify environmentally acceptable methods of the disposition of treated wastes and sludge from the wastewater treatment plants.

A. Organization of the Element

This element is divided into four main headings that include the Introduction, Terms and Concepts, Existing Regulatory Framework, and Data and Analysis. The Terms and Concepts section define the terms utilized throughout most of this document. The Existing Regulatory Framework describes the current federal, state, regional and county regulations. The Data and Analysis section identifies the County's private and publicly owned facilities. This section describes the County's population and demographic characteristics, discusses potential funding sources and provides current and projected needs at the recommended level of service.

B. Relationship to other Elements of the Comprehensive Plan

There are several key linkages between the Sanitary Sewer Element and other elements of the Comprehensive Plan which include the following:

The *Future Land Use Element,* as an overall blueprint for managing growth in the County, locates and describes land use densities and intensities that will strongly influence future growth and development. Together, the Future Land Use Element and the Infrastructure Element function together to implement many growth-management strategies.

The *Conservation* and *Coastal Management Elements* identifies all of the County's natural resources (i.e., geology, topography, minerals, soils, surface water quality and groundwater quality and quantity; floodplains, natural vegetative communities, wildlife habitats, fisheries, air quality, hazardous waste in addition; to coastal management issues beach and dune preservation, beach access, archaeological and

historic sites, natural disaster planning, coastal high hazard areas and evacuation planning) and discusses various preservation techniques (i.e., preservation ordinances, conservation easements, financial incentives and land acquisition) as well as various land management techniques which will help to eliminate various land use conflicts.

The *Intergovernmental Coordination Element* provides opportunities to improve County collaboration and coordination with other agencies, such as the Florida Department of Environmental Protection and the Northwest Florida Water Management District in the exchanging of important information relative to environment located within Santa Rosa County.

The *Capital Improvements Element* will reflect the County's strategy for the delivery of infrastructure and other public services, which will serve a primary role in growth management and help shape future Sanitary Sewer demand. In addition, the Capital Improvements Element will reflect the five-year budget plan for capital plan for capital outlay, which should support the Goals, Objectives, and Policies of this Sub-Element.

The *Infrastructure Element* consists of the Sanitary Sewer, Potable Water, Natural Groundwater Aquifer Recharge, Solid Waste and Stormwater Management Sub-Elements. From a growth management perspective, the Sanitary Sewer Sub-Element will help implement growth management strategies which will have an impact on the timing, planning, and location of development into the next planning horizon, thus protecting the groundwater resources throughout the County and ensuring sufficient sanitary sewer services for the residents of Santa Rosa County.

6-2 TERMS AND CONCEPTS

Biochemical Oxygen Demand (BOD): The quantity of oxygen used in the aerobic stabilization of wastewaters and polluted waters. The standard 5-day BOD value is commonly used to define the strength of municipal wastewaters, to evaluate the efficiency of treatment by measuring oxygen demand remaining in the effluent and to determine the amount of organic pollutant in surface waters.

Domestic Waste: Human body waste and household-type wastes, including bath and toilet type wastes, laundry wastes, kitchen wastes, and other similar wastes from household or established appurtenances.

Effluent: Liquid by-product of the wastewater treatment process.

Force Main: A pressurized segment of the collection system.

Infiltration: Water, other than wastewater, that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections or manholes.

Inflow: Water, other than wastewater, that enters a sewer system (including sewer service connections) from sources such as, but not limited to, roof leaders, cellar drains, yard drains, area drains, drains from springs and swampy areas, manhole covers, cross connections between storm sewers and sanitary sewers, catch basins, cooling towers, storm waters, surface runoff, street wash waters or drainage.

Influent: Wastewater or other liquid (raw or partially treated) flowing into a reservoir, basin, treatment process, or treatment plant.

Level of Wastewater Treatment: The proportion of solid and organic materials removed from the wastewater. The most common levels of treatment are: primary, secondary; tertiary.

Lift Station: A pumping facility which discharges flow directly into a gravity conduit.

NPDES: National Pollution Discharge Elimination System.

Primary Treatment: Removes between 30 and 35 percent of the organic material and up to 50 percent of the solids from the sewage. Because screens and settling tanks are the most common methods used to remove the solids, this process is also referred to as physical treatment.

Secondary Treatment: Removes between 80 and 90 percent of the total organic material and suspended solids from the sewage. This level of treatment generally requires multiple steps involving one biological process and one or more processes for removal of suspended solids.

Sludge: The accumulated solids separated from liquids during processing, or the precipitate resulting from chemical treatment, coagulation, or sedimentation of wastewater.

Tertiary Treatment: A level of wastewater treatment, which removes the organic material and suspended solids, synthetic organic compounds and inorganic chemicals. If not removed, these agents may cause pollution problems. Tertiary treatment adds steps to the primary and secondary processes, which will remove these pollutants. The most common tertiary processes remove

Wastewater: A combination of the liquid and water-carried wastes from residences, commercial buildings, industrial plants, and institutions, together with any groundwater, surface water, and storm water that may be infiltrated.

Regional Treatment Facilities

Regional treatment facilities are large-scale sanitary sewer systems, which usually provide service to populated areas. These facilities generally provide for the collection, treatment and disposal of wastewater.

Collection methods include a series of sewer pipes, which collect sewage from individual sources and move it to the central location for treatment. The major components of the collection system are interceptors, which connect directly to the treatment plant; trunk mains, which connect to the interceptors; and mains, which connect to the trunk mains. In Santa Rosa, as well as the rest of Florida, the collection system includes a series of pump stations and force mains to transfer wastewater because of the flat topography.

The treatment plant removes the solid and organic matter from the sewage. In the regional treatment facility, this is usually accomplished by using more than one detached treatment processes. Preliminary treatment removes large objects like rags, plastics and wood by mechanical means. Primary treatment removes 30 to 50 percent of the solids. Removal is accomplished by using settling tanks. Secondary treatment involves the removal of 80 to 90 percent of organic and solid materials from sewage. The treatment process involves multiple steps of biological processes for removal of materials.

However, primary or secondary treatment does not remove the inorganic pollutants. *Tertiary* treatment is the process used to remove the majority of these pollutants. Tertiary treatment is an advanced treatment system, which is added to primary and secondary treatment to remove these compounds. Phosphorus and nitrogen are the most commonly removed of these inorganic compounds.

Effluent and sludge are the remaining products of the treatment process. These byproducts must then be disposed of. Effluent is treated, or reclaimed, wastewater and sludge is the accumulated solid material. Effluent disposal methods include discharge to a water body, reuse through irrigation or injection into deep

aquifers. Sludge requires additional treatment before disposal to remove any pathogens. Common disposal methods for sludge are burial in landfills or use as a soil conditioner and fertilizer for agriculture.

Package Treatment Facilities

Package treatment facilities are small pre-engineered facilities, that consist of a collection network, treatment plant and disposal system. Package treatment plants generally serve small isolated developments and are usually partially or completely preassembled by the manufacturer prior to shipment to the site. A secondary level of treatment is usually provided by these plants. Package treatment plants are generally constructed of steel or precast concrete and have multiple treatment processes contained within a single tank. These treatment facilities are generally considered to be less reliable than regional treatment facilities. Problems that are usually experienced at these facilities include:

- These plants are usually constructed by the developer at minimum accepted standards. This, in turn, results in pollution problems down the road.
- Maintenance and monitoring have proven to be expensive and time consuming. Therefore, these tasks are not regularly handled, resulting in decreased treatment levels and efficiency.
- Effluent disposal often is simply discharged into a nearby water body or retention pond. This can severely decrease the surface and ground water quality, especially when the effluent has not been treated properly.

Septic Tank Systems

Septic tank systems provide on-site wastewater treatment for both residential and small-scale commercial developments. The septic tank system consists of two components. One is the septic tank, while the other is the drainage field. The tank receives sewage from the dwelling unit or commercial establishment and provides a period of settling, during which time a significant portion of the solids settle out. The treatment process is accomplished by bacteria, which gradually decompose the solids, which have settled to the bottom of the septic tank. The remaining liquids are discharged through underground drainage pipes into the drain field and percolate into the soil. Once in the soil, microorganisms and filtration processes purify the liquids. Every three to five years, the accumulated solids should be removed. These solids, called septage, are generally transported to regional sanitary sewer facilities for treatment prior to disposal.

Residential septic tanks usually range in capacity from 900 to 1000 gallons. Generally, commercial septic tanks have a larger capacity. Since effluent from septic tanks is discharged to the drain field where it is allowed to percolate into the soil, soil permeability and depth to the water table are limiting factors for septic tank use. To ensure adequate performance and protect groundwater quality, elevation of septic tank drain fields is often required.

The correct soils are needed to assure the proper functioning of these septic tank systems. According to the Santa Rosa County soil survey, the majority of soils in the County have severe limitations for septic tank use. Soils which have slight or moderate limitations are Bonifay, Fuquay, Kalmia, Kureb, Lakeland, Lucy, Maxton, Orangeburg, Ortega, Red Bay, Tifton, and Troup. Soils with slight limitations are the best suited for septic tank usage. Moderate soils have limitations, which can be easily removed with minor additions, which interfere with the proper functioning of the septic tank systems. However, additions need to be made during construction and the original problems are reoccurring. The soil survey provides detailed soil maps suitable for determining specific site limitations.

Soil information has been obtained from the Natural Resources Conservation Service, formally known as the Soil Conservation Service. According to the Santa Rosa County Health Department, there is no known information as to problems in the areas presently served by septic tanks in Santa Rosa County.

6-3 EXISTING REGULATORY FRAMEWORK

A. Federal

The Federal Water Pollution Control Act, Public Law 92-500, and its amendments through the Clean Water Act (1977 and 1982) and the Water Quality Act of 1987 regulate sanitary sewer services on the Federal level. The goal of these acts is the restoration and maintenance for the chemical, physical and biological composition of the nation's water bodies. The acts established policies of implementation of area-wide waste treatment and management to ensure the control of sources of pollutants. Local governments were required to develop plans for construction of facilities to treat "point" sources of pollution, including effluent from sewage treatment plants. The Environmental Protection Agency (EPA) is responsible for implementation of the act.

The Clean Water Act of 1972 called for the EPA to develop national pretreatment standards to control industrial discharge into sewage systems. All publicly-owned treatment works (POTWs) must enforce the Federal standards. The National Pretreatment Program is a cooperative effort of federal, state, and local officials for reducing undesirable industrial wastewaters introduced into municipal sewers. The overall framework for the National Pretreatment Program is contained in the General Pretreatment Regulations that the EPA established in 1978 and modified in 1981. These regulations require all large POTWs – more than five million gallons, and smaller POTWs with significant industrial discharges, to establish local pretreatment programs. Similarly, the National Pollutant Discharge Elimination System (NPDES) regulates the direct discharge of wastewaters to surface waters. Under this program, a NPDES permit is required for POTWs and industries before discharging wastewater directly to surface waters. The permits require compliance with all federal standards and may also require additional controls based on local conditions.

B. State

The *Florida Department of Environmental Protection (DEP)* is responsible for carrying out the Water Pollution Control Act and the Clean Water Act at the State level. Chapter 62-600 (formerly Chapter 17-6) of the Florida Administrative Code states the rules established by DEP for regulation of sewer facilities. The rules apply to facilities which treat flows exceeding 10,000 gallons per day (gpd) for residential and a 5,000 gpd for commercial and industrial.

The *Florida Department of Health* or Santa Rosa County Health Department regulates septic tank and drain field installation in the State. Within each County, the DOH has an office to regulate septic systems. These regulations have been adopted by rule in Chapter 64E-6. While 64E-6 does not set the criteria for septic tank effluent quality, it does require that septic tanks are installed in such a manner that, with reasonable maintenance, they will not create a health hazard or endanger the safety of any domestic water supply (groundwater or surface water). In addition, 64E-6 also establishes criteria for mandatory connections to wastewater and potable water systems.

The *Florida Public Service Commission* has the responsibility for regulating the rates and service of privately-owned water and sewer utilities in counties where the Board of County Commissioners has officially transferred jurisdiction to the commission. This authority was set out by Chapter 367, F.S., in the

"Water and Wastewater System Regulatory Law." The commission establishes service standards which regulated utilities must meet. Section 367.171 provides for the adoption of a resolution where counties may transfer authority to regulate services to the Public Service Commission. Within Santa Rosa, most privately-owned utilities are regulated locally by the Water and Sewer Authority, as discussed in more detail under County regulatory framework. Only large multi-jurisdictional private utilities whose operations extend beyond Santa Rosa are regulated b the PSC.

Additional State Statutes and Rules

In addition, the Sanitary Sewer Element of the Comprehensive Plan must remain consistent with the State Comprehensive Plan, Chapter 163, Part II of the Florida Statutes (F.S.), and Rule 9J-5 of the Florida Administrative Code (F.A.C.).

The State Comprehensive Plan, Chapter 187, F.S. contains the adopted goals and policies of the State of Florida. The State Comprehensive Plan establishes legislative framework, or direction, which all the State government agencies must be consistent with. Since the original plan adoption in 1990, various sections of the State Plan were amended. These amendments included the adoption of a new goal and supporting policies pertaining to "Health" and a new policy was added to the goal of "Agriculture", which are applicable to the Sanitary Sewer Sub-Element. This goal states that the State should have "an environment which supports a healthy population and which does not cause illness. Several policies were also added to support this goal which include :

- Every Florida resident has a right to breath clean air, drink pure water and eat nutritious foods;
- The State should assure a safe and healthful environment;
- Future growth will not cause adverse impacts to the environment and people's health; and
- Employers shall provide a safe and healthful workplace.

In addition, the policy added to the "Agriculture" goal states that Florida will "eliminate the discharge of inadequately treated wastewater and storm water runoff into waters of the state".

Several amendments have also been made to Chapter 163, F.S. which indirectly affect the Sanitary Sewer Sub-Element. In 1993, Section 163.3180(2)(a) was added by the State Legislature requiring local governments to have certain types of public infrastructure, including sanitary sewer, to be in place at the time a certificate of occupancy (CO) is issued for new developments. Then in 1994, Chapter 163 added a requirement that states that "each independent special district must submit a public facilities report to the appropriate local government," to achieve greater coordination. This procedure will aid the county in formulating the Comprehensive Plan and implementing the land development regulations that provide strategies which maximize the use of existing facilities and services. In an attempt to promote redevelopment, urban infill development, and other strategies for urban revitalization, Chapter 163 also included a new section which mandates that "local government's Comprehensive Plans implement development regulations must provide strategies which maximize the use of existing facilities and services."

In addition, setback distances for newly constructed public drinking water wells are described in Chapter 17-555.312, FAC. Public water supply wells serving water systems having total sewage flows greater than 2,000 gallons per day shall be placed no closer than 200 feet from septic tanks. Public water supply wells shall be placed no closer than 100 feet from septic tanks for sewage flows less than or equal to 2,000 gallons per day. In accordance with Chapter 17-610, FAC, Reuse of Reclaimed Water and Land Application, a 500-foot setback distance shall be provided from the edge of the wetted reuse area to potable water supply wells. The distance is reduced to 200 feet if facility Class I reliability is provided in accordance with Rules 17-610.462 (1), FAC or 100 feet if facility Class I reliability is provided and if high-

level disinfection if provided. Public drinking water supply wells shall not be constructed within 300 feet of storage and treatment facilities of dairy farms or closer than 100 feet from other sanitary hazards. As much as practical, wells are to be located on ground least subject to localized flooding and upstream of sanitary hazards.

C. Regional

The West Florida Regional Planning Council adopted the Strategic Regional Policy Plan (SRPP) in 1996. This document provides a long-range guide for the economic, physical, and social development of West Florida. The following themes from within the Natural Resources of Regional Significance (NRRS) pertain to the Sanitary Sewer Element:

- Require buffer zones around water bodies, landscaping techniques that minimize erosion, and proper maintenance of onsite domestic waste treatment facilities so as to protect water quality.
- Protect wetlands from pollution and unnatural degradation due to development.
- Implement intergovernmental coordination and interlocal agreements for cost-sharing in the planning and construction of new area-wide wastewater treatment and solid waste facilities, where feasible.
- Allow the use of reclaimed wastewater for irrigation.
- Prohibit any activities that would introduce wastes or other by-products into the groundwater system via recharge areas.
- Coordinate with HRS public county health units to ensure required upgrading of defective septic tank systems or tie-in to central sewer to meet state regulations.
- Amend septic tank zoning and permitting procedures to prohibit the construction of septic tanks in 100-year floodplains.
- Where conditions are inadequate to support alternative wastewater disposal systems require that an adequate sewer system is in place or will be in place by the time a subdivision is ready for occupancy before subdivision permitting occurs.
- Identify areas served by septic tanks and develop plans to provide sewer service within a twenty-year period.
- Coastal communities should adopt and implement regulations that limit stormwater and wastewater discharges into estuaries.
- Require all developments adjacent to marine, aquatic, and estuarine areas to include structural and/or nonstructural facilities for treatment of stormwater and domestic waste that are sufficient to eliminate any chance of degradation of these areas.

D. Local

The *Santa Rosa County Utility Board* is responsible for the regulation of the majority of the privately owned water and wastewater utilities in Santa Rosa County, while the private wastewater utilities with operation both within the County and outside of the County are regulated by the Public Service Commission (PSC). The Utility Board is composed of a five-member board, appointed by the Board of County Commissioners for four year terms. Their responsibilities extend to all utilities that provide water, including non-potable water, or sewer services within the unincorporated area of Santa Rosa County. Both the Utility Board and the Public Service Commission are responsible for regulation of the rates and the service area boundary.

Chapter 22 of the County's Code of Ordinances serves to regulate public utilities including wastewater and potable water facilities within the County. These regulations include the issuance and modification of franchise certificates, franchise operation, utility rate increase requests, operational procedures, abandonment of facilities, and reports.

The *Santa Rosa Environmental Health Department* is responsible for permitting, installation and operation of septic tanks and drain fields within the County. The Health Department follows guidelines established by DOH and DEP. The Health Department also oversees monitoring of septic tanks once in operation if there is any evidence of contamination to ground or surface water supply. This monitoring process is done in accordance with DEP and DOH standards.

Package treatment plants are also under the jurisdiction of the County Health Department in accordance with county and state regulations. Before any building permit is issued, septic tank sites and package treatment plant sites have to be inspected. Septic tanks and package treatment plants have to be operating properly before the permit is issued.

Article 5 of the County's Land Development Code addresses Concurrency Management. In relation to sanitary sewer facilities, these regulations provide the County with guidelines for determining the availability of adequate facility capacity in the evaluation of development orders, provides criteria for concurrency review of these development orders, and provides level of service standards for these facilities. These issues, along with others that are discussed in more detail within the regulations, help to shape development within Santa Rosa County, which will in turn ensure that adequate facilities are provided to support the rapid growth of the area.

6-4 DATA AND ANALYSIS

A. Septic Tank Systems

Septic systems are generally small and designed to serve one or a limited number of land uses. Despite expansion of the wastewater collection network, many residents within the unincorporated portion of the County do not have access to wastewater treatment facilities or package treatment plants. For these land uses, wastewater treatment and disposal is provided by individual septic systems.

Septic tank systems provide on-site wastewater treatment for both residential and small-scale commercial developments. Residential septic tanks usually range in capacity from 900 to 1,000 gallons. Generally, commercial septic tanks have a larger capacity. Since effluent from septic tanks is discharged to the drain field where it is allowed to percolate into the soil, soil permeability and depth to the water table are limiting factors for septic tank use. To ensure adequate performance and protect groundwater quality, elevation of septic tank drain fields is often required.

Beginning in 1985, Santa Rosa County's Health Department began using a computer-aided database to track records for new septic tank systems, as well as repairs on existing systems. This database is used to track information such as permit number, location, soil type and system type (i.e. mound or standard). The number of systems that have been ~~permitted~~ installed from 19~~85~~90-~~2001~~07 is represented in *Table 6-1*, on the following page.

Table 6-1
Number of Septic Tanks ~~Permitted~~ Installed within Santa Rosa County
~~1985-2001~~1990-2007

Year	*Number of Facilities*
~~1985~~	~~1,838~~
~~1986~~	~~1,428~~
~~1987~~	~~1,425~~
~~1988~~	~~1,279~~
~~1989~~	~~831~~
1990	~~769~~1,127
1991-92	1,136
1992-93	~~1,256~~1,197
1993-94	~~1,682~~1,260
1994-95	~~2,130~~1,535
1995-96	~~1,168~~1,147
1996-97	~~1,304~~1,352
1997-98	~~1,387~~1,193
1998-99	~~1,308~~541
1999-00	~~1,237~~481
2000-01	~~815~~679
2001-02	~~830~~676
2002-03	666
2003-04	921
2004-05	1,301
2005-06	1,320
2006-07	806
2007-08	503

Source: Santa Rosa County Health Department, Division of Environmental Health~~,~~website ~~2002~~1/16/2009.

The decline in septic tanks over the last four years can be accounted for primarily by the fact that the service areas for the wastewater facilities of the County continue to grow.

Other factors contributing to this steady decrease in septic tank systems include the implementation of more stringent regulations, thus making it more difficult to have a new system permitted by the Santa Rosa County Health Department, and the increased urbanization of what were previously rural areas of the County.

Nevertheless, the use of septic tank systems remains advantageous in rural settings where housing densities are low and where soil characteristics allow their use. However, there are still some disadvantages to these systems, which include:

- System overflows and surface water and adjacent water well pollution if the systems are not properly maintained.
- Unfavorable soil characteristics and system densities may cause the potential for groundwater pollution.

- Cleaners used for system maintenance, especially those which are organic based may cause difficulties with ground water pollution.

In Santa Rosa County, septic tanks, at a minimum, must comply with current State standards including suitable soil types and minimum lot sizes. The County shall continue to enforce State standards through the County Health Department Review of applications for septic tanks. In some cases the septic tank may meet DOH standards, but the cumulative effect of many septic tanks in an area can cause severe problems to ground and surface water. The County is discouraging the use of septic tanks in areas where it is feasible to connect to a central system.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or performated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented hardpan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented hardpan interfere with installation.

Soils of Santa Rosa County

The Soil Survey of Santa Rosa County, provided by the Soil Conservation Service, 1977, provides a five-class system for defining soil potential. The potential of a soil is the ability of that soil to produce, yield or support the given structure or activity at a cost expressed in economic, social or environmental units of value. The criteria used for rating soil potential include the relative difficulty or cost of overcoming soil limitations, the continuing limitations after practices in general use in overcoming the limitations are installed and the suitability of the soil relative to other soils in the County. A five-class system of soil potential is used. The classes are defined as follows:

- Very high potential - Soil limitations are minor or are relatively easy to overcome. Performance for the intended use is excellent. These soils are the best in the survey area for the particular use.
- High potential - Some soil limitations exist, but practices necessary to overcome the limitations can be installed at reasonable cost. Performance for the intended use is good.
- Medium potential - Soil limitations exist and can be overcome with recommended practices; limitations, however, are mostly of a continuing nature and require practices that are more difficult or costly than average. Performance for the intended uses range from fair to good.
- Low potential - Serious soil limitations exist and they are difficult to overcome. Practices necessary to overcome the limitations are relatively costly compared to those required for soils of higher potential. Necessary practices can involve environmental values and considerations. Performance for the intended use is poor or unreliable.
- Very low potential - Very serious soil limitations exist and they are most difficult to overcome. Initial costs of practices and maintenance cost are very high compared to those soils with high potential. Environmental values are usually depreciated. Performance for the intended use is inadequate or below acceptable standards.

Since installation of septic tanks began prior to accurate record keeping, the location and number of all septic tanks within the County is unknown. Considering the tremendous number of septic tanks which are located throughout the County, it is interesting to note that out of the eleven different general soil series found in the County only five have very low ratings for septic tank absorption fields (Pactolus-Rutlege-Mulat, Bibb-Kinston-Johns, Dorovan-Pamlico, Bohicket, and Chewacla-Wahee-Riverview). These soils are generally coterminous with the presence of wetlands, floodplains and marshes. Five of the eleven soils have high or medium ratings for septic tank absorption fields (Ortega-Kureb, Red Bay-Lucy, Troup-Orangeburg-Dothan, Dothan-

Orangeburg, and Troup-Dothan-Bonifay) while one is rated as very high (Lakeland-Troup). Following are descriptions of the soils in Santa Rosa County. Map 3-7 of the Future Land Use Map Series identifies the soils in the county.

Lakeland – Troup: Nearly level to strongly sloping soils; some are excessively drained and sandy throughout, some are well drained and have at least 40 inches of sand over a loamy subsoil. This unit is primarily in the southeastern part of the County. It consists of broad areas of rolling sandhills interspersed with long, narrow bottom lands surrounded by steep side slopes. The Troup soils are generally on side slopes in the sandhills and in broad areas in other parts of the County. The Lakeland soils generally are higher than the Troup soils, but in some places are at the same elevation. These soils are not normally used for crops and pasture because of low available water capacity and steepness in some areas.

Ratings for septic tank absorption fields: Lakeland - Very high; Troup - Very high

Ortega – Kureb: Nearly level to gently sloping, moderately welled drained and excessively drained soils that are sandy throughout. This unit is in the flatwoods in the southern part of the County This unit is higher than the surrounding soils. Ortega soils are on the high ridges, Kureb soils are at the higher elevations. The soils in this unit are poorly suited to cultivated crops and improved pasture. Droughtiness is the main limitation.

Ratings for septic tank absorption fields: Ortega - Very high; Kureb - High

Red Bay – Lucy: These soils are nearly level to sloping, well drained, loamy and sandy soils that have a red or dark red, loamy subsoil. This unit consists of cleared and cultivated farmland in the northwestern part of the County near the Town of Jay. A few thousand acres of this unit is near the center of the County around Allentown, where farming is also quite extensive. The areas are mostly large and the soils flat; the sloping soils are along the edges of the fields near sandy bottomed creeks or streams. Most of this unit is used for cultivated crops. Nearly all of the acreage has been cleared and is farmed extensively.

Ratings for septic tank absorption fields: Red Bay - High; Lucy - High

Troup – Orangeburg – Dothan: Sloping to strongly sloping, well drained, sandy and loamy soils that have a loamy subsoil. This map unit consists of undulating sandy soils on sides of steep hills separated by long, narrow stream bottoms. These areas are mainly in the extreme western and northwestern parts of the County where the uplands drop to the terraces adjacent to the Escambia River bottom land. A small area is on rolling terrain in the north central part of the County. The soils in this unit are poorly suited to cultivated crops. Steepness and susceptibility to erosion are the main limitations.

Ratings for septic tank absorption fields: Troup - Very high; Orangeburg – High; Dothan –Medium;

Dothan – Orangeburg: These soils are nearly level to sloping, well drained, loamy soils that have a loamy subsoil at a depth of less than 20 inches. This map unit is scattered throughout the County north of Highway 90. Most of the unit is in the north central part of the County. These soils are undulating. The soils in this unit have high potential for crops and pasture.

Ratings for septic tank absorption field: Dothan – Medium; Orangeburg - High

Troup – Dothan – Bonifay: Gently sloping to strongly sloping, well drained soils; some have 40 inches of sand over a loamy subsoil, and some are sandy or loamy and have a loamy subsoil at a shallow depth. This map unit is north of the City of Milton. This unit is higher than the surrounding soils. The soils are mainly undulating. The Troup soils are generally higher than the other soils in this unit. The soils in this unit have low potential for crops because of droughtiness and rapid leaching of plant nutrients.

Ratings for septic tank absorption field: Troup - Very high; Dothan – Medium; Bonifay -High

Pactolus – Rutlege – Mulat: This soil is level to gently sloping, somewhat poorly drained to very poorly drained soils that are sandy and loamy throughout. This map unit consists of broad, flat areas of soils that are normally wet during most years. This unit is in the southern part of the County and along the southernmost strip of land between East Bay and Santa Rosa Sound. A few small areas extend to the central part of the County, where this unit is lower than the surrounding soils. Pactolus soils are higher than the other soils in this unit. These soils are moderately well suited to commonly grown grasses such as Pensacola bahiagrass and Coastal bermudagrass.

Ratings for septic tank absorption field: Pactolus – High; Rutlege – Low; Mulat - Very low

Bibb – Kinston – Johns: Level soils; some are poorly drained and are stratified loamy and sandy material, and some are somewhat poorly drained and loamy. This map unit is in swamps and on floodplains and stream terraces throughout most of the County, except for the southern and southeastern parts. This unit is lower than the surrounding soils. The areas are generally long and narrow and are commonly surrounded by steep slopes or abrupt dropoffs from the uplands. The soils are sometimes flooded. The Bibb and Kinston soils are at the lower elevations on the floodplain, and the Johns soils are on the first stream terrace adjacent to the bottom land. These soils have medium potential for good pasture if the areas are cleared and water is controlled.

Ratings for septic tank absorption field: Bibb - Very low; Kinston - Very low; Johns - Medium

Dorovan – Pamlico: This soil is nearly level, very poorly drained, organic soils that are underlain by sandy material. This map unit is mainly in the southern part of the County. It consists of heavily vegetated swamps in wet depressional areas adjacent to the alluvial floodplains. Dorovan soils are mainly toward the center of the areas, and Pamlico soils are mainly closer to the outer edges. These soils are not suited to cultivated crops or pasture because of flooding and a constantly high water table.

Ratings for septic tank absorption field: Dorovan - Very low; Pamlico - Very low

Bohicket: Level, very poorly drained, clayey soils that are underlain by sandy and loamy materials. This map unit consists of low lying, wet soils in salt marshes. These soils are along the coast and the mouth of major rivers and streams in the southern part of the County. The areas are thoroughly dissected by numerous small bayous and streams. These soils are not suited to crops or pasture because of wetness and salt content.

Ratings for septic tank absorption field: Bohicket - Very low

Chewacla – Wahee – Riverview: This map unit is level, somewhat poorly drained and well drained, loamy soils. This unit consists of alluvial swamps. They are lower than the surrounding soils. This unit is along the western boundary of the County. This unit has a network of sloughs and old river beds that have been cut off from the main channel. The numerous lakes are almost filled with water. Chewacla and Wahee soils are at the lower elevations on the floodplain, and the Riverview soils are at the higher elevations. These soils are poorly suited to cultivated crops and pasture. Flooding by stream overflow is the major limitation.

Ratings for septic tank absorption field: Chewacla - Very low; Wahee - Very low; Riverview - Very low

B. Private Wastewater Treatment Facilities

There are basically three types of private wastewater treatment facilities used within the County today. These facilities include septic tanks, which have previously been discussed, individually owned package treatment plants and Franchised/Investor owned facilities.

B.1 Franchised/Investor Owned Treatment Facilities

There are four investor-owned/community-owned private utility companies within the County. The majority of these facilities serve the more heavily populated areas of the County and are predominantly in the central and southern part of the County.

Much of the residential development in the central and southern portions of the County is served by these private facilities. Future development wastewater needs will continue to be met through these facilities. The permitted design capacities for these franchise plants range in size from 0.0~~6~~5 million to ~~1.0~~2.99 million gallons per-day (MGD). These Franchised/Investor Owned Treatment Facilities are described further below:

Avalon Utilities

The Avalon Utilities wastewater treatment plant is permitted as a 0.1 mgd extended aeration type facility. The current flow to the plant is about ~~0.09~~0.02 mgd. The effluent from the plant is discharged via spray irrigation to the Moors Golf Course. The service population for this plant is approximately ~~204~~473, which provides a level of service of ~~44~~42 gallons per person per day. Even though the plant is currently operating at ~~9~~20% of capacity, Avalon Utilities expects to expand their system during the planning period.

~~Highway 191 Wastewater Treatment Plant~~/Sundial Utilities, Inc.

The Highway 191 WWTP is a nitrification/denitrification extended aeration with filtration type facility. The plant is permitted at ~~0.06~~0.15 mgd. Current flow to this plant is about ~~0.018~~0.062 mgd. The effluent from the plant is discharged via rapid infiltration basins. The service population for this plant is approximately ~~200~~1,380, which provides a level of service of ~~90~~45 gallons per person per day. Sundial Utilities is not expected to expand the capacity of this plant ~~to 0.25 mgd over the next 2 – 3 years~~during the next 5 years.

Holley-Navarre Wastewater System

The Holly-Navarre WWTP is a ~~1.0~~2.99 mgd extended aeration with filtration type facility. The current flow to the plant is about 0.642 mgd. The effluent from the plant is discharged via spray irrigation to a golf course with a wetted area of 93.6 acres. The service population for this plant is approximately 10,391, which provides a level of service of 62 gallons per person per day. The Holley-Navarre Water System is currently in the permitting stage and expects to expand their system to 2.0 mgd within the next 2 years.

Pace Water System

The Pace Water System WWTP is a ~~2.0~~1.6 mgd facility with oxidation ditches (nitrification/denitrification), clarification and filtration. The current flow to the plant is about ~~0.85~~1.245 mgd. The effluent from the plant is discharged via slow rate spray field irrigation to 118 customers including Stonebrook Golf Course and Pace swamp. The facility also contains a 504,000 gallon reject pond. The service population for this plant is approximately ~~12,105~~13,210, which provides a level of service of ~~70~~94 gallons per person per day. Due to the growth in the Pace/Pea Ridge area of the County, the Pace Water System expects to expand their system to ~~4.0~~5.0 mgd within the next 5 years.

B.2 Individually-Owned Package Treatment Plants

There are currently two individually-owned package treatment plants operating within Santa Rosa County. Each of these systems serves individual subdivisions or developments, and therefore, have no defined service areas. The classic problems associated with package treatment plants include:

- Minimum building construction standards
- Minimum or poor maintenance
- Irregular monitoring
- Improper disposal of effluent (i.e., effluent is disposed of in a nearby water body or a retention pond) which in turn can cause a decrease in surface and groundwater quality.

C. Public Wastewater Treatment Facilities

Within Santa Rosa County (including the unincorporated areas and municipalities of the County) there are six public wastewater treatment facilities (WWTF). Santa Rosa County owns and operates one public WWTF at Navarre Beach, the City of Milton owns one WWTF, the Town of Jay owns one WWTF, and the City of Gulf Breeze owns one WWTF. Completing the list of public facilities, the Department of Transportation (DOT) and the Department of Corrections each own one WWTF respectively. *Map 6-1* (Appendix A) depicts the sewer service areas.

C.1 Santa Rosa County Facility

As stated previously, Santa Rosa County owns and operates a WWTP at Navarre Beach. This is a 0.9 mgd permitted facility. The plant uses ~~an oxidation ditch with flow equalization, tertiary filters, chlorination and dechlorination~~activated sludge with nutrient removal treatment system. Current flow to the plant is about 0.~~378~~216 mgd. The effluent from the plant is discharged into the Class III Zone of Santa Rosa Sound. The plant is operating under a consent decree from the Department of Environmental Protection while the County works to develop an alternative effluent discharge point. The County is currently working with the Eglin Air Force Base Encroachment Committee to allow the effluent from the Navarre Beach WWTP to be discharged onto Eglin Air Force Base via spray irrigation. The service population for this plant is approximately ~~4,591~~5,823, which provides a level of service of ~~82~~37 gallons per person per day. No expansion of this treatment facility is expected during the planning period.

C.2 City of Milton Facility

The City of Milton WWTP is a 2.5 mgd facility, which uses an oxidation ditch and aeration basin. Current flow is about 1.~~344~~8 mgd. The effluent from this plant is discharged into the Blackwater River, which flows into Blackwater Bay and East Bay. The service population for this plant is approximately ~~9,829~~10,699, which provides a level of service of ~~136~~138 gallons per person per day. The City is currently examining the need to expand their system by 1.0 mgd in the East Milton area during the planning period.

C.3 Town of Jay Facility

The Town of Jay WWTP is a 0.12 mgd facility. Current flow is about ~~0.064~~0.48 mgd. The effluent from this plant is discharged via a percolation pond. The service population for this plant is approximately ~~328~~755, which provides a level of service of ~~195~~64 gallons per person per day. The level of service for this plant is skewed due to the heavy use by the hospital and the high school. No expansion is expected during the planning period for this plant.

C.4 City of Gulf Breeze Facility

The City of Gulf Breeze owns and operates South Santa Rosa Utilities. The WWTP is permitted overall at 2.0 mgd and uses the bardentho process. However, for effluent disposal, the plant is permitted at 1.777 mgd. Current flow is about 1.3 mgd. The effluent from this plant is discharged via a holding pond to spray irrigation at Tiger Point Golf Course. The service population for this plant is approximately 12,702, which provides a level of service of 102 gallons per person per day. The City expects to expand their system by an additional 1.0 mgd during the planning period.

C.5 Public Agency Facilities

In reference to public wastewater systems, there are two package treatment plants owned and operated by public agencies (i.e., Department of Transportation (DOT) and Department of Corrections). Since these individual wastewater systems are owned by public agencies, these systems can also be considered public systems.

D. Sanitary Sewer Analysis

The Existing Conditions section identified all of the wastewater facilities (Public and Private) located within Santa Rosa County. A close examination of these facilities is necessary to determine the current, as well as future, needs of Santa Rosa County. The items that will be analyzed include minimum level of service (LOS) standards, wastewater treatment plant needs based on existing and future population and demographic characteristics, and the identification of existing problems and future needs. These items will form the basis for developing the goals, objectives and policies. The next section will identify existing and future population and demographic characteristics, wastewater treatment plant needs based on existing and future population characteristics, conditions under the current delivery strategy and management alternatives. By analyzing the existing conditions and identifying the County's projected future needs meaningful goals, objectives and policies can be established.

D.1 Population Projections

Sewage connection growth is projected at seventy percent of the water system growth rate. The indirect projection method for sewage system growth is necessary because there is limited sewage system historical operating data from which a direct projection may be made. Some of the growth will occur within redeveloped areas that are currently on septic tanks, but the majority of new growth will be from new developments. The overall population projections shown in *Table 6-2*, on the following page, were obtained from the University of Florida's Bureau of Economic Business Research and the Santa Rosa County Community Planning, Zoning and Development Division.

The County's population trends were based on historical population data and projected to the year 2020. The projections were then utilized throughout the Comprehensive Plan. Therefore, the actual and anticipated rates of development for the County have been primarily consistent from one element to the next. A large percentage of residential development has taken place in the central and southern portions of the County. These areas are currently serviced by roads, water, sewer, or septic facilities and solid waste collection. However, some of these areas are served by septic tanks and potable water wells. New development is subject to the requirements of the Concurrency Management System and may be obligated to provide new infrastructure to coincide with the development. Infrastructure obstacles are limited to specific geographic areas of the County and any existing problems tend to encompass only one public facility type.

Table 6-2
Santa Rosa County Population Projections: 2000-202~~0~~5

Unincorporated Santa Rosa County		*Incorporated Cities*			*Total*
Year		*Town of Jay*	*City of Milton*	*City of Gulf Breeze*	
2000	104,454	579	7,045	5,665	117,743
200~~57~~	~~120,779~~127,411	~~561~~572	~~6,989~~7,717	~~5,719~~5,805	~~134,080~~142,144
2010	~~139,677~~135,069	~~539~~408	~~6,918~~7,297	~~5,696~~5,476	~~152,872~~148,250
2015	~~157,782~~150,294	~~501~~343	~~6,786~~7,345	~~5,693~~5,460	~~170,781~~163,443
2020	~~176,280~~164,422	~~451~~279	~~6,544~~7,393	~~5,599~~5,446	~~188,800~~177,541
2025	178,093	222	7,466	5,458	191,239

Source: Santa Rosa County Community Planning, Zoning and Development Division; Bureau of Economic Business Research – University of Florida, ~~2001~~2008

D.2 Conditions Under Current Delivery Strategy

Table 6-3, on the following page, describes Wastewater Treatment Facilities in Santa Rosa County, which consist of the following:

- Regional Facilities
- Investor/Community Owned Utility Companies
- Package Plant Systems
- On-site Disposal Systems (septic tanks)

The City of Milton, the City of Gulf Breeze, Pace Water System and Holley-Navarre Water System provides central services to the more urbanized areas of the County. Two governing boards regulate wastewater system boundaries and water system rates in the County: the Public Service Commission (PSC) and Santa Rosa County Utility Board. However the construction and operation of these wastewater systems are regulated through DEP.

These utility companies primarily serve the municipal areas and the large residential developments that have been growing along the U.S. Highway 98 and the U.S. Highway 90 corridors of the County.

Septic tanks and the smaller private package treatment plants are operated throughout the County, predominantly in the more rural areas. Package treatment plants provide secondary level treatment and the discharge is located at the plant in holding ponds. Evaporation, percolation and drain fields are the most common methods of discharge for package treatment plants. The majority of package treatment plants operating in the County use this type of disposal, others discharge into nearby swamps, creeks and rivers. Package treatment plants, when they are not operating correctly, can cause serious environmental problems to surface and ground water.

Table 6-3
Current Conditions of the Public Wastewater Treatment Facilities
Santa Rosa County, June 2001 – August 2001

Facility Name	*DEP ID #*	*Design Capacity*	*Average Daily Flow*	*Treatment Type*	*Type of Disposal*
Berrydale Forestry Camp WWTP	010233	0.050 MGD	0.088 MGD	Extended Aeration	Spray Irrigation
I-10 Rest Stop East WWTP	010221	0.0086 MGD	0.0078 MGD	Extended Aeration	Percolation Pond
Holley-Navarre WWTP	010211	~~1.0~~2.99 MGD[2]	0.~~6~~42 MGD	Extended Aeration	Spray Irrigation
Town of Jay WWTP	010206	0.120 MGD	0.~~06~~4048 MGD	Oxidation Ditch	Percolation Pond
City of Milton WWTP	021903	2.5 MGD	1.~~34~~48 MGD	Oxidation Ditch	Surface Water Discharge
Adrian Woods Subdivision/ Garcon Utilities WWTP	010219	0.060 MGD	0.0015 MGD	Nitrification/ Denitrification	Spray Irrigation
Navarre Beach WWTP	023981	0.90 MGD	0.~~378~~216 MGD	Oxidation Ditch	Surface Water Discharge
Pace Water System WWTP	102202	~~2.5~~1.6 MGD	~~0.850~~1.245 MGD	Oxidation Ditch	Spray Irrigation
South Santa Rosa Utilities WWTP	010212	1.4 MGD	1.3 MGD	Contact Stabilization	Spray Irrigation
Avalon Utilities WWTP	010218	0.10 MGD	0.01 MGD	Extended Aeration	Spray Irrigation
~~Highway 191~~/Sundial Utilities WWTP	016779	0.0~~6~~25 MGD	0.01~~8~~62 MGD	Extended Aeration	Spray Irrigation

Santa Rosa County Regional Reclaimed Water System	349721	0. 25		Biological Nutrient emoval Unit	Aeration Basins and Clarifiers
South Santa Rosa Utility System East	3998580	0.7			
Holley Wastewater Reclaimation Facility	548464	0.25			

Source: Florida Department of Environmental Protection, 1/5/2009.

D.3 Potential Sources of Groundwater Pollution to Natural Recharge Areas

It is important to consider the water quality of the groundwater resources when planning for the wastewater needs of the County. Improper, or careless, discharge of effluent from a treatment plant may result in groundwater pollution, thus affecting many residents downstream. Therefore, it is important to consider and analyze the natural recharge areas of the groundwater supply in the wastewater planning process.

A natural recharge area is defined as an area, which is contributing to or providing volumes of water, which make a contribution to the storage or regional flow of an aquifer. There are no Floridan Aquifer recharge areas in Santa Rosa County, however, there are Sand and Gravel Aquifer (Surficial Aquifer) recharge areas predominately in the northern part of the County. Potential pollution sources that are of concern within this sub-element include septic tank systems, small package treatment plants, and the potential for unpermitted discharge of the larger public facilities in Santa Rosa County. Within this area, package treatment plants are of primary concern as they potentially provide lower levels of treatment than the larger public facilities.

E. Level of Service Standard

In 1991, Santa Rosa County established the Concurrency Management System through Ordinance 91-24. The Concurrency Management System is based on the adopted Level of Service (LOS) established in Policy 6.1.B.2 of the Infrastructure Element. The reservation of capacity is based on the capacity being provided at the LOS standard of a minimum of 90 gallons per capita per day (gpcd). The County has complied with this LOS standard.

F. Implementation

The majority of the sanitary sewer providers in the County are private companies or municipal providers. This trend is expected to continue in the future, however, revenue sources are available to the County to expand its sanitary sewer capacities if necessary and/or desirable. New sources of revenue consist of unit connection fees and general revenue. The available funding options include, but are not limited to, Water and Sewer Revenue Bonds, the State Revolving Fund Loan, Private Equity/Industrial Development Bonds, User Fees, and Capital Cost Recovery Charges (or Impact Fees).

F.1 Water and Sewer Revenue Bonds

Water and Sewer Revenue Bonds are long-term utility revenue bonds which can be sold to raise the required capital funds. Such debt would be backed by the pledge of system revenues, including a rate covenant in the bond resolution that requires rates to be sufficient to generate the requisite cash needs. In addition, in the case where the implementing entity possesses taxing powers, the bonds may be further backed by a pledge of ad valorem taxing powers.

F.2 The State Revolving Fund Loan

The State Revolving Fund Loan (SRFL) is a low interest loan managed by the Florida Department of Environmental Protection. It replaces the EPA Grant Program by making available subsidized loans with an interest rate approximately 3 percent lower than the bond market. It is funded by a combination of federal and state appropriations.

In a cost comparison, the savings in using the SRF loan instead of conventional bond borrowing for eligible wastewater projects results in substantial savings over the term of the borrowing.

For every $1 million of construction cost, there is a savings of approximately $865,000 in debt service cost over the 20 year life of the loan. The savings are not only in the interest rate but also in the cost of financing. The debt service reserve requirement is only 2 percent of the debt service principal. The capitalized interest is accrued only as funds are drawn for construction invoicing instead of being included in the up front project amount. The savings in financing related costs is about $245,000 which means you are borrowing less and, therefore, paying interest on less principal. State revolving loans are a practical and realistic way in which to fund the construction of new or improve existing facilities.

F.3 Private Equity/Industrial Development Bonds

A third viable option is Private Equity/Industrial Development Bonds. It is possible that a private party would implement, own and operate the desired facilities. In fact, as a result of the reduction in federal grant support, there has been a corresponding increase in interest in the private ownership of facilities is well established. Many small treatment facilities are owned and operated by private parties.

In the case of private ownership, the financing would be affected through an equity contribution by the private party and, presumably, through the sale of tax exempt industrial development bonds (IDB). However, the private ownership option would require a much more extensive feasibility study due to recent tax law changes and ceilings placed on IDB issues. Thus, for the purpose of this study, private ownership is not recommended.

F.4 User Fees

In addition, capital funds could be acquired through additional charges on existing user fees. In the case of an existing wastewater treatment service, user charges could be increased and the resulting funds could be accumulated in a capital improvements fund, to be utilized for the construction of the proposed additional facilities. Such funds would not pay for a significant amount of the required capital costs; thus, they would be utilized in combination with the other means of acquiring capital funds.

F.5 Capital Cost Recovery Charges

Capital Cost Recovery Charges, or impact fees are fees designed to recover the cost of providing capacity for new customers. A decision of the Florida Supreme Court in the case of *Contract & Builders Assn. v. The City of Dunedin* is considered to set a precedent for the use of impact fees to finance system expansion and improvements. In Dunedin, the judges ruled that the City's impact fee ordinance was invalid

because it did not expressly limit the use of impact fees to expansion of the treatment capacity of the system. The decision outlined the basic requirements of an equitable impact fee structure. They are:

- Impact fees must reflect a pro rata share of the cost of new capacity.
- Impact fee receipts may be applied only to capital projects expressly designed to expand system capacity.
- Anticipated impact fee receipts may not exceed the costs to be incurred by the municipality in expanding capacity to accommodate new users of the system.