Potable Water
FOUNDATION DOCUMENT

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Potable Water

9-1 INTRODUCTION

Potable water is the term applied to water that is considered fit for human consumption. This resource is not only used as drinking water, but for cooking, washing clothes and dishes, bathing, and other various commercial and industrial purposes. Within Santa Rosa County, the average daily usage of potable water is approximately 100 gallons per person per day (gpcd).

With the rapid growth rate of Santa Rosa County, an important part of the planning process is the evaluation of the potable water resources available. The availability of potable water has major implications regarding the type and density of development an area can accommodate. The availability of potable water is dependent on the type and capacity of facilities, the existing regulations, and the nature of the intended use. Generally, potable water is made available through a system consisting of three principal components: a water source, treatment facilities, and a storage and distribution system.

The purpose of the Santa Rosa County Potable Water Element is to identify existing and future sources of potable water supply, potable water needs; determine the adequacy of existing facilities to meet those needs and to define operational responsibilities, geographic service areas, and the level of service provided to the customer. The analysis of the existing conditions and future needs then serves as a basis for formulating suitable recommendations concerning the management of the potable water system, in addition to formulating the Goals, Objectives and Policies for effective management of the potable water resource in the future.

A. Organization of the Element

This element is divided into four sections: the Introduction, Terms and Concepts, Existing Regulatory Framework, and Data and Analysis. Terms and Concepts define the terms used 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 condition of the County's existing utility systems, both public and private. Also included within this section is an inventory of the City of Milton's facilities, the City of Gulf Breeze's facilities and a list identifying the number of privately owned facilities within the County. The Potable Water Needs and Assessments section describes the County's potable water facility standards, population and demographic characteristics, and provides a current and projected needs assessment at the recommended level of service. The Implementation section discusses funding sources and future actions to assist in the planning, design and implementation to ensure adequate water supply quantity and quality. Finally, the Conclusions and Recommendations section summarizes the main issues made throughout this document and includes recommendations based on the identified needs.

B. Relationship to other Elements of the Comprehensive Plan

There are several key linkages between the Potable Water Element and other elements of the Comprehensive Plan. These linkages are outlined on the following page:

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. Both the Future Land Use and Infrastructure Elements function together to implement many growth management strategies.

The *Conservation and Coastal Management Elements* identifies all of the County's natural resources and discusses various preservation techniques 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 School Board, the Florida Department of Environmental Protection, the Northwest Florida Water Management District or others, in the delivery of potable water resources.

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 demand for potable water. In addition, the Capital Improvements Element will reflect issues that should support the Goals, Objectives, and Policies of this Element.

The *Infrastructure Element* consists of five Sub-elements, Potable Water, Natural Groundwater Aquifer Recharge, Sanitary Sewer, Solid Waste, and Stormwater. The Potable Water Sub-Element, from a growth management perspective, will shape development trends into the next planning horizon. The preservation of potable water resources and their respective development allocations are major issues over this next planning timeframe.

9-2 TERMS AND CONCEPTS

Terms included in Appendix B of the Foundation Document are applicable to this element and are identified and described by the Florida Department of Community Affairs, in Rule 9J-5 of the Florida Administrative Code (F.A.C.) and in Section 163.3164, Florida Statutes (F.S.). All other terms and concepts used in this element are consistent with the intent of Rule 9J-5 and Chapter 163, F.S.

Average Household Size: It was determined that, for the Comprehensive Plan Amendments, the average household size within Santa Rosa County is 2.63 persons (2.63 persons per household based on 2000 Census data). This value is used to convert from population served to equivalent residential connections (ERCs) and equivalent residential unit (ERU) demand.

Consumption per Capita (per person): The amount of potable water consumed per person per day within Santa Rosa County.

Consumptive Use Permit (CUP): A permit for any use of water which reduces the supply from which it is withdrawn or diverted. A consumptive use permit must be obtained from the Governing Board of the Northwest Florida Water Management District (NWFWMD) before withdrawal of water shall be commenced for quantities set forth in Chapter 40D-2.031, F.A.C.

Equivalent Residential Connection (ERC): The number of connections to a water supply source or treatment system. This value is obtained from the population served, when divided by the average household size (2.63 persons per household).

Equivalent Residential Unit (ERU): The number of equivalent residential connection multiplied by the average number of persons per household. This figure is often used to compare commercial and industrial users with residential users to obtain applicable level of service standards.

Franchised System: These systems are smaller facilities, which are owned and operated by private utility companies.

Gallons per Day (gpd): Unit of flow measurement indicating both the amount of water leaving the plant, as well as the actual capacity of the plant.

Groundwater Recharge Areas: Areas contributing to or providing volumes of water which make a contribution to the storage or regional flow of an aquifer.

Potable Water: Water that is fit for human consumption.

Concepts

Water Supply and Treatment

Potable water is either produced from surface water obtained from lakes, rivers, man-made surface impoundments, etc., or groundwater. Surface water, groundwater, or a combination of the two constitutes a source of supply for potable water systems. The selection of the source of the potable water supply must consider the type and quality of the water resources available, the cost of developing the source for use, and the manner and cost of providing protection of the resource to ensure its long-term availability. In Santa Rosa County, as is the case in most of Florida, groundwater is the source of potable water.

The water withdrawn from the source is commonly referred to as raw water. This raw water typically requires treatment before being used for public consumption. Treatment removes impurities from the raw water in order to improve its quality for either public health or aesthetic reasons, or both. The treatment process adds to the cost of supplying water, but it also expands the range of raw water sources that can be used.

After treatment, the water is supplied to individual users via a system of pipes and storage reservoirs. In the smallest systems, for individual households or businesses, the entire potable water system is normally contained on the development site. In larger community systems the withdrawal and treatment may take place some distance away from the final users, and an extensive distribution network may be required. Large transmission lines, called distribution mains, carry water to major demand areas and interconnect with a network of smaller lines which eventually supply individual establishments. Both the distribution mains and distribution networks should be interconnected to allow water to circulate within the system to areas of highest momentary demand.

Water is delivered under pressure within the distribution system in order to ensure adequate flow to meet demands. Demand fluctuates during each day, usually exhibiting peaks during the morning and evening hours corresponding to periods of highest residential use. Localized demand peaks also occur when the system is designed and used for firefighting purposes. In order to provide adequate quantities and pressure to meet peak use and fire flow demands, storage tanks are linked with the distribution system at strategic locations. During low demand periods, these tanks are filled as water is pumped into the system. During the peak demand periods, water flows into the distribution system to augment flows and maintain pressure. Ground level and elevated storage tanks are both commonly used. Elevated storage tanks (water towers) are usually the most economical. Many systems also include auxiliary pumps, which operate during peak demand periods.

Potable Water Demand

The demand for potable water, and consequently the capacity of potable water systems, is described in terms of gallons per day (gpd). The basic unit normally used in estimating demand is based on consumption per capita (per person), expressed in gallons per capita per day (gpcd). It is an accepted practice to convert per capita demand to equivalent residential unit (ERU) demand based on the average household size within an area. Demand for non-residential uses, such as commercial or industrial users, are also frequently converted to ERU figures based on statistical records of average daily demand for the various non-residential users.

This means of measuring demand, either in gallons per capita per day (gpcd) or ERU, provides the means for establishing the level of service standard for a facility. For example, if average daily water use is 100 gallons per person per day, the level of service (LOS) standard would be expressed as:

LOS = 100 gpcd, average daily demand

If the average household size within the area is 2.5 persons per household, an equivalent way of expressing the LOS standard is:

LOS = 250 gpd per ERU, average daily demand

Similarly, if a commercial business uses 1,000 gallons per day per 1,000 square feet of floor area, the demand created by an establishment of 1,000 square feet would equate to 4 ERU on an average daily basis. By this method, future demand can be estimated by projecting the total population or dwelling units, plus the total ERU of non-residential users to be served by a facility. The needed capacity for a facility can therefore be projected.

9-3 EXISTING REGULATORY FRAMEWORK

A. Federal

The quality of the nation's water supply is protected by the Clean Water Act (33 CFR 320-220) and the Safe Drinking Water Act (40 CFR 141-149). The Clean Water Act mandates that states develop Water Management Plans for areas with substantial water-quality control problems and provides for the distribution of limited funds to pay for treatment facilities. The Management Plans regulate the location and construction of facilities that may produce discharges, require pretreatment of waste, and identify and control non-point sources of pollution. The act gives states the authority to determine the total maximum daily pollutants that affected waters can receive.

In 1974, the Safe Drinking Water Act (SDWA), Public Law 92-523, was established requiring the United States Environmental Protection Agency (EPA) to set primary and secondary drinking water standards and establish maximum contaminant levels for each contaminant that may have an adverse effect on human health. The "primary" standards are those required for public health and the "secondary" standards are those recommended for aesthetic quality. Subsequent to the original act, the 1986 Amendments to the SDWA were established as Public Law 99-339. These amendments included revisions to the National Primary Drinking Water Regulation requiring the regulation of 83 contaminants, defining and requiring treatment techniques for regulated contaminants, filtration of surface water, disinfection of all water supplies, prohibition of lead products in conveyance of drinking water, and protection of groundwater sources through the Wellhead Protection Program.

Under Section 1413 of the SDWA, "a state has primary enforcement responsibility for public water systems when such state has adopted drinking water regulations which are no less stringent than the national primary drinking water standards in effect." As such, the State of Florida [through the Florida Department of Environmental Protection (FDEP)] is authorized with the responsibility of enacting and enforcing the 1986 Amendments to the SDWA.

B. State

Department of Environmental Protection

In accordance with federal requirements, the Florida Legislature has adopted the Florida Safe Drinking Water Act, Section 403.850-403.864, Florida Statutes (F.S.). The Florida Department of Environmental Protection (DEP) is the state agency responsible for implementing this act. In this regard, DEP has promulgated rules classifying and regulating public water systems under Chapter 62-550 of the Florida Administrative Code (F.A.C.). The primary and secondary standards of the Federal Safe Drinking Water Act are mandatory in Florida. Specific state drinking water regulations are under (1) Chapter 62-550 of the F.A.C., Drinking Water Standards, Monitoring and Reporting, (2) Chapter 62-555 of the F.A.C., Permitting and Construction of Public Water Systems and (3) Chapter 62-~~562~~560 of the F.A.C., Public Water System Non-Compliance Requirements.

Chapter 17-555, F.A.C., addresses the permitting requirements for public water systems including the location and construction of wells serving the system and the treatment plant.

Section 381.261, F.S., gives general supervision and control over all private water systems and certain public water systems to the Department of Health. The public water systems under the Department of Heath control include systems that meet all of the following criteria:

- Consist of distribution and storage facilities only and do not have any collection or treatment facilities;
- Obtain all water from, but are not owned or operated by, a public water system to which such rules apply;
- Do not sell water to any person;
- Are not carriers which convey passengers in interstate commerce;
- And which also have at least 15 service connections or which regularly serve at least 25 individuals daily at least 60 days out of the year.

The Department of Health also has supervision and control of all water systems that "have less than 15 service connections used by year-round residents or serve less than 25 individuals daily at least 60 days out of the year or at least 25 individuals daily less than 60 days out of the year." Private systems are regulated in accordance with Chapter 10D-4, F.A.C.

Setback distances for newly constructed public drinking water wells are described in Chapter 62-555.312, F.A.C. 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 62-610, F.A.C., 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 62-610.462 (1), F.A.C. or 100 feet if facility Class I reliability is provided and if high-level disinfection is 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.

On a similar note, the Florida Water Resource Act, Section 373, F.S., established a program for regulating the consumptive use of water in Florida and divided the state into five water management districts charged with responsibility for implementing the consumptive use regulatory program. Santa Rosa County falls within the boundaries of the Northwest Florida Water Management District. Consumptive Use is regulated under Chapter 40C-2, F.A.C., Permitting of Consumptive Uses of Water.

Florida Public Service Commission

The 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 has been set out by Chapter 367, F.S., in the "Water and Wastewater System Regulatory Law." The commission establishes service standards that regulated utilities must meet. Section 367.171, F.S., provides for the adoption of a resolution where counties may transfer authority to regulate services to the Public Service Commission.

Additional State Statutes and Rules

In addition, the Potable Water Sub-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 1985, various sections of the State Plan have been amended. These amendments include the adoption of a new goal pertaining to "Health" and a new policy pertaining to "Agriculture", which are applicable to the Potable Water 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".

These policies require Santa Rosa County to ensure the cleanliness of potable water to safeguard the environment from effects of pollution to the treatment of wastewater discharges and to protect the health of the citizens of the County.

Several amendments have also been made to Chapter 163, F.S., which indirectly affect the Potable Water 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 potable water, 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. In an attempt to promote redevelopment, urban infill development, and other strategies for urban revitilization, Chapter 163 also included a new

section, which mandates that "local government's comprehensive plans implementing development regulations must provide strategies which maximize the use of existing facilities and services."

The changes made to Rule 9J-5, F.A.C., include the addition of several terms and concepts which are included in the previous section, along with reinforcement of the ideas which are included in the State Comprehensive Plan.

C. Regional

Northwest Florida Water Management District

The Florida Water Resources Act of 1972 established the authority for management of the State's water resources through five water management districts under the Florida Department of Natural Resources (DNR). Among other things, the Act empowered the districts to permit well drilling and the withdrawal of ground water for consumptive use that is shown to be reasonable or beneficial. Later, the Florida Environmental Reorganization Act of 1975 created the Department of Environmental Regulation (DER) and transferred all its powers and functions of the DNR relating to water management. Since 1975, the water management districts have function under the DER, which is now known as the Department of Environmental Protection (DEP), and generally have been delegated the primary responsibility for quantity-related aspects of water management under general statutory authority as contained in Chapters 403 and 373, F.S.

Santa Rosa County falls within the Northwest Florida Water Management District (NWFWMD). The NWFWMD is responsible for managing water supplies to meet existing and future demand. The authority of the District includes regulation over water well permitting, water quality provisions, the permitting and construction of public water systems, underground storage tank requirements, and public water system non-compliance requirements. The District's rules pertinent to Santa Rosa County include Chapter 40D-2, F.A.C., which governs Consumptive Use Permitting, Chapter 40D-3, F.A.C., which governs Well Construction permitting, and Chapter 40D-5, F.A.C., which governs Artificial Recharge/Water Reuse permitting. In addition, the Water Management Districts are a source of technical information on the geology and hydrology of areas within their respective jurisdiction.

The method of managing water supplies through consumptive use permitting requires that a permit be issued for all uses of ground or surface water which:

- Exceed 100,000 gallons per day (estimated on an average annual basis); or
- Is from a facility (wells, pumps, etc.) or facilities which are capable of withdrawing 1,000,000 gallons of water per day or more; or
- Is from a well in which the outside diameter of the largest permanent water bearing casing is six inches or greater.

Consumptive Use Permit (CUP) applications must show reasonable or beneficial use of the water being withdrawn and that there is no interference with existing legal uses of water.

All water wells, regardless of size, must comply with Florida's well construction standards. Permits are required for the construction, alteration, repair or abandonment of water wells with an inside diameter of 2 inches or greater. Chapter 17-524, F.A.C., provides requirements for the prevention of new potable water well contamination. Chapter 17-531, F.A.C., establishes licensing requirements for water well contractors. The Water Management Districts process applications and renewal requests for water well contractors. Chapter 17-532, F.A.C., establishes minimum standards for the aforementioned circumstances with the intent to conserve and protect the groundwaters of the state. The Water Management Districts have been

delegated administration and enforcement of Chapters 17-524 and 17-532, F.A.C., standards by the DEP. The Department of Health has been delegated implementation of testing and clearing for use of new potable water wells by the DEP.

Approved in February 2001, the *Regional Water Supply Plan* (RWSP) for Santa Rosa, Okaloosa and Walton counties was developed by the Northwest Florida Water Management District to address current and future water supply issues in the region. The RWSP identifies current water sources, current and future water demands within the region, as well as alternative water supply sources that will meet and exceed the region's water needs through the 2020-planning horizon. The RWSP also identifies strategies to better determine the ability of current and alternative sources to meet the region's future demands.

West Florida Regional Planning Council

The West Florida Regional Planning Council (WFRPC) adopted the Strategic Regional Policy Plan (SRPP) in 1996. The SRPP sets standards, as well as goals, objectives and policies to ensure water quantity and quality to meet current and future demands. These issues are discussed in further detail in the Natural Resources of Regional Significance section of the Plan.

D. Local

Santa Rosa County Utility Board

On the local level, the Santa Rosa County Health Department and the Northwest Florida Water Management District are responsible for the enforcement of the drinking water standards and permitting of the public water supply system. 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 water 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.

Santa Rosa County Utility Regulations

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.

Santa Rosa County Concurrency Management Regulations

Article 5 of the County's Land Development Code addresses Concurrency Management. In relation to potable water 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.

9-4 DATA AND ANALYSIS

A. Existing Conditions

In Santa Rosa County, the source of groundwater is either the shallower surficial aquifer, known as the Sand-and-Gravel Aquifer, or the deeper Floridan Aquifer. According to the Northwest Florida Water Management District, the Sand-and-Gravel Aquifer is the principal source for potable water in Santa Rosa and Escambia Counties. Water from the Floridan Aquifer is used in the southern portion of the County and the Sand-and-Gravel Aquifer is used in the central and northern portion of the County.

A.1 Hydrogeology

The hydrology of the West Florida Region consists of four major aquifers: the Surficial Aquifer System, which includes the Sand-and-Gravel Aquifer, the Floridan Aquifer, Sub-Floridan System, and the Intermediate System. The composition of the Floridan System and Surficial Aquifer System allows for the storing and transmitting of ground water to, from, and throughout the respective aquifer. Each of these Systems is different, however, in that each has different water yielding properties due to variations in composition and thickness.

The thickness of the Surficial Aquifer System is variable. Its thickness ranges from a few feet to as much as 300 feet in the western part of the Region. In most of Santa Rosa County and in all of Escambia County, the Surficial Aquifer System is the primary source of potable water and is commonly called the Sand-and-Gravel Aquifer. The primary components of this aquifer are sand, clays, and gravel, with sands being the primary component. East of the Choctawhatchee River the aquifer is thin and is a minor water-bearing layer.

A.2 Groundwater Quality

Water levels have steadily declined since water production began. Since pre-development times, water levels in the Floridan Aquifer have been lowered throughout all of Santa Rosa and Okaloosa counties and about half of Walton County. Heads are presently below MSL throughout much of coastal Santa Rosa, Okaloosa and Walton counties. At its lowest, the potentiometric surface is depressed as much as 150 ft. below MSL. This head reversal reflects a maximum loss of about 200 ft. The net result of water level declines is a regionally significant cone of depression.

Within the three counties that make up Region II, Santa Rosa, Okaloosa and Walton, the cone of depression has grown in an asymmetrical fashion. Head declines are greatest (both areally and vertically) in the western half of the Region. The asymmetrical growth is driven by the relatively higher recharge in Walton County, as compared to Santa Rosa and Okaloosa counties. Heads in northern Walton County are virtually unaffected by current pumping elsewhere in the region.

The substantial depression of the potentiometric surface puts wells in coastal parts of the Region at risk for saltwater intrusion. The Ghyben-Herzberg principle states that for every foot of potentiometric surface head above sea level, there are 40 feet of freshwater below land surface. For one foot of drawdown, there is a theoretical 40-foot rise of saline water from below. Along the coastline, areas exist with naturally occurring ground waters that exceed drinking water standards. These areas include much of coastal Santa Rosa and Walton counties. For example, along Santa Rosa Island, sodium exceeds its standard from the vicinity of the Santa Rosa/Okaloosa county line west to Gulf Breeze and beyond. On the mainland, at Navarre, sodium is near its standard. In the Tiger Point area, both sodium and chloride have concentrations around 500 mg/L. In a large area of Walton County south of Choctawhatchee Bay, both sodium and chloride are at or above their respective water quality standards. In addition, at some unknown distance

south of the Gulf shoreline, Floridan Aquifer ground water everywhere south of Okaloosa County exceeds sodium and chloride standards. As a result, the 250 mg/L isochlor may be conceptualized as a broad, shallow arc, onshore in coastal Santa Rosa County, offshore south of Okaloosa County, and onshore again in coastal Walton County. Please refer to *Map 11-5*, Potentiometric Surface of the Floridan Aquifer System, in Appendix A.

To date, water produced from the Floridan Aquifer in coastal Region II has been little affected by the deterioration of water quality. Prior to the cessation of their use, water from Navarre Beach wells was regularly exceeding the sodium standard (160 mg/L) and experiencing increasing chloride concentrations. In coastal Walton County, selected wells owned by Florida Community Services Corp. have experienced increases in both sodium and chloride concentrations. Elsewhere, temporal concentration trends are relatively stable.

Continuation of the cone will eventually result in more widespread deterioration of water quality in supply wells and is, therefore, unsustainable. These factors lead to the current level of concern about the Region's ground water resources. As a consequence, long-term alternatives and options for new sources of water are needed to alleviate or prevent future problems anticipated with the continued use of the Floridan Aquifer in coastal areas. However, systems located in the transition zone very near to the non-potable portions of the Floridan Aquifer have already been impacted.

In Santa Rosa County where the Sand-and-Gravel Aquifer is the primary source for water supply, the aquifer is fully capable of providing a sustainable supply of water to meet the projected ~~2020~~2025 demands. However, under present pumping conditions, the Floridan Aquifer is susceptible to saltwater encroachment in the coastal part of Region II. To address this threat, the NWFWMD ~~is currently~~has develop~~ing~~ged, in cooperation with the three counties and coastal utilities dependent on Floridan Aquifer withdrawals, a density-dependent, solute transport model. The model, when completed, will be used to assess the severity of the saltwater encroachment problem and determine the sustainability of current Floridan Aquifer withdrawal patterns.

A.3 Environmental Constraints

Water quality is the main groundwater problem in Santa Rosa County for two reasons: (1) susceptibility of saline-water intrusion from the Gulf of Mexico and Santa Rosa Sound and upconing from the Floridan Aquifer along the coast and (2) susceptibility of the surficial aquifer to contamination from human activities. Such activities include the dredging of canals, which may create an avenue for saltwater to enter the surficial aquifer system, the spilling or leaking of chemicals into the ground and septic tanks percolating to the water table.

The greatest need for potable water is along the coast where the population is more concentrated. Excessive pumping of the Floridan Aquifer along the coast increases the possibility of more widespread saltwater intrusion. The trend toward developing well fields farther inland will help to alleviate this problem. Well fields along the coast should be monitored periodically for chlorides and pumping rates should be adjusted to prevent excessive drawdown, which causes saltwater intrusion.

Saline water intrusion impacts the water supply in three ways: (1) in areas where water in the Floridan Aquifer is potable, upconing of saline water can raise the chloride concentration above drinking water standards; (2) in areas of heavy irrigation, a higher salinity of Floridan water percolates into the surficial aquifer therefore raising the chloride and sulfate concentration in the surficial aquifer. As the salinity of the irrigation water increases, the rate of contamination of the surficial aquifer due to percolation increases; and (3) in severe cases, upconing of poorer quality water may cause the water to become too saline for

irrigation. Lowering of the potentiometric surface and increased contamination of the surficial aquifer is also contributed to by free-flowing or leaky wells.

Leaking of chemicals into the ground is also an area of concern in Santa Rosa County. Air Products and Sterling Fibers are both under permit requirements from DEP to cleanup a plume of contaminated groundwater on their sites associated with various spills and incidents over the years. In addition, EPA has identified one site in Santa Rosa County as being on their Comprehensive Environmental Response Compensation and Liability Act (CERCLA) list. This list identifies EPA's potential Super Fund sites. The site identified is Naval Air Station, Whiting Field.

B. Existing Community Water Systems

Within Santa Rosa County, water supply systems large enough to require consumptive use permits from the Department of Environmental Protection (DEP) fall into one of three categories: Community Water Systems, Non-Transient Non-Community Water Systems, and Non-Community Water Systems. These systems may be either public systems or privately owned. In Santa Rosa County, there are fifteen (15) Community Water Systems, four (4) Non-Transient, Non-Community Water Systems, and eight (8) Non-Community Water Systems permitted by DEP. A complete list of these facilities, as supplied by the Department of Environmental Protection (DEP), is shown in *Table 9-1. Map 9-1* (Appendix A) depicts the Potable Water Service Areas in Santa Rosa County.

Table 9-1
Water Supply Systems in Santa Rosa County

Name of Water System	*Location of Office*	*Population Served*	*Capacity (mgd)*
Community Water Systems			
Pace Water System, Inc.	Pace	~~36,750~~44,562	~~11.088~~14.8176
City of Milton Water System	Milton	~~16,220~~19,026	6.696
South Santa Rosa Utilities	Gulf Breeze	~~10,656~~11,980	6.480
Midway Water System, Inc.	Gulf Breeze	~~11,500~~16,074	~~4.896~~5.400
Holley-Navarre Water System	Navarre	~~31,825~~45,504	~~4.752~~15.696
East Milton Water System	Milton	~~11,645~~11,178	~~3.756~~5.328
Point Baker Water System, Inc.	Milton	~~9,233~~10,794	~~3.154~~4.2336
NAS Whiting Field	Milton	~~3,559~~2,785	2.448
Gulf Breeze Water Department	Gulf Breeze	~~5,922~~6,300	~~2.160~~1.800
Bagdad-Garcon Water System	Milton	~~5,436~~7,879	~~2.016~~3.240
Chumuckla Water System, Inc.	Pace	~~3,629~~4,382	~~1.908~~2.124
Navarre Beach Water System	Navarre Beach	~~4,591~~5,277	1.872
Moore Creek-Mt. Carmel Utilities	Jay	~~3,570~~3,707	~~1.296~~1.872

Table 9-1
Water Supply Systems in Santa Rosa County

Name of Water System	*Location of Office*	*Population Served*	*Capacity (mgd)*
Berrydale Water System	Milton	~~2,187~~3,020	~~1.008~~1.800
City of Jay Utilities Department	Jay	~~2,152~~1,848	~~0.864~~0.792
	Total	*~~158,875~~194,316*	*~~54.394~~74.5992*
Non-Transient Non-Community Water Systems			
Sterling Fibers, Inc.	Pace	385	1.152
Blackwater Forest Headquarters	Milton	100	0.216
~~Blackwater Career Development Center~~Santa Rosa Juvenile Residential Facility	Holt	~~70~~25	~~0.094~~0.0936
Choctaw Field – NAS	Milton	30	-
Blackwater Stop Camp	Munson	~~33~~41	~~0.065~~0.0648
	Total	*~~585~~540*	*~~1.462~~1.5264*
Non-Community Water Systems			
Evans Cedar Lakes RV Campground	Milton	~~25~~35	0.115
Blackwater River State Park	Holt	100	0.112
Bear Lake Recreation Area	Milton	25	0.086
Camp Paquette Recreation Area	Milton	25	0.086
~~Blackwater Stop Camp~~	~~Munson~~	~~3341~~	~~0.0650.0648~~
Camp Koinonia	Milton	30	0.043
Munson Country Store	Milton	25	0.029
Coldwater Recreation Area	Milton	~~50~~25	0.028
Adventures Unlimited	Milton	150	0.036
	Total	*~~313~~415*	*~~0.564~~0.535*
Total Capacity for all DEP Permitted Water Systems			*~~56.42~~76.6606 mgd*

Source: Florida Department of Environmental Protection, ~~November 2002~~March 2009

B.1 Publicly Owned Community Water Systems

The best available information on the County-owned systems has been obtained from DEP and the County's consulting engineers' various reports over the past years. These reports contain valuable assessments of not only the current condition of the County's public facilities, but also the improvements necessary to accommodate existing and future populations. The County has been making ongoing improvements to its systems through the years as needed and in conformance with these reports. Information for the other public community water systems has been obtained from DEP and the NWFWMD.

City of Milton Water System

The City of Milton Water System has the largest capacity of the publicly owned community water systems in Santa Rosa County with a design capacity of 6.696 mgd. This system is a chlorination, pH adjustment and fluoridation treatment plant for the treatment of six Surficial Aquifer wells. After treatment, the water is stored in five elevated storage tanks with 100,000 to 300,000-gallon capacities.

The City of Milton system serves both residential and commercial development. In ~~2000~~2008, the system had ~~5,793~~6,967 service connections and served a population of ~~16,220~~19,026. The average daily demand was ~~2,138,545~~1.96 million gallons per day and the maximum daily demand was ~~3,396,000~~3.00 million gallons per day. This produces a level of service of ~~132~~103 gallons per person per day for the City of Milton System.

NAS Whiting Field Water System

The NAS Whiting Field system is a GAC Filtration, pH adjustment, chlorination and fluoridation treatment plant for the treatment of three Surficial Aquifer wells. After treatment, the water is stored in four elevated storage tanks with 100,000-gallon capacity each. The design capacity of the plant is 2.448 mgd.

The NAS Whiting Field System serves the military base only. In ~~2001~~2008, the system had 166 service connections and served a population of 2,785. The average daily demand was ~~482,545~~244,538 gallons per day and the maximum daily demand was ~~1,006,000~~634,000 gallons per day. This produces a level of service of ~~173~~87.8 gallons per person per day for the NAS Whiting Field System.

Gulf Breeze Water Department

The City of Gulf Breeze System is a filtration and chlorination treatment plant. The City of Gulf Breeze purchases its water from the ~~Escambia County Utility Authority~~Fairpoint Regional Utility System. After treatment, the water is stored in two storage tanks. One tank is a 1,000,000-gallon capacity ground storage tank and the other is a 100,000 gallon elevated storage tank. The design capacity of the plant is ~~2.16~~1.80 mgd.

The City of Gulf Breeze system serves both residential and commercial development. In ~~2000~~2008, the system had ~~2,500~~2,608 service connections and served a population of ~~5,922~~6,300. The average daily demand was ~~1,074,000~~811,741 gallons per day and the maximum daily demand was ~~1,499,000~~1,138,000 gallons per day. This produces a level of service of ~~181~~129 gallons per person per day for the City of Gulf Breeze System.

Navarre Beach Water System

Navarre Beach Utilities owns and operates the Navarre Beach Water System to serve the residents of Navarre Beach. The Navarre Beach water system is an orthophosphate and chlorination treatment plant for the treatment of two Floridan Aquifer wells. After treatment, the water is then stored in two elevated storage tanks with a 250,000 and 300,000 gallon capacity respectively. The design capacity of the plant is ~~2.21~~.872 mgd. Navarre Beach Utilities also purchases 400,000 gallons per day from the ~~Midway Water System~~Fairpoint Regional Utility System.

Navarre Beach Utilities serves both residential and commercial development. In ~~2001~~2008, the system had ~~1,743~~1969 service connections and served a population of ~~4,591~~5277. The average daily demand was ~~219,549~~531,038 gallons per day and the maximum daily demand was ~~999,000~~1,158,000 gallons per day. This produces a level of service of ~~48~~101 gallons per person per day for the Navarre Beach System.

City of Jay Utilities Department

The Jay System is an orthophosphate, pH adjustment and fluoridation treatment plant for the treatment of two Surficial Aquifer wells. After treatment, the water is stored in two elevated storage tanks with a 75,000 and 100,000-gallon capacity respectively. The design capacity of the plant is ~~0.864~~0.792 mgd.

The Town of Jay system serves both residential and commercial development. In ~~2000~~2008, the system had ~~571~~528 service connections and served a population of ~~2,150~~1,848. The average daily demand was ~~172,865~~214,737 gallons per day and the maximum daily demand was ~~500,000~~691,000 gallons per day. This produces a level of service of ~~80~~116 gallons per person per day for the Jay Water System.

B.2 Privately Owned Community Water Systems

There are 10 privately owned water systems permitted by DEP in Santa Rosa County. These systems are locally regulated by the Santa Rosa County Utility Board. Information for the privately owned community water systems has been obtained from DEP and the NWFWMD.

Pace Water System, Inc.

The design capacity of the Pace Water System is ~~11.088~~14.8176 mgd. The Pace Water system serves both residential and commercial development. In ~~2001~~2008, the system had ~~10,500~~12,732 service connections and served a population of ~~36,750~~44,562. The average daily demand was ~~3,444,977~~6,904,500 gallons per day and the maximum daily demand was ~~7,536,000~~ 13,624,000 gallons per day. This produces a level of service of ~~94~~155 gallons per person per day for the Pace Water system.

South Santa Rosa Utilities

The design capacity of the South Santa Rosa Utilities water system is 6.480 mgd. The South Santa Rosa Water system serves both residential and commercial development. In ~~1999~~2008, the system had ~~3,976~~4,470 service connections and served a population of ~~10,656~~11,980. The average daily demand was ~~950,000~~913,757 gallons per day and the maximum daily demand was ~~1,300,000~~1,293,000 gallons per day. This produces a level of service of ~~90~~76 gallons per person per day for the South Santa Rosa Water system.

Midway Water System, Inc.

The design capacity of the Midway Water System is ~~4.896~~5.4 mgd. The Midway Water system serves both residential and commercial development. In ~~2001~~2008, the system had ~~3,300~~5,394 service connections and served a population of ~~11,500~~16,074. The average daily demand was ~~2,295,008~~1,570,216 gallons per day and the maximum daily demand was ~~3,861,500~~3,061,569 gallons per day. This produces a level of service of ~~200~~98 gallons per person per day for the Midway Water system.

Holley-Navarre Water System

The design capacity of the Holley-Navarre Water System is ~~4.752~~15.696 mgd. The Holley-Navarre system serves both residential and commercial development. In ~~2002~~2008, the system had ~~9,093~~13,001 service connections and served a population of ~~31,825~~45,504. The average daily demand was ~~2,051,150~~13,248,263 gallons per day and the maximum daily demand was ~~4,006,000~~17,455,300 gallons per day. This produces a level of service of ~~65~~291 gallons per person per day for the Holley-Navarre system. *Need to resolve the separation of Holley-Navarre and Fairpoint as the numbers include all the Fairpoint wells.*

East Milton Water System

The design capacity of the East Milton System is plant is ~~3.756~~5.328 mgd. The East Milton system serves both residential and commercial development. In ~~1999~~2008, the system had ~~3,061~~3,487 service

connections and served a population of ~~10,713~~11,178. The average daily demand was ~~1,099,727~~2,291,033 gallons per day and the maximum daily demand was ~~2,148,000~~4,435,000 gallons per day. This produces a level of service of ~~103~~205 gallons per person per day for the East Milton system.

Point Baker Water System, Inc.

The design capacity of the Point Baker Water System is ~~3.154~~4.2336 mgd. The Point Baker system serves both residential and commercial development. In ~~2000~~2008, the system had ~~2,638~~3,084 service connections and served a population of ~~9,233~~10,794. The average daily demand was ~~893,473~~1,772,743 gallons per day and the maximum daily demand was ~~1,792,000~~3,656,000 gallons per day. This produces a level of service of ~~97~~164 gallons per person per day for the Point Baker system.

Bagdad-Garcon Water System

The design capacity of the Bagdad-Garcon System is ~~2.016~~3.24 mgd. The Bagdad-Garcon system serves both residential and commercial development. In ~~2001~~2008, the system had ~~1,553~~2,251 service connections and served a population of ~~5,436~~7,879. The average daily demand was ~~466,182~~909,547 gallons per day and the maximum daily demand was ~~832,000~~1,683,000 gallons per day. This produces a level of service of ~~86~~115 gallons per person per day for the Bagdad-Garcon system.

Chumuckla Water System, Inc.

The design capacity of the Chumuckla Water System is ~~1.908~~2.124 mgd. The Chumuckla system serves both residential and commercial development. In ~~2001~~2008, the system had ~~1,037~~1,252 service connections and served a population of ~~3,629~~4,382. The average daily demand was ~~278,059~~502,902 gallons per day and the maximum daily demand was ~~737,000~~1,653,000 gallons per day. This produces a level of service of ~~77~~115 gallons per person per day for the Chumuckla system.

Moore Creek-Mt. Carmel Utilities

The design capacity of the Moore Creek-Mt. Carmel water system is ~~1.296~~1.872 mgd. The Moore Creek-Mt. Carmel system serves both residential and commercial development. In ~~2001~~2008, the system had ~~1,020~~1,059 service connections and served a population of ~~3,570~~3,707. The average daily demand was ~~354,275~~378,061 gallons per day and the maximum daily demand was ~~694,000~~1,074,000 gallons per day. This produces a level of service of ~~99~~102 gallons per person per day for the Moore Creek-Mt. Carmel system.

Berrydale Water System

The design capacity of the Berrydale Water System is ~~1.008~~1.8 mgd. The Berrydale system serves both residential and commercial development. In ~~2001~~2008, the system had ~~625~~863 service connections and served a population of ~~2,187~~3,020. The average daily demand was ~~189,642~~483,850 gallons per day and the maximum daily demand was ~~350,000~~831,000 gallons per day. This produces a level of service of ~~87~~ 160gallons per person per day for the Berrydale system.

B.3 Fire Protection

The responsibility for evaluating and classifying the adequacy of fire protection in an area lies within the Insurance Service Office (ISO). The ISO has established a classification scheme to evaluate areas within defined fire department service areas with ratings of one to ten, with one representing the highest level of fire protection and ten representing the lowest level of fire protection or no protection at all. The classification scheme is based upon the evaluation of many different aspects of an area, including the water supply system, the serving fire department, and the alarm notification system. The evaluation of the water supply system represents 40 percent of the total evaluation and covers the system storage capacity, pump capacity, emergency supply sources (defined as systems and facilities not ordinarily in use), supplemental suction supply sources for use by the fire department including surface water sources, wells, cisterns, water supply carried by the fire department in tanker trucks, transmission and distribution network

capacity to deliver fire flow and the distribution, type frequency of inspection and the condition of the available fire hydrants. The fire protection within a department service area is used by insurance companies in setting homeowner's insurance rates.

Santa Rosa County currently has seventeen (17) defined fire department districts. These districts serve all portions of the County. The majority of the subdivisions within the County have been equipped with the necessary fire fighting equipment (i.e. fire hydrants, etc.). However, in a few isolated incidents, the fire department continues to use tanker trucks where this equipment is not present. These facilities have been given split classification under the ISO classification system. The primary rating, or the first number in the representative rating, indicates the rating for facilities that are located within five miles of an existing fire station and are within 1,000 feet of a fire hydrant. On the other hand, the second classification number is for facilities that are within 5 miles of an existing fire station, but are not within 1,000 feet of a fire hydrant. In this latter case, the highest obtainable rating is 9 (on the one through ten scale). The 11 districts with split ISO ratings have at least a 9 secondary rating. The 17 districts in Santa Rosa County have primary ratings in the range of 4 to 8.

C. Potable Water Analysis

C.1 Water Demand Factors

Future water use will consist of several major components: domestic, industrial and agricultural water uses. Except for agriculture water, demand for these categories will increase proportionally to the increase in population and the changes in land use. It is anticipated that water use patterns in the near future will closely follow those of the present. It should be recognized that future water demand projections were prepared using today's patterns, which do not consider extreme changes in water use practices or substantial increases in industrial or other demands. However, the introduction of one large water-dependent industry could substantially alter water use in Santa Rosa County. *Table 9-2*shows the projected demand for potable water in ~~2020~~2025 (projected from 1995 Consumptive Use Permit and average day demand figures).

Table 9-2
Projected Water Demand (MGD) By Category
Santa Rosa County, ~~2020~~2025

	GROUND	*SURFACE*	*TOTALS*
Public Supply	~~21.1~~26.85	0.0	~~21.1~~26.85
Domestic/Small Public	~~0.9~~1.39	0.0	~~0.9~~1.39
Com./Industrial	~~8.2~~8.70	0.0	~~8.2~~8.70
Agricultural Irrigation	0.5	0.0	0.5
Recreational Irrigation	~~2.6~~2.44	0.0	~~2.6~~2.44
Thermoelectric Power Generation	0.0	0.0	0.0
Total	*~~33.3~~39.88*	*0.0*	*~~33.3~~39.88*

Source: Regional Water Supply Plan for Santa Rosa, Okaloosa and Walton Counties Water Supply Planning

C.2 Water Demand for Santa Rosa County Community Water Systems

Santa Rosa County has fifteen (15) Community Water Supply utilities that have a total combined capacity of ~~54.394~~74.5992 mgd. The average day and maximum day demand (calculated for the year~~s 1999, 2000, or 2001~~2008 for individual water systems) for each water system is identified in *Table 9-3*. Additionally, the ~~2020~~2025 projected average day demand is shown in the table. As Table 9-3 indicates, the Community Water Systems in Santa Rosa County currently have excess capacity and are projected to have excess capacity in ~~2020~~2025.

Table 9-3
Current and Projected Water System Capacity and Demand
Santa Rosa County

Water System	*Design Capacity (mgd)*	*~~2000~~2008 Demand (mgd)*		*Projected ~~2020~~2025 Average Day Demand / surplus (deficit) (mgd)*
		Average Day Demand	*Maximum Day Demand*	
Coastal Water Systems				
South Santa Rosa Utilities	6.480	~~0.950~~0.914	~~1.300~~1.293	~~1.44 / 5.04~~1.07/5.41
Midway Water System, Inc.	~~4.896~~5.400	~~2.295~~1.570	~~3.862~~3.062	~~1.47 / 3.43~~4.33/1.07
Holley-Navarre Water System	~~4.752~~15.696	~~2.051~~13.248	~~4.006~~17.455	~~3.73 / 1.02~~ 2.64/13.056
Gulf Breeze Water Department	~~2.160~~1.800	~~1.074~~0.812	~~1.499~~1.138	~~1.11 / 1.05~~2.27/(0.47)
Navarre Beach Water System	1.872	~~0.220~~0.531	~~0.999~~1.158	~~0.43 / 0.87~~0.30/1.572
Total Coastal Water Systems	*~~20.16~~31.248*	*~~6.59~~17.075*	*~~11.666~~24.106*	*~~11.98~~10.61*
Inland Water Systems				
Pace Water System, Inc.	~~11.088~~14.8176	~~3.445~~6.905	~~7.536~~13.624	~~4.68 / 6.41~~5.72/9.0976
City of Milton Water System	6.696	~~2.139~~1.961	~~3.396~~7.462	~~2.64 / 4.06~~3.27/3.426
East Milton Water System	~~3.756~~5.328	~~1.020~~2.291	~~2.148~~4.435	~~1.85 / 1.91~~ 2.63/2.698
Point Baker Water System, Inc.	~~3.154~~4.2336	~~0.893~~1.773	~~1.792~~3.656	~~(No projection)~~1.48/2.7536
NAS Whiting Field	2.448	~~0.483~~0.245	~~1.006~~0.634	(No projection)
Bagdad-Garcon Water System	~~2.016~~3.240	~~0.466~~0.910	~~0.832~~1.683	~~0.70 / 1.32~~1.29/1.95
Chumuckla Water System, Inc.	~~1.908~~2.124	~~0.278~~0.503	~~0.737~~1.653	~~0.43 / 1.48~~0.69/1.434
Moore Creek-Mt. Carmel Utilities	~~1.296~~1.872	~~0.354~~0.378	~~0.694~~1.074	~~0.62 / 0.68 0.50~~/1.372
Berrydale Water System	~~1.008~~1.800	~~0.190~~0.484	~~0.350~~0.831	~~0.43 / 0.58~~ 0.37/1.43
City of Jay Utilities Department	~~0.864~~0.792	~~0.173~~0.215	~~0.500~~0.691	~~0.27 / 0.59~~0.29/0.502
Total Inland Water Systems	*~~34.234~~43.3512*	*~~9.441~~15.665*	*~~18.991~~35.743*	*16.24-*
Total County Community Water Systems	*~~54.394~~74.5992*	*~~16.031~~32.74*	*~~30.657~~59.849*	*-26.85*

Sources: Florida Department of Environmental Protection, ~~November 2002~~Janvy 2009; Regional Water Supply Plan for Santa Rosa, Okaloosa and Walton Counties~~, July 2000~~October 2006, Northwest Florida Water Management District.

The "coastal" utilities are those located within the Water Resource Caution Area on Fair Point Peninsula and Santa Rosa Island south of Eglin AFB. Coastal utilities obtain water from a combination of sources including; purchases of Sand-and-Gravel Aquifer water from ~~Escambia County Utilities Authority (ECUA)~~Fairpoint Regional Utility System, Sand-and-Gravel Aquifer water obtained within the utilities' service areas, and the Floridan Aquifer. The dependence of the coastal utilities on the Floridan Aquifer has raised questions about the long-term sustainability of that portion of the water supply. In contrast, the "inland" utilities are primarily dependent on the Sand-and-Gravel Aquifer, which is capable of providing for the 2020 demands in a sustainable manner.

D. Level of Service Standard

The level of service (LOS) standard for potable water facilities providing service in Santa Rosa County is100 gallons per capita per day (average demand).

D.1 Projected Ability to Meet Los Standard

The future potable water demand was calculated using the established LOS standard listed above which includes residential and non-residential flows. The 2000, 2010 and 2020 year demands were calculated using the peak seasonal projected populations for Santa Rosa County from Table 3-6 of the Future Land Use Element, and assuming that capital improvements planned for the water systems are completed. No population projections have been made for individual water systems in the county. Total capacity is based on the combined capacity of the fifteen community water systems described in Section B. *Table 9-4* describes the potable water demand and capacity.

Table 9-4
Projected Potable Water Demand and Capacity
Community Water Systems - Santa Rosa County

Year	*Permanent Population*	*Seasonal Population*	*Total Population*	*Total Demand @ LOS 100 gpcd*	*Countywide Capacity*
2000	117,743	3,496	123,239	12.324 mgd	54.394 mgd
2010	~~152,872~~148,200	~~4,144~~2,328	~~159,026~~150,~~528~~	~~15.903~~15.053 mgd	~~54.394~~74.599 mgd
2015	162,850	2,667	165,517	16.552 mgal	74.599
2020	~~188,800~~177,500	~~5,051~~3,092	~~195,871~~180,~~592~~	~~19.587~~ 18.059mgd	~~54.394~~74.599 mgd
2025	191,200	3,584	194,784	19.478 mgal	74.599

Source: Tables 3-5 and 3-6, Future Land Use Element (for population figures); text of this element for capacity figures.

E. Protection of Potable Water Quality and Quantity

E.1 Well Field Areas of Influence

Land use activities can reduce the quality and quantity of water infiltrating into the aquifer, which can directly affect the County's potable water supplies. In the case of the well field areas of influence, rain which infiltrates into the soil within the area of influence may be drawn down into the well field cone of depression and thus into the County's wells. Any activity on the land surface that reduces the quantity of water infiltrating into the aquifer can directly affect the water supply. For this reason, the area of influence is the most important of the areas having significant water resource potential. Activities within the area of influence which can directly influence the water supply are listed below:

- Paving or covering soils of excellent to good recharge potential;
- Overdrainage of water table by use of deep ditches;
- Over pumping of private wells for irrigation of lawns;
- Excavation and recontouring of soils of excellent to good recharge potential;
- Development of wetlands;
- Seepage of contaminants such as hazardous or toxic substances into the soil.

The majority of water that infiltrates into the local aquifer comes through soils having excellent to good recharge potential. These soils are essential to the continuous recharge of the County's water supply. Development in areas where such soils are located can result in paving and covering of these soils so that less recharge reaches the local aquifer. Limiting impervious cover of these soils and making provision for no reduction of recharge are ways to mitigate the effects of development in highly pervious soils.

Ditches that are excavated below the water table have the potential to lower the historic water table in the vicinity of the ditch. Ditches that are below the water table and which are perpendicular to the flow of groundwater have very high potential for lowering the water table. The lowering of the water table has a two-fold effect: a lower water table reduces the volume of water available for public supply and increases the potential for saltwater intrusion. Designing ditches or swales which are higher than the water table, diversion of discharge to retention facilities for subsequent percolation into the groundwater system, minimizing ditches which are perpendicular to groundwater flow and piping of surface runoff will help reduce the adverse impacts of drainage facilities on the water table. Lakes, retention ponds and detention ponds have the same effect as ditches if they are excavated below the water table. Where possible, such drainage facilities should be designed as dry facilities except during operation.

When owners of private wells in the vicinity of the well fields pump water from the local aquifer, they reduce the volume of water available for public supply as well as lower the water table. Over pumpage during droughts can lead to further reduction of water levels and increase the potential for saltwater intrusion. Except during emergency conditions, such as droughts, the County has little control of pumpage from private wells. However, the County may take steps to reduce outside irrigation by encouraging the use of drought resistant grasses and better irrigation practices. Education of the public on irrigation and fertilization practices could help homeowners develop lawns with deeper root systems and thus more capable of going several days between waterings.

Development of wetlands has significant impact within the area of influence of well fields. Because of the very nature of wetlands, to develop such areas requires drainage facilities. The high water table in the wetland can create problems during construction and during periods of high rainfall. Ditching and drainage facilities are designed to lower the water table of the wetland. The wetland area can serve as a means of maintaining the water table in the area around the wetland. Usually, the wetland area is at lower elevations

than the surrounding land. Groundwater flow is often toward the wetland and the rate at which water is discharged to the wetland is balanced by the evapo-transpiration losses of the wetland. Draining the wetland and lowering the water table will also lower the water table of the surrounding land, thus reducing water storage in the aquifer and the volume of water available for public supply. During periods of drought, the wetland may serve as a source of recharge for the aquifer and thus reduce the adverse impact of the drought. If development is allowed, it should be a type that requires no drainage construction or impact to the water table.

The vulnerability of the groundwater system to hazardous and toxic substances has recently become an important issue to purveyors of public supplies. Such contaminants include heavy metals and a wide variety of inorganic and organic compounds such as solvents, pesticides, fertilizers, herbicides, radionuclides and petroleum products. In addition to these compounds, other pollutants include viruses and microorganisms found in sewage and waste products from industrial processes. Potential sources of these contaminants are listed below:

- Landfills and dumps
- Underground storage tanks and pipelines
- Septic tanks
- Direct industrial and/or municipal discharges
- Leaks from sewer lines
- Stormwater runoff
- Land application of fertilizers, pesticides and chemicals
- Accidental, indiscriminate spills or-dumping

Santa Rosa County does not currently have a welhead protection ordinance, although it does prohibit the location of septic tanks within 200 feet of a public supply water well. To help deal with potential contamination, the County plans to establish Wellhead Protection Areas (WHPA) around each public water supply well to reduce the potential of groundwater contamination. The protection ordinance will prohibit activities including, but not limited to: landfills and dumps, underground storage tanks and pipelines, septic tanks, direct industrial and/or municipal discharges, leaks from sewer lines, storm water runoff, land application of fertilizers, pesticides and chemicals and accidental indiscriminate spills or dumps.

E.2 Areas of Groundwater Recharge

The areas of groundwater recharge to the shallow aquifer are located in certain areas of the County. These areas are important to fresh water resources because they directly affect the volume of recharge entering the local aquifer. Activities that can reduce the beneficial use of these areas include:

- Paving or covering soils of excellent to good recharge potential.
- Over drainage of water table by use of deep ditches.

Both of the above activities were discussed above. The areas of groundwater recharge outside well field areas of influence are important to the County's overall water resources. Though water recharging the aquifer in these areas does not enter the public supply, it is available to homeowners through private wells. Water pumped for irrigation by individuals reduces demand on the public supply and thus enables the recharge within the area of influence to be used to supply more customers. Also, should the water table level drop in these areas, the potential for saltwater intrusion will increase with subsequent possible impact on the well fields. Thus, a reduction in recharge potential can have serious consequences throughout the County.

E.3 Wetlands, Lakes and Floodplains

Wetlands help maintain groundwater levels and remove some pollutants present in stormwater runoff. Wetlands also serve as storage areas for stormwater. Development is one activity which threatens the beneficial use of wetlands. Development invariably leads either to drainage of the wetland, filling or in some cases, both. As used in this sub-element, a wetland refers to areas which are naturally wet during much of the year or have a water table within 6 inches of the surface for at least 3 months of the year. A wetland area includes swamps, marshes and lakes. Frequently, wetlands can be determined by the types of natural vegetation or soils. The 100-year floodplain is the area that has probability of flooding in any one year out of a hundred. The 100-year floodplain frequently encompasses an area larger than the adjacent wetlands.

The filling of the 100-year floodplain may not reduce the water table, but it does have the adverse impact of reduction of storage volume within the 100-year floodplain. When the floodplain is filled, the storage-volume is displaced by an amount equal to the volume of fill. When floods occur, the water elevation will rise to higher levels because of the reduction of storage. The higher flood levels could affect residences or businesses to the extent that they are flooded (whereas before the floodplain was filled, these establishments did not flood). To prohibit the loss of floodplain, the County should limit development in the floodplain by requiring compensating storage whenever the 100-year floodplain is filled.

E.4 Water Conservation Programs

Another key element to potable water supply planning involves protection of the water resources available through conservation. In order to offset the growing demands placed on the Floridan and Surficial Aquifer, conservation practices that should be implemented include supply management and demand reduction.

Supply management practices include accurate metering, leak detection and pressure reduction. Meters are currently used to monitor water supply flow within the County. However, Santa Rosa County should employ a meter-testing program to audit the current program. Second, a leak detection program should be implemented as part of this auditing program to aid in conservation practices and to make system maintenance more efficient. Third, a load balancing program should be developed to better utilize existing facilities. Practices of this program should also involve pressure reductions where feasible.

Conservation through reduction involves three primary components. These practices include conservation rate structures, reuse of wastewater effluent (which is discussed in more detail in the Sanitary Sewer Element) and local water conservation ordinances. The characteristics of each utility and their respective customers determine the effectiveness of these practices.

Fairpoint Regional Utility

Due to the threat of saltwater intrusion, utilities in the coastal area have begun to implement plans to procure water from other sources. All of the current efforts by larger utilities to develop non-traditional sources are focused on inland ground water sources. This strategy is consistent with the recommendations of previous NWFWMD water supply planning efforts. The utilities are now in various stages of developing ground water supplies from inland areas located outside of their respective coastal zone service areas. Development of alternate sources will help these utilities meet future water demands and will enable them to minimize future coastal zone pumping from the Floridan Aquifer.

Fairpoint Regional Utility System (FRUS) is comprised of the City of Gulf Breeze, Midway Water System and Holley-Navarre Water System. Although not a FRUS member, the Santa Rosa County BOCC (Navarre Beach Water System) will receive water from the utility and is currently upgrading its wastewater treatment facility with four additional sprayfields and expanding its reuse program. In 1998, Eglin AFB granted Holley-Navarre, Midway and South Santa Rosa Utility System preliminary approval to build a pipeline through the Eglin Reservation along SR 87. The project is expected to be online in late 2002 or early 2003.

Water Resources Caution Area (WRCA)

In response to existing and anticipated water supply problems, the WMD has designated the coastal area of Santa Rosa, Okaloosa and Walton counties as a Water Resource Caution Area (WRCA). Please refer to *Map 11-6*, Water Resource Caution Areas, in Appendix A.

The WRCA designation subjects all non-exempt withdrawals to more rigorous scrutiny to ensure that the proposed withdrawal does not result in unacceptable impacts to the resource. Permittees within a WRCA also have increased water use reporting requirements, must implement water conservation measures, and must improve water use efficiencies. They are also required to perform an evaluation of the technical, environmental, and economic feasibility of providing reclaimed water for reuse. In Santa Rosa, Okaloosa, and Walton counties, the WCRA designation prohibits any new or expanded use of the Floridan Aquifer for nonpotable purposes.